Appendix O: HAZUS Results

Hazus: Flood Global Risk Report

Region Name: Andover_FL

Flood Scenario: Andover_Flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 1 square miles and contains 63 census blocks. The region contains over 1 thousand households and has a total population of 3,151 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 1,311 buildings in the region with a total building replacement value (excluding contents) of 565 million dollars. Approximately 92.68% of the buildings (and 82.42% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,311 buildings in the region which have an aggregate total replacement value of 565 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	465,593	82.4%
Commercial	48,915	8.7%
Industrial	10,756	1.9%
Agricultural	1,016	0.2%
Religion	3,670	0.6%
Government	17,765	3.1%
Education	17,173	3.0%
Total	**564,888**	**100%**

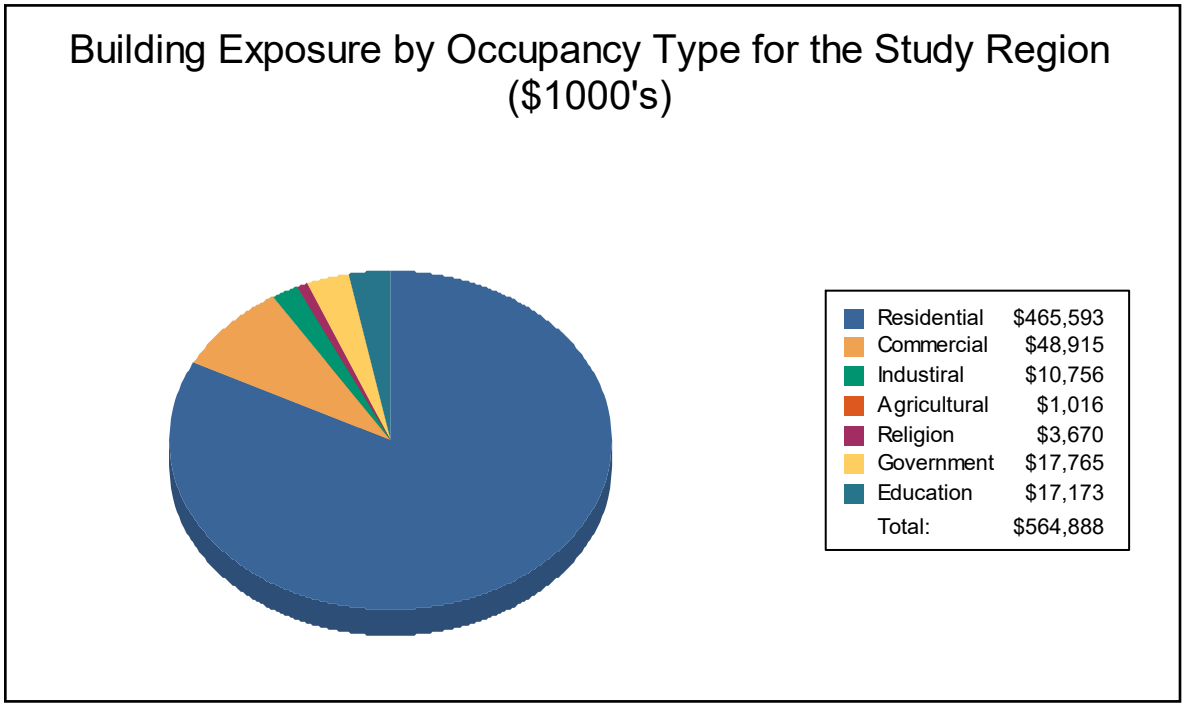
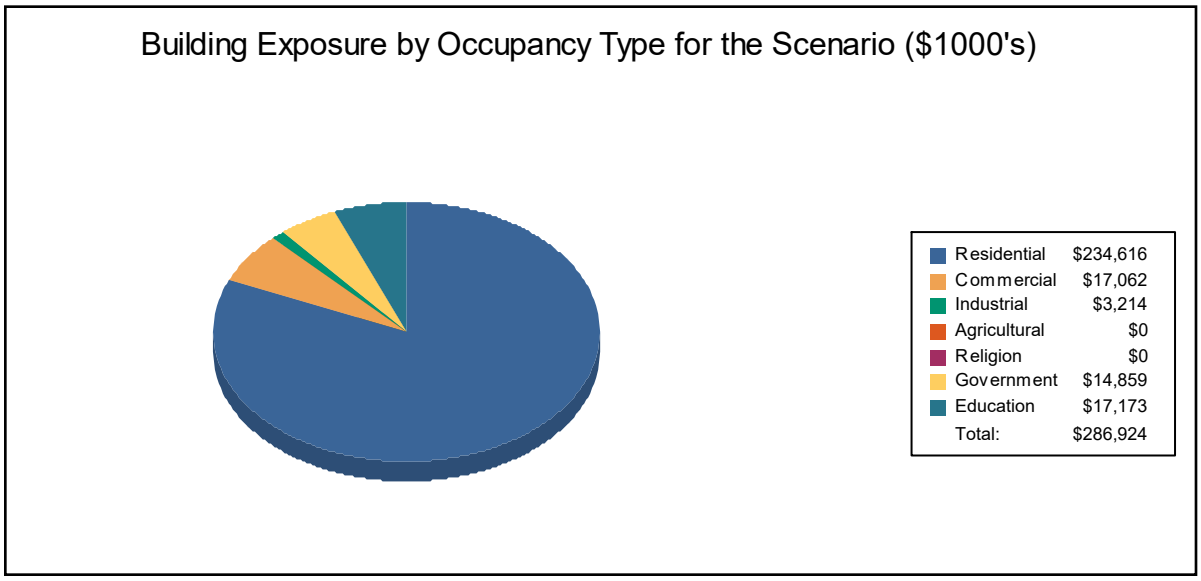


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	234,616	81.8%
Commercial	17,062	5.9%
Industrial	3,214	1.1%
Agricultural	0	0.0%
Religion	0	0.0%
Government	14,859	5.2%
Education	17,173	6.0%
Total	**286,924**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, 1 police station and 1 emergency operation center.

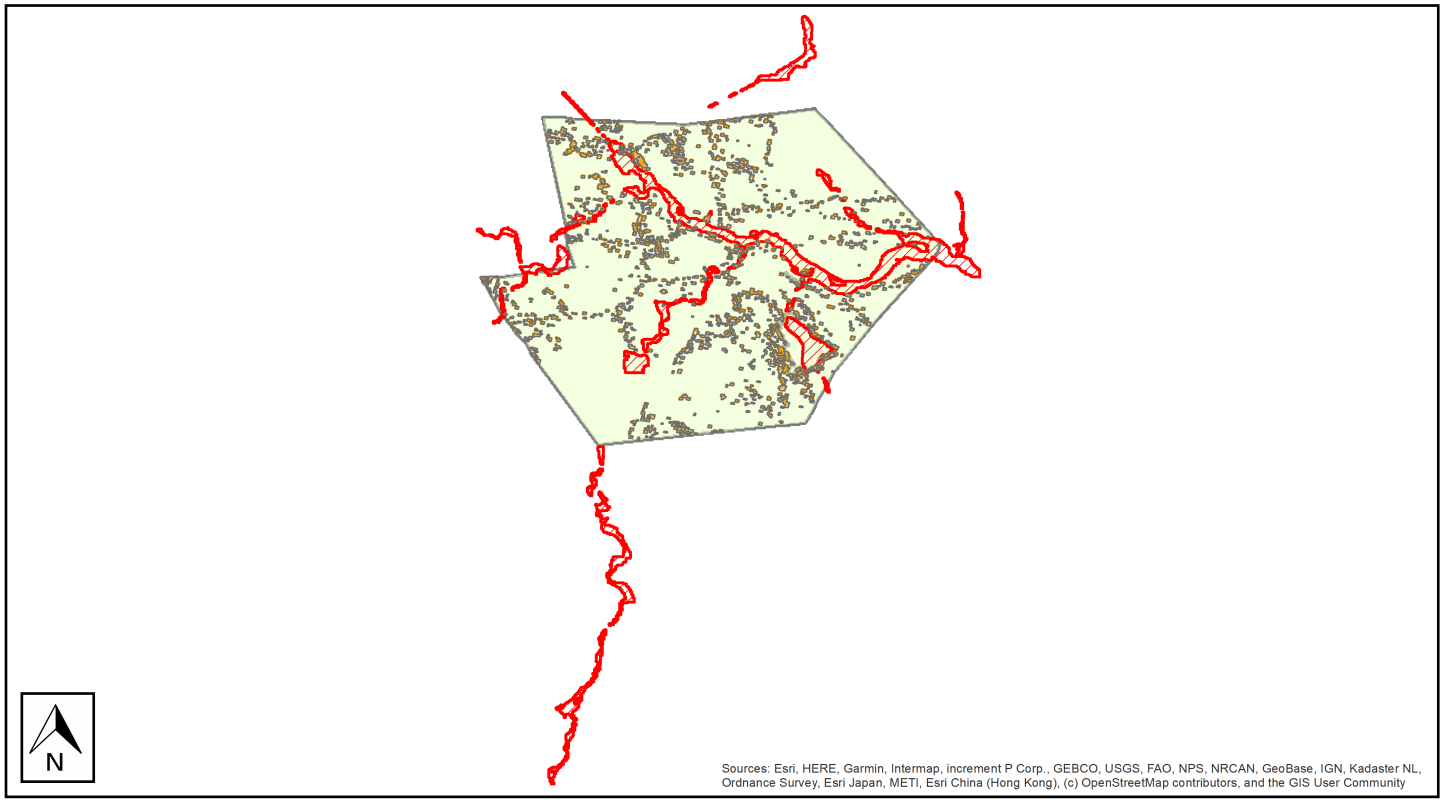
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Andover_FL
Scenario Name:	Andover_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

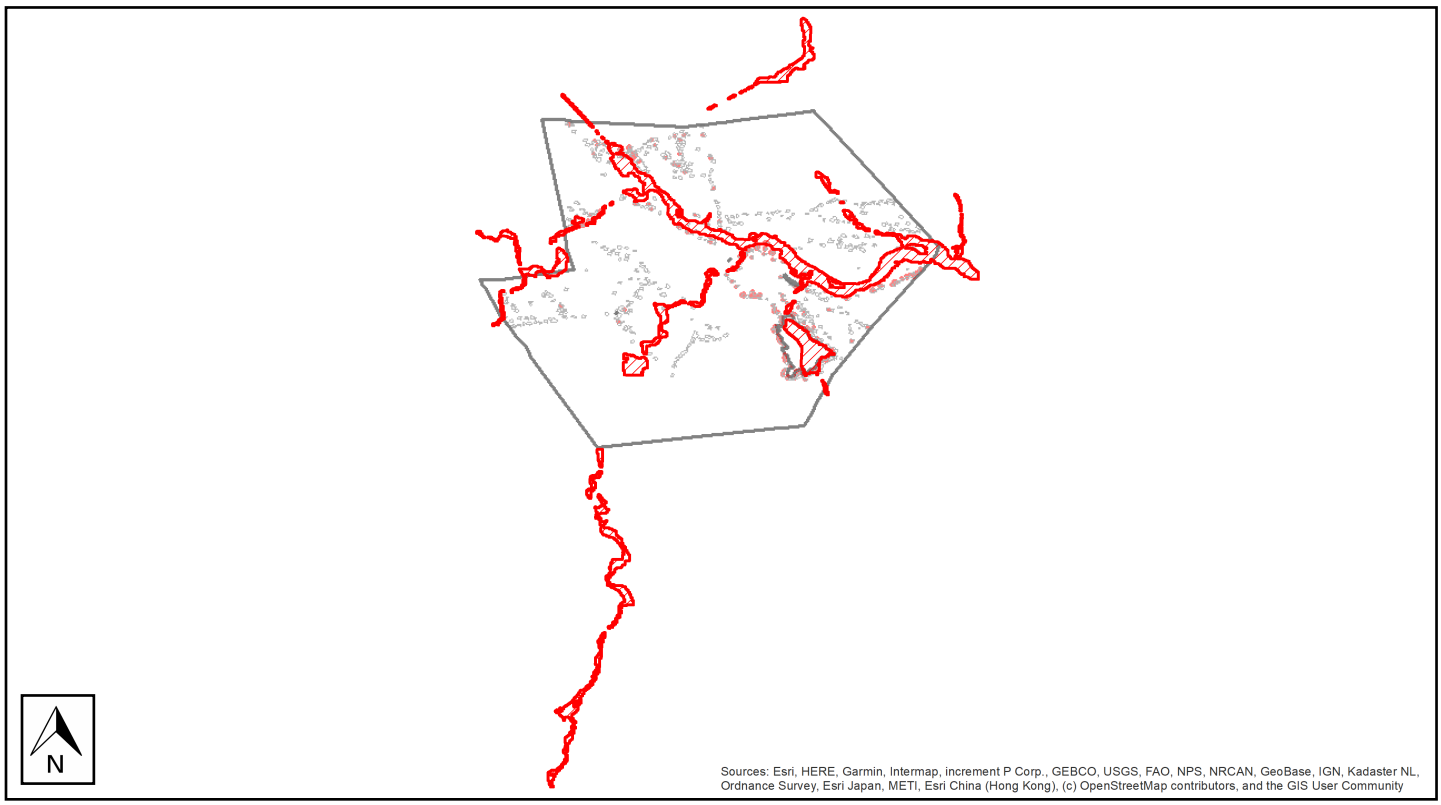


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	67	1	33	0	0	0	0	0	0	0	0
Total	**2**		**1**		**0**		**0**		**0**		**0**	

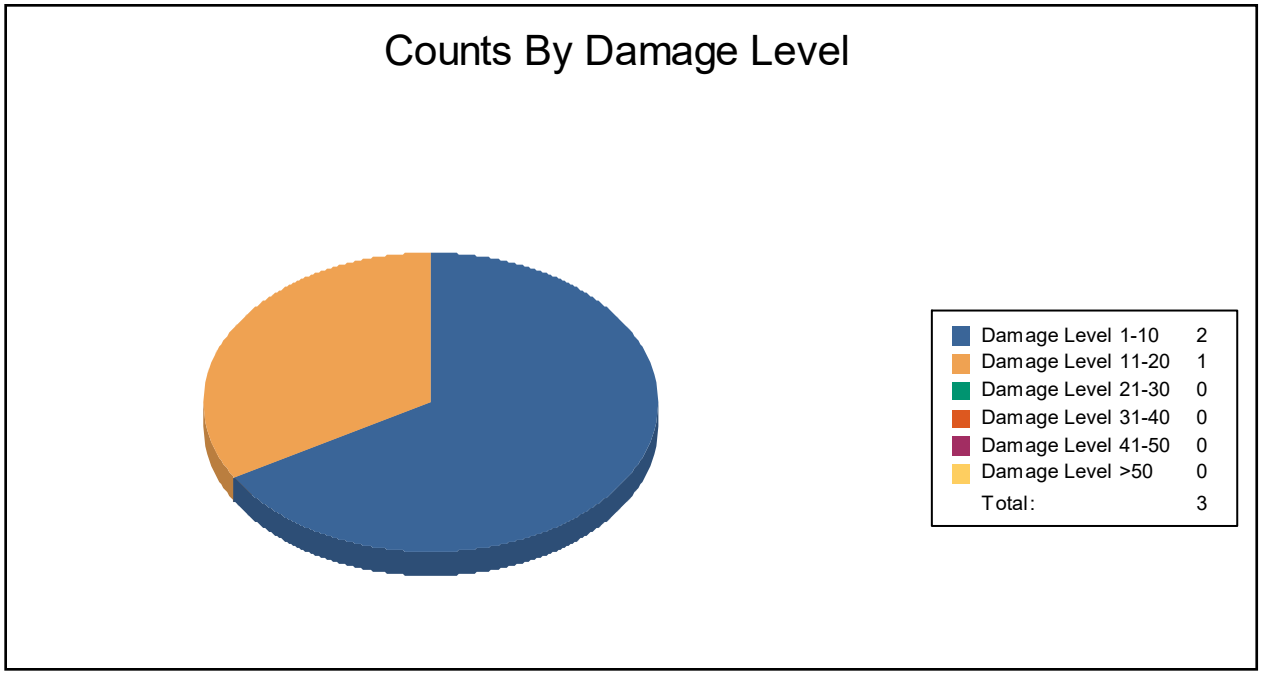


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	67	1	33	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

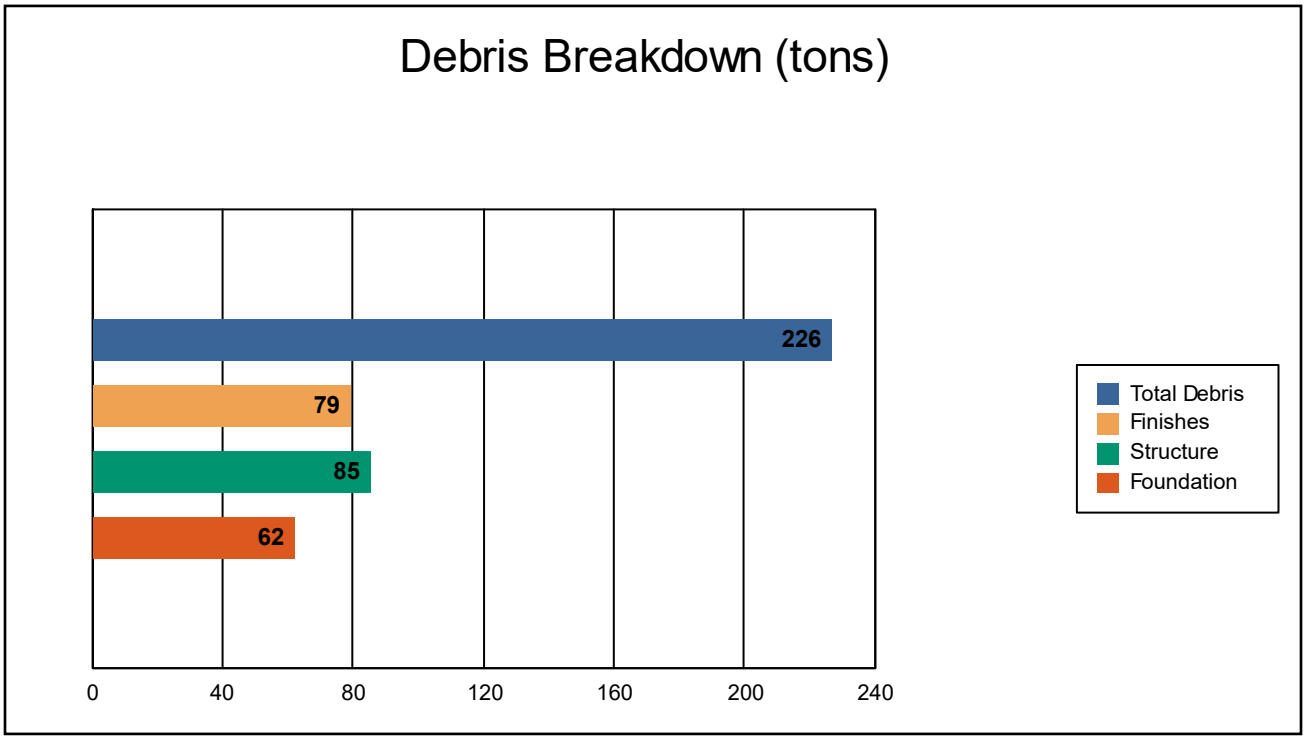
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

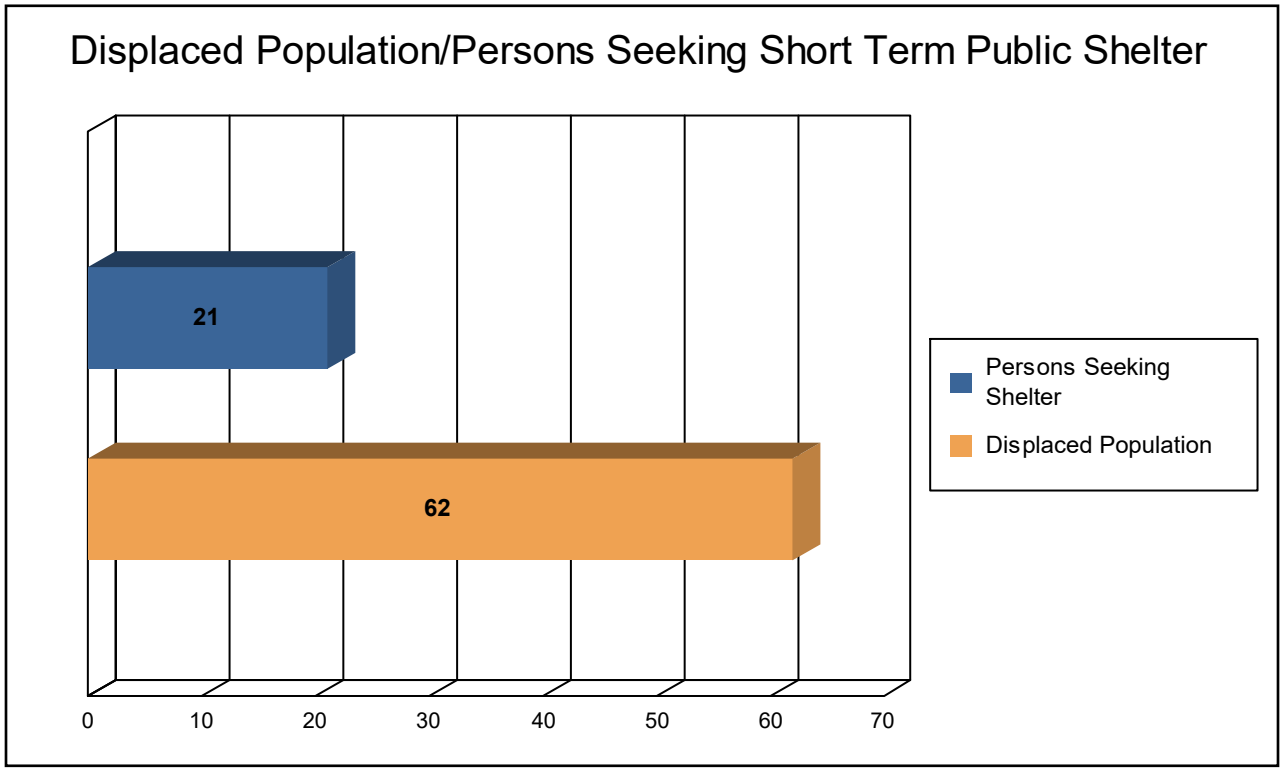


The model estimates that a total of 226 tons of debris will be generated. Of the total amount, Finishes comprises 35% of the total, Structure comprises 38% of the total, and Foundation comprises 27%. If the debris tonnage is converted into an estimated number of truckloads, it will require 10 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 21 households (or 62 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 21 people (out of a total population of 3,151) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 9.69 million dollars, which represents 3.38 % of the total replacement value of the scenario buildings.

Building-Related Losses

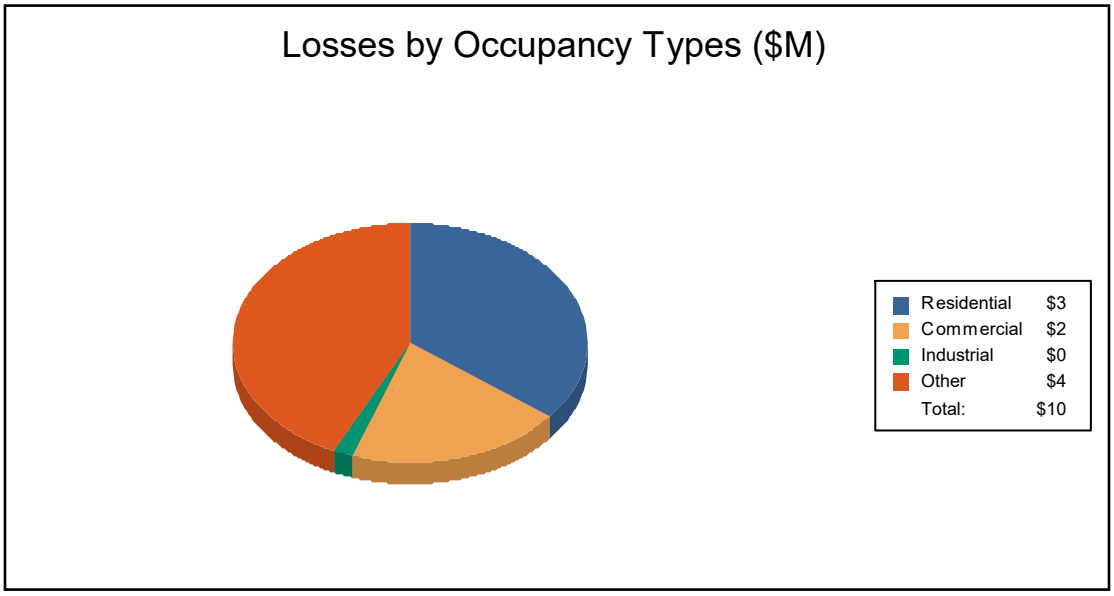
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 4.64 million dollars. 52% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 35.45% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.97	0.31	0.06	0.12	2.46
	Content	0.84	0.56	0.09	0.66	2.14
	Inventory	0.00	0.03	0.01	0.00	0.04
	Subtotal	**2.81**	**0.89**	**0.16**	**0.78**	**4.64**
Business Interruption						
	Income	0.00	0.54	0.00	0.25	0.79
	Relocation	0.48	0.11	0.00	0.12	0.71
	Rental Income	0.14	0.09	0.00	0.01	0.24
	Wage	0.00	0.30	0.00	3.00	3.31
	Subtotal	**0.62**	**1.03**	**0.01**	**3.38**	**5.04**
ALL	**Total**	**3.43**	**1.93**	**0.16**	**4.16**	**9.69**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,593	99,295	564,888
Total	**3,151**	**465,593**	**99,295**	**564,888**
Total Study Region	**3,151**	**465,593**	**99,295**	**564,888**

Hazus: Flood Global Risk Report

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Flood Scenario: Andover_Flood

Print Date: Wednesday, April 5, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
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Building Inventory

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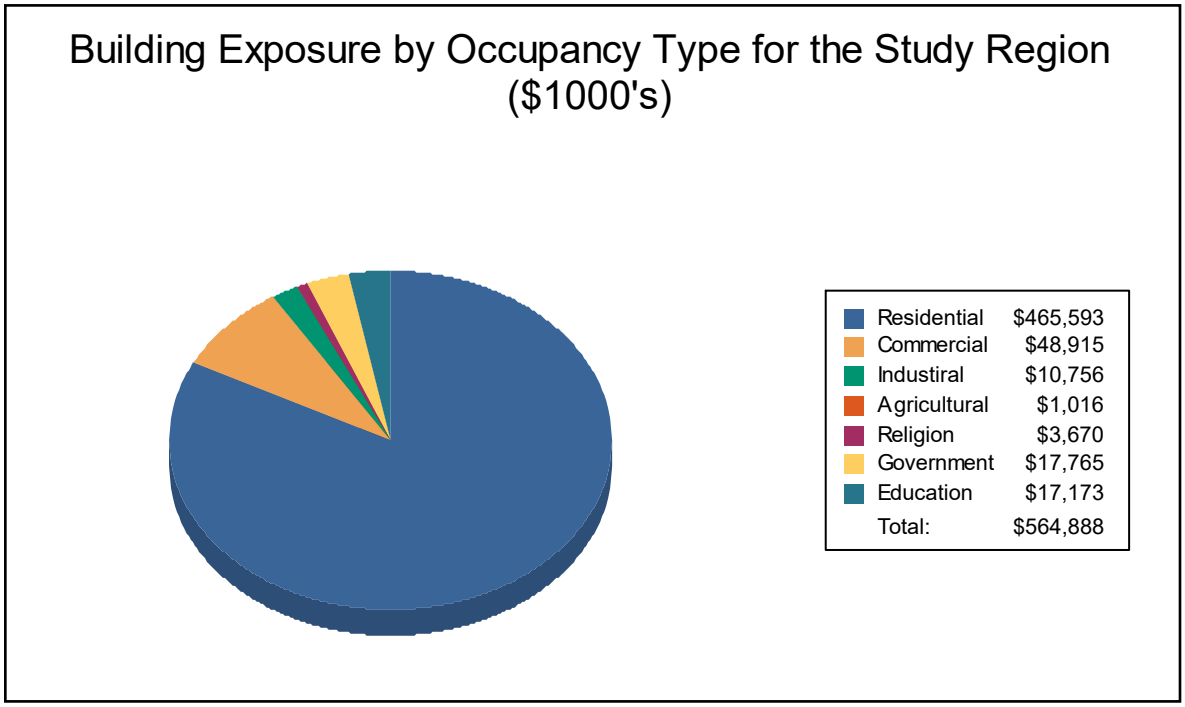

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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Commercial	17,062	5.9%
Industrial	3,214	1.1%
Agricultural	0	0.0%
Religion	0	0.0%
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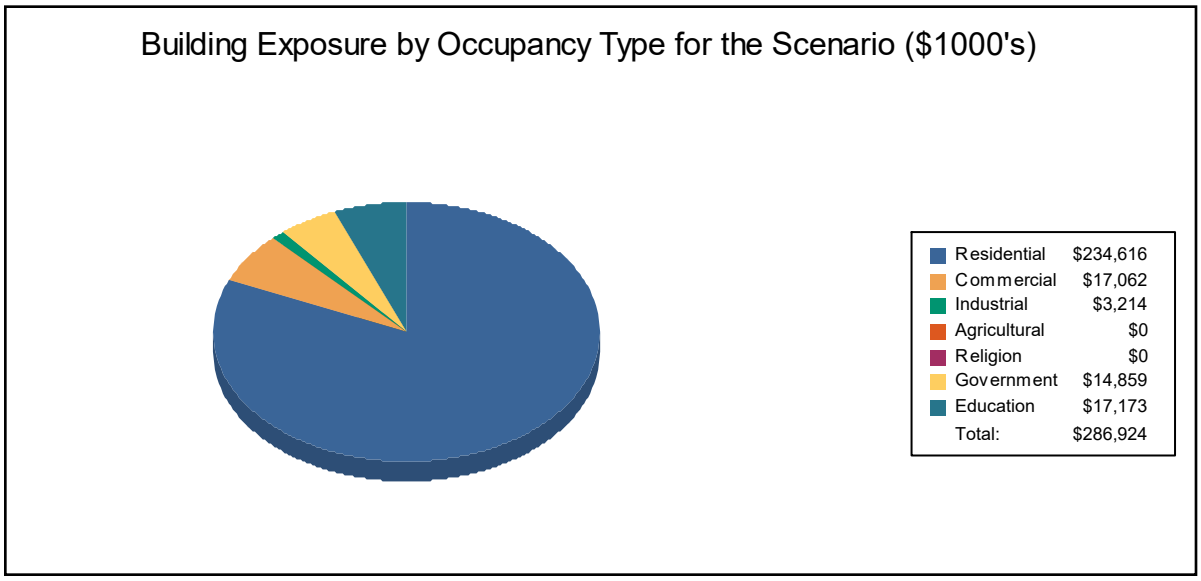
Total	**286,924**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, 1 police station and 1 emergency operation center.

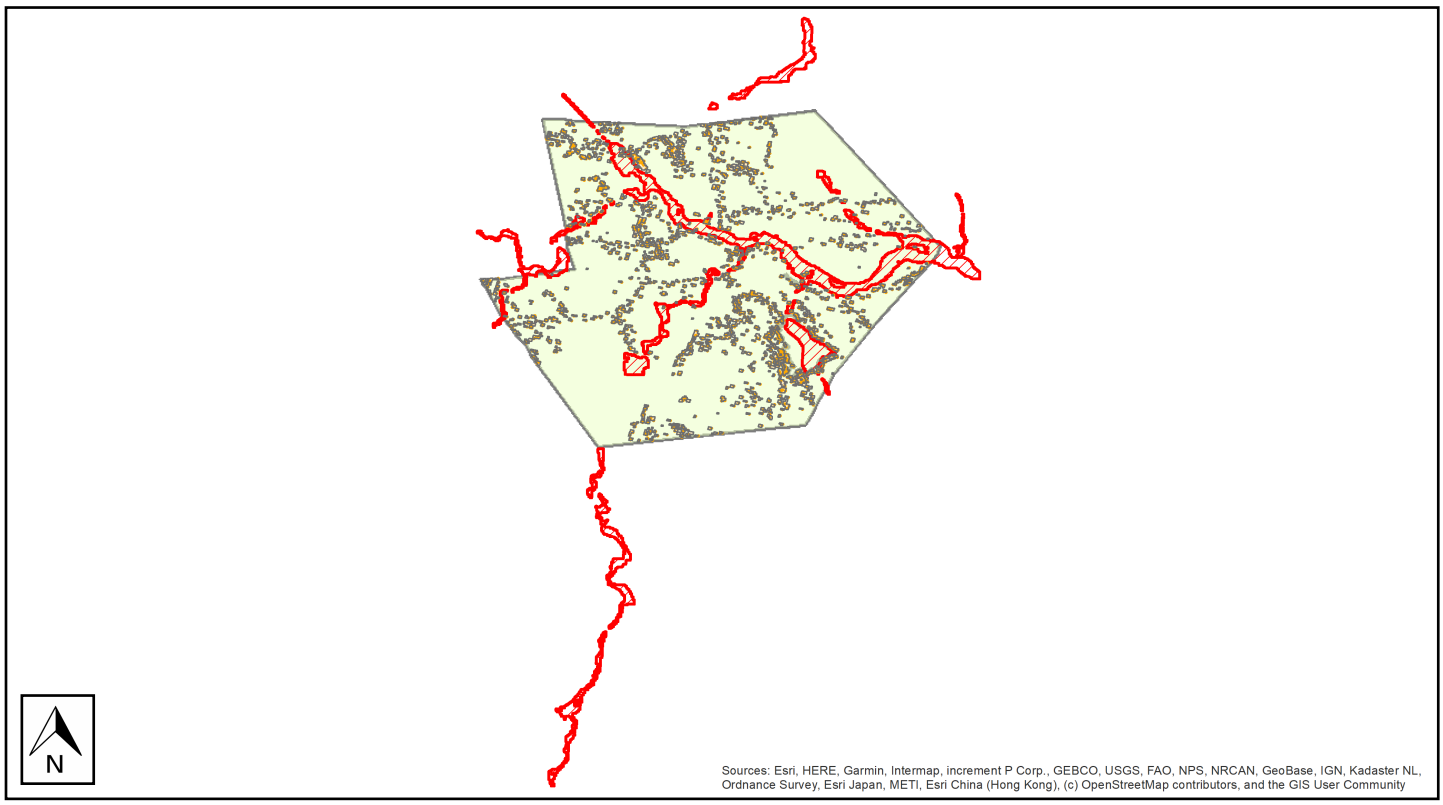
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Andover_FL
Scenario Name:	Andover_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

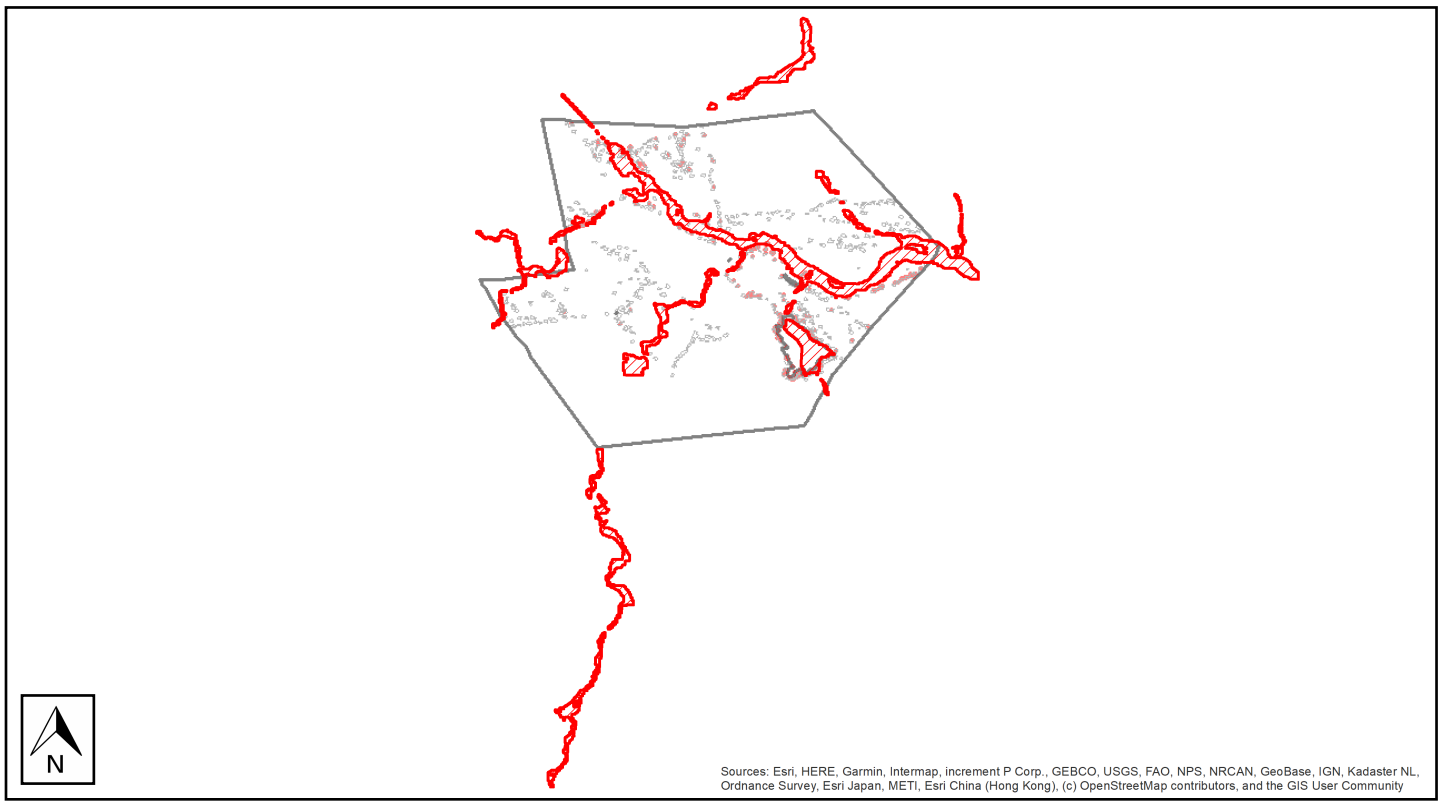


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	50	2	50	0	0	0	0	0	0	0	0
Total	**2**		**2**		**0**		**0**		**0**		**0**	

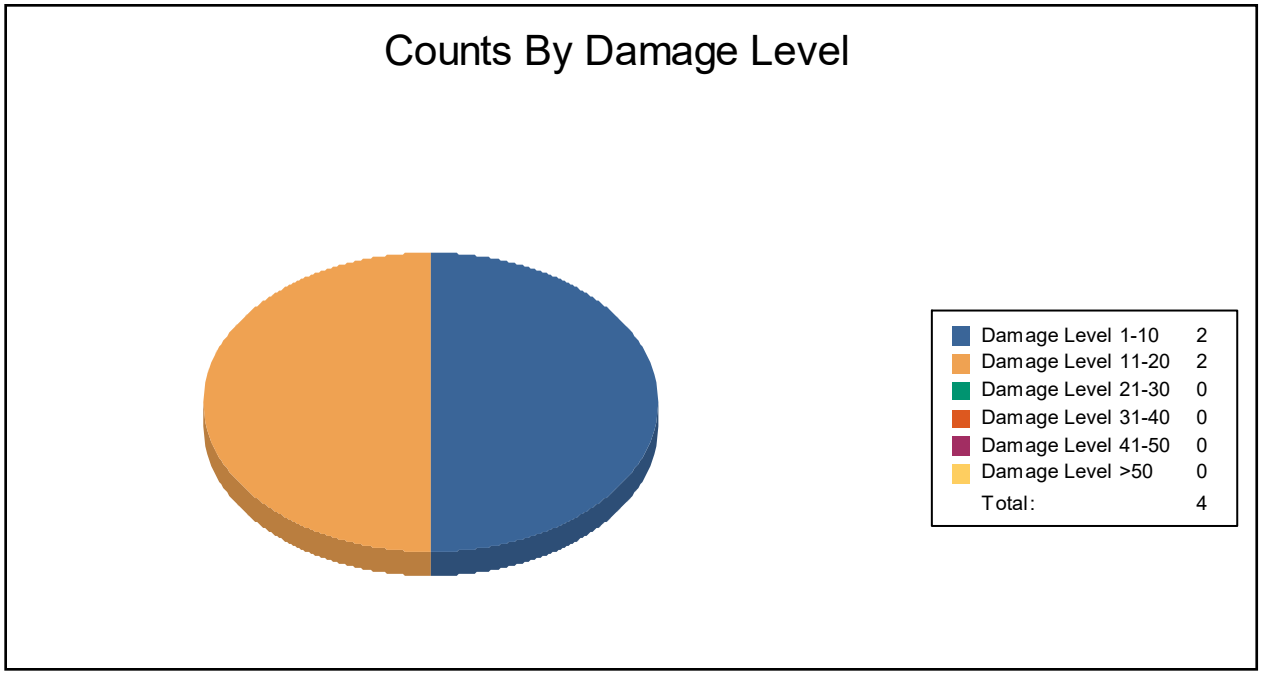


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	50	2	50	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

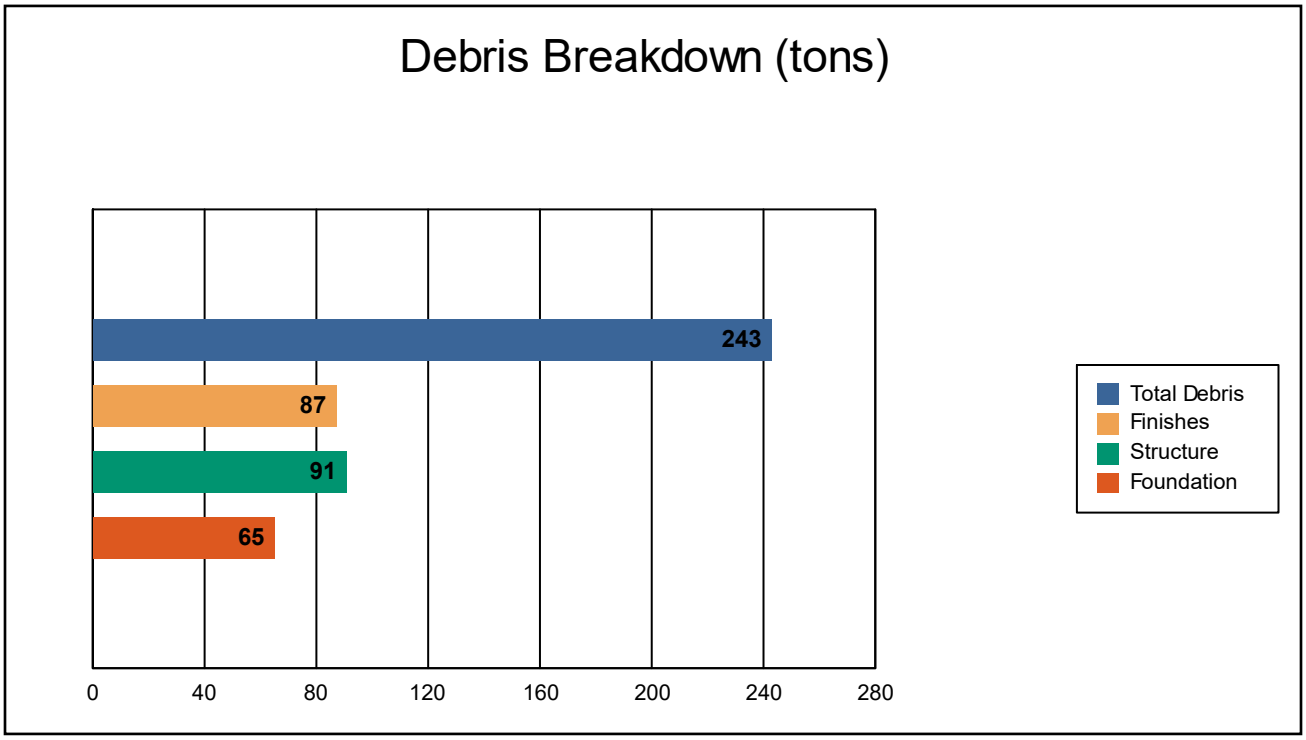
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

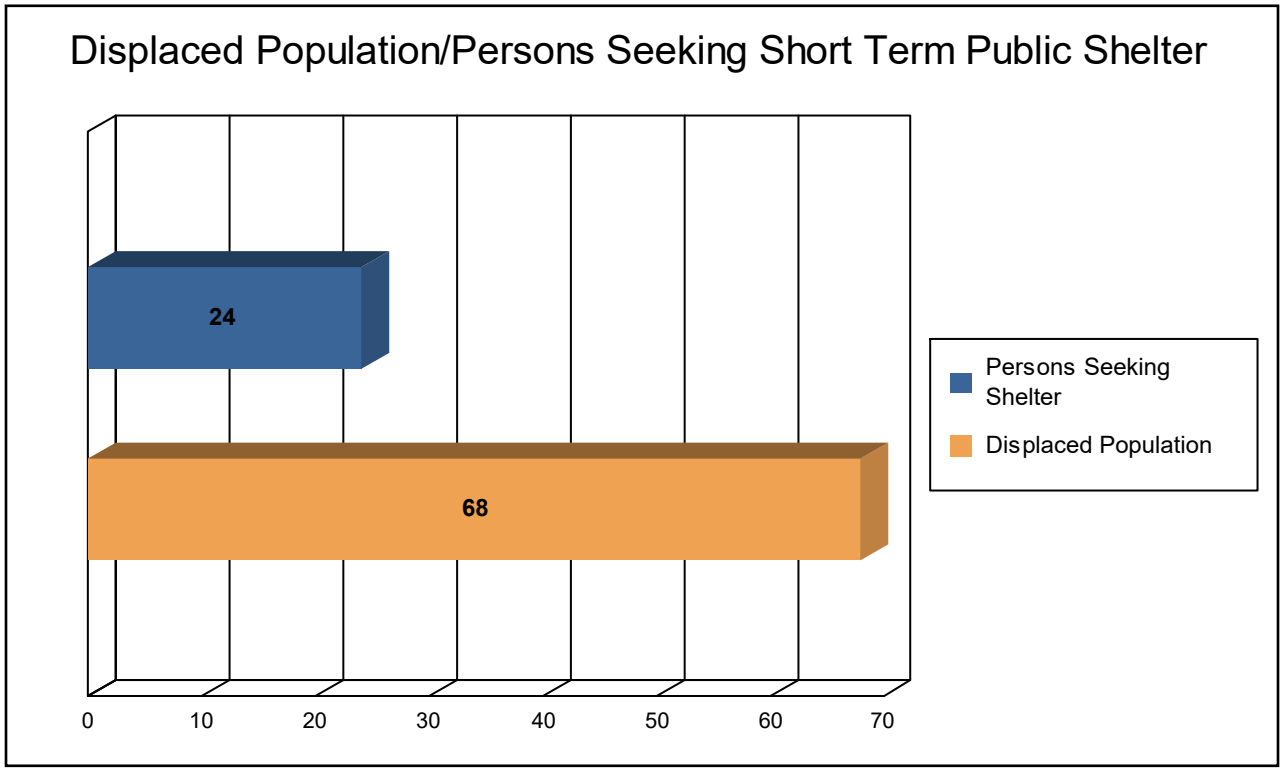


The model estimates that a total of 243 tons of debris will be generated. Of the total amount, Finishes comprises 36% of the total, Structure comprises 37% of the total, and Foundation comprises 27%. If the debris tonnage is converted into an estimated number of truckloads, it will require 10 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 23 households (or 68 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 24 people (out of a total population of 3,151) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 10.57 million dollars, which represents 3.68 % of the total replacement value of the scenario buildings.

Building-Related Losses

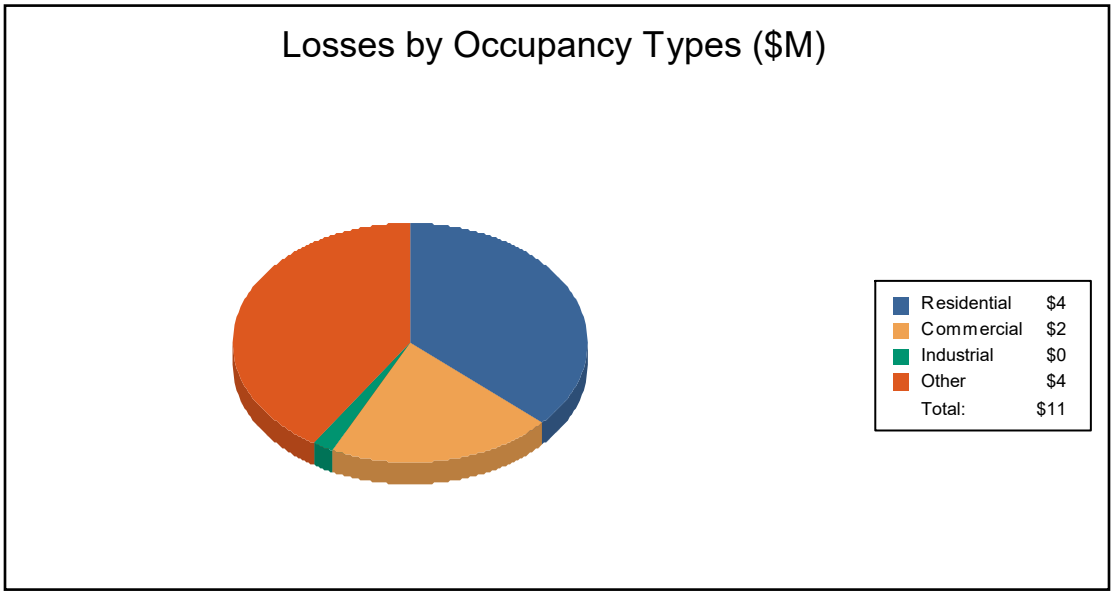
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 5.27 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 36.59% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.22	0.37	0.07	0.13	2.78
	Content	0.95	0.67	0.11	0.70	2.43
	Inventory	0.00	0.04	0.02	0.00	0.06
	Subtotal	**3.17**	**1.08**	**0.20**	**0.84**	**5.27**
Business Interruption						
	Income	0.00	0.59	0.00	0.25	0.84
	Relocation	0.55	0.11	0.00	0.12	0.78
	Rental Income	0.16	0.09	0.00	0.01	0.26
	Wage	0.00	0.34	0.01	3.09	3.43
	Subtotal	**0.70**	**1.12**	**0.01**	**3.47**	**5.30**
ALL	**Total**	**3.87**	**2.19**	**0.21**	**4.30**	**10.57**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,593	99,295	564,888
Total	**3,151**	**465,593**	**99,295**	**564,888**
Total Study Region	**3,151**	**465,593**	**99,295**	**564,888**

Hazus: Flood Global Risk Report

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Flood Scenario: Andover_Flood

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Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 1 square miles and contains 63 census blocks. The region contains over 1 thousand households and has a total population of 3,151 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 1,311 buildings in the region with a total building replacement value (excluding contents) of 565 million dollars. Approximately 92.68% of the buildings (and 82.42% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,311 buildings in the region which have an aggregate total replacement value of 565 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	465,593	82.4%
Commercial	48,915	8.7%
Industrial	10,756	1.9%
Agricultural	1,016	0.2%
Religion	3,670	0.6%
Government	17,765	3.1%
Education	17,173	3.0%
Total	**564,888**	**100%**

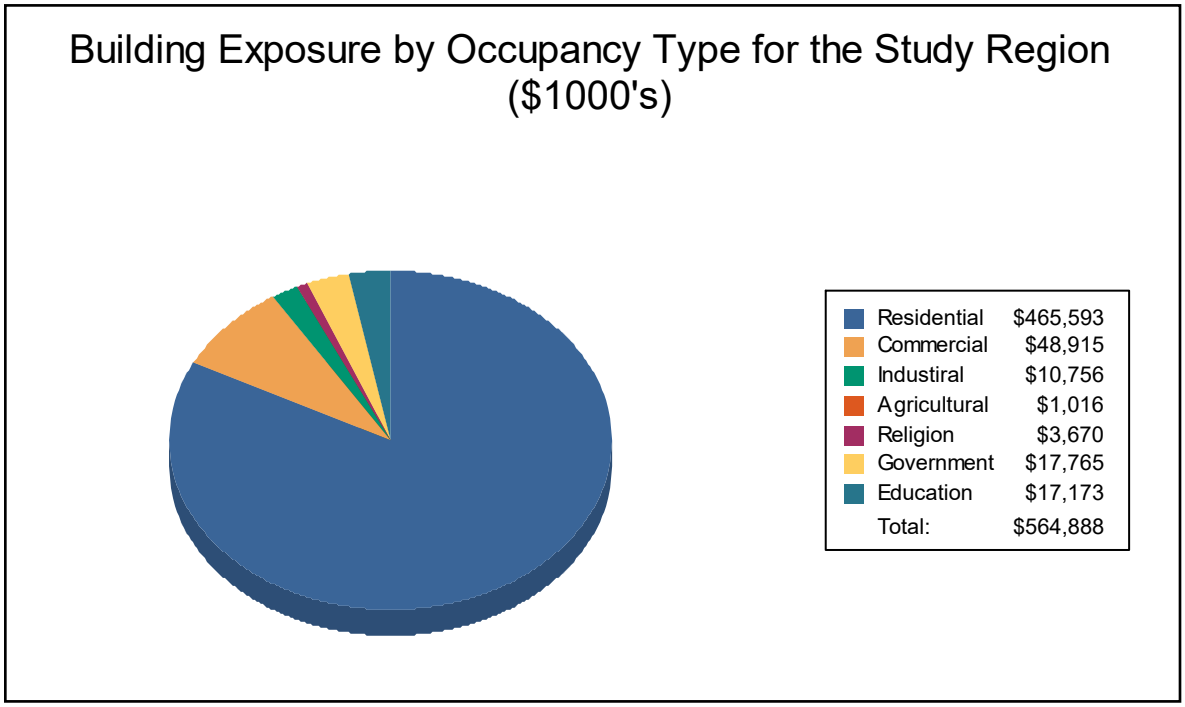
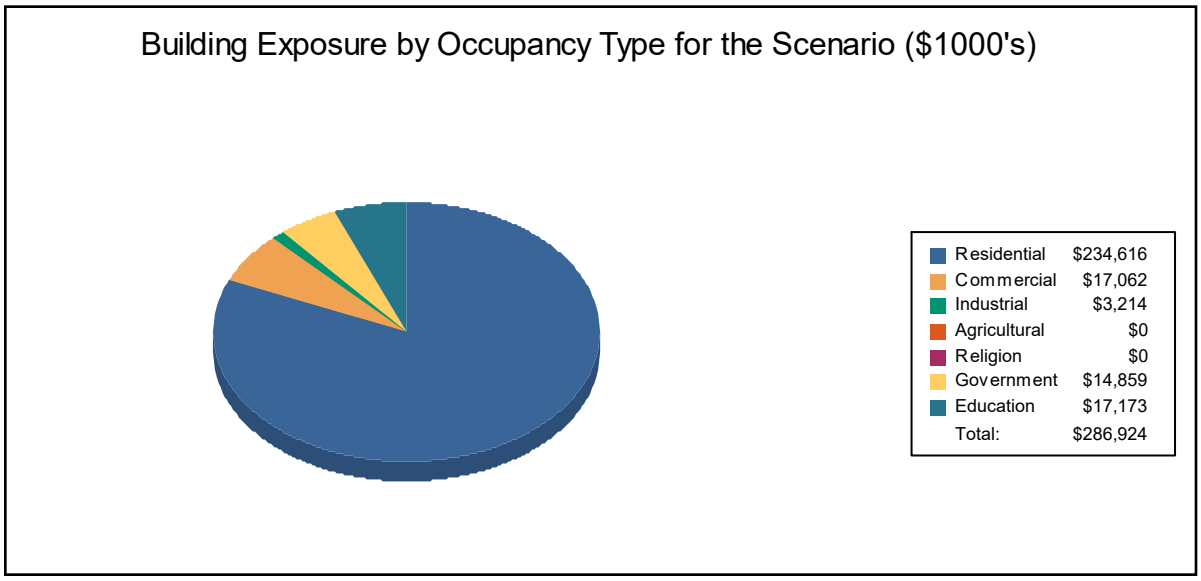


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	234,616	81.8%
Commercial	17,062	5.9%
Industrial	3,214	1.1%
Agricultural	0	0.0%
Religion	0	0.0%
Government	14,859	5.2%
Education	17,173	6.0%
Total	**286,924**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, 1 police station and 1 emergency operation center.

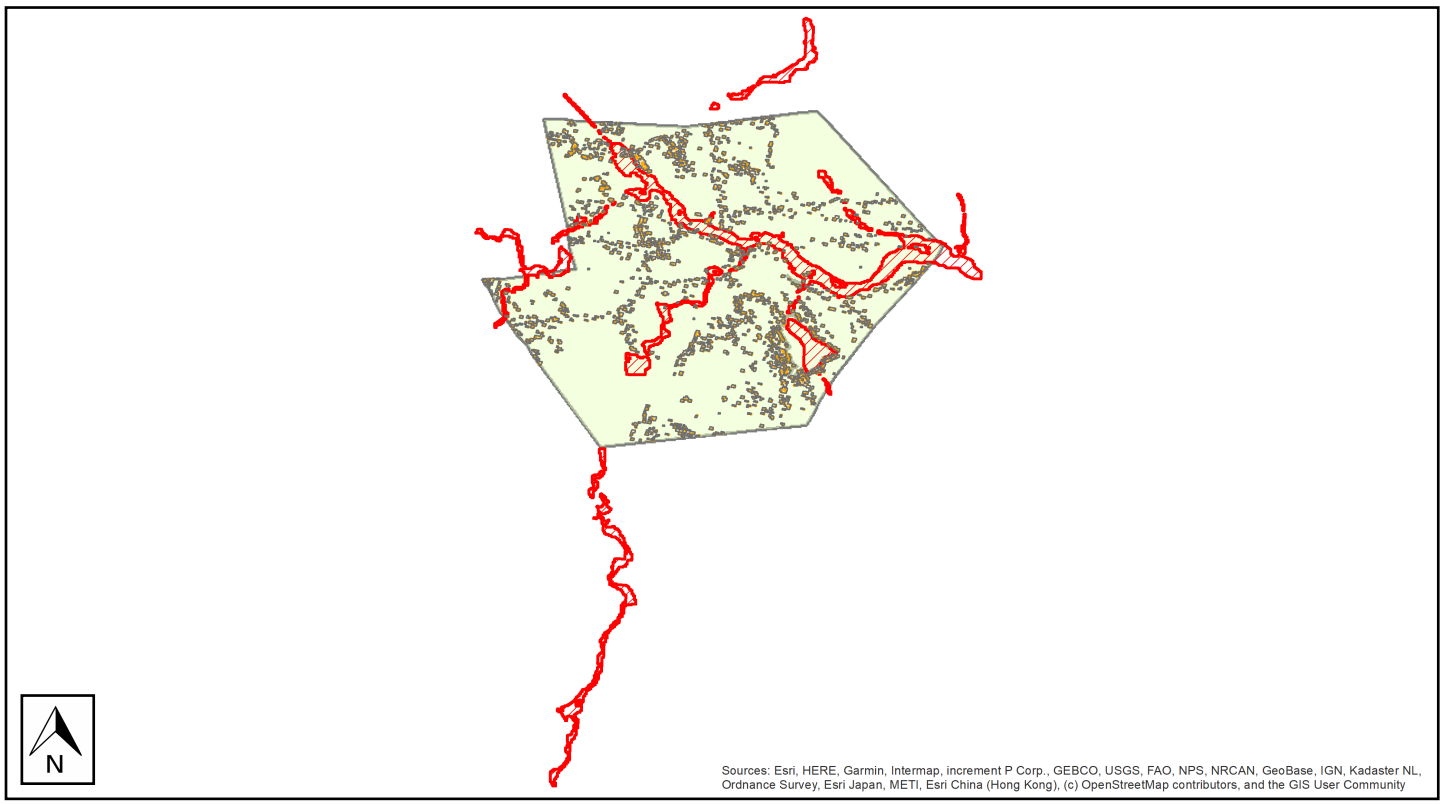
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Andover_FL
Scenario Name:	Andover_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

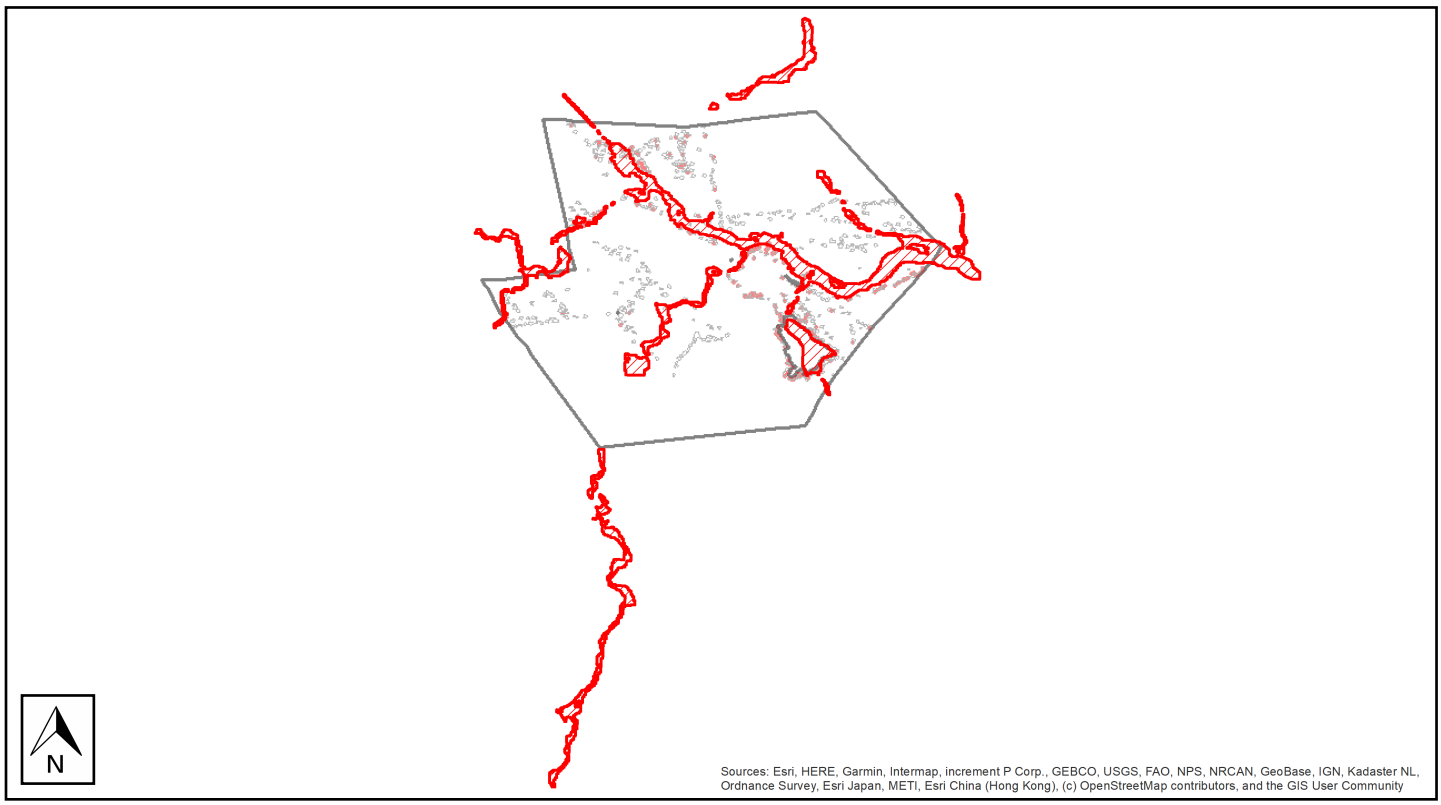


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	43	3	43	1	14	0	0	0	0	0	0
Total	**3**		**3**		**1**		**0**		**0**		**0**	

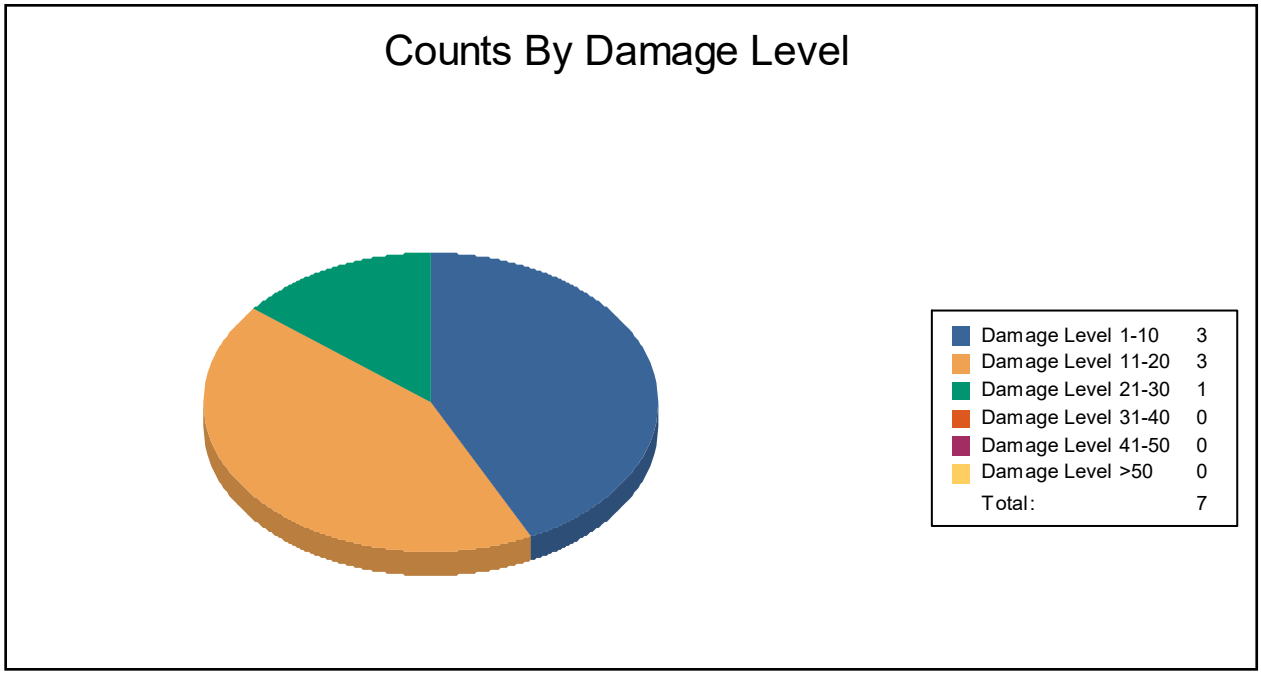


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	43	3	43	1	14	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

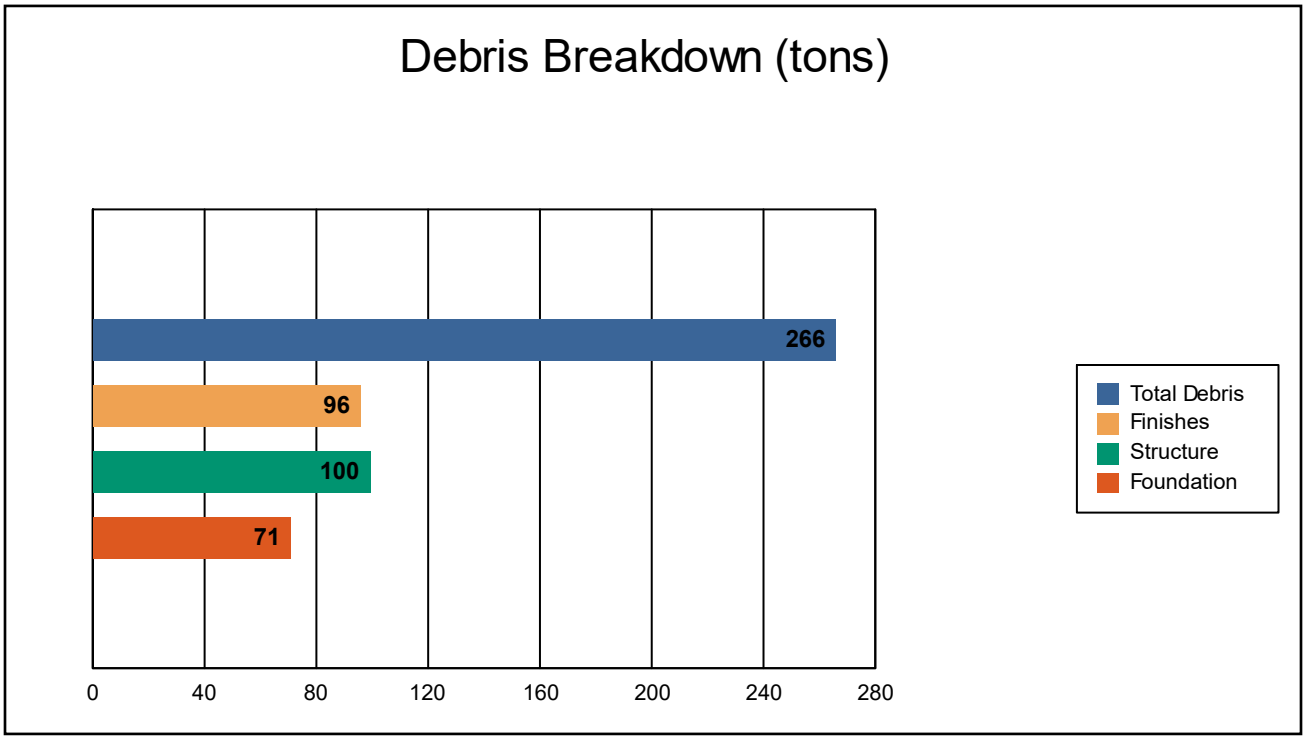
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

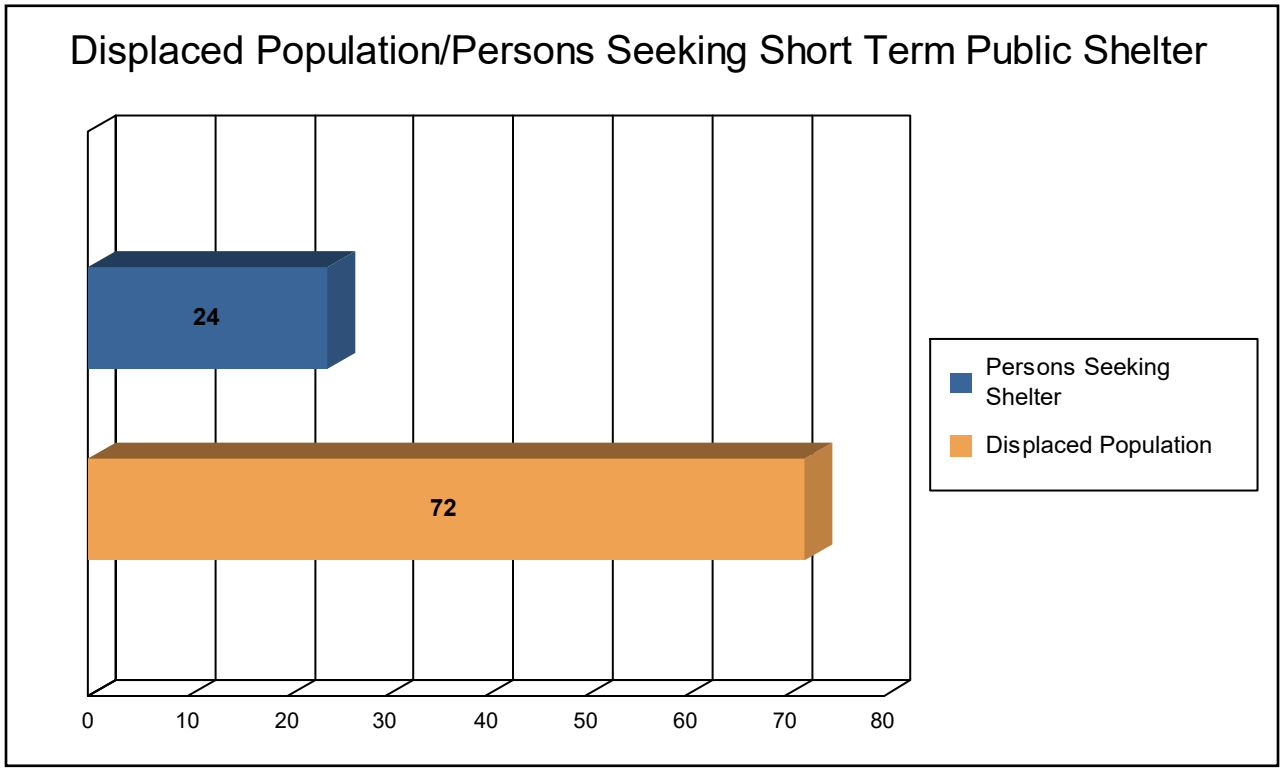


The model estimates that a total of 266 tons of debris will be generated. Of the total amount, Finishes comprises 36% of the total, Structure comprises 37% of the total, and Foundation comprises 27%. If the debris tonnage is converted into an estimated number of truckloads, it will require 11 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 24 households (or 72 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 24 people (out of a total population of 3,151) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 12.25 million dollars, which represents 4.27 % of the total replacement value of the scenario buildings.

Building-Related Losses

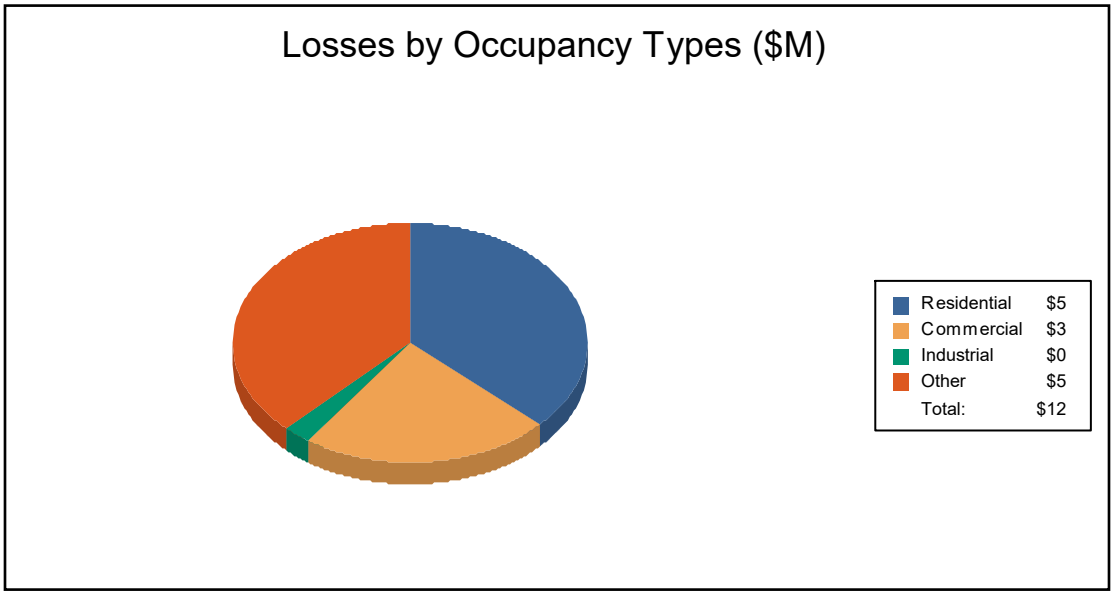
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 6.44 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 36.85% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.60	0.53	0.10	0.15	3.37
	Content	1.12	0.92	0.17	0.78	2.99
	Inventory	0.00	0.06	0.03	0.00	0.08
	Subtotal	**3.71**	**1.51**	**0.30**	**0.93**	**6.44**
Business Interruption						
	Income	0.00	0.68	0.00	0.27	0.95
	Relocation	0.62	0.14	0.00	0.13	0.88
	Rental Income	0.18	0.10	0.00	0.02	0.30
	Wage	0.00	0.38	0.01	3.28	3.67
	Subtotal	**0.80**	**1.30**	**0.01**	**3.69**	**5.80**
ALL	**Total**	**4.51**	**2.81**	**0.31**	**4.62**	**12.25**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,593	99,295	564,888
Total	**3,151**	**465,593**	**99,295**	**564,888**
Total Study Region	**3,151**	**465,593**	**99,295**	**564,888**

Hazus: Flood Global Risk Report

Region Name: Andover_FL

Flood Scenario: Andover_Flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
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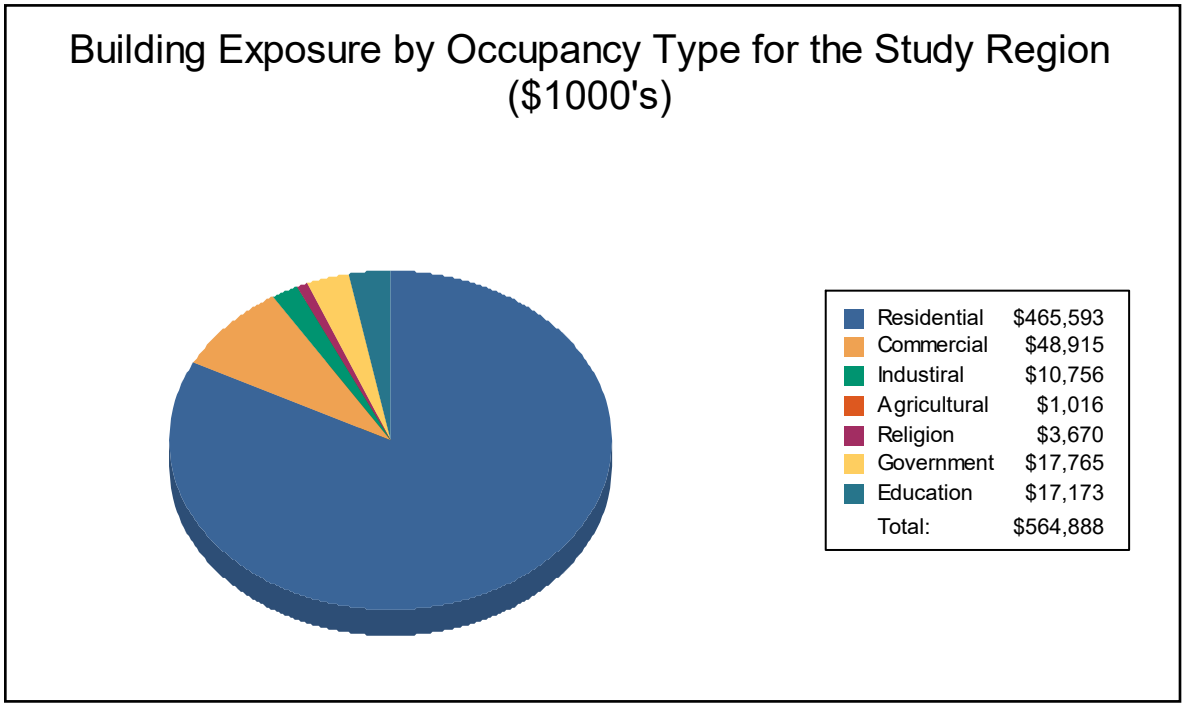

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	234,616	81.8%
Commercial	17,062	5.9%
Industrial	3,214	1.1%
Agricultural	0	0.0%
Religion	0	0.0%
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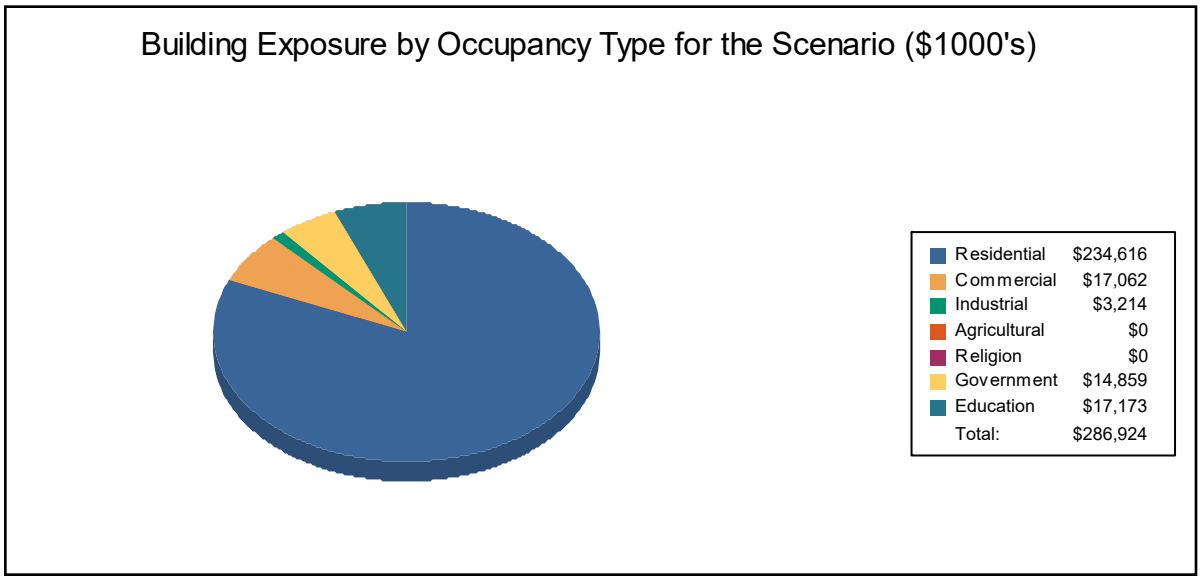


Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, 1 police station and 1 emergency operation center.

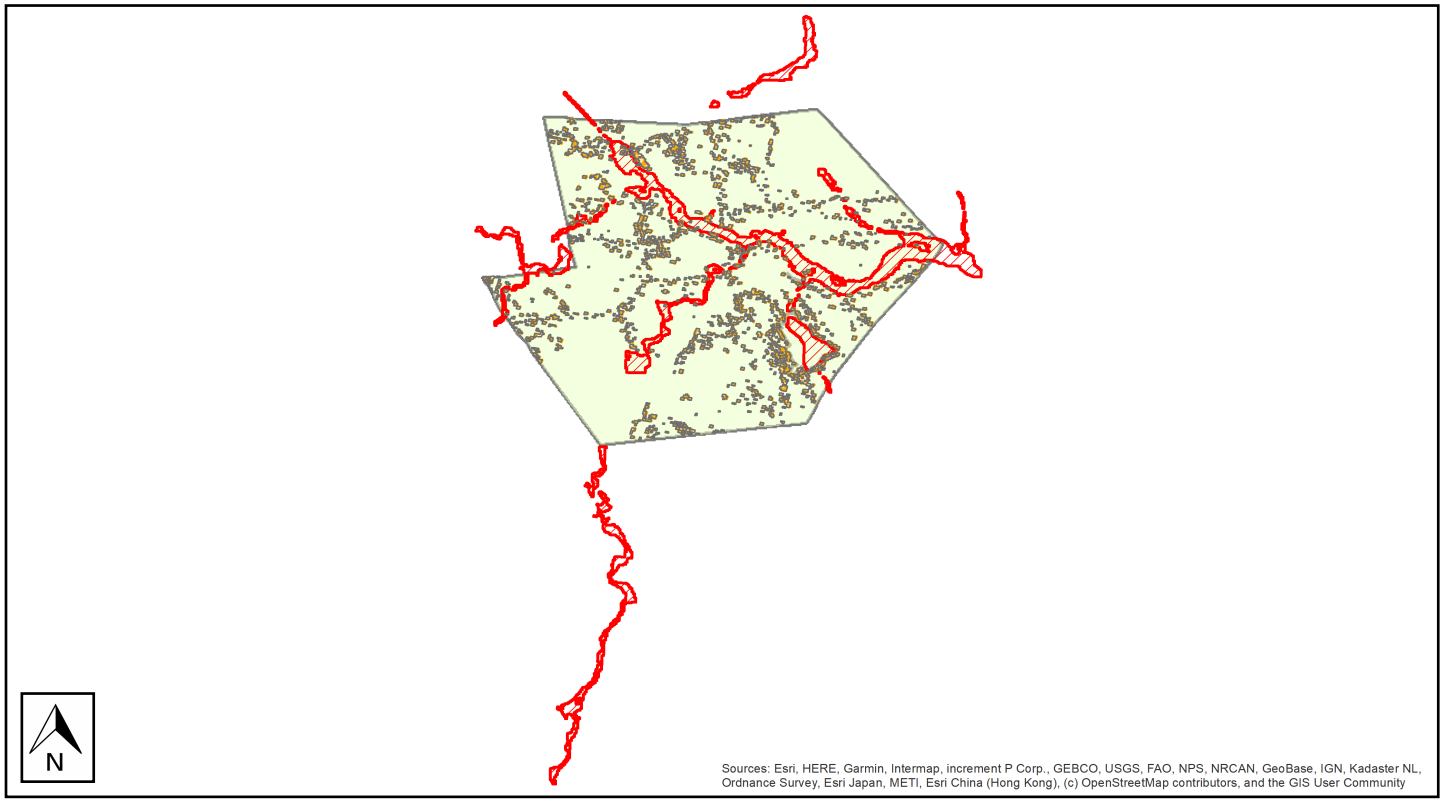
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Andover_FL
Scenario Name:	Andover_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

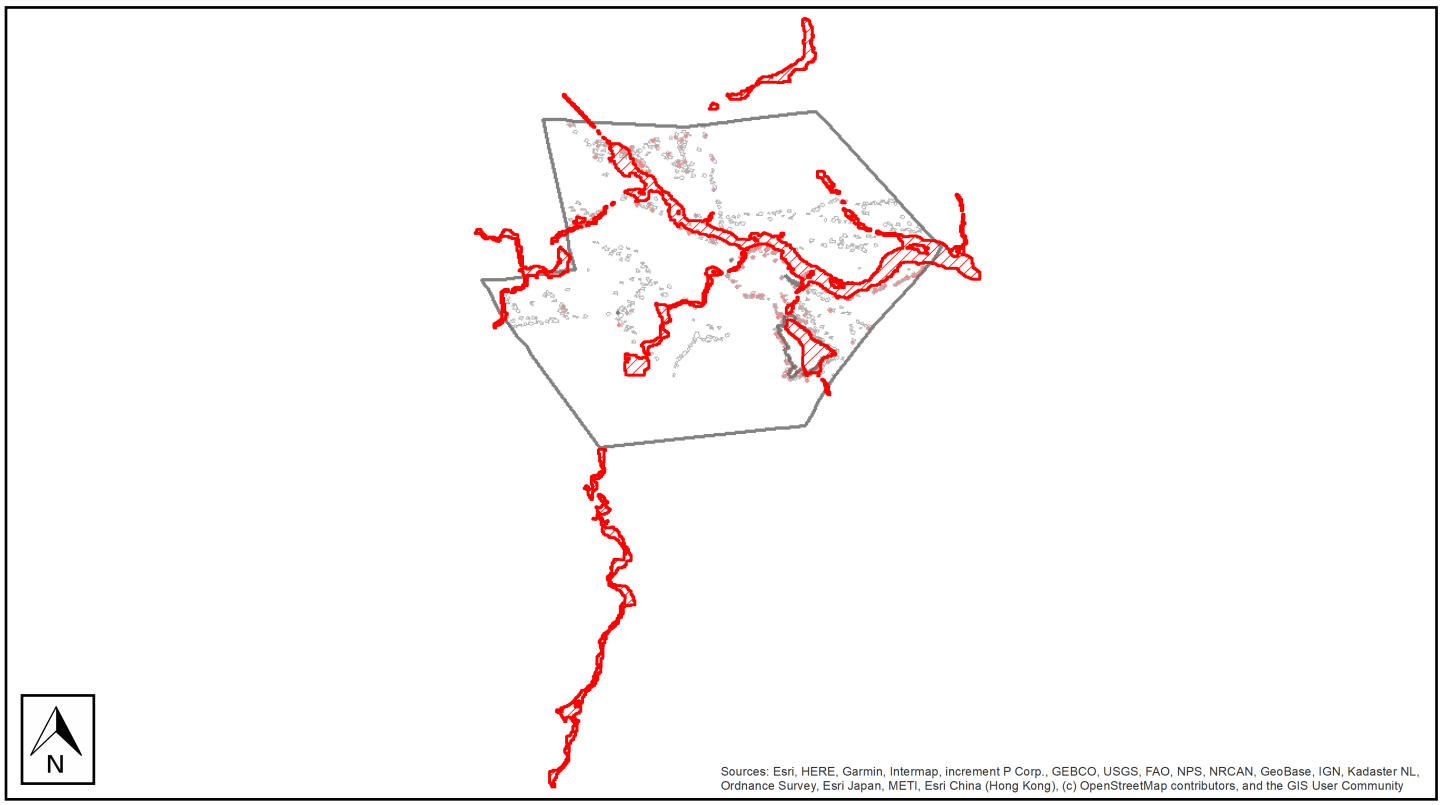


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	43	3	43	1	14	0	0	0	0	0	0
Total	**3**		**3**		**1**		**0**		**0**		**0**	

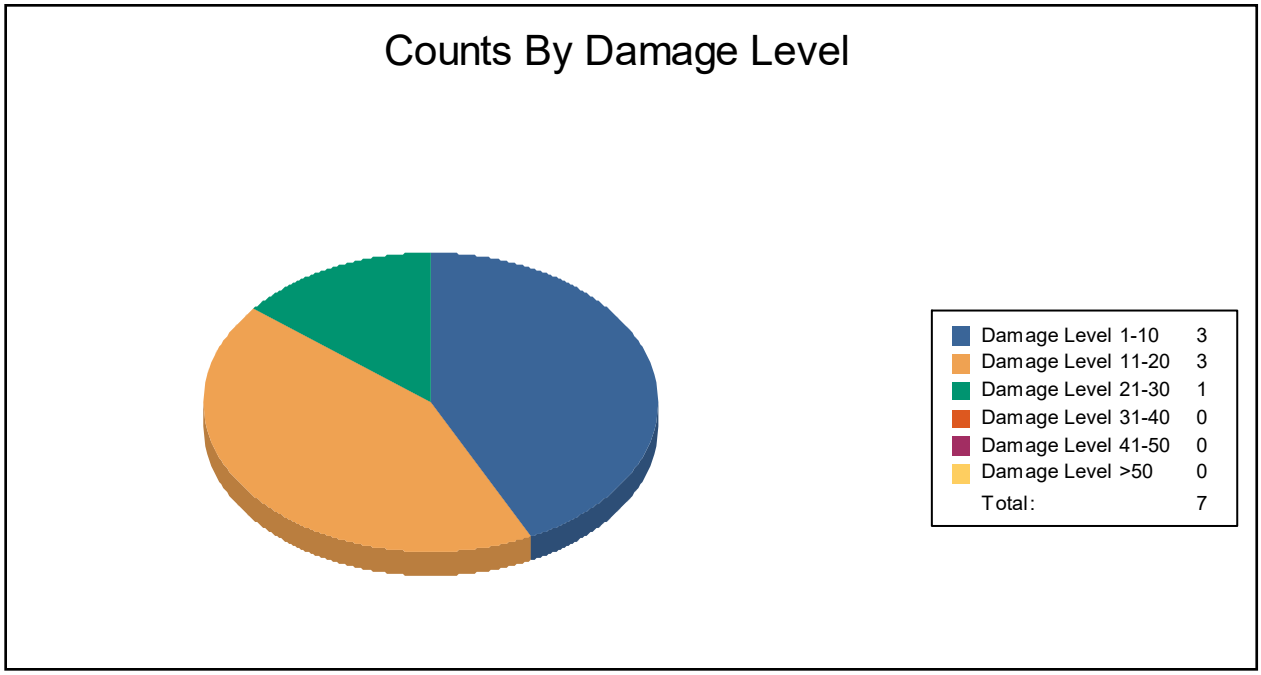


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	43	3	43	1	14	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

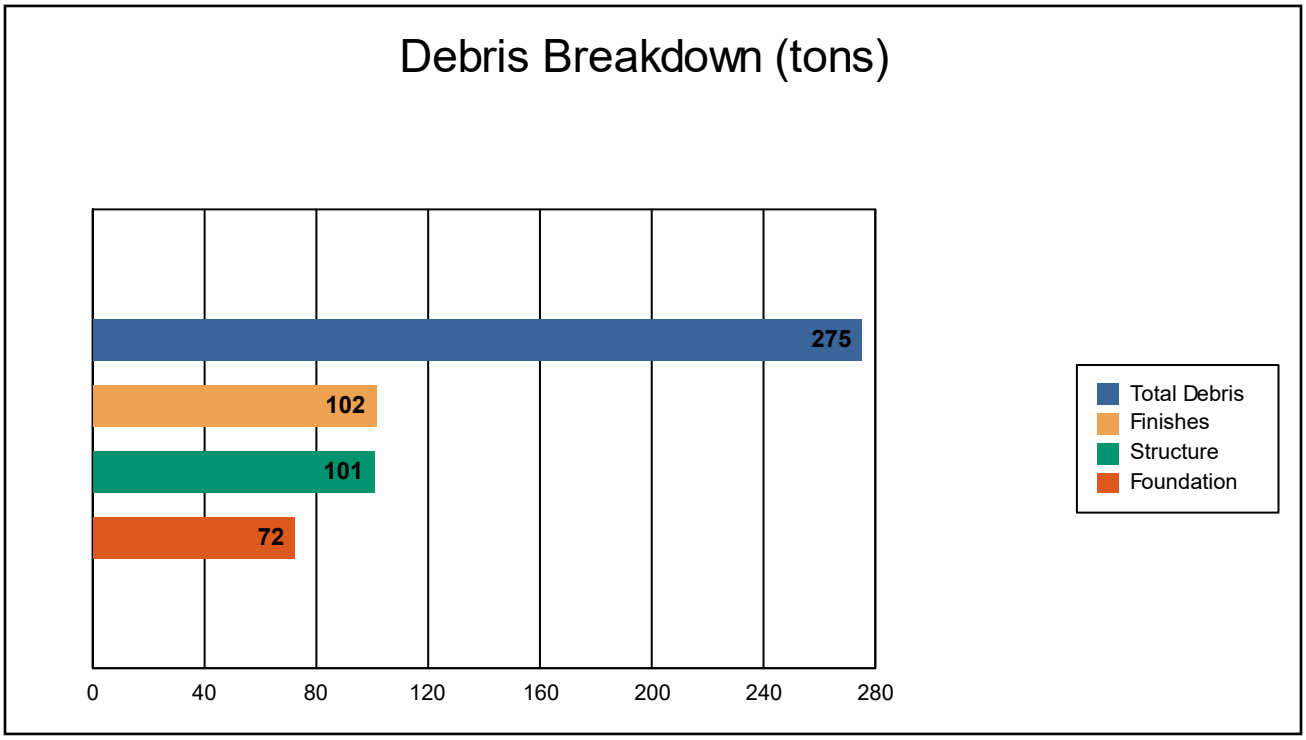
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

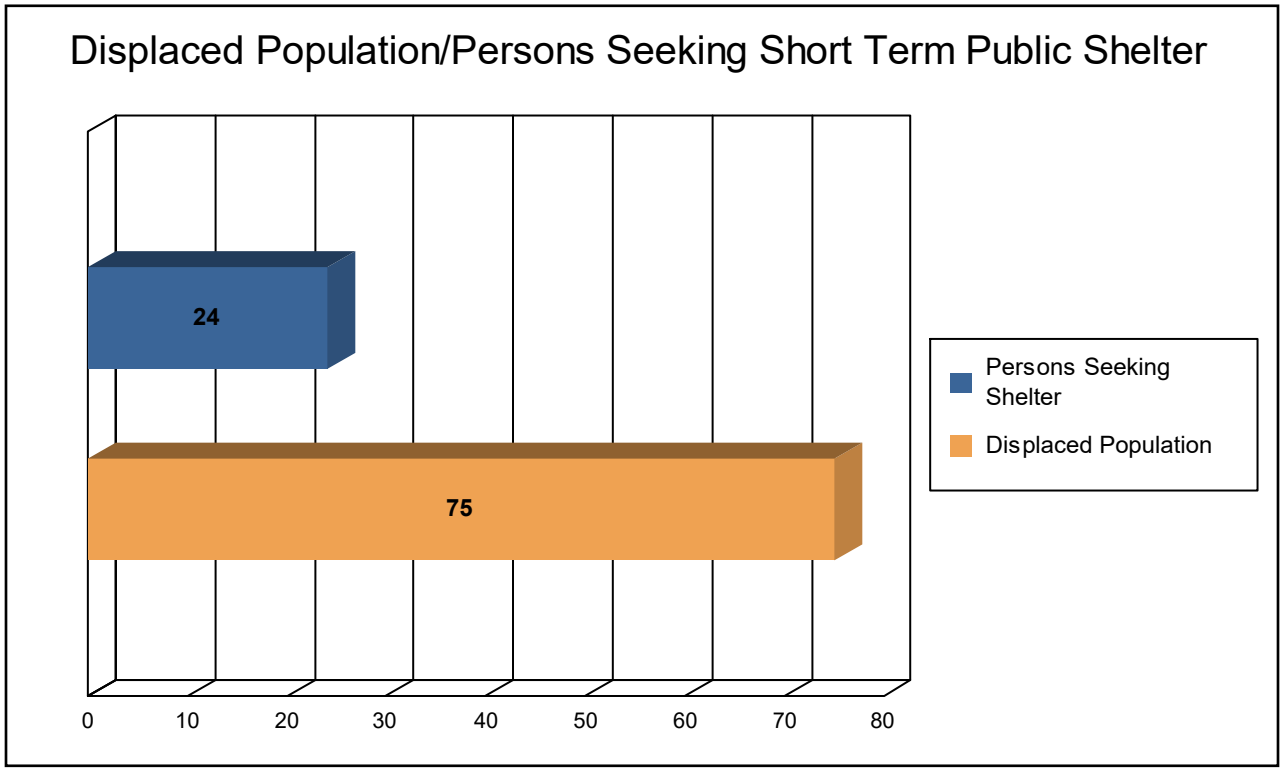


The model estimates that a total of 275 tons of debris will be generated. Of the total amount, Finishes comprises 37% of the total, Structure comprises 37% of the total, and Foundation comprises 26%. If the debris tonnage is converted into an estimated number of truckloads, it will require 11 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 25 households (or 75 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 24 people (out of a total population of 3,151) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 12.91 million dollars, which represents 4.50 % of the total replacement value of the scenario buildings.

Building-Related Losses

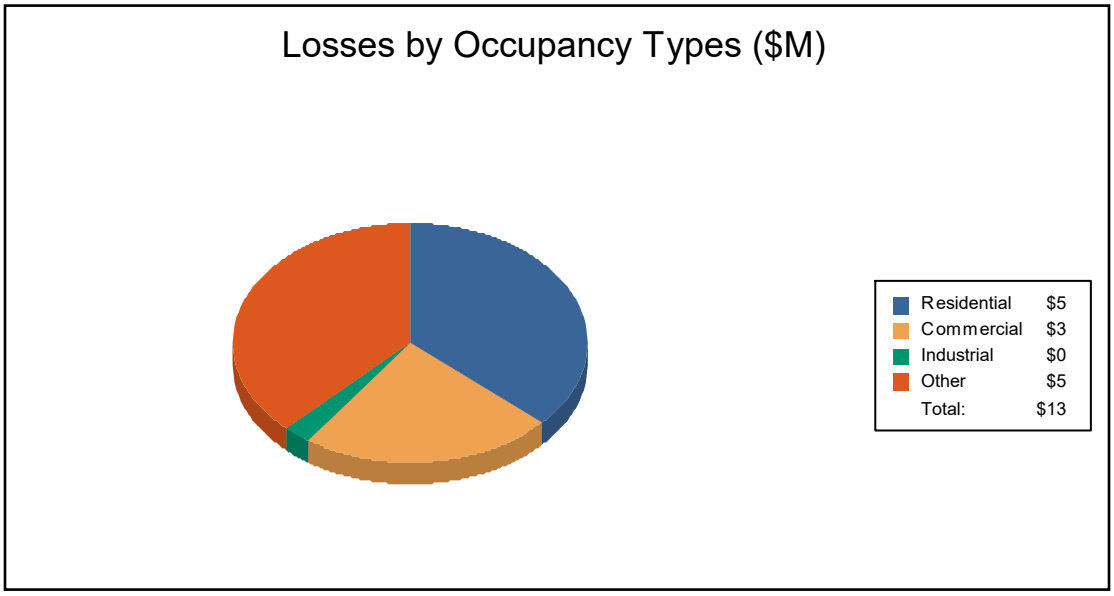
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 6.86 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 36.79% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.74	0.57	0.11	0.16	3.57
	Content	1.18	0.98	0.19	0.85	3.20
	Inventory	0.00	0.07	0.03	0.00	0.09
	Subtotal	**3.92**	**1.62**	**0.32**	**1.01**	**6.86**
Business Interruption						
	Income	0.00	0.70	0.00	0.28	0.98
	Relocation	0.64	0.14	0.00	0.13	0.91
	Rental Income	0.19	0.10	0.00	0.02	0.31
	Wage	0.00	0.40	0.01	3.44	3.85
	Subtotal	**0.83**	**1.34**	**0.01**	**3.87**	**6.05**
ALL	**Total**	**4.75**	**2.95**	**0.34**	**4.87**	**12.91**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,593	99,295	564,888
Total	**3,151**	**465,593**	**99,295**	**564,888**
Total Study Region	**3,151**	**465,593**	**99,295**	**564,888**

Hazus: Flood Global Risk Report

Region Name: Andover_FL

Flood Scenario: Andover_Flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 1 square miles and contains 63 census blocks. The region contains over 1 thousand households and has a total population of 3,151 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 1,311 buildings in the region with a total building replacement value (excluding contents) of 565 million dollars. Approximately 92.68% of the buildings (and 82.42% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,311 buildings in the region which have an aggregate total replacement value of 565 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	465,593	82.4%
Commercial	48,915	8.7%
Industrial	10,756	1.9%
Agricultural	1,016	0.2%
Religion	3,670	0.6%
Government	17,765	3.1%
Education	17,173	3.0%
Total	**564,888**	**100%**

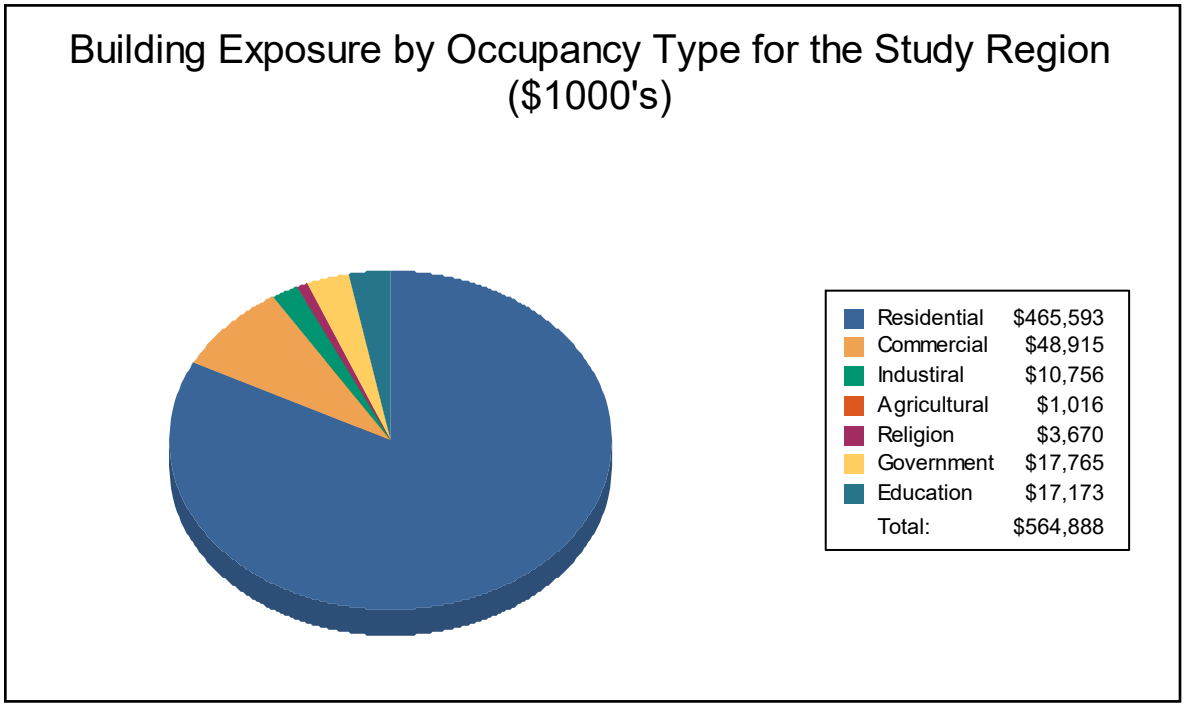
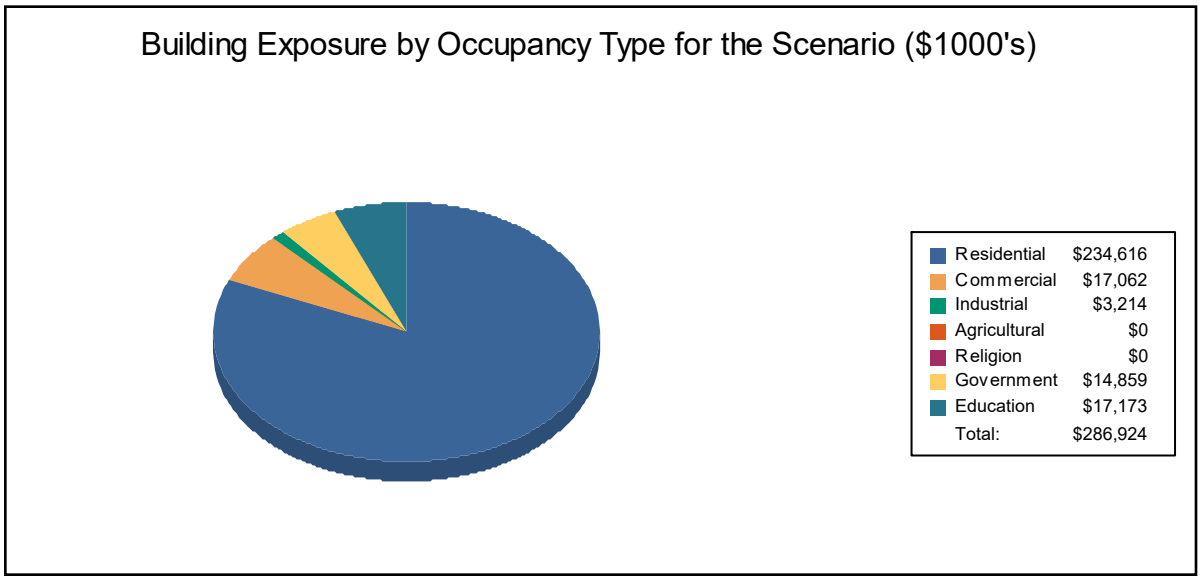


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	234,616	81.8%
Commercial	17,062	5.9%
Industrial	3,214	1.1%
Agricultural	0	0.0%
Religion	0	0.0%
Government	14,859	5.2%
Education	17,173	6.0%
Total	**286,924**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, 1 police station and 1 emergency operation center.

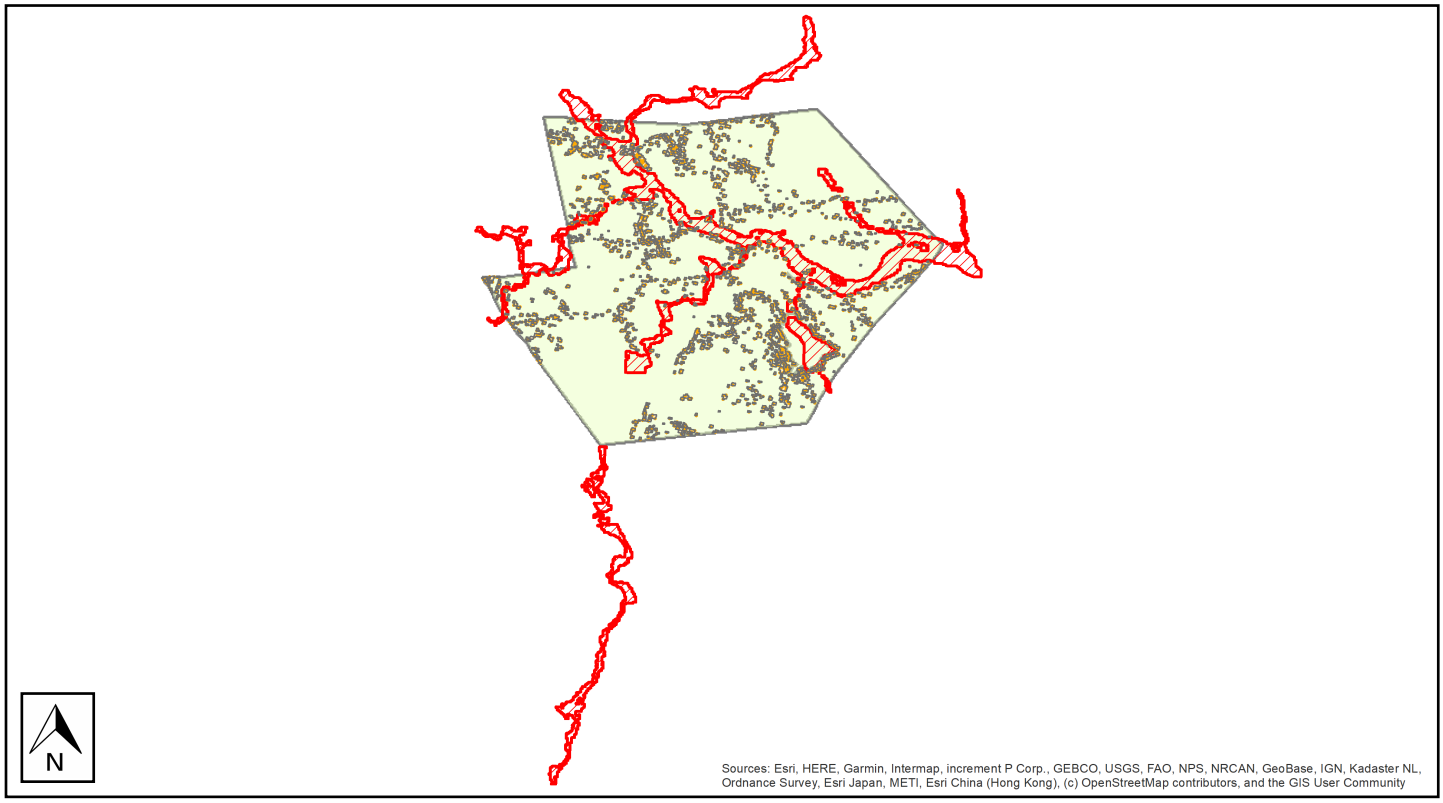
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Andover_FL
Scenario Name:	Andover_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

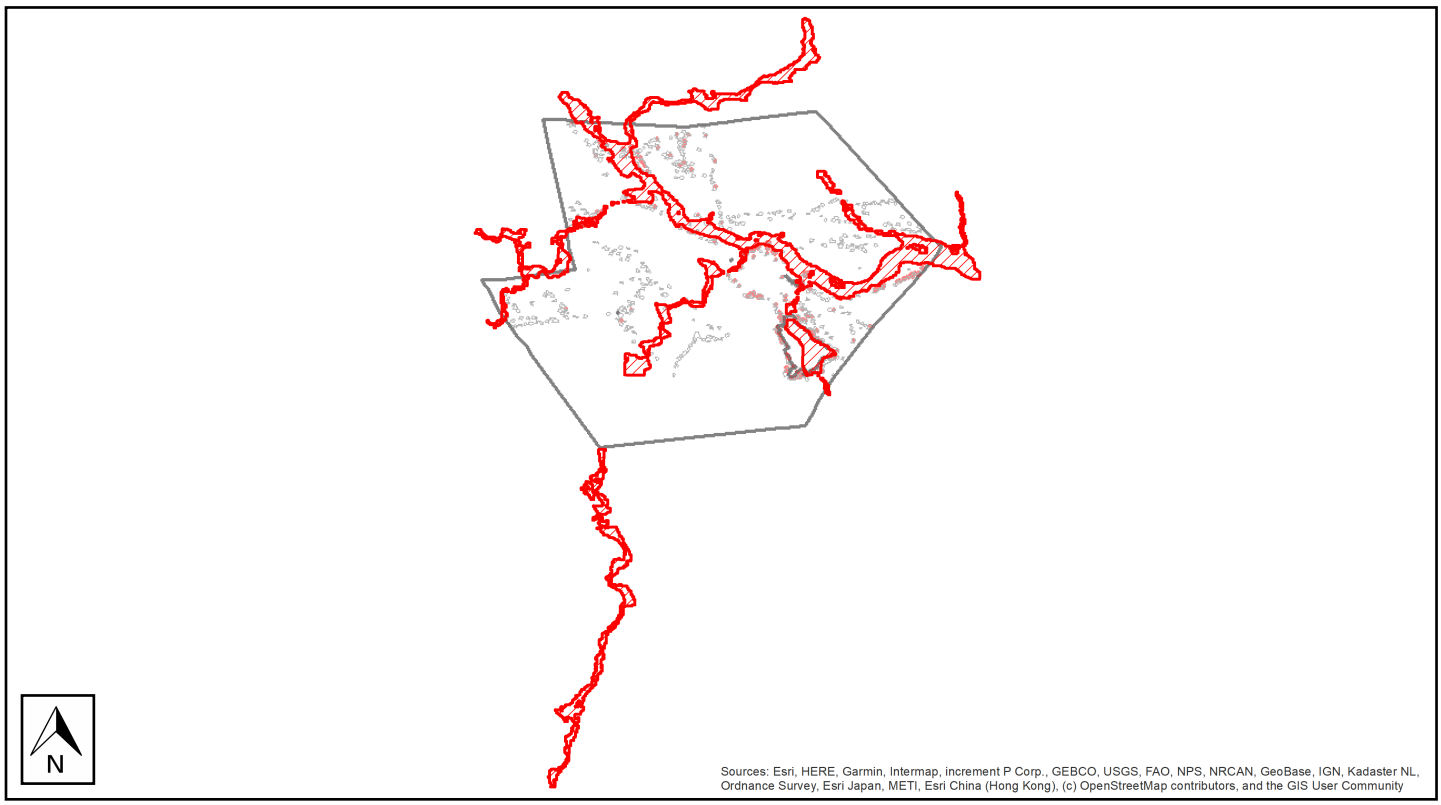


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	20	3	60	1	20	0	0	0	0	0	0
Total	**1**		**3**		**1**		**0**		**0**		**0**	

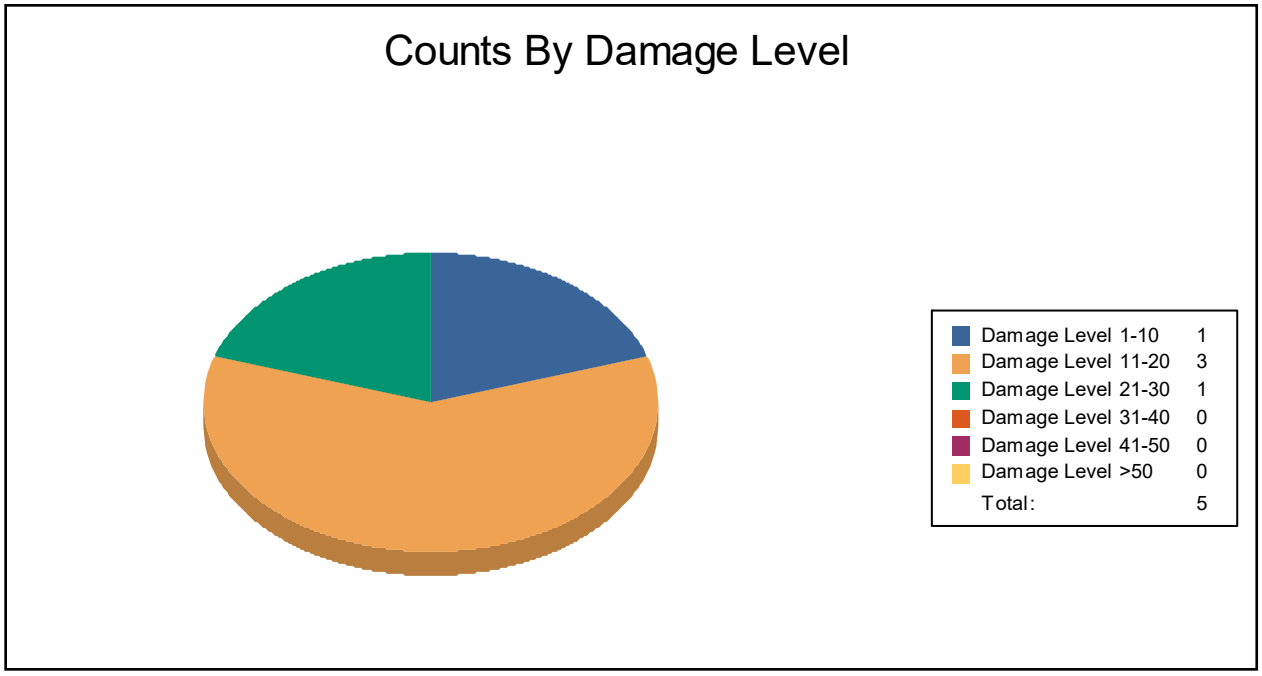


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	20	3	60	1	20	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

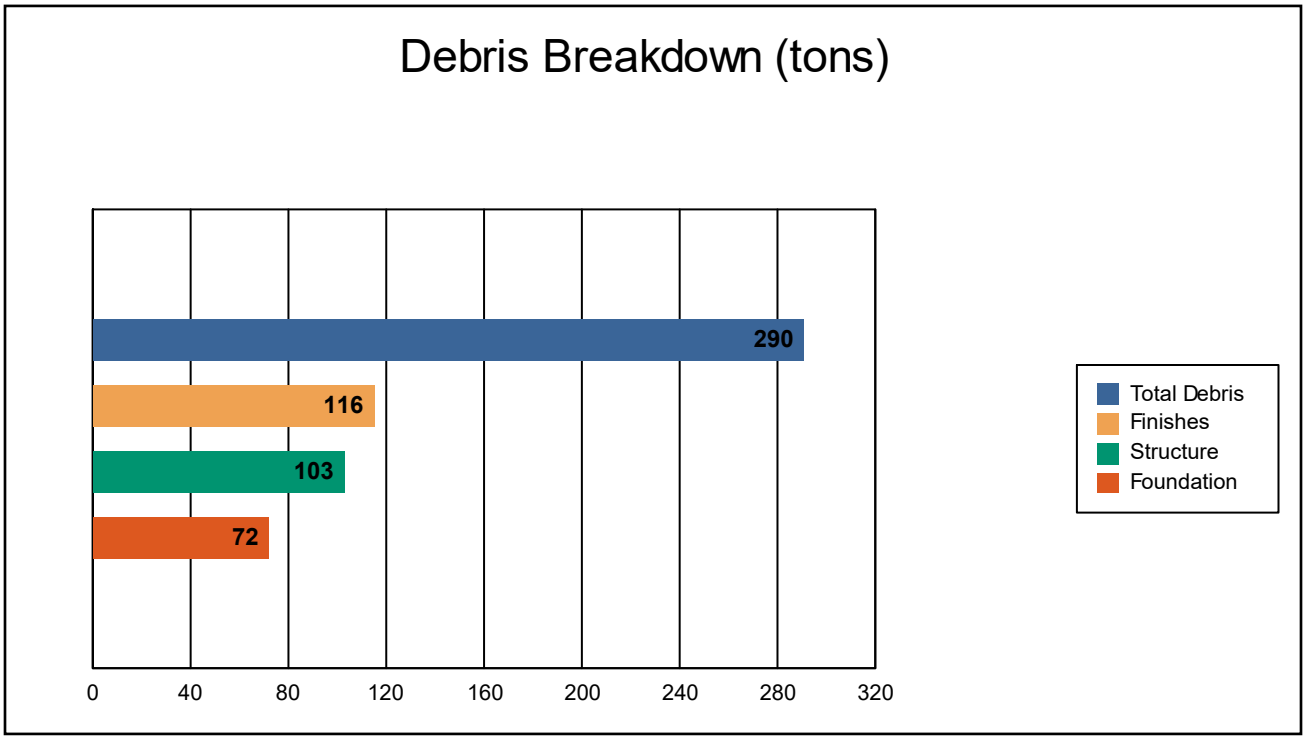
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

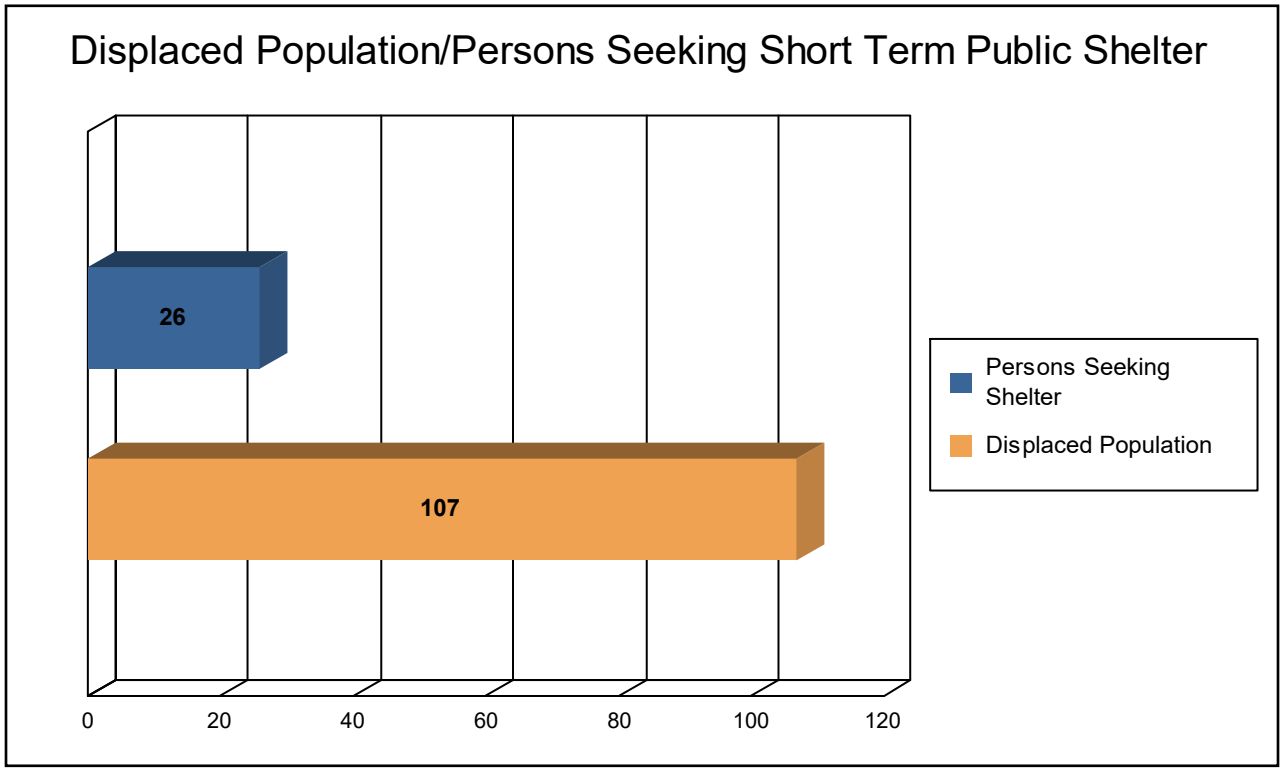


The model estimates that a total of 290 tons of debris will be generated. Of the total amount, Finishes comprises 40% of the total, Structure comprises 35% of the total, and Foundation comprises 25%. If the debris tonnage is converted into an estimated number of truckloads, it will require 12 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 36 households (or 107 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 26 people (out of a total population of 3,151) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 17.04 million dollars, which represents 5.94 % of the total replacement value of the scenario buildings.

Building-Related Losses

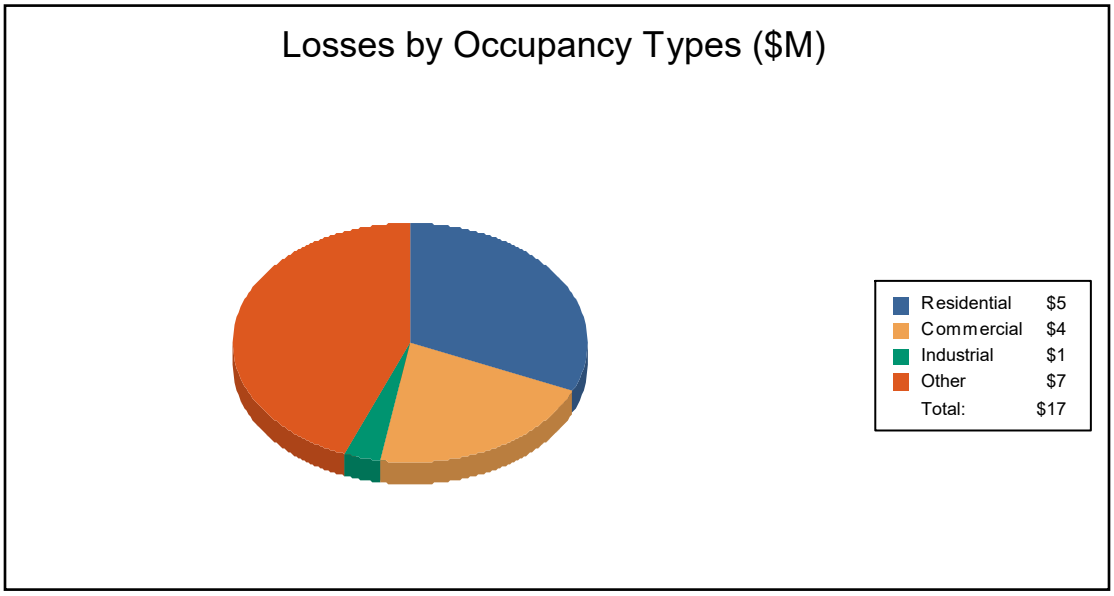
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 8.28 million dollars. 51% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 31.60% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.10	0.74	0.17	0.20	4.21
	Content	1.35	1.22	0.31	1.05	3.93
	Inventory	0.00	0.10	0.05	0.00	0.15
	Subtotal	**4.45**	**2.06**	**0.52**	**1.25**	**8.28**
Business Interruption						
	Income	0.00	0.81	0.01	0.31	1.13
	Relocation	0.71	0.15	0.00	0.24	1.10
	Rental Income	0.23	0.12	0.00	0.07	0.42
	Wage	0.00	0.49	0.01	5.62	6.12
	Subtotal	**0.93**	**1.57**	**0.02**	**6.24**	**8.76**
ALL	**Total**	**5.38**	**3.62**	**0.54**	**7.49**	**17.04**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,593	99,295	564,888
Total	**3,151**	**465,593**	**99,295**	**564,888**
Total Study Region	**3,151**	**465,593**	**99,295**	**564,888**

Hazus: Flood Global Risk Report

Region Name: Avon_FL

Flood Scenario: Avon_flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 233 census blocks. The region contains over 7 thousand households and has a total population of 18,932 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,760 buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89.18% of the buildings (and 76.34% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,760 buildings in the region which have an aggregate total replacement value of 5,274 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,025,934	76.3%
Commercial	794,485	15.1%
Industrial	163,163	3.1%
Agricultural	4,367	0.1%
Religion	30,103	0.6%
Government	73,993	1.4%
Education	181,879	3.4%
Total	**5,273,924**	**100%**

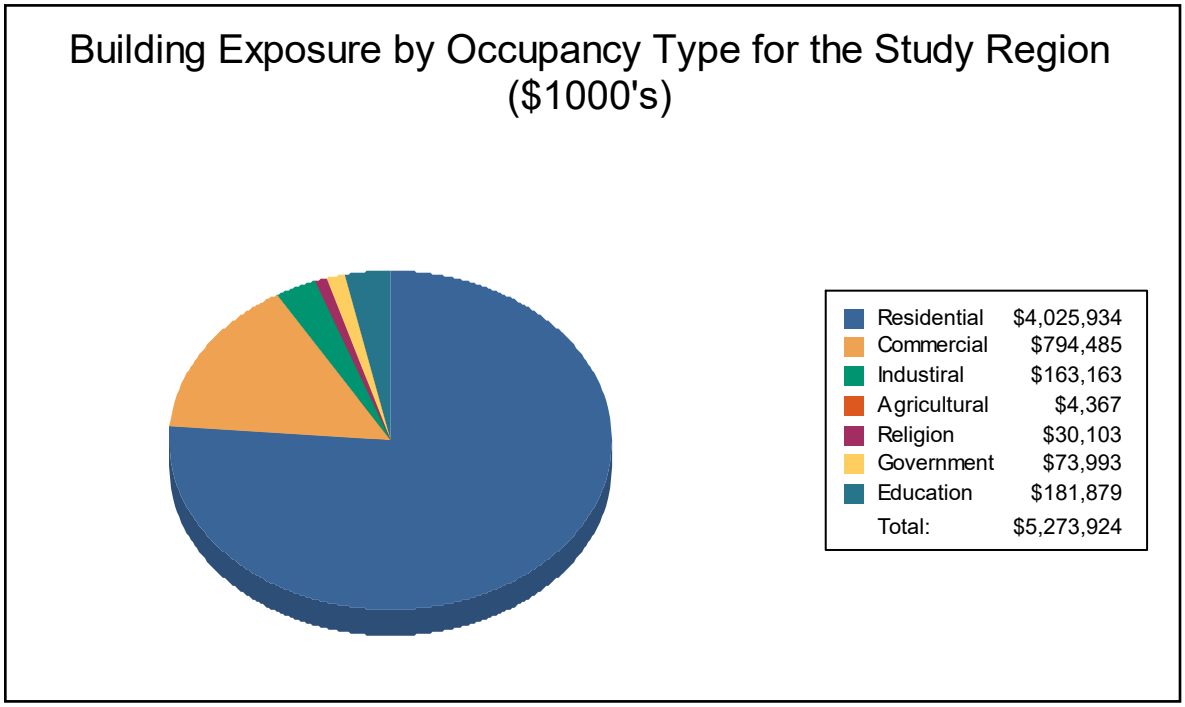
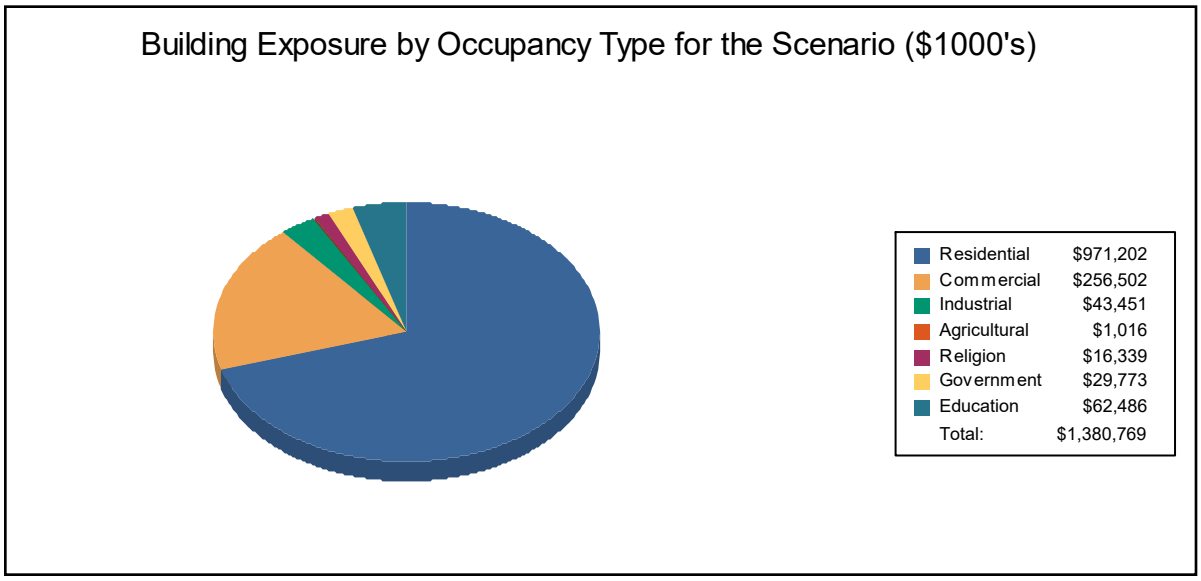


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	971,202	70.3%
Commercial	256,502	18.6%
Industrial	43,451	3.1%
Agricultural	1,016	0.1%
Religion	16,339	1.2%
Government	29,773	2.2%
Education	62,486	4.5%
Total	**1,380,769**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

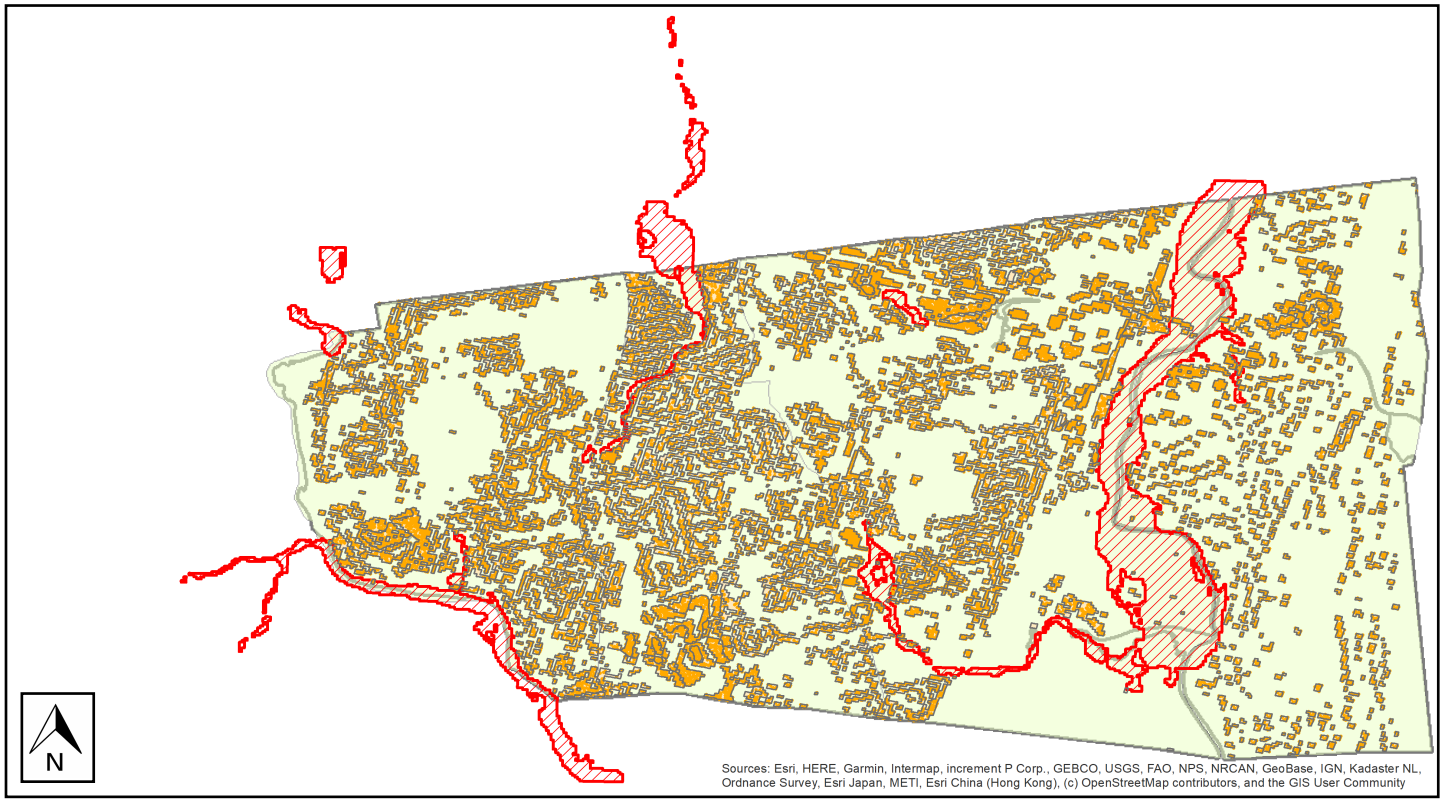
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Avon_FL
Scenario Name:	Avon_flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 88% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

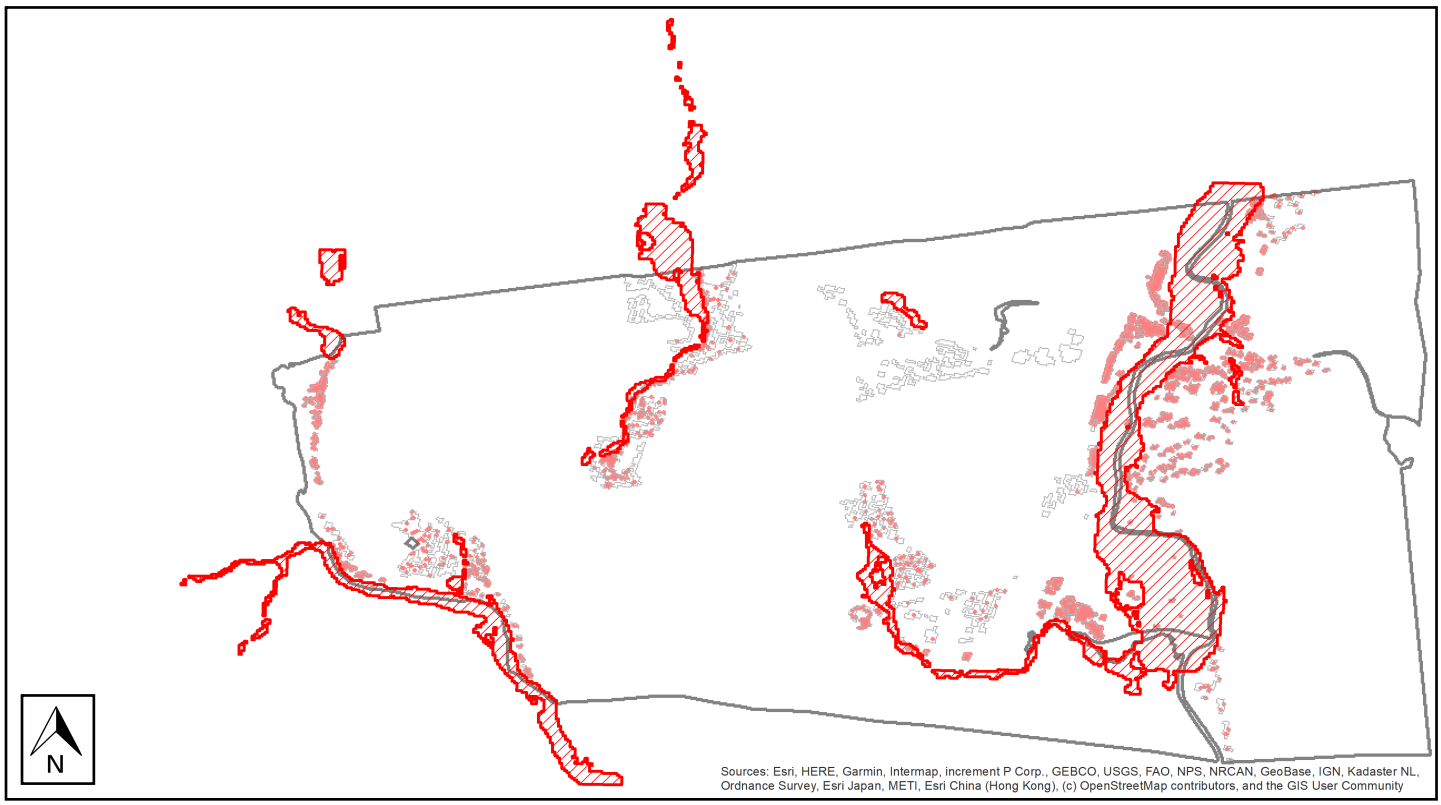


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	8	57	4	29	2	14	0	0	0	0	0	0
Total	**8**		**4**		**2**		**0**		**0**		**0**	

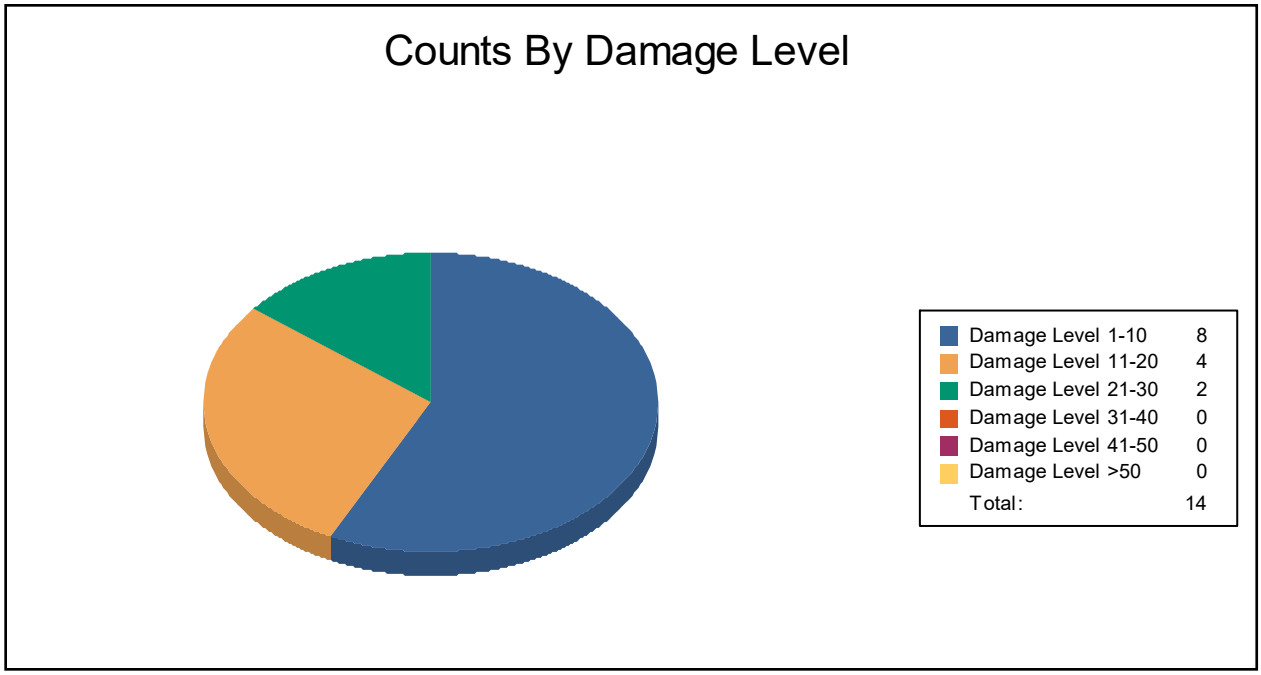


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	8	57	4	29	2	14	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

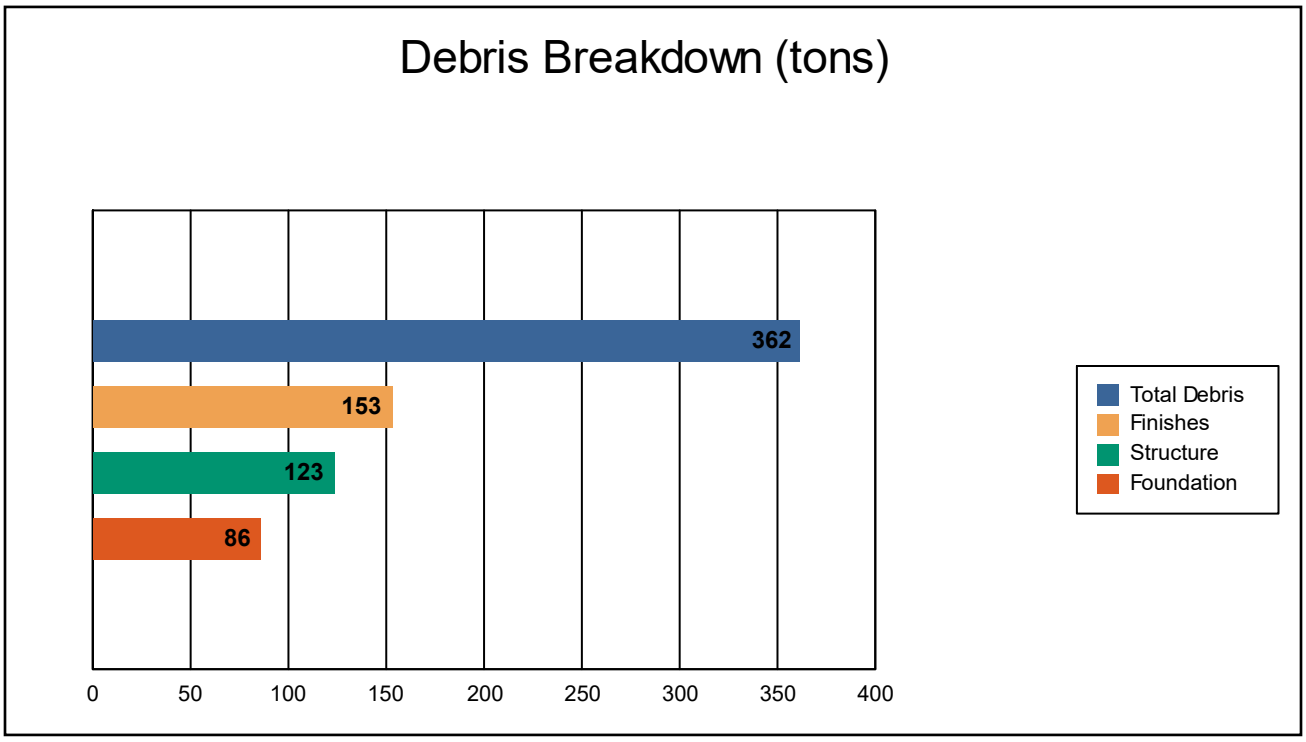
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

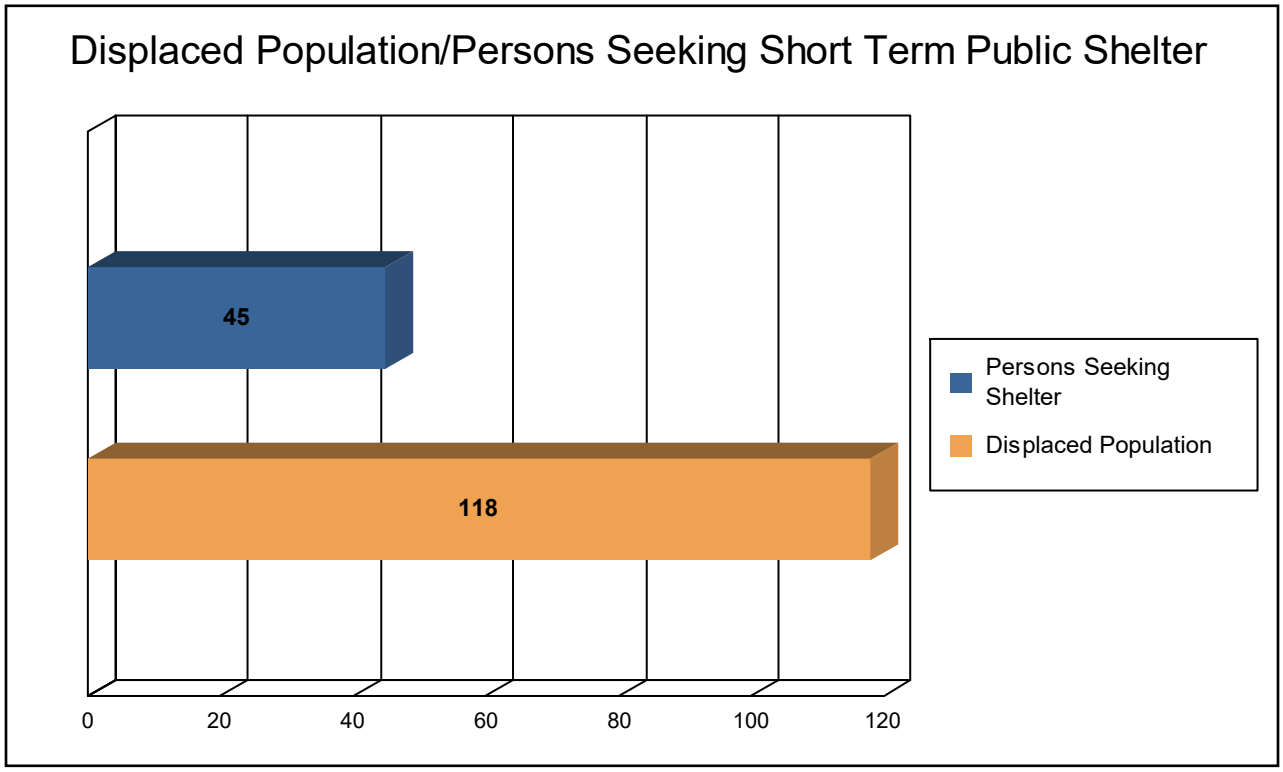


The model estimates that a total of 362 tons of debris will be generated. Of the total amount, Finishes comprises 42% of the total, Structure comprises 34% of the total, and Foundation comprises 24%. If the debris tonnage is converted into an estimated number of truckloads, it will require 15 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 39 households (or 118 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 45 people (out of a total population of 18,932) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 34.81 million dollars, which represents 2.52 % of the total replacement value of the scenario buildings.

Building-Related Losses

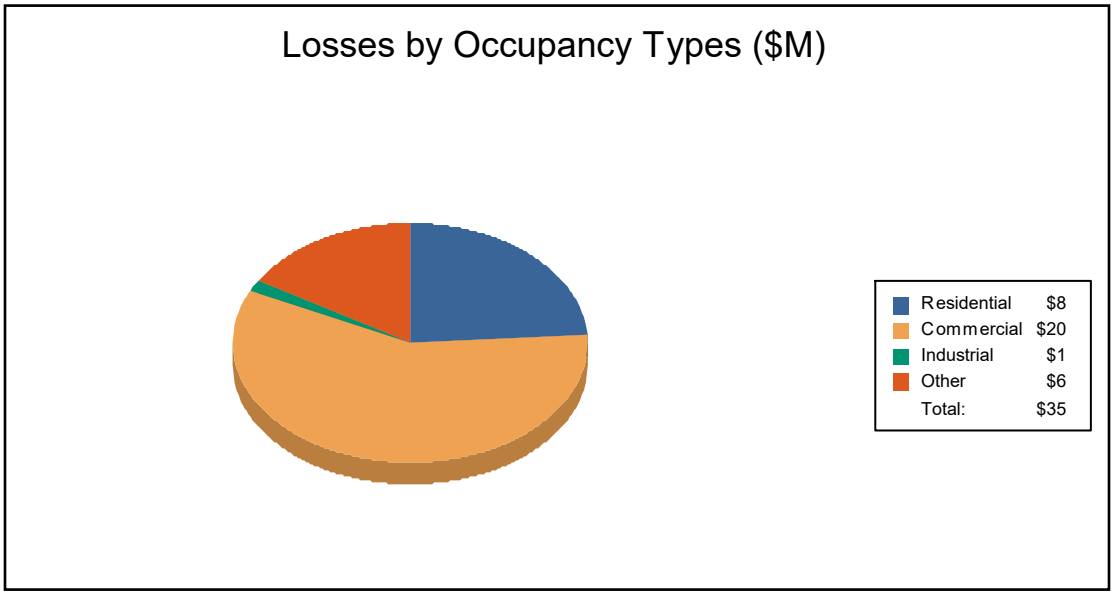
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 18.07 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 23.76% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.03	2.56	0.16	0.26	7.01
	Content	1.93	6.89	0.31	1.40	10.52
	Inventory	0.00	0.42	0.05	0.07	0.54
	Subtotal	**5.96**	**9.87**	**0.52**	**1.72**	**18.07**
Business Interruption						
	Income	0.20	4.18	0.01	0.50	4.89
	Relocation	1.03	0.82	0.00	0.27	2.12
	Rental Income	0.60	0.56	0.00	0.04	1.19
	Wage	0.48	4.89	0.01	3.16	8.54
	Subtotal	**2.31**	**10.45**	**0.02**	**3.96**	**16.74**
ALL	**Total**	**8.27**	**20.31**	**0.54**	**5.69**	**34.81**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,025,934	1,247,990	5,273,924
Total	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**
Total Study Region	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**

Hazus: Flood Global Risk Report

Region Name: Avon_FL

Flood Scenario: Avon_flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 233 census blocks. The region contains over 7 thousand households and has a total population of 18,932 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,760 buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89.18% of the buildings (and 76.34% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,760 buildings in the region which have an aggregate total replacement value of 5,274 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,025,934	76.3%
Commercial	794,485	15.1%
Industrial	163,163	3.1%
Agricultural	4,367	0.1%
Religion	30,103	0.6%
Government	73,993	1.4%
Education	181,879	3.4%
Total	**5,273,924**	**100%**

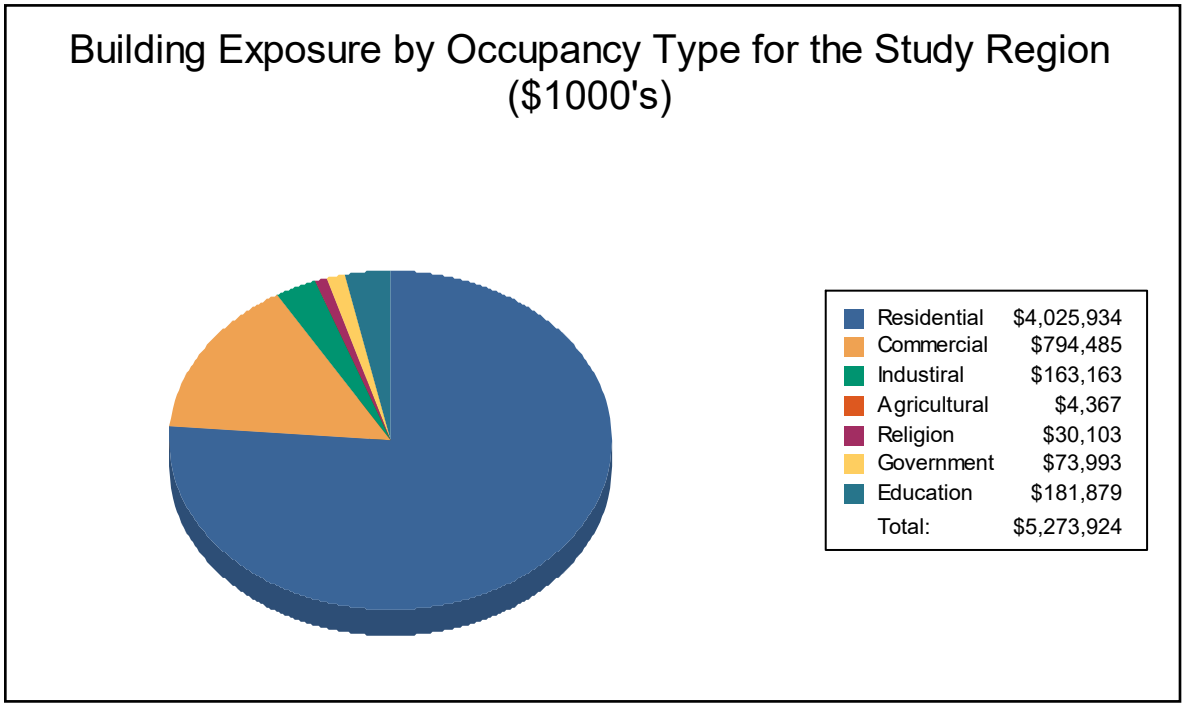
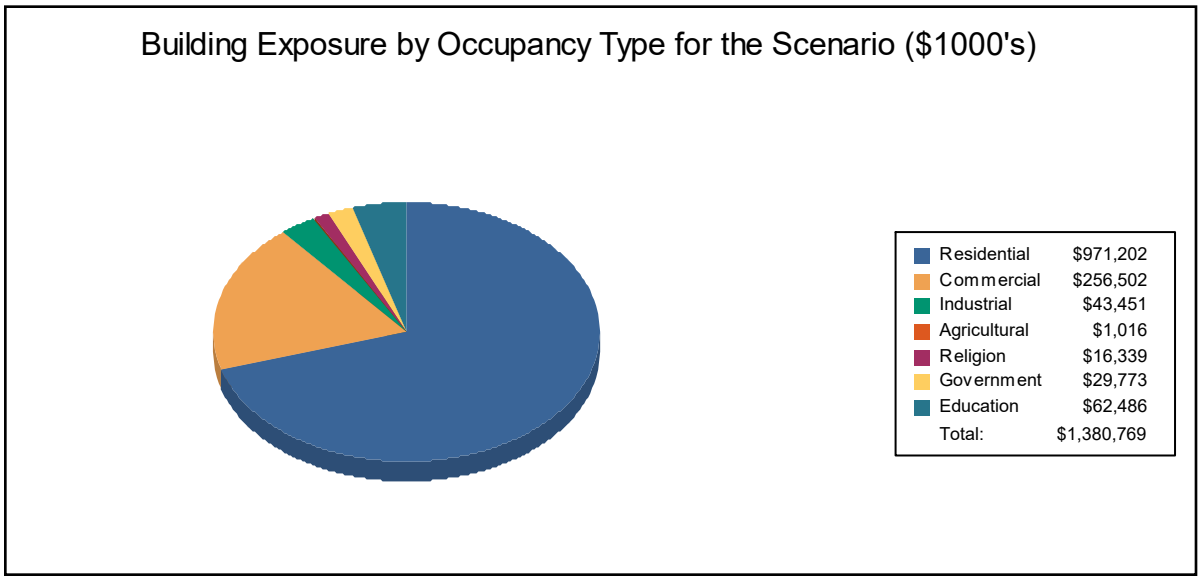


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	971,202	70.3%
Commercial	256,502	18.6%
Industrial	43,451	3.1%
Agricultural	1,016	0.1%
Religion	16,339	1.2%
Government	29,773	2.2%
Education	62,486	4.5%
Total	**1,380,769**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

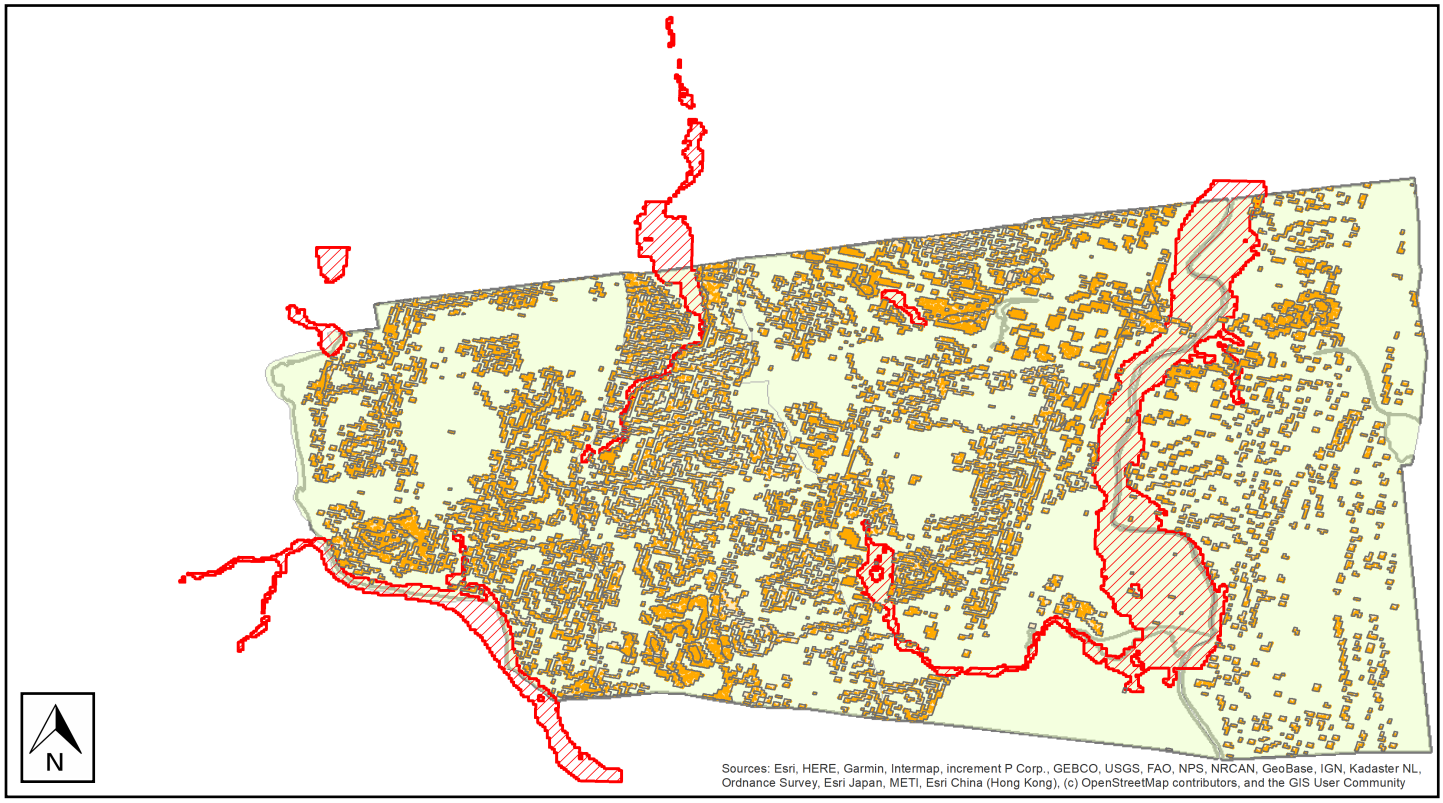
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Avon_FL
Scenario Name:	Avon_flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 7 buildings will be at least moderately damaged. This is over 93% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

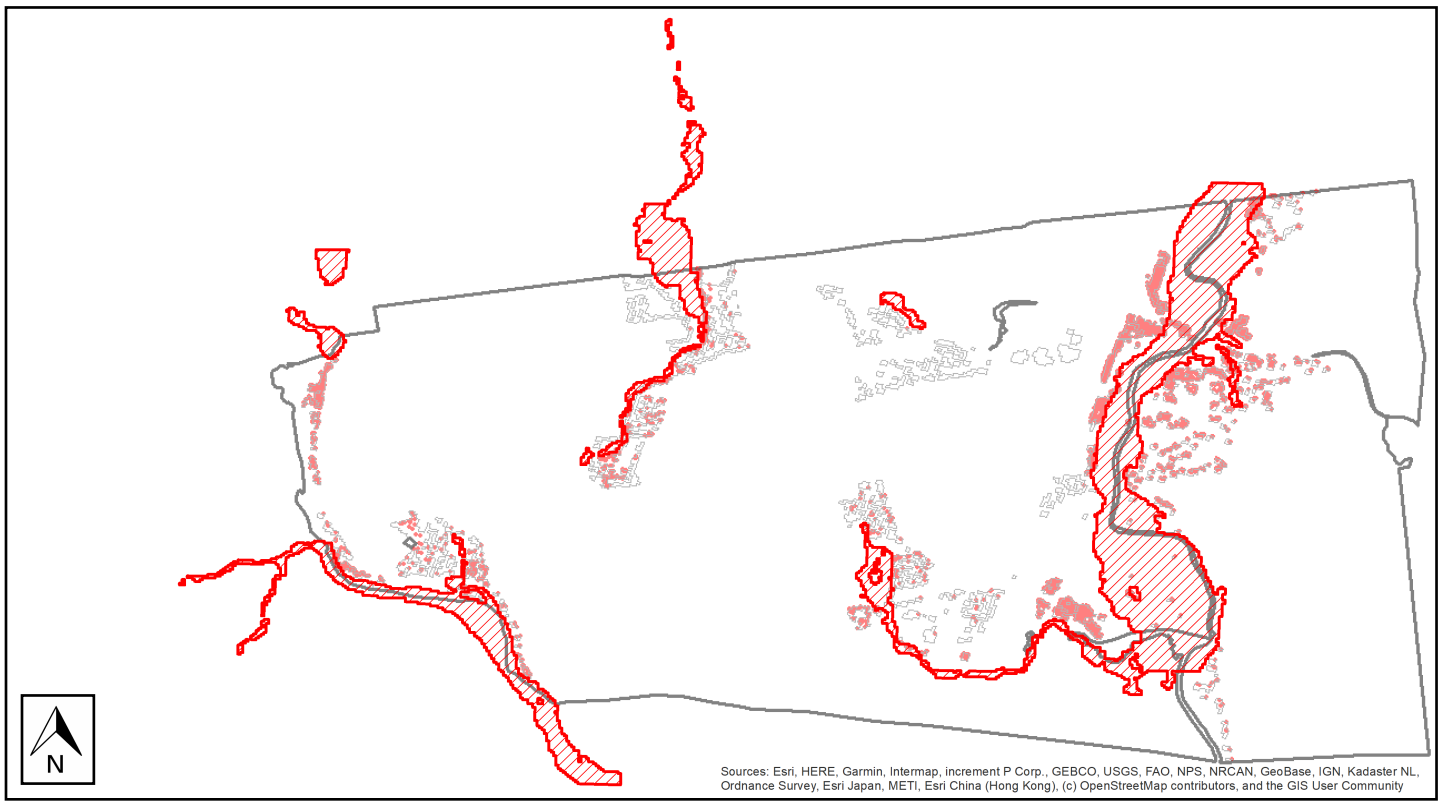


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	8	53	5	33	1	7	0	0	1	7	0	0
Total	**8**		**5**		**1**		**0**		**1**		**0**	

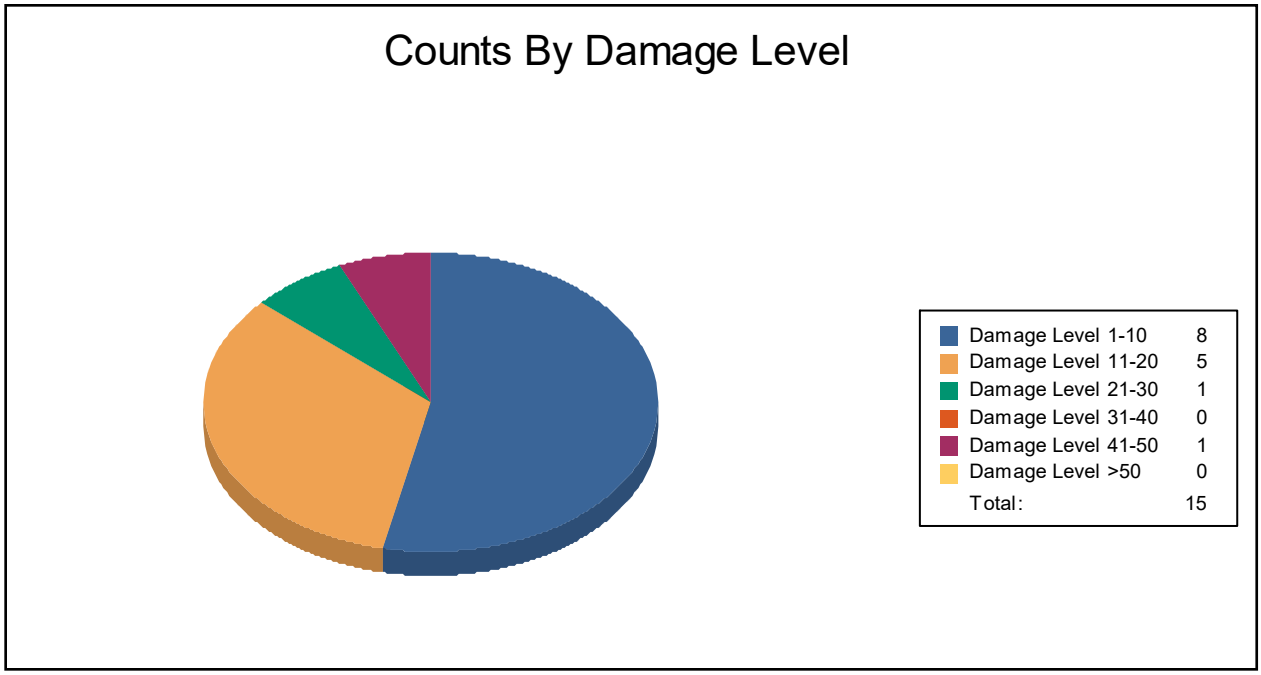


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	8	53	5	33	1	7	0	0	1	7	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

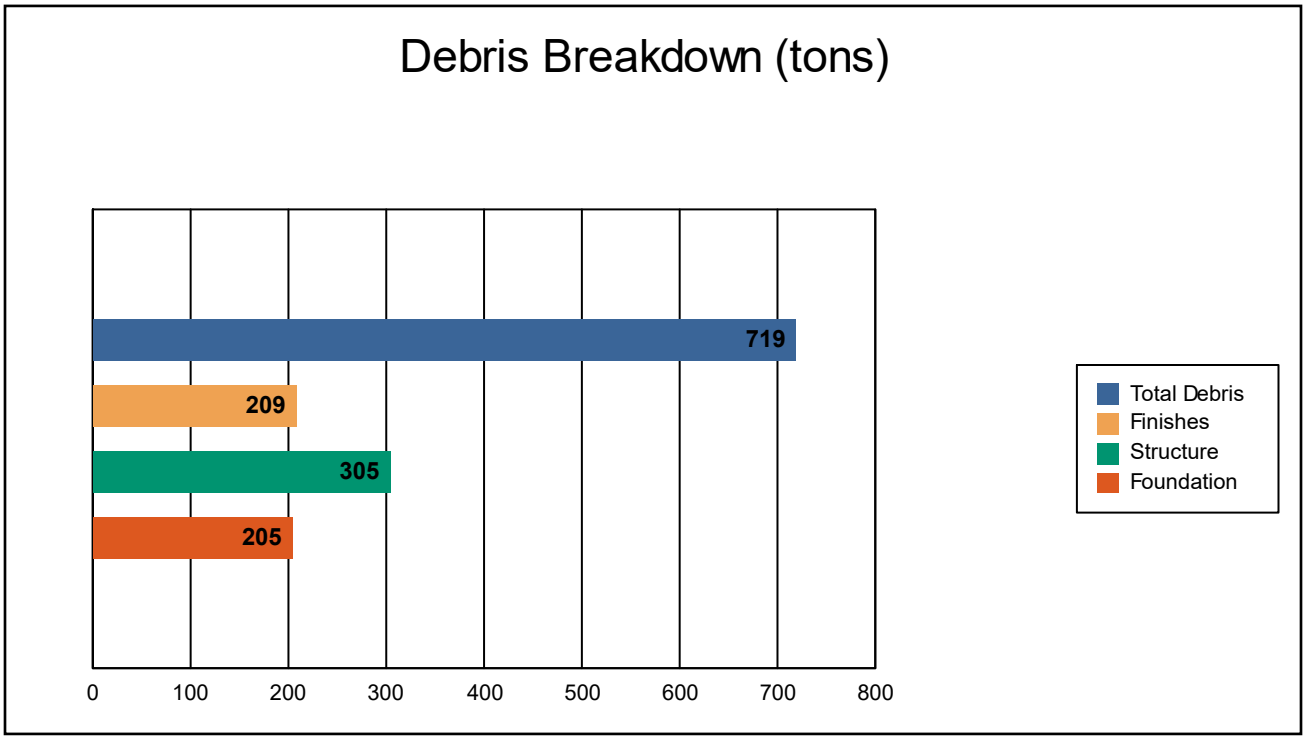
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

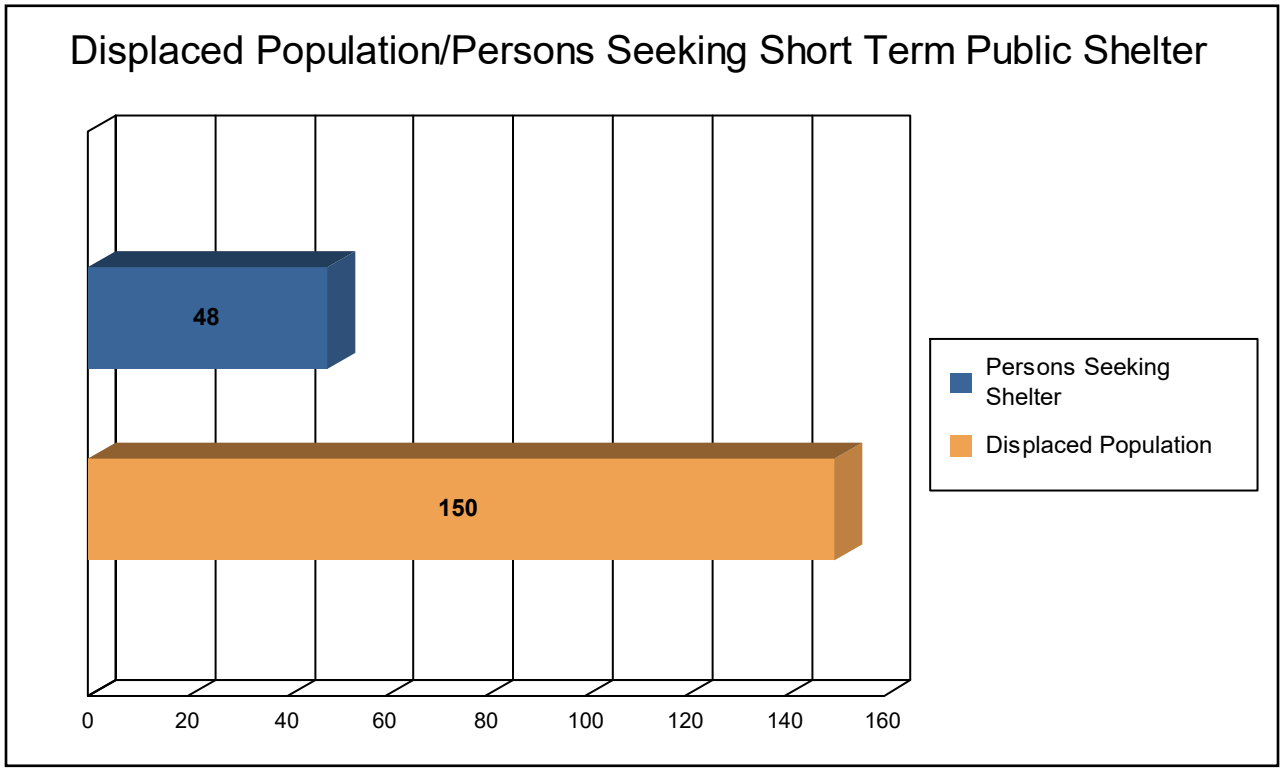


The model estimates that a total of 719 tons of debris will be generated. Of the total amount, Finishes comprises 29% of the total, Structure comprises 42% of the total, and Foundation comprises 29%. If the debris tonnage is converted into an estimated number of truckloads, it will require 29 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 50 households (or 150 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 48 people (out of a total population of 18,932) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 48.35 million dollars, which represents 3.50 % of the total replacement value of the scenario buildings.

Building-Related Losses

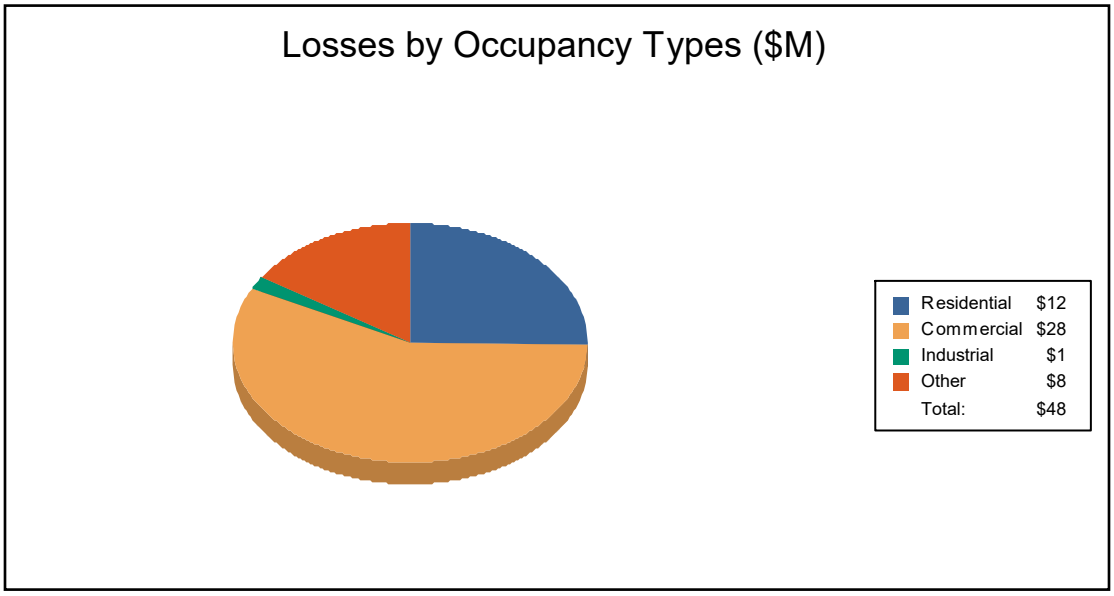
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 25.96 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 25.36% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6.09	3.79	0.24	0.40	10.51
	Content	2.84	9.43	0.41	2.00	14.68
	Inventory	0.00	0.61	0.06	0.09	0.76
	Subtotal	**8.93**	**13.83**	**0.71**	**2.49**	**25.96**
Business Interruption						
	Income	0.37	5.47	0.01	0.62	6.46
	Relocation	1.29	1.10	0.00	0.34	2.74
	Rental Income	0.80	0.75	0.00	0.06	1.61
	Wage	0.87	6.51	0.01	4.19	11.59
	Subtotal	**3.33**	**13.83**	**0.02**	**5.21**	**22.39**
ALL	**Total**	**12.26**	**27.66**	**0.73**	**7.70**	**48.35**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,025,934	1,247,990	5,273,924
Total	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**
Total Study Region	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**

Hazus: Flood Global Risk Report

Region Name: Avon_FL

Flood Scenario: Avon_flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 233 census blocks. The region contains over 7 thousand households and has a total population of 18,932 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,760 buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89.18% of the buildings (and 76.34% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,760 buildings in the region which have an aggregate total replacement value of 5,274 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,025,934	76.3%
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Industrial	163,163	3.1%
Agricultural	4,367	0.1%
Religion	30,103	0.6%
Government	73,993	1.4%
Education	181,879	3.4%
Total	**5,273,924**	**100%**

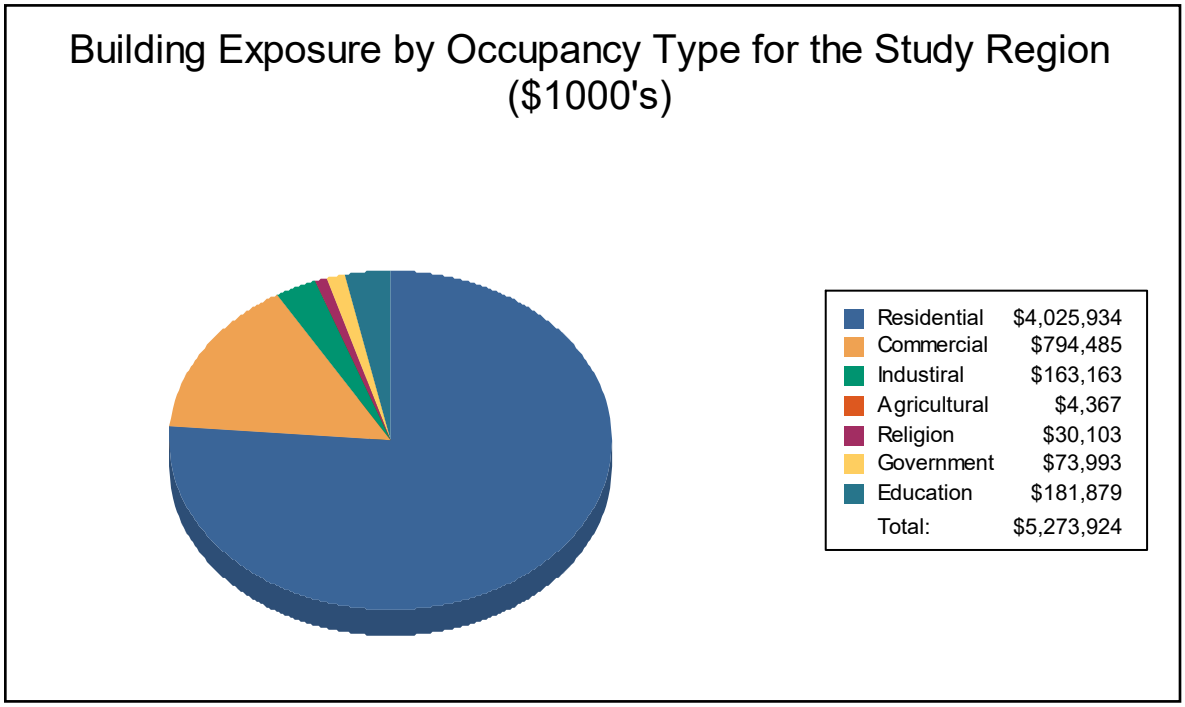
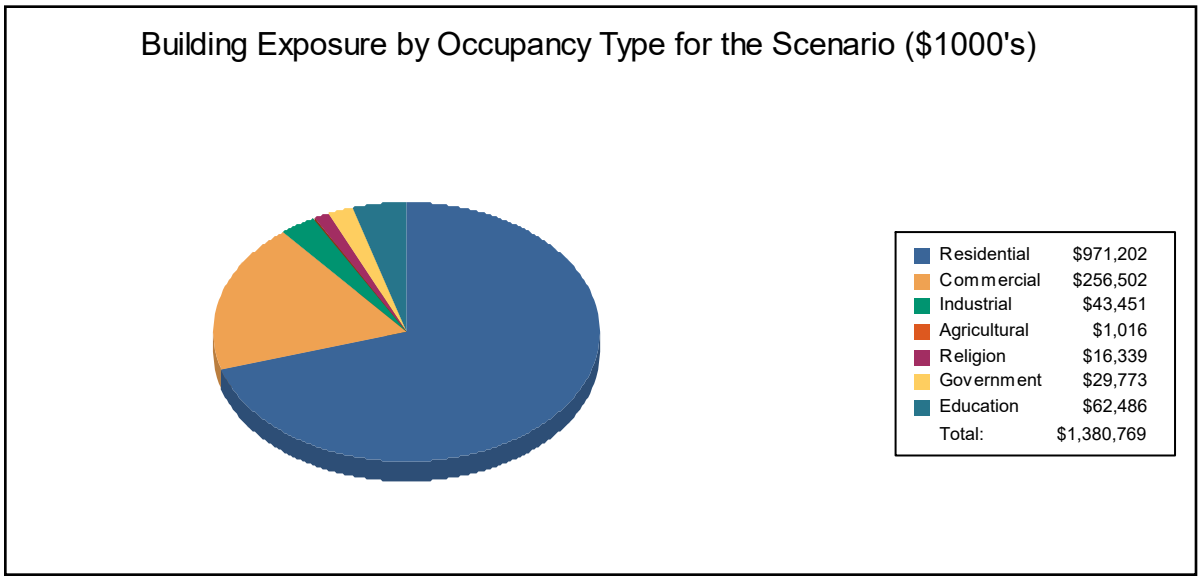


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	971,202	70.3%
Commercial	256,502	18.6%
Industrial	43,451	3.1%
Agricultural	1,016	0.1%
Religion	16,339	1.2%
Government	29,773	2.2%
Education	62,486	4.5%
Total	**1,380,769**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

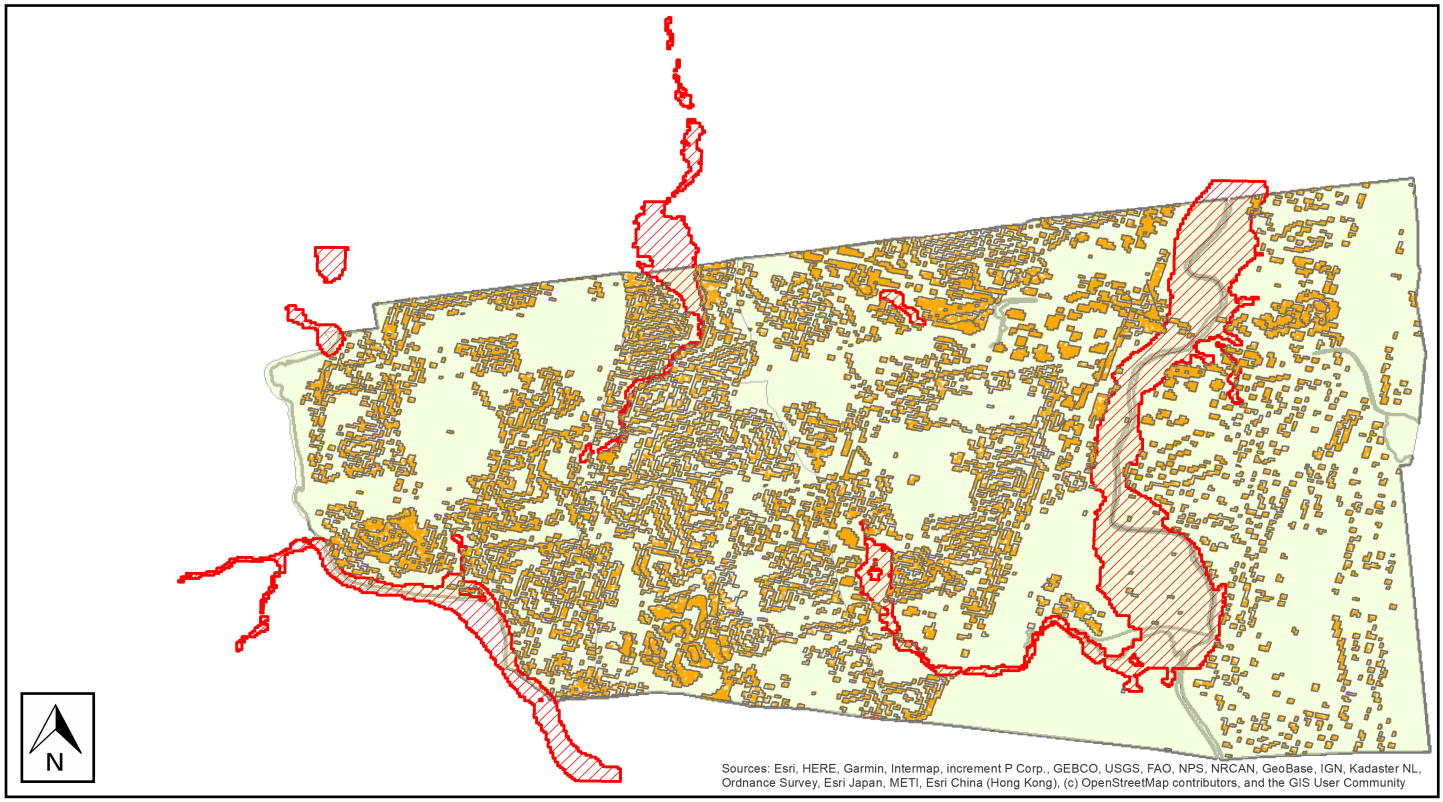
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Avon_FL
Scenario Name:	Avon_flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 8 buildings will be at least moderately damaged. This is over 93% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

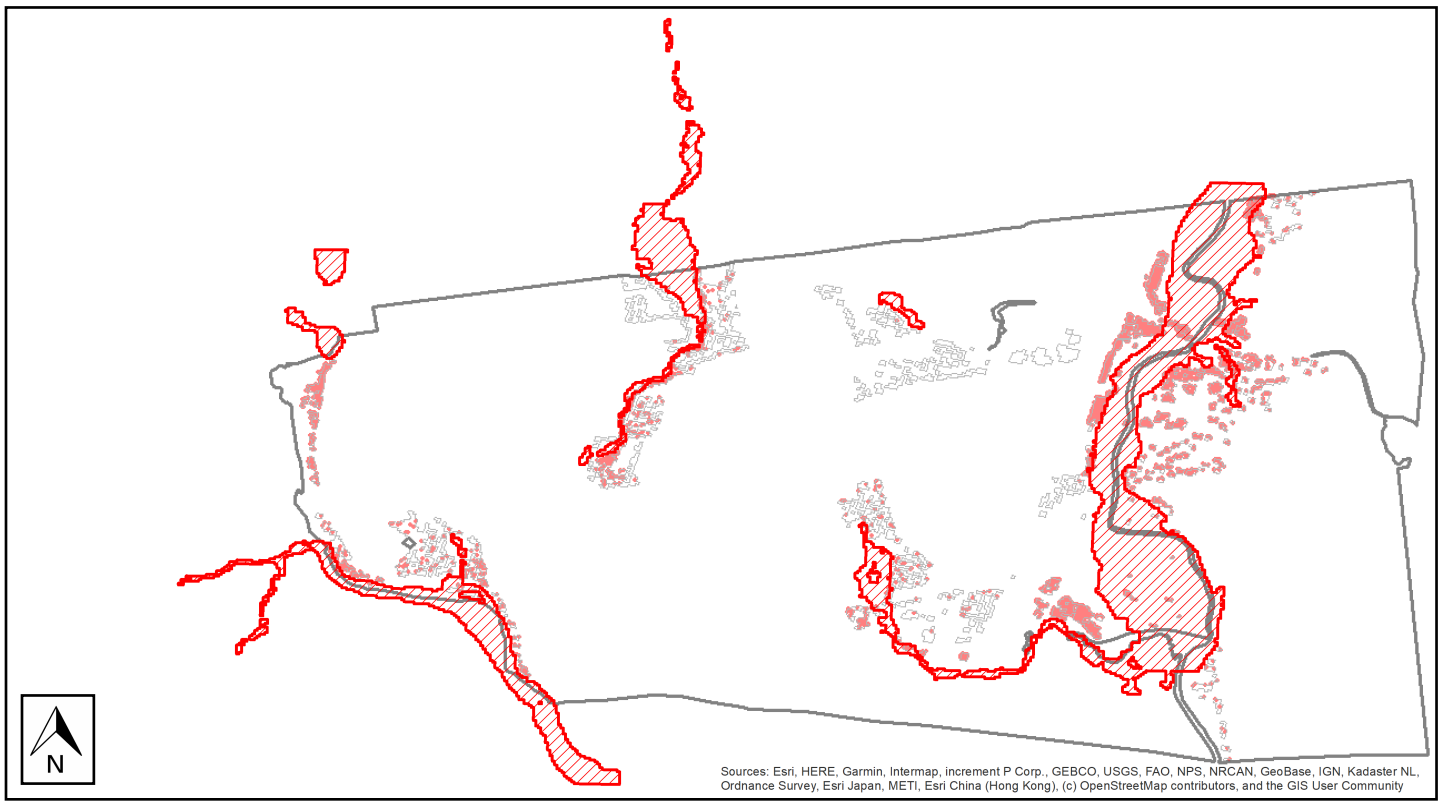


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	7	47	7	47	0	0	0	0	0	0	1	7
Total	**7**		**7**		**0**		**0**		**0**		**1**	

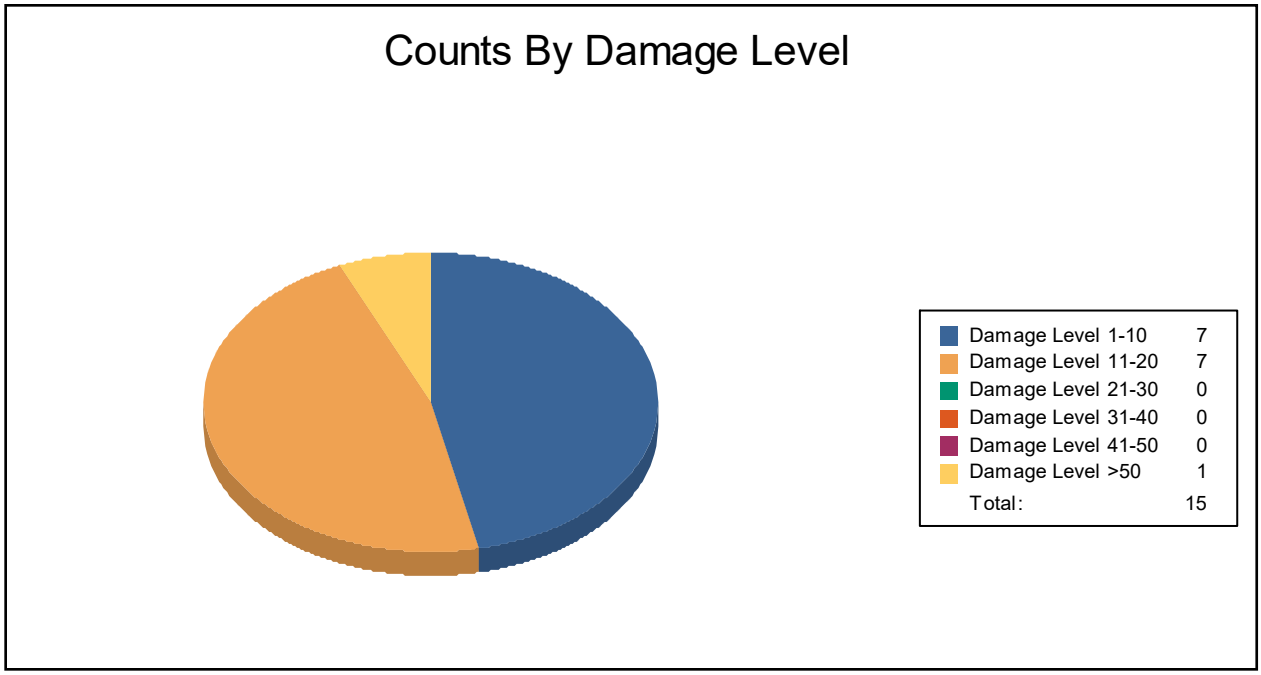


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	7	47	7	47	0	0	0	0	0	0	1	7

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

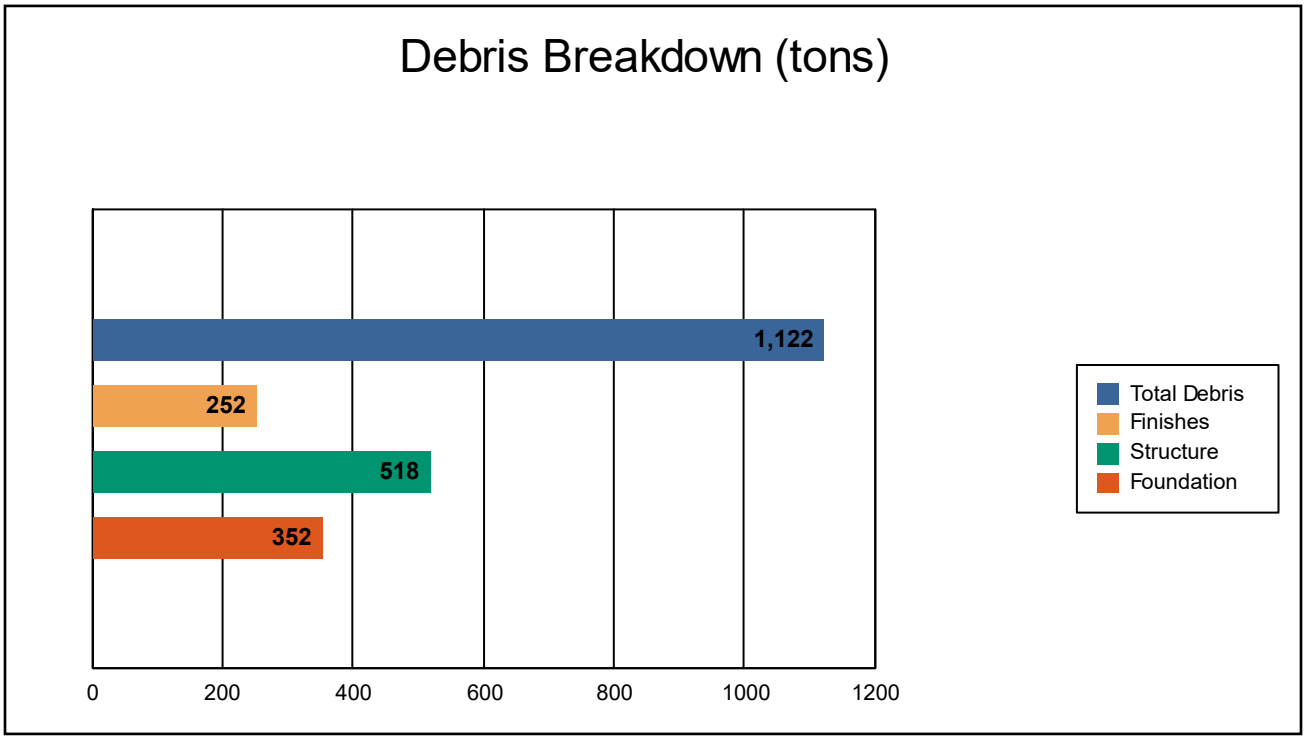
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

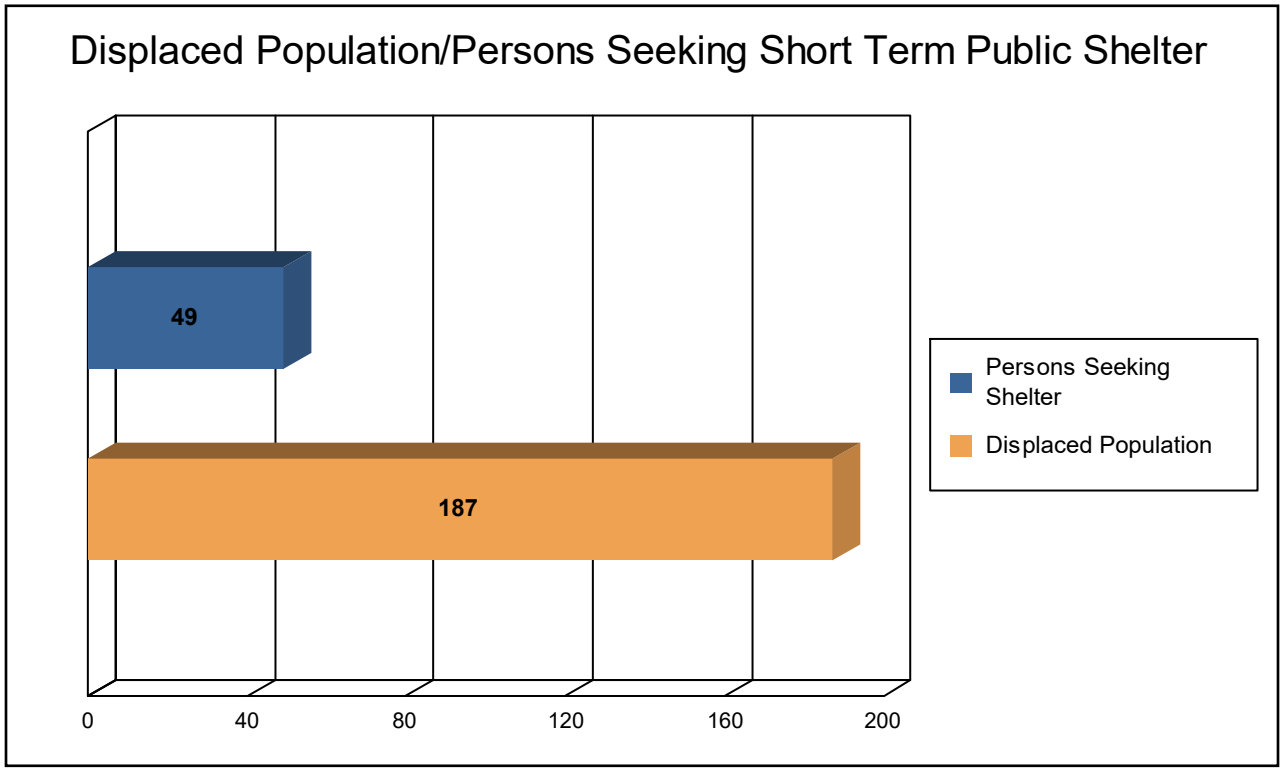


The model estimates that a total of 1,122 tons of debris will be generated. Of the total amount, Finishes comprises 22% of the total, Structure comprises 46% of the total, and Foundation comprises 31%. If the debris tonnage is converted into an estimated number of truckloads, it will require 45 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 62 households (or 187 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 49 people (out of a total population of 18,932) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 59.23 million dollars, which represents 4.29 % of the total replacement value of the scenario buildings.

Building-Related Losses

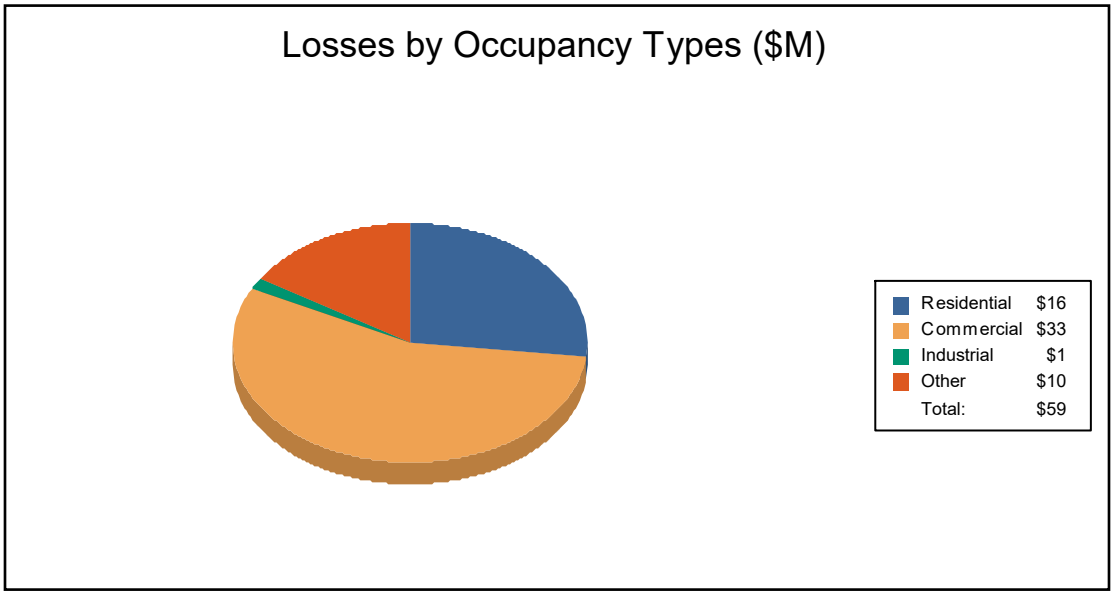
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 32.36 million dollars. 45% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 26.98% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	8.07	4.79	0.29	0.56	13.71
	Content	3.73	11.02	0.47	2.55	17.77
	Inventory	0.00	0.72	0.06	0.10	0.88
	Subtotal	**11.80**	**16.53**	**0.82**	**3.21**	**32.36**
Business Interruption						
	Income	0.49	6.44	0.01	0.73	7.67
	Relocation	1.57	1.26	0.00	0.41	3.24
	Rental Income	0.96	0.87	0.00	0.08	1.90
	Wage	1.16	7.74	0.01	5.14	14.05
	Subtotal	**4.18**	**16.31**	**0.02**	**6.35**	**26.87**
ALL	**Total**	**15.98**	**32.84**	**0.84**	**9.57**	**59.23**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,025,934	1,247,990	5,273,924
Total	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**
Total Study Region	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**

Hazus: Flood Global Risk Report

Region Name: Avon_FL

Flood Scenario: Avon_flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 233 census blocks. The region contains over 7 thousand households and has a total population of 18,932 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,760 buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89.18% of the buildings (and 76.34% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,760 buildings in the region which have an aggregate total replacement value of 5,274 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,025,934	76.3%
Commercial	794,485	15.1%
Industrial	163,163	3.1%
Agricultural	4,367	0.1%
Religion	30,103	0.6%
Government	73,993	1.4%
Education	181,879	3.4%
Total	**5,273,924**	**100%**

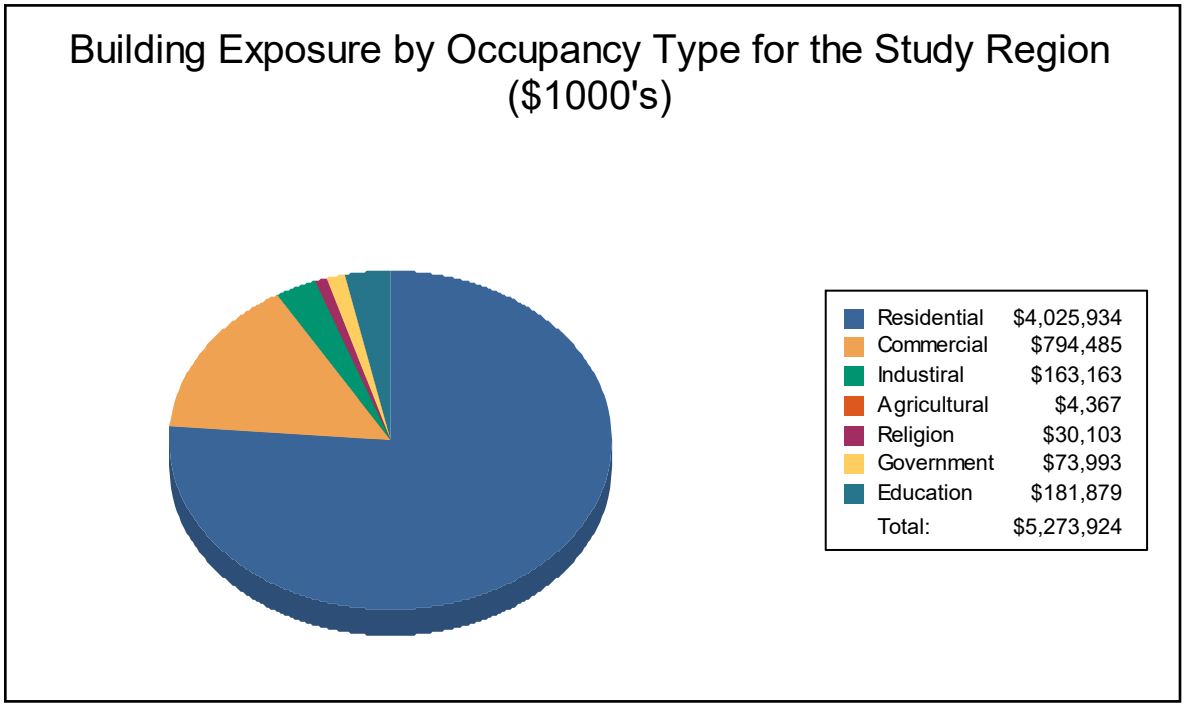
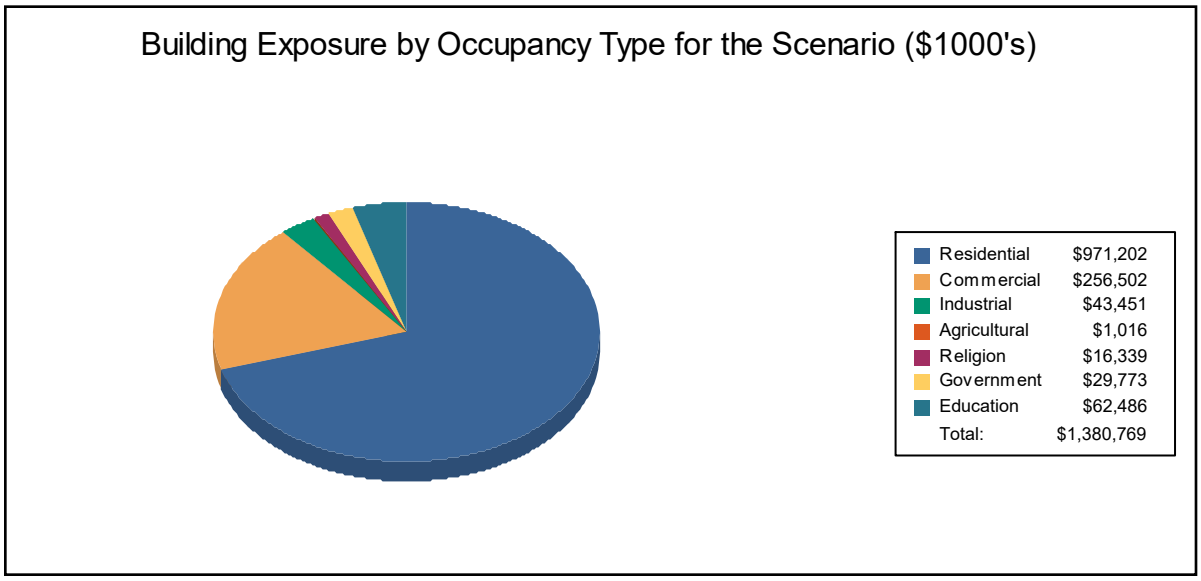


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	971,202	70.3%
Commercial	256,502	18.6%
Industrial	43,451	3.1%
Agricultural	1,016	0.1%
Religion	16,339	1.2%
Government	29,773	2.2%
Education	62,486	4.5%
Total	**1,380,769**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

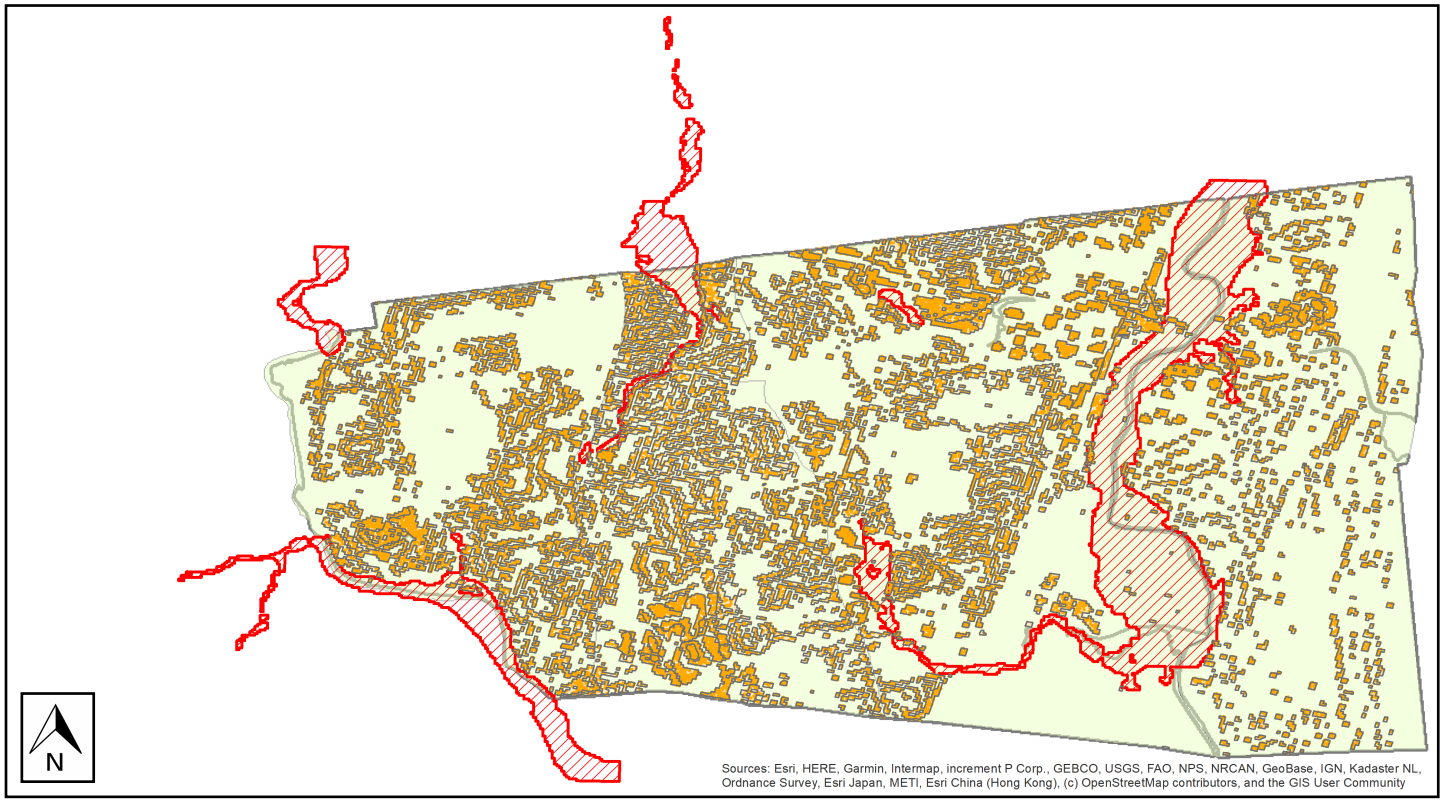
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Avon_FL
Scenario Name:	Avon_flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 12 buildings will be at least moderately damaged. This is over 88% of the total number of buildings in the scenario. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

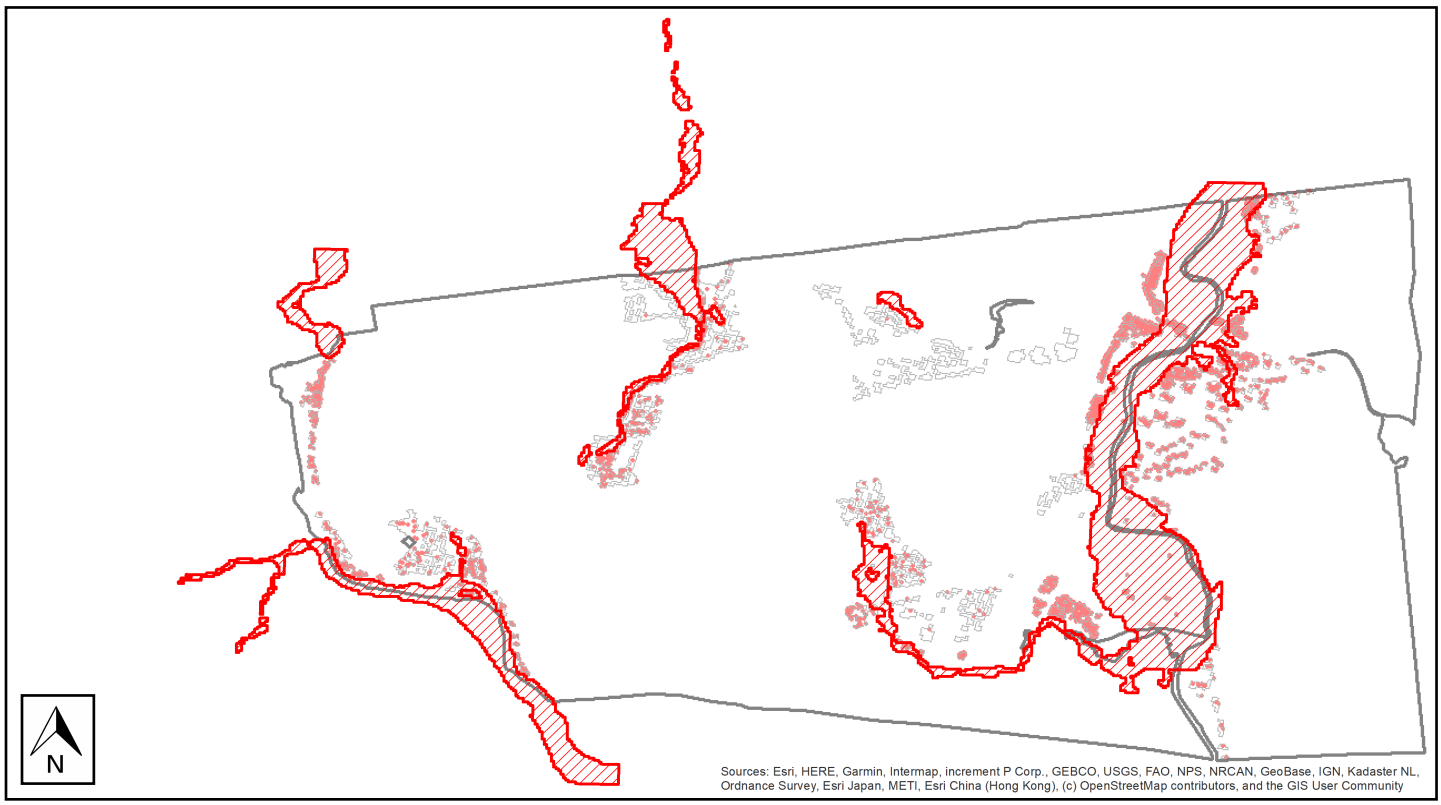


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	12	50	10	42	0	0	0	0	0	0	2	8
Total	**12**		**10**		**0**		**0**		**0**		**2**	

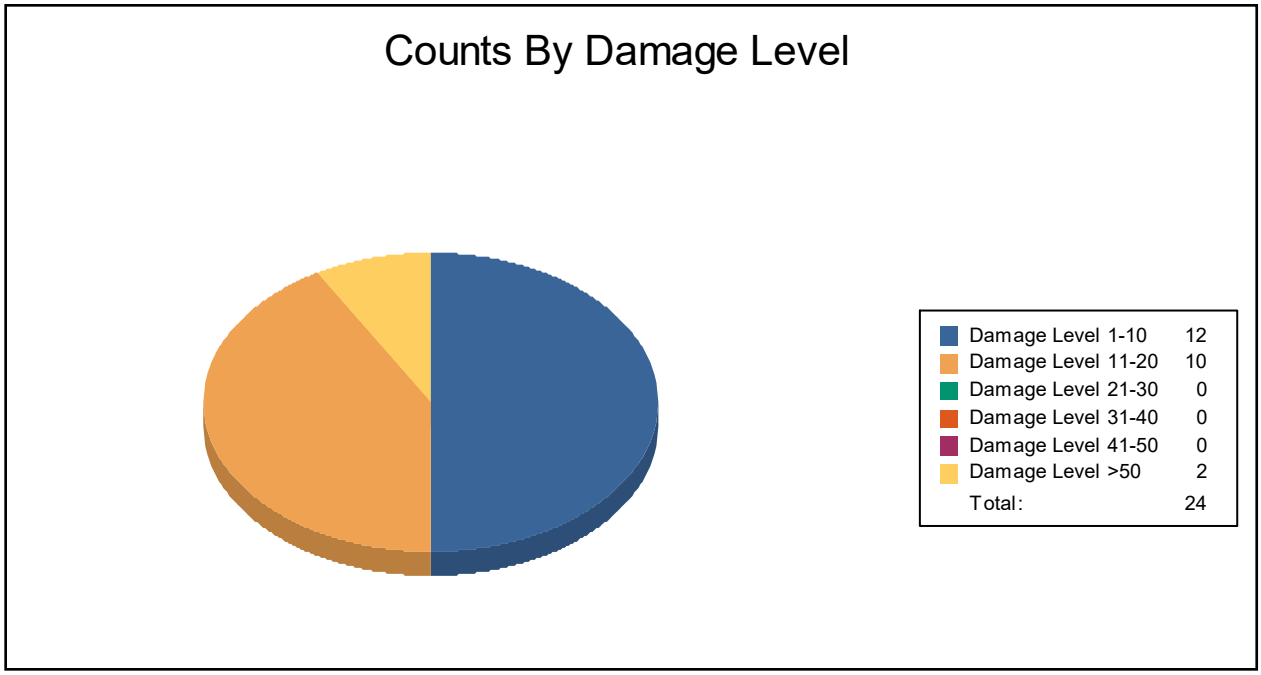


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	12	50	10	42	0	0	0	0	0	0	2	8

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

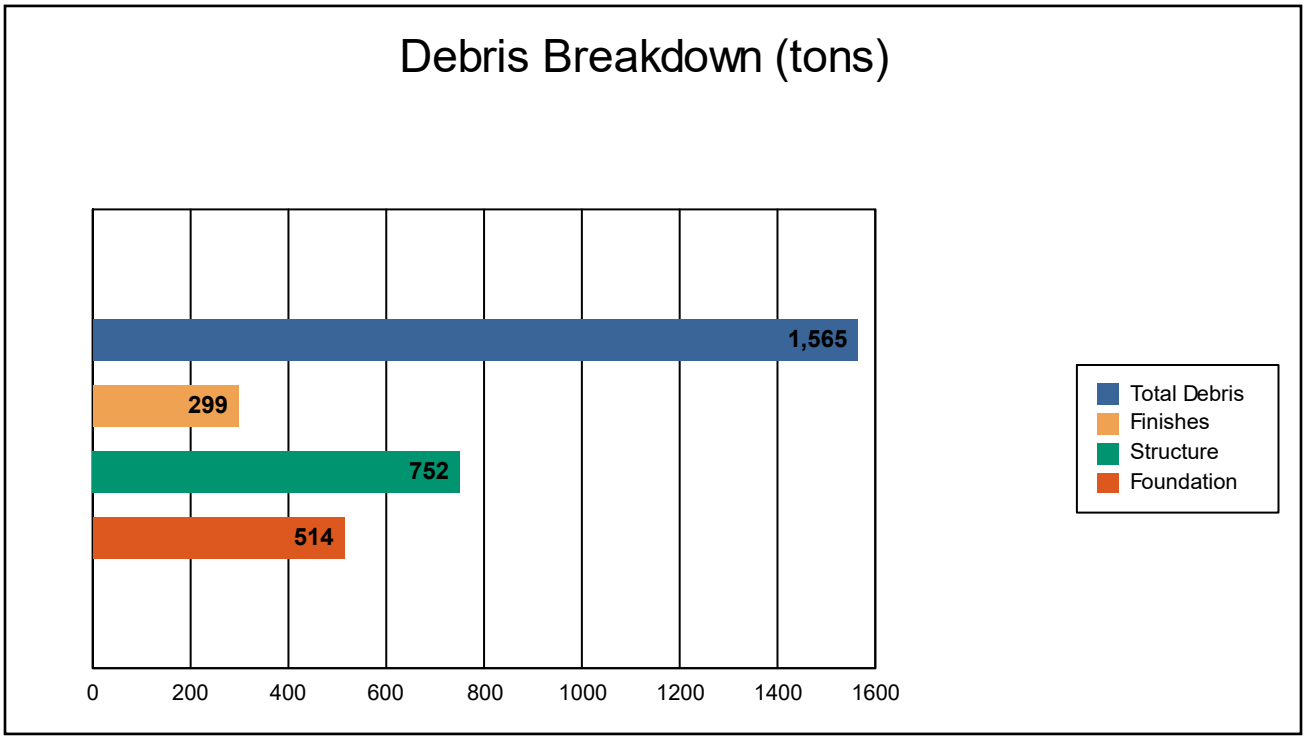
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

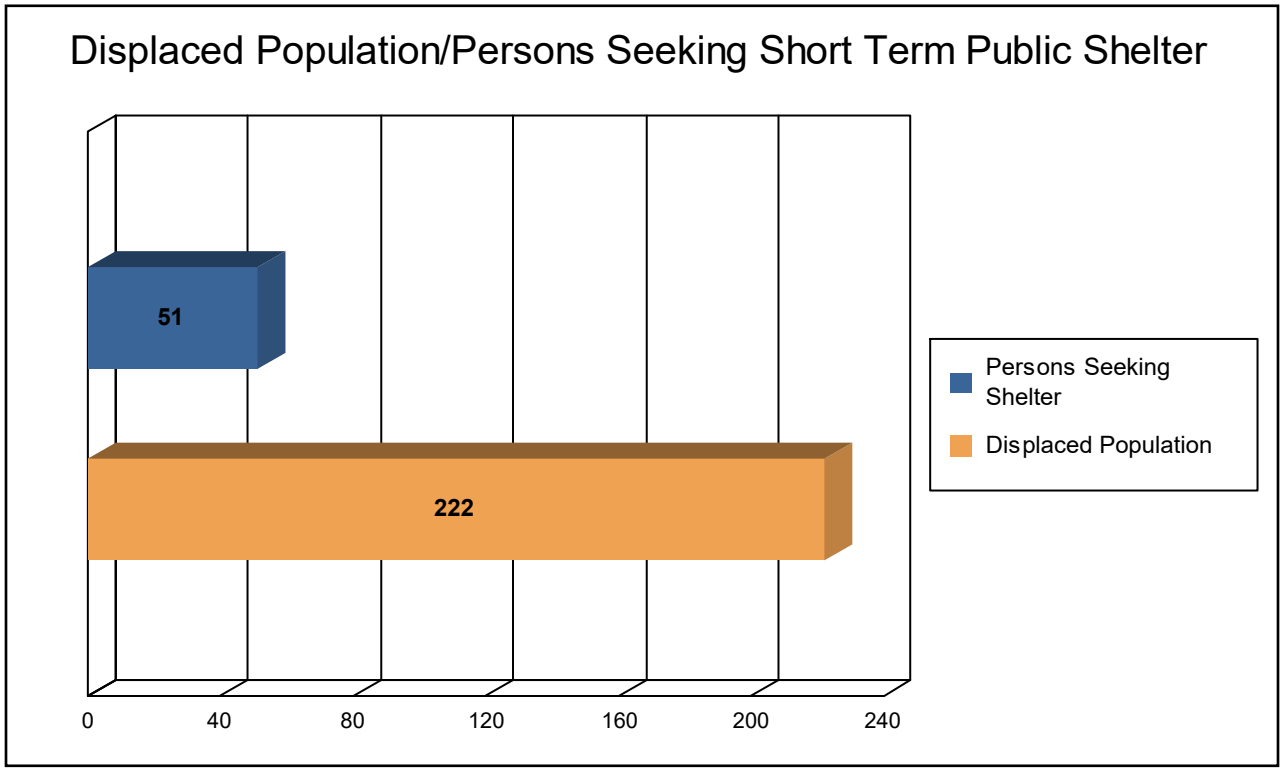


The model estimates that a total of 1,565 tons of debris will be generated. Of the total amount, Finishes comprises 19% of the total, Structure comprises 48% of the total, and Foundation comprises 33%. If the debris tonnage is converted into an estimated number of truckloads, it will require 63 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 74 households (or 222 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 51 people (out of a total population of 18,932) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 69.93 million dollars, which represents 5.06 % of the total replacement value of the scenario buildings.

Building-Related Losses

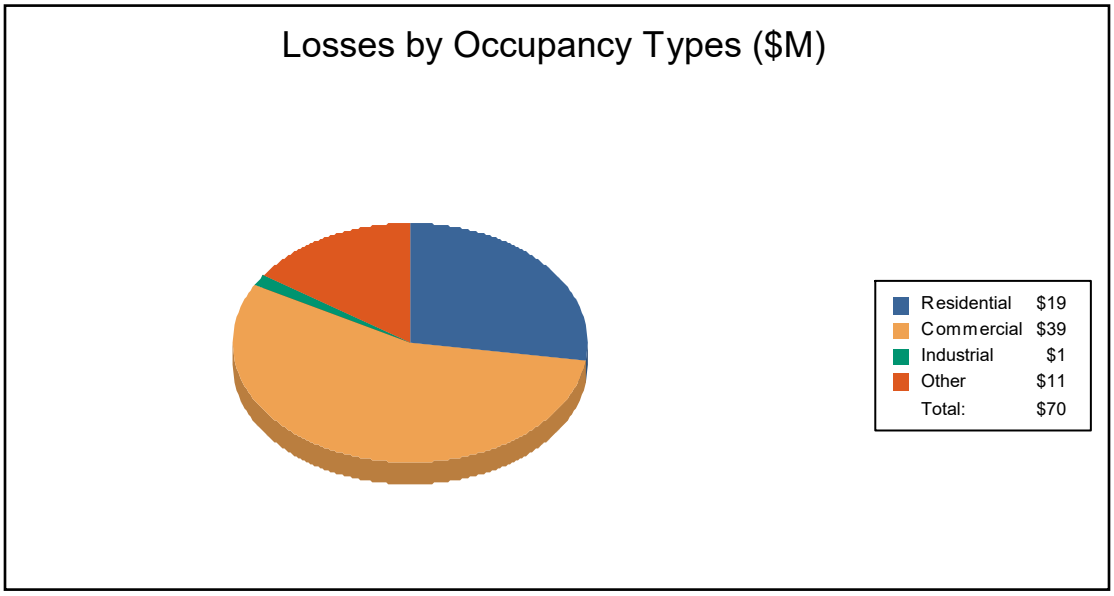
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 39.01 million dollars. 44% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 27.47% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.96	5.77	0.32	0.72	16.77
	Content	4.59	13.05	0.51	3.05	21.21
	Inventory	0.00	0.85	0.07	0.12	1.03
	Subtotal	**14.55**	**19.67**	**0.90**	**3.89**	**39.01**
Business Interruption						
	Income	0.50	7.55	0.01	0.81	8.87
	Relocation	1.89	1.47	0.00	0.43	3.80
	Rental Income	1.09	1.01	0.00	0.08	2.18
	Wage	1.18	9.20	0.01	5.69	16.08
	Subtotal	**4.66**	**19.24**	**0.02**	**7.00**	**30.93**
ALL	**Total**	**19.21**	**38.91**	**0.92**	**10.89**	**69.93**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,025,934	1,247,990	5,273,924
Total	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**
Total Study Region	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**

Hazus: Flood Global Risk Report

Region Name: Avon_FL

Flood Scenario: Avon_flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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Note:
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The geographical size of the region is approximately 6 square miles and contains 233 census blocks. The region contains over 7 thousand households and has a total population of 18,932 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,760 buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89.18% of the buildings (and 76.34% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,760 buildings in the region which have an aggregate total replacement value of 5,274 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,025,934	76.3%
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Agricultural	4,367	0.1%
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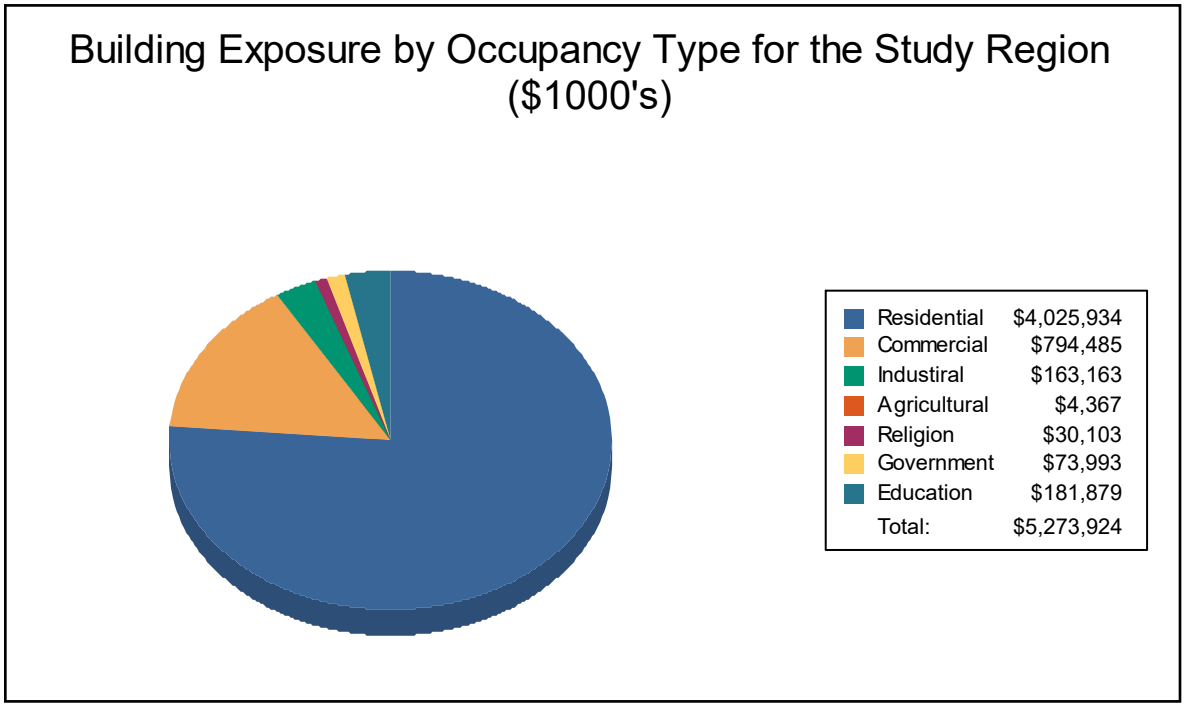

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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Commercial	256,502	18.6%
Industrial	43,451	3.1%
Agricultural	1,016	0.1%
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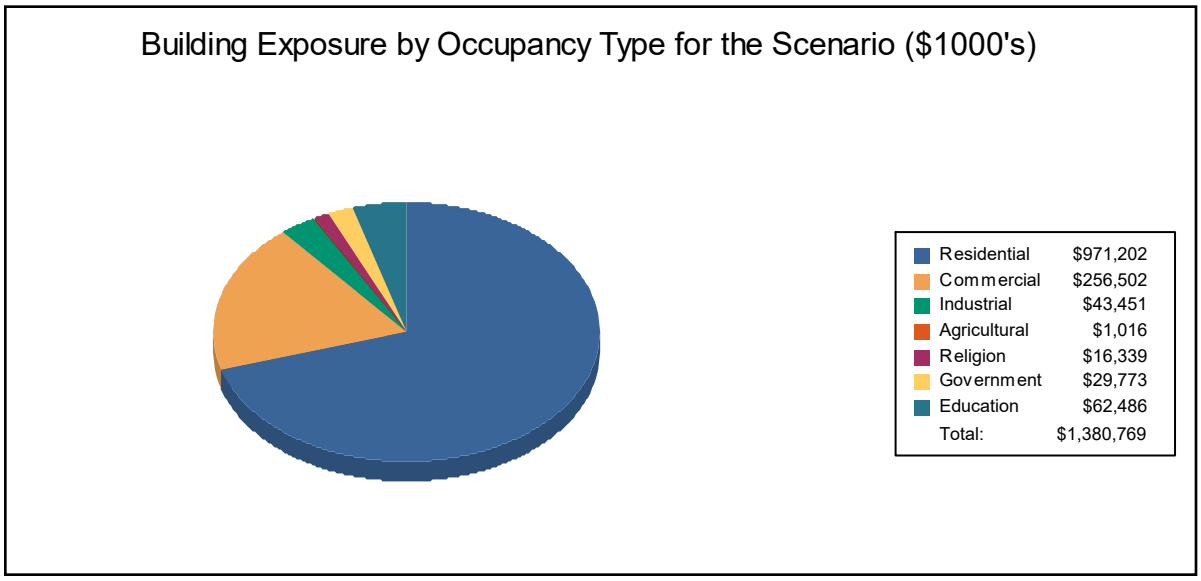
Education	62,486	4.5%
Total	**1,380,769**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

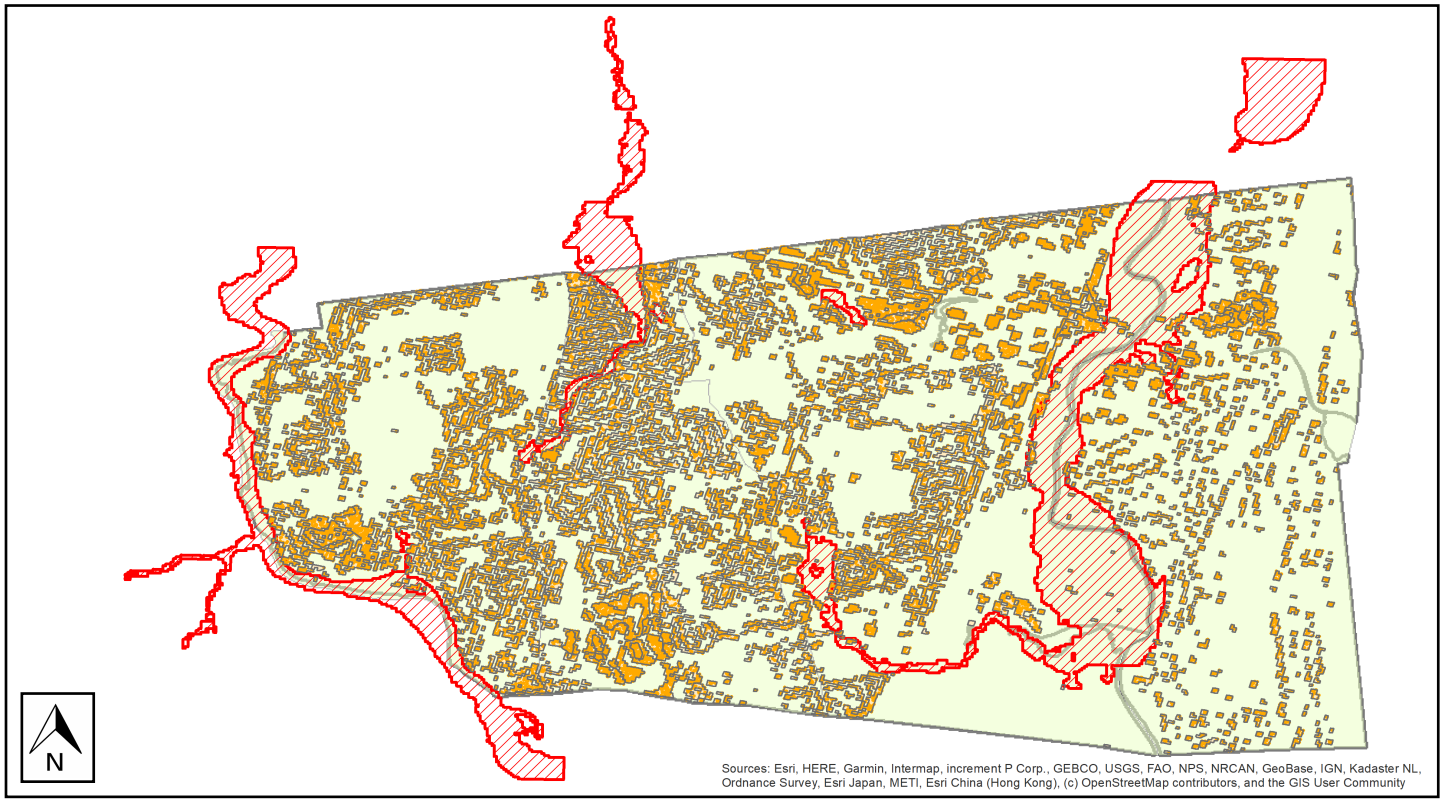
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Avon_FL
Scenario Name:	Avon_flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 31 buildings will be at least moderately damaged. This is over 74% of the total number of buildings in the scenario. There are an estimated 6 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

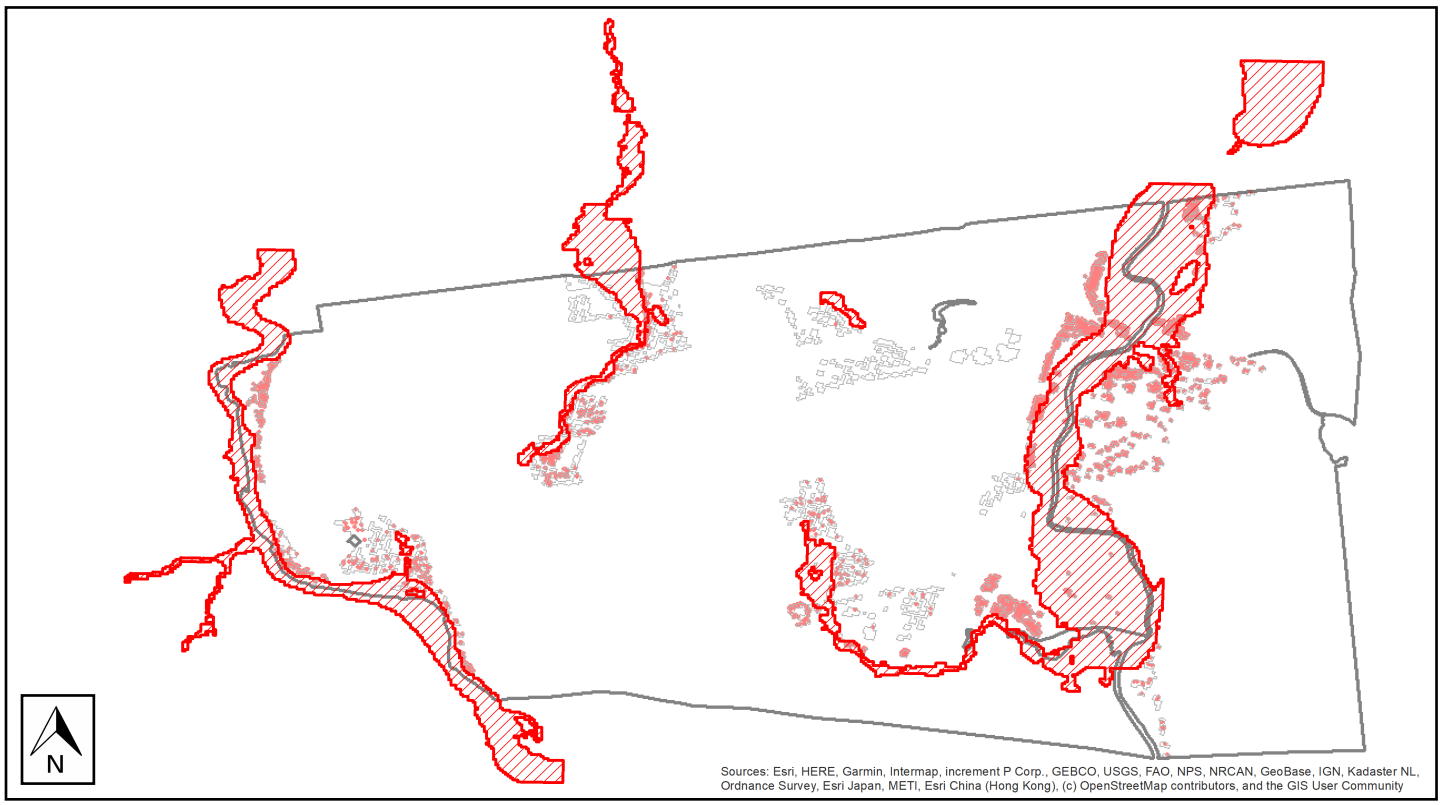


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	10	24	11	27	10	24	2	5	2	5	6	15
Total	**10**		**11**		**10**		**2**		**2**		**6**	

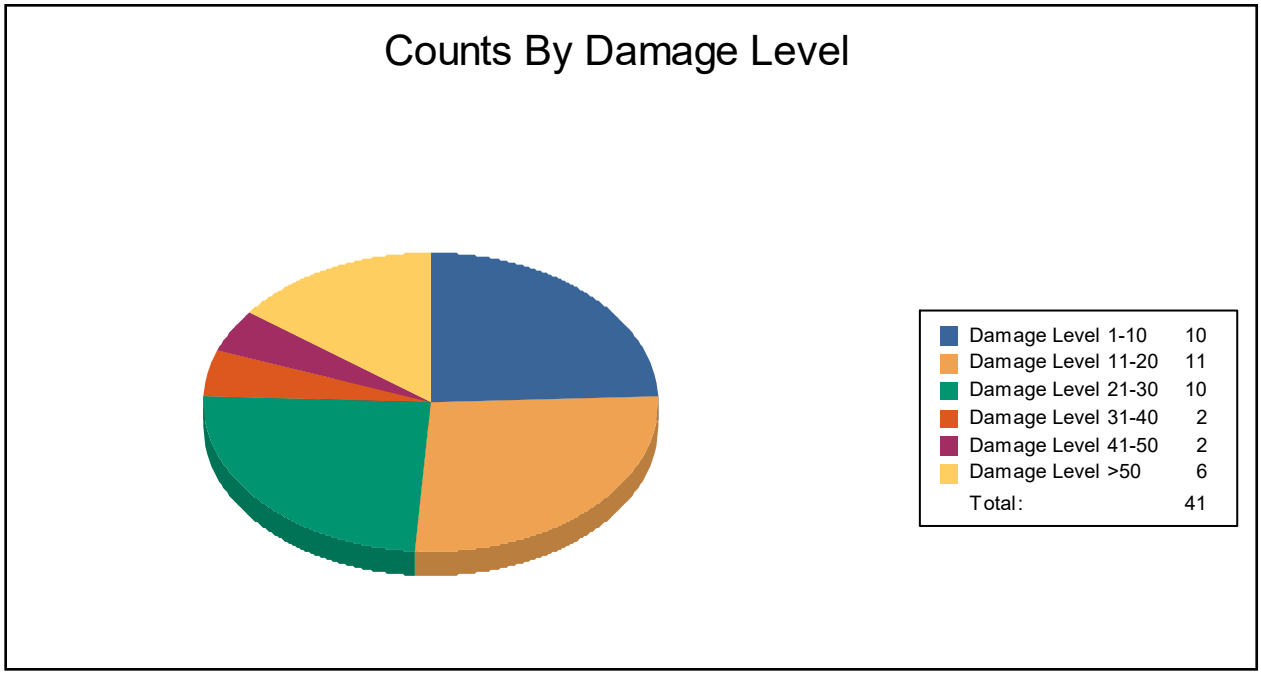


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	10	24	11	27	10	24	2	5	2	5	6	15

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

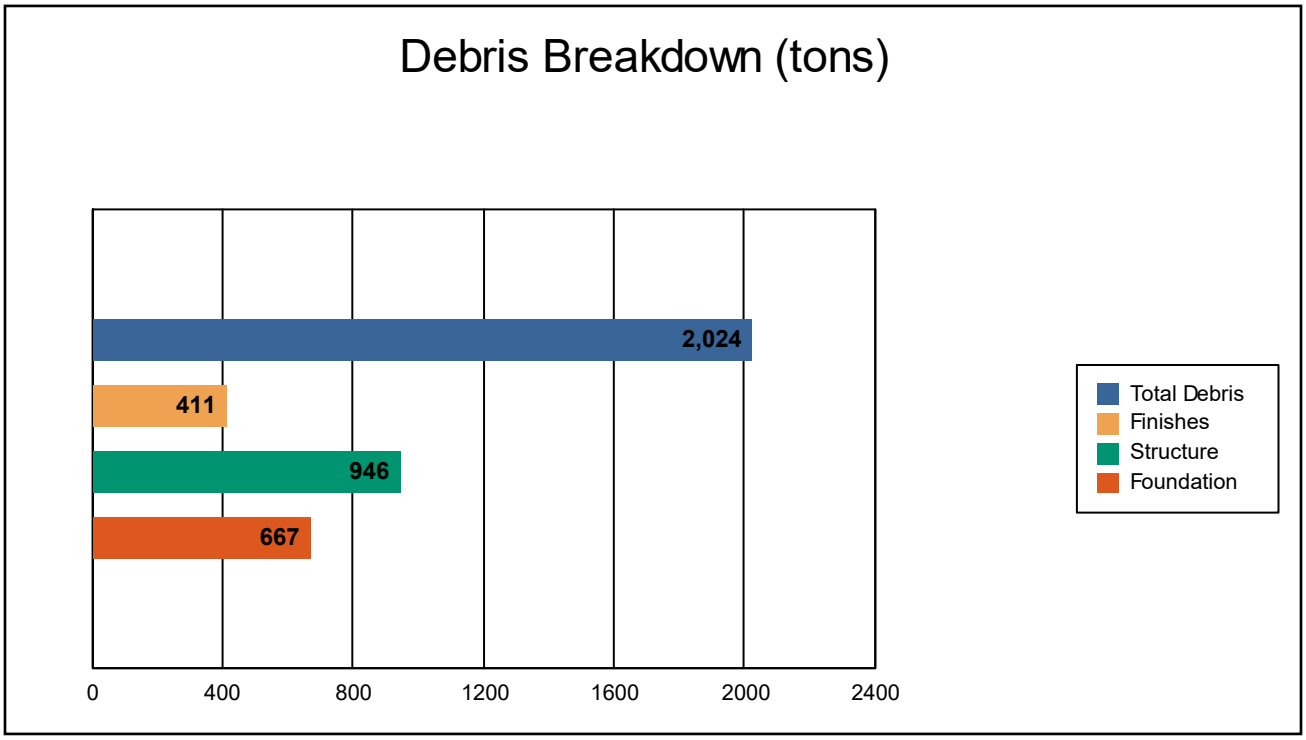
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

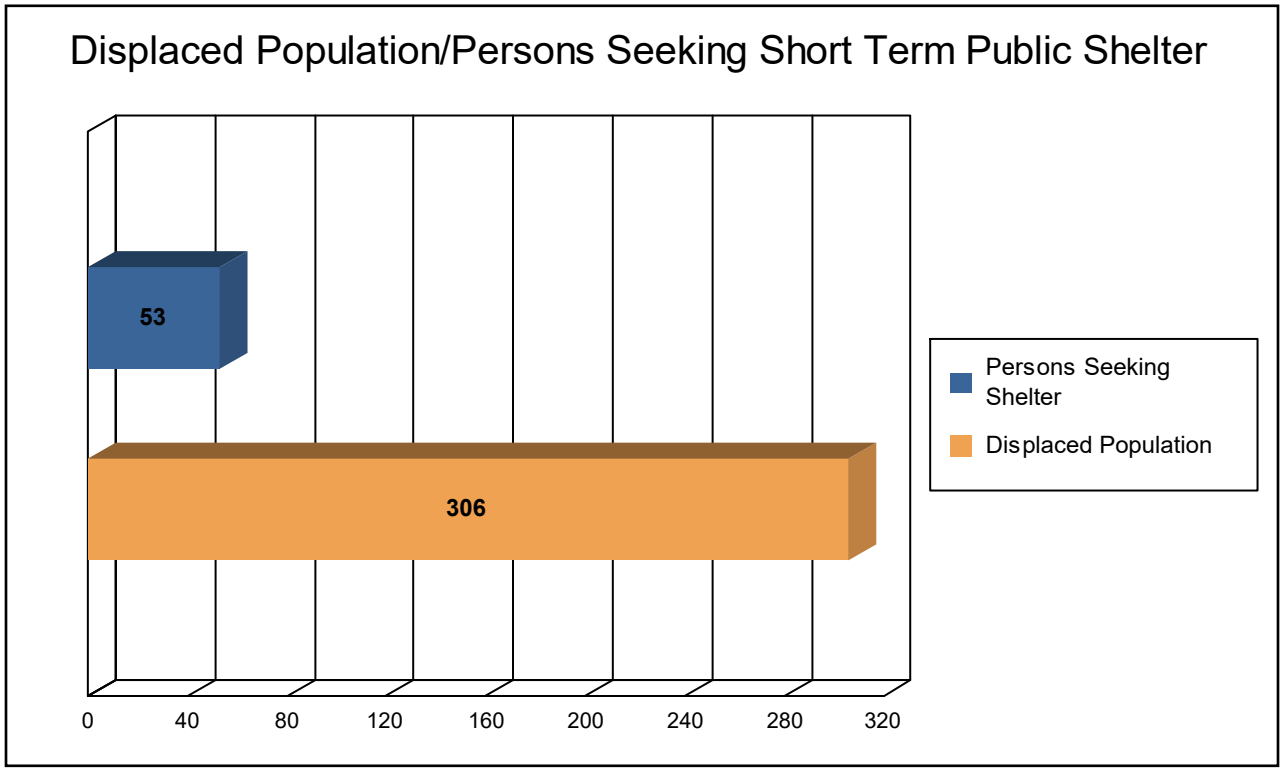


The model estimates that a total of 2,024 tons of debris will be generated. Of the total amount, Finishes comprises 20% of the total, Structure comprises 47% of the total, and Foundation comprises 33%. If the debris tonnage is converted into an estimated number of truckloads, it will require 81 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 102 households (or 306 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 53 people (out of a total population of 18,932) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 102.56 million dollars, which represents 7.43 % of the total replacement value of the scenario buildings.

Building-Related Losses

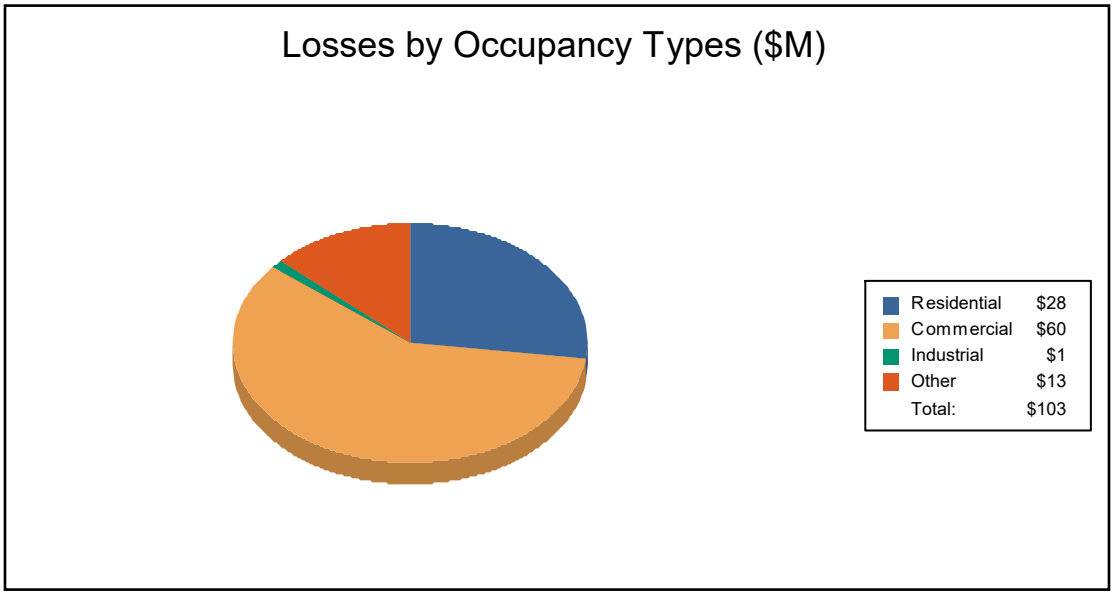
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 58.16 million dollars. 43% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 27.22% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	15.28	8.71	0.36	1.08	25.43
	Content	6.80	20.01	0.56	3.76	31.13
	Inventory	0.00	1.35	0.08	0.18	1.60
	Subtotal	**22.09**	**30.07**	**0.99**	**5.02**	**58.16**
Business Interruption						
	Income	0.52	11.35	0.01	0.95	12.82
	Relocation	2.69	2.36	0.00	0.49	5.55
	Rental Income	1.42	1.60	0.00	0.09	3.11
	Wage	1.21	14.77	0.02	6.93	22.93
	Subtotal	**5.84**	**30.08**	**0.03**	**8.46**	**44.40**
ALL	**Total**	**27.92**	**60.15**	**1.02**	**13.48**	**102.56**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,025,934	1,247,990	5,273,924
Total	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**
Total Study Region	**18,932**	**4,025,934**	**1,247,990**	**5,273,924**

Hazus: Flood Global Risk Report

Region Name: Berlin_FL

Flood Scenario: Berlin_Flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

RiskMAP
Increasing Resilience Together

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 283 census blocks. The region contains over 8 thousand households and has a total population of 20,175 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,043 buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 84.82% of the buildings (and 58.89% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,043 buildings in the region which have an aggregate total replacement value of 4,779 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,814,177	58.9%
Commercial	1,097,012	23.0%
Industrial	464,162	9.7%
Agricultural	9,373	0.2%
Religion	54,546	1.1%
Government	217,948	4.6%
Education	121,289	2.5%
Total	**4,778,507**	**100%**

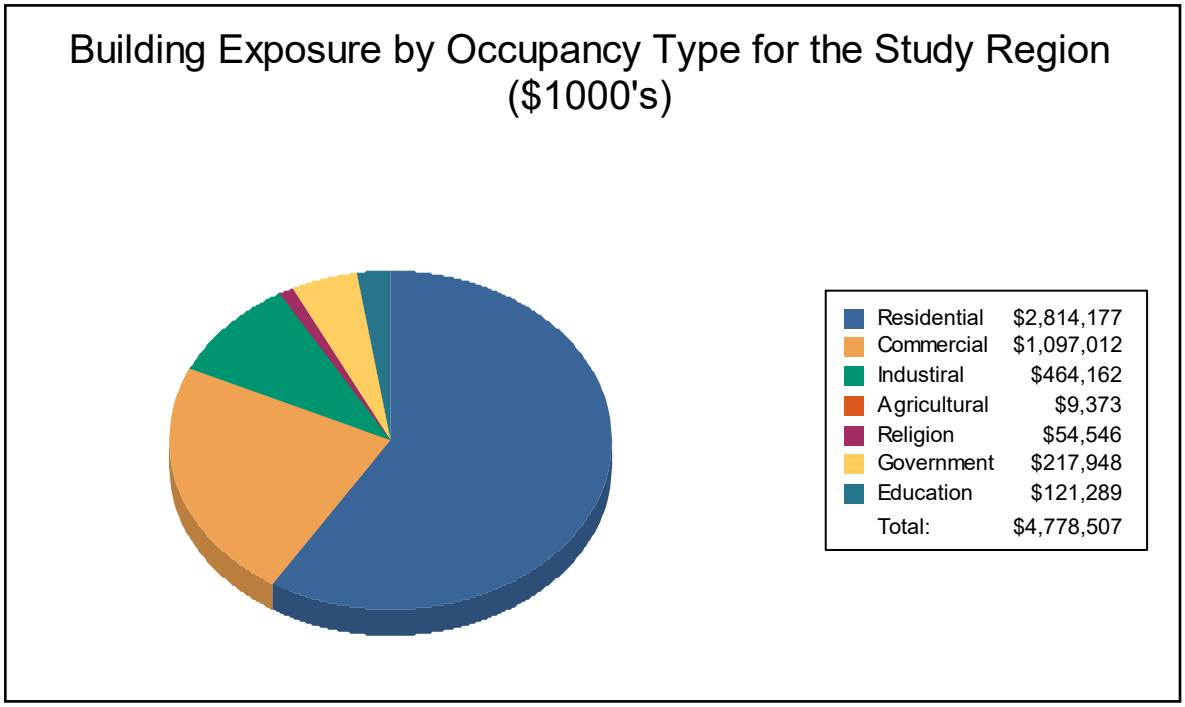
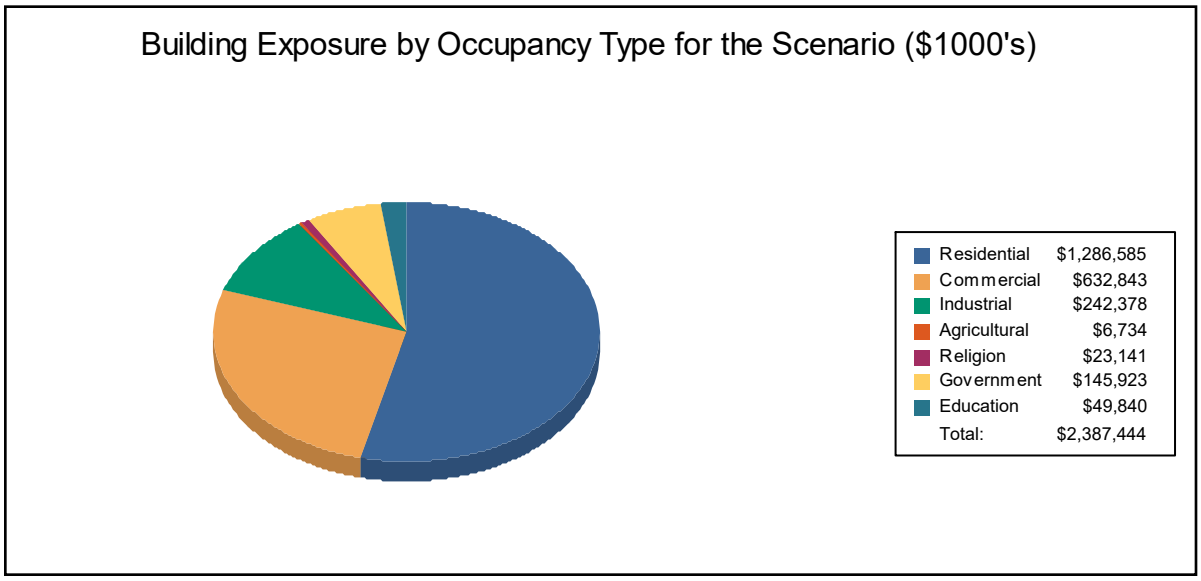


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,286,585	53.9%
Commercial	632,843	26.5%
Industrial	242,378	10.2%
Agricultural	6,734	0.3%
Religion	23,141	1.0%
Government	145,923	6.1%
Education	49,840	2.1%
Total	**2,387,444**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

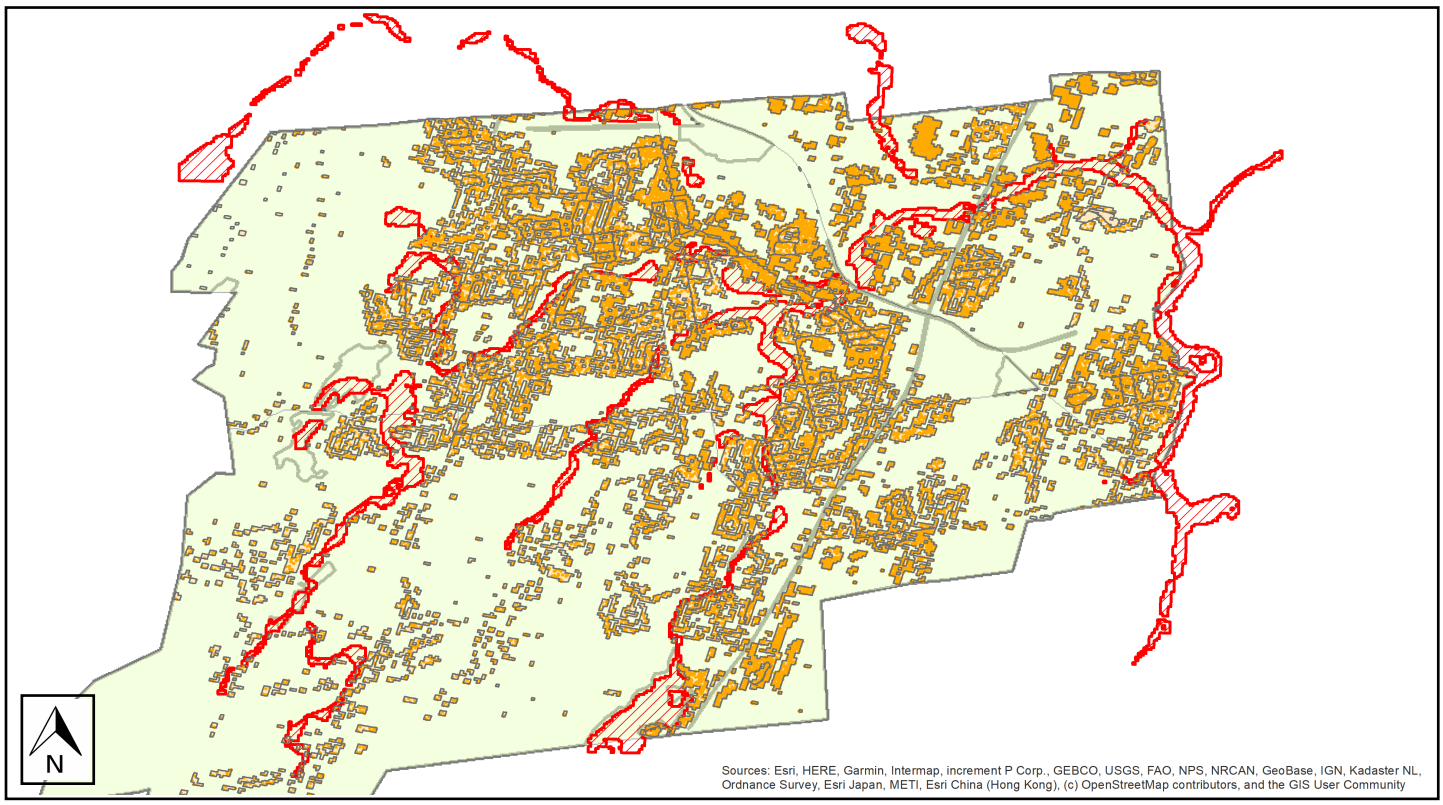
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Berlin_FL
Scenario Name:	Berlin_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 18 buildings will be at least moderately damaged. This is over 92% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

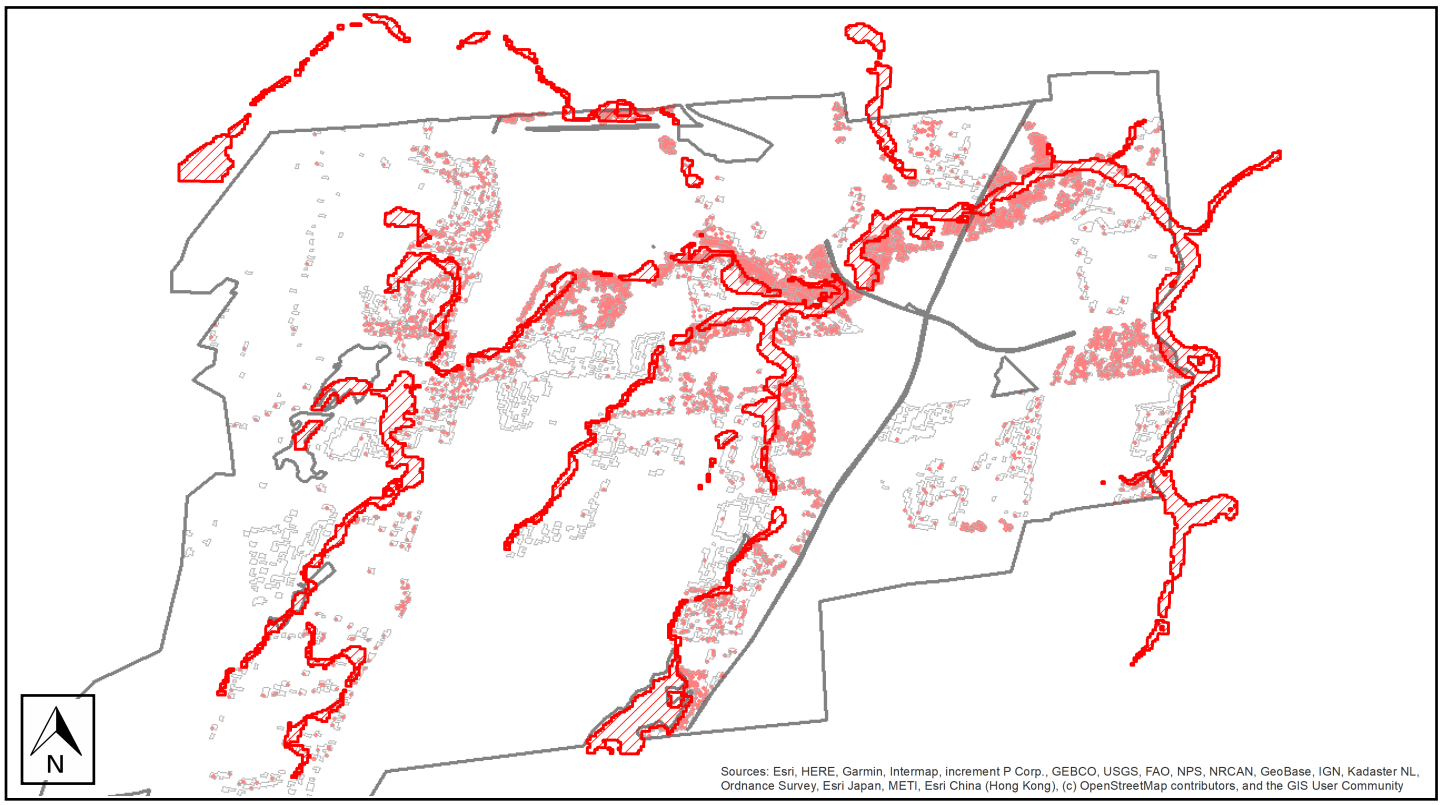


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	36	67	18	33	0	0	0	0	0	0	0	0
Total	**36**		**18**		**0**		**0**		**0**		**0**	

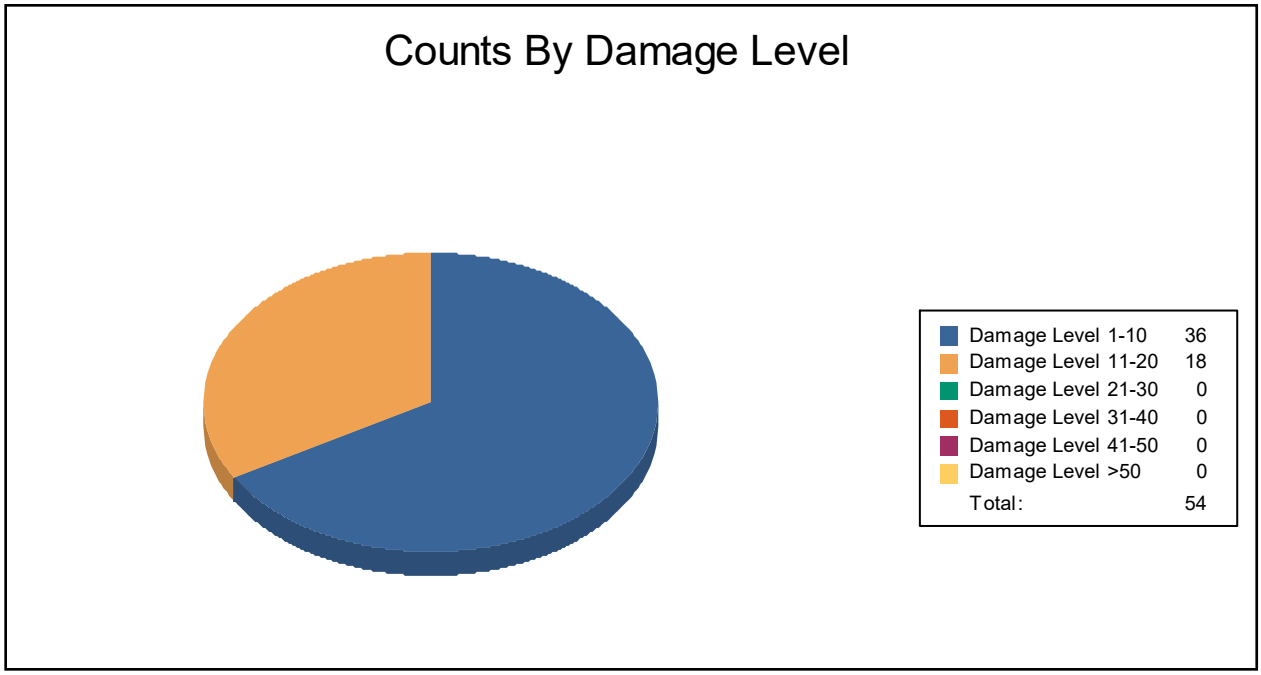


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	36	67	18	33	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

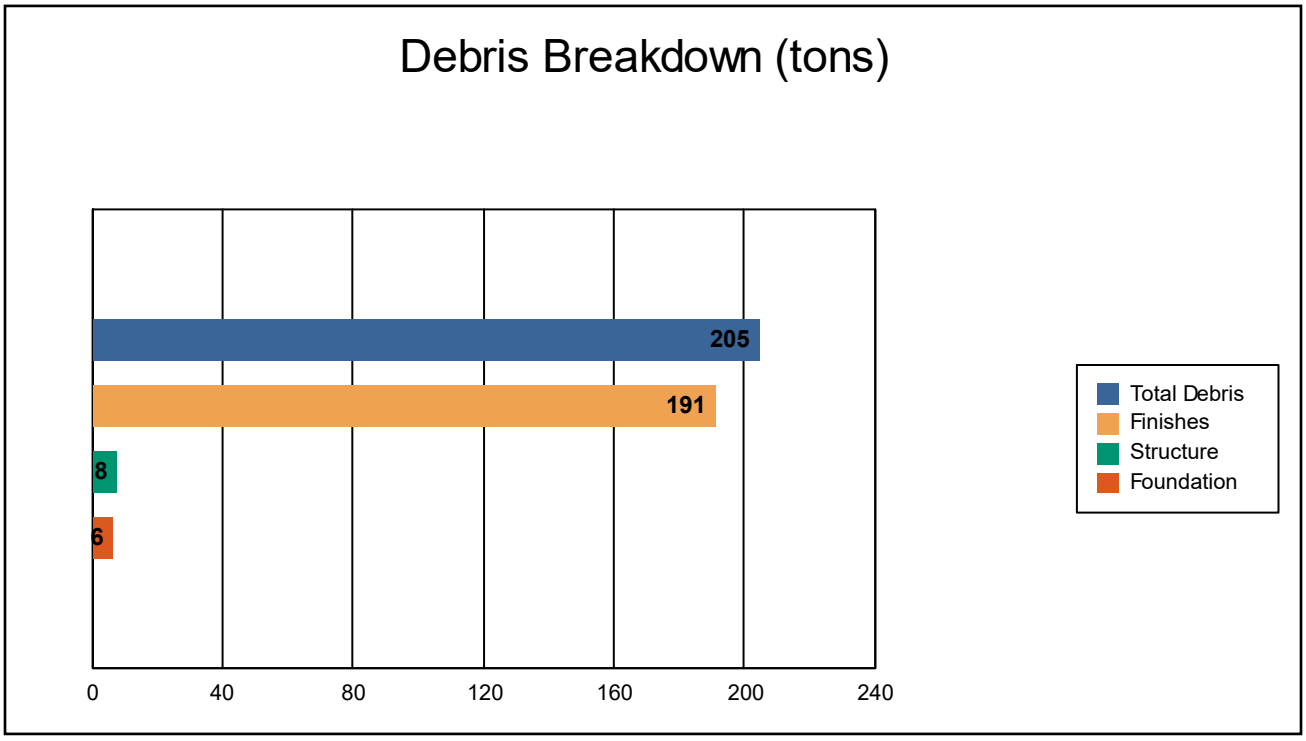
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

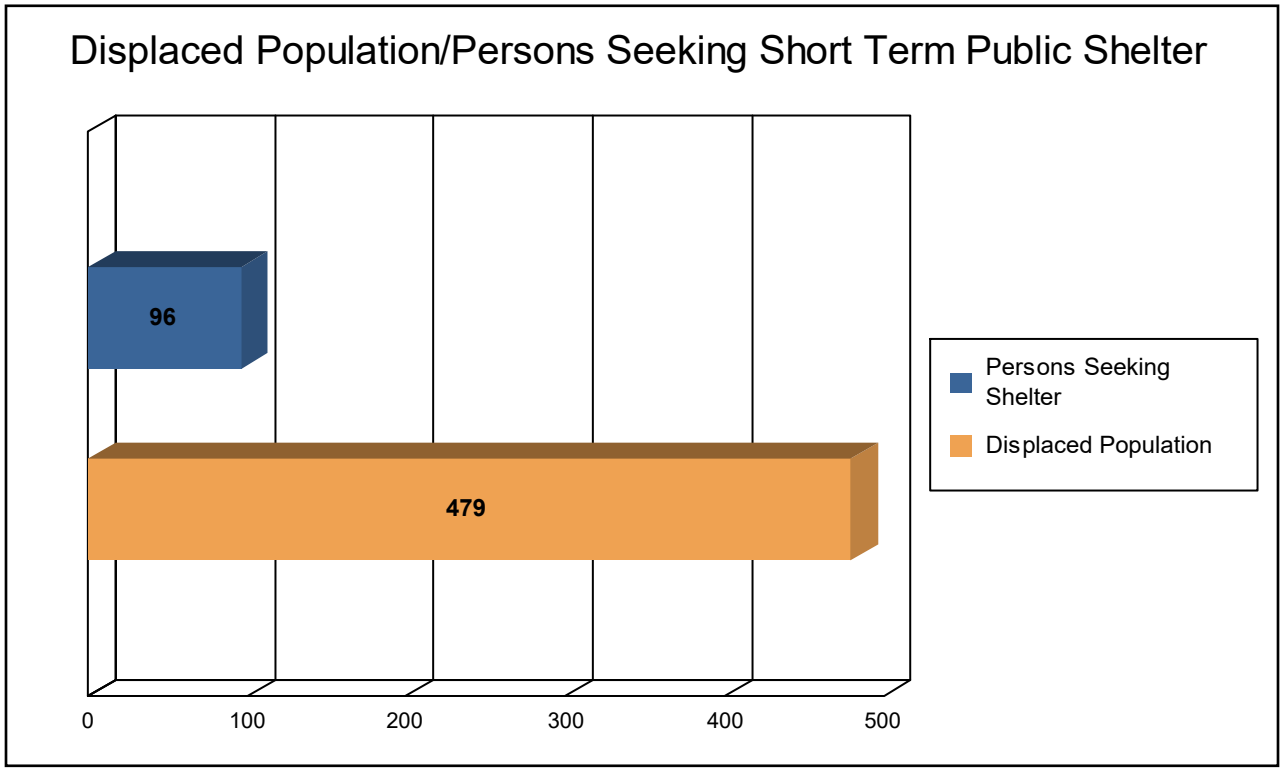


The model estimates that a total of 205 tons of debris will be generated. Of the total amount, Finishes comprises 93% of the total, Structure comprises 4% of the total, and Foundation comprises 3%. If the debris tonnage is converted into an estimated number of truckloads, it will require 9 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 160 households (or 479 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 96 people (out of a total population of 20,175) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 83.03 million dollars, which represents 3.48 % of the total replacement value of the scenario buildings.

Building-Related Losses

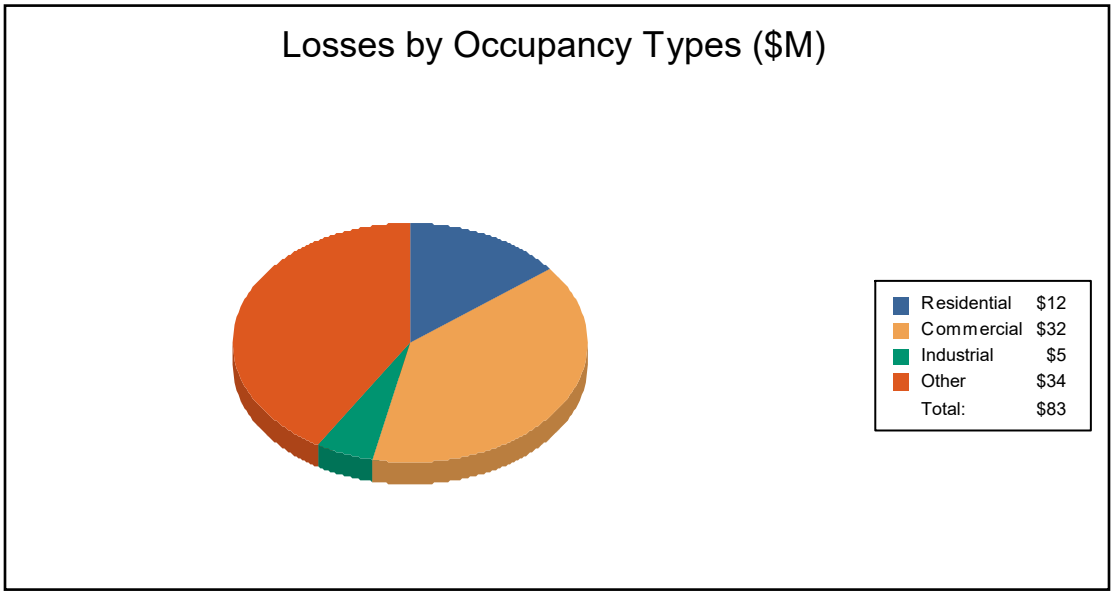
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 28.10 million dollars. 66% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 14.44% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.66	2.10	1.20	0.60	9.55
	Content	2.53	7.84	2.57	3.34	16.27
	Inventory	0.00	1.53	0.36	0.38	2.28
	Subtotal	**8.19**	**11.47**	**4.13**	**4.32**	**28.10**
Business Interruption						
	Income	0.02	6.73	0.09	1.75	8.59
	Relocation	2.71	2.31	0.14	1.60	6.76
	Rental Income	1.02	1.60	0.03	0.48	3.12
	Wage	0.05	10.09	0.17	26.14	36.46
	Subtotal	**3.80**	**20.73**	**0.43**	**29.97**	**54.93**
ALL	**Total**	**11.99**	**32.20**	**4.56**	**34.29**	**83.03**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,177	1,964,330	4,778,507
Total	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**
Total Study Region	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**

Hazus: Flood Global Risk Report

Region Name: Berlin_FL

Flood Scenario: Berlin_Flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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Note:
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The geographical size of the region is approximately 6 square miles and contains 283 census blocks. The region contains over 8 thousand households and has a total population of 20,175 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,043 buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 84.82% of the buildings (and 58.89% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,043 buildings in the region which have an aggregate total replacement value of 4,779 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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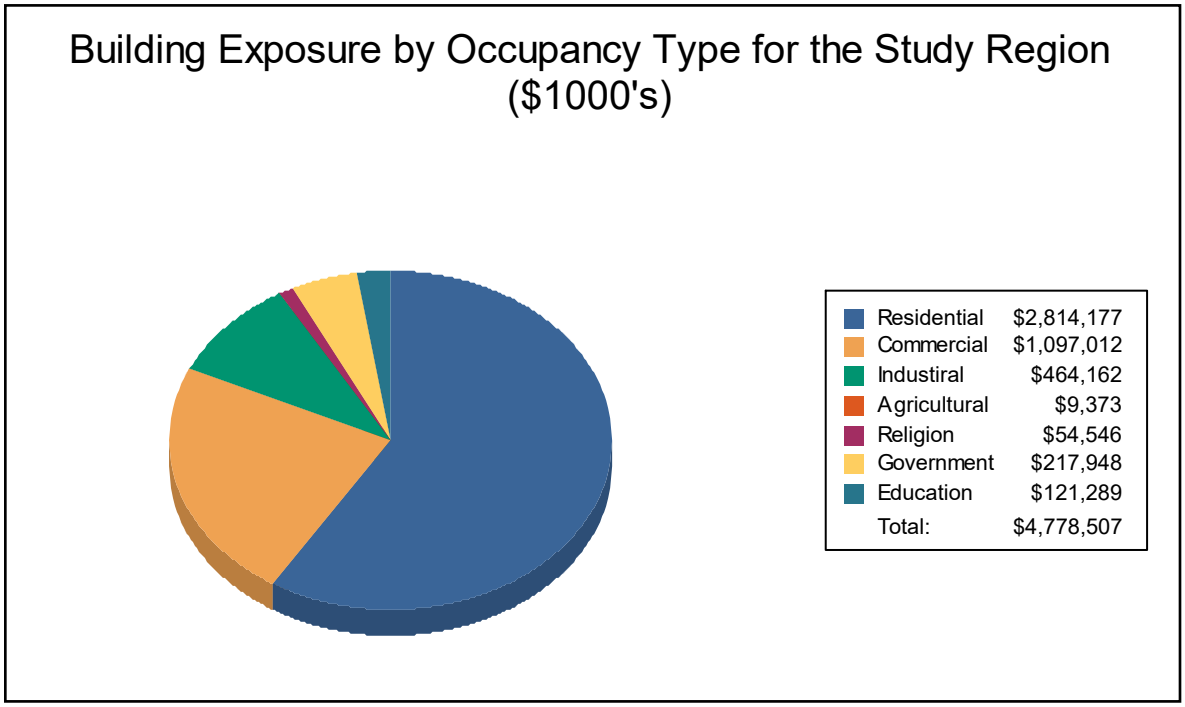

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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Commercial	632,843	26.5%
Industrial	242,378	10.2%
Agricultural	6,734	0.3%
Religion	23,141	1.0%
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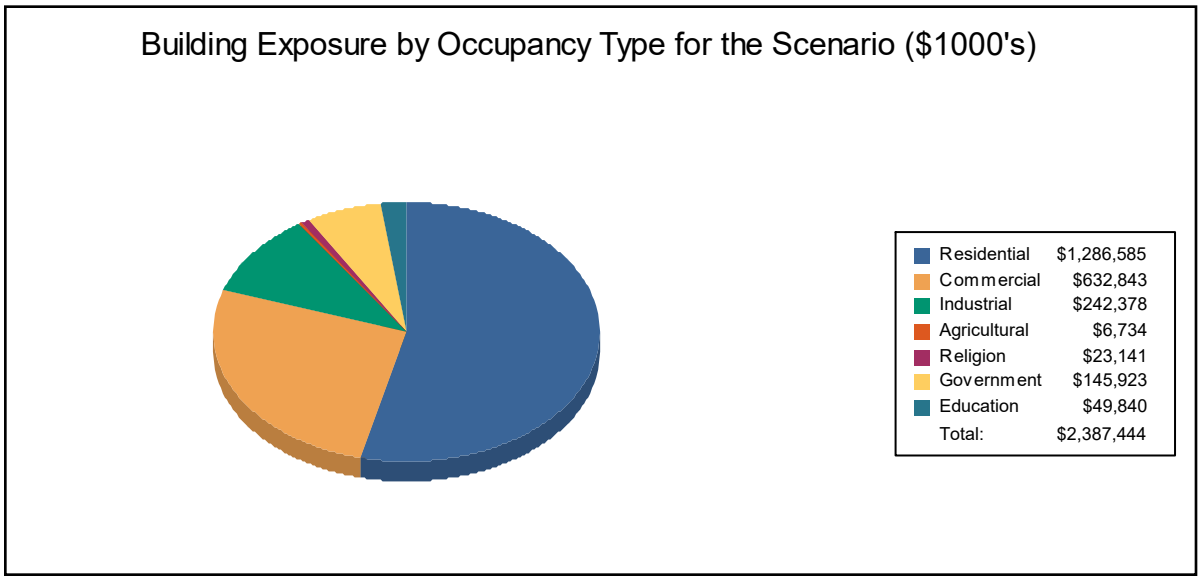
Education	49,840	2.1%
Total	**2,387,444**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

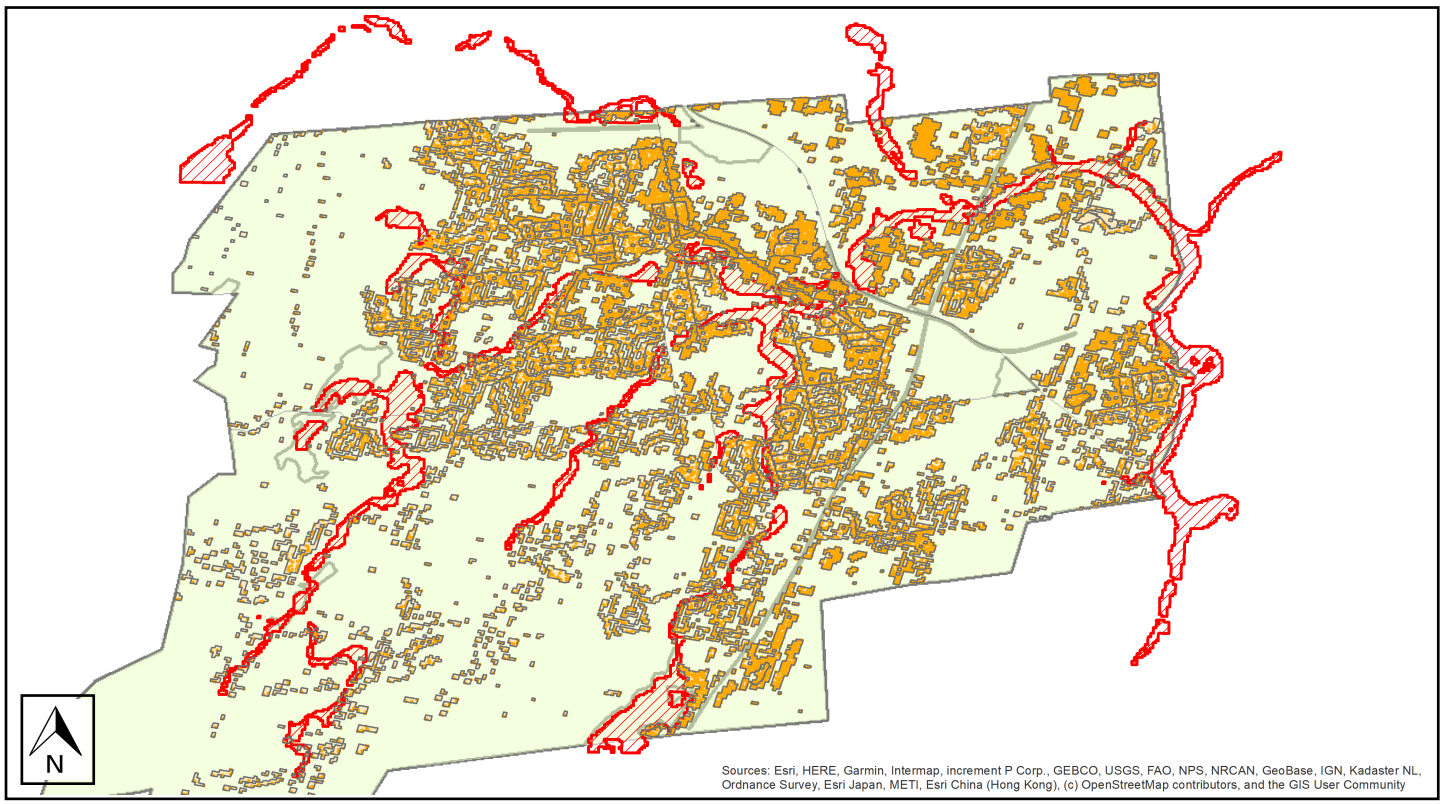
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Berlin_FL
Scenario Name:	Berlin_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 29 buildings will be at least moderately damaged. This is over 95% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

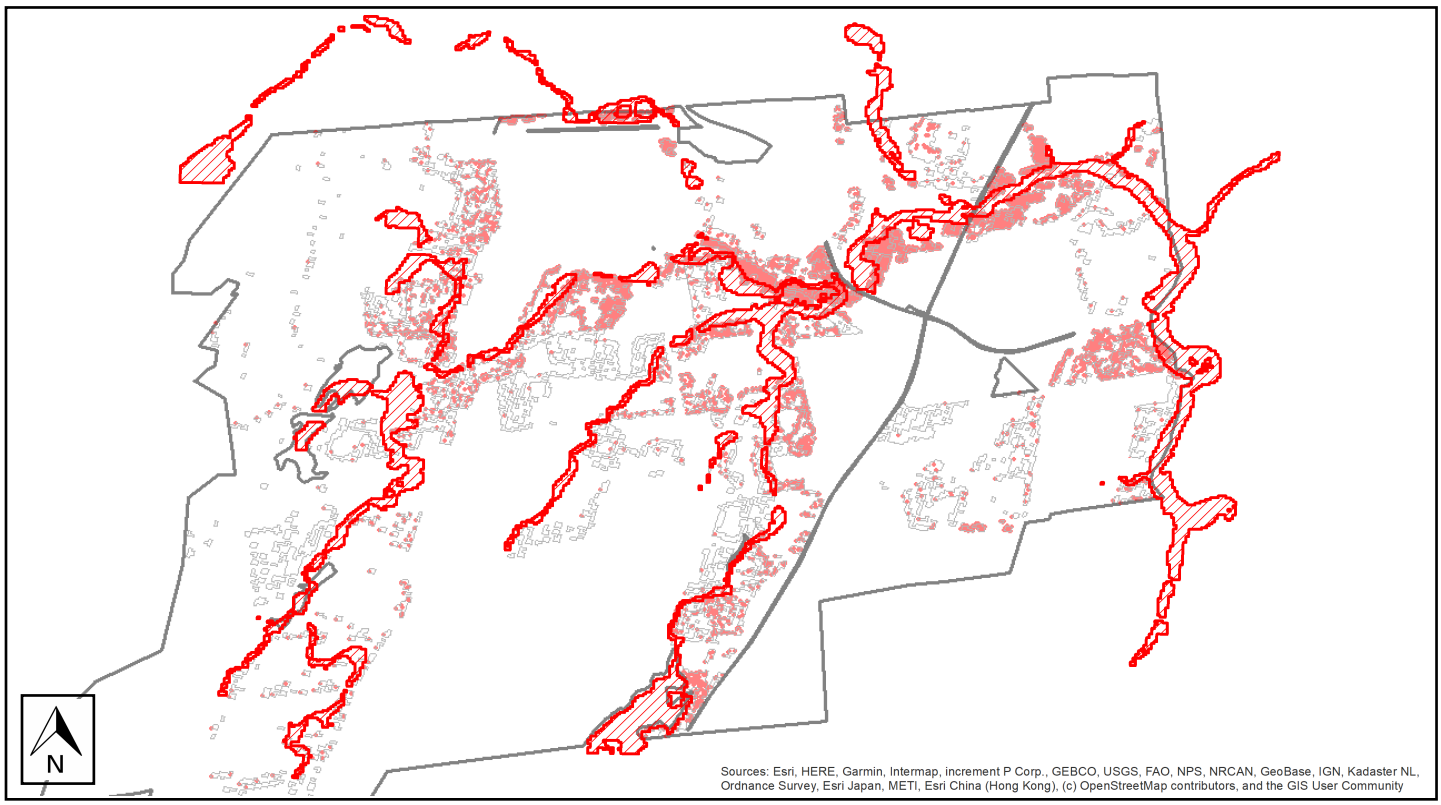


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	31	52	28	47	1	2	0	0	0	0	0	0
Total	**31**		**28**		**1**		**0**		**0**		**0**	

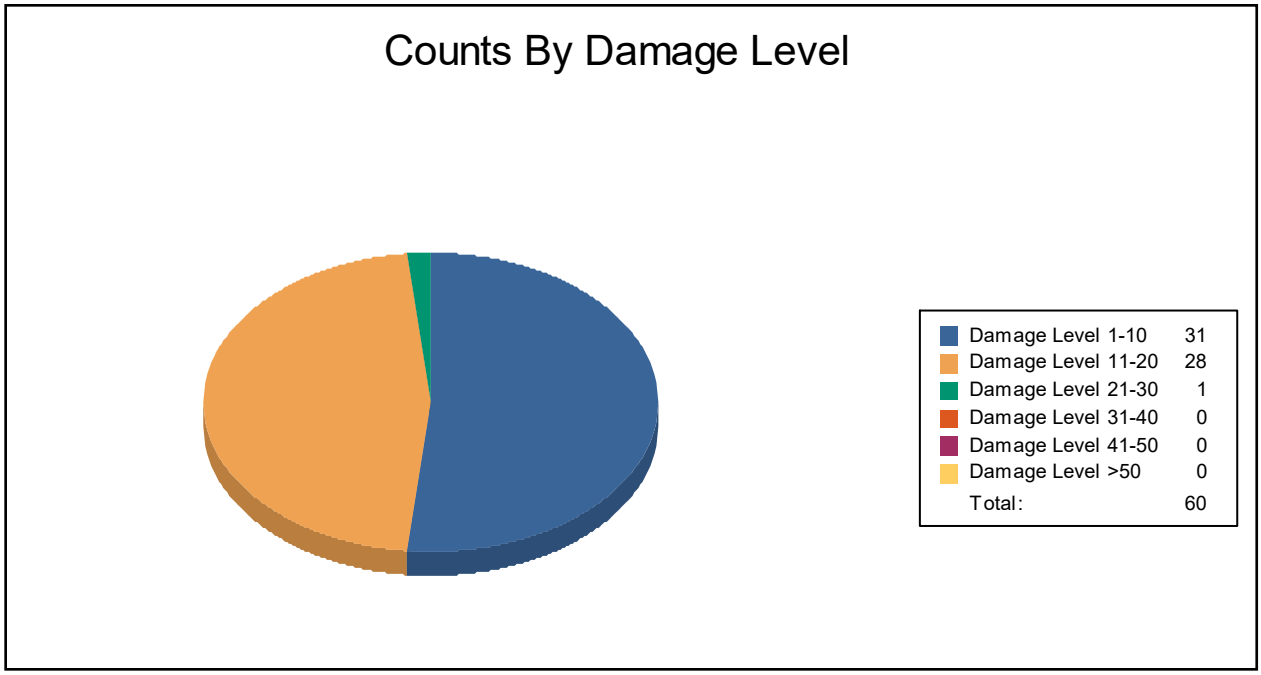


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	31	52	28	47	1	2	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

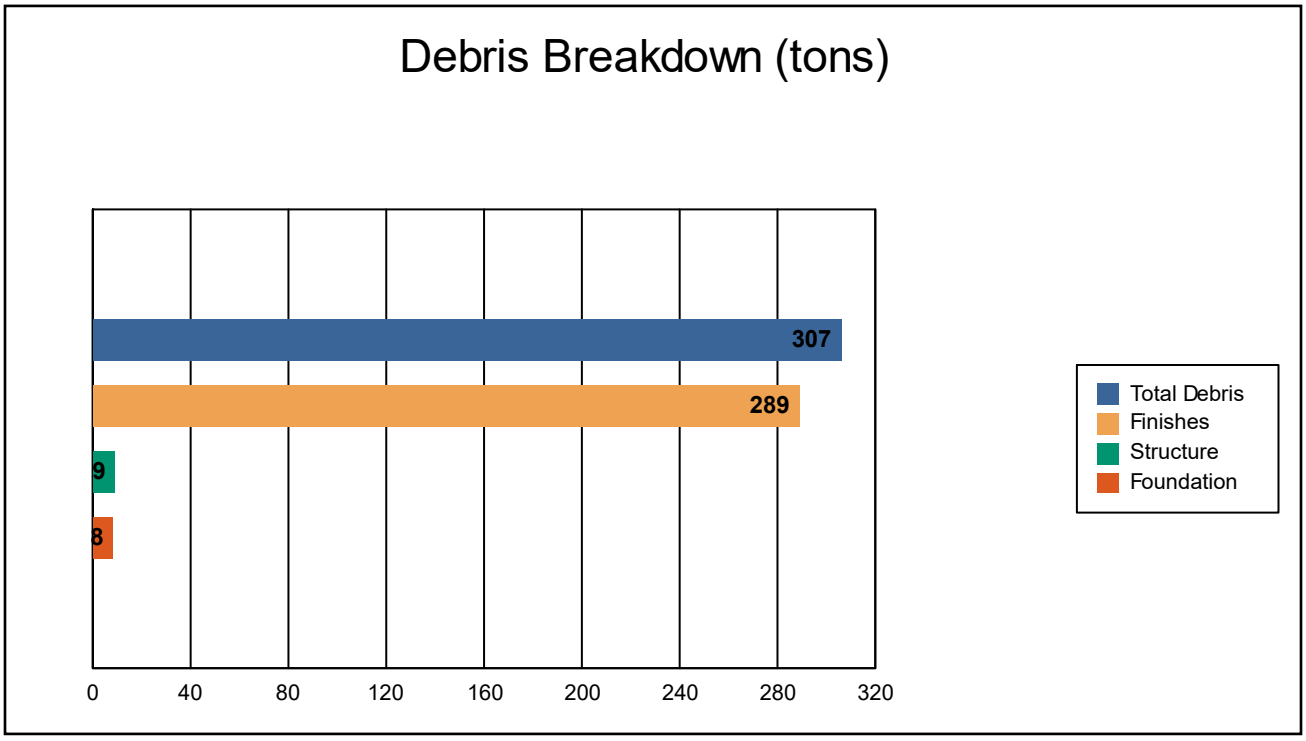
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

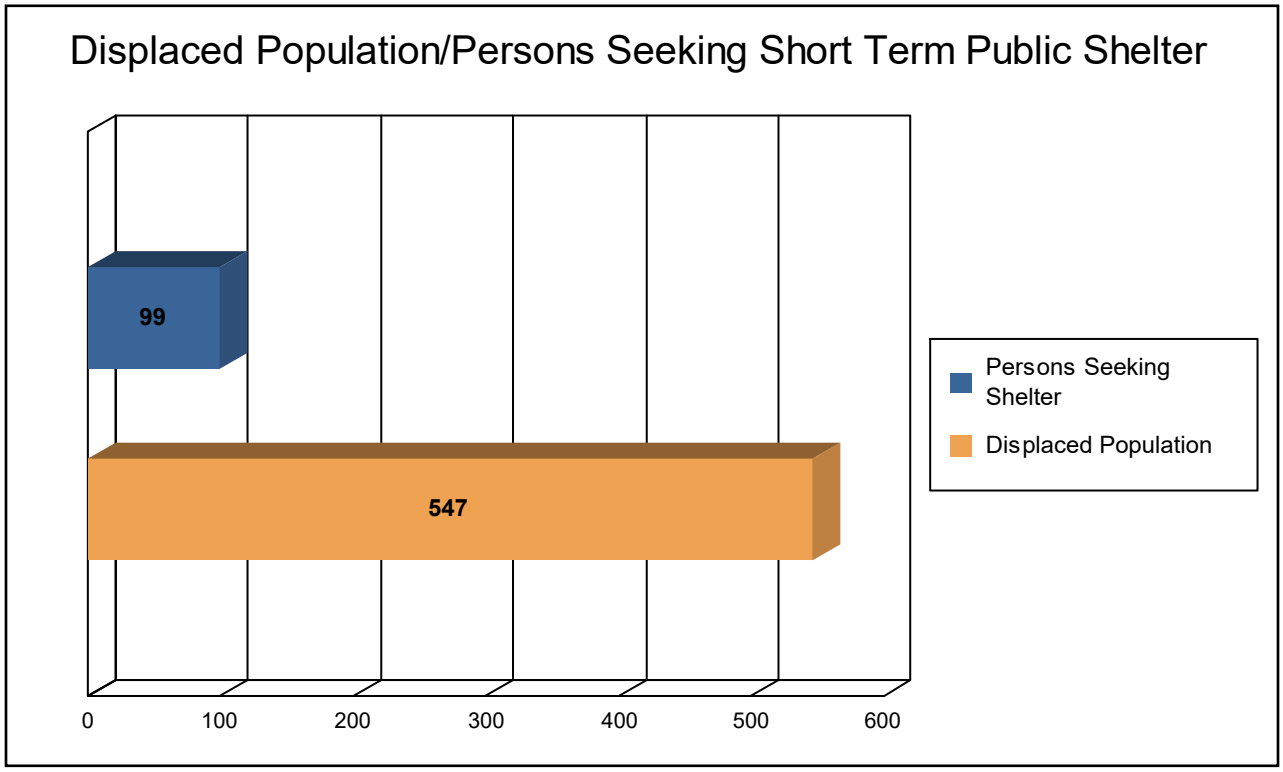


The model estimates that a total of 307 tons of debris will be generated. Of the total amount, Finishes comprises 94% of the total, Structure comprises 3% of the total, and Foundation comprises 3%. If the debris tonnage is converted into an estimated number of truckloads, it will require 13 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 182 households (or 547 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 99 people (out of a total population of 20,175) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 106.09 million dollars, which represents 4.44 % of the total replacement value of the scenario buildings.

Building-Related Losses

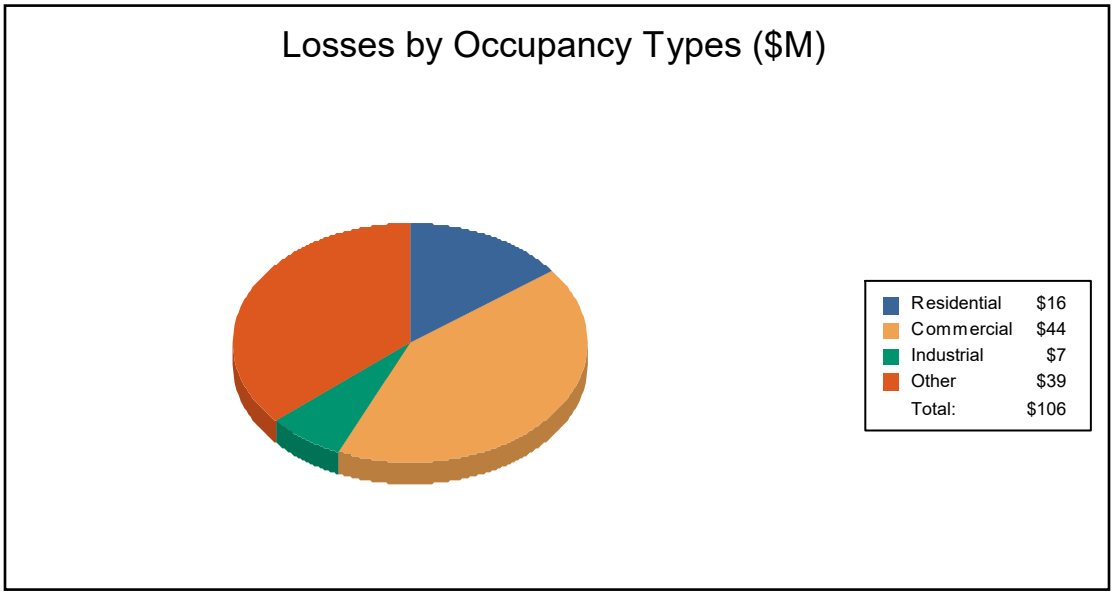
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 41.19 million dollars. 61% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 14.80% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.73	3.16	1.88	0.84	13.61
	Content	3.48	11.50	4.33	4.81	24.12
	Inventory	0.00	2.39	0.61	0.47	3.47
	Subtotal	**11.21**	**17.05**	**6.82**	**6.13**	**41.19**
Business Interruption						
	Income	0.02	8.82	0.13	1.91	10.89
	Relocation	3.21	3.05	0.19	1.72	8.16
	Rental Income	1.21	2.10	0.03	0.52	3.86
	Wage	0.05	13.31	0.24	28.39	41.99
	Subtotal	**4.49**	**27.28**	**0.60**	**32.53**	**64.90**
ALL	**Total**	**15.70**	**44.32**	**7.41**	**38.66**	**106.09**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,177	1,964,330	4,778,507
Total	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**
Total Study Region	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**

Hazus: Flood Global Risk Report

Region Name: Berlin_FL

Flood Scenario: Berlin_Flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 283 census blocks. The region contains over 8 thousand households and has a total population of 20,175 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,043 buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 84.82% of the buildings (and 58.89% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,043 buildings in the region which have an aggregate total replacement value of 4,779 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,814,177	58.9%
Commercial	1,097,012	23.0%
Industrial	464,162	9.7%
Agricultural	9,373	0.2%
Religion	54,546	1.1%
Government	217,948	4.6%
Education	121,289	2.5%
Total	**4,778,507**	**100%**

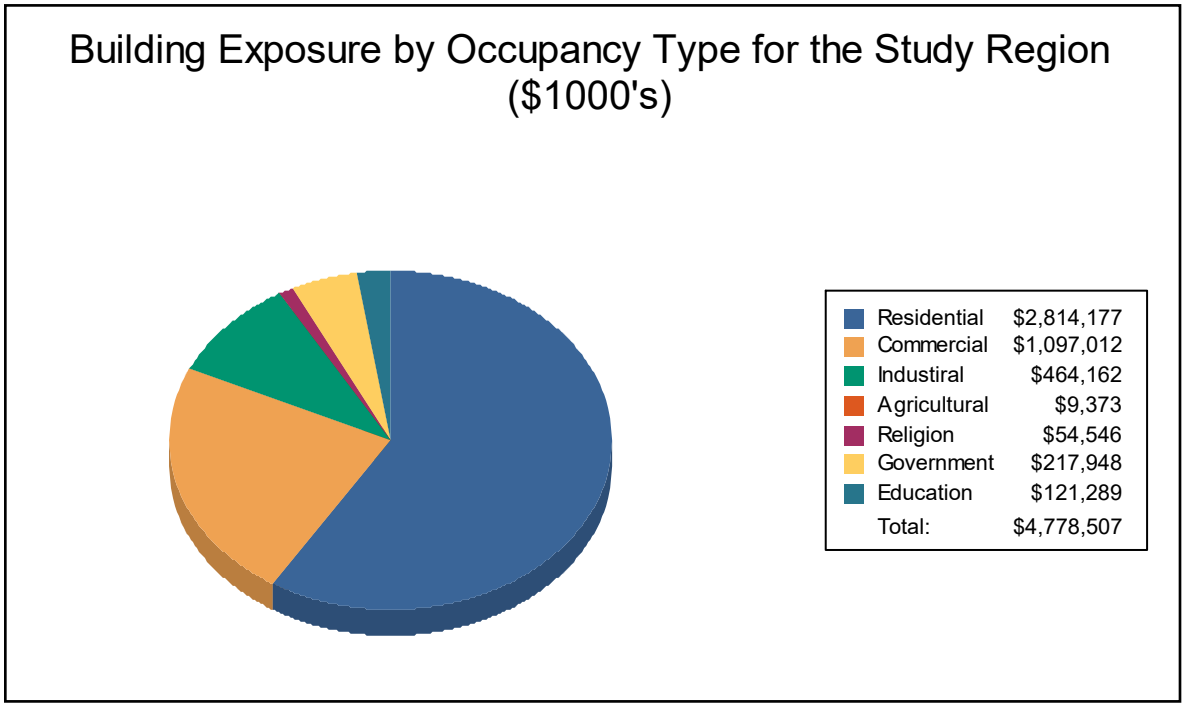
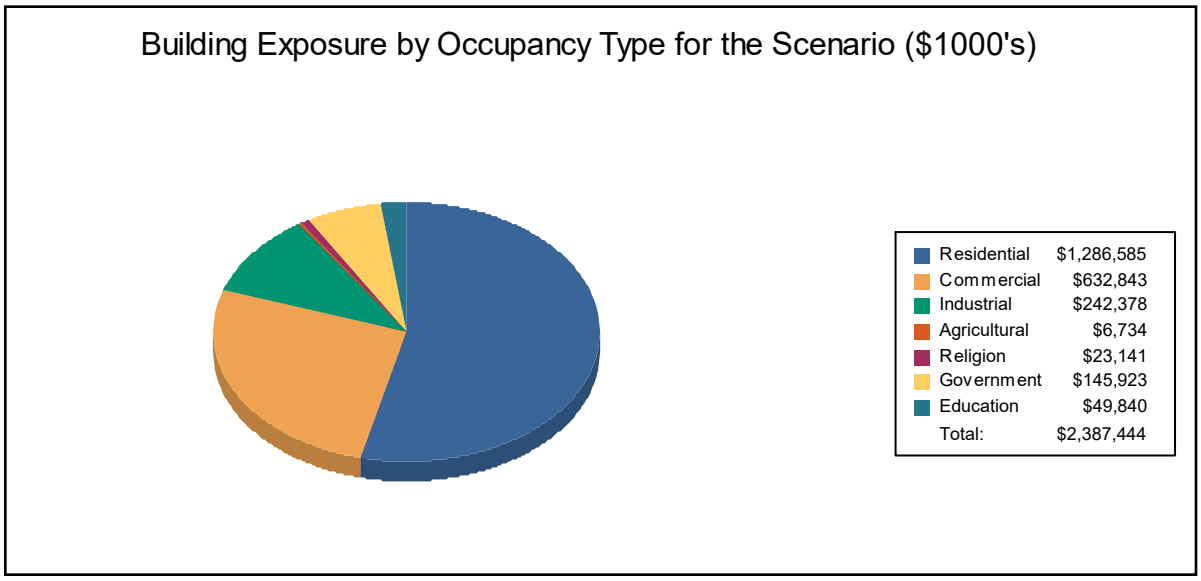


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,286,585	53.9%
Commercial	632,843	26.5%
Industrial	242,378	10.2%
Agricultural	6,734	0.3%
Religion	23,141	1.0%
Government	145,923	6.1%
Education	49,840	2.1%
Total	**2,387,444**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

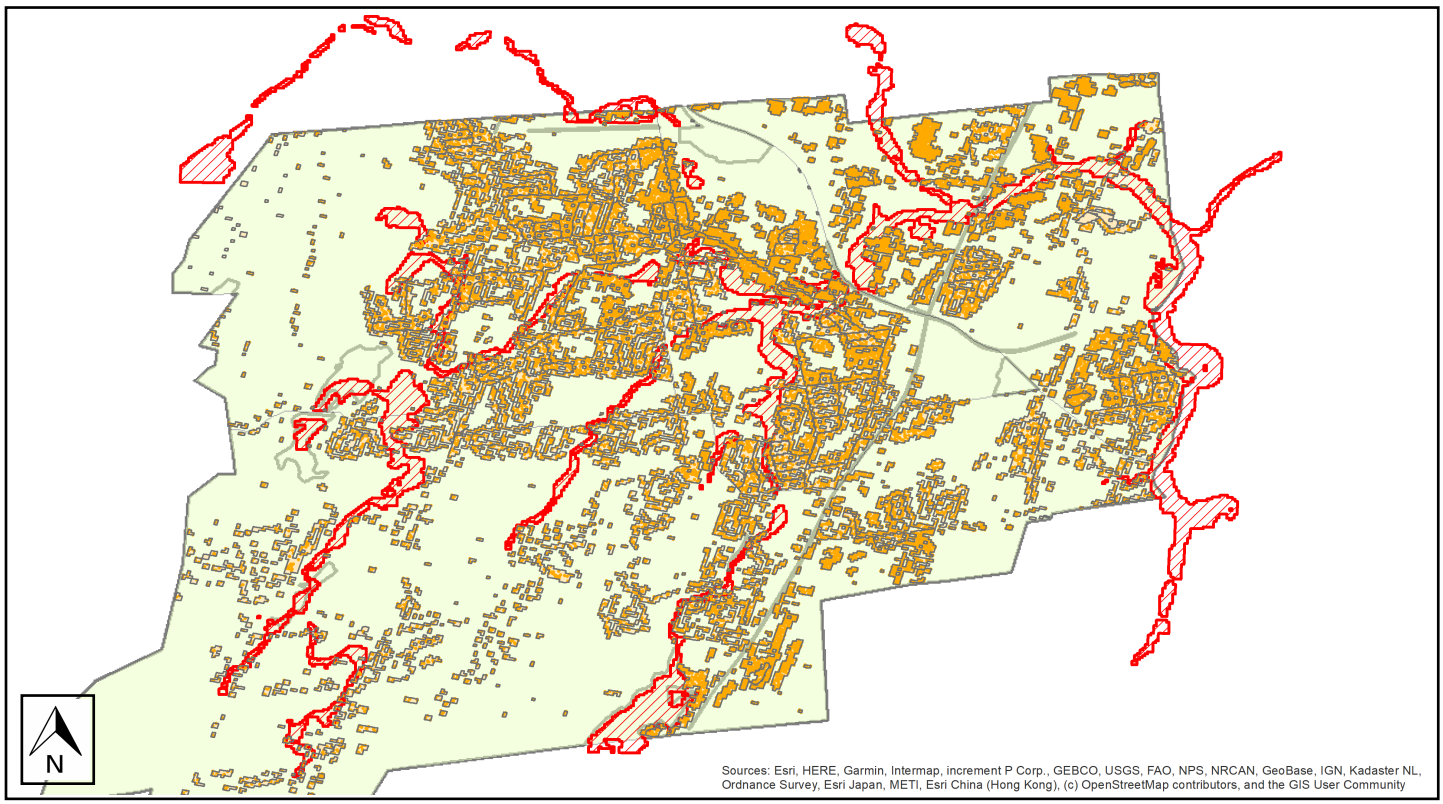
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Berlin_FL
Scenario Name:	Berlin_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 38 buildings will be at least moderately damaged. This is over 95% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

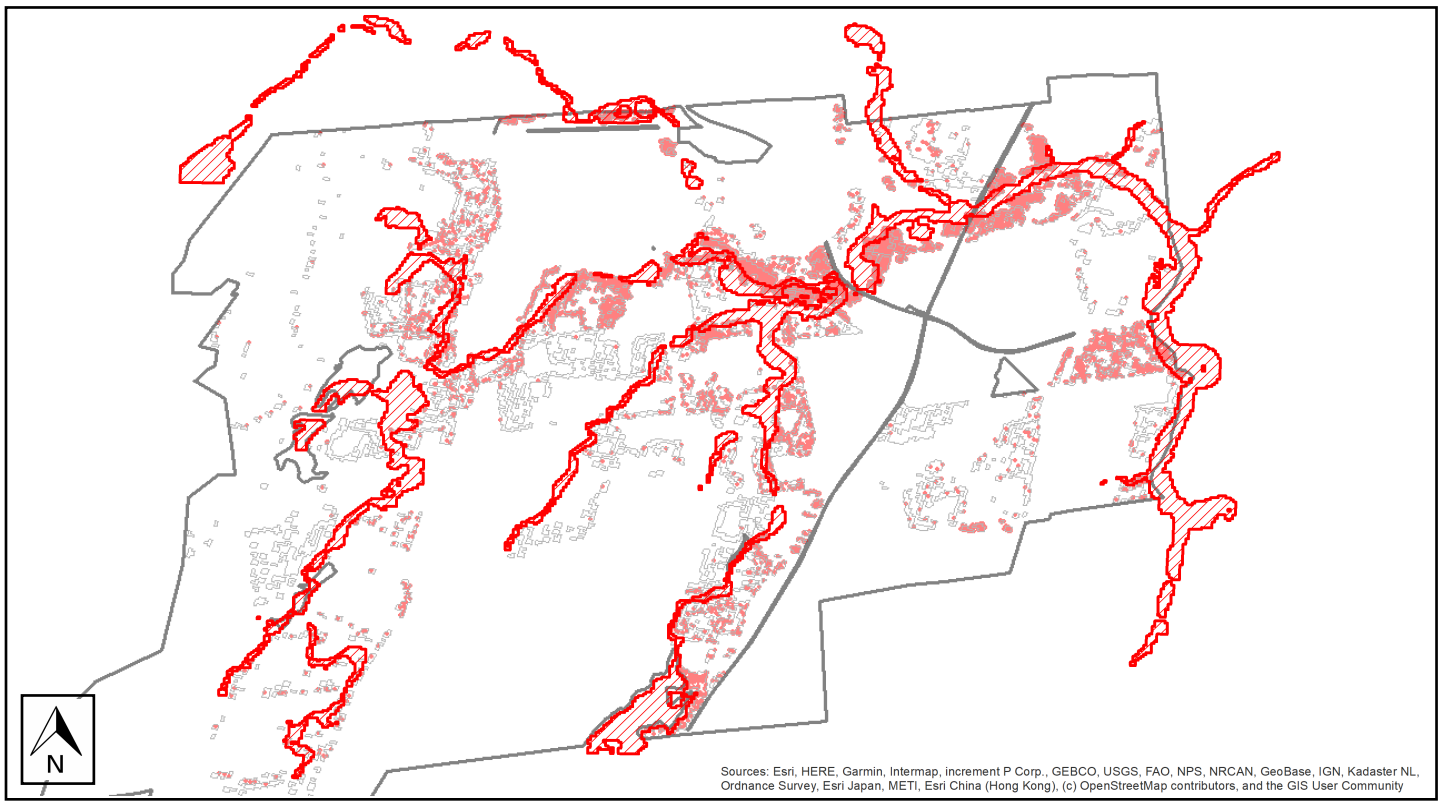


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	100	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	36	49	34	46	4	5	0	0	0	0	0	0
Total	**37**		**34**		**4**		**0**		**0**		**0**	

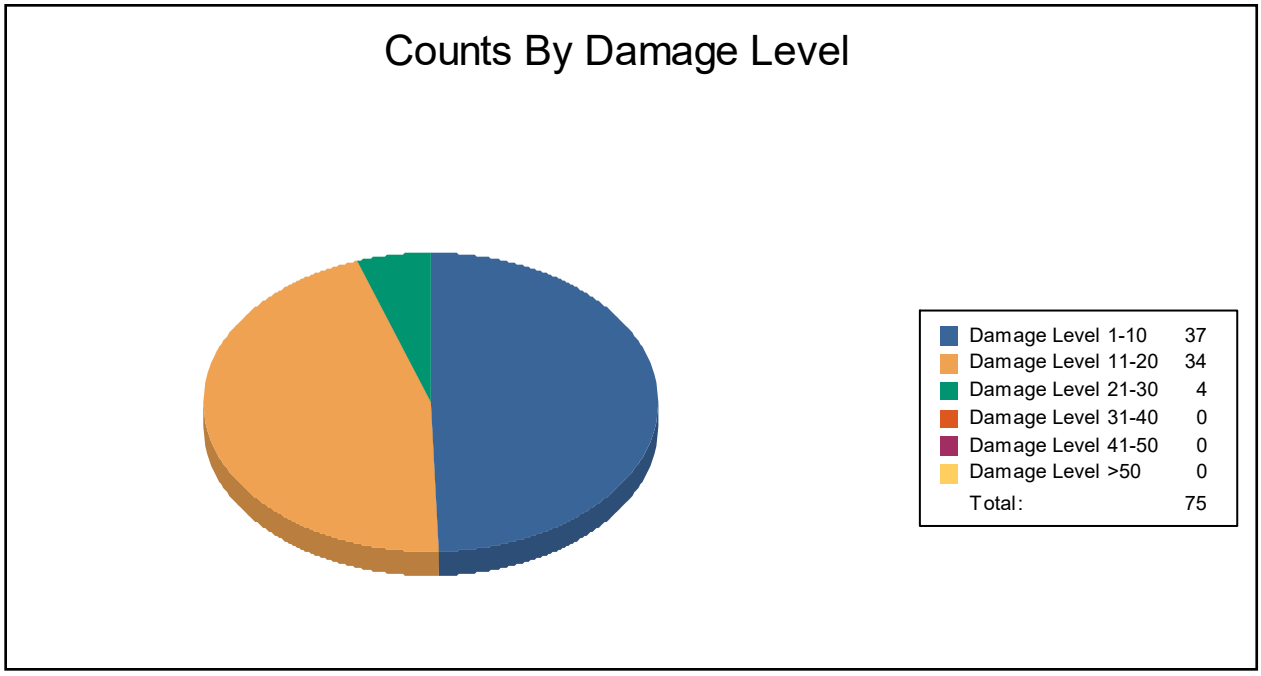


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	36	49	34	46	4	5	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

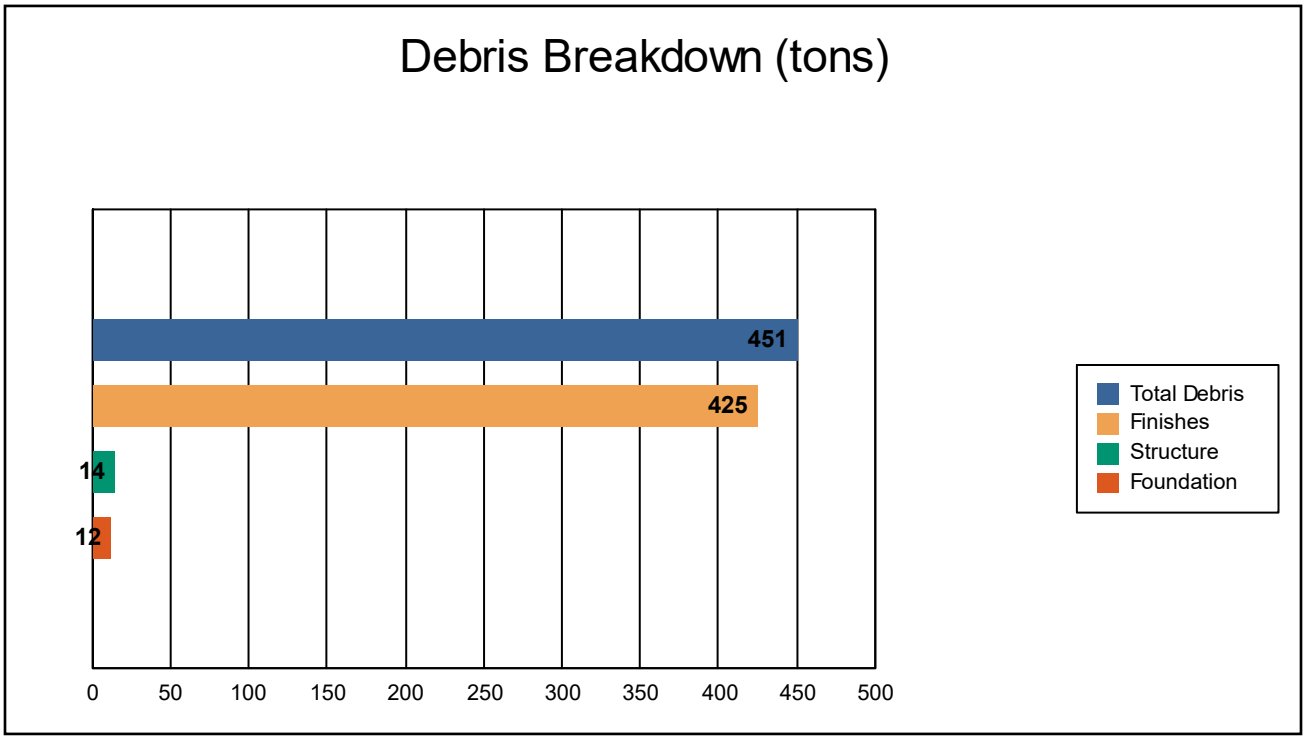
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

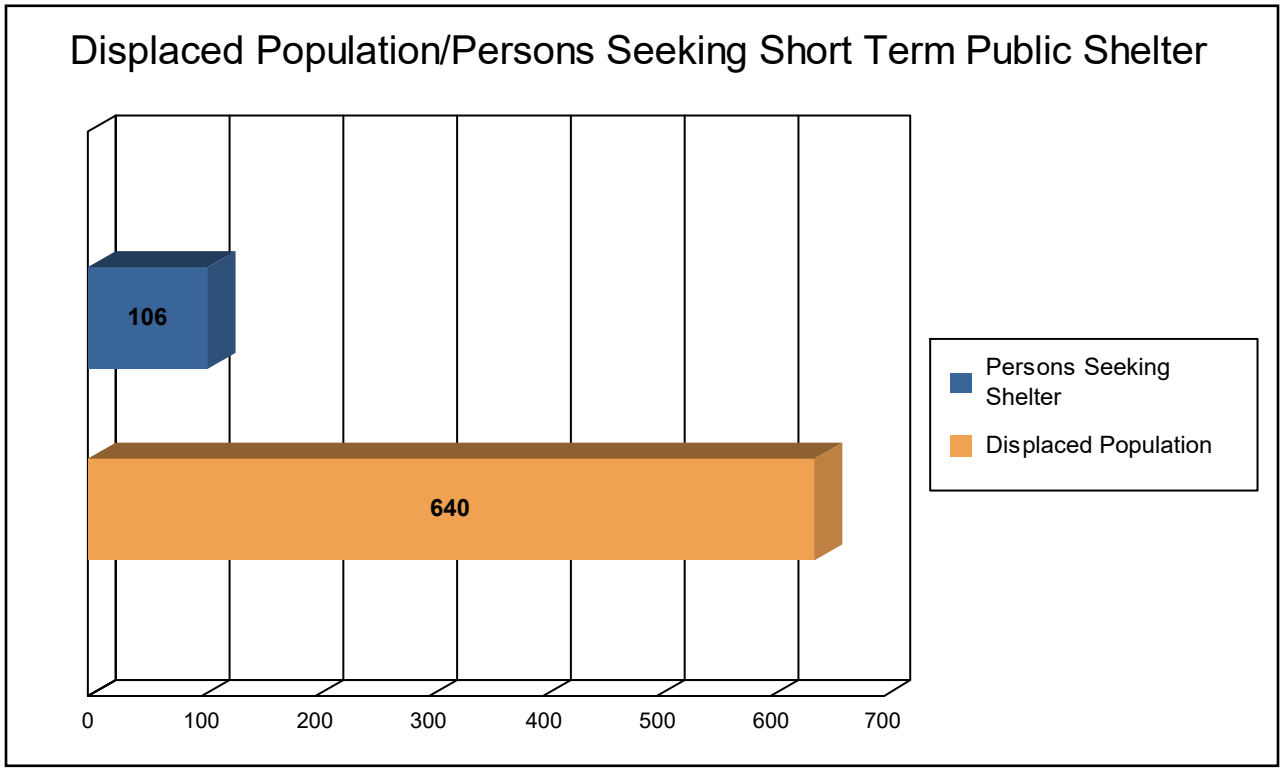


The model estimates that a total of 451 tons of debris will be generated. Of the total amount, Finishes comprises 94% of the total, Structure comprises 3% of the total, and Foundation comprises 3%. If the debris tonnage is converted into an estimated number of truckloads, it will require 19 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 213 households (or 640 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 106 people (out of a total population of 20,175) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 136.20 million dollars, which represents 5.70 % of the total replacement value of the scenario buildings.

Building-Related Losses

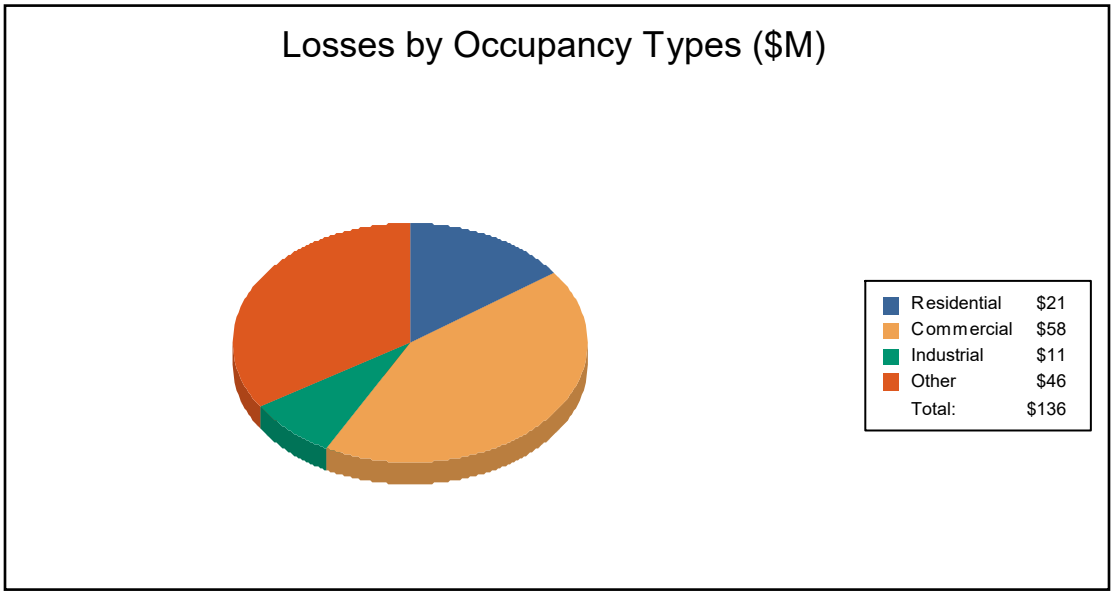
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 57.86 million dollars. 58% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 15.11% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	10.50	4.56	2.77	1.13	18.97
	Content	4.73	16.13	6.78	6.31	33.95
	Inventory	0.00	3.36	0.95	0.63	4.94
	Subtotal	**15.24**	**24.05**	**10.51**	**8.07**	**57.86**
Business Interruption						
	Income	0.03	11.14	0.16	2.16	13.48
	Relocation	3.79	3.85	0.24	1.97	9.85
	Rental Income	1.46	2.64	0.04	0.61	4.75
	Wage	0.07	16.57	0.30	33.33	50.26
	Subtotal	**5.34**	**34.19**	**0.73**	**38.07**	**78.34**
ALL	**Total**	**20.58**	**58.25**	**11.24**	**46.14**	**136.20**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,177	1,964,330	4,778,507
Total	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**
Total Study Region	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**

Hazus: Flood Global Risk Report

Region Name: Berlin_FL

Flood Scenario: Berlin_Flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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Note:
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The geographical size of the region is approximately 6 square miles and contains 283 census blocks. The region contains over 8 thousand households and has a total population of 20,175 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,043 buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 84.82% of the buildings (and 58.89% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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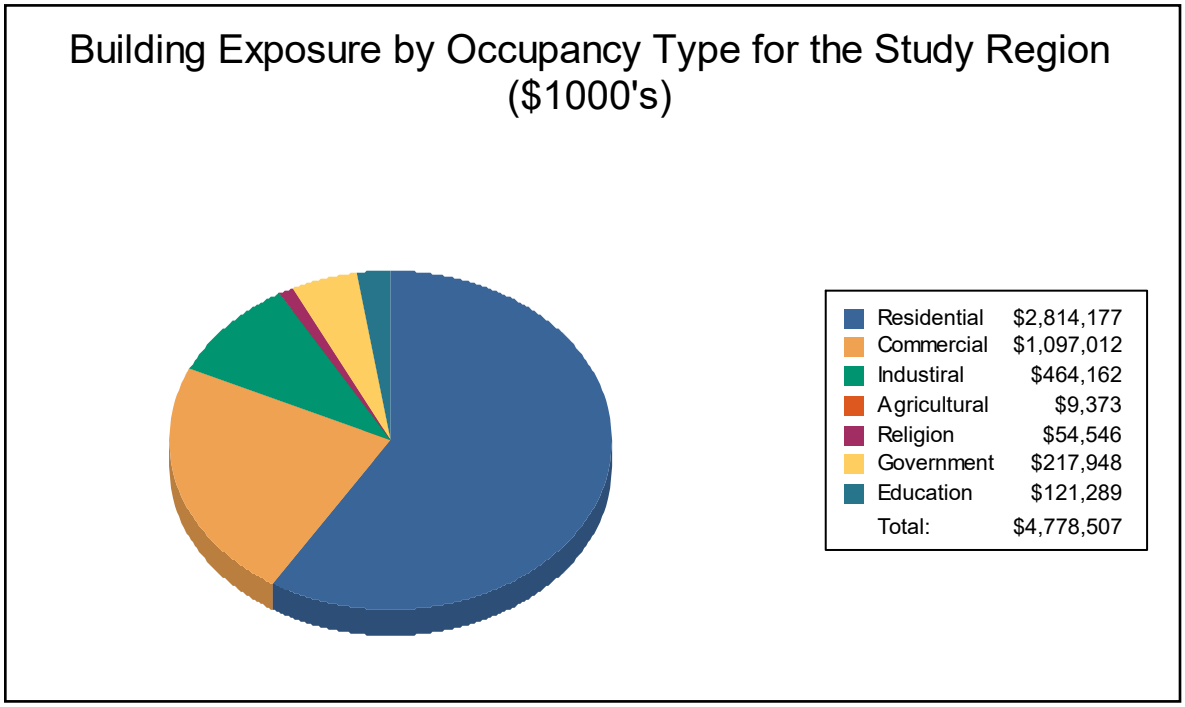

Table 2
Building Exposure by Occupancy Type for the Scenario

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Residential	1,286,585	53.9%
Commercial	632,843	26.5%
Industrial	242,378	10.2%
Agricultural	6,734	0.3%
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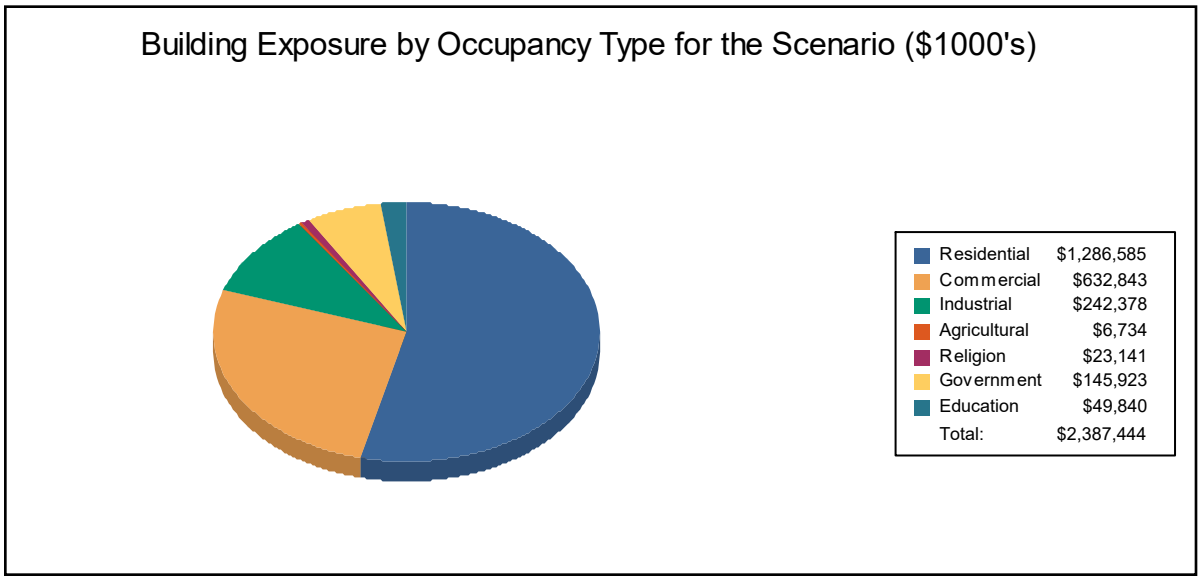


Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

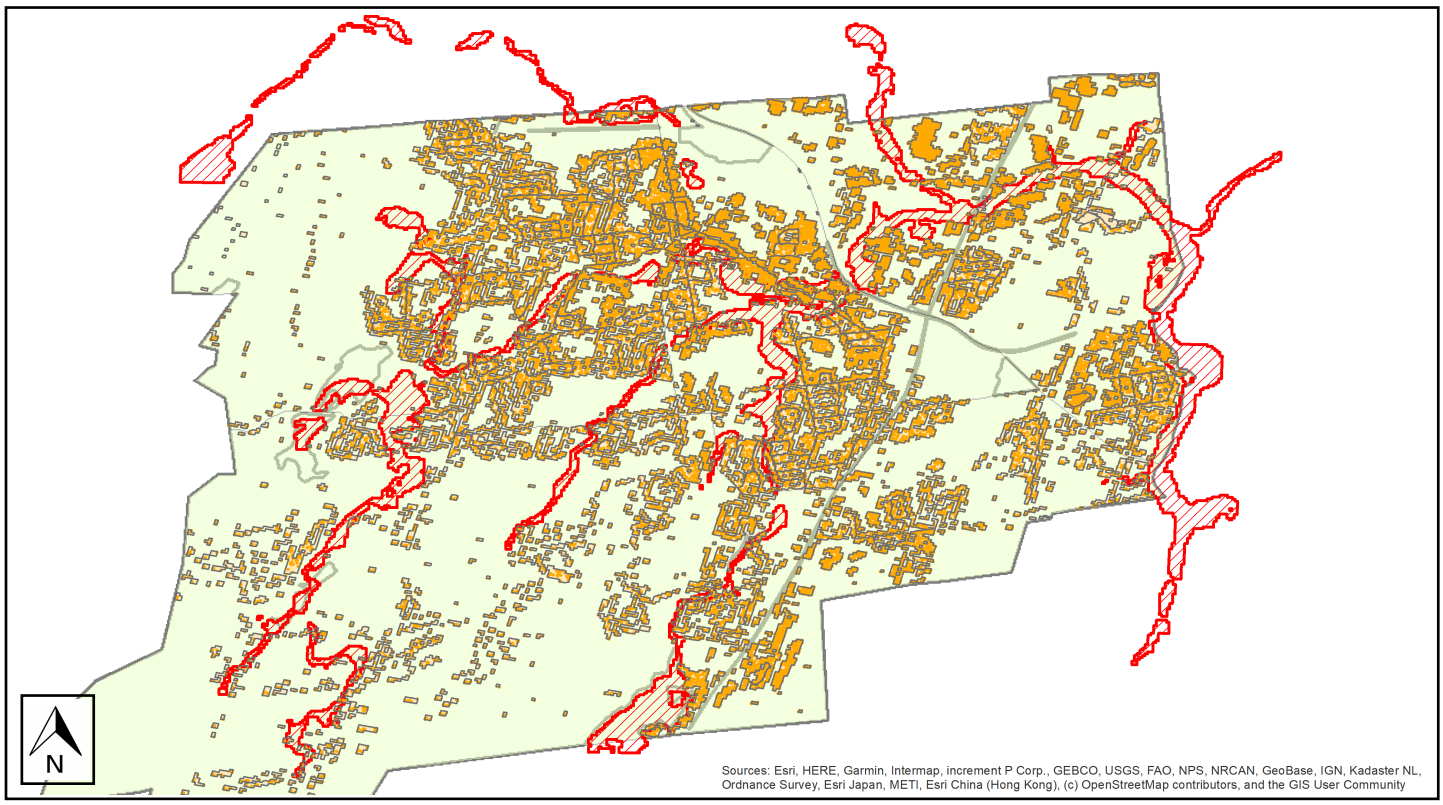
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Berlin_FL
Scenario Name:	Berlin_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 48 buildings will be at least moderately damaged. This is over 94% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

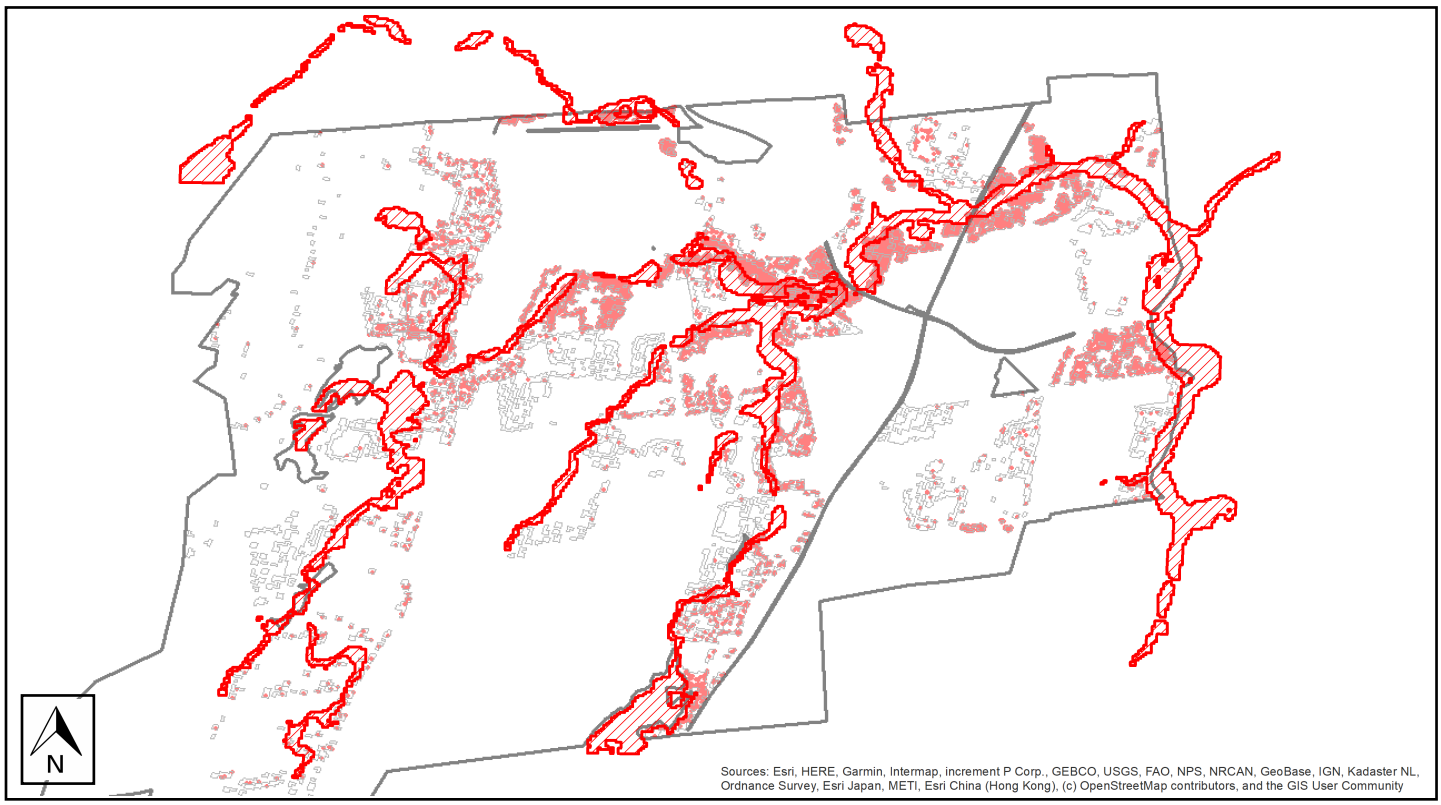


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	100	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	34	41	41	50	7	9	0	0	0	0	0	0
Total	**35**		**41**		**7**		**0**		**0**		**0**	

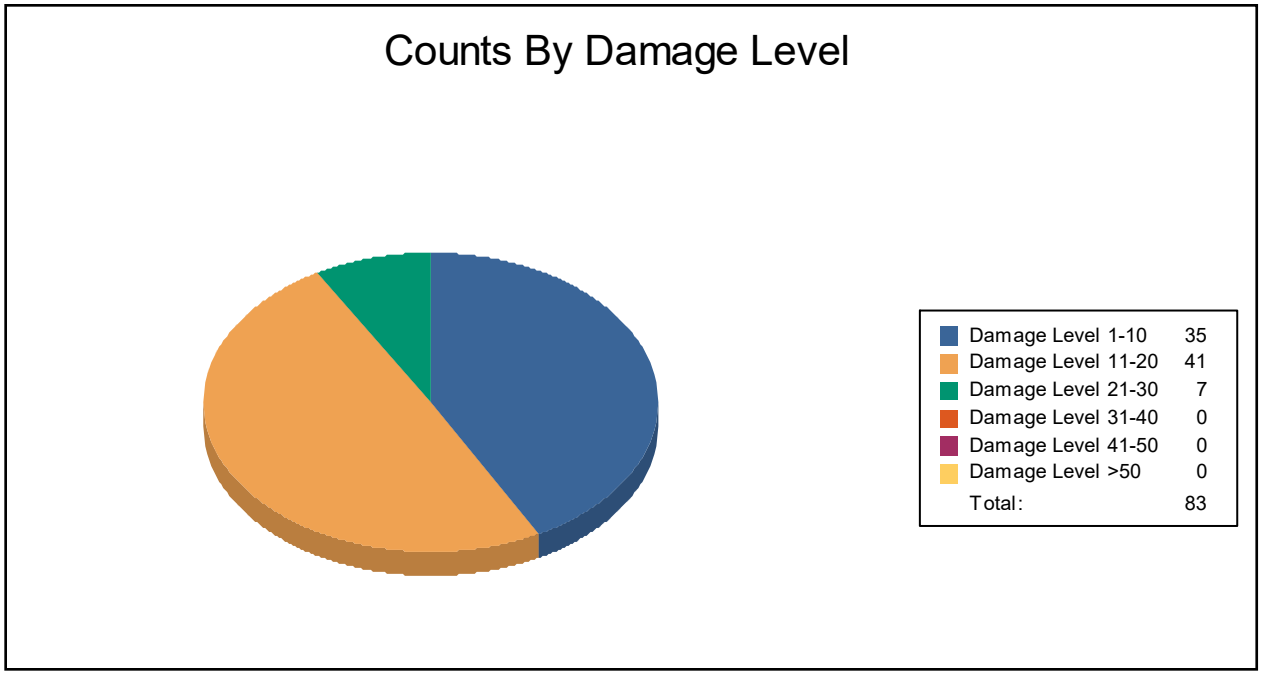


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	34	41	41	50	7	9	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

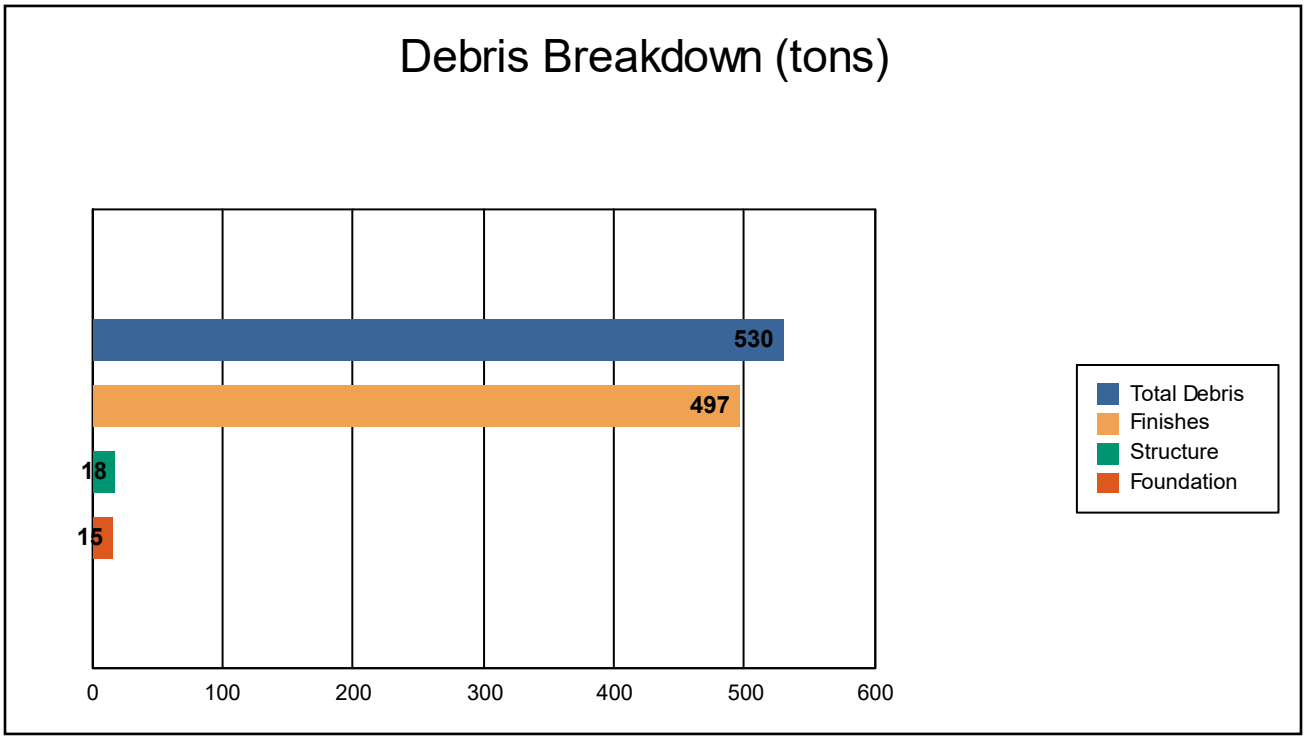
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

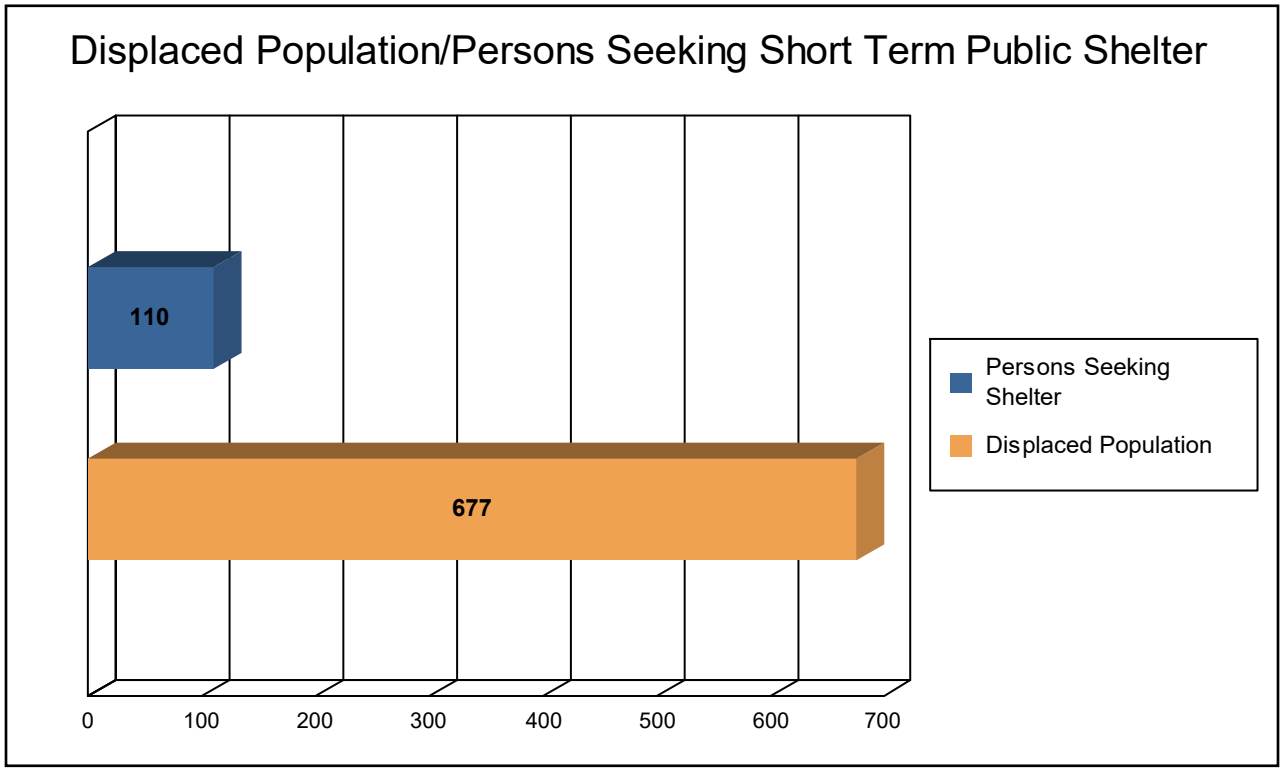


The model estimates that a total of 530 tons of debris will be generated. Of the total amount, Finishes comprises 94% of the total, Structure comprises 3% of the total, and Foundation comprises 3%. If the debris tonnage is converted into an estimated number of truckloads, it will require 22 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 226 households (or 677 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 110 people (out of a total population of 20,175) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 154.34 million dollars, which represents 6.46 % of the total replacement value of the scenario buildings.

Building-Related Losses

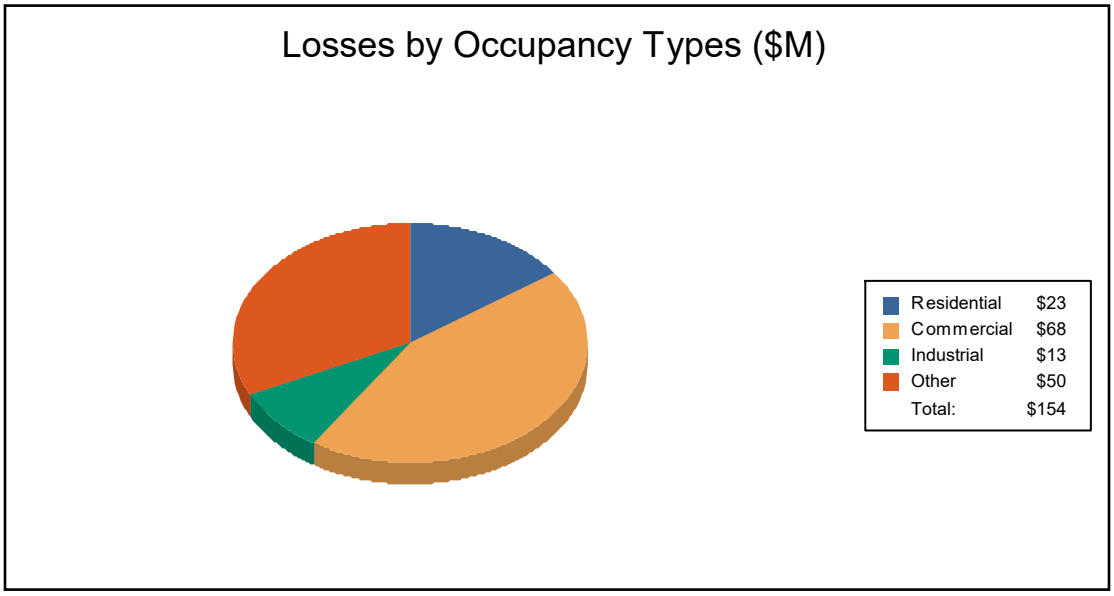
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 68.70 million dollars. 55% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 14.95% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	11.94	5.61	3.28	1.32	22.15
	Content	5.39	19.72	8.20	7.44	40.74
	Inventory	0.00	3.94	1.15	0.72	5.81
	Subtotal	**17.33**	**29.27**	**12.63**	**9.47**	**68.70**
Business Interruption						
	Income	0.03	12.80	0.17	2.27	15.26
	Relocation	4.07	4.35	0.25	2.07	10.74
	Rental Income	1.57	2.97	0.04	0.64	5.23
	Wage	0.07	18.87	0.32	35.15	54.41
	Subtotal	**5.74**	**38.99**	**0.78**	**40.13**	**85.64**
ALL	**Total**	**23.07**	**68.25**	**13.41**	**49.60**	**154.34**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,177	1,964,330	4,778,507
Total	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**
Total Study Region	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**

Hazus: Flood Global Risk Report

Region Name: Berlin_FL

Flood Scenario: Berlin_Flood

Print Date: Wednesday, April 5, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 283 census blocks. The region contains over 8 thousand households and has a total population of 20,175 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,043 buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 84.82% of the buildings (and 58.89% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,043 buildings in the region which have an aggregate total replacement value of 4,779 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,814,177	58.9%
Commercial	1,097,012	23.0%
Industrial	464,162	9.7%
Agricultural	9,373	0.2%
Religion	54,546	1.1%
Government	217,948	4.6%
Education	121,289	2.5%
Total	**4,778,507**	**100%**

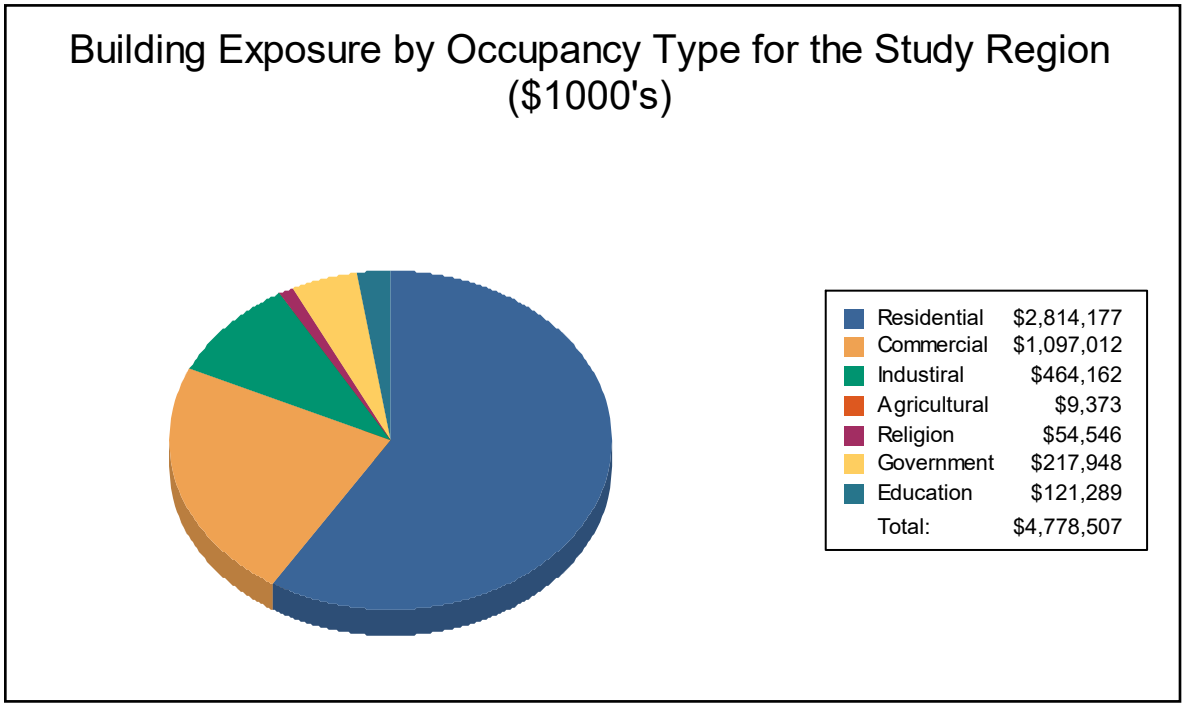
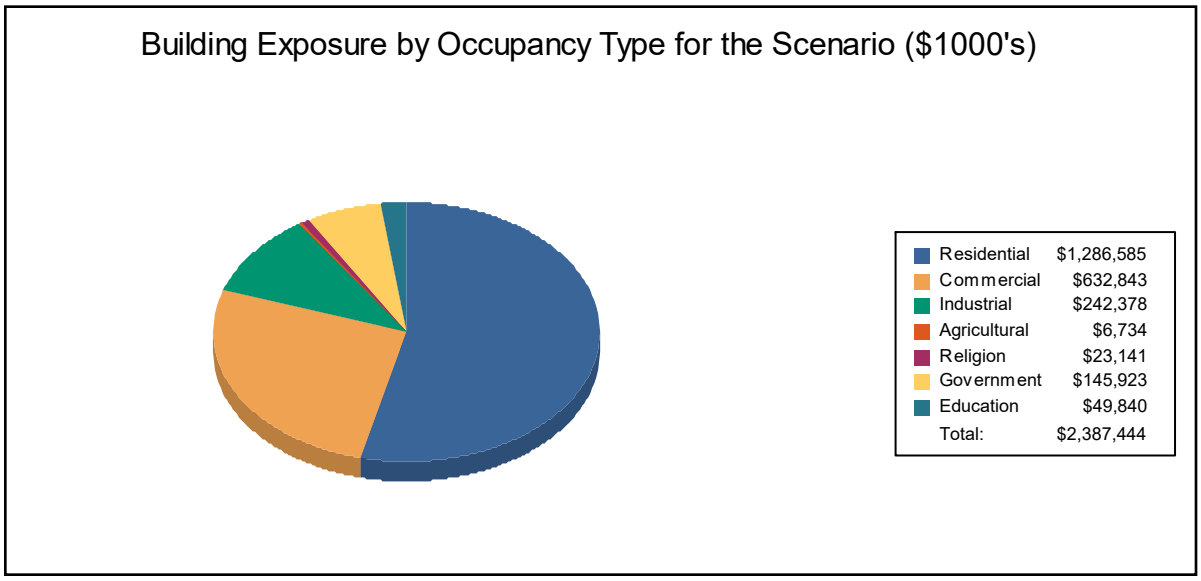


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,286,585	53.9%
Commercial	632,843	26.5%
Industrial	242,378	10.2%
Agricultural	6,734	0.3%
Religion	23,141	1.0%
Government	145,923	6.1%
Education	49,840	2.1%
Total	**2,387,444**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 4 fire stations, 1 police station and 1 emergency operation center.

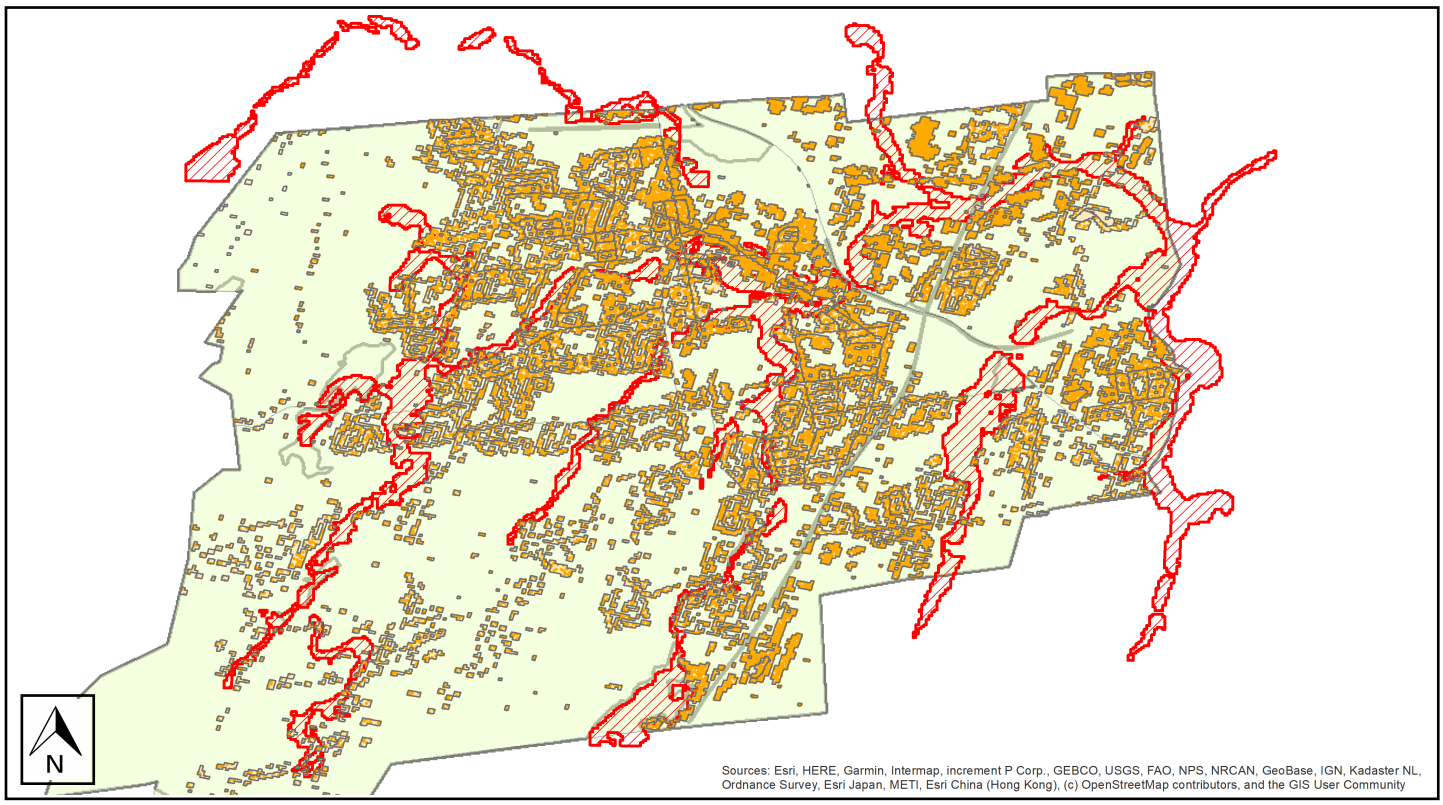
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Berlin_FL
Scenario Name:	Berlin_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 69 buildings will be at least moderately damaged. This is over 92% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

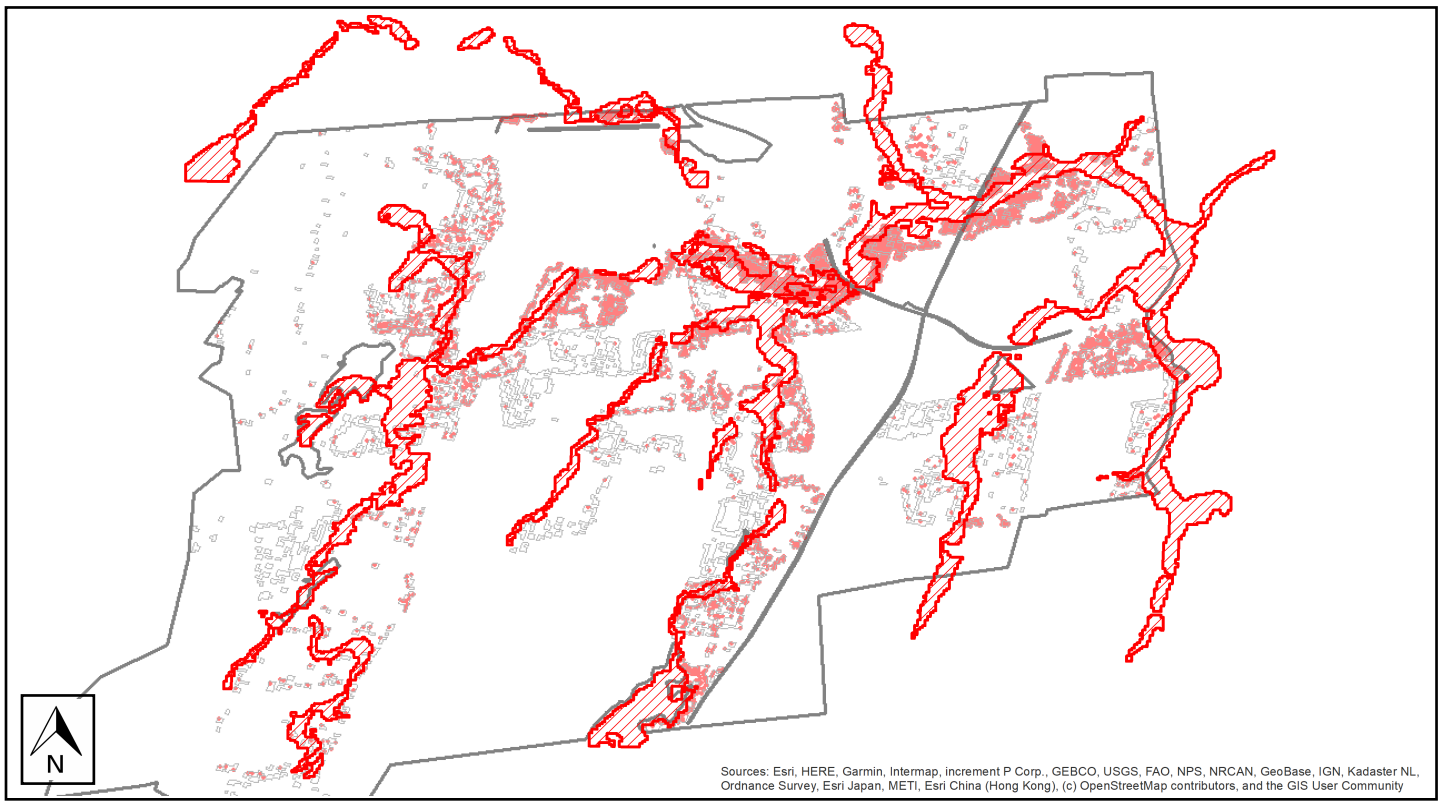


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	4	67	2	33	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	49	42	53	46	14	12	0	0	0	0	0	0
Total	**53**		**55**		**14**		**0**		**0**		**0**	

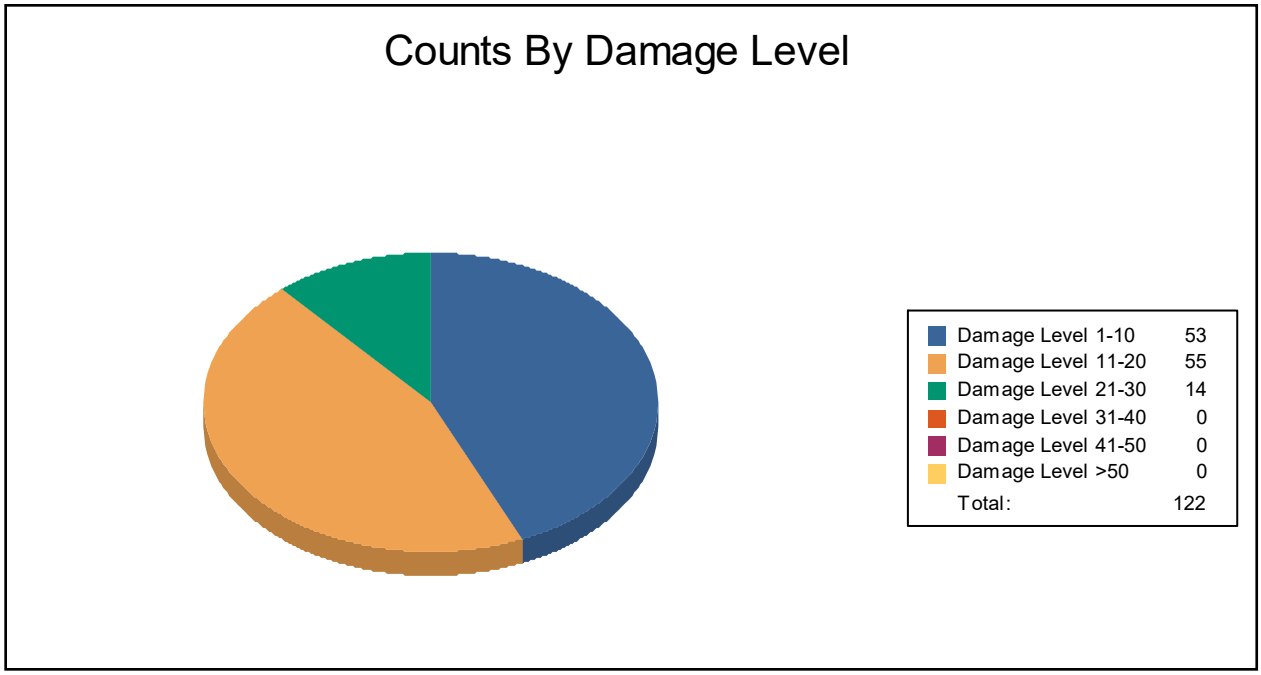


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	1	33	2	67	0	0	0	0	0	0	0	0
Wood	49	42	53	46	14	12	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

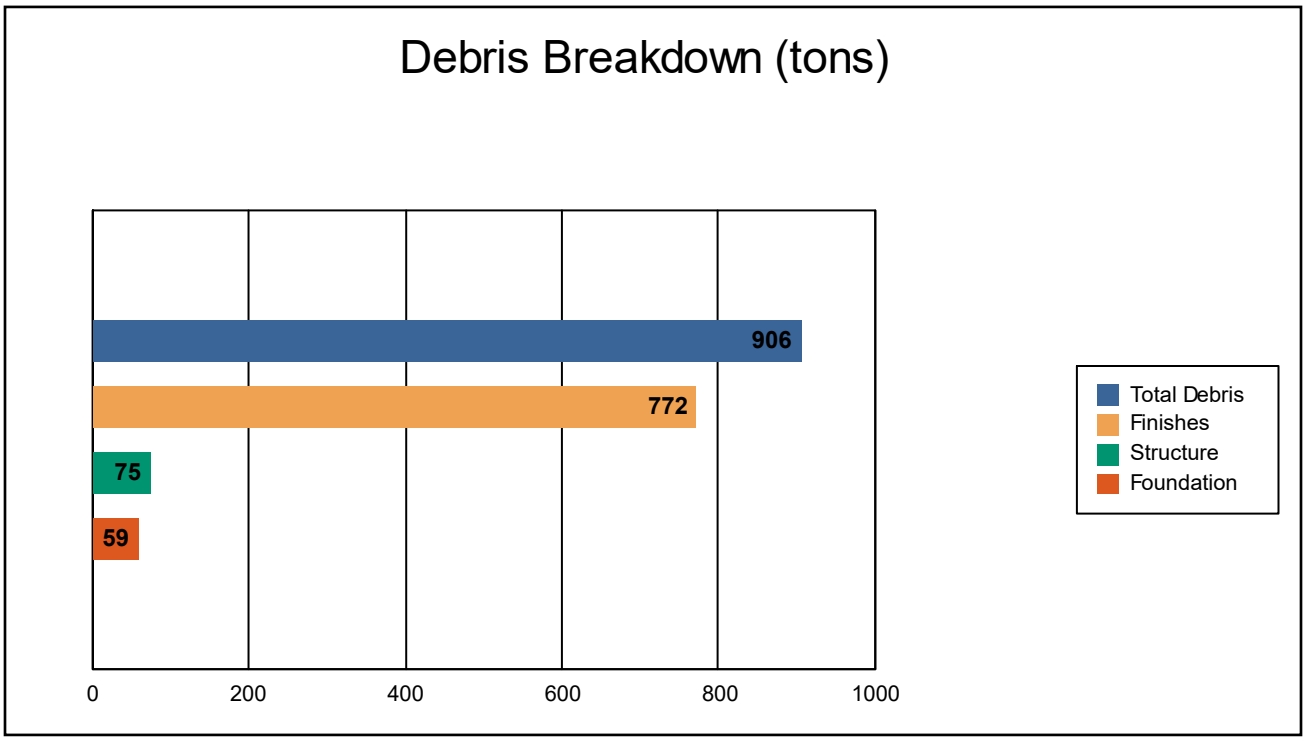
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

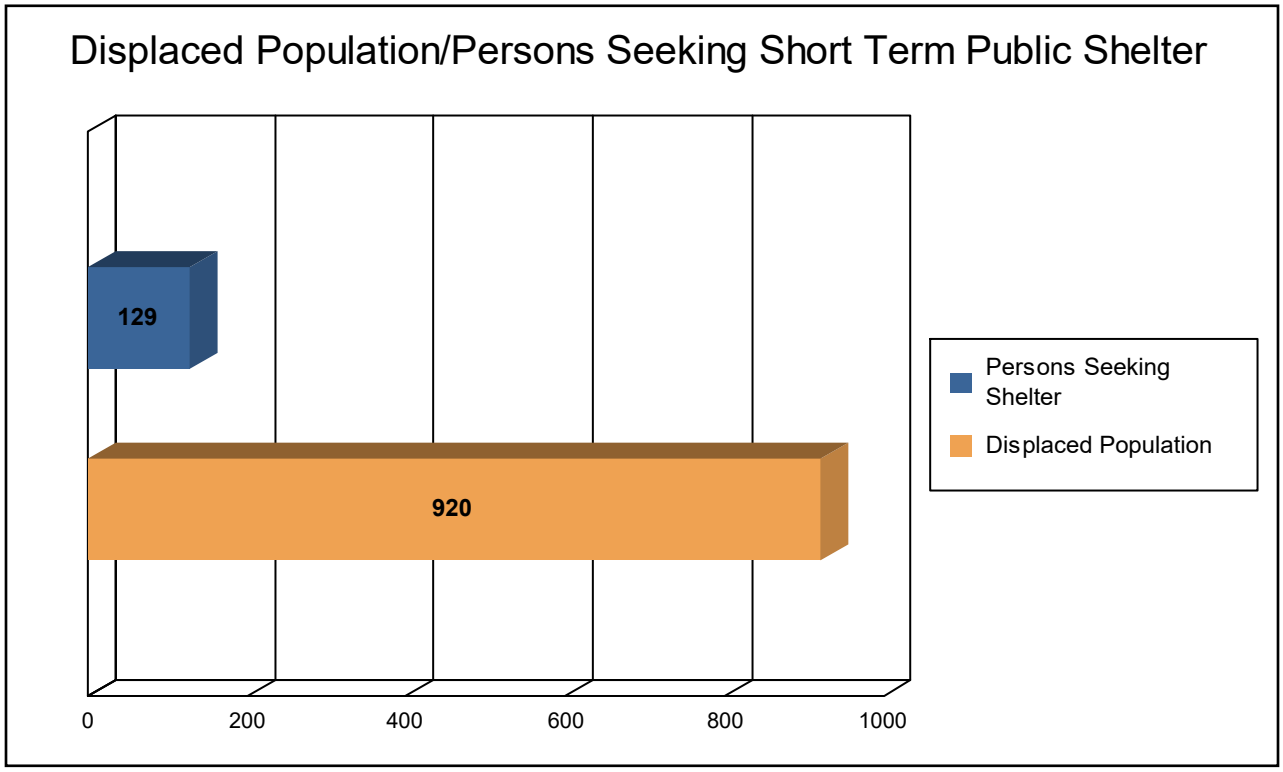


The model estimates that a total of 906 tons of debris will be generated. Of the total amount, Finishes comprises 85% of the total, Structure comprises 8% of the total, and Foundation comprises 6%. If the debris tonnage is converted into an estimated number of truckloads, it will require 37 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 307 households (or 920 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 129 people (out of a total population of 20,175) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 242.65 million dollars, which represents 10.16 % of the total replacement value of the scenario buildings.

Building-Related Losses

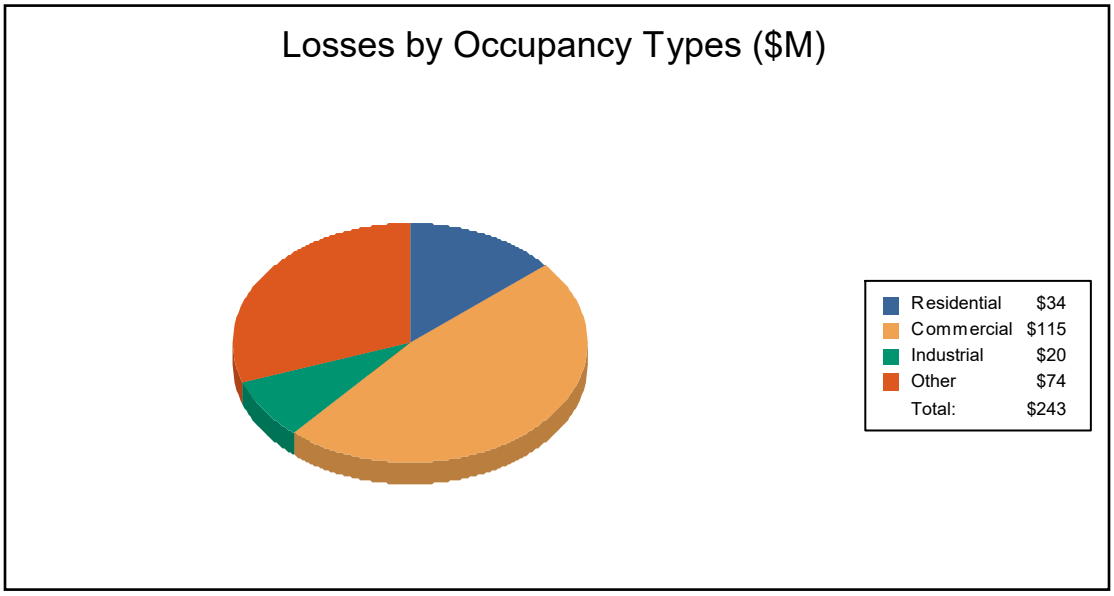
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 109.98 million dollars. 55% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.84% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	17.77	9.57	4.87	2.30	34.51
	Content	8.03	33.71	12.34	11.62	65.70
	Inventory	0.00	7.07	1.70	1.00	9.77
	Subtotal	**25.80**	**50.36**	**18.92**	**14.92**	**109.98**
Business Interruption						
	Income	0.03	21.90	0.24	3.35	25.52
	Relocation	5.51	7.39	0.33	3.05	16.27
	Rental Income	2.16	5.19	0.06	0.94	8.35
	Wage	0.09	30.60	0.43	51.40	82.53
	Subtotal	**7.79**	**65.08**	**1.06**	**58.74**	**132.67**
ALL	**Total**	**33.59**	**115.44**	**19.97**	**73.65**	**242.65**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,177	1,964,330	4,778,507
Total	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**
Total Study Region	**20,175**	**2,814,177**	**1,964,330**	**4,778,507**

Hazus: Flood Global Risk Report

Region Name: Bloomfield_FL

Flood Scenario: Bloomfield_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 278 census blocks. The region contains over 9 thousand households and has a total population of 21,511 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,958 buildings in the region with a total building replacement value (excluding contents) of 4,731 million dollars. Approximately 85.61% of the buildings (and 48.52% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,958 buildings in the region which have an aggregate total replacement value of 4,731 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,295,814	48.5%
Commercial	1,346,643	28.5%
Industrial	691,562	14.6%
Agricultural	18,488	0.4%
Religion	123,539	2.6%
Government	69,502	1.5%
Education	185,798	3.9%
Total	**4,731,346**	**100%**

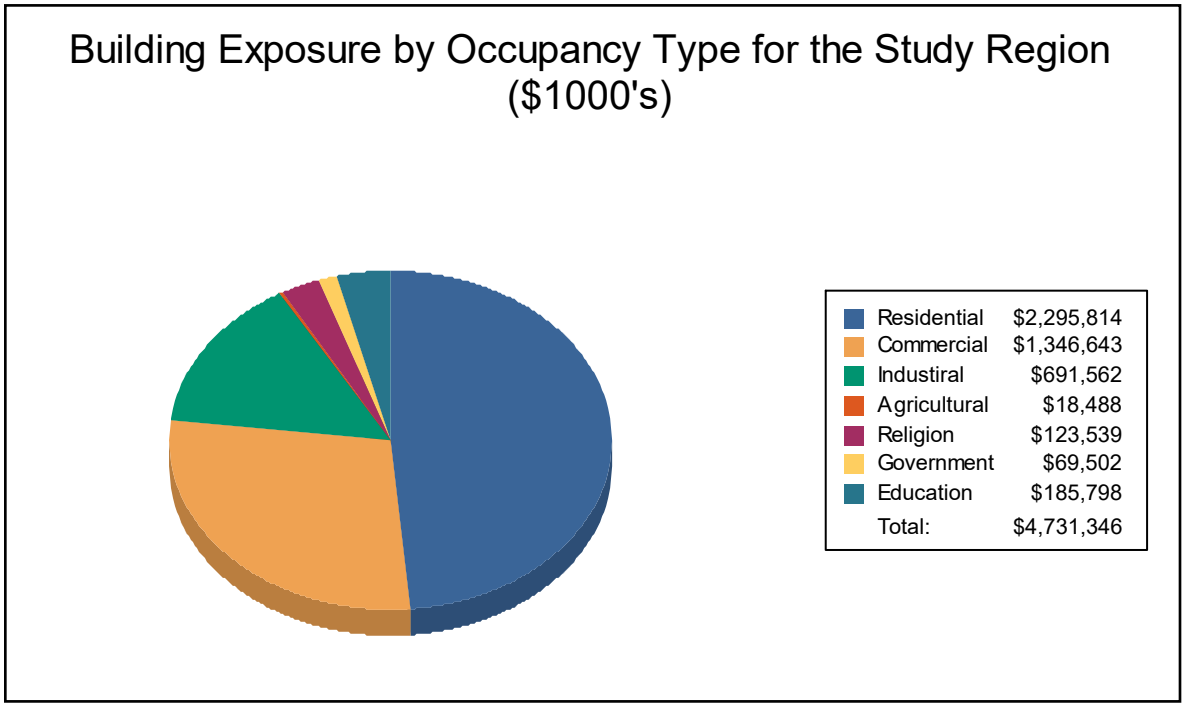
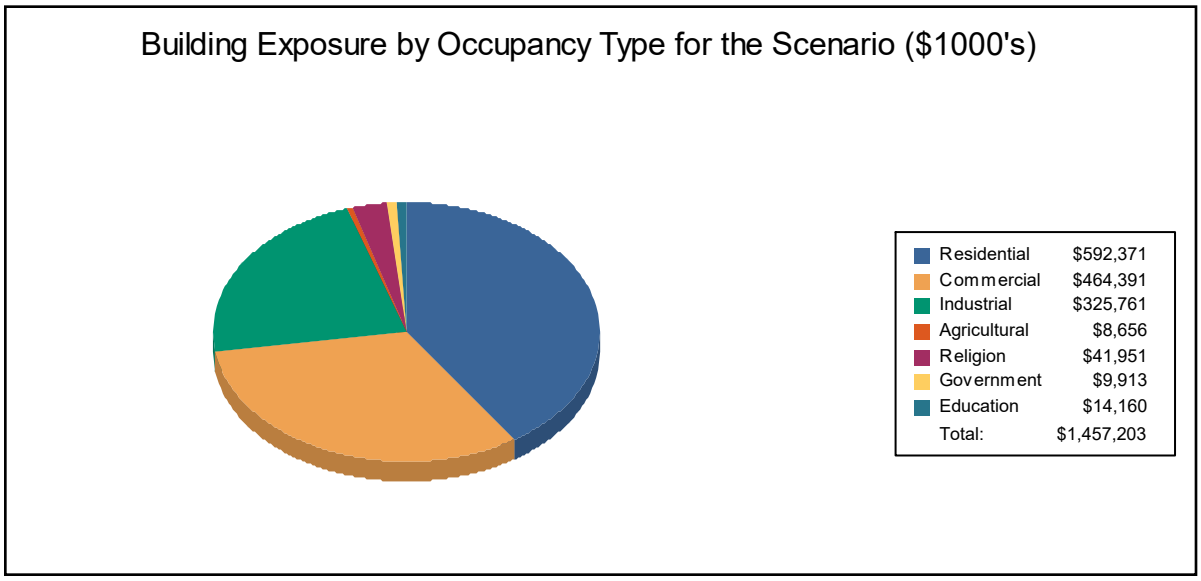


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	592,371	40.7%
Commercial	464,391	31.9%
Industrial	325,761	22.4%
Agricultural	8,656	0.6%
Religion	41,951	2.9%
Government	9,913	0.7%
Education	14,160	1.0%
Total	**1,457,203**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 6 fire stations, 1 police station and 1 emergency operation center.

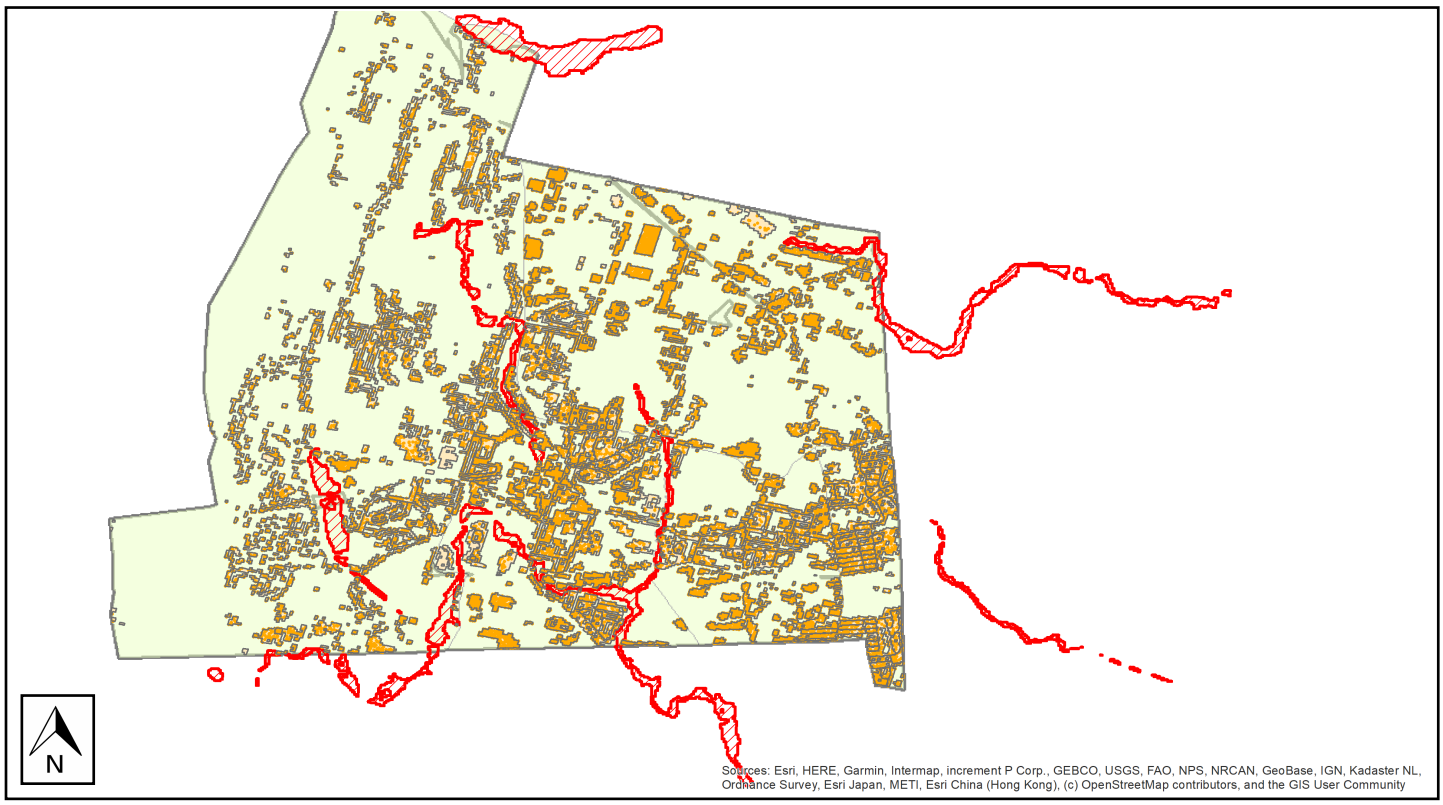
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bloomfield_FL
Scenario Name:	Bloomfield_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

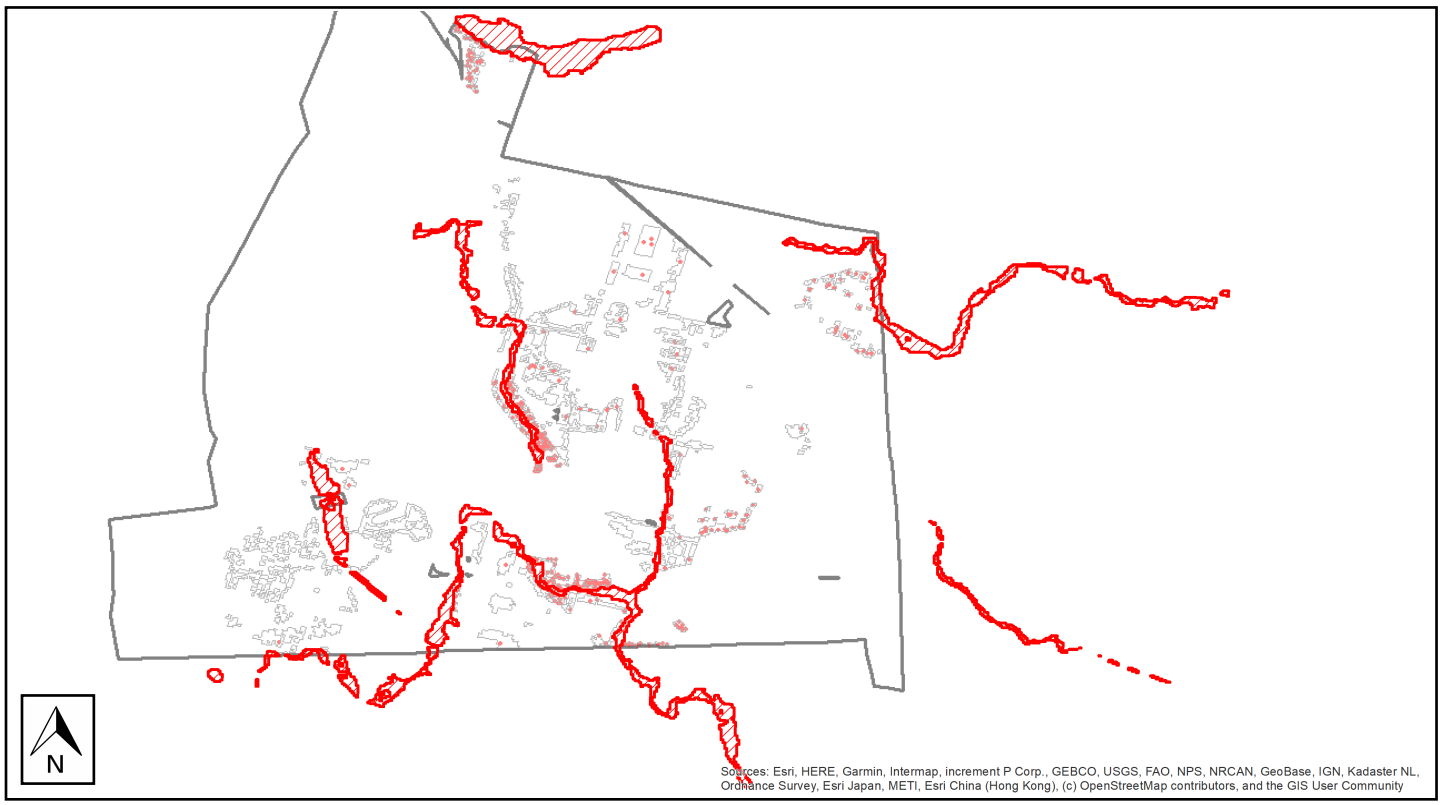


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	1	100	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

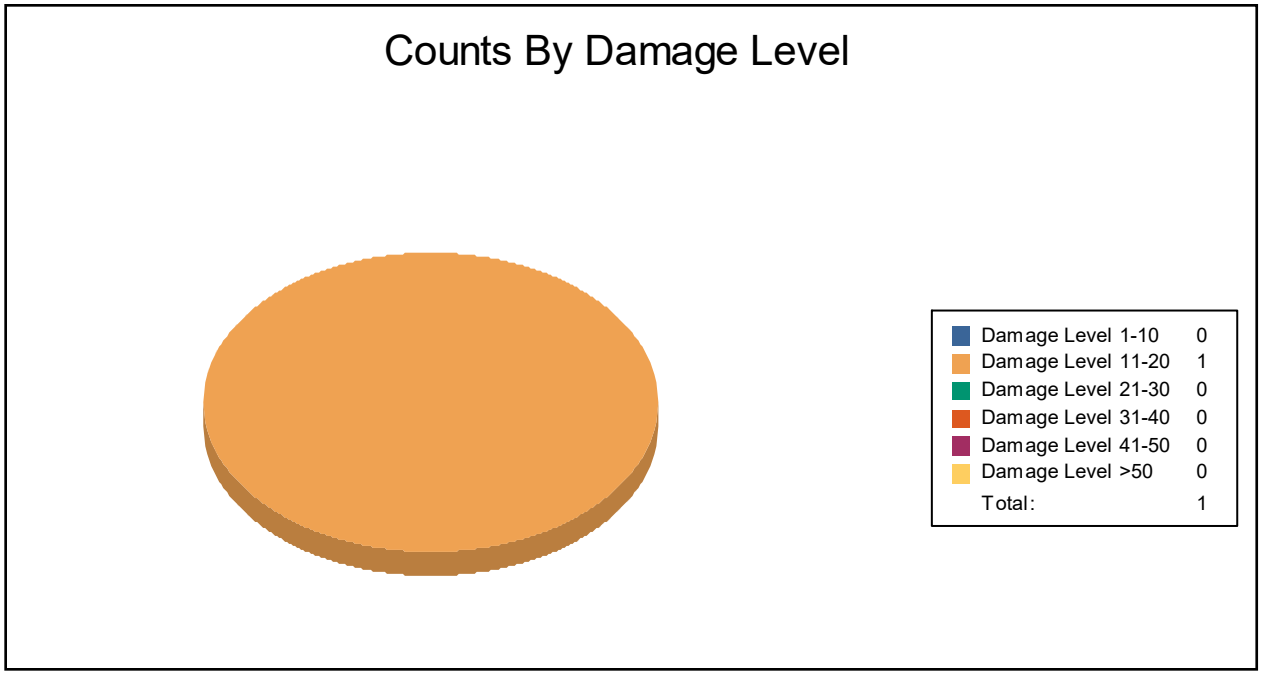


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	1	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

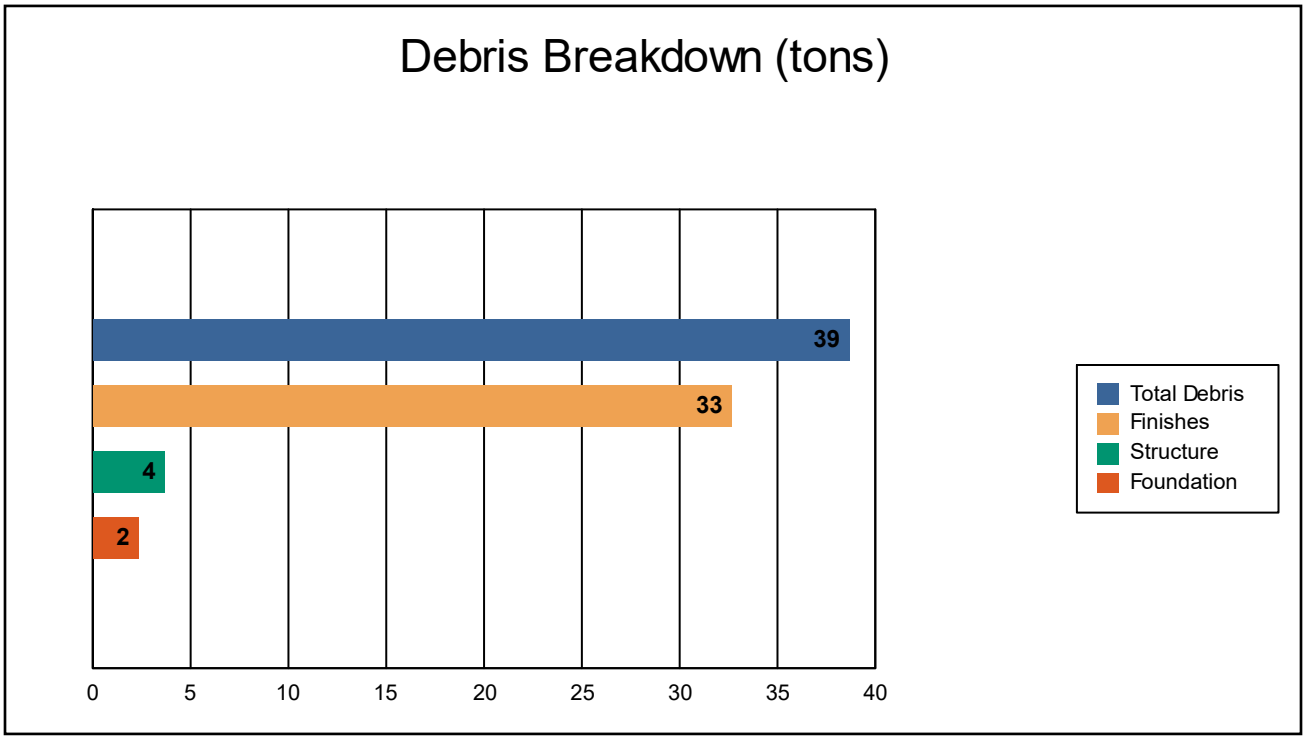
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

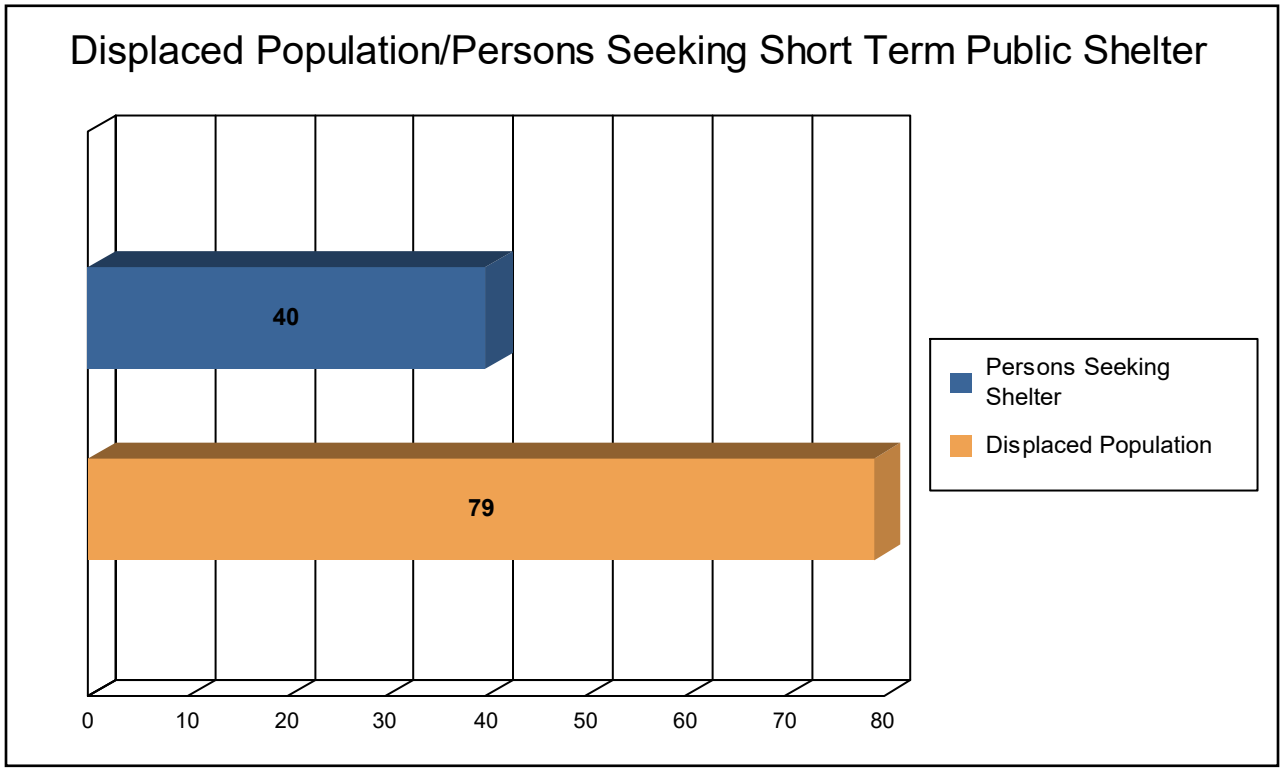


The model estimates that a total of 39 tons of debris will be generated. Of the total amount, Finishes comprises 84% of the total, Structure comprises 10% of the total, and Foundation comprises 6%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 26 households (or 79 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 40 people (out of a total population of 21,511) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 5.32 million dollars, which represents 0.37 % of the total replacement value of the scenario buildings.

Building-Related Losses

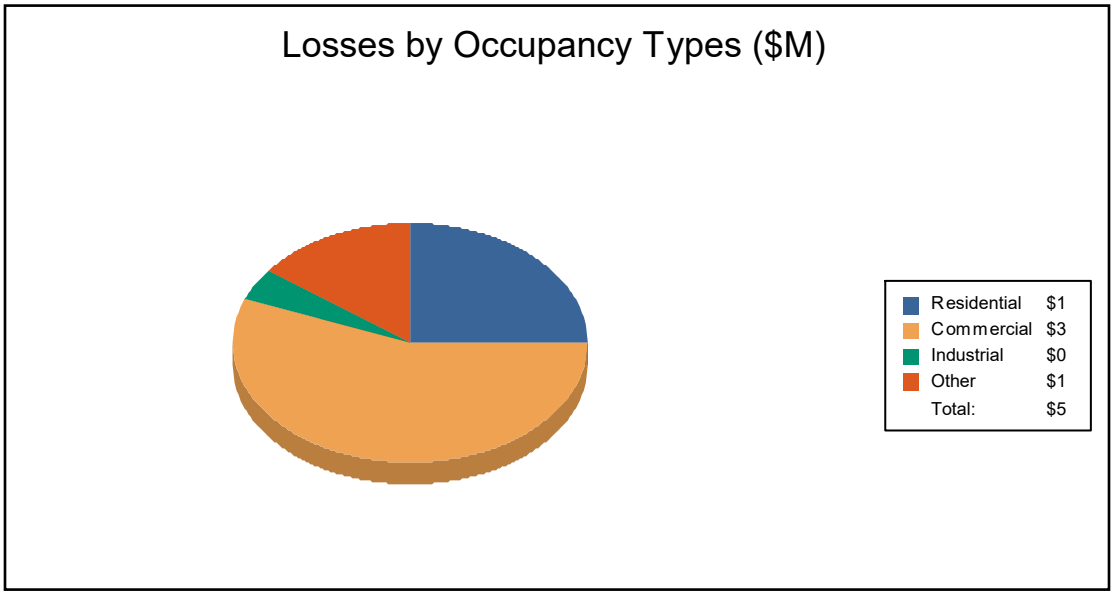
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 2.53 million dollars. 52% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 24.92% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.70	0.21	0.06	0.04	1.02
	Content	0.31	0.65	0.16	0.29	1.41
	Inventory	0.00	0.05	0.02	0.04	0.10
	Subtotal	**1.02**	**0.91**	**0.23**	**0.37**	**2.53**
Business Interruption						
	Income	0.00	0.75	0.00	0.10	0.85
	Relocation	0.22	0.22	0.00	0.05	0.49
	Rental Income	0.09	0.16	0.00	0.00	0.25
	Wage	0.00	0.94	0.00	0.26	1.20
	Subtotal	**0.31**	**2.06**	**0.01**	**0.41**	**2.79**
ALL	**Total**	**1.33**	**2.97**	**0.24**	**0.79**	**5.32**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	21,511	2,295,814	2,435,532	4,731,346
Total	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**
Total Study Region	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**

Hazus: Flood Global Risk Report

Region Name: Bloomfield_FL

Flood Scenario: Bloomfield_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 278 census blocks. The region contains over 9 thousand households and has a total population of 21,511 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,958 buildings in the region with a total building replacement value (excluding contents) of 4,731 million dollars. Approximately 85.61% of the buildings (and 48.52% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,958 buildings in the region which have an aggregate total replacement value of 4,731 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,295,814	48.5%
Commercial	1,346,643	28.5%
Industrial	691,562	14.6%
Agricultural	18,488	0.4%
Religion	123,539	2.6%
Government	69,502	1.5%
Education	185,798	3.9%
Total	**4,731,346**	**100%**

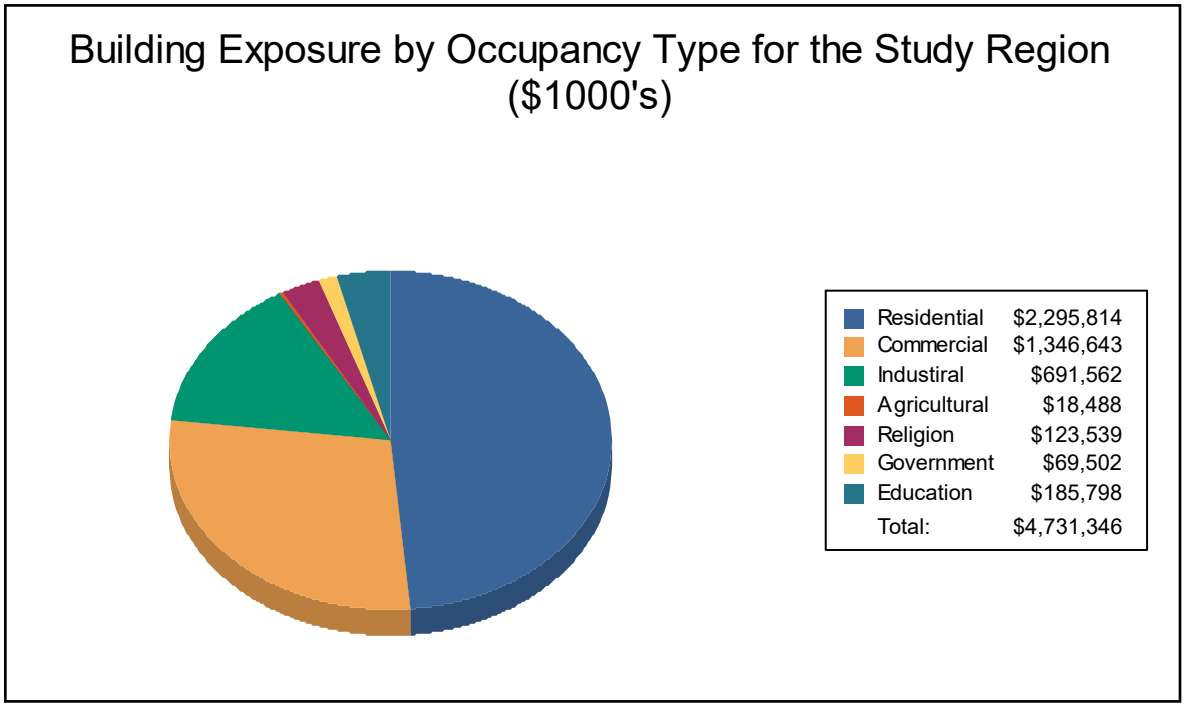
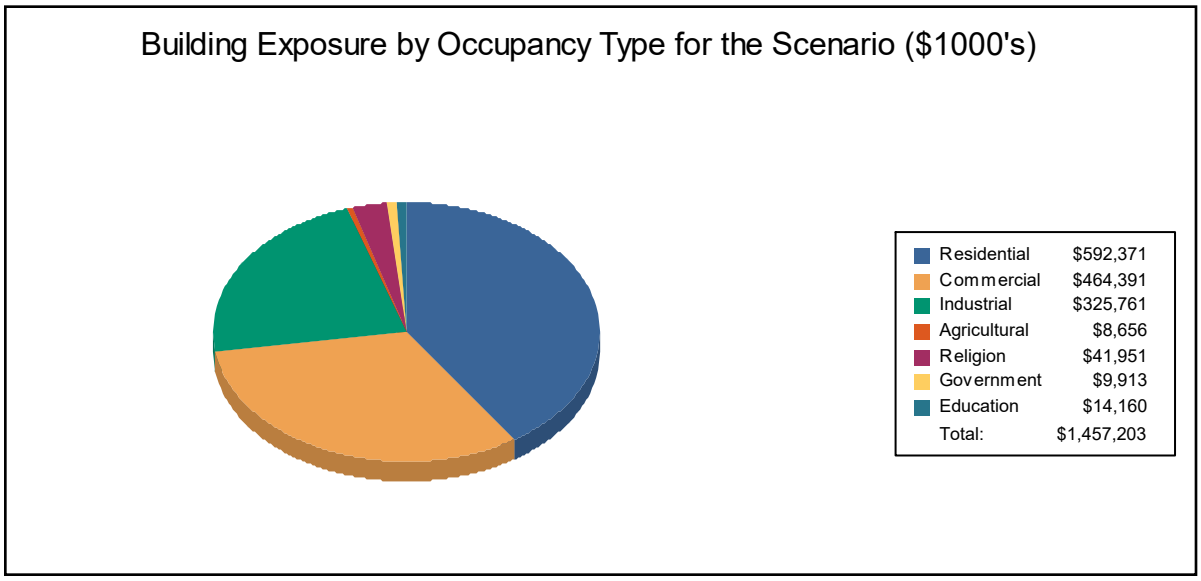


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	592,371	40.7%
Commercial	464,391	31.9%
Industrial	325,761	22.4%
Agricultural	8,656	0.6%
Religion	41,951	2.9%
Government	9,913	0.7%
Education	14,160	1.0%
Total	**1,457,203**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 6 fire stations, 1 police station and 1 emergency operation center.

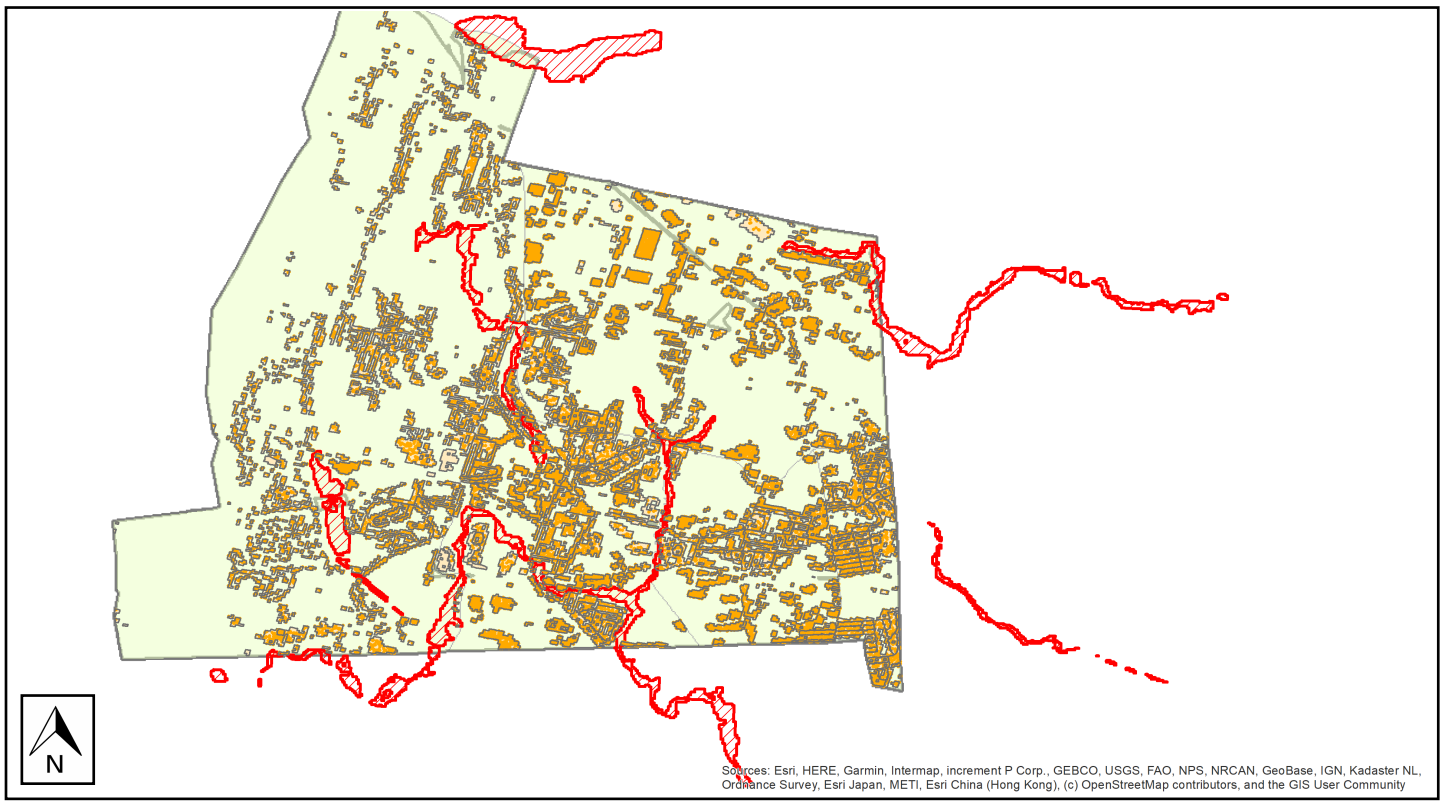
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bloomfield_FL
Scenario Name:	Bloomfield_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

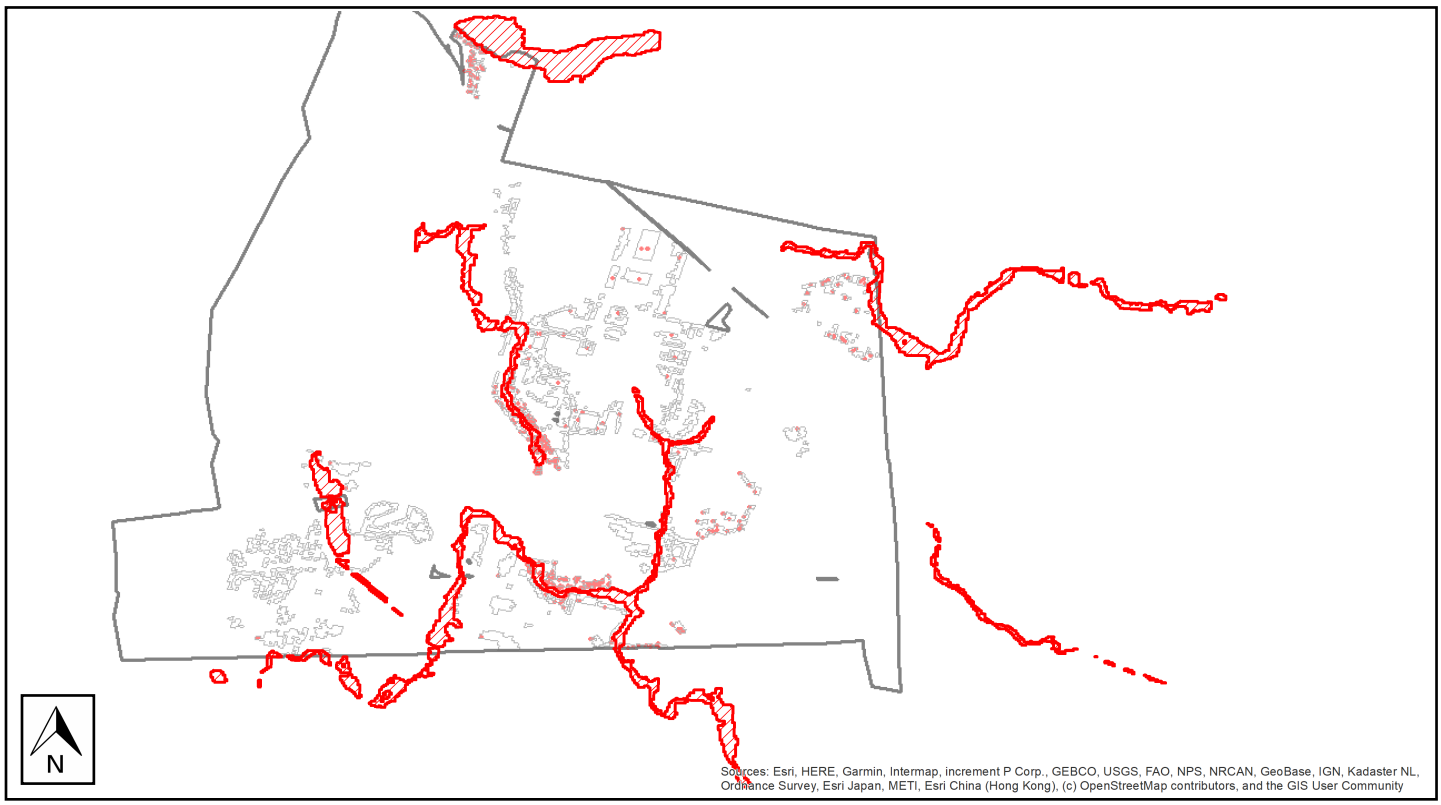


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

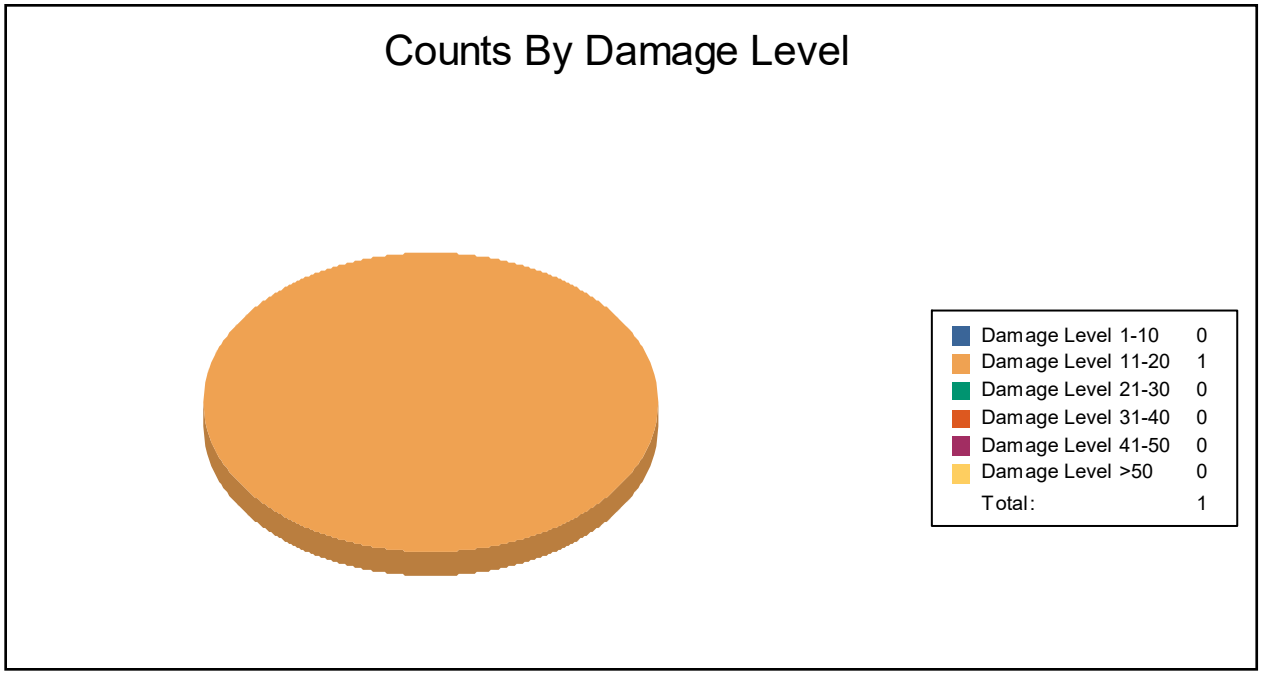


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

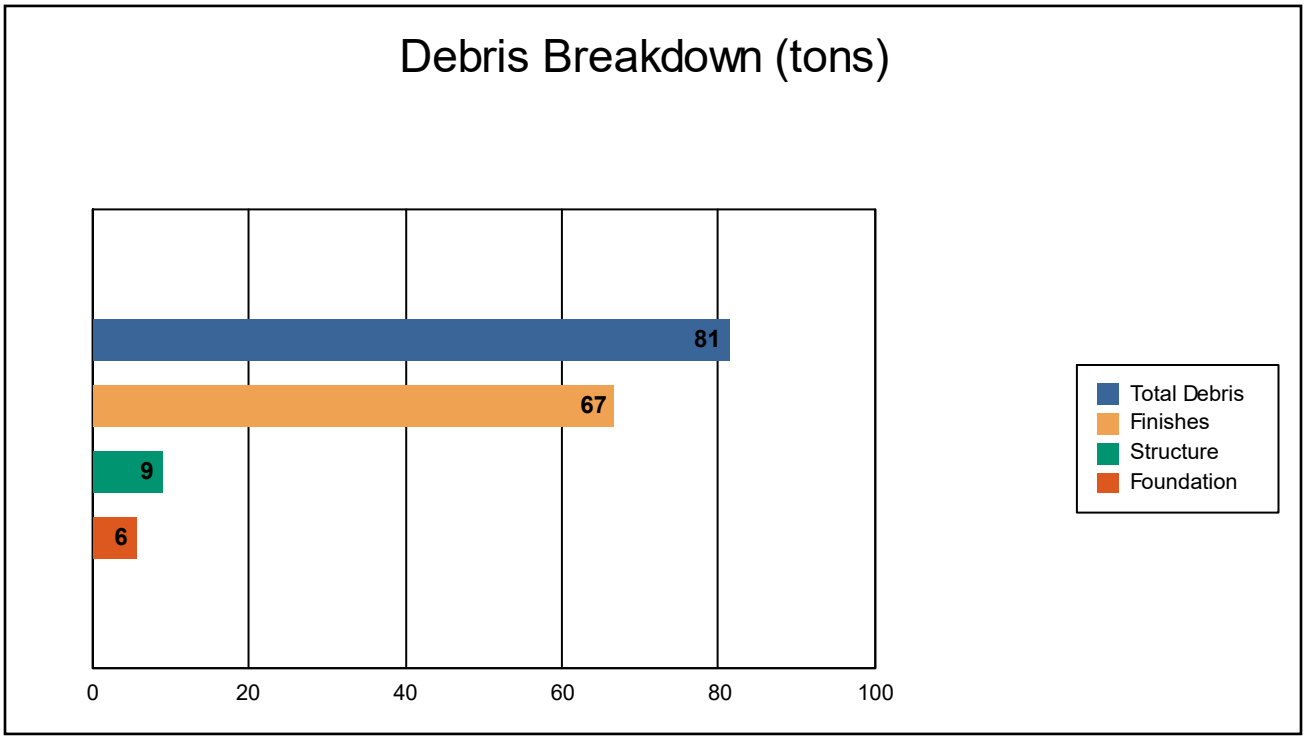
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

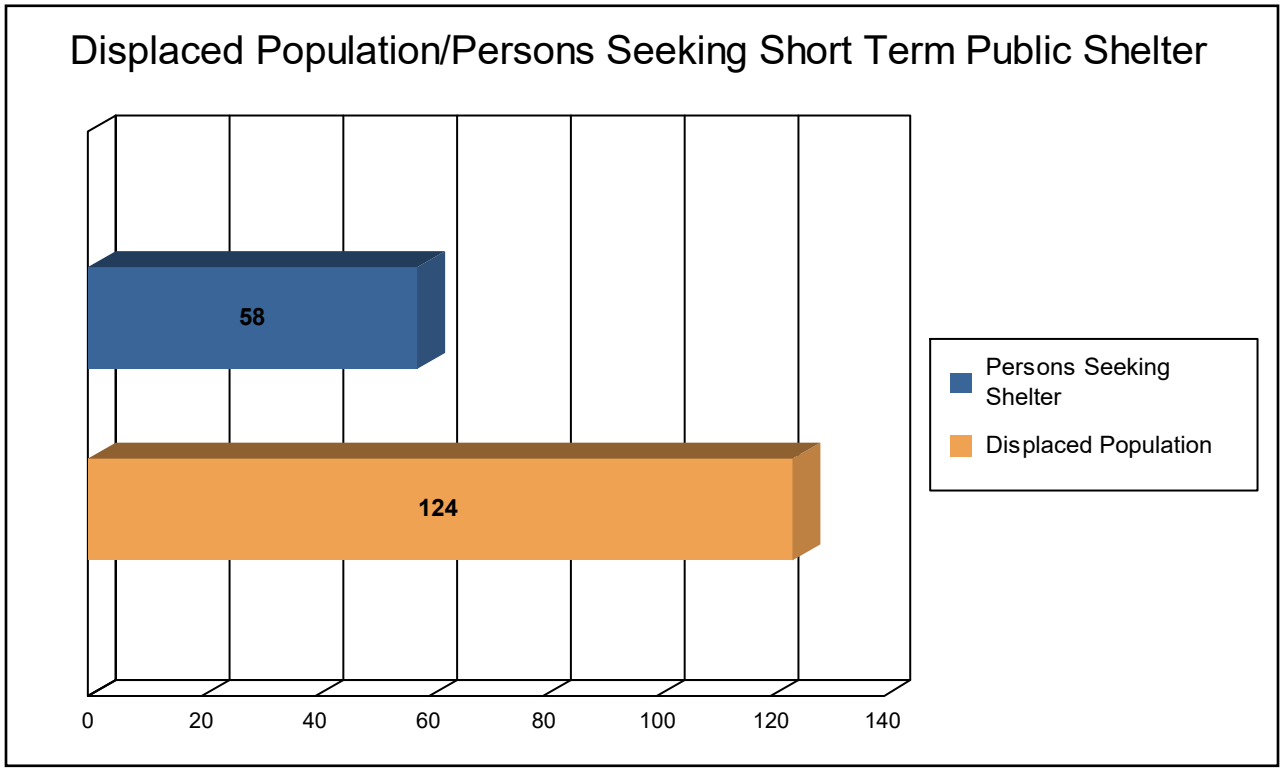


The model estimates that a total of 81 tons of debris will be generated. Of the total amount, Finishes comprises 82% of the total, Structure comprises 11% of the total, and Foundation comprises 7%. If the debris tonnage is converted into an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 41 households (or 124 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 58 people (out of a total population of 21,511) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 12.89 million dollars, which represents 0.88 % of the total replacement value of the scenario buildings.

Building-Related Losses

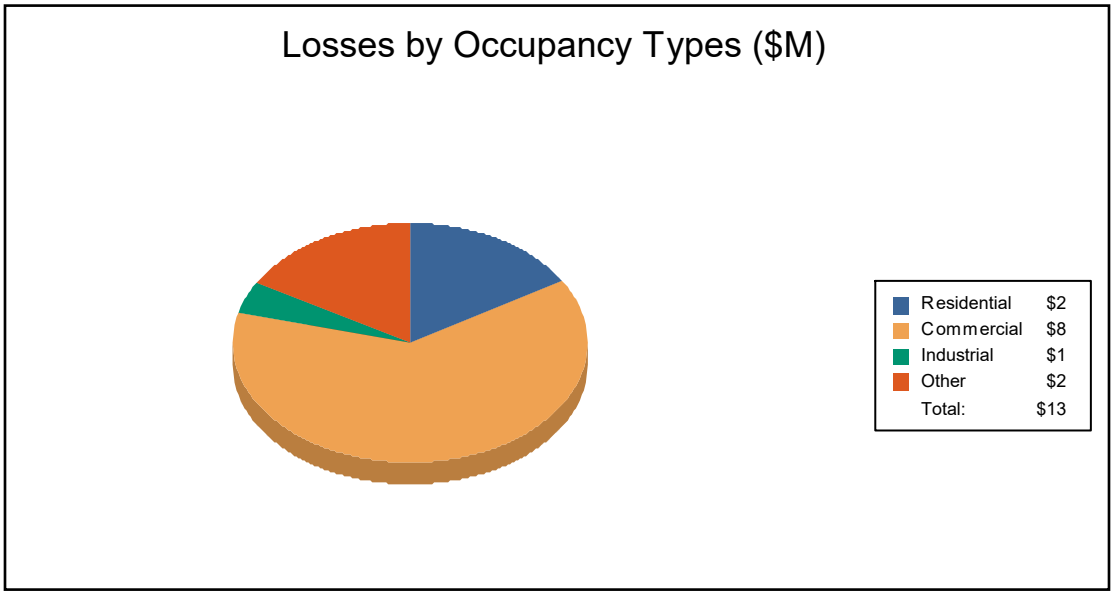
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 6.84 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 16.48% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.11	0.79	0.15	0.13	2.19
	Content	0.50	2.51	0.37	0.81	4.19
	Inventory	0.00	0.26	0.04	0.16	0.46
	Subtotal	**1.62**	**3.56**	**0.56**	**1.10**	**6.84**
Business Interruption						
	Income	0.00	1.60	0.00	0.23	1.84
	Relocation	0.34	0.49	0.01	0.11	0.95
	Rental Income	0.16	0.36	0.00	0.01	0.53
	Wage	0.01	2.03	0.01	0.69	2.74
	Subtotal	**0.51**	**4.48**	**0.02**	**1.04**	**6.05**
ALL	**Total**	**2.12**	**8.04**	**0.58**	**2.14**	**12.89**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	21,511	2,295,814	2,435,532	4,731,346
Total	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**
Total Study Region	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**

Hazus: Flood Global Risk Report

Region Name: Bloomfield_FL

Flood Scenario: Bloomfield_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 278 census blocks. The region contains over 9 thousand households and has a total population of 21,511 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,958 buildings in the region with a total building replacement value (excluding contents) of 4,731 million dollars. Approximately 85.61% of the buildings (and 48.52% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,958 buildings in the region which have an aggregate total replacement value of 4,731 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,295,814	48.5%
Commercial	1,346,643	28.5%
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Agricultural	18,488	0.4%
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Total	**4,731,346**	**100%**

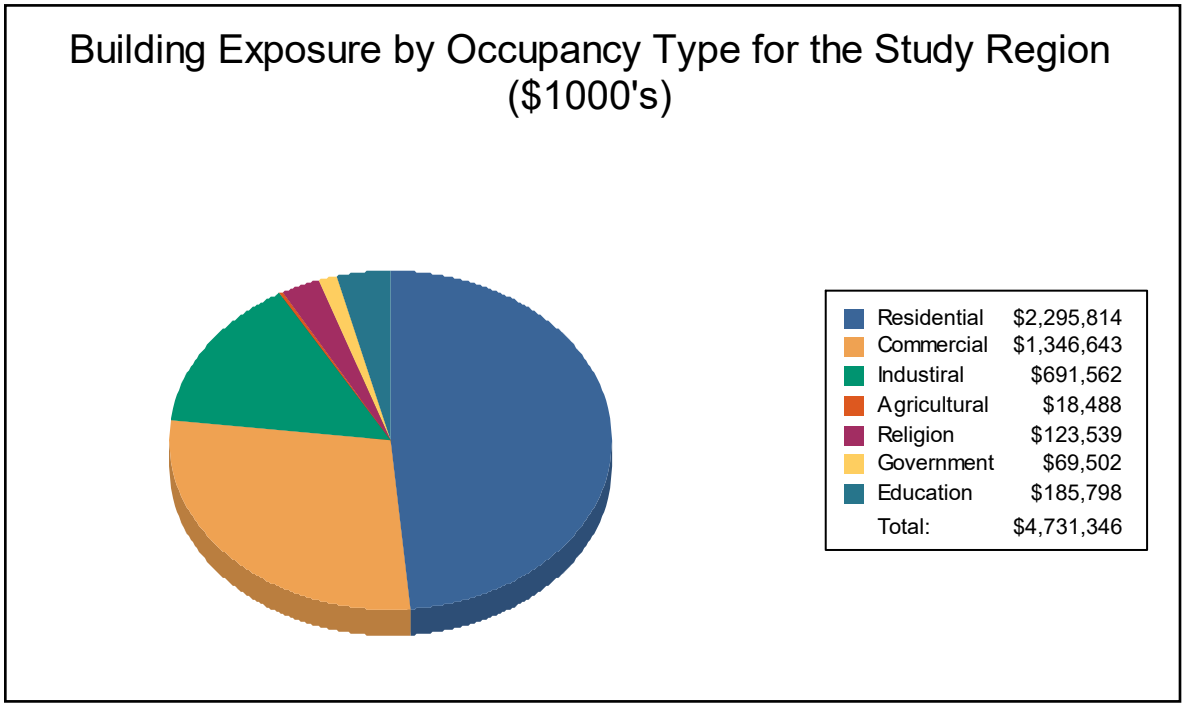

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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Commercial	464,391	31.9%
Industrial	325,761	22.4%
Agricultural	8,656	0.6%
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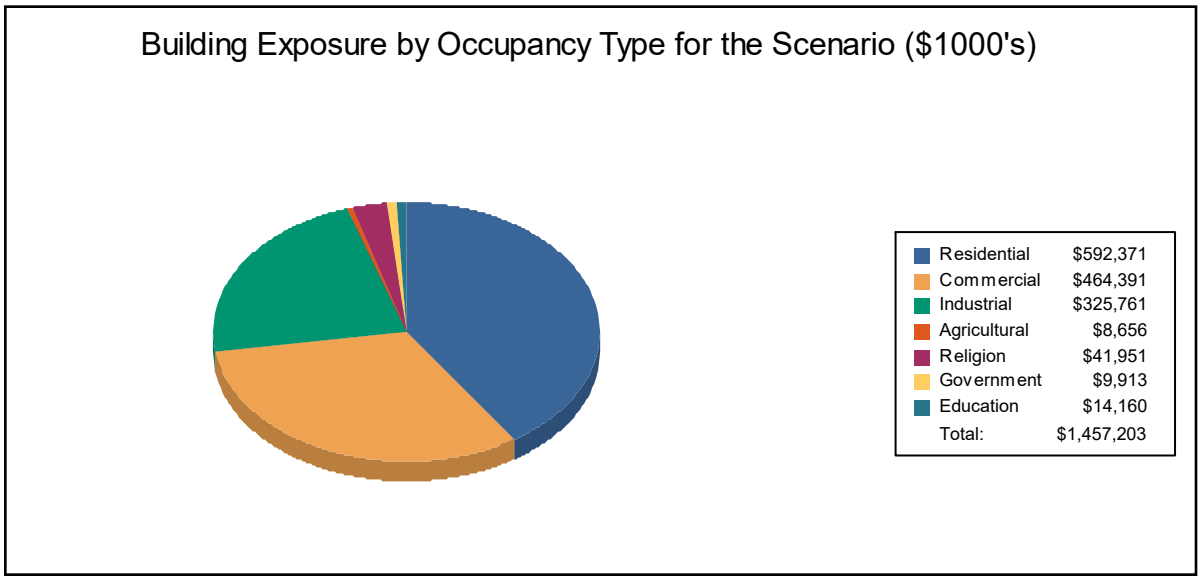
Government	9,913	0.7%
Education	14,160	1.0%
Total	**1,457,203**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 6 fire stations, 1 police station and 1 emergency operation center.

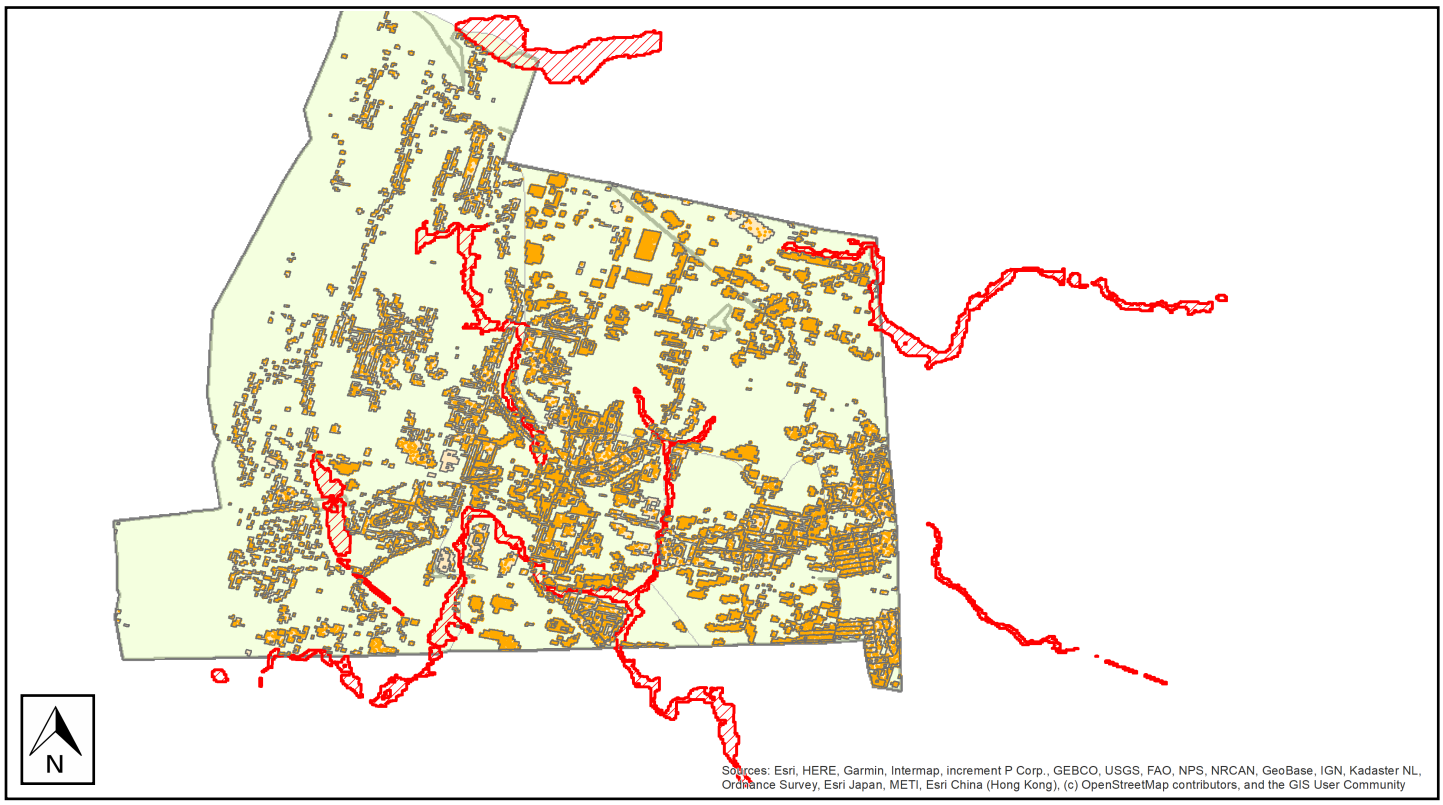
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bloomfield_FL
Scenario Name:	Bloomfield_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

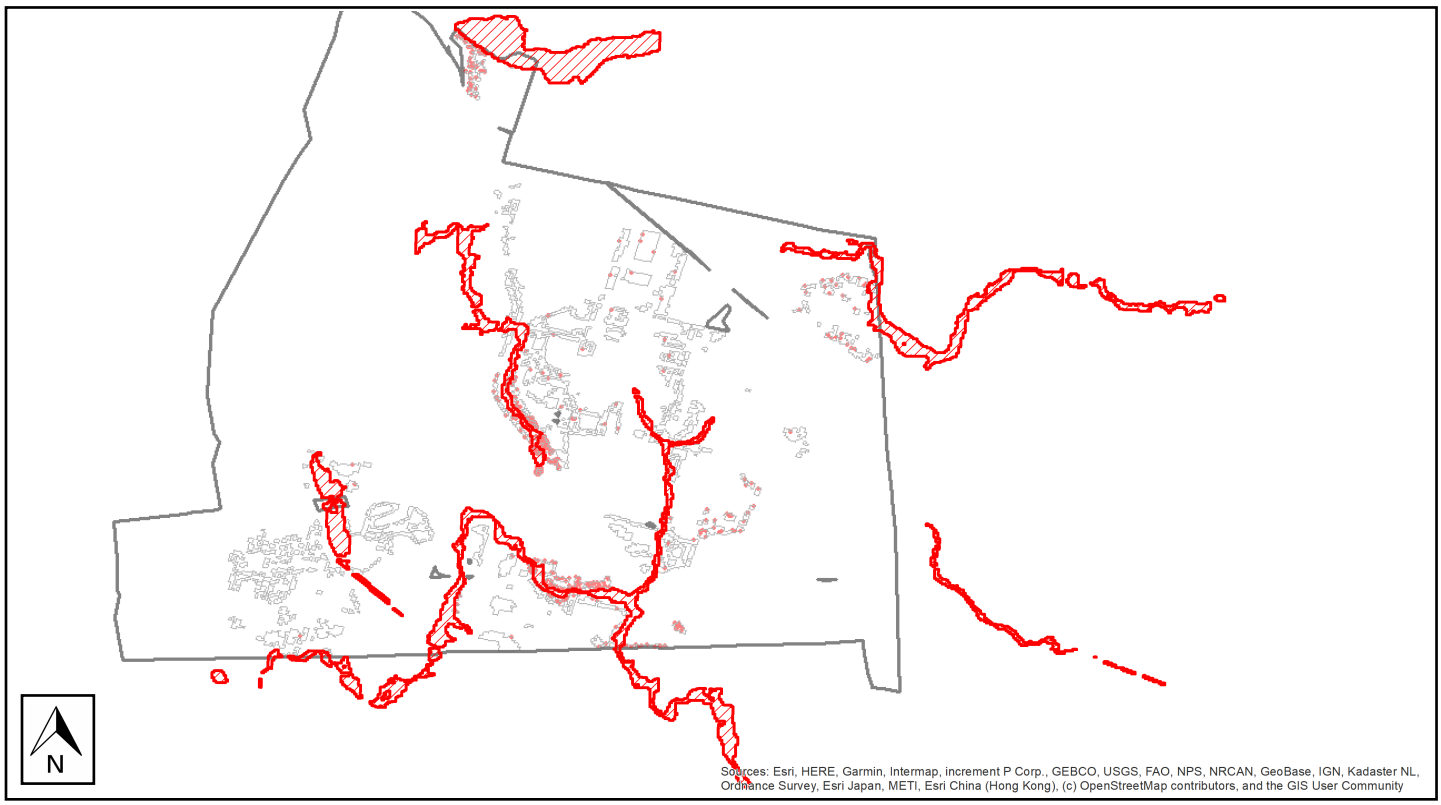


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

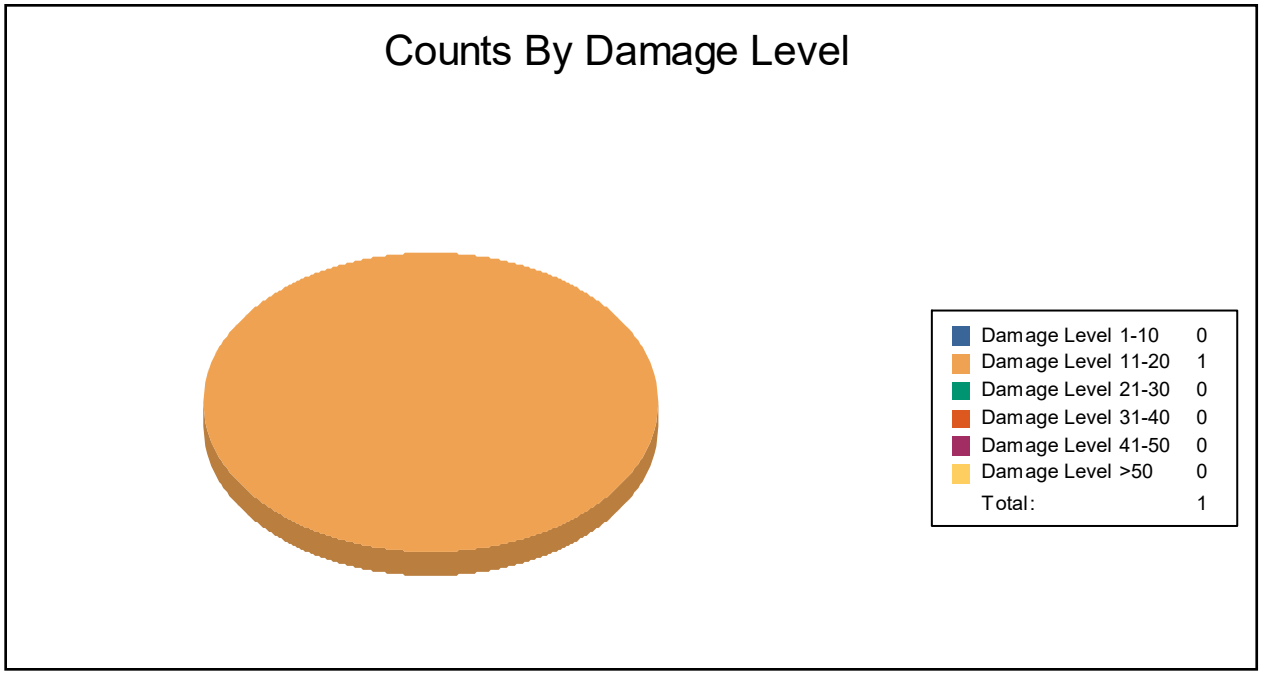


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

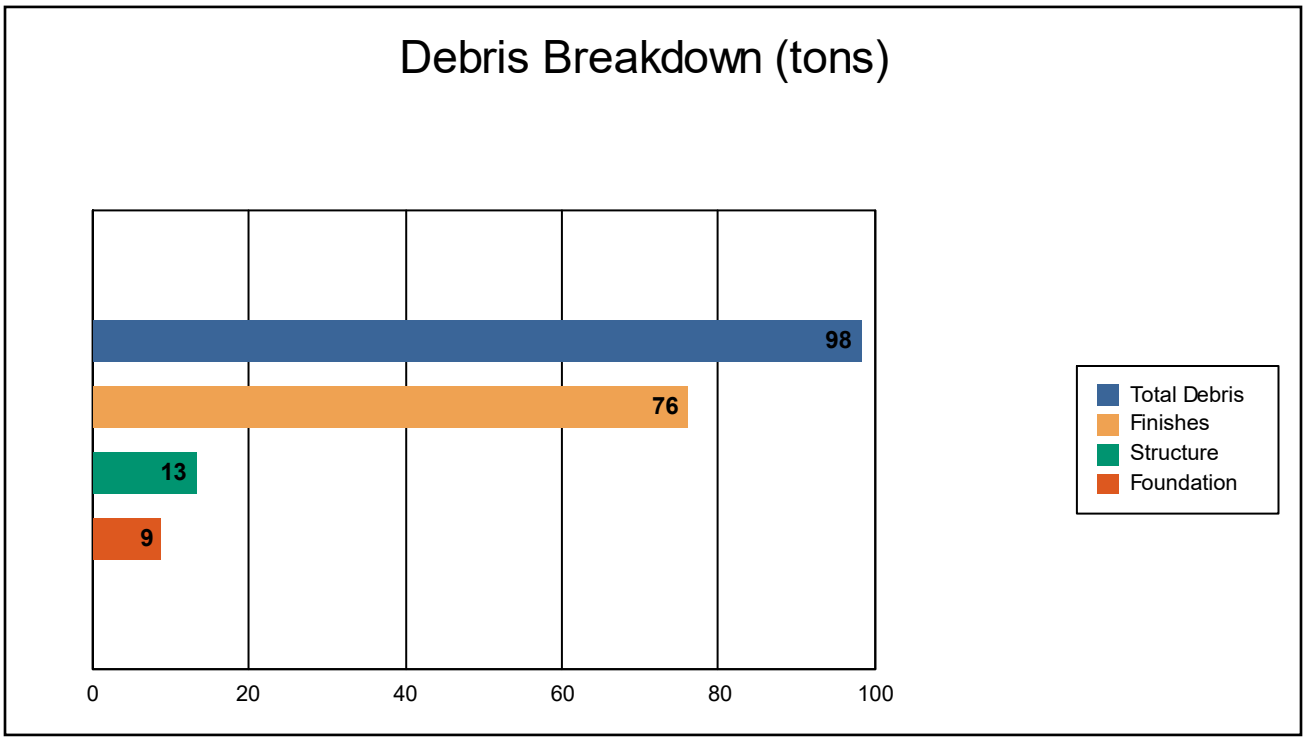
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

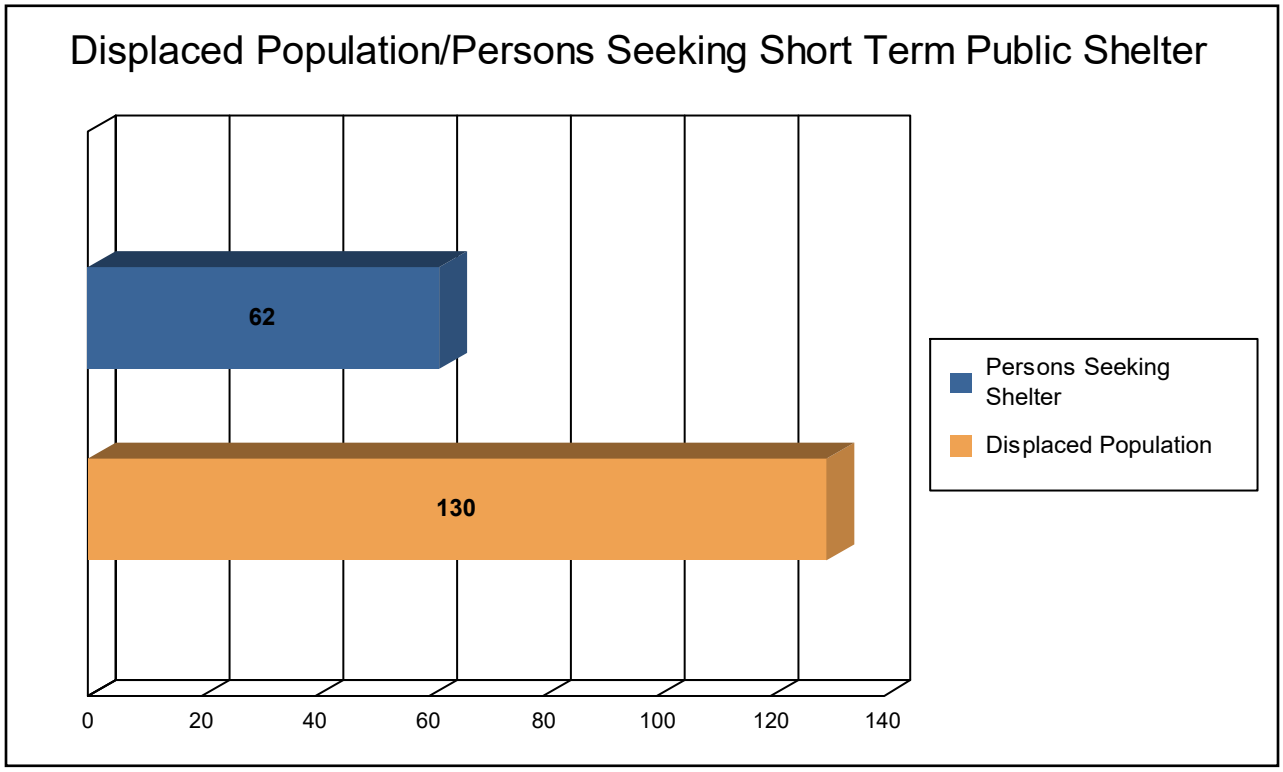


The model estimates that a total of 98 tons of debris will be generated. Of the total amount, Finishes comprises 77% of the total, Structure comprises 13% of the total, and Foundation comprises 9%. If the debris tonnage is converted into an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 43 households (or 130 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 62 people (out of a total population of 21,511) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 13.86 million dollars, which represents 0.95 % of the total replacement value of the scenario buildings.

Building-Related Losses

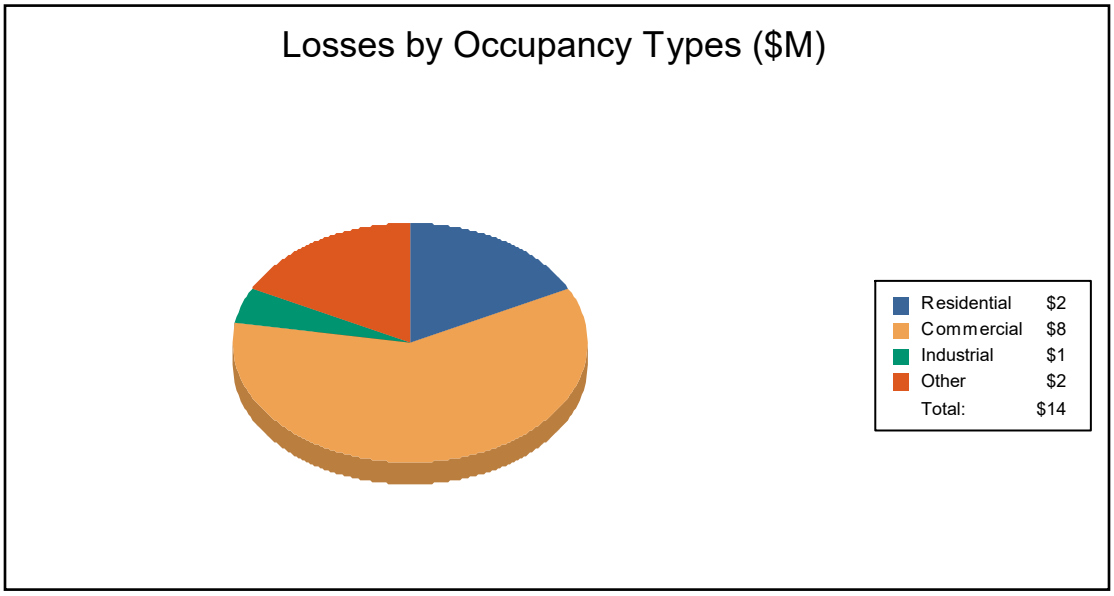
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 7.41 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 17.54% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.30	0.82	0.17	0.14	2.43
	Content	0.59	2.60	0.42	0.88	4.49
	Inventory	0.00	0.27	0.04	0.18	0.49
	Subtotal	**1.89**	**3.69**	**0.64**	**1.20**	**7.41**
Business Interruption						
	Income	0.00	1.66	0.00	0.27	1.94
	Relocation	0.37	0.51	0.01	0.14	1.02
	Rental Income	0.16	0.38	0.00	0.01	0.56
	Wage	0.01	2.10	0.01	0.82	2.93
	Subtotal	**0.55**	**4.64**	**0.02**	**1.24**	**6.45**
ALL	**Total**	**2.43**	**8.33**	**0.66**	**2.43**	**13.86**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	21,511	2,295,814	2,435,532	4,731,346
Total	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**
Total Study Region	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**

Hazus: Flood Global Risk Report

Region Name: Bloomfield_FL

Flood Scenario: Bloomfield_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 278 census blocks. The region contains over 9 thousand households and has a total population of 21,511 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,958 buildings in the region with a total building replacement value (excluding contents) of 4,731 million dollars. Approximately 85.61% of the buildings (and 48.52% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,958 buildings in the region which have an aggregate total replacement value of 4,731 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,295,814	48.5%
Commercial	1,346,643	28.5%
Industrial	691,562	14.6%
Agricultural	18,488	0.4%
Religion	123,539	2.6%
Government	69,502	1.5%
Education	185,798	3.9%
Total	**4,731,346**	**100%**

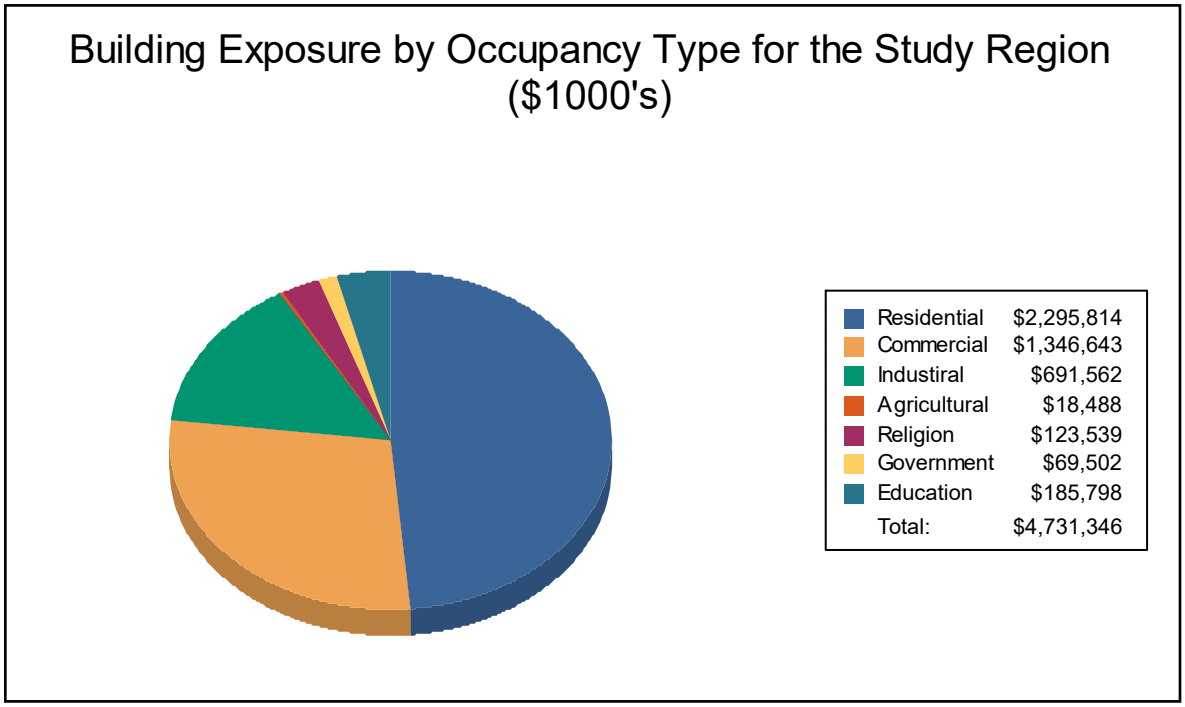
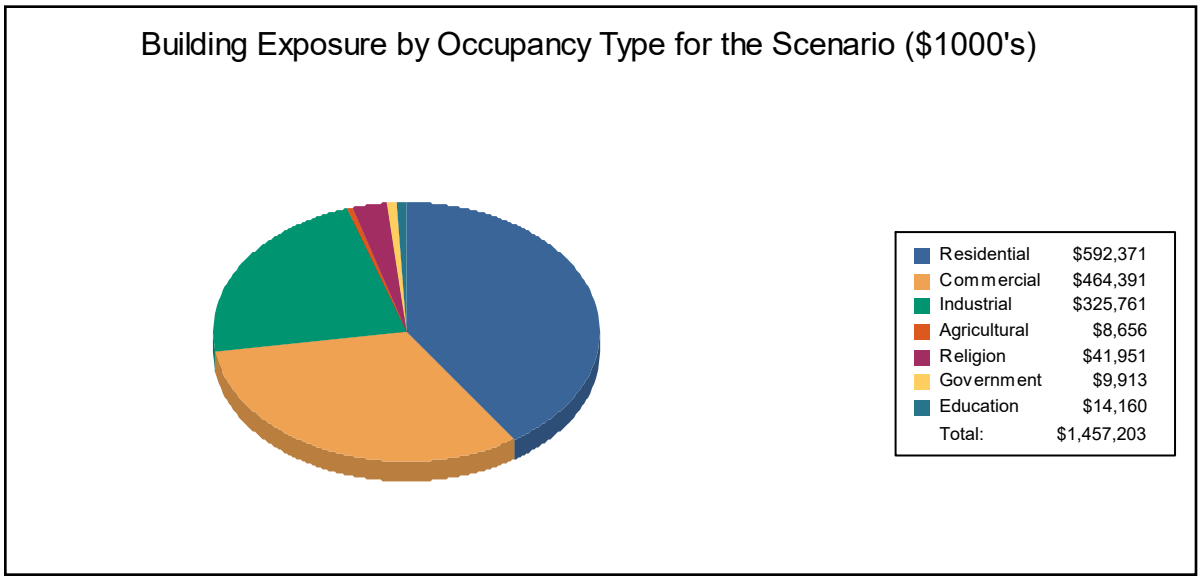


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	592,371	40.7%
Commercial	464,391	31.9%
Industrial	325,761	22.4%
Agricultural	8,656	0.6%
Religion	41,951	2.9%
Government	9,913	0.7%
Education	14,160	1.0%
Total	**1,457,203**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 6 fire stations, 1 police station and 1 emergency operation center.

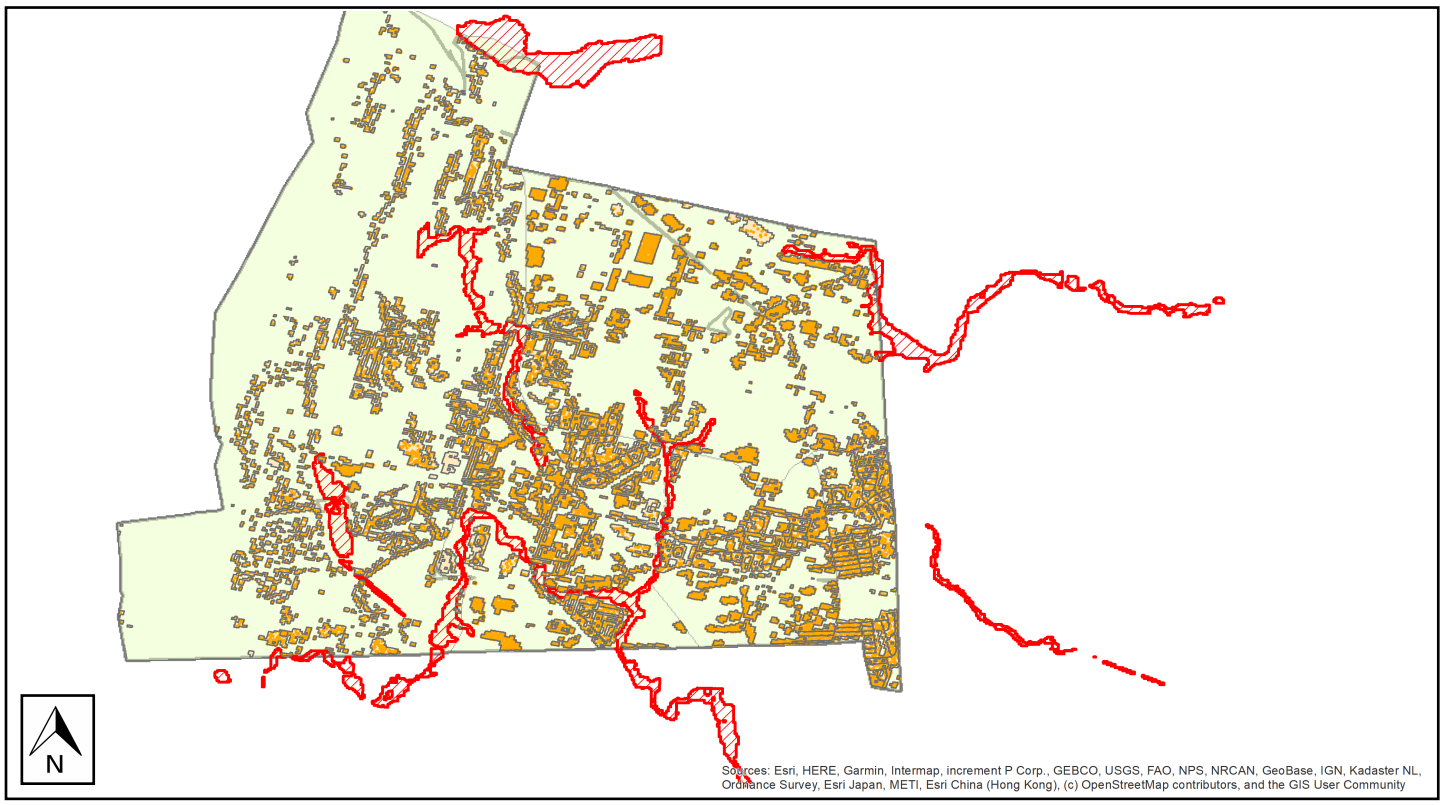
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bloomfield_FL
Scenario Name:	Bloomfield_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

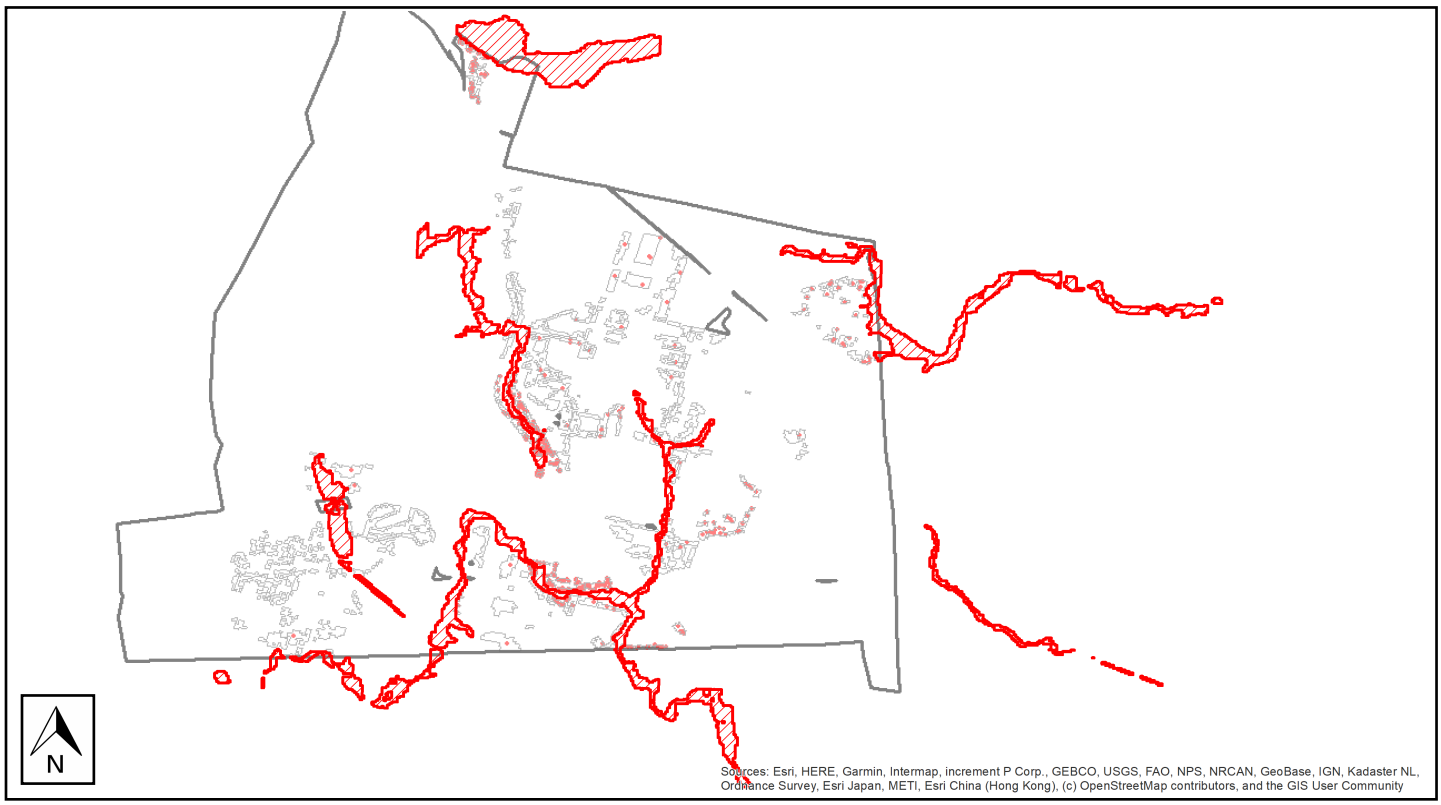


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

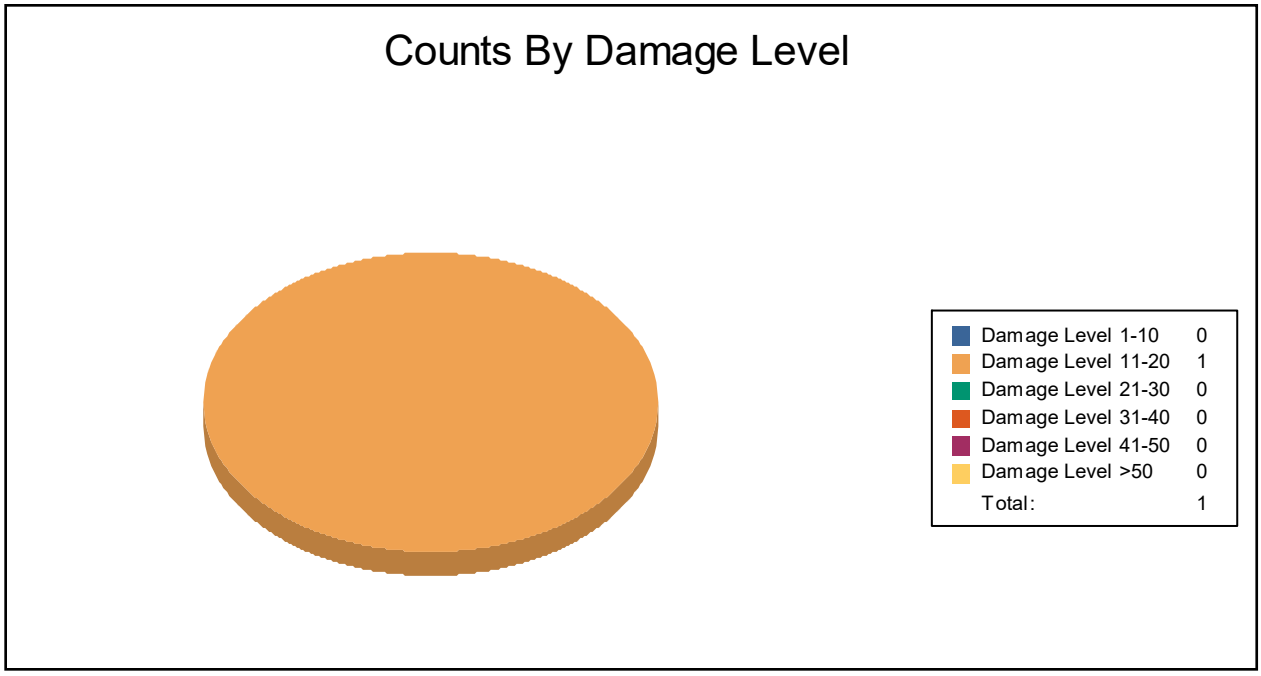


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

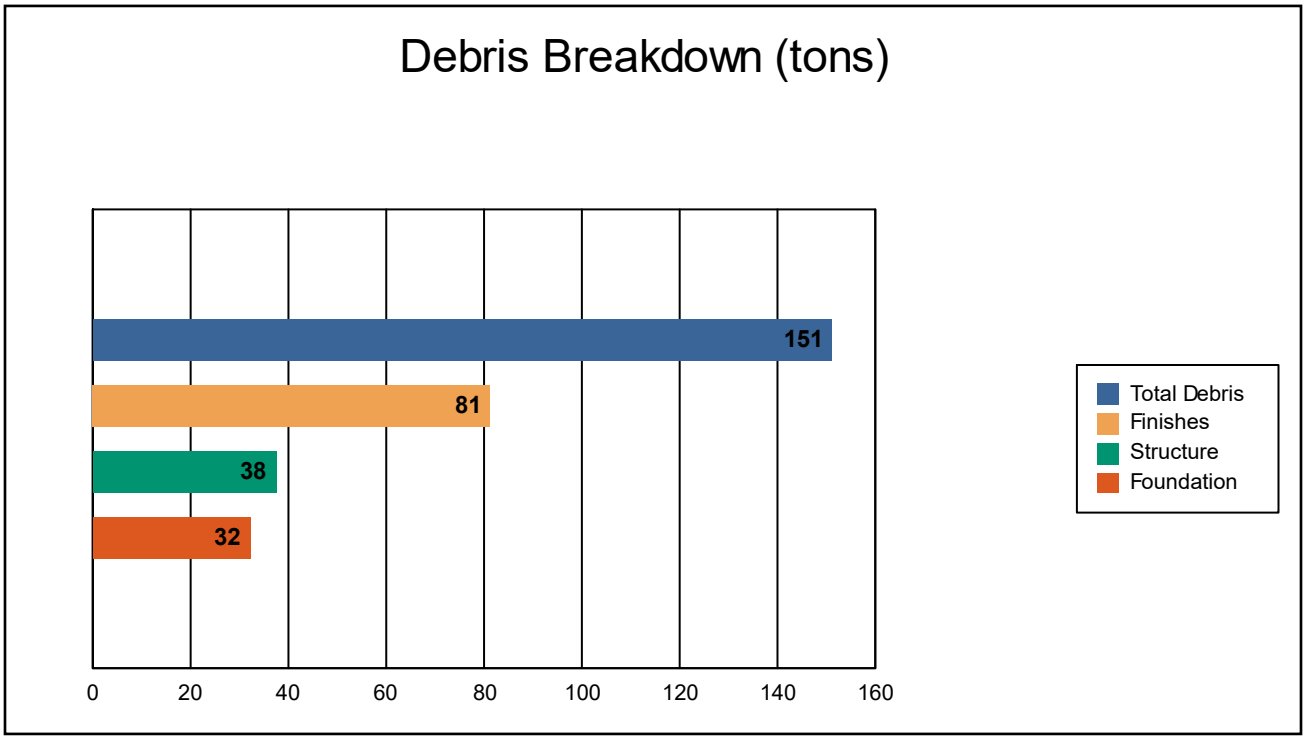
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

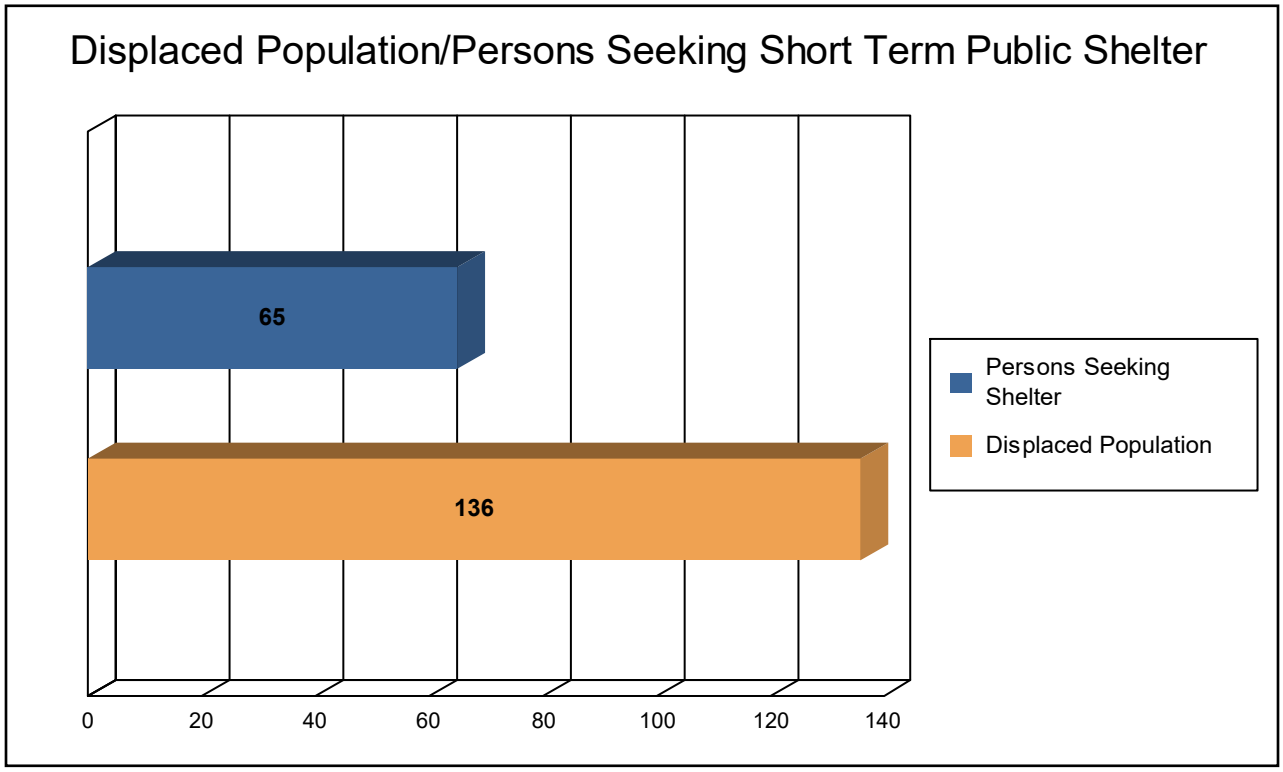


The model estimates that a total of 151 tons of debris will be generated. Of the total amount, Finishes comprises 54% of the total, Structure comprises 25% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 7 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 45 households (or 136 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 65 people (out of a total population of 21,511) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 14.86 million dollars, which represents 1.02 % of the total replacement value of the scenario buildings.

Building-Related Losses

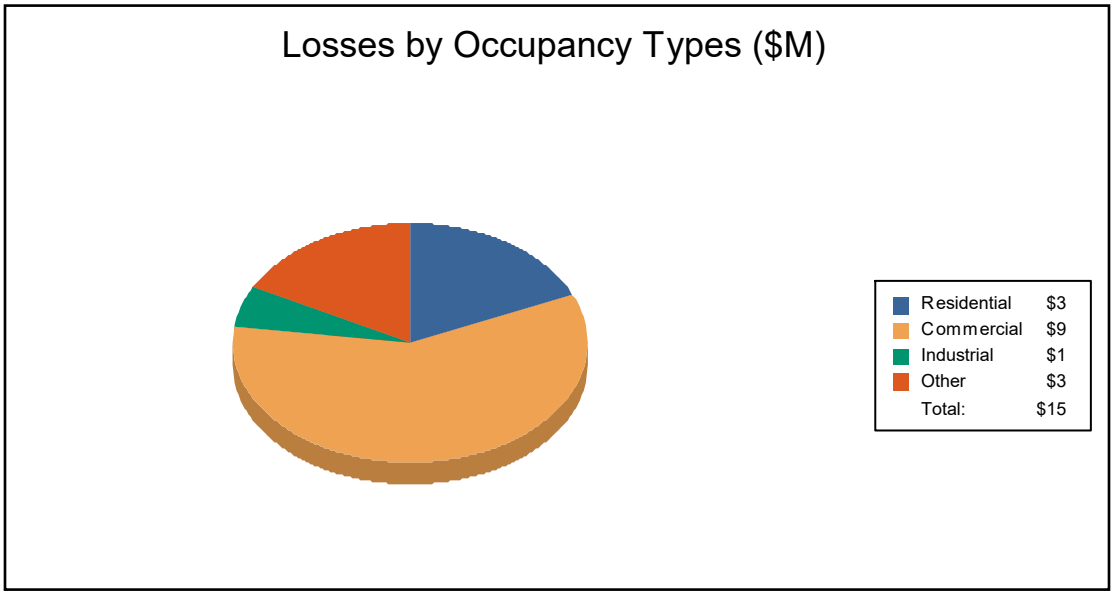
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 8.08 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 18.24% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.46	0.87	0.22	0.15	2.71
	Content	0.66	2.74	0.51	0.93	4.84
	Inventory	0.00	0.29	0.05	0.19	0.53
	Subtotal	**2.12**	**3.91**	**0.79**	**1.26**	**8.08**
Business Interruption						
	Income	0.00	1.73	0.00	0.29	2.02
	Relocation	0.40	0.53	0.01	0.14	1.08
	Rental Income	0.18	0.39	0.00	0.01	0.58
	Wage	0.01	2.23	0.01	0.85	3.10
	Subtotal	**0.59**	**4.87**	**0.03**	**1.29**	**6.78**
ALL	**Total**	**2.71**	**8.78**	**0.82**	**2.55**	**14.86**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	21,511	2,295,814	2,435,532	4,731,346
Total	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**
Total Study Region	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**

Hazus: Flood Global Risk Report

Region Name: Bloomfield_FL

Flood Scenario: Bloomfield_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 278 census blocks. The region contains over 9 thousand households and has a total population of 21,511 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,958 buildings in the region with a total building replacement value (excluding contents) of 4,731 million dollars. Approximately 85.61% of the buildings (and 48.52% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,958 buildings in the region which have an aggregate total replacement value of 4,731 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,295,814	48.5%
Commercial	1,346,643	28.5%
Industrial	691,562	14.6%
Agricultural	18,488	0.4%
Religion	123,539	2.6%
Government	69,502	1.5%
Education	185,798	3.9%
Total	**4,731,346**	**100%**

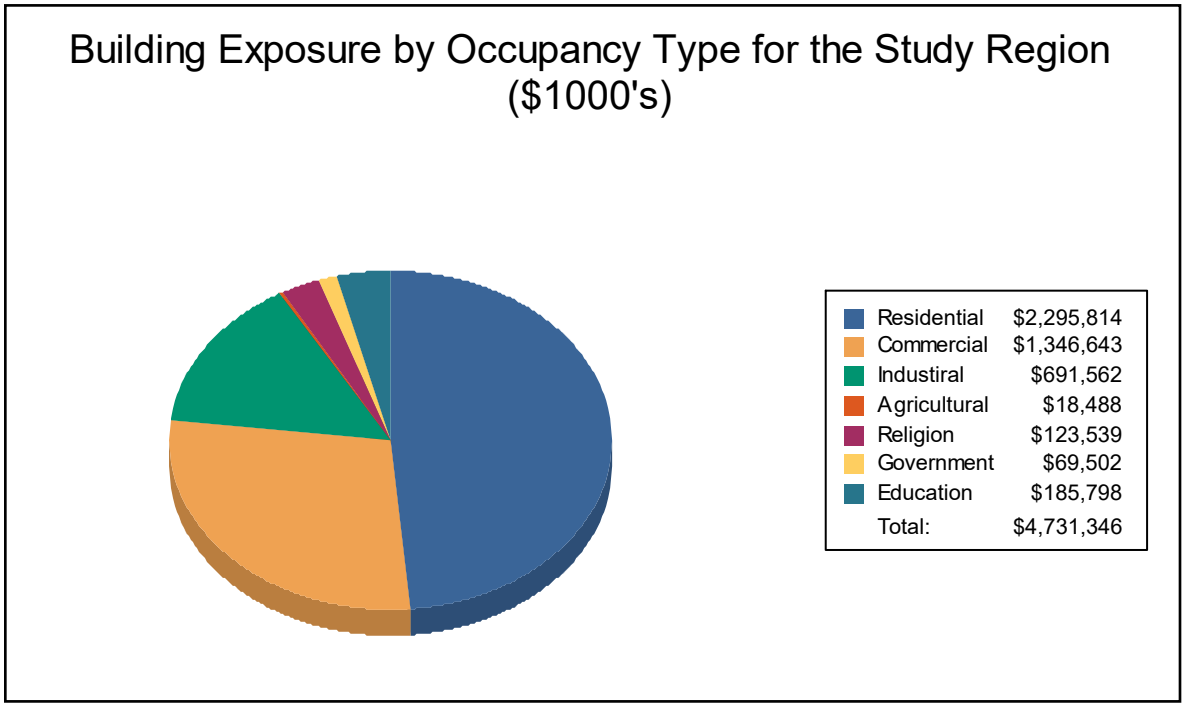
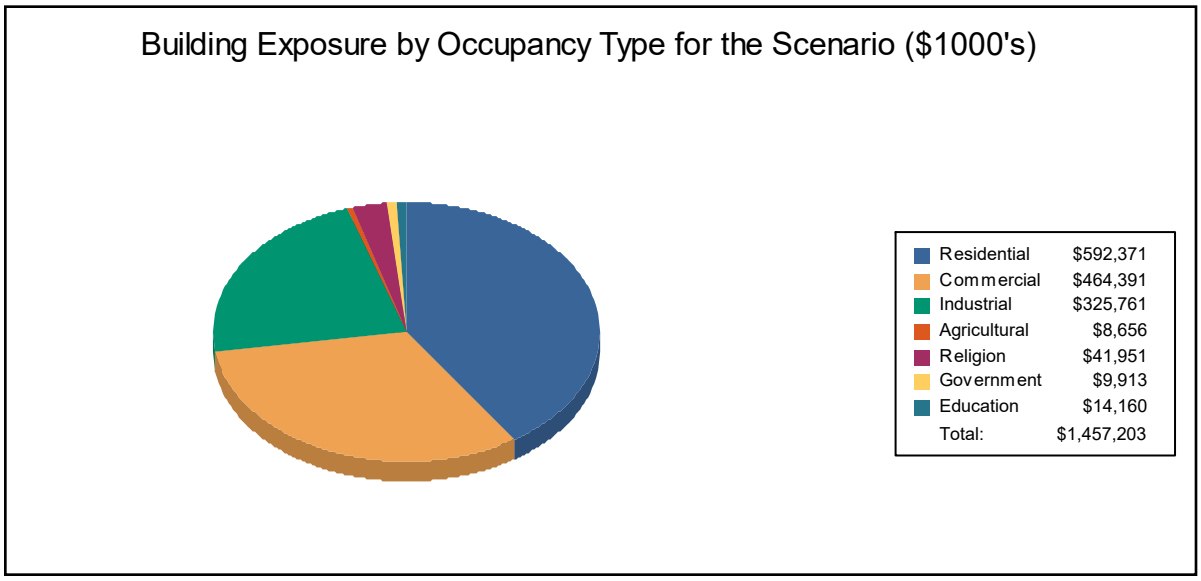


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	592,371	40.7%
Commercial	464,391	31.9%
Industrial	325,761	22.4%
Agricultural	8,656	0.6%
Religion	41,951	2.9%
Government	9,913	0.7%
Education	14,160	1.0%
Total	**1,457,203**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 6 fire stations, 1 police station and 1 emergency operation center.

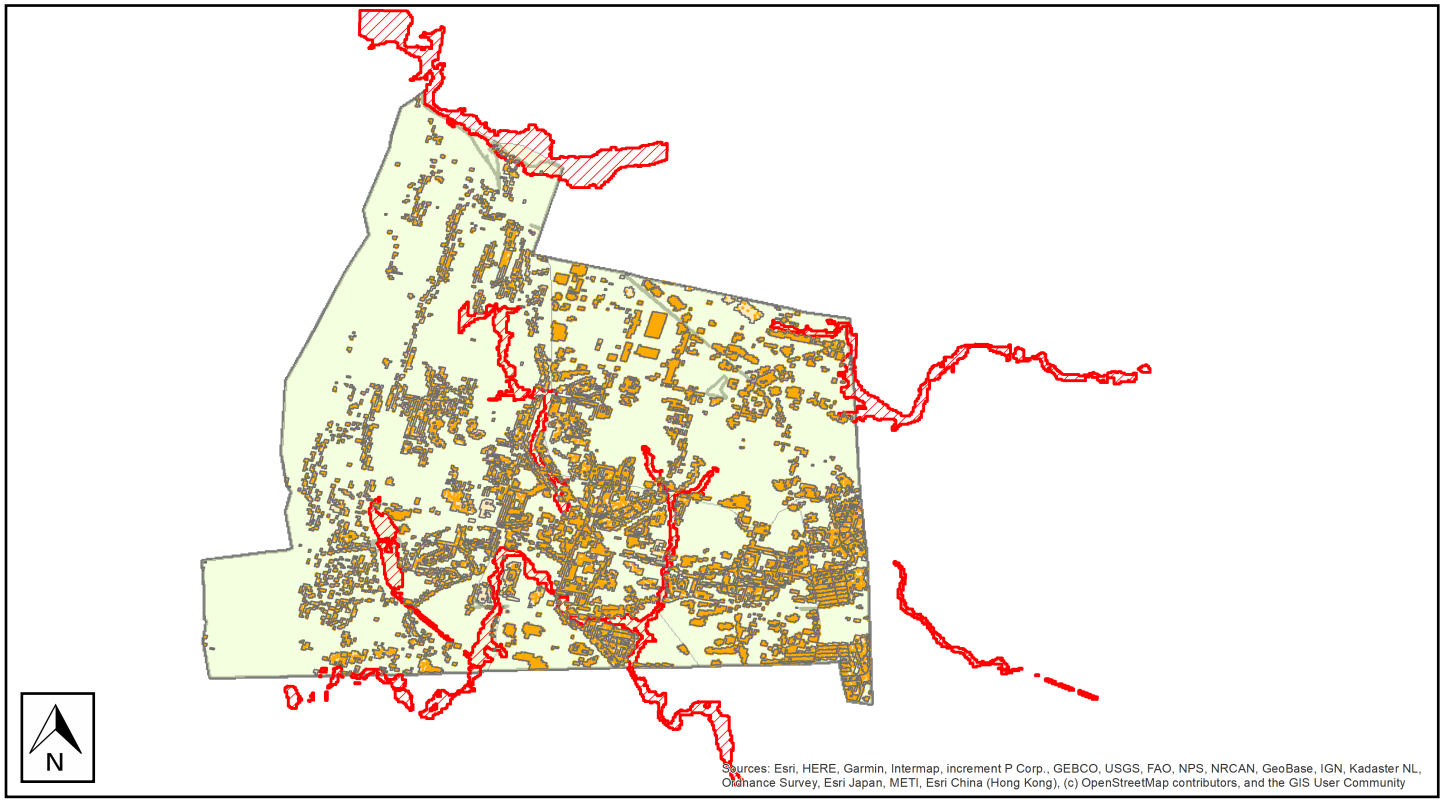
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bloomfield_FL
Scenario Name:	Bloomfield_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

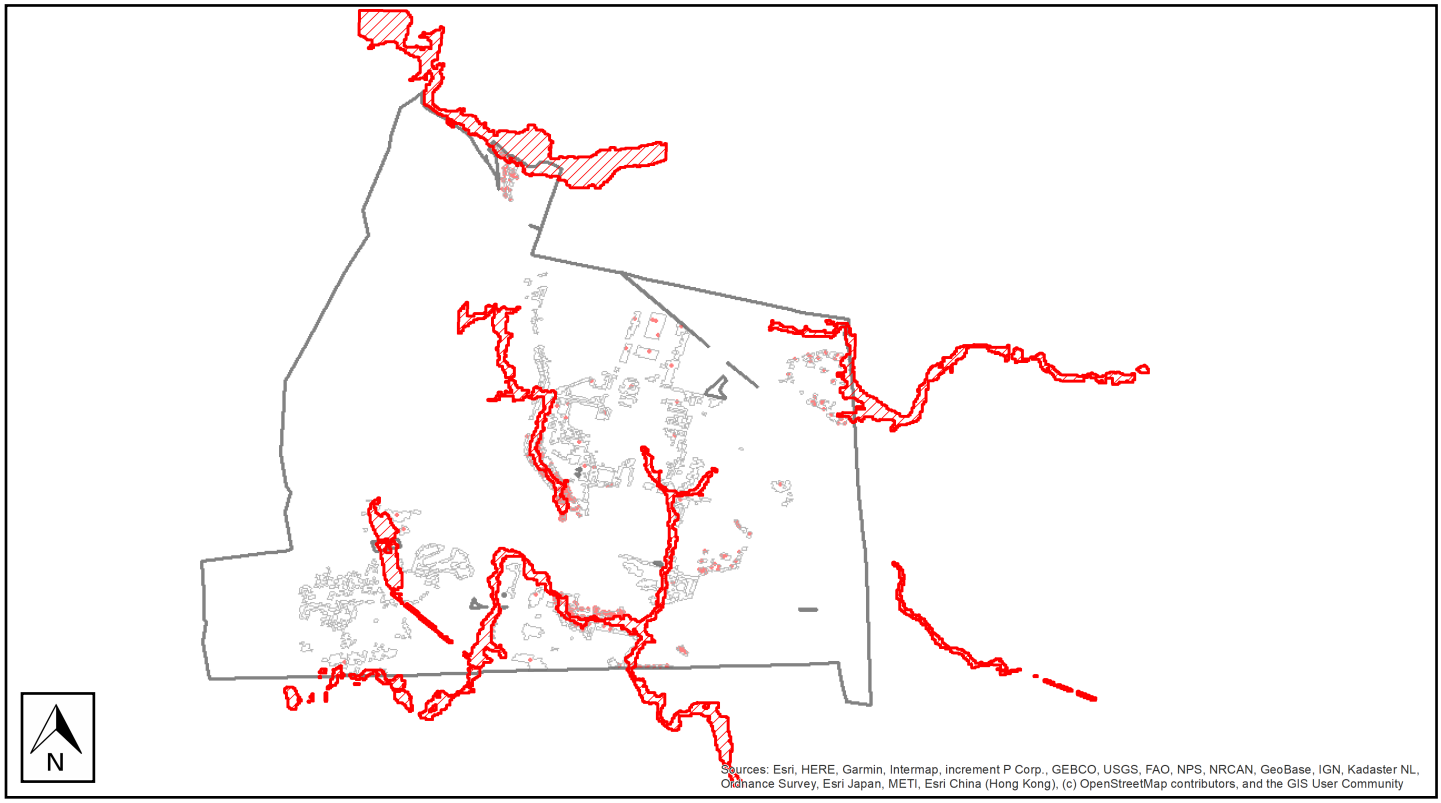


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	1	100	0	0	0	0	0	0	0	0
Total	**0**		**2**		**0**		**0**		**0**		**0**	

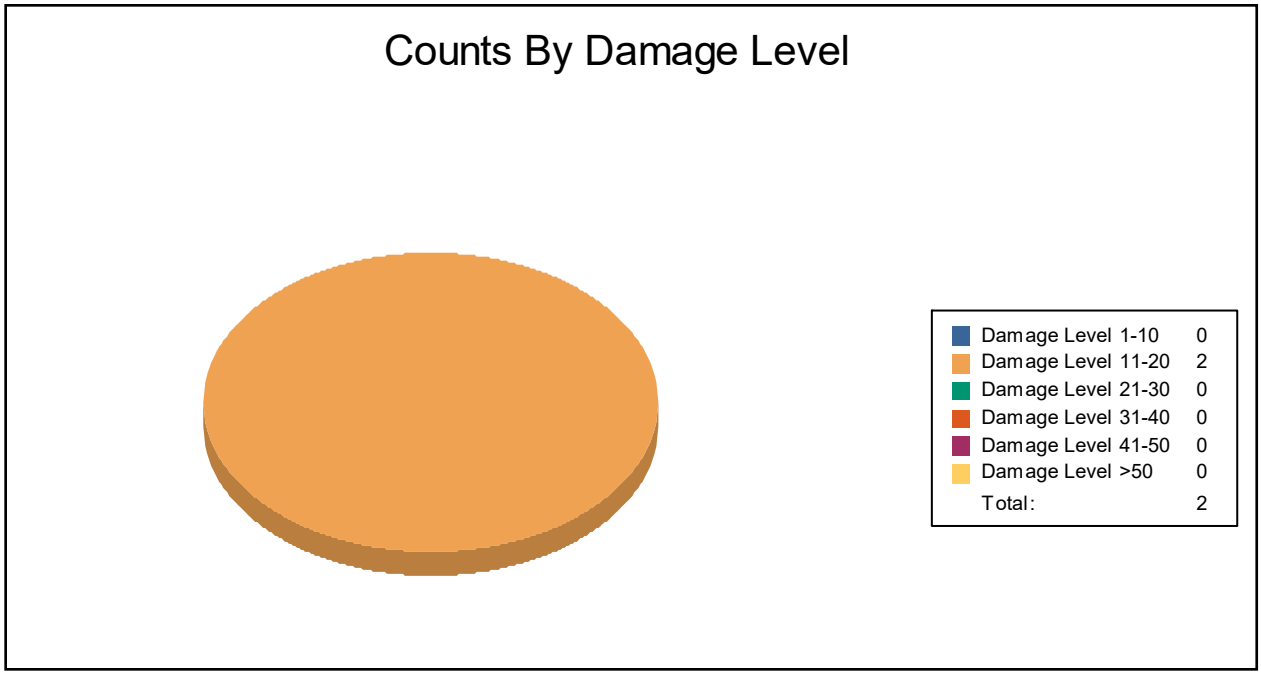


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	1	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

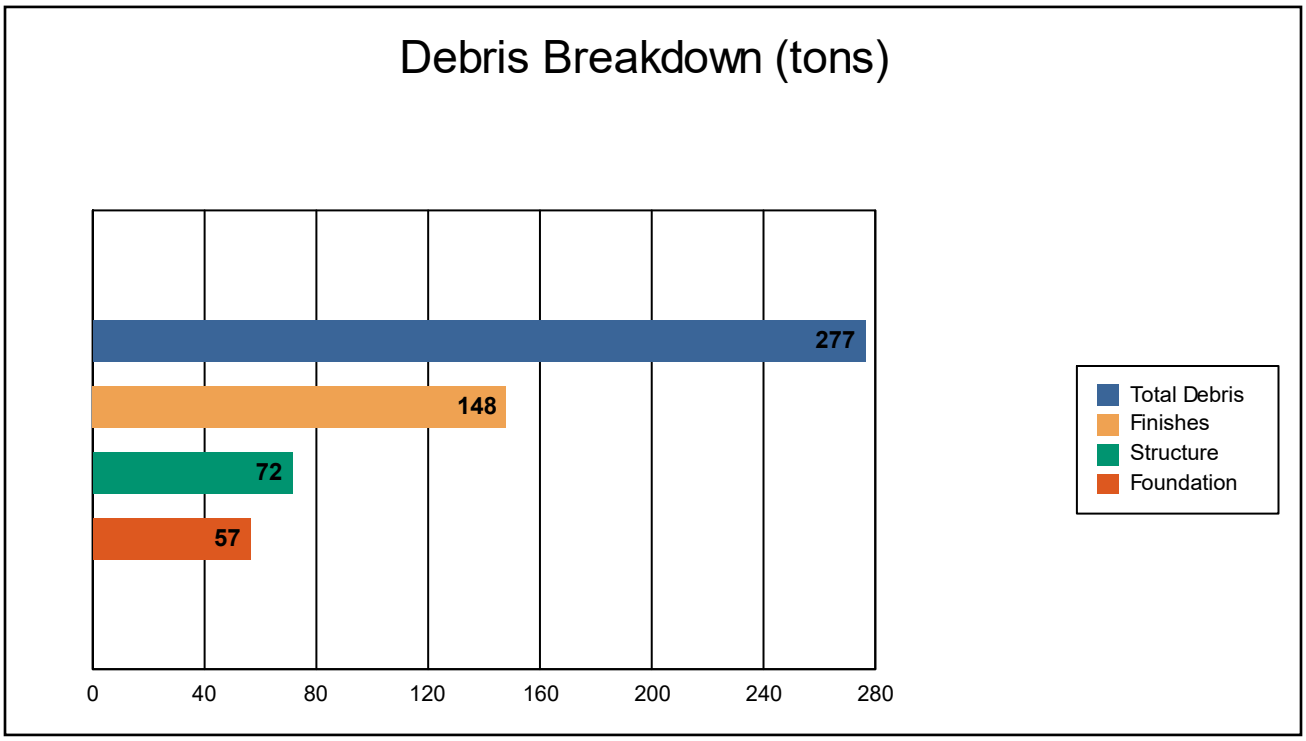
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

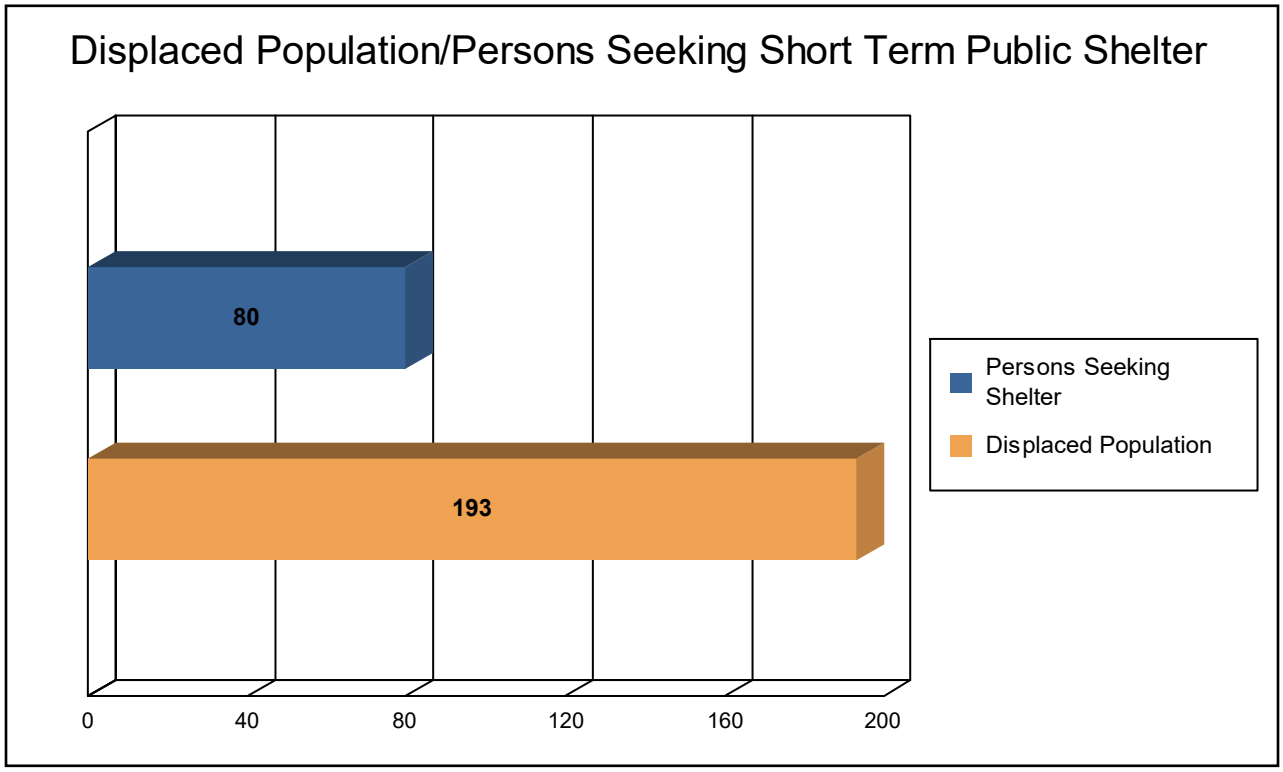


The model estimates that a total of 277 tons of debris will be generated. Of the total amount, Finishes comprises 53% of the total, Structure comprises 26% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 12 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 64 households (or 193 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 80 people (out of a total population of 21,511) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 22.91 million dollars, which represents 1.57 % of the total replacement value of the scenario buildings.

Building-Related Losses

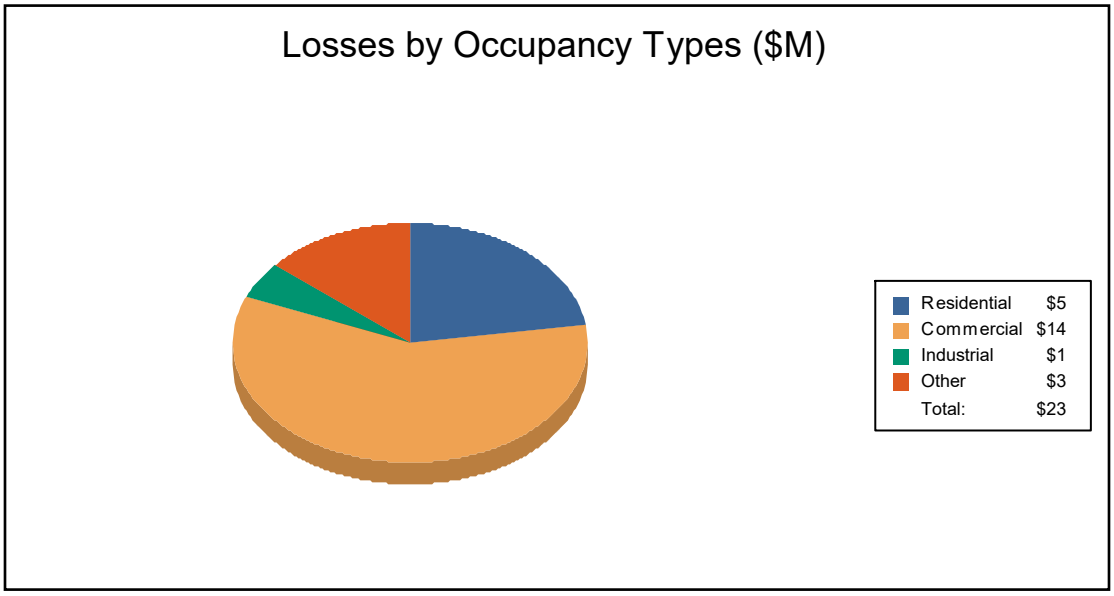
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 12.81 million dollars. 44% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.48% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.89	1.37	0.30	0.19	4.75
	Content	1.29	4.34	0.66	1.11	7.40
	Inventory	0.00	0.39	0.07	0.19	0.66
	Subtotal	**4.18**	**6.10**	**1.04**	**1.49**	**12.81**
Business Interruption						
	Income	0.01	2.63	0.01	0.33	2.97
	Relocation	0.66	0.72	0.02	0.16	1.56
	Rental Income	0.27	0.52	0.00	0.02	0.81
	Wage	0.03	3.55	0.02	1.17	4.77
	Subtotal	**0.98**	**7.41**	**0.04**	**1.68**	**10.10**
ALL	**Total**	**5.15**	**13.52**	**1.08**	**3.17**	**22.91**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	21,511	2,295,814	2,435,532	4,731,346
Total	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**
Total Study Region	**21,511**	**2,295,814**	**2,435,532**	**4,731,346**

Hazus: Flood Global Risk Report

Region Name: Bolton_FL

Flood Scenario: Bolton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 86 census blocks. The region contains over 2 thousand households and has a total population of 4,858 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 1,357 buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85.26% of the buildings (and 69.53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,357 buildings in the region which have an aggregate total replacement value of 820 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	570,381	69.5%
Commercial	135,211	16.5%
Industrial	36,037	4.4%
Agricultural	7,140	0.9%
Religion	1,994	0.2%
Government	4,912	0.6%
Education	64,614	7.9%
Total	**820,289**	**100%**

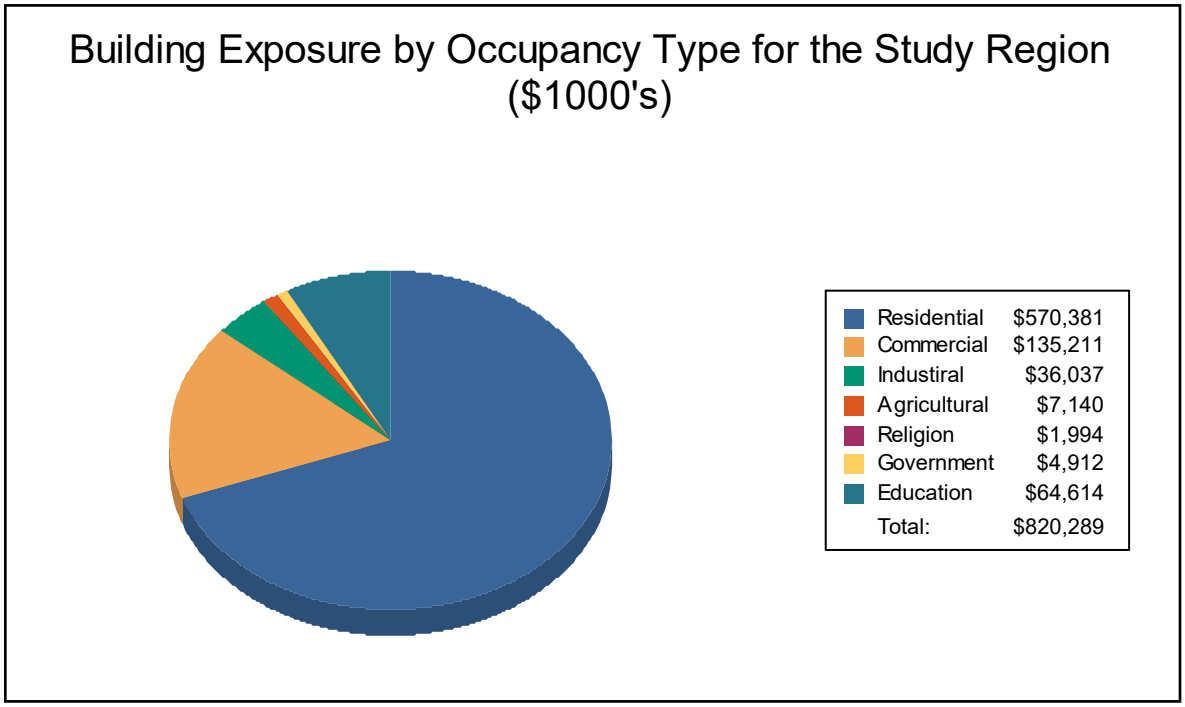
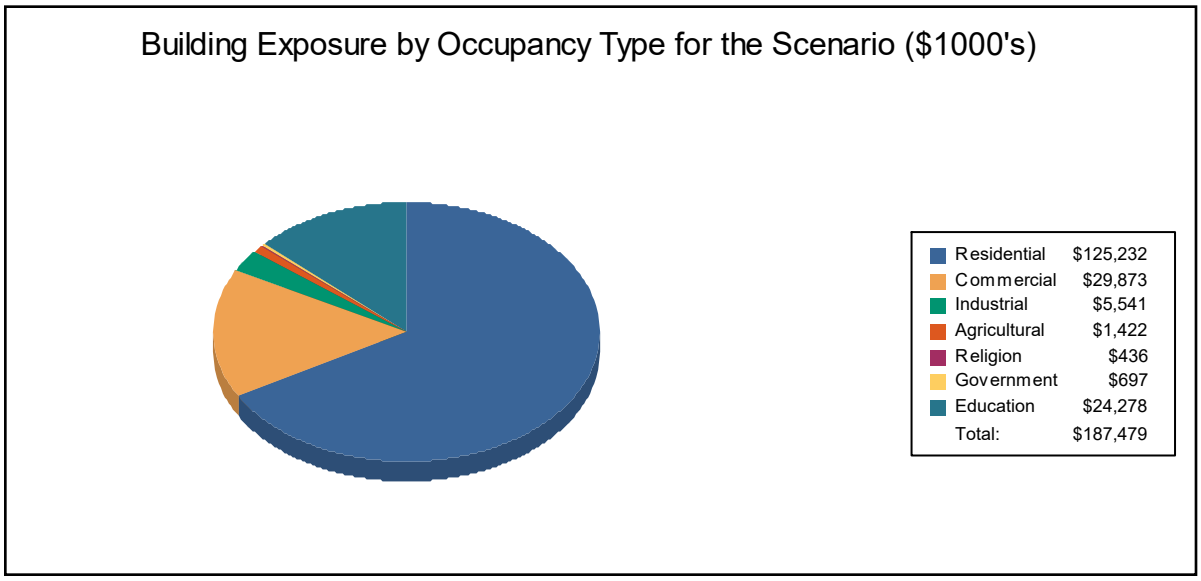


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	125,232	66.8%
Commercial	29,873	15.9%
Industrial	5,541	3.0%
Agricultural	1,422	0.8%
Religion	436	0.2%
Government	697	0.4%
Education	24,278	12.9%
Total	**187,479**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 1 fire station, no police stations and 1 emergency operation center.

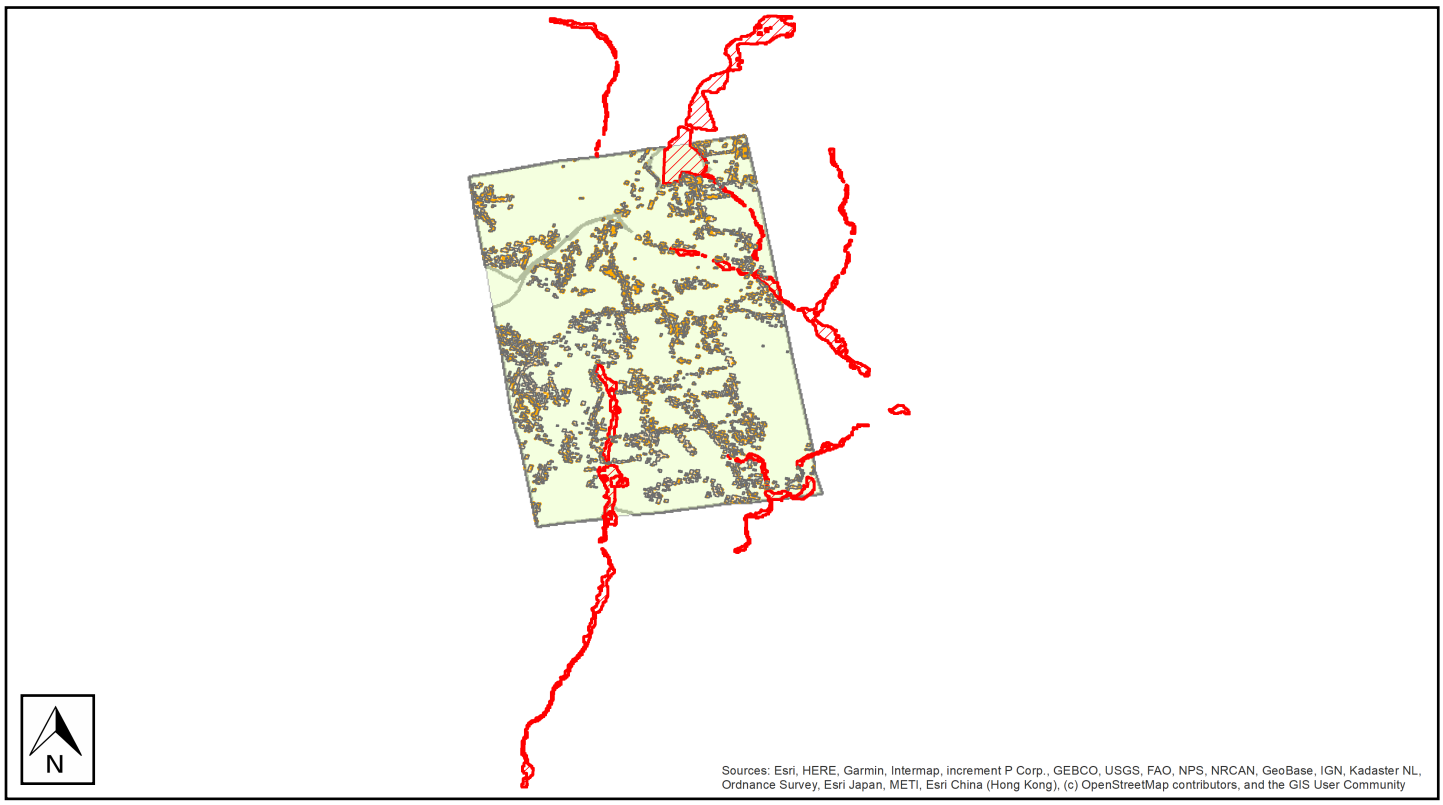
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bolton_FL
Scenario Name:	Bolton_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

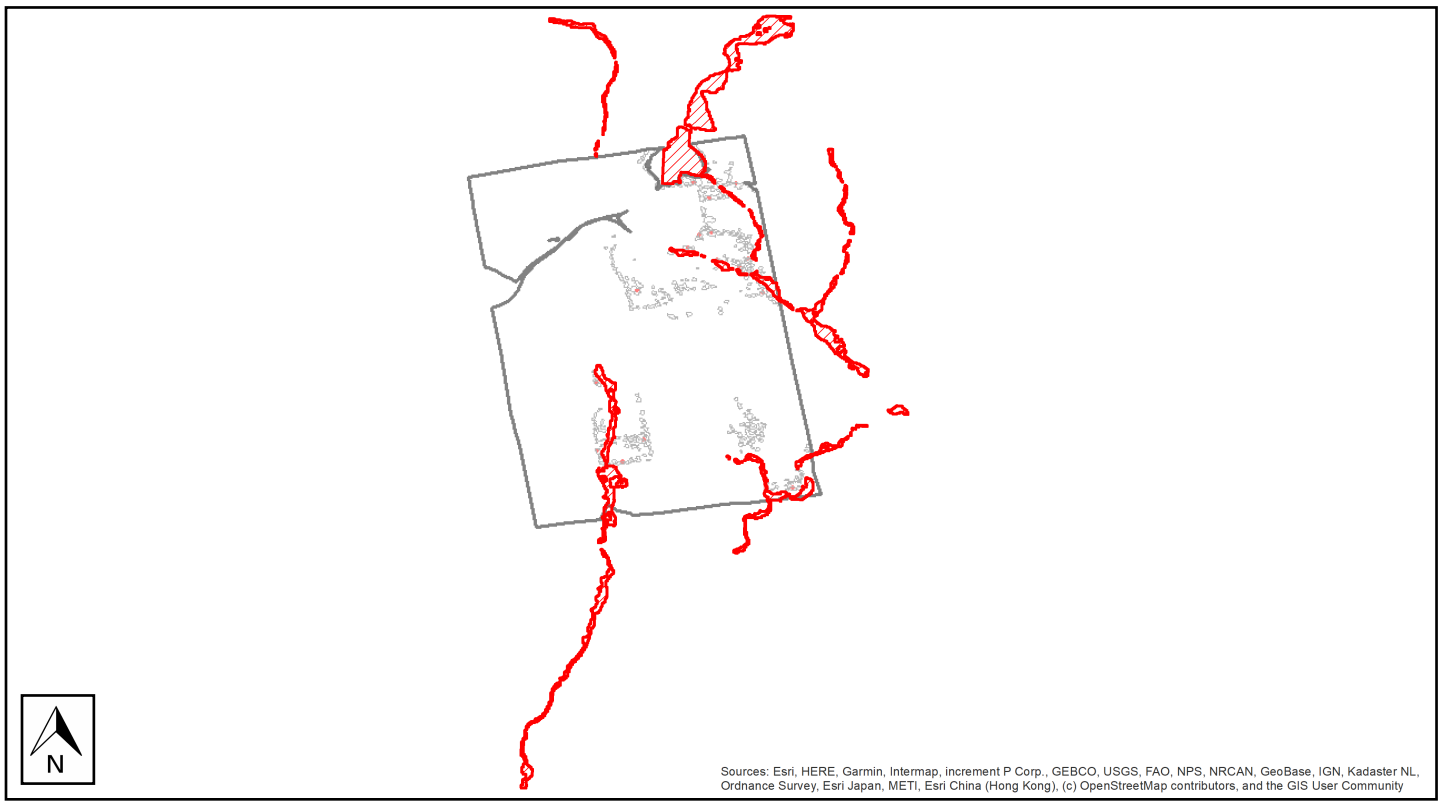


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

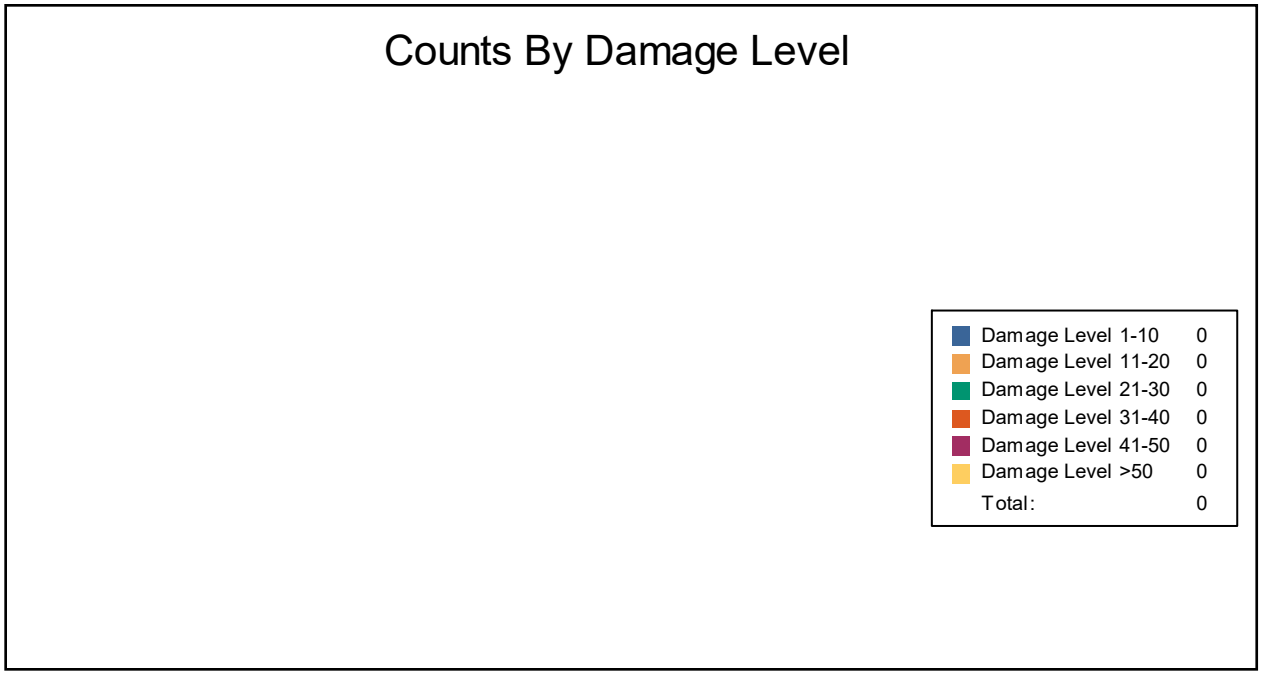


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

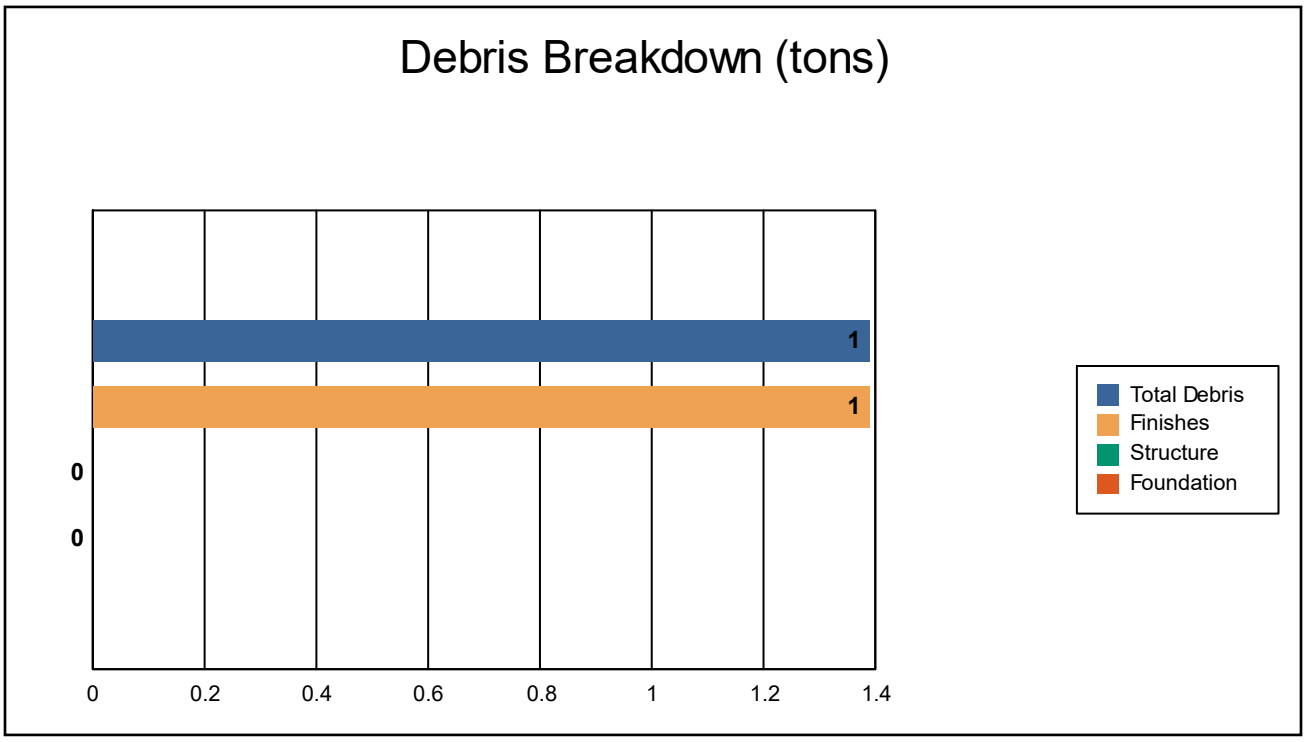
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

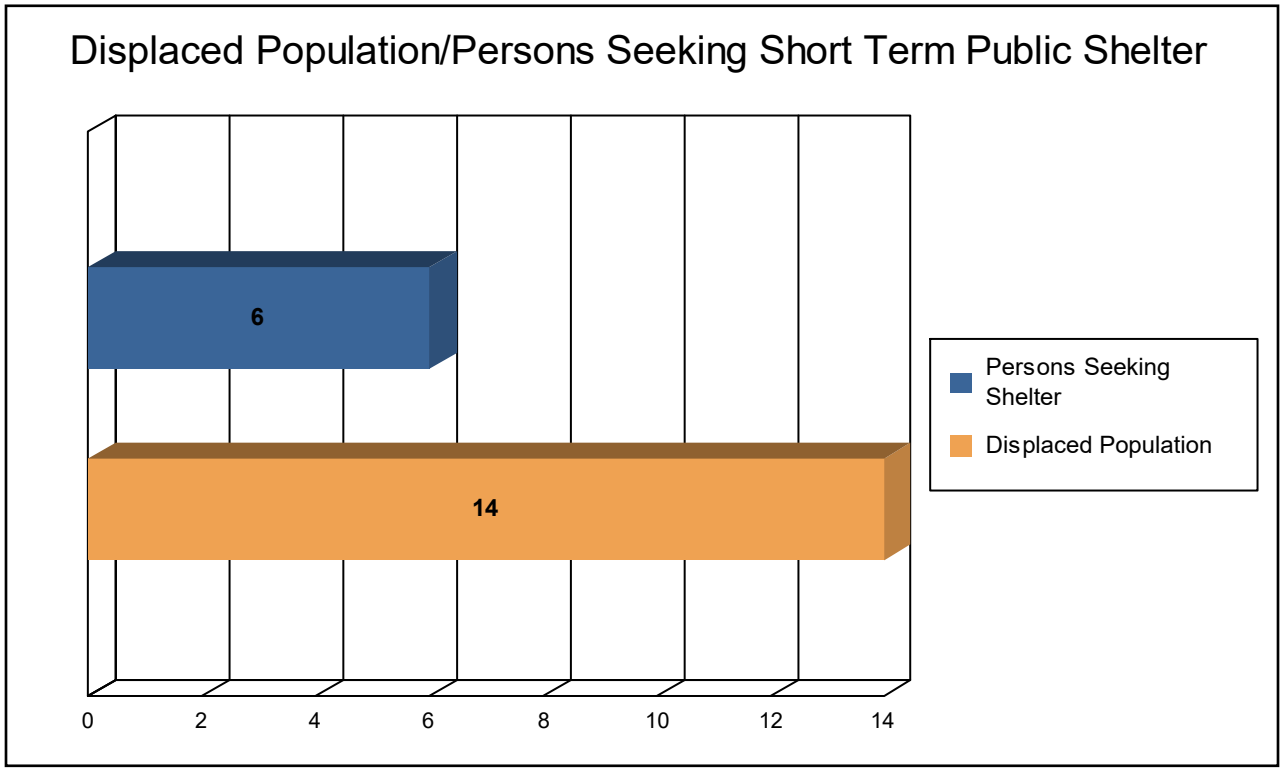


The model estimates that a total of 1 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 5 households (or 14 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 6 people (out of a total population of 4,858) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 0.24 million dollars, which represents 0.13 % of the total replacement value of the scenario buildings.

Building-Related Losses

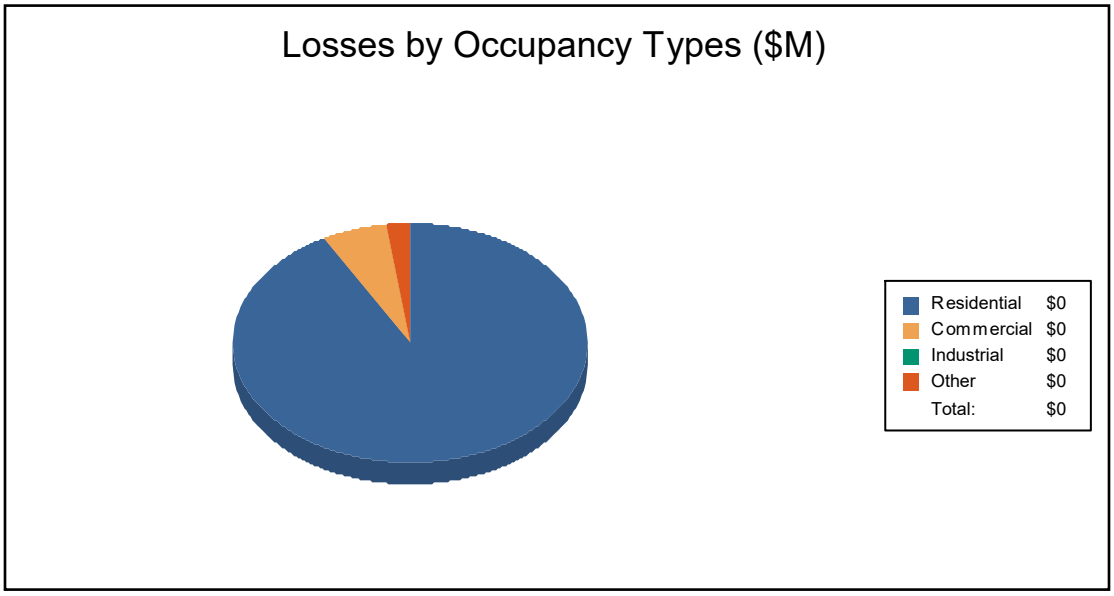
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 0.14 million dollars. 41% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 91.98% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.10	0.00	0.00	0.00	0.10
	Content	0.04	0.00	0.00	0.00	0.04
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.14**	**0.00**	**0.00**	**0.00**	**0.14**
Business Interruption						
	Income	0.01	0.01	0.00	0.00	0.02
	Relocation	0.04	0.00	0.00	0.00	0.04
	Rental Income	0.01	0.00	0.00	0.00	0.02
	Wage	0.02	0.00	0.00	0.00	0.02
	Subtotal	**0.08**	**0.01**	**0.00**	**0.01**	**0.10**
ALL	**Total**	**0.22**	**0.01**	**0.00**	**0.01**	**0.24**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,381	249,908	820,289
Total	**4,858**	**570,381**	**249,908**	**820,289**
Total Study Region	**4,858**	**570,381**	**249,908**	**820,289**

Hazus: Flood Global Risk Report

Region Name: Bolton_FL

Flood Scenario: Bolton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

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There are an estimated 1,357 buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85.26% of the buildings (and 69.53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,357 buildings in the region which have an aggregate total replacement value of 820 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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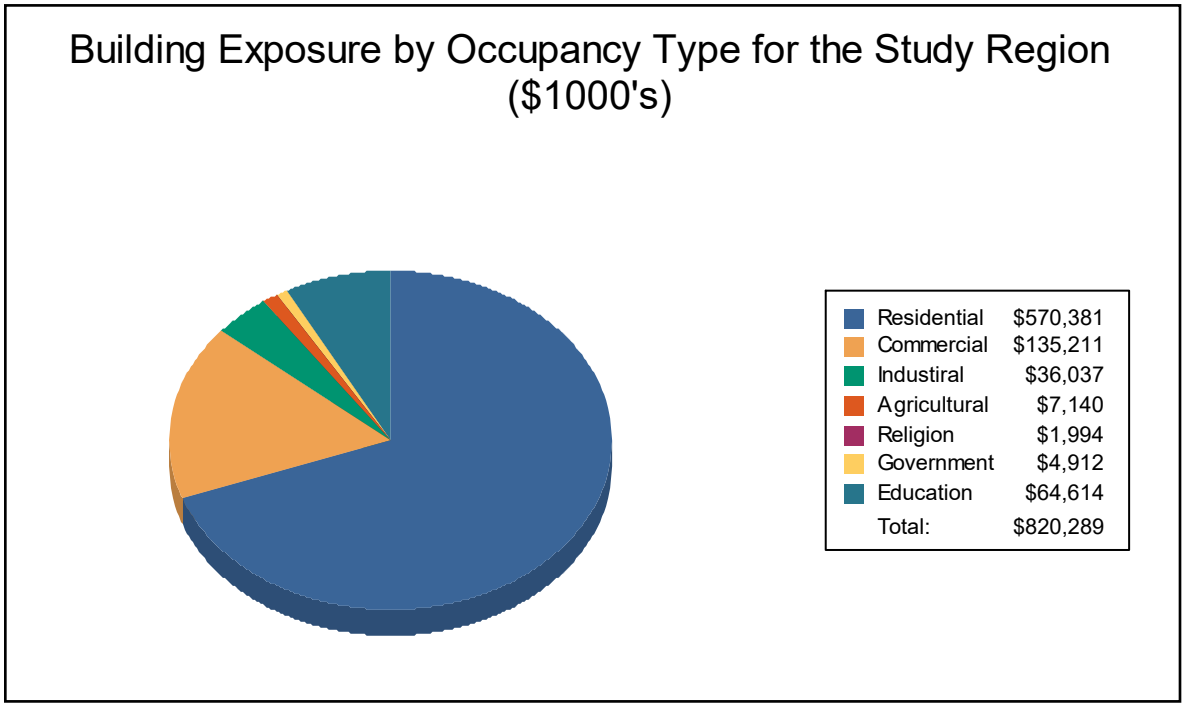

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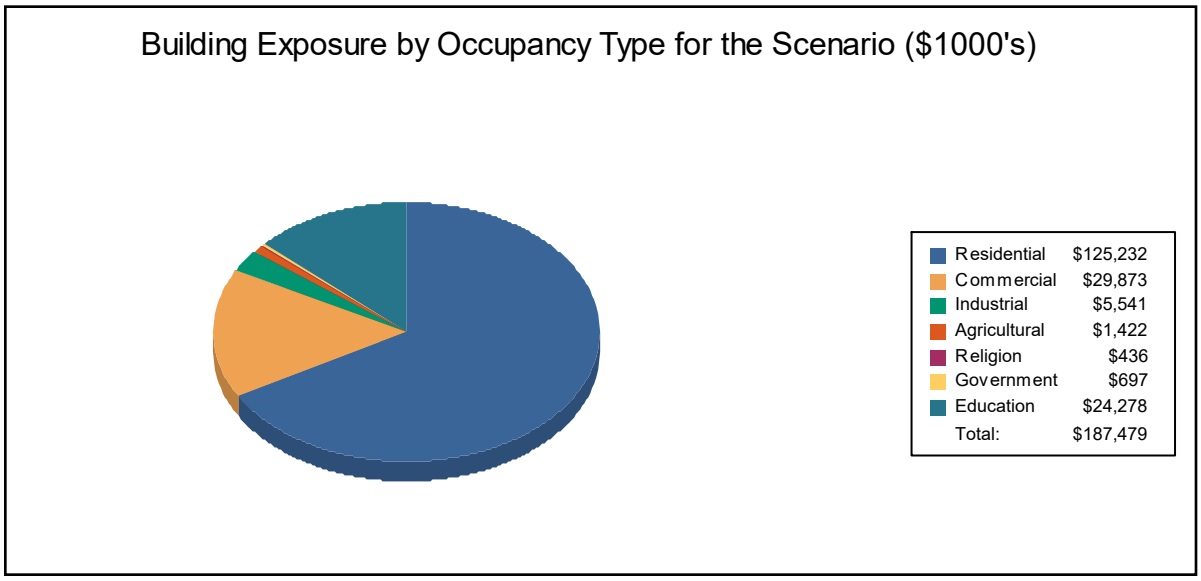


Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 1 fire station, no police stations and 1 emergency operation center.

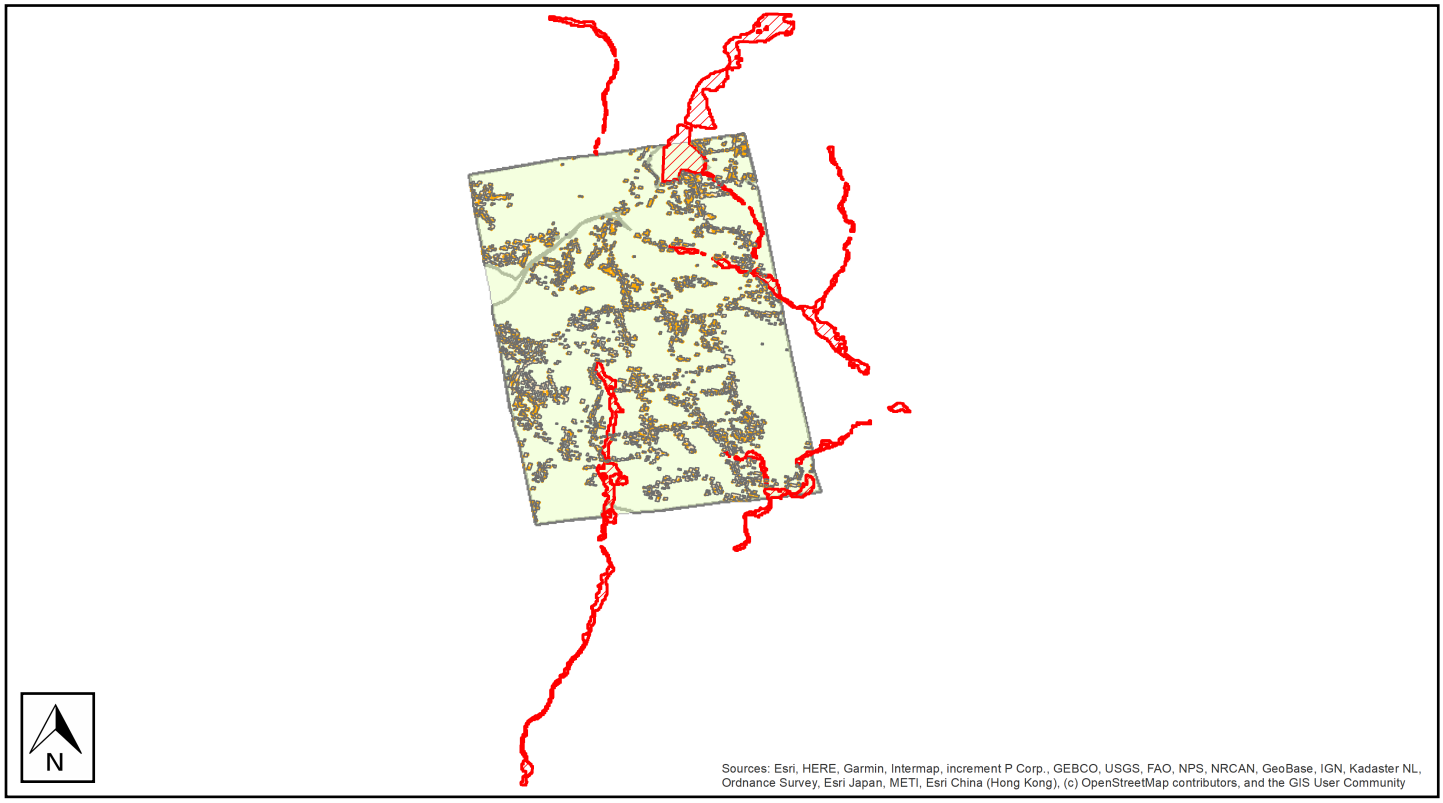
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bolton_FL
Scenario Name:	Bolton_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

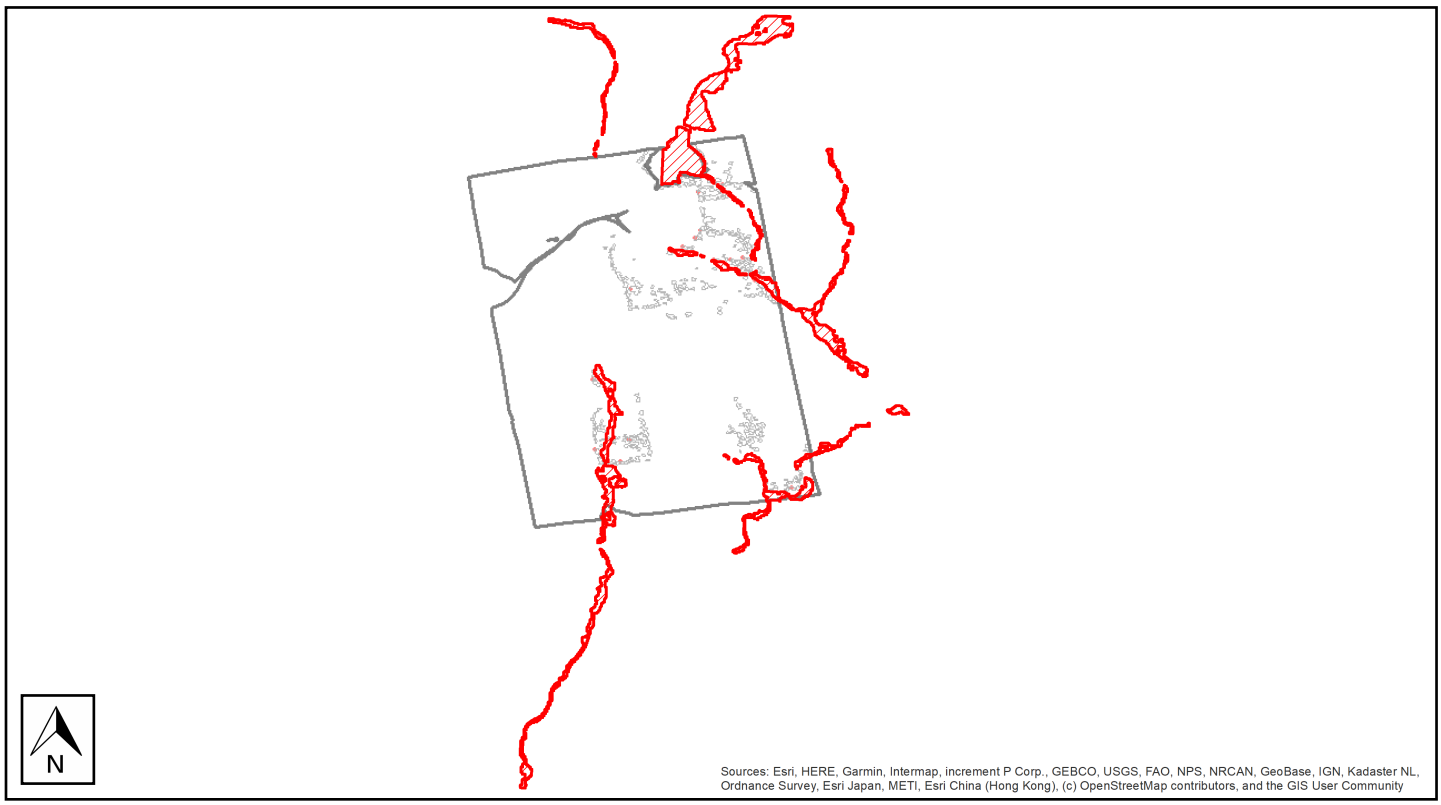


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

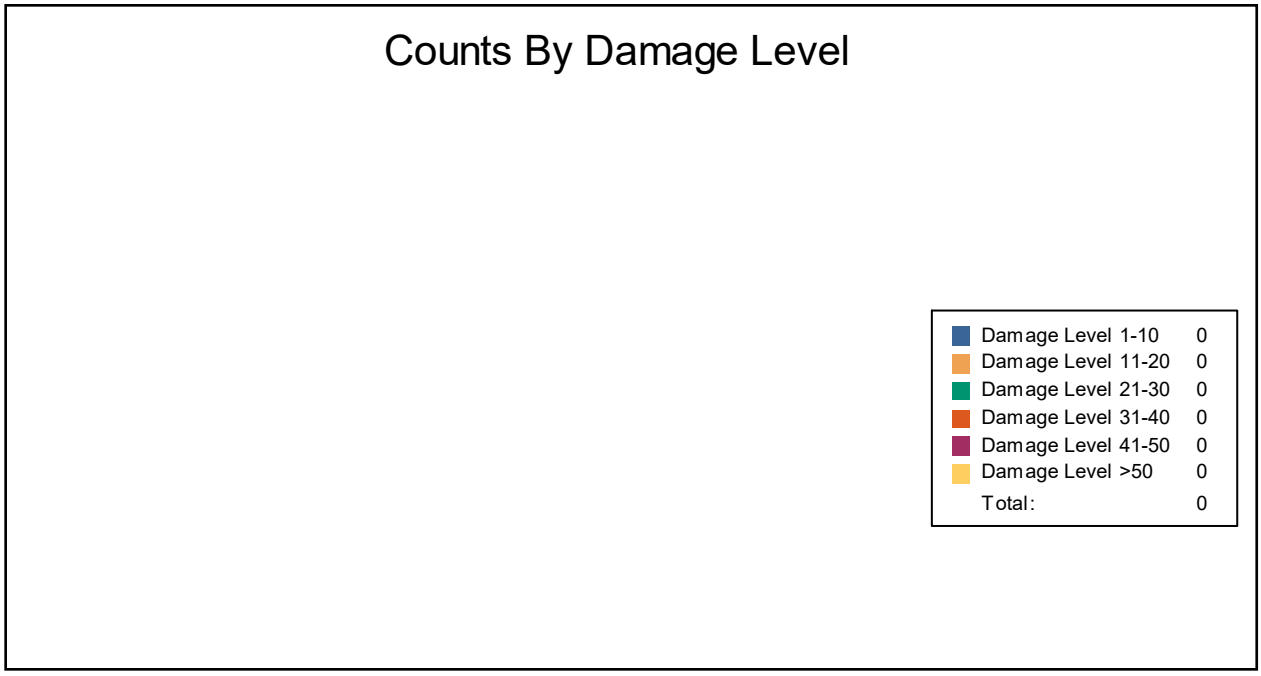


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

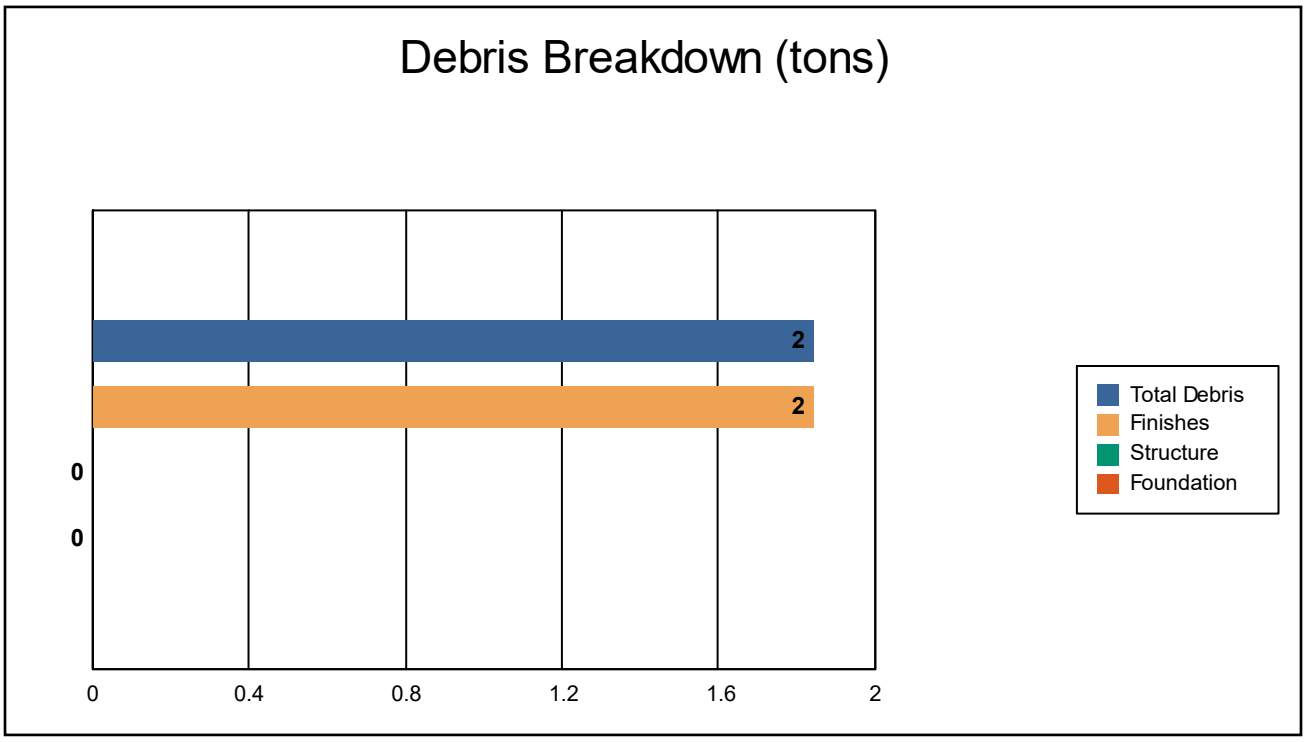
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

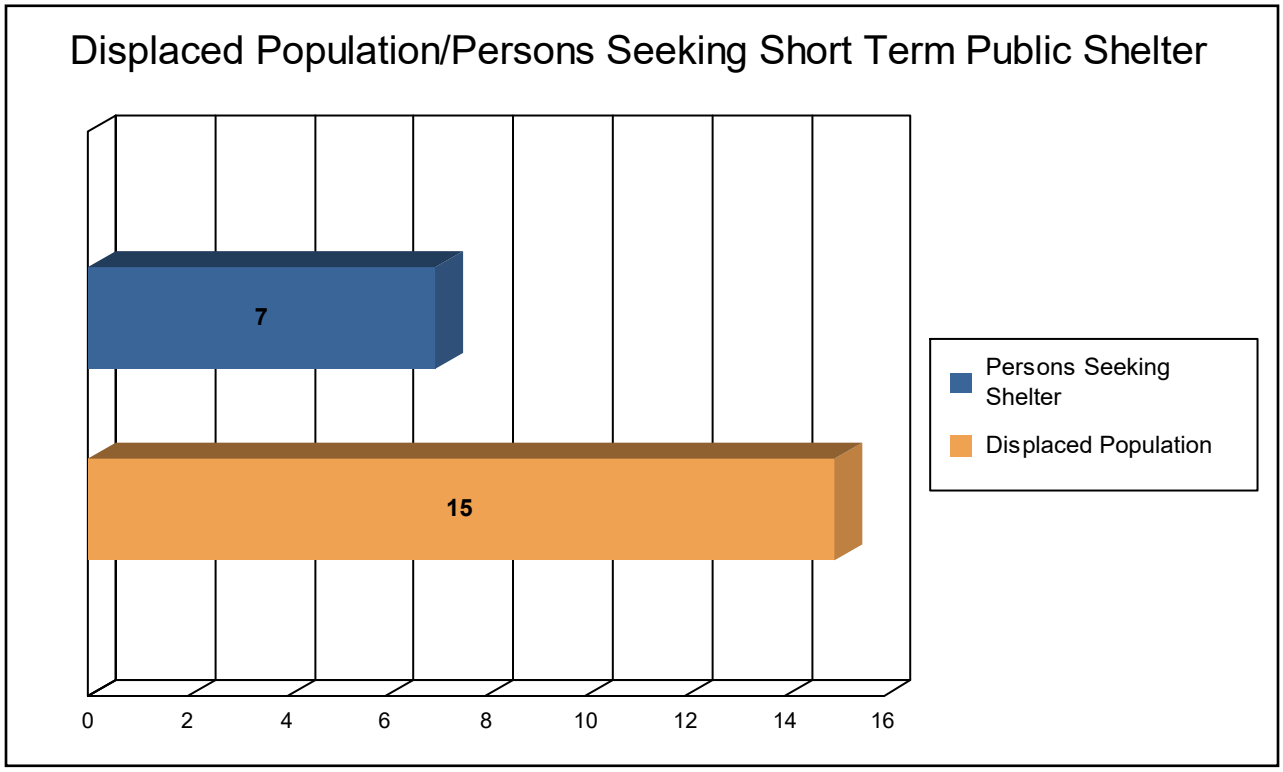


The model estimates that a total of 2 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 5 households (or 15 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 7 people (out of a total population of 4,858) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 0.28 million dollars, which represents 0.15 % of the total replacement value of the scenario buildings.

Building-Related Losses

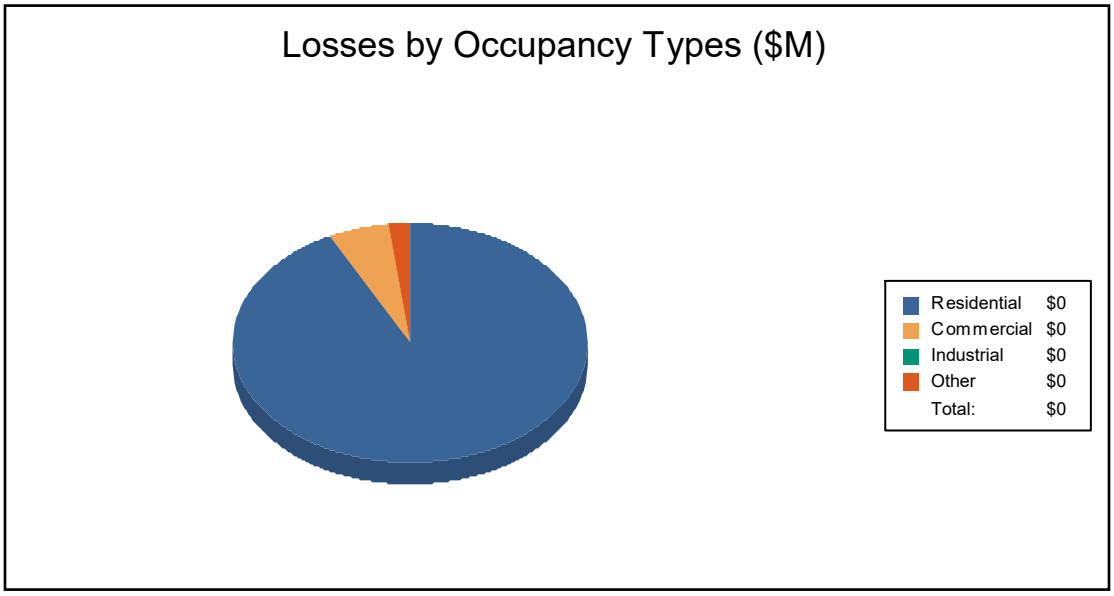
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 0.17 million dollars. 37% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 92.36% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.12	0.00	0.00	0.00	0.12
	Content	0.05	0.00	0.00	0.00	0.05
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.17**	**0.00**	**0.00**	**0.00**	**0.17**
Business Interruption						
	Income	0.01	0.01	0.00	0.00	0.02
	Relocation	0.05	0.00	0.00	0.00	0.05
	Rental Income	0.02	0.00	0.00	0.00	0.02
	Wage	0.02	0.00	0.00	0.00	0.02
	Subtotal	**0.08**	**0.01**	**0.00**	**0.01**	**0.10**
ALL	**Total**	**0.25**	**0.02**	**0.00**	**0.01**	**0.28**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,381	249,908	820,289
Total	**4,858**	**570,381**	**249,908**	**820,289**
Total Study Region	**4,858**	**570,381**	**249,908**	**820,289**

Hazus: Flood Global Risk Report

Region Name: Bolton_FL

Flood Scenario: Bolton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
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Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 86 census blocks. The region contains over 2 thousand households and has a total population of 4,858 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 1,357 buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85.26% of the buildings (and 69.53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,357 buildings in the region which have an aggregate total replacement value of 820 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	570,381	69.5%
Commercial	135,211	16.5%
Industrial	36,037	4.4%
Agricultural	7,140	0.9%
Religion	1,994	0.2%
Government	4,912	0.6%
Education	64,614	7.9%
Total	**820,289**	**100%**

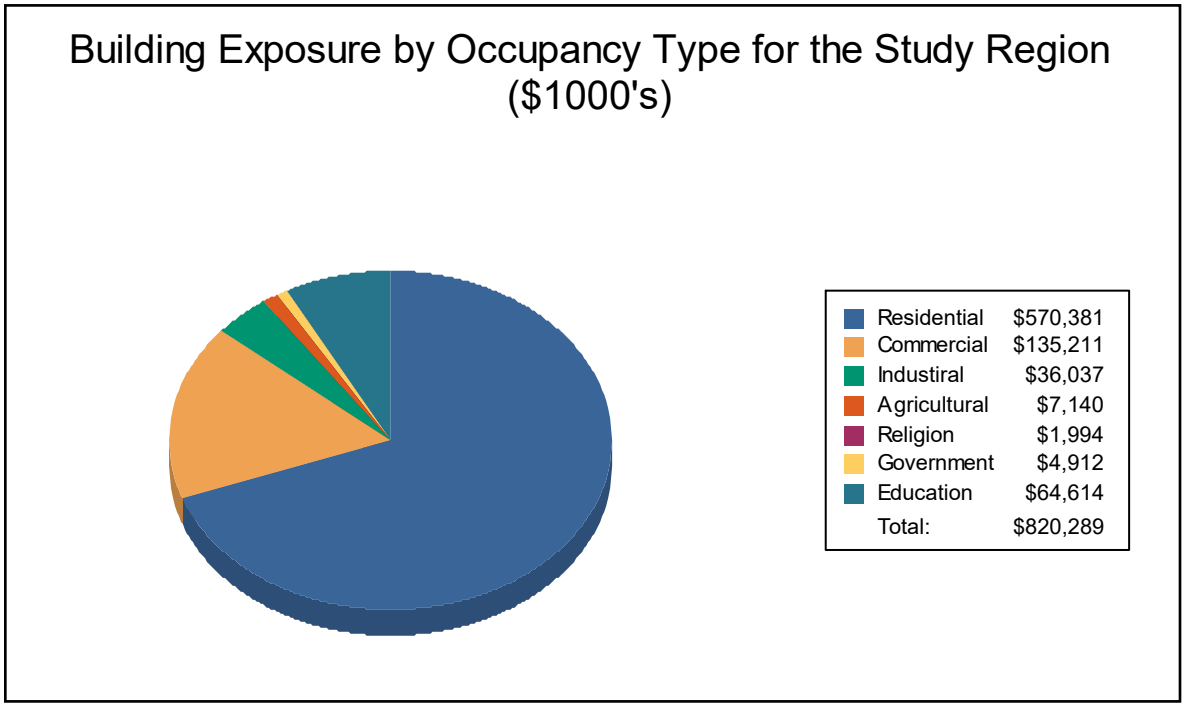
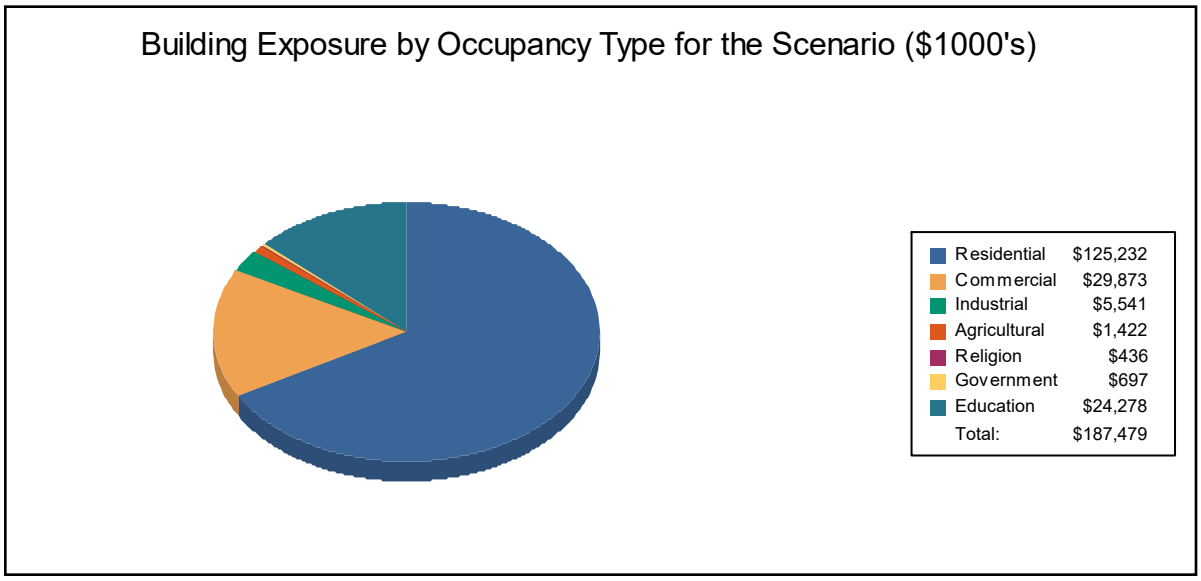


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	125,232	66.8%
Commercial	29,873	15.9%
Industrial	5,541	3.0%
Agricultural	1,422	0.8%
Religion	436	0.2%
Government	697	0.4%
Education	24,278	12.9%
Total	**187,479**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 1 fire station, no police stations and 1 emergency operation center.

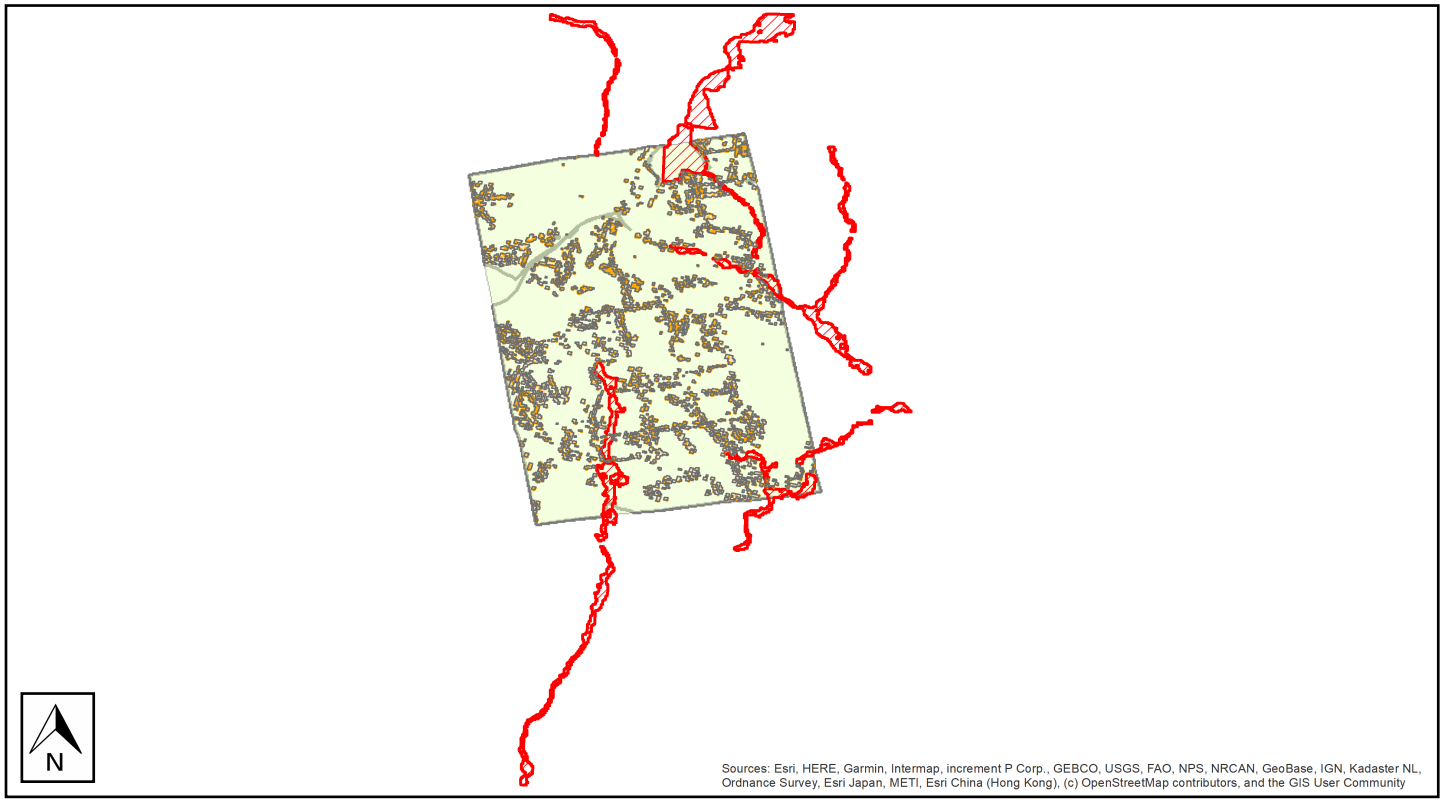
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bolton_FL
Scenario Name:	Bolton_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

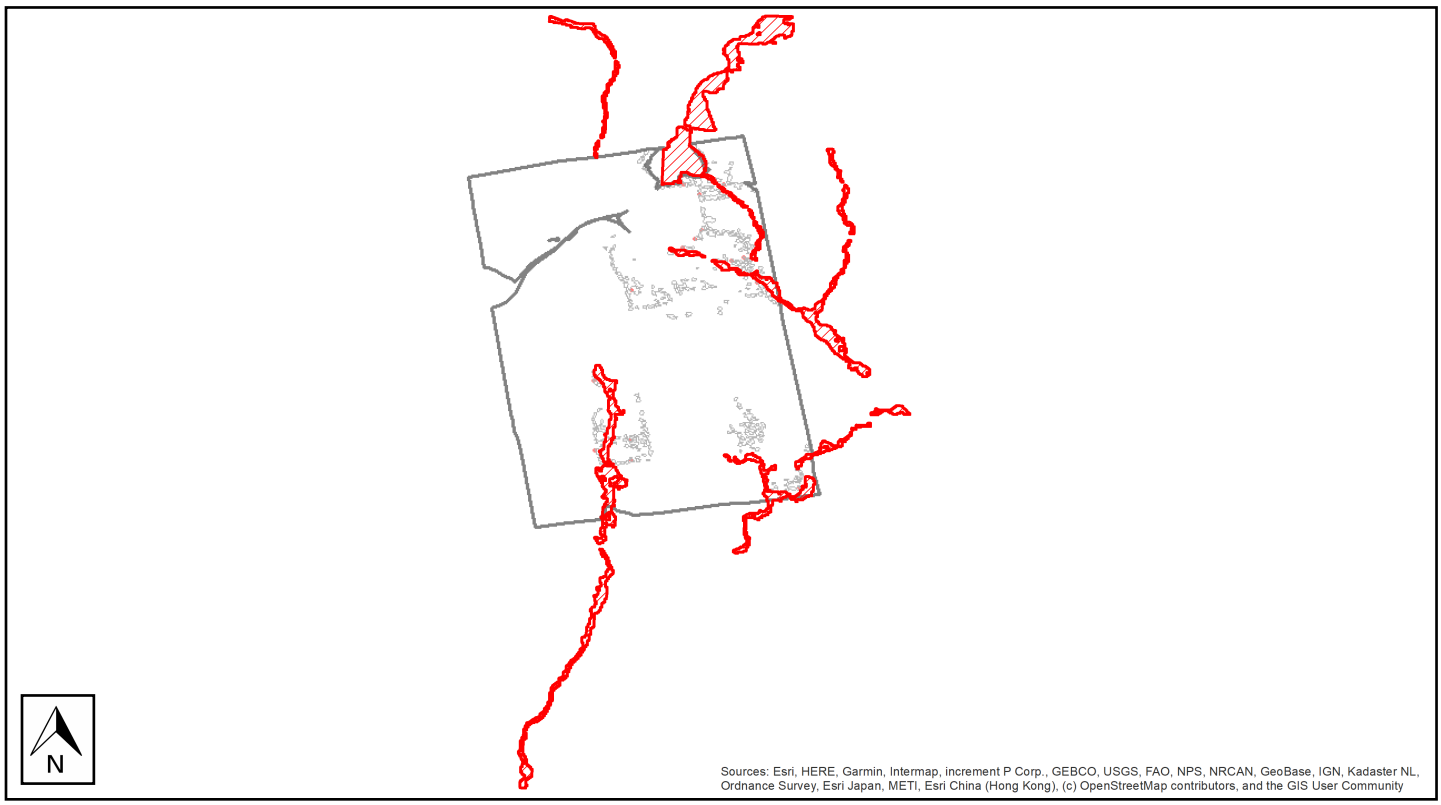


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

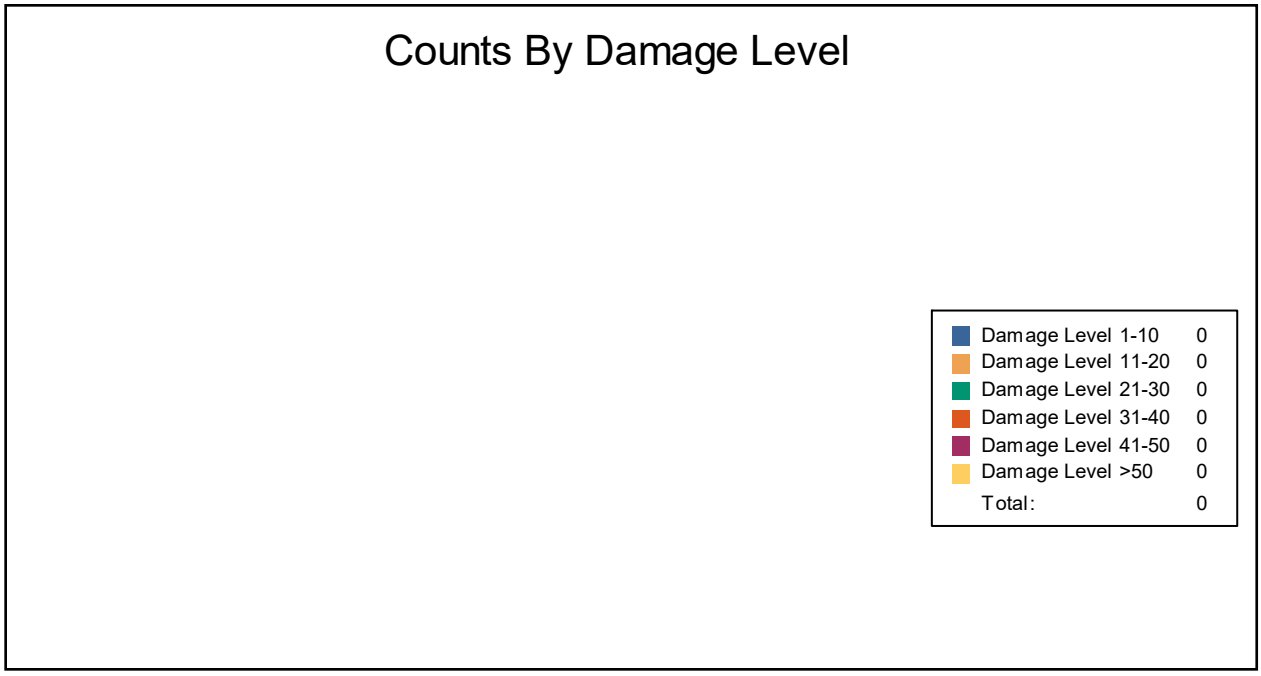


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

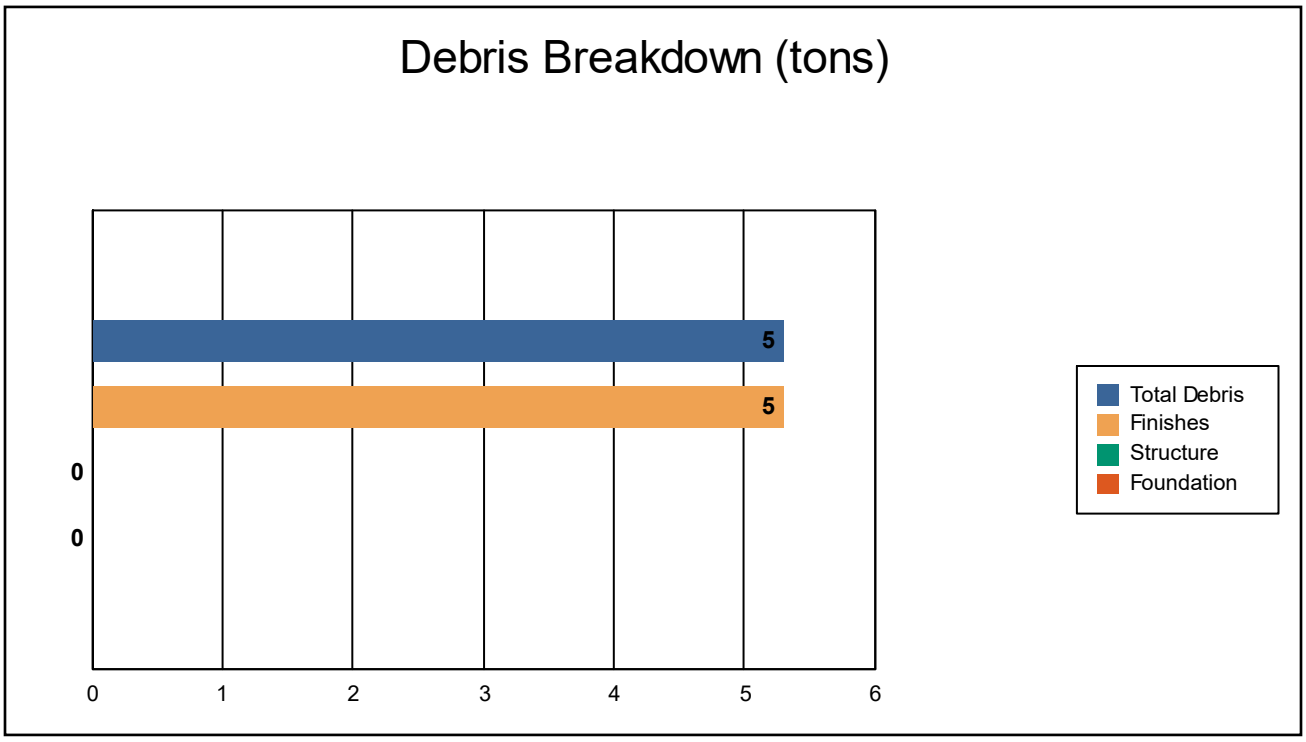
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

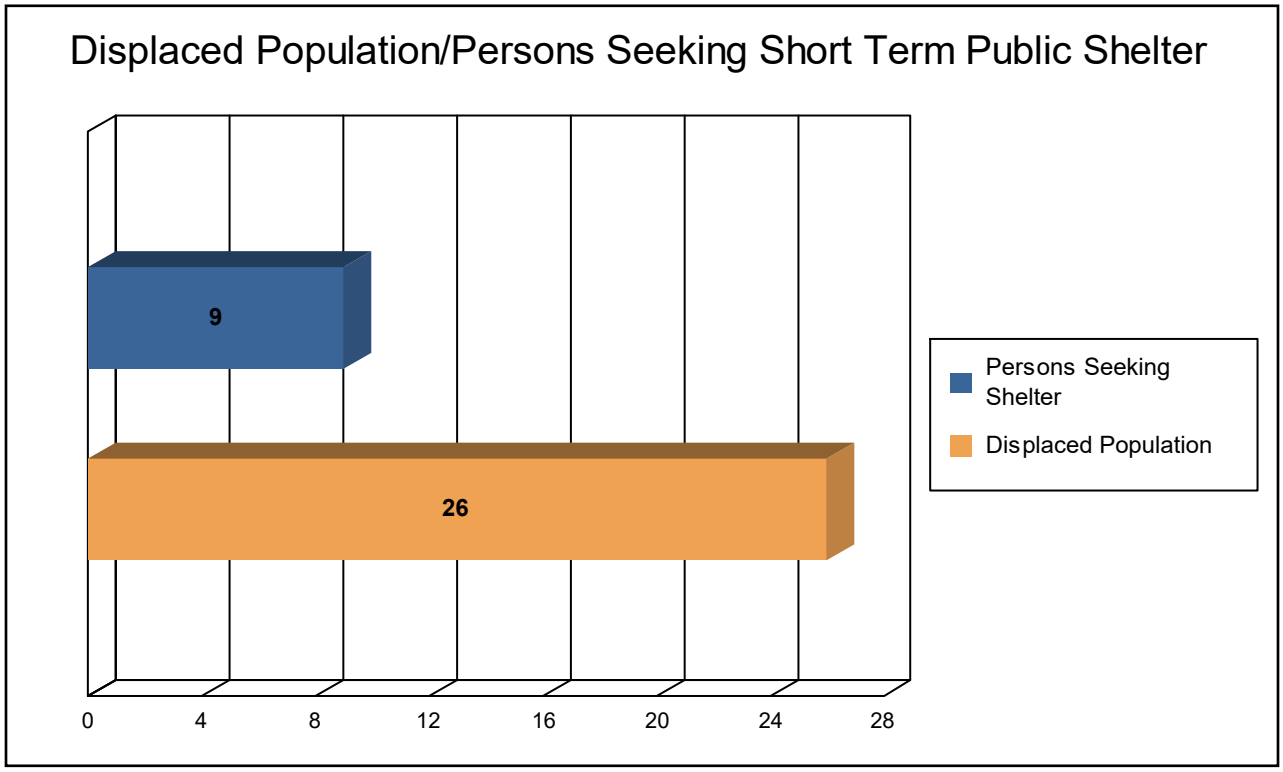


The model estimates that a total of 5 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 9 households (or 26 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 9 people (out of a total population of 4,858) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 0.38 million dollars, which represents 0.20 % of the total replacement value of the scenario buildings.

Building-Related Losses

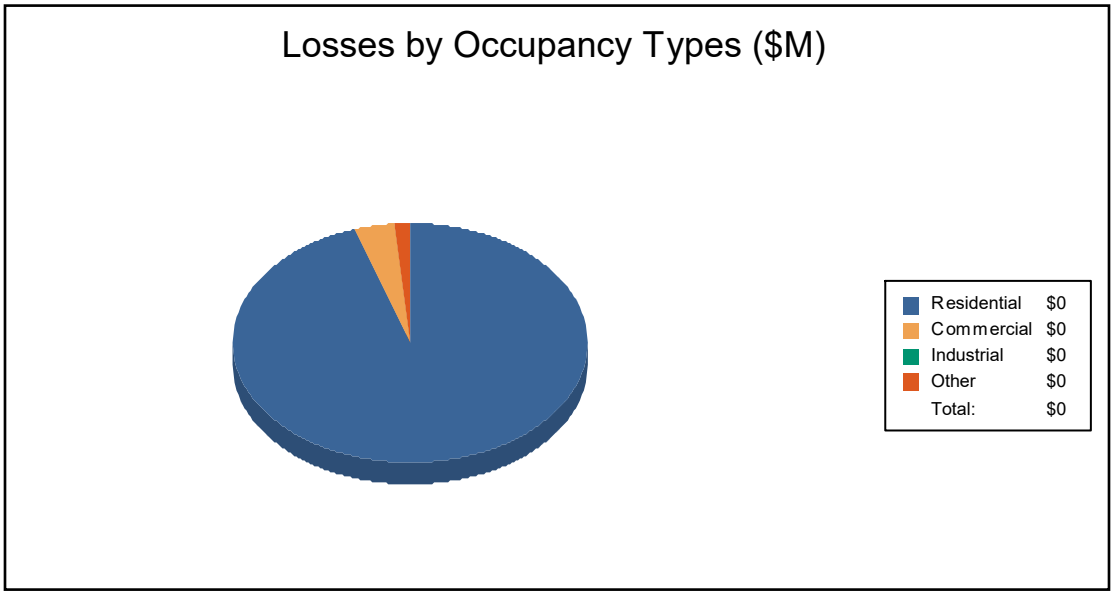
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 0.26 million dollars. 31% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 95.00% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.19	0.00	0.00	0.00	0.19
	Content	0.07	0.00	0.00	0.00	0.08
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.26**	**0.00**	**0.00**	**0.00**	**0.26**
Business Interruption						
	Income	0.01	0.01	0.00	0.00	0.02
	Relocation	0.06	0.00	0.00	0.00	0.06
	Rental Income	0.02	0.00	0.00	0.00	0.02
	Wage	0.02	0.00	0.00	0.00	0.02
	Subtotal	**0.10**	**0.01**	**0.00**	**0.01**	**0.12**
ALL	**Total**	**0.36**	**0.01**	**0.00**	**0.01**	**0.38**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,381	249,908	820,289
Total	**4,858**	**570,381**	**249,908**	**820,289**
Total Study Region	**4,858**	**570,381**	**249,908**	**820,289**

Hazus: Flood Global Risk Report

Region Name: Bolton_FL

Flood Scenario: Bolton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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Note:
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There are an estimated 1,357 buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85.26% of the buildings (and 69.53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,357 buildings in the region which have an aggregate total replacement value of 820 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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Building Exposure by Occupancy Type for the Study Region

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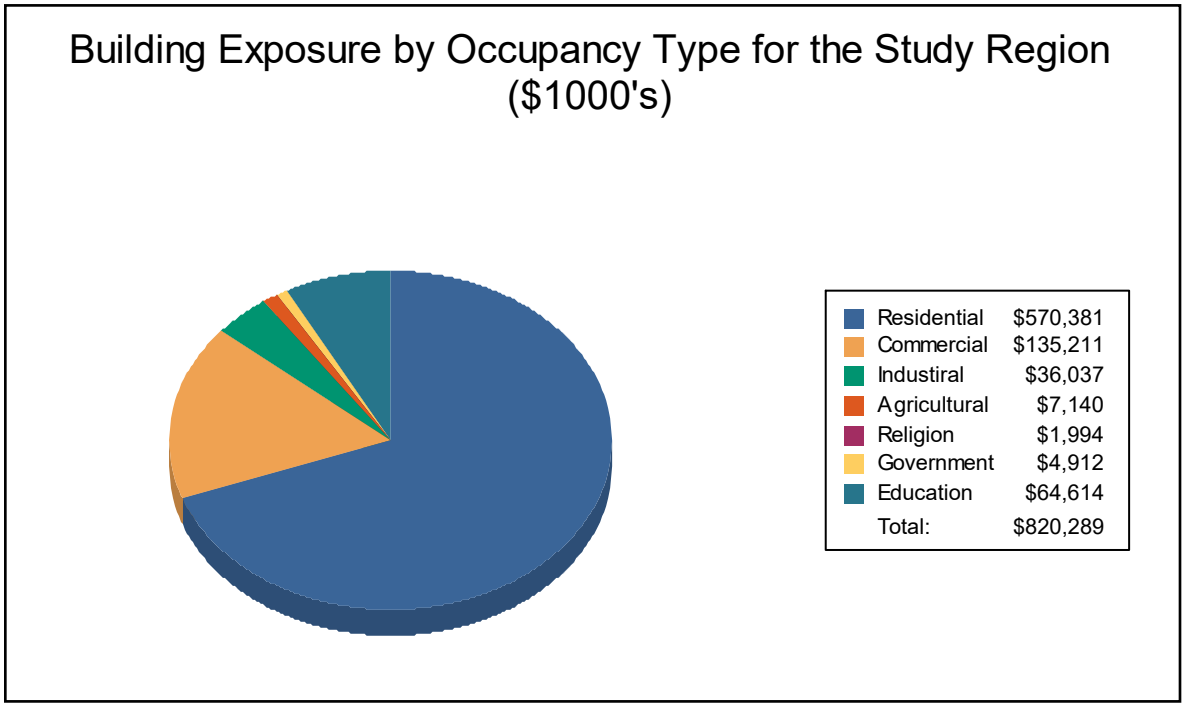

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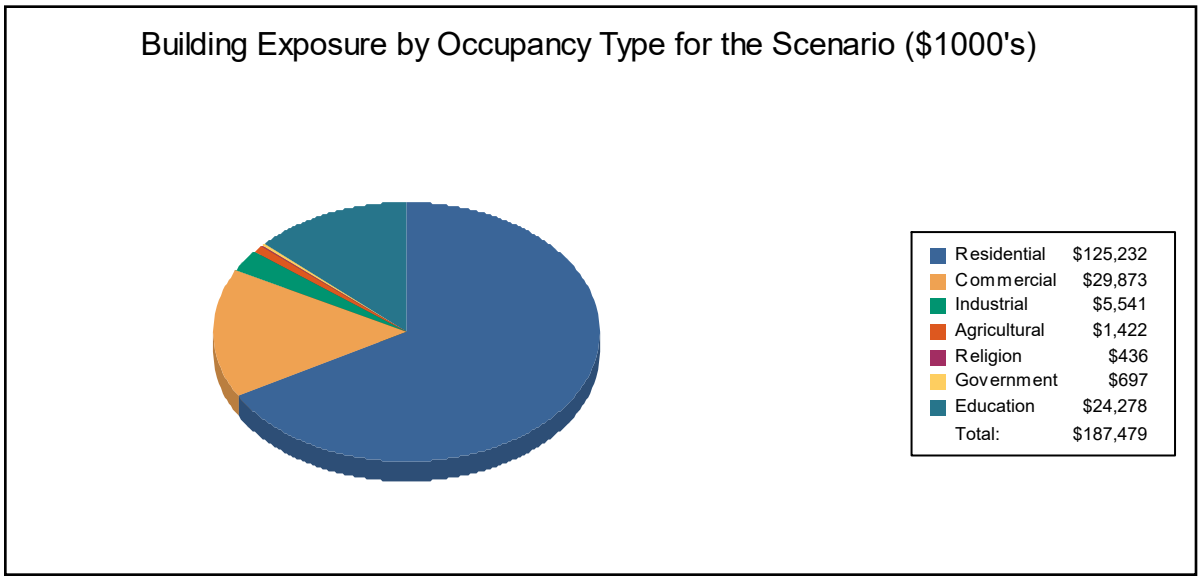


Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 1 fire station, no police stations and 1 emergency operation center.

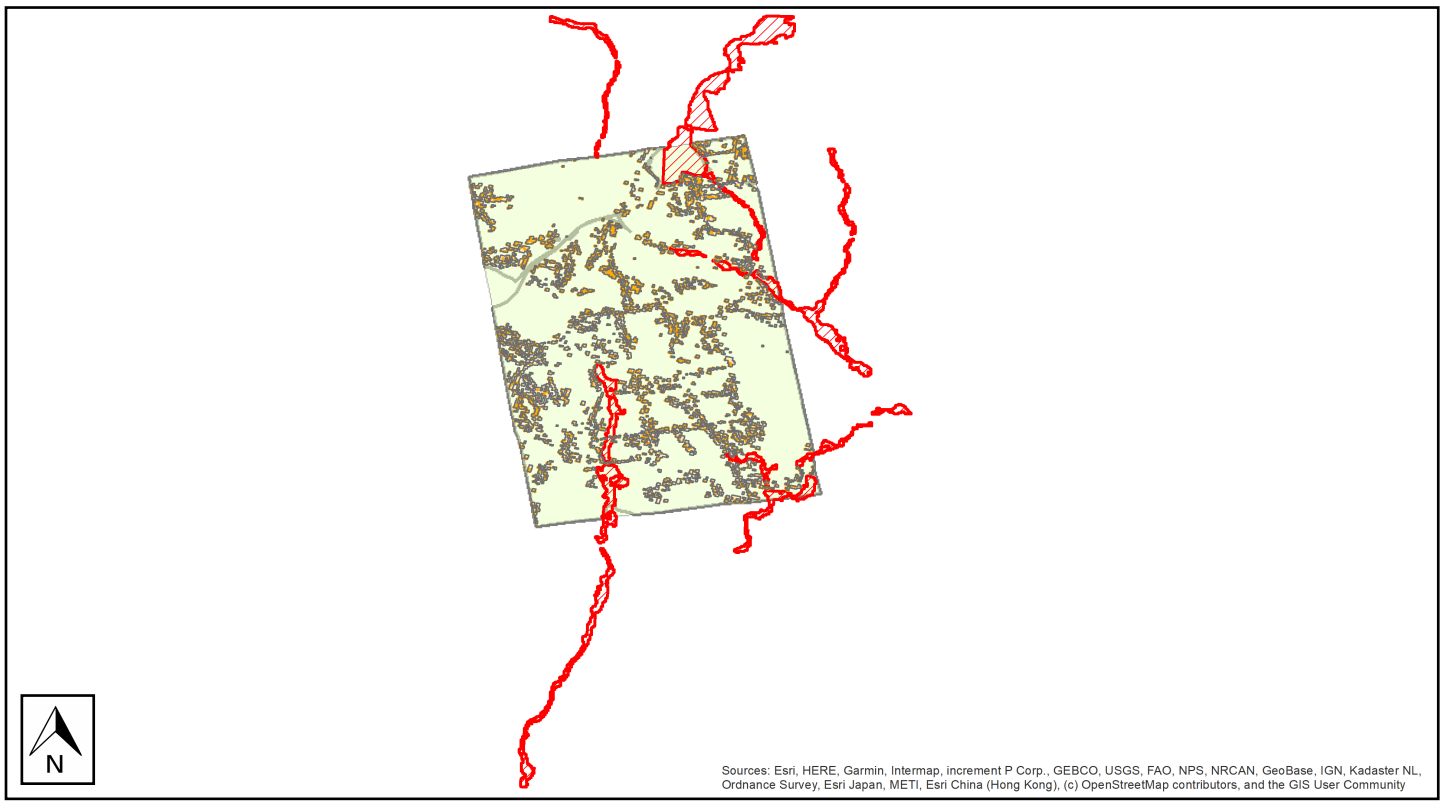
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bolton_FL
Scenario Name:	Bolton_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

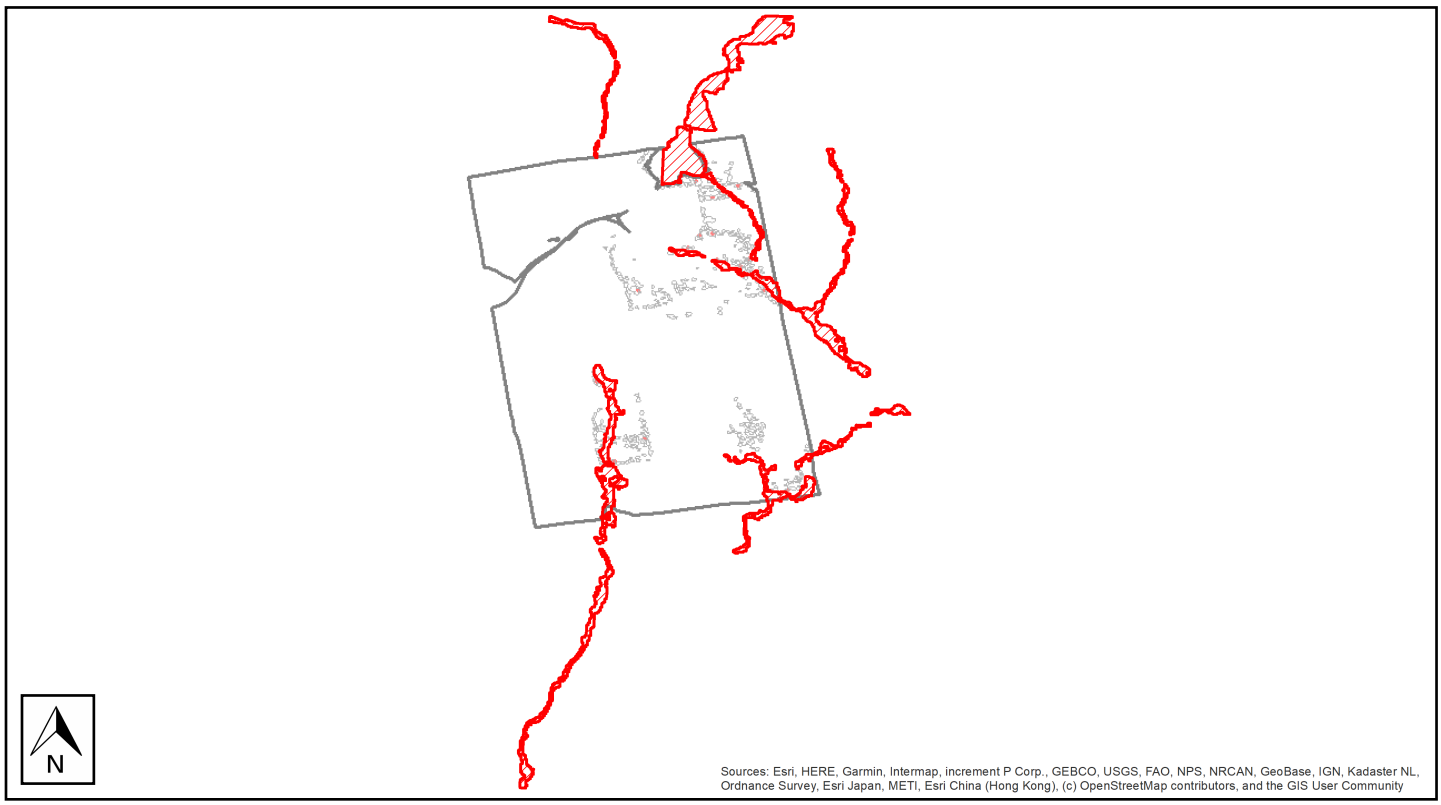


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

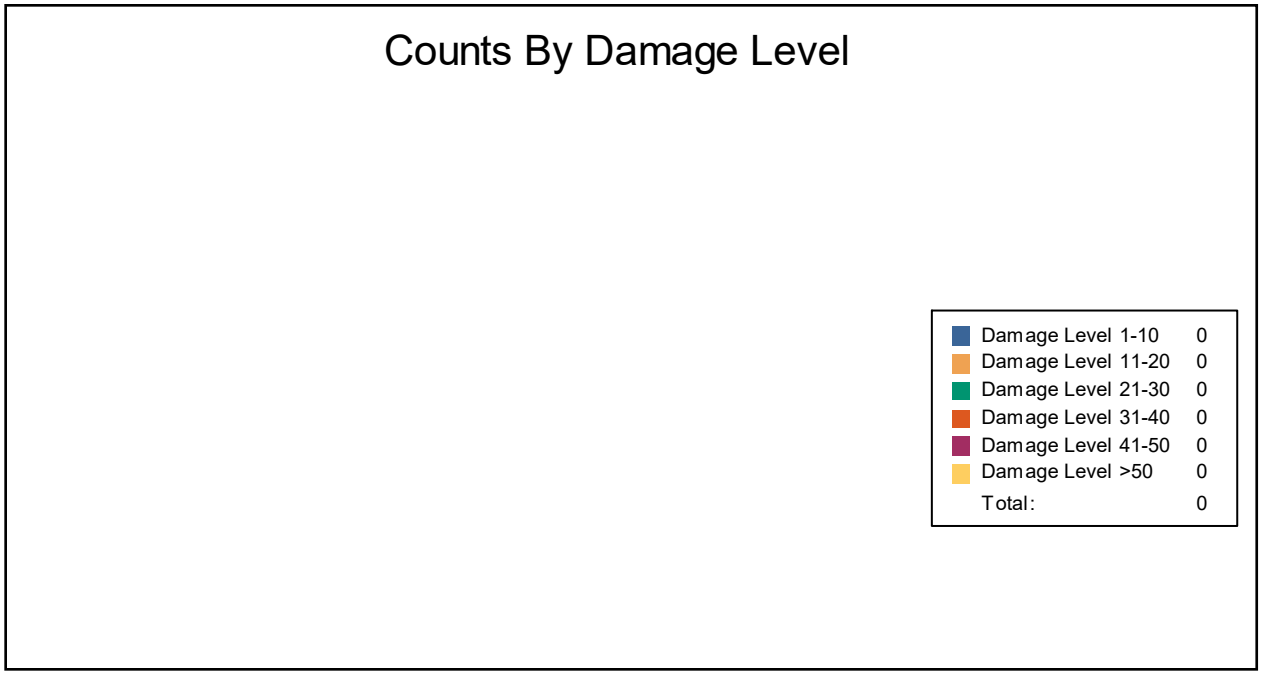


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

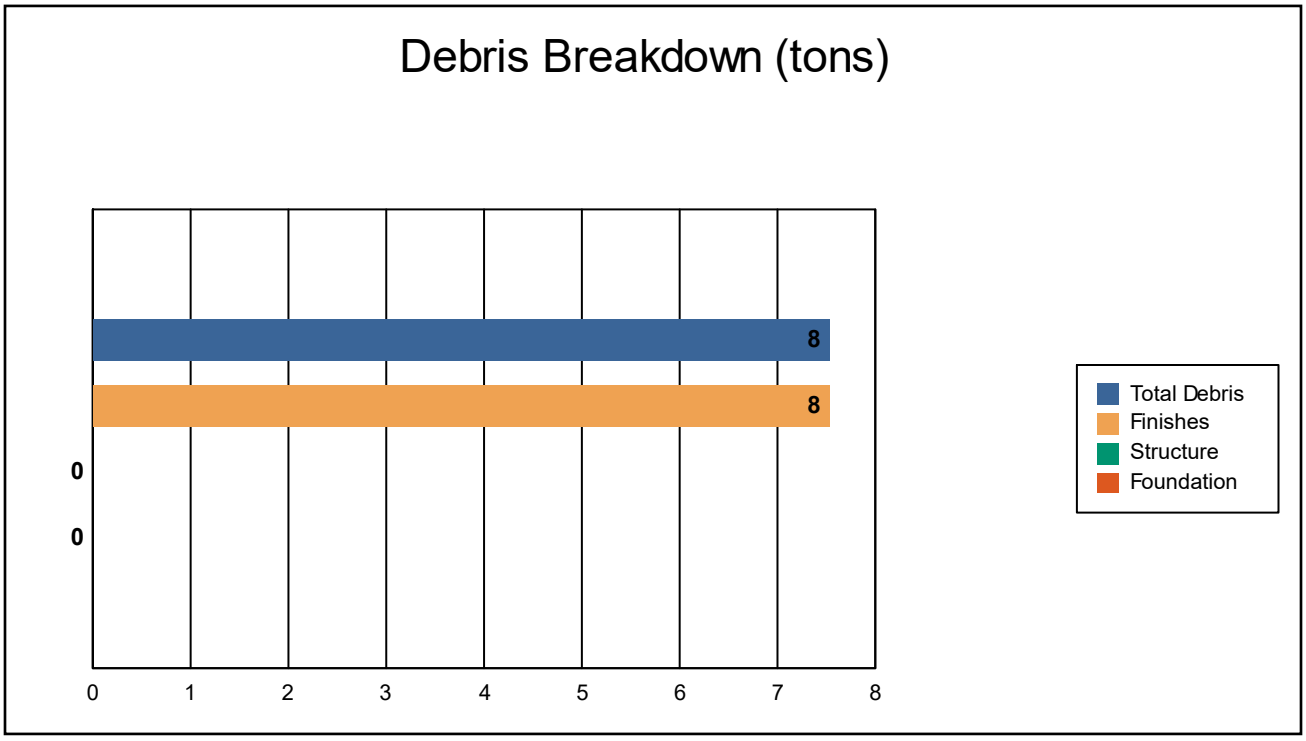
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

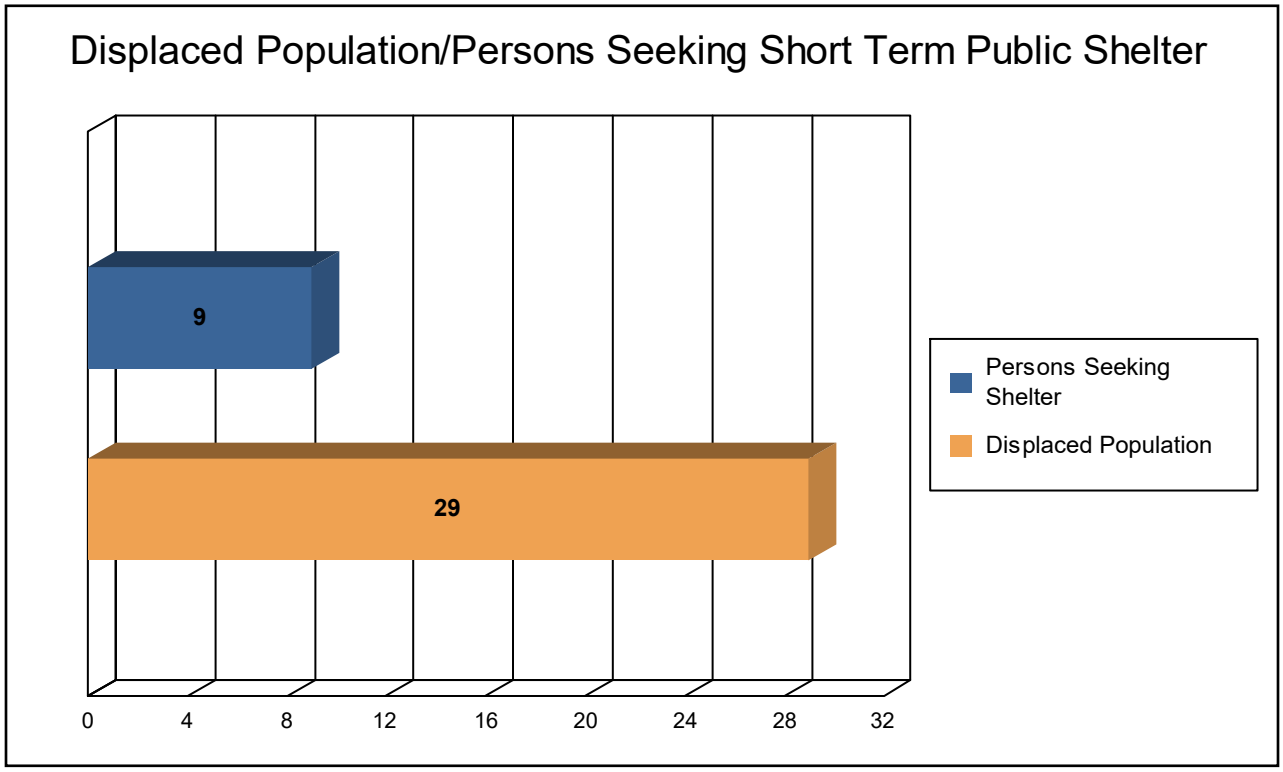


The model estimates that a total of 8 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 10 households (or 29 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 9 people (out of a total population of 4,858) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 0.42 million dollars, which represents 0.23 % of the total replacement value of the scenario buildings.

Building-Related Losses

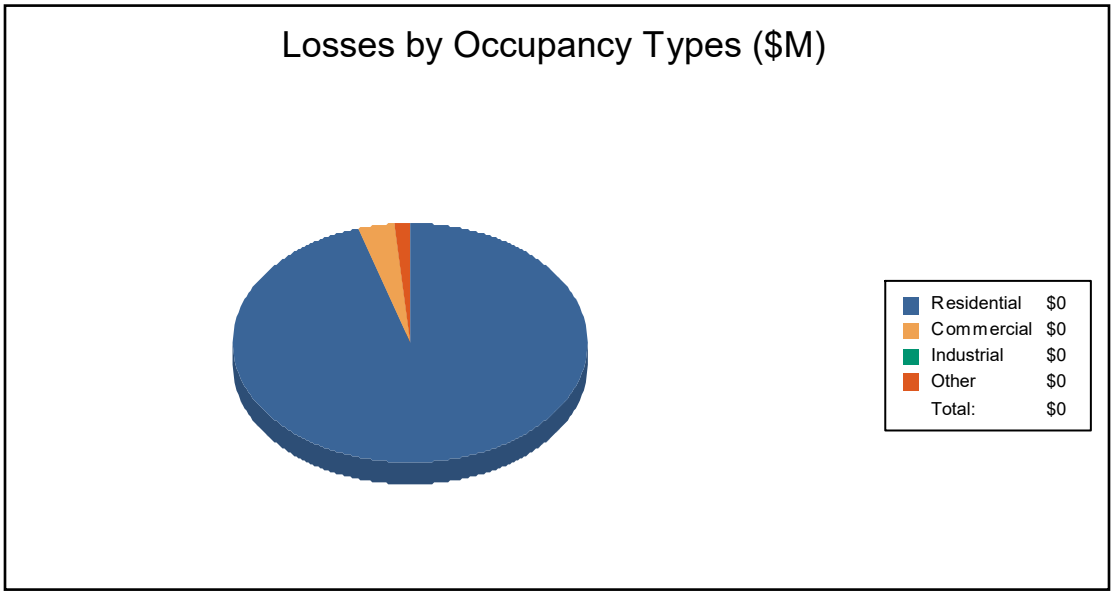
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 0.29 million dollars. 32% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 95.26% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.20	0.00	0.00	0.00	0.20
	Content	0.08	0.00	0.00	0.00	0.08
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.28**	**0.00**	**0.00**	**0.00**	**0.29**
Business Interruption						
	Income	0.01	0.01	0.00	0.00	0.02
	Relocation	0.07	0.00	0.00	0.00	0.07
	Rental Income	0.02	0.00	0.00	0.00	0.02
	Wage	0.02	0.00	0.00	0.00	0.02
	Subtotal	**0.12**	**0.01**	**0.00**	**0.01**	**0.14**
ALL	**Total**	**0.40**	**0.01**	**0.00**	**0.01**	**0.42**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,381	249,908	820,289
Total	**4,858**	**570,381**	**249,908**	**820,289**
Total Study Region	**4,858**	**570,381**	**249,908**	**820,289**

Hazus: Flood Global Risk Report

Region Name: Bolton_FL

Flood Scenario: Bolton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
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The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 86 census blocks. The region contains over 2 thousand households and has a total population of 4,858 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 1,357 buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85.26% of the buildings (and 69.53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,357 buildings in the region which have an aggregate total replacement value of 820 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	570,381	69.5%
Commercial	135,211	16.5%
Industrial	36,037	4.4%
Agricultural	7,140	0.9%
Religion	1,994	0.2%
Government	4,912	0.6%
Education	64,614	7.9%
Total	**820,289**	**100%**

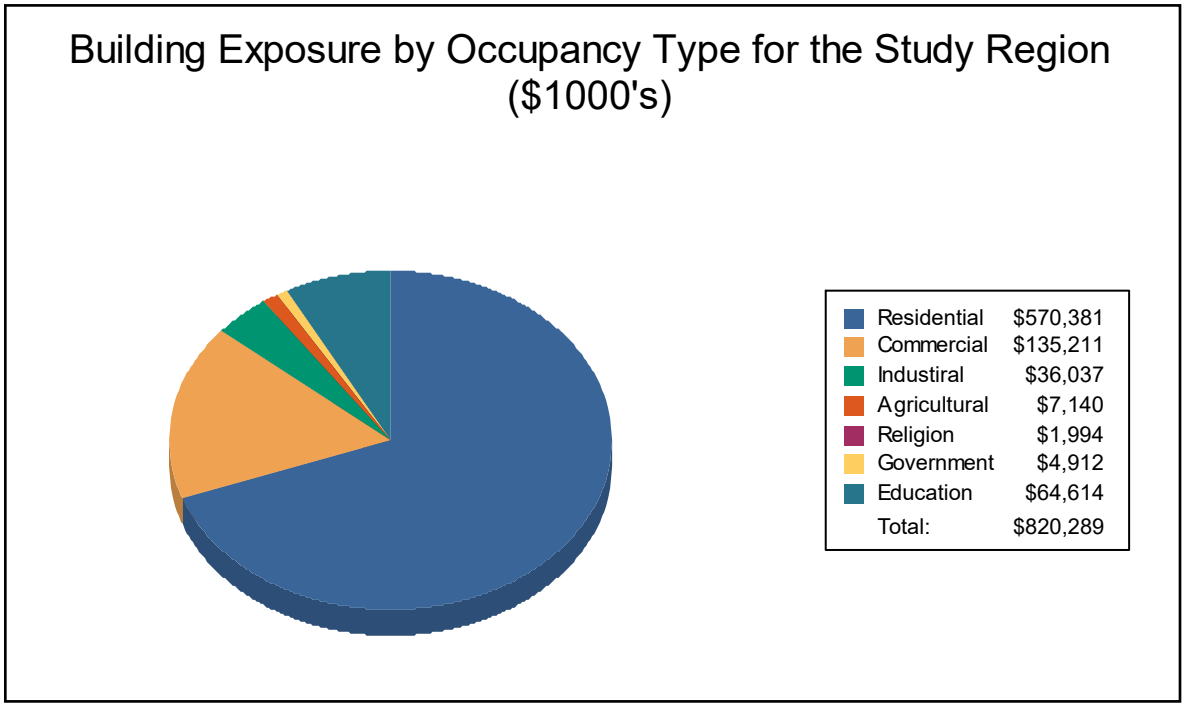
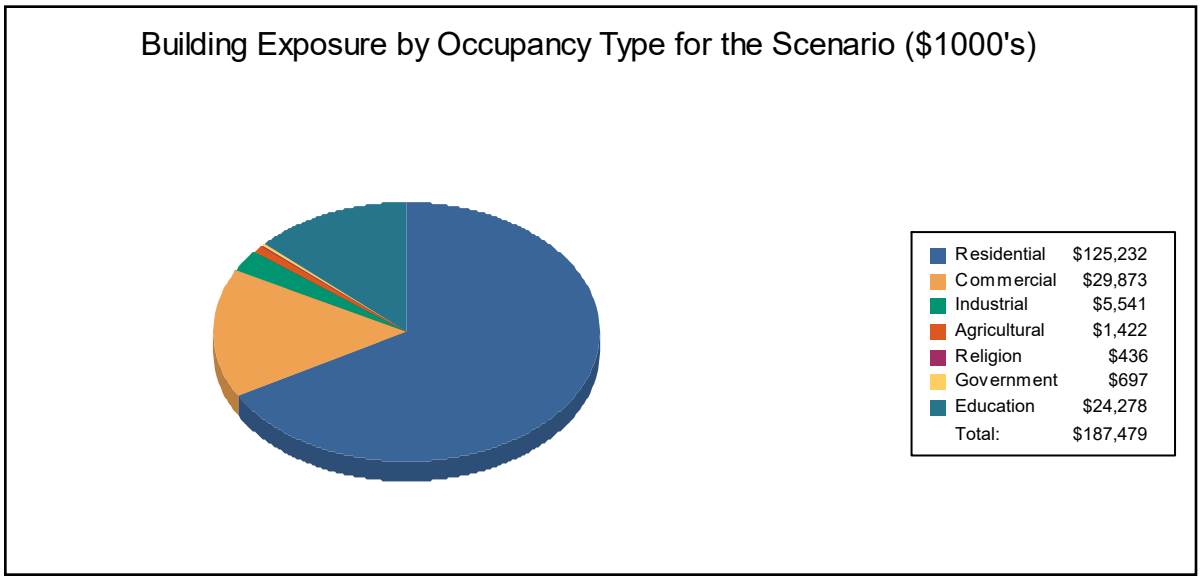


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	125,232	66.8%
Commercial	29,873	15.9%
Industrial	5,541	3.0%
Agricultural	1,422	0.8%
Religion	436	0.2%
Government	697	0.4%
Education	24,278	12.9%
Total	**187,479**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 1 fire station, no police stations and 1 emergency operation center.

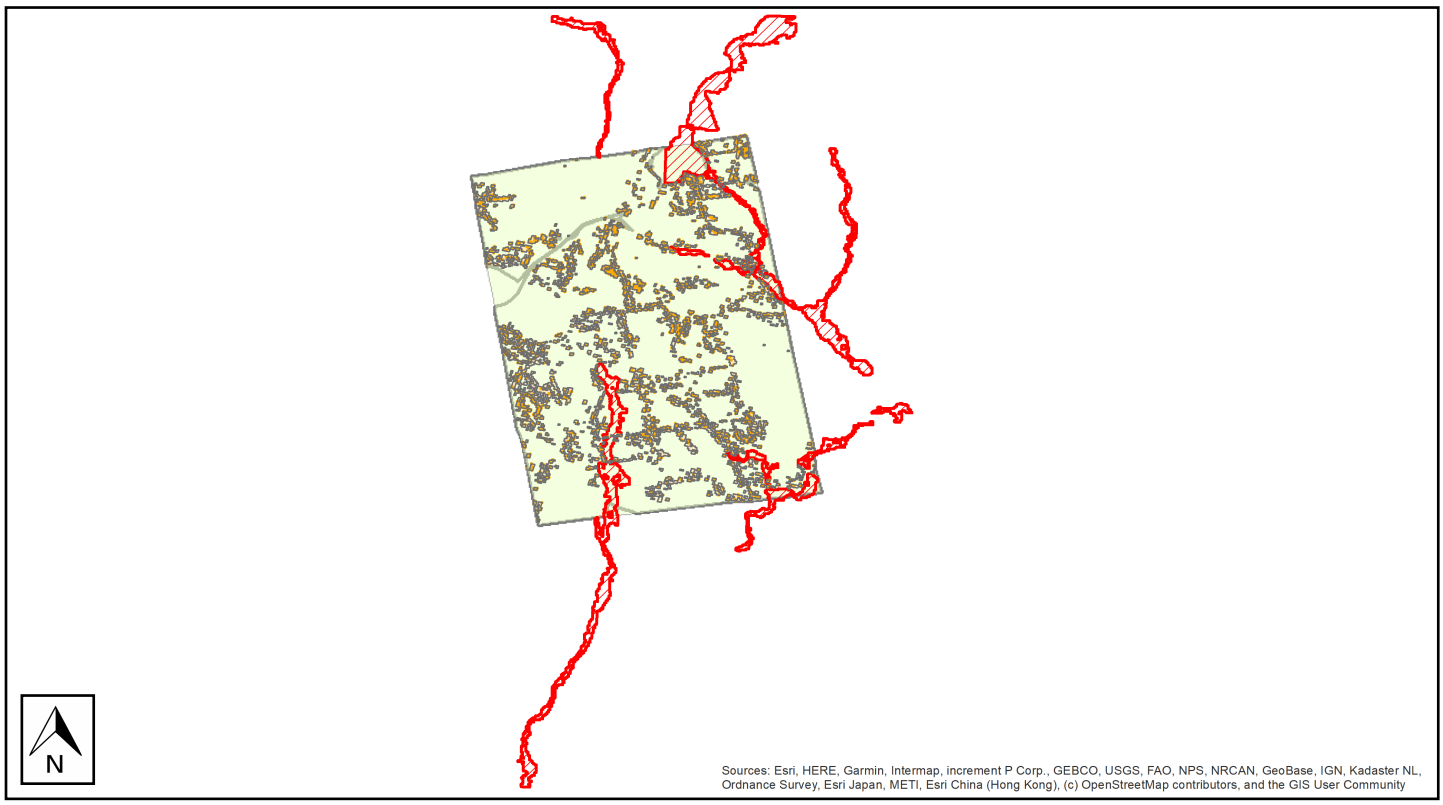
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Bolton_FL
Scenario Name:	Bolton_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

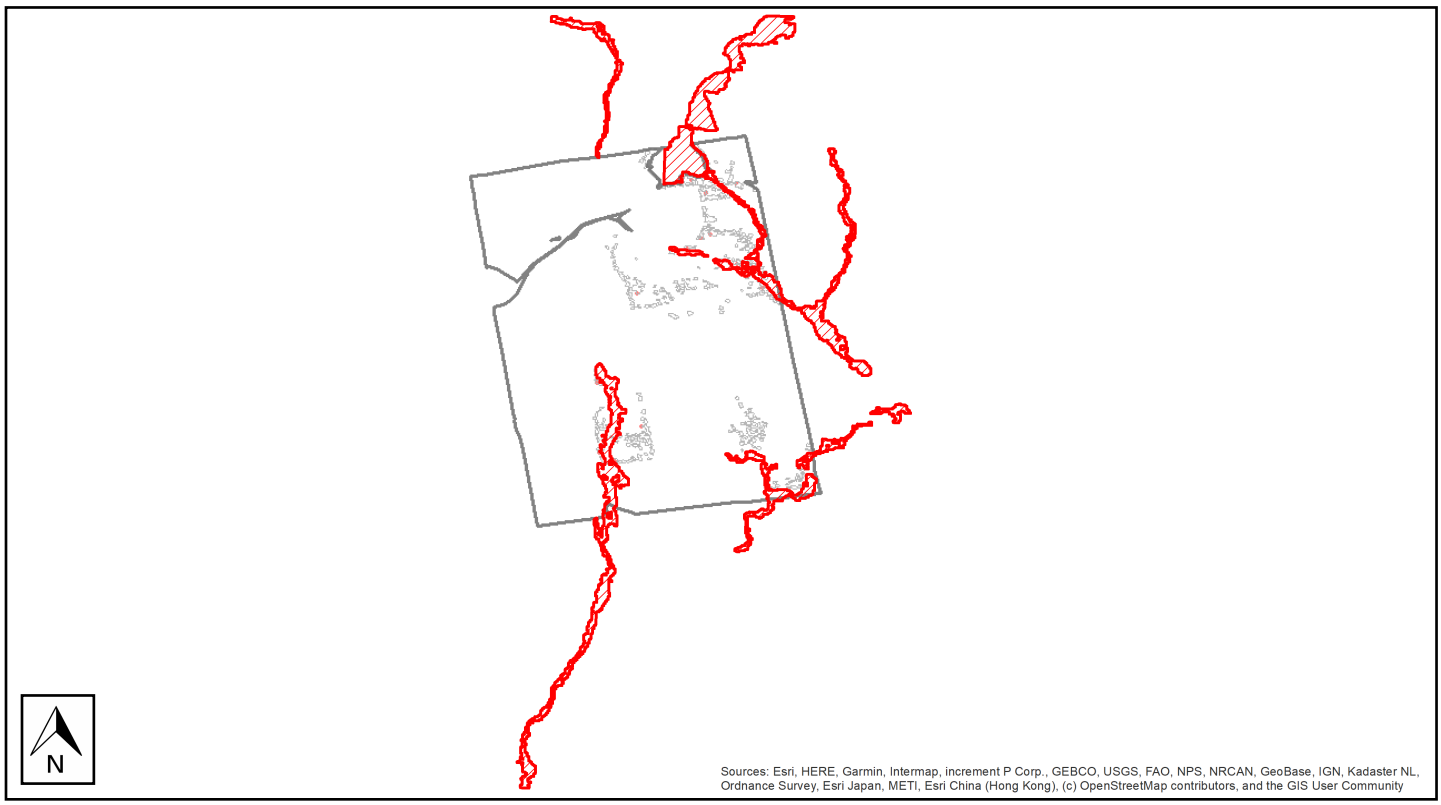


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

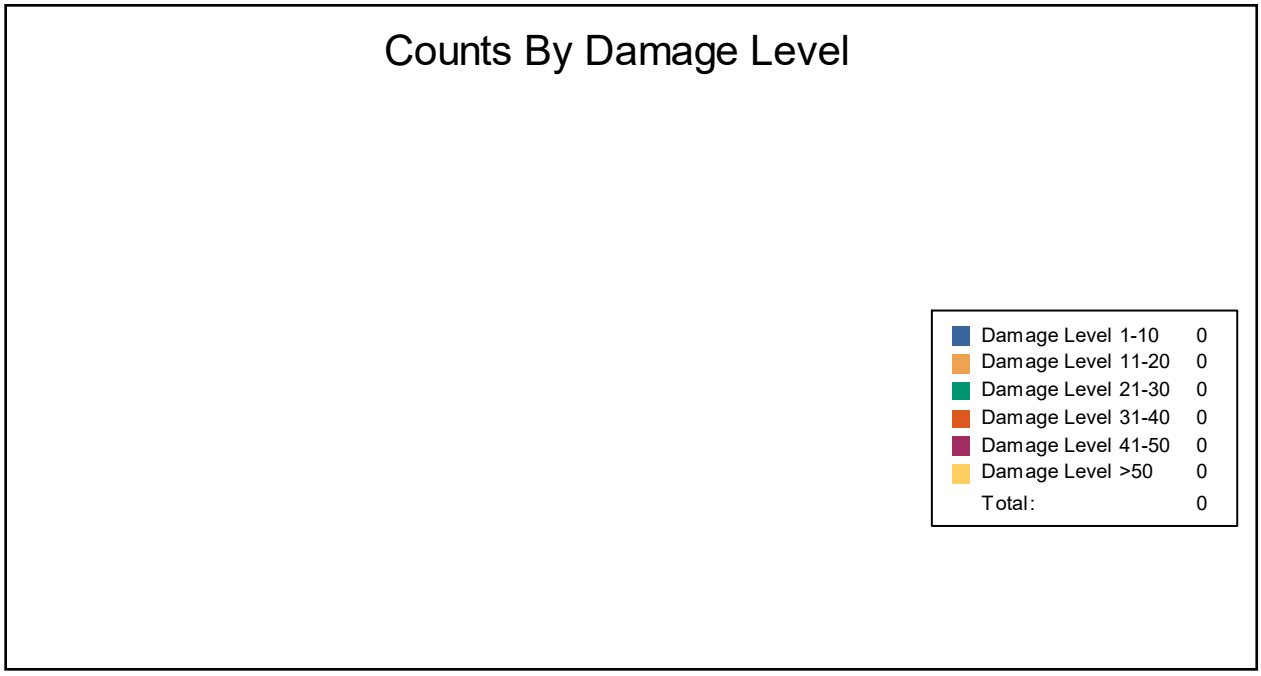


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

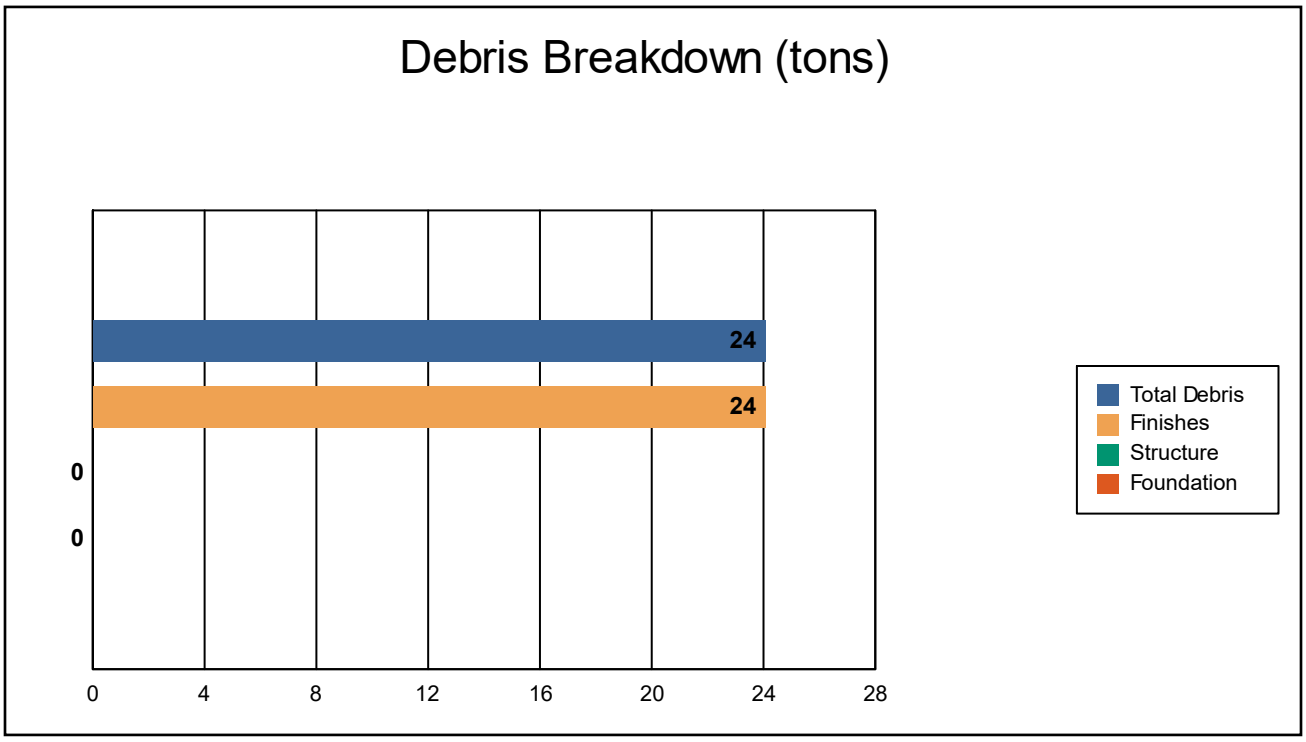
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

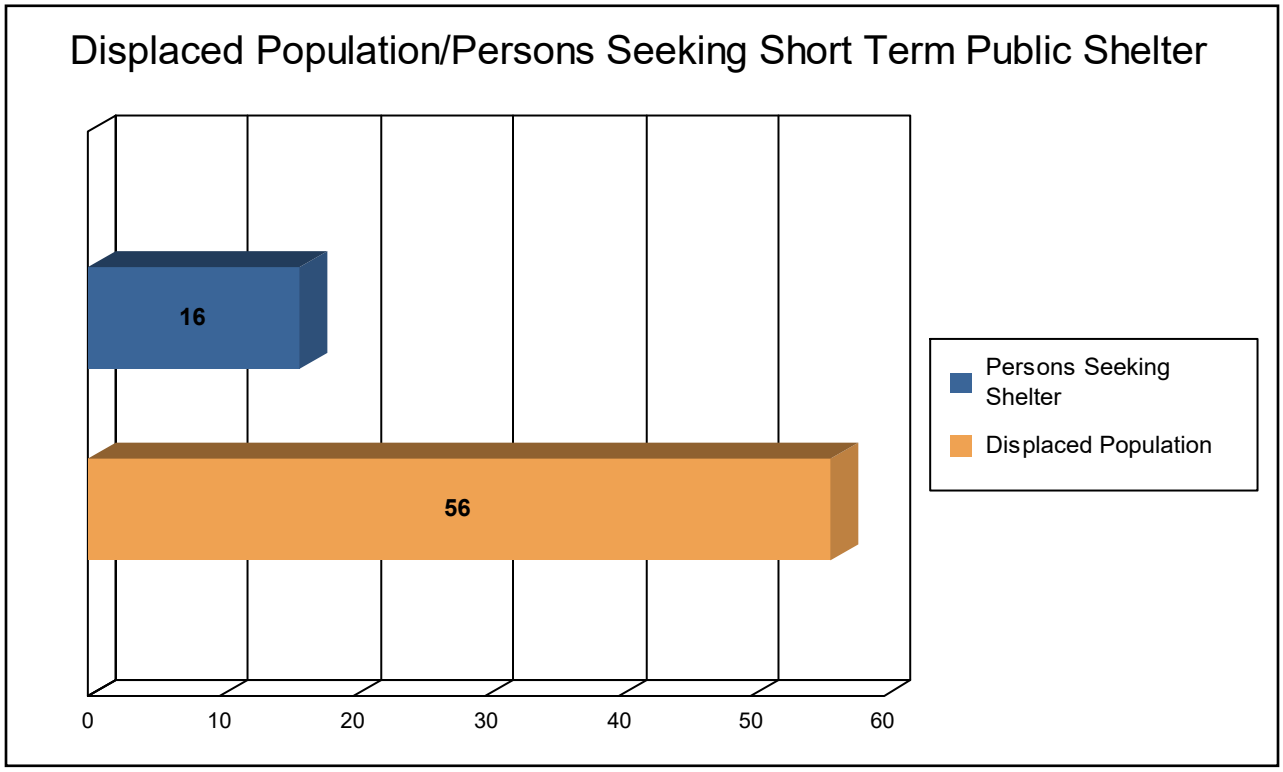


The model estimates that a total of 24 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 19 households (or 56 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 16 people (out of a total population of 4,858) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 1.31 million dollars, which represents 0.70 % of the total replacement value of the scenario buildings.

Building-Related Losses

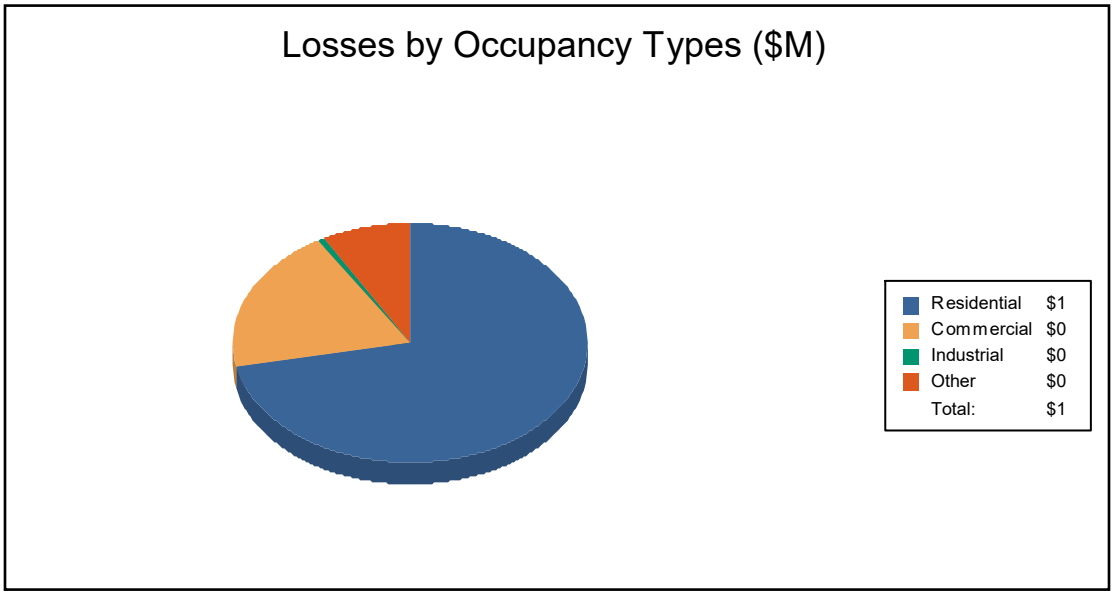
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 0.83 million dollars. 37% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 71.64% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.48	0.03	0.00	0.00	0.52
	Content	0.21	0.08	0.00	0.00	0.29
	Inventory	0.00	0.01	0.00	0.00	0.01
	Subtotal	**0.70**	**0.12**	**0.01**	**0.00**	**0.83**
Business Interruption						
	Income	0.01	0.08	0.00	0.02	0.11
	Relocation	0.16	0.01	0.00	0.01	0.18
	Rental Income	0.06	0.00	0.00	0.00	0.06
	Wage	0.02	0.05	0.00	0.07	0.14
	Subtotal	**0.24**	**0.14**	**0.00**	**0.10**	**0.48**
ALL	**Total**	**0.94**	**0.26**	**0.01**	**0.10**	**1.31**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,381	249,908	820,289
Total	**4,858**	**570,381**	**249,908**	**820,289**
Total Study Region	**4,858**	**570,381**	**249,908**	**820,289**

Hazus: Flood Global Risk Report

Region Name: Canton_FL

Flood Scenario: Canton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 3 square miles and contains 143 census blocks. The region contains over 4 thousand households and has a total population of 10,124 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,901 buildings in the region with a total building replacement value (excluding contents) of 2,156 million dollars. Approximately 84.03% of the buildings (and 68.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,901 buildings in the region which have an aggregate total replacement value of 2,156 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,481,178	68.7%
Commercial	415,279	19.3%
Industrial	72,246	3.4%
Agricultural	5,101	0.2%
Religion	19,251	0.9%
Government	76,031	3.5%
Education	86,739	4.0%
Total	**2,155,825**	**100%**

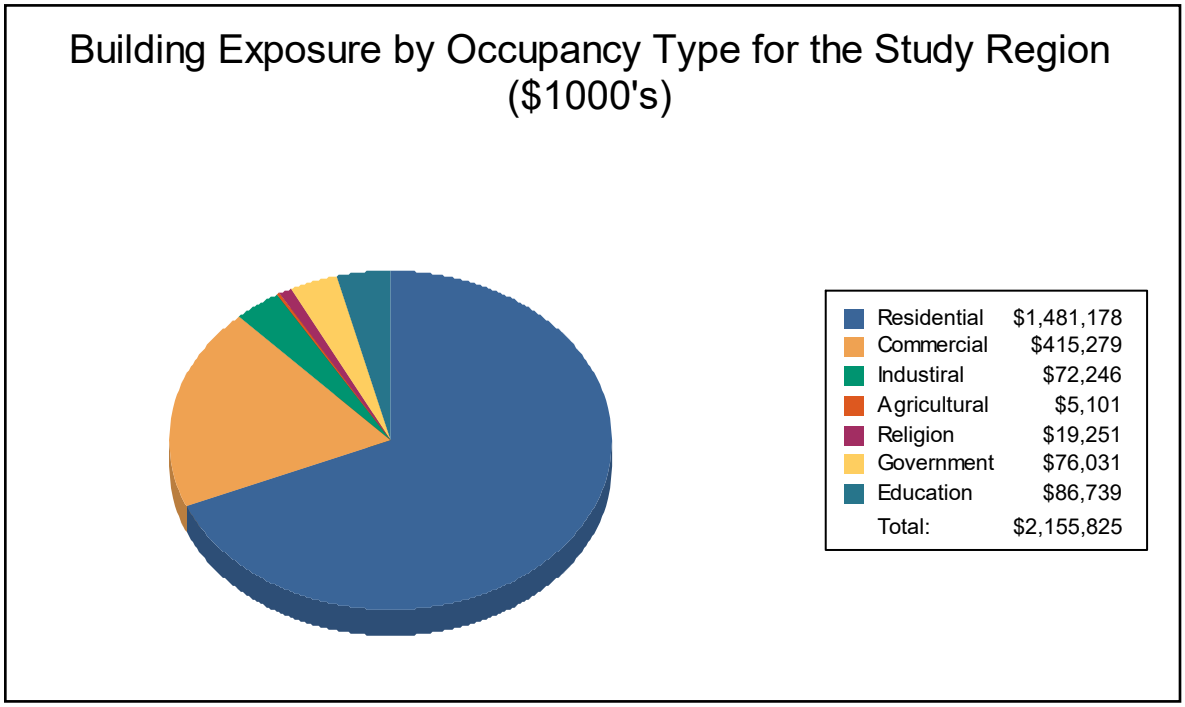
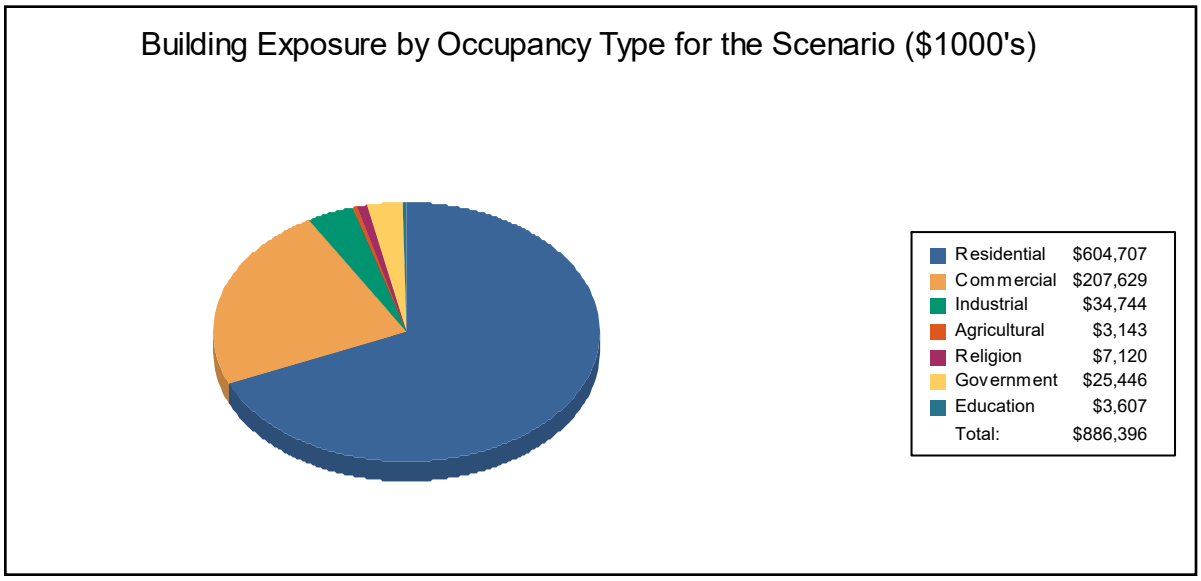


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	604,707	68.2%
Commercial	207,629	23.4%
Industrial	34,744	3.9%
Agricultural	3,143	0.4%
Religion	7,120	0.8%
Government	25,446	2.9%
Education	3,607	0.4%
Total	**886,396**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

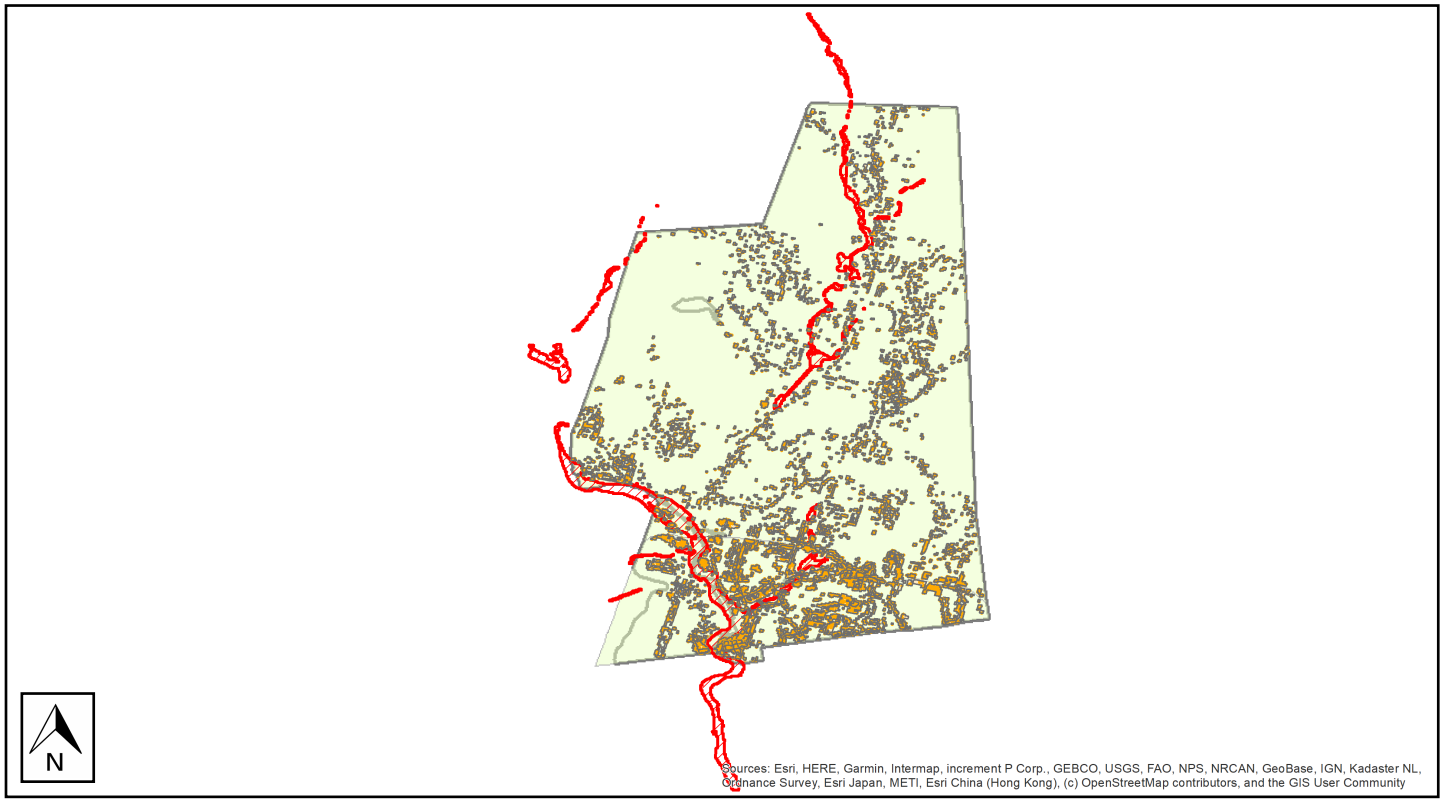
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Canton_FL
Scenario Name:	Canton_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 5 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

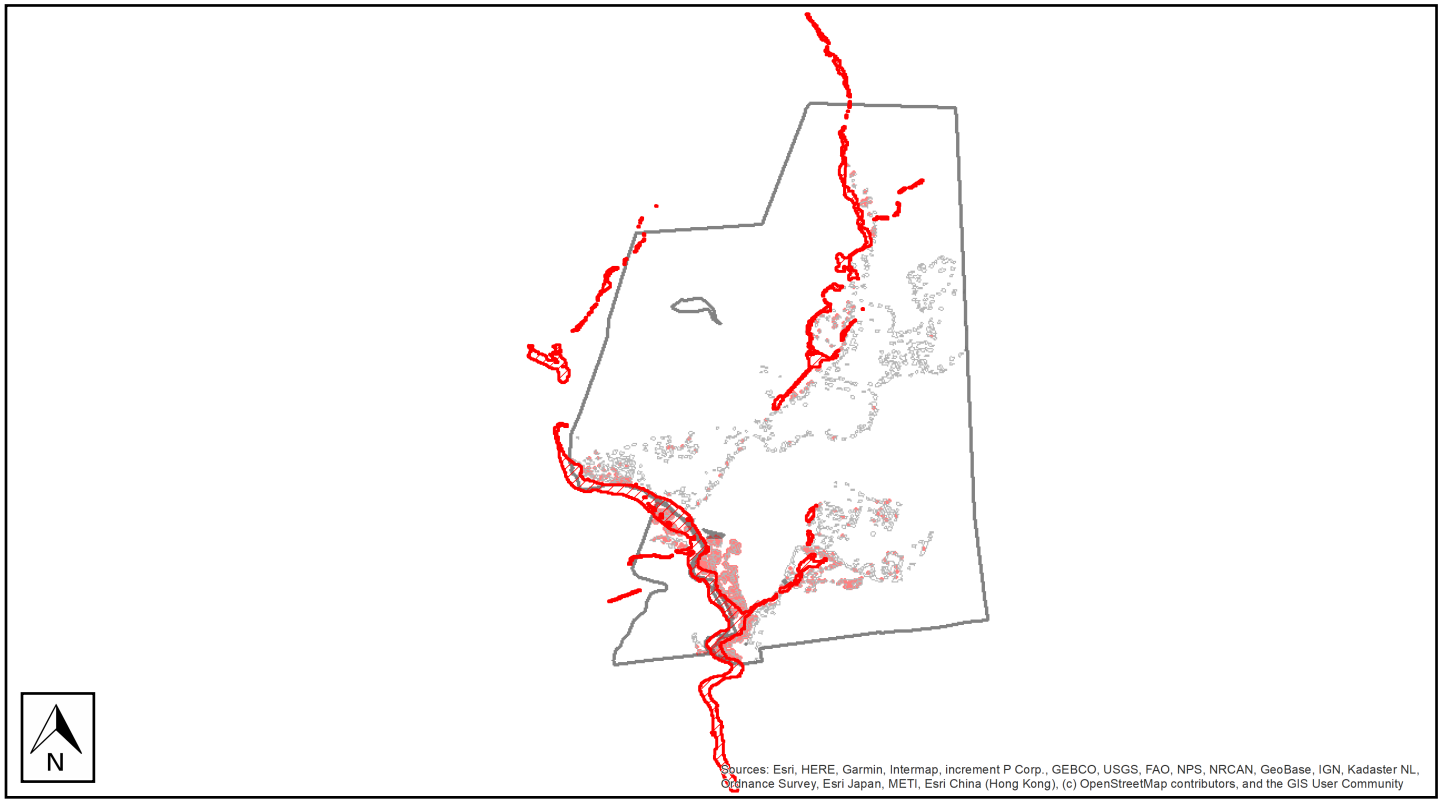


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	2	67	1	33	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	20	2	40	2	40	0	0	0	0	0	0
Total	**3**		**3**		**2**		**0**		**0**		**0**	

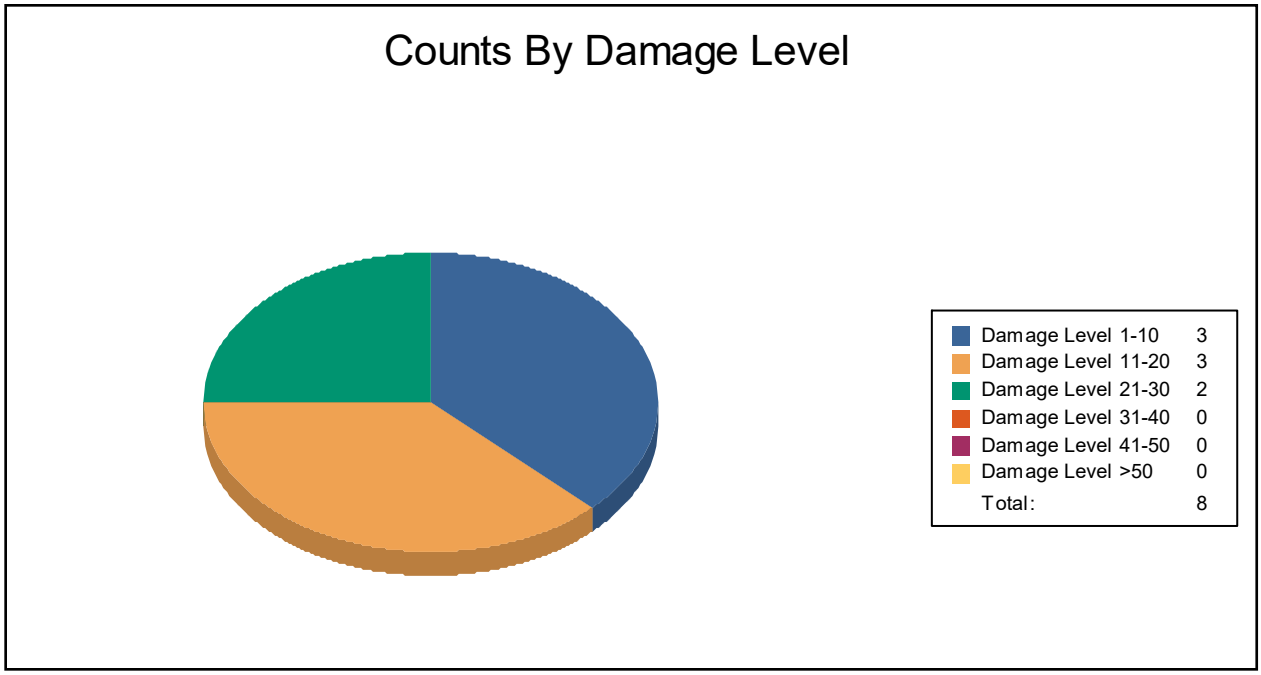


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	1	100	0	0	0	0	0	0	0	0	0	0
Wood	1	20	2	40	2	40	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

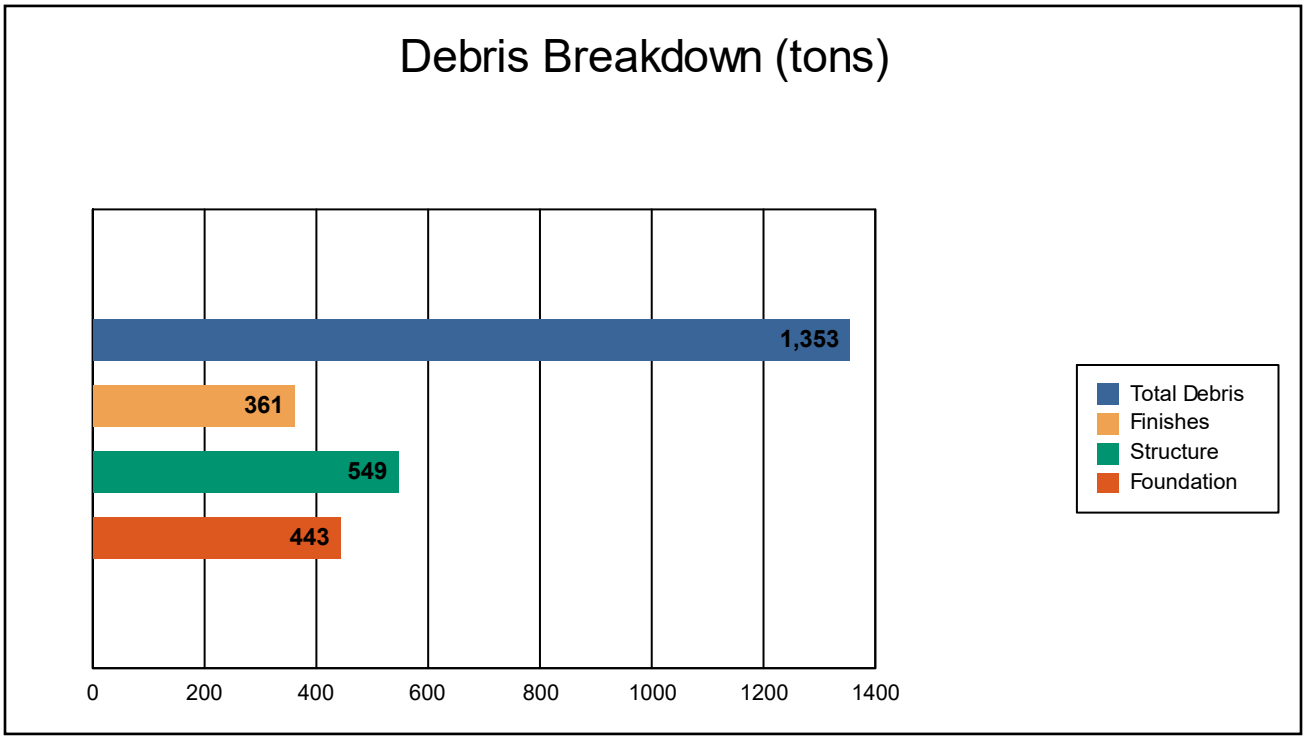
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

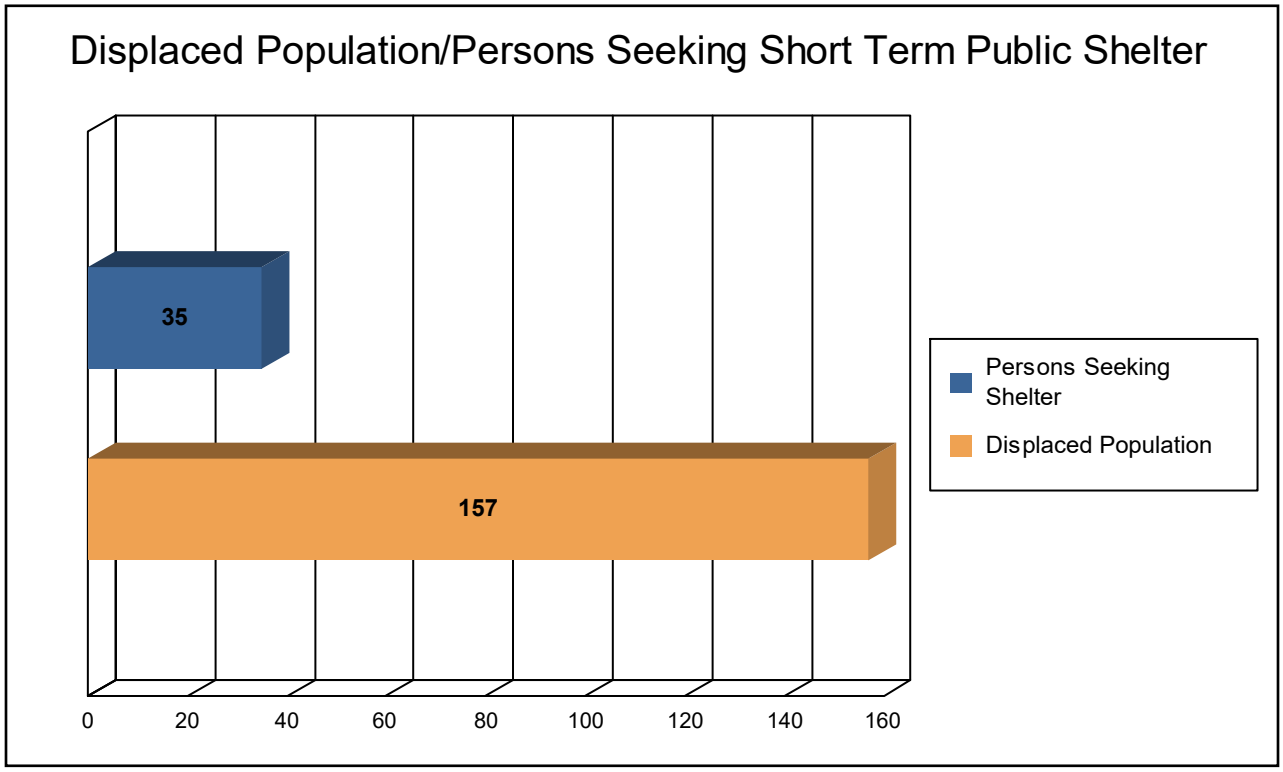


The model estimates that a total of 1,353 tons of debris will be generated. Of the total amount, Finishes comprises 27% of the total, Structure comprises 41% of the total, and Foundation comprises 33%. If the debris tonnage is converted into an estimated number of truckloads, it will require 55 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 52 households (or 157 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 35 people (out of a total population of 10,124) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 76.14 million dollars, which represents 8.59 % of the total replacement value of the scenario buildings.

Building-Related Losses

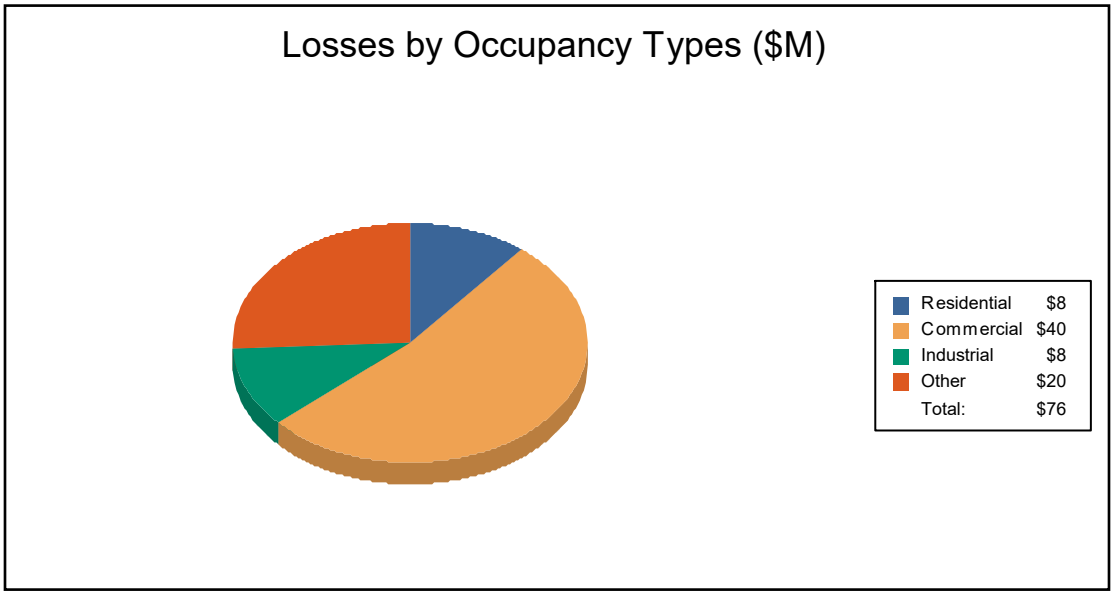
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 39.20 million dollars. 49% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 10.90% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.32	5.89	1.97	1.49	13.67
	Content	2.22	11.23	5.06	4.94	23.45
	Inventory	0.00	1.23	0.67	0.19	2.08
	Subtotal	**6.54**	**18.35**	**7.69**	**6.62**	**39.20**
Business Interruption						
	Income	0.08	10.47	0.13	0.95	11.63
	Relocation	0.91	2.32	0.16	0.83	4.21
	Rental Income	0.60	1.80	0.05	0.24	2.68
	Wage	0.18	6.97	0.23	11.03	18.41
	Subtotal	**1.76**	**21.56**	**0.57**	**13.06**	**36.94**
ALL	**Total**	**8.30**	**39.91**	**8.26**	**19.68**	**76.14**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,178	674,647	2,155,825
Total	**10,124**	**1,481,178**	**674,647**	**2,155,825**
Total Study Region	**10,124**	**1,481,178**	**674,647**	**2,155,825**

Hazus: Flood Global Risk Report

Region Name: Canton_FL

Flood Scenario: Canton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 3 square miles and contains 143 census blocks. The region contains over 4 thousand households and has a total population of 10,124 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,901 buildings in the region with a total building replacement value (excluding contents) of 2,156 million dollars. Approximately 84.03% of the buildings (and 68.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,901 buildings in the region which have an aggregate total replacement value of 2,156 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,481,178	68.7%
Commercial	415,279	19.3%
Industrial	72,246	3.4%
Agricultural	5,101	0.2%
Religion	19,251	0.9%
Government	76,031	3.5%
Education	86,739	4.0%
Total	**2,155,825**	**100%**

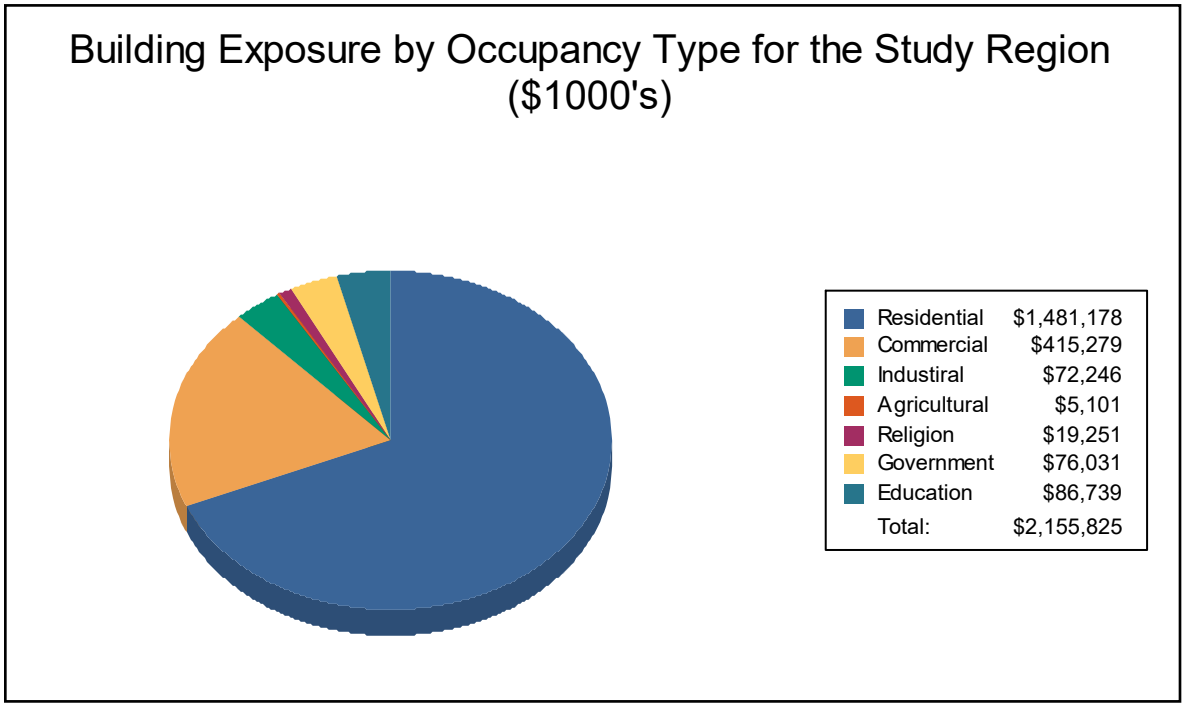
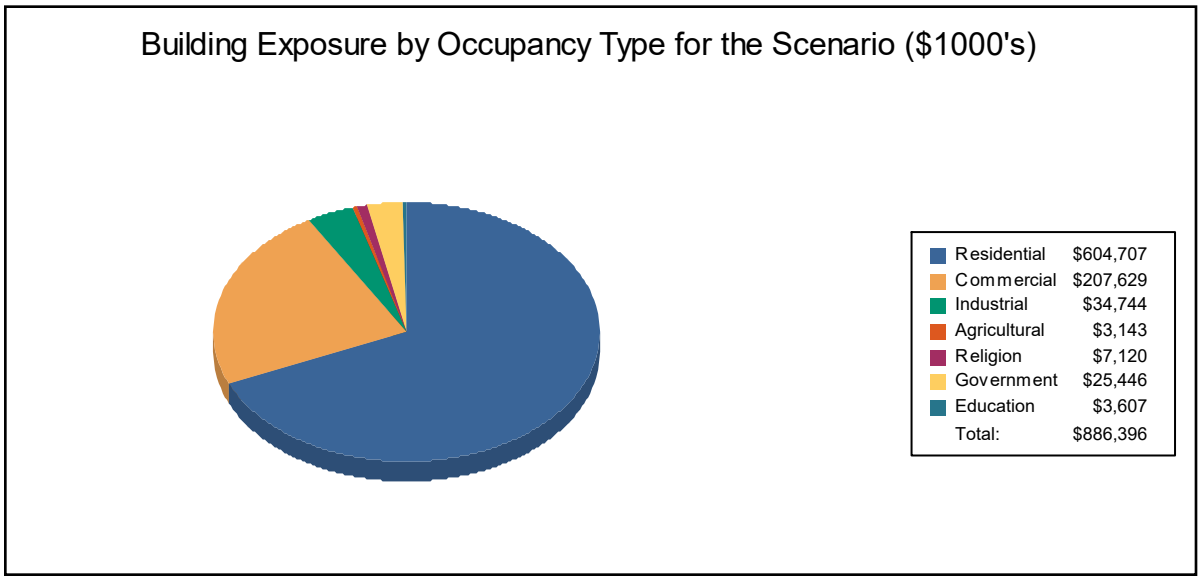


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	604,707	68.2%
Commercial	207,629	23.4%
Industrial	34,744	3.9%
Agricultural	3,143	0.4%
Religion	7,120	0.8%
Government	25,446	2.9%
Education	3,607	0.4%
Total	**886,396**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

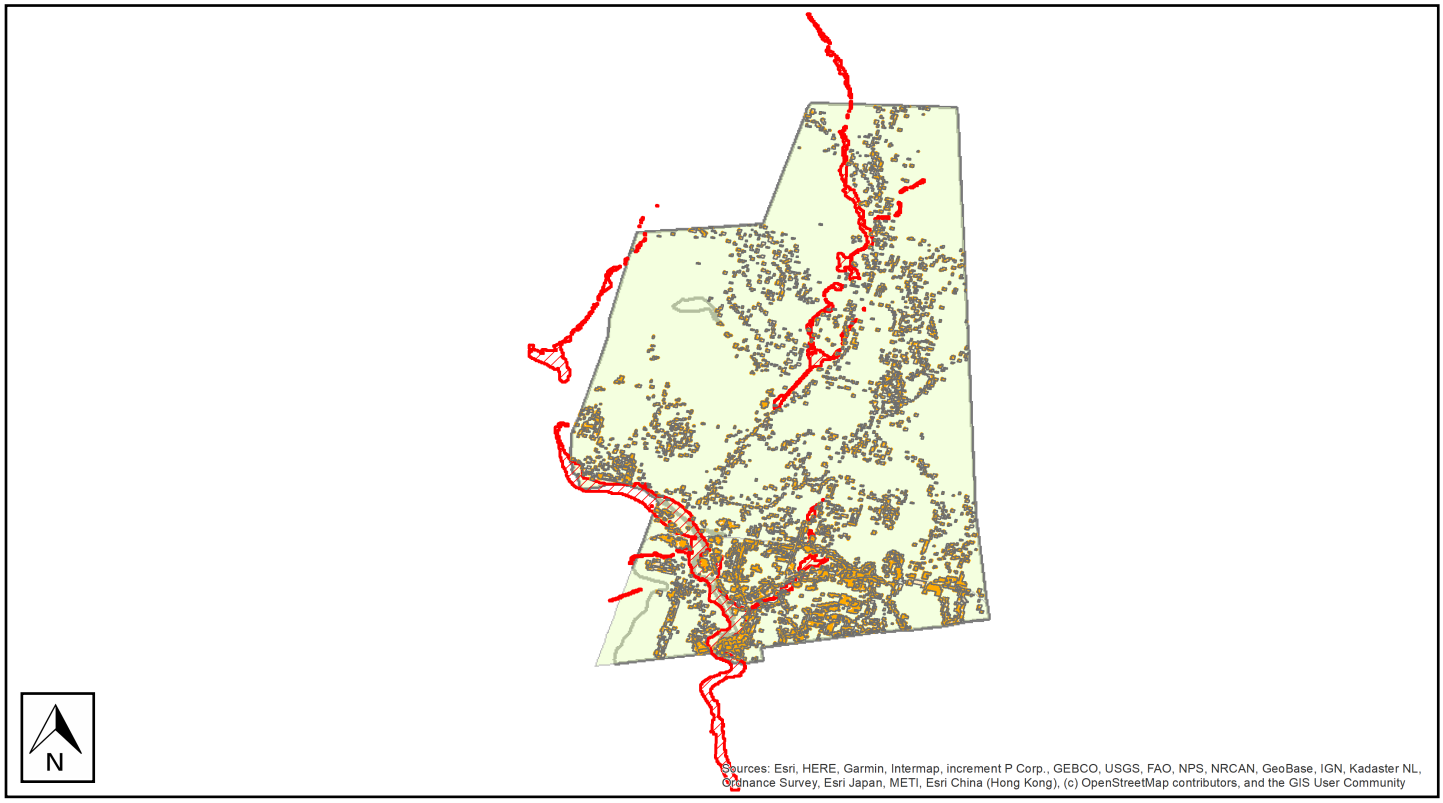
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Canton_FL
Scenario Name:	Canton_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 10 buildings will be at least moderately damaged. This is over 70% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

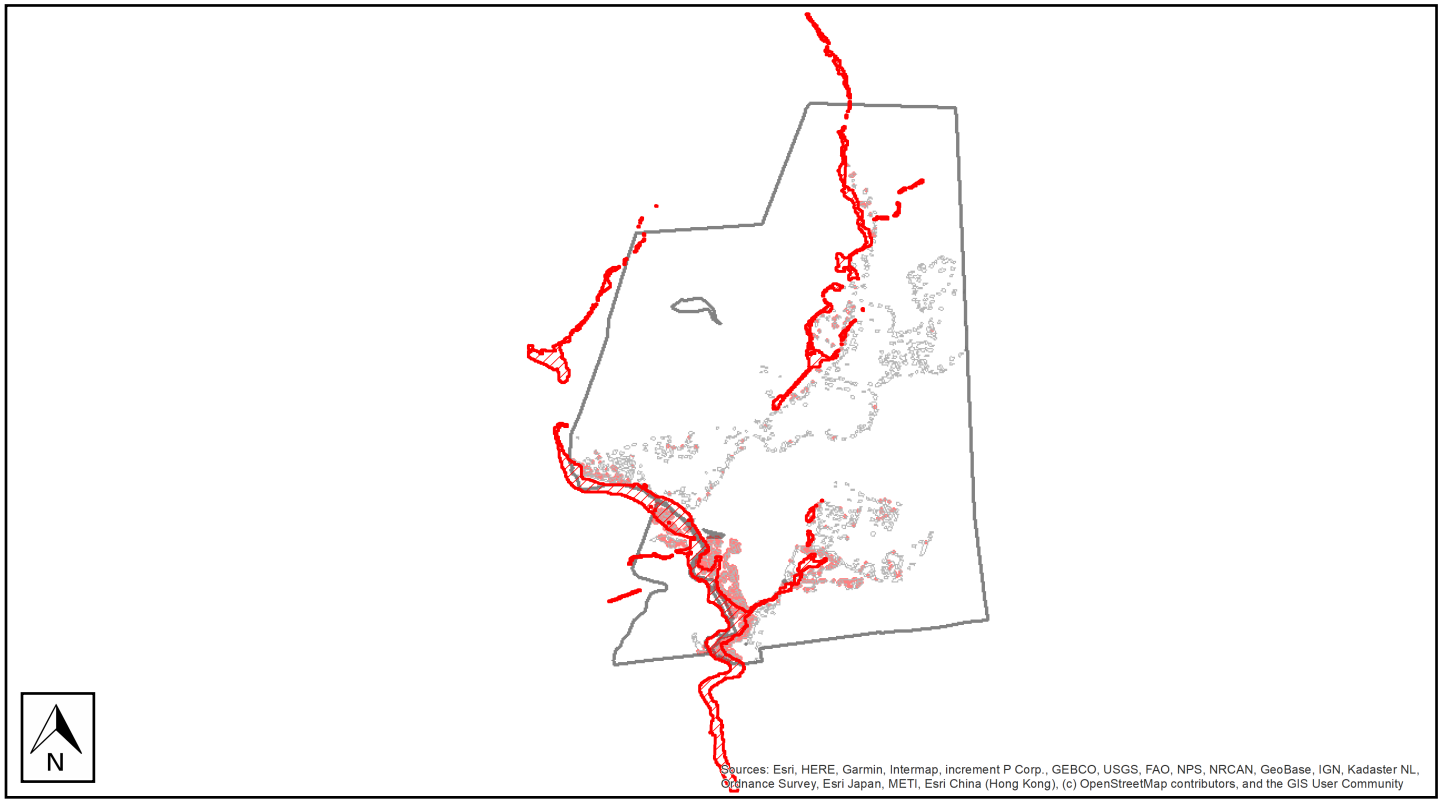


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	3	75	0	0	1	25	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	1	100	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	2	40	1	20	1	20	1	20	0	0
Total	**0**		**6**		**1**		**2**		**1**		**0**	

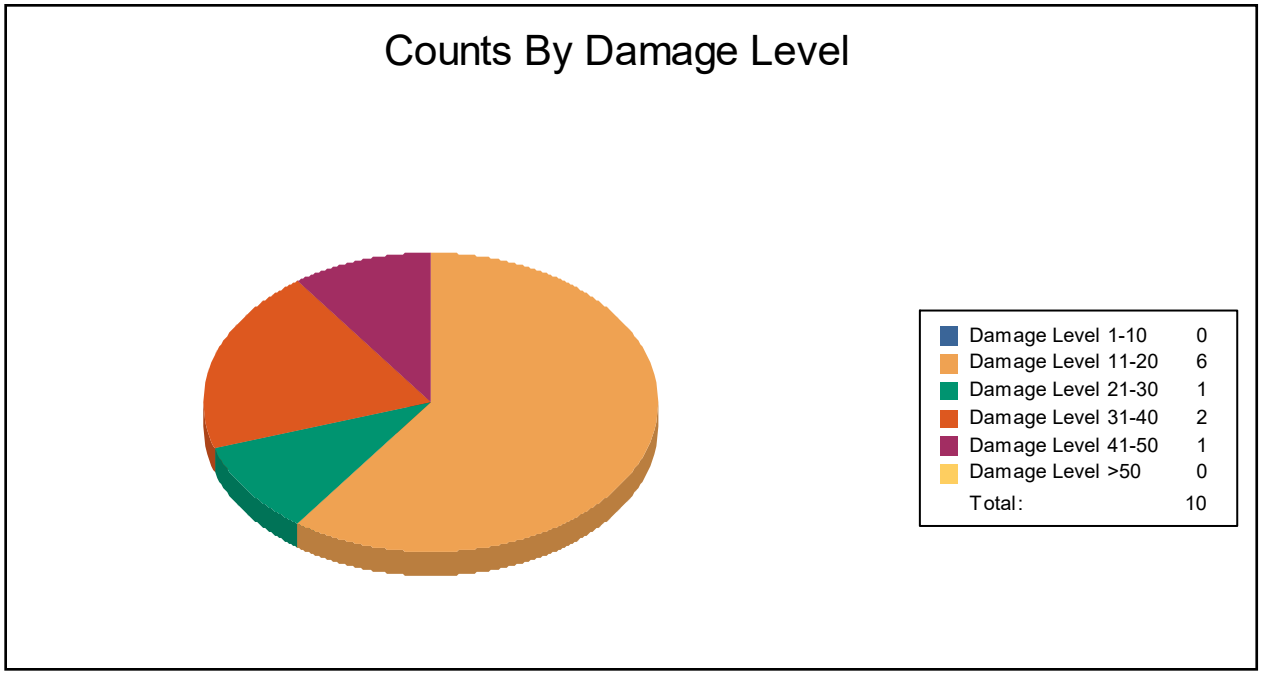


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	2	100	0	0	0	0	0	0	0	0
Steel	0	0	2	100	0	0	0	0	0	0	0	0
Wood	0	0	2	40	1	20	1	20	1	20	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

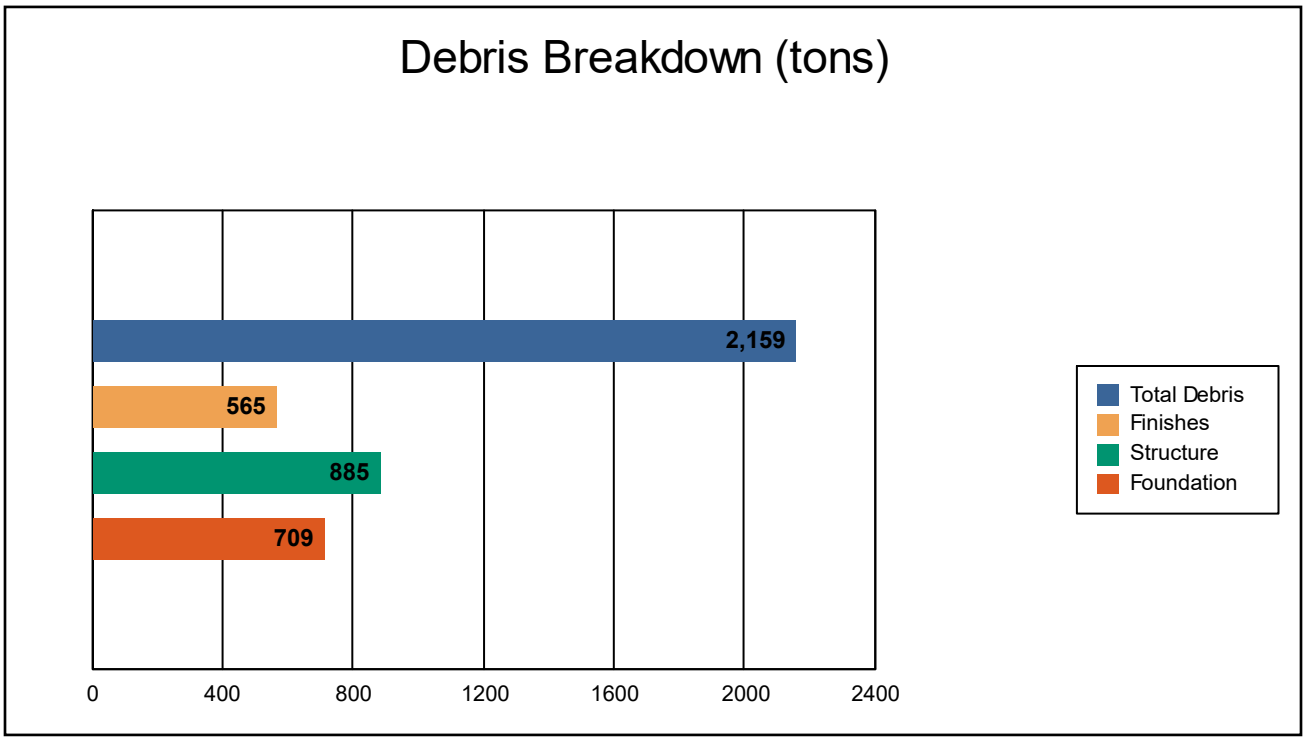
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

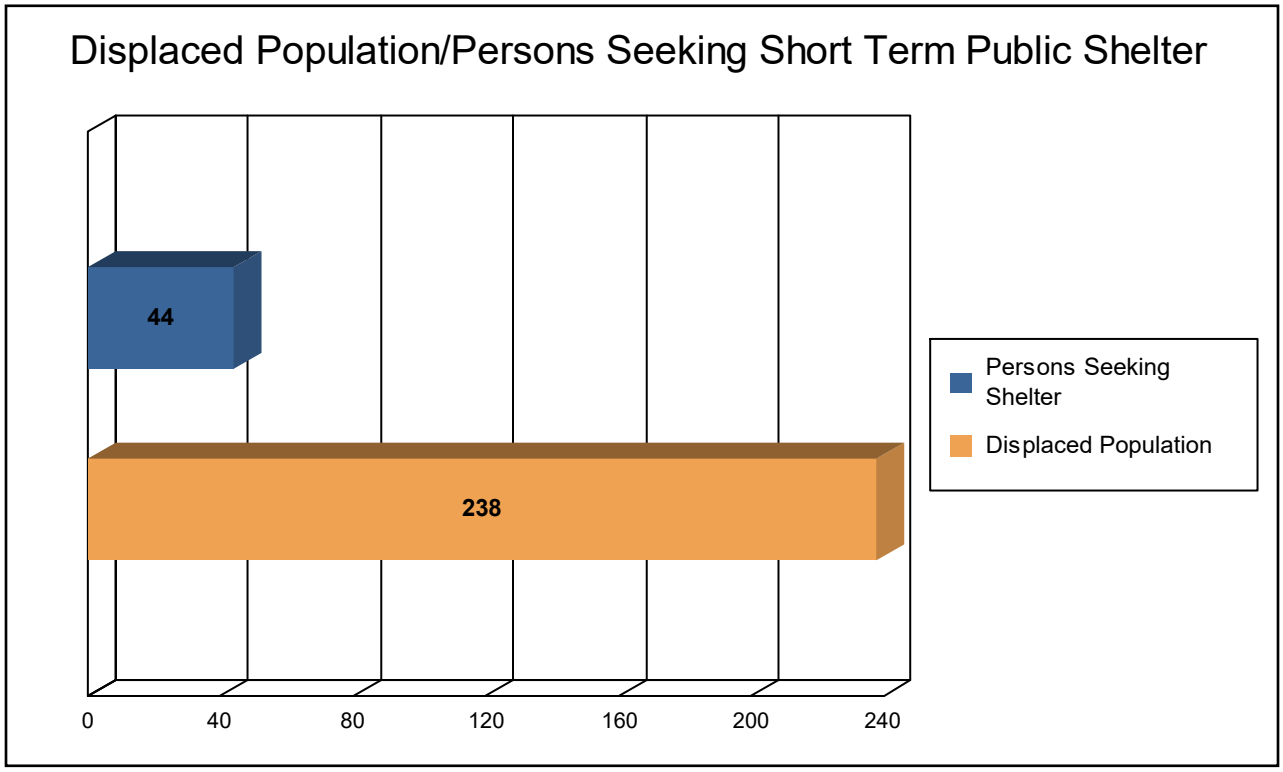


The model estimates that a total of 2,159 tons of debris will be generated. Of the total amount, Finishes comprises 26% of the total, Structure comprises 41% of the total, and Foundation comprises 33%. If the debris tonnage is converted into an estimated number of truckloads, it will require 87 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 79 households (or 238 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 44 people (out of a total population of 10,124) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 112.16 million dollars, which represents 12.65 % of the total replacement value of the scenario buildings.

Building-Related Losses

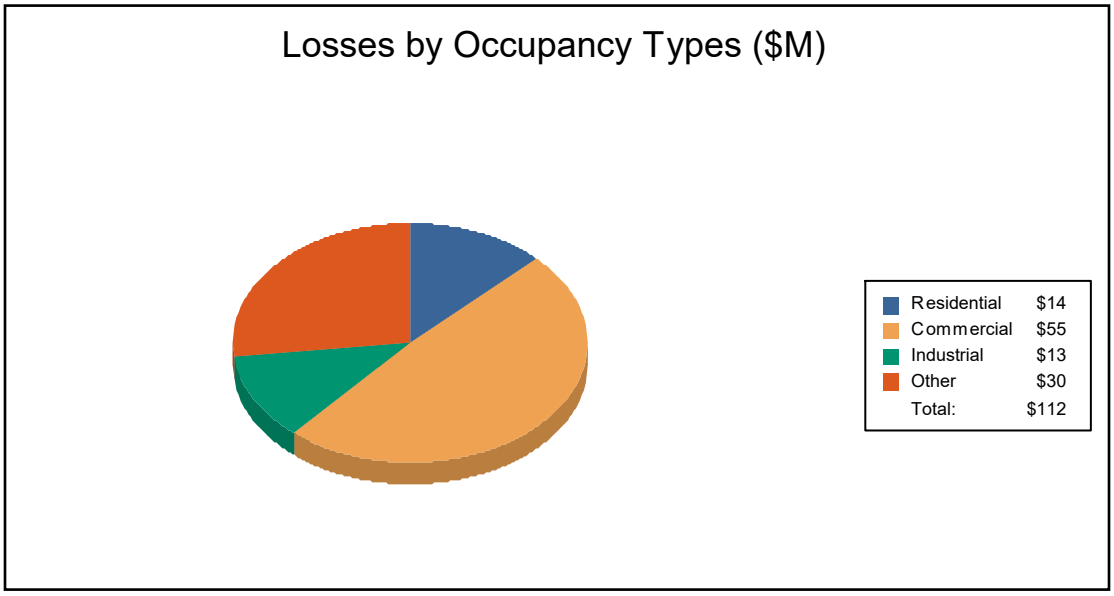
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 59.93 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 12.54% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.08	9.08	3.19	2.51	21.86
	Content	3.77	16.26	7.94	6.29	34.27
	Inventory	0.00	2.38	1.04	0.39	3.81
	Subtotal	**10.86**	**27.72**	**12.17**	**9.19**	**59.93**
Business Interruption						
	Income	0.30	12.89	0.17	1.29	14.66
	Relocation	1.25	3.02	0.20	1.10	5.57
	Rental Income	0.96	2.35	0.06	0.32	3.68
	Wage	0.70	8.91	0.30	18.40	28.32
	Subtotal	**3.21**	**27.17**	**0.73**	**21.11**	**52.23**
ALL	**Total**	**14.07**	**54.89**	**12.91**	**30.30**	**112.16**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,178	674,647	2,155,825
Total	**10,124**	**1,481,178**	**674,647**	**2,155,825**
Total Study Region	**10,124**	**1,481,178**	**674,647**	**2,155,825**

Hazus: Flood Global Risk Report

Region Name: Canton_FL

Flood Scenario: Canton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 3 square miles and contains 143 census blocks. The region contains over 4 thousand households and has a total population of 10,124 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,901 buildings in the region with a total building replacement value (excluding contents) of 2,156 million dollars. Approximately 84.03% of the buildings (and 68.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,901 buildings in the region which have an aggregate total replacement value of 2,156 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,481,178	68.7%
Commercial	415,279	19.3%
Industrial	72,246	3.4%
Agricultural	5,101	0.2%
Religion	19,251	0.9%
Government	76,031	3.5%
Education	86,739	4.0%
Total	**2,155,825**	**100%**

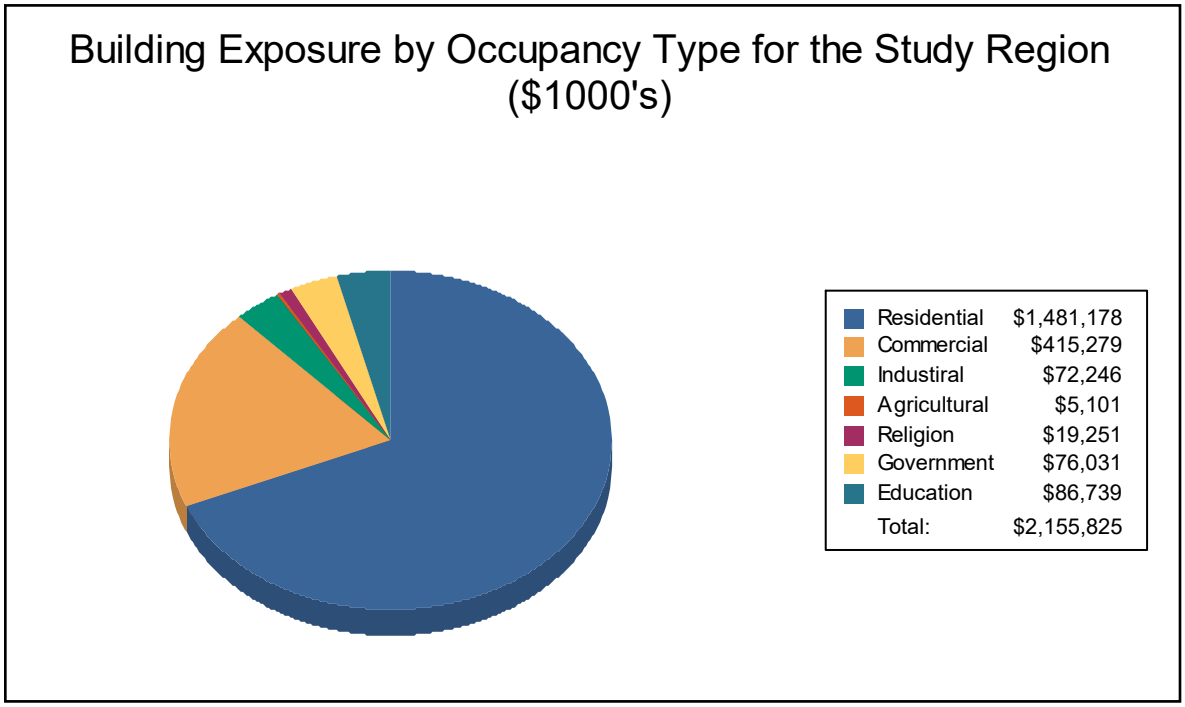
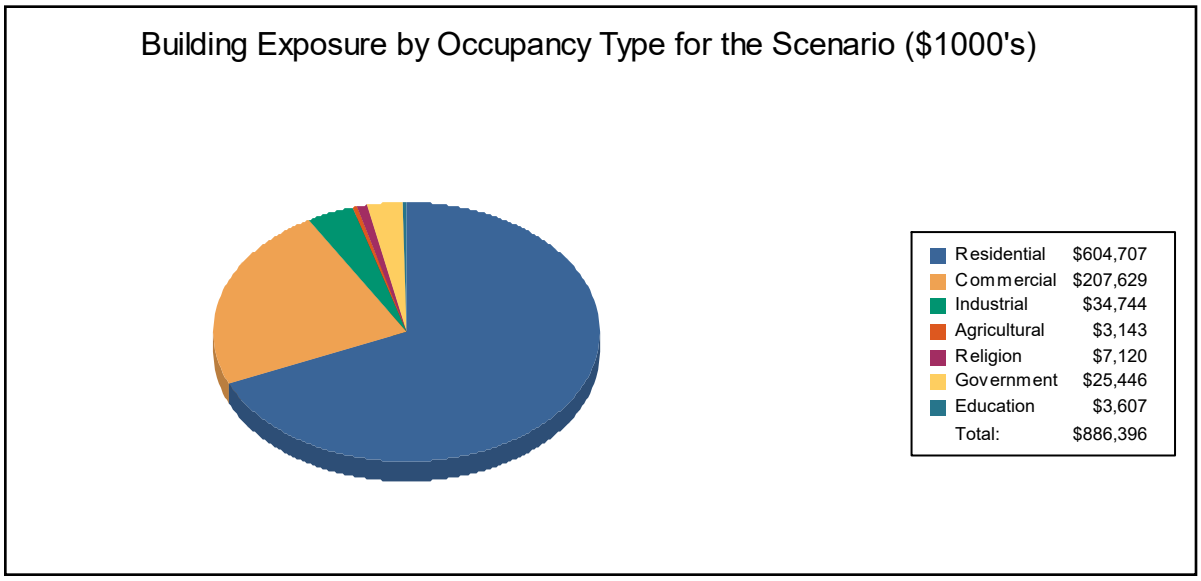


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	604,707	68.2%
Commercial	207,629	23.4%
Industrial	34,744	3.9%
Agricultural	3,143	0.4%
Religion	7,120	0.8%
Government	25,446	2.9%
Education	3,607	0.4%
Total	**886,396**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

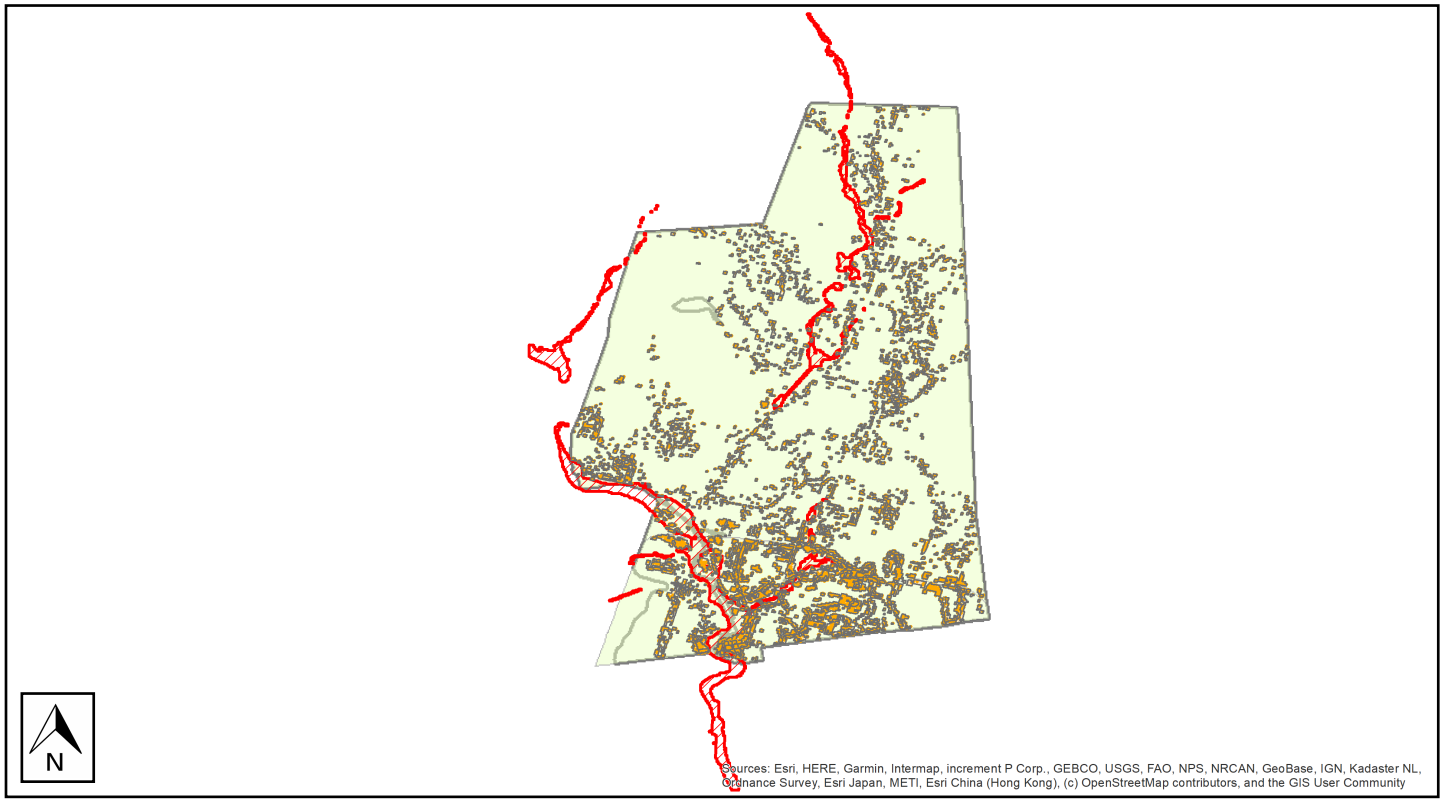
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Canton_FL
Scenario Name:	Canton_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 13 buildings will be at least moderately damaged. This is over 54% of the total number of buildings in the scenario. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

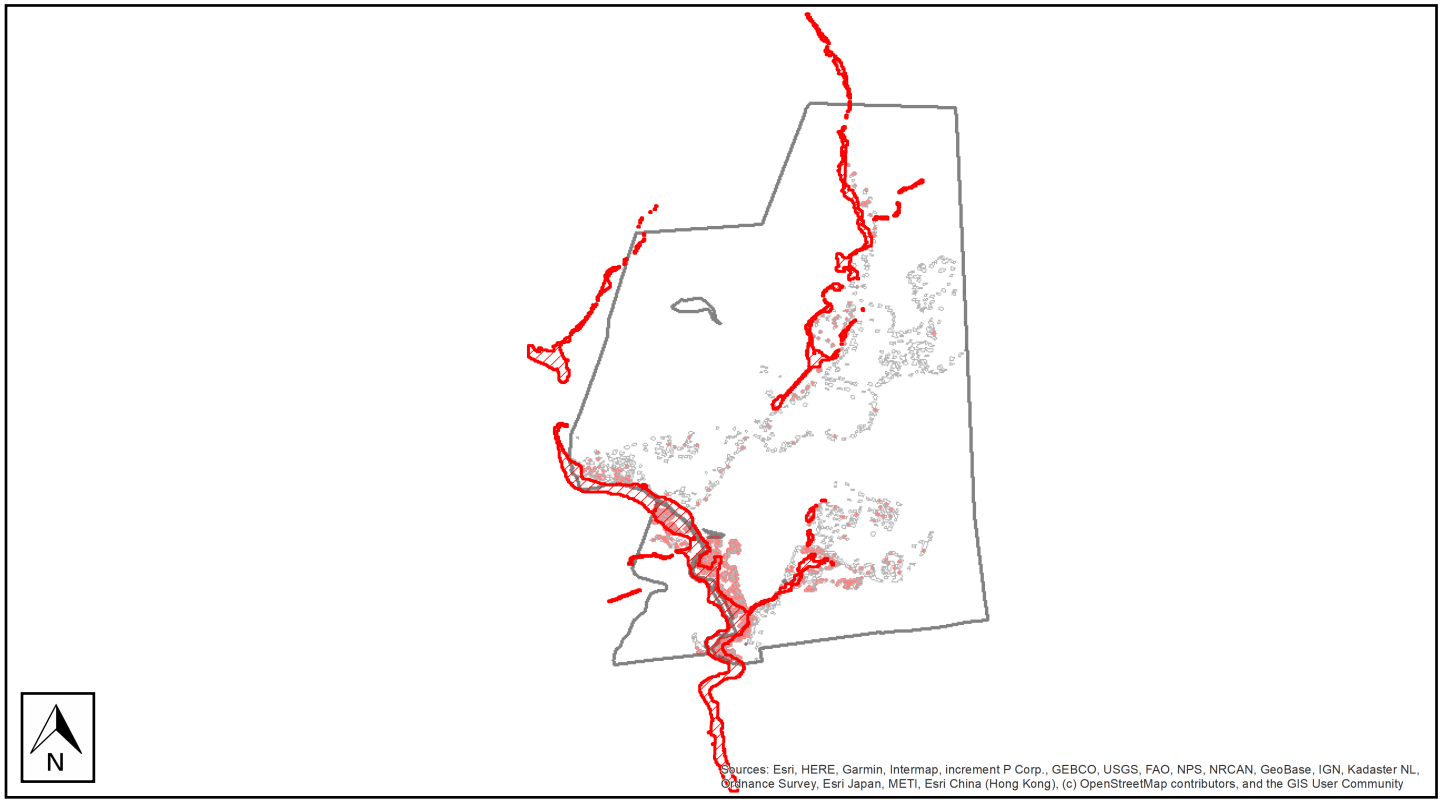


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	20	3	60	1	20	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	1	100	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	2	29	0	0	1	14	4	57
Total	**0**		**1**		**6**		**1**		**1**		**4**	

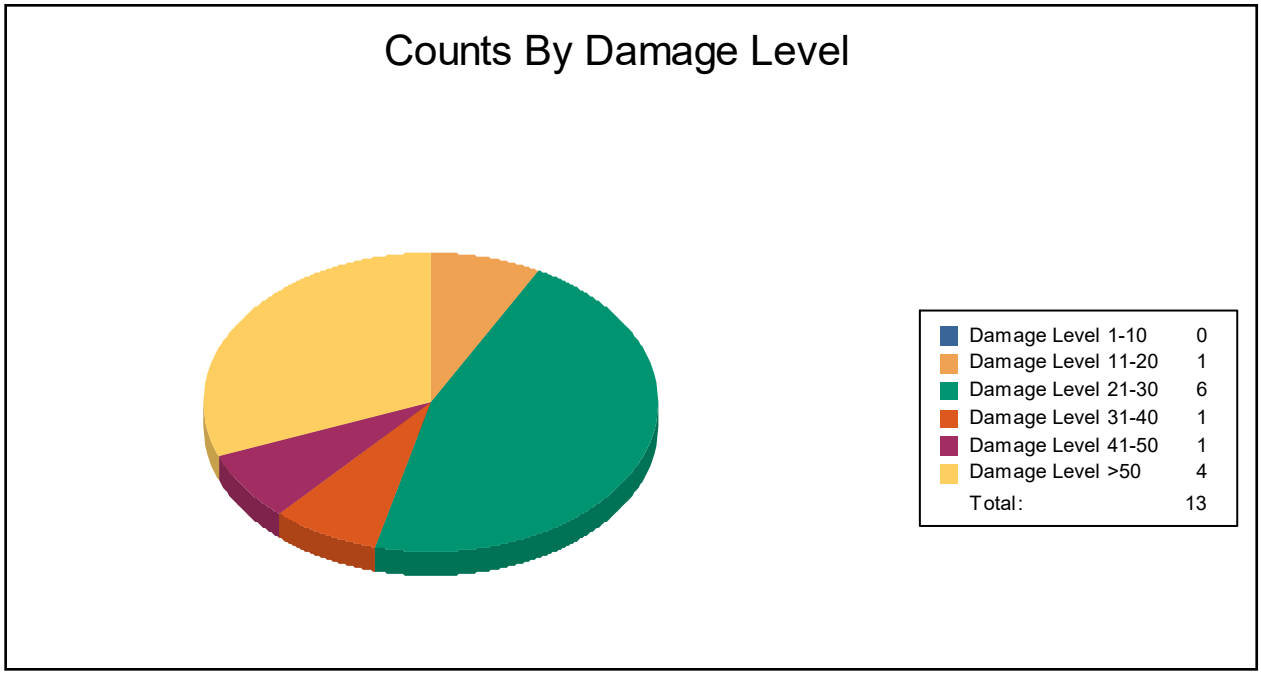


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	2	67	0	0	0	0	1	33
Steel	0	0	1	33	2	67	0	0	0	0	0	0
Wood	0	0	0	0	2	33	0	0	1	17	3	50

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

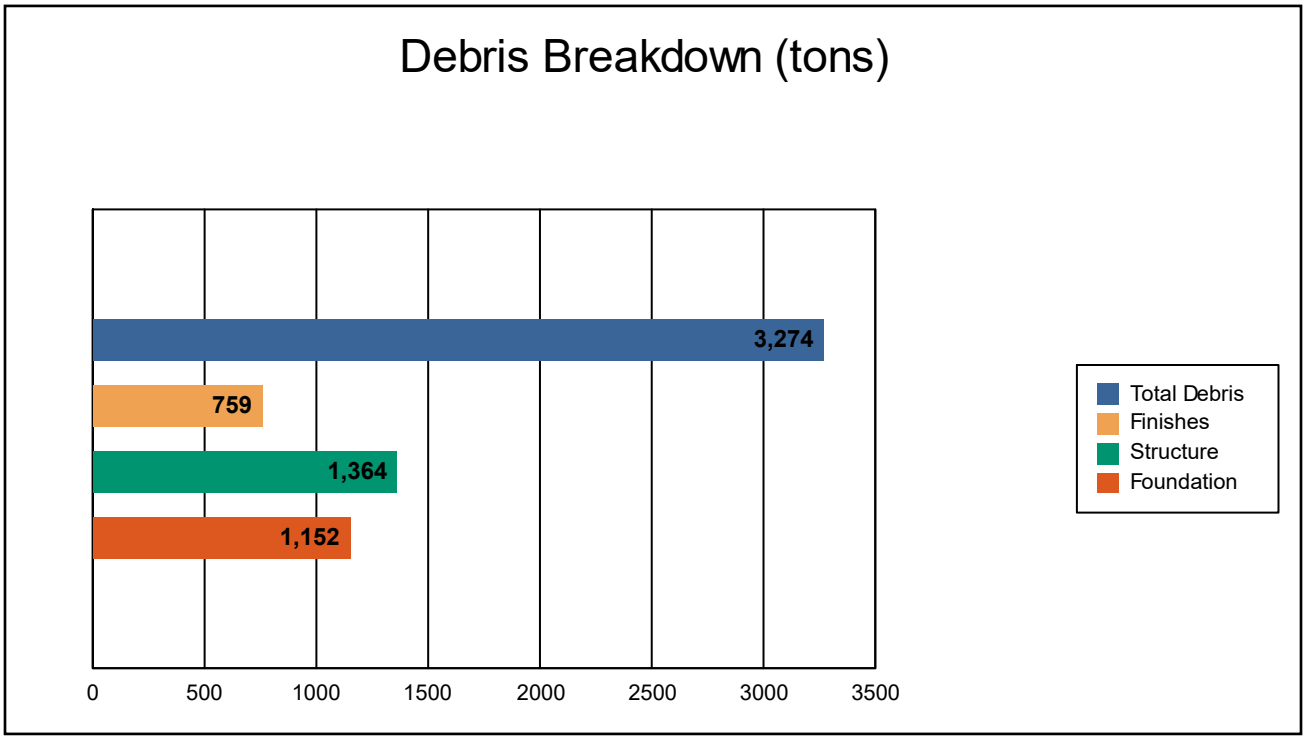
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

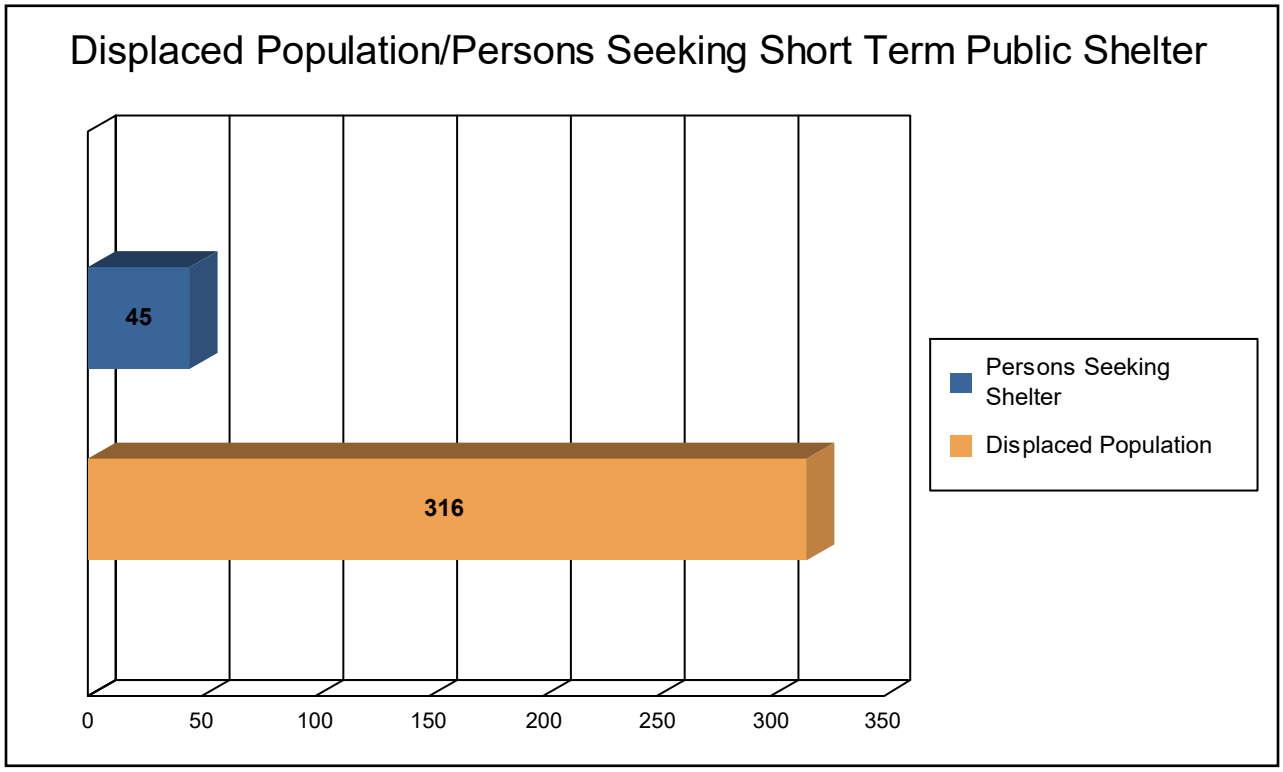


The model estimates that a total of 3,274 tons of debris will be generated. Of the total amount, Finishes comprises 23% of the total, Structure comprises 42% of the total, and Foundation comprises 35%. If the debris tonnage is converted into an estimated number of truckloads, it will require 131 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 105 households (or 316 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 45 people (out of a total population of 10,124) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 147.49 million dollars, which represents 16.64 % of the total replacement value of the scenario buildings.

Building-Related Losses

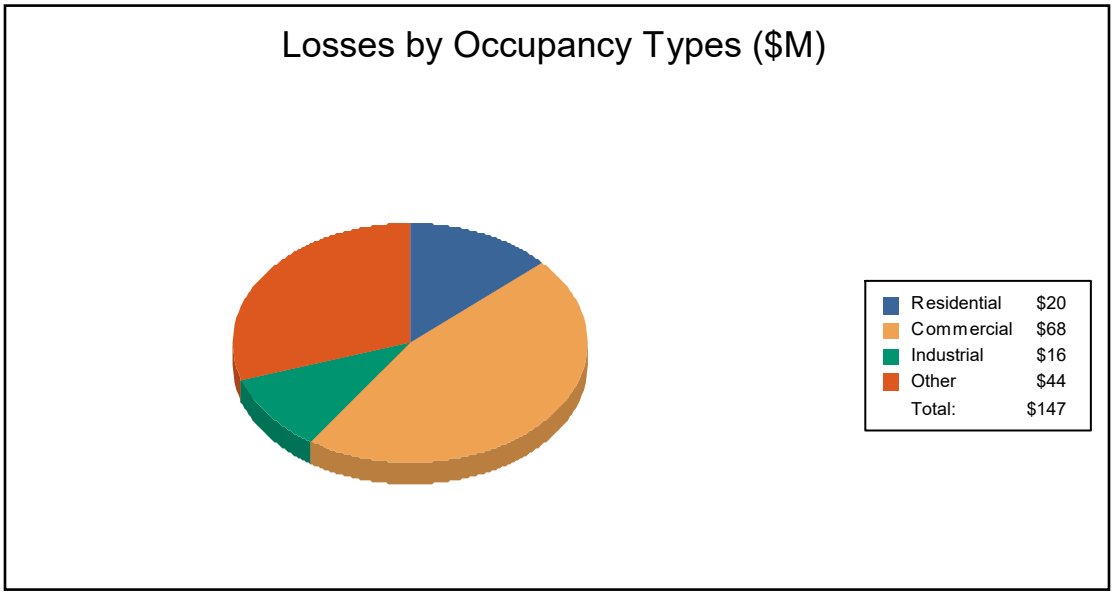
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 77.93 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.45% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.93	11.67	3.93	3.52	29.04
	Content	5.52	20.57	9.63	8.14	43.86
	Inventory	0.00	3.27	1.23	0.53	5.03
	Subtotal	**15.45**	**35.51**	**14.78**	**12.19**	**77.93**
Business Interruption						
	Income	0.44	15.22	0.19	1.58	17.43
	Relocation	1.59	3.62	0.21	1.43	6.85
	Rental Income	1.32	2.80	0.06	0.41	4.60
	Wage	1.04	10.80	0.32	28.52	40.68
	Subtotal	**4.39**	**32.45**	**0.78**	**31.93**	**69.55**
ALL	**Total**	**19.84**	**67.96**	**15.57**	**44.12**	**147.49**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,178	674,647	2,155,825
Total	**10,124**	**1,481,178**	**674,647**	**2,155,825**
Total Study Region	**10,124**	**1,481,178**	**674,647**	**2,155,825**

Hazus: Flood Global Risk Report

Region Name: Canton_FL

Flood Scenario: Canton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 3 square miles and contains 143 census blocks. The region contains over 4 thousand households and has a total population of 10,124 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,901 buildings in the region with a total building replacement value (excluding contents) of 2,156 million dollars. Approximately 84.03% of the buildings (and 68.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,901 buildings in the region which have an aggregate total replacement value of 2,156 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,481,178	68.7%
Commercial	415,279	19.3%
Industrial	72,246	3.4%
Agricultural	5,101	0.2%
Religion	19,251	0.9%
Government	76,031	3.5%
Education	86,739	4.0%
Total	**2,155,825**	**100%**

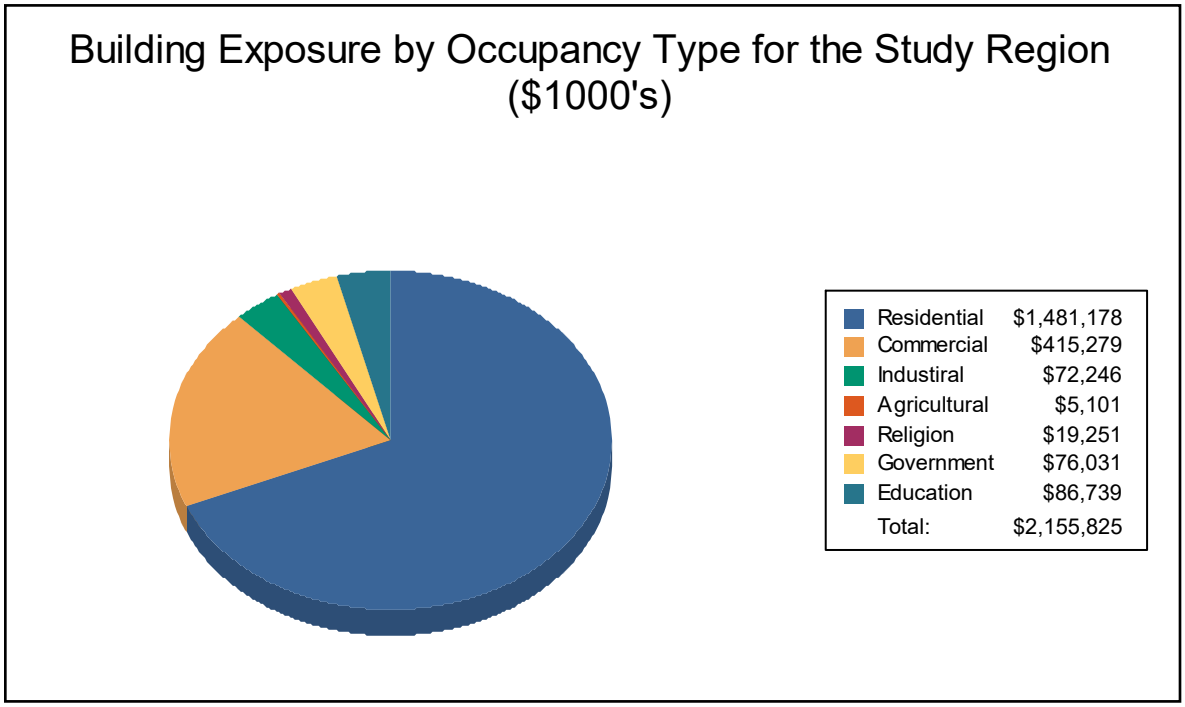
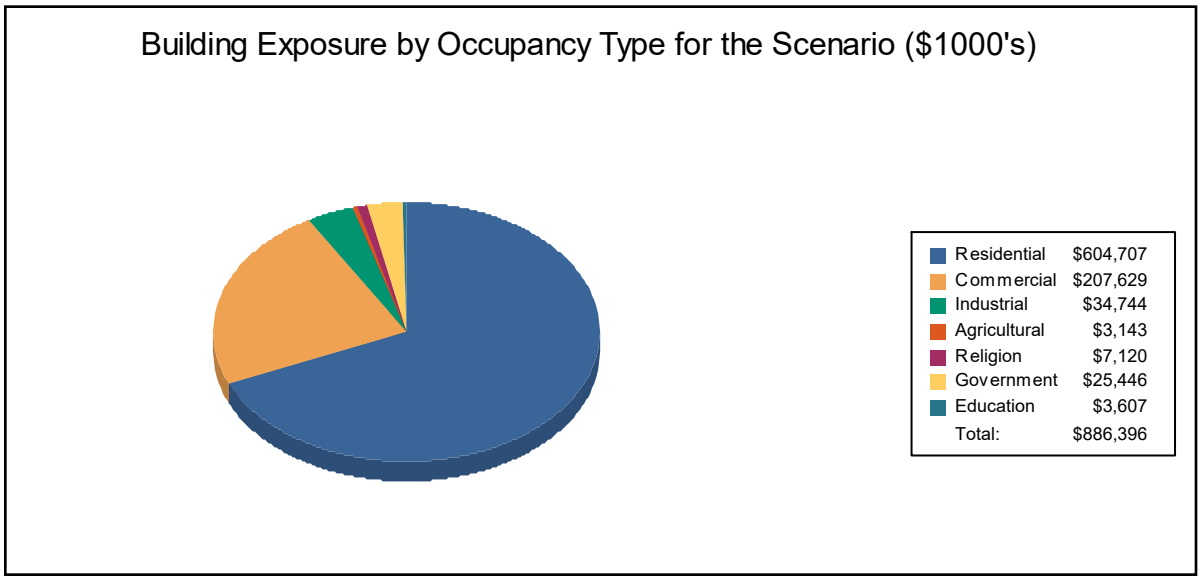


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	604,707	68.2%
Commercial	207,629	23.4%
Industrial	34,744	3.9%
Agricultural	3,143	0.4%
Religion	7,120	0.8%
Government	25,446	2.9%
Education	3,607	0.4%
Total	**886,396**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

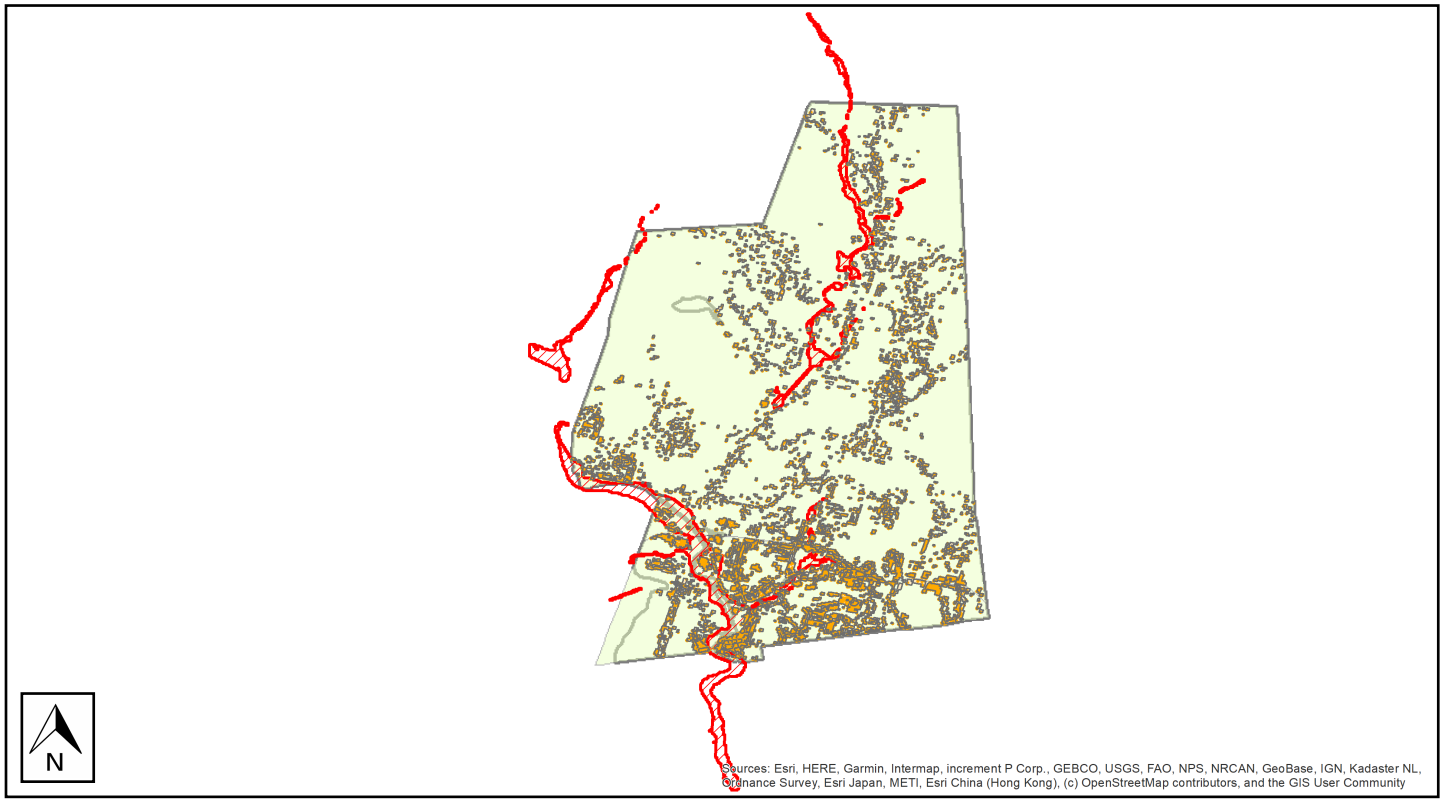
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Canton_FL
Scenario Name:	Canton_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 16 buildings will be at least moderately damaged. This is over 38% of the total number of buildings in the scenario. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

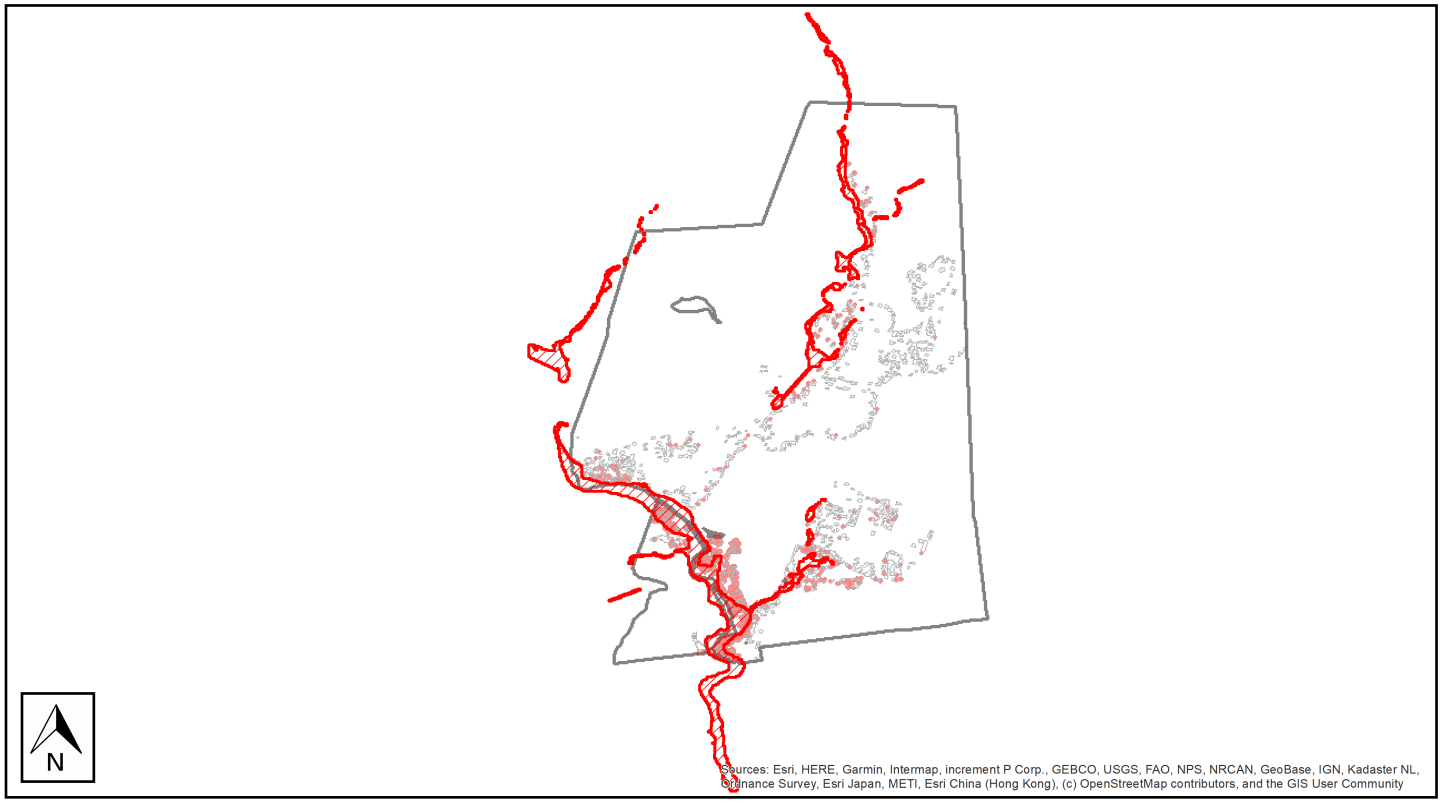


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	2	40	2	40	1	20	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	1	50	0	0	1	50	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	1	11	2	22	0	0	1	11	5	56
Total	**0**		**1**		**5**		**2**		**3**		**5**	

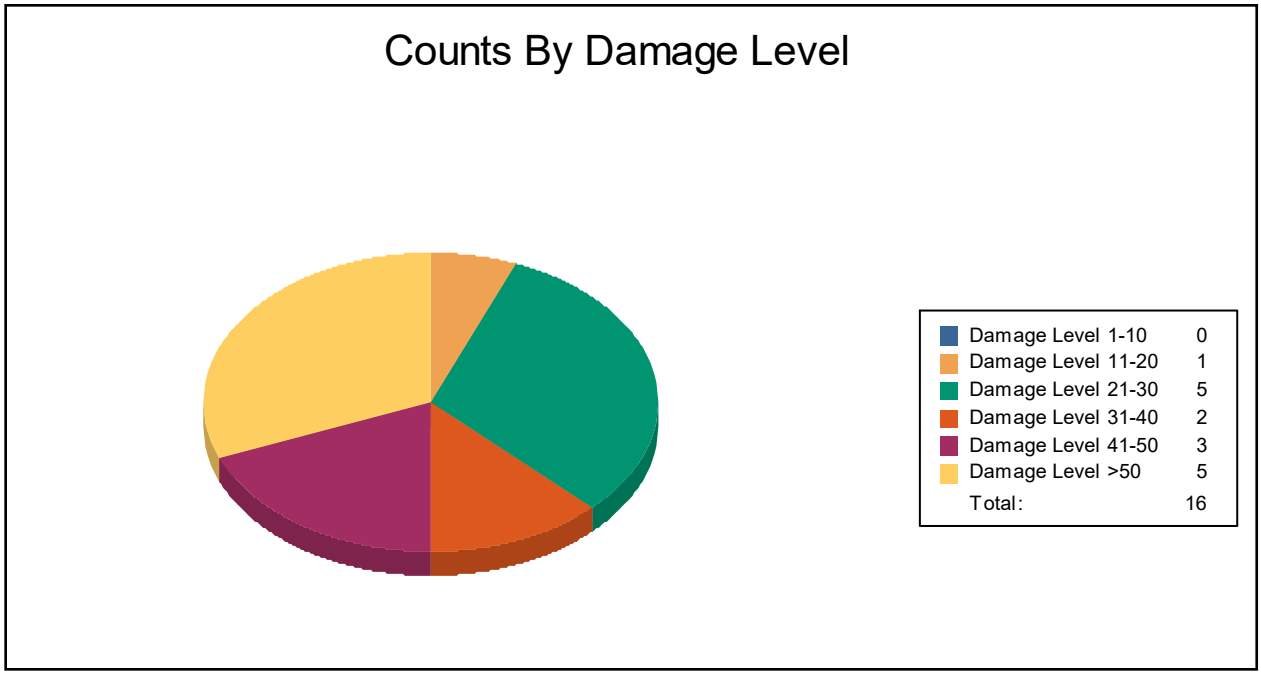


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	1	25	1	25	1	25	1	25
Steel	0	0	0	0	2	50	1	25	1	25	0	0
Wood	0	0	1	11	2	22	1	11	1	11	4	44

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

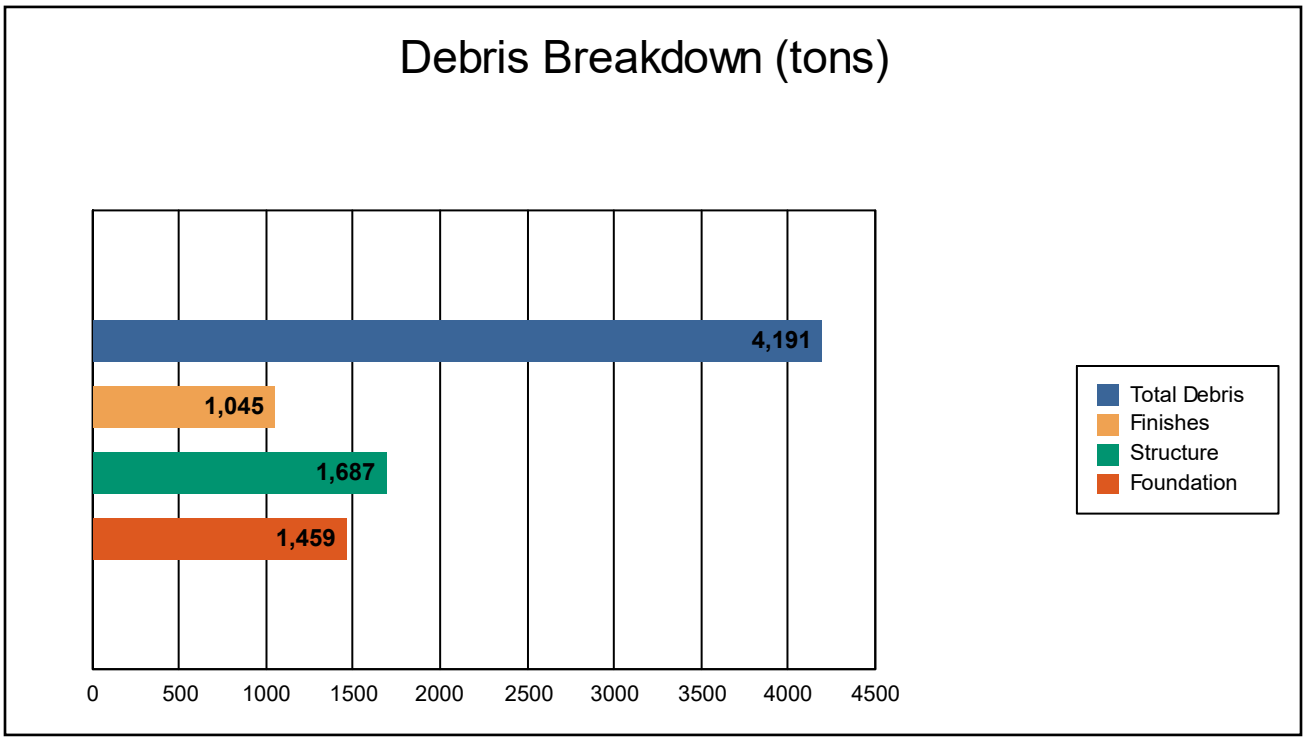
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

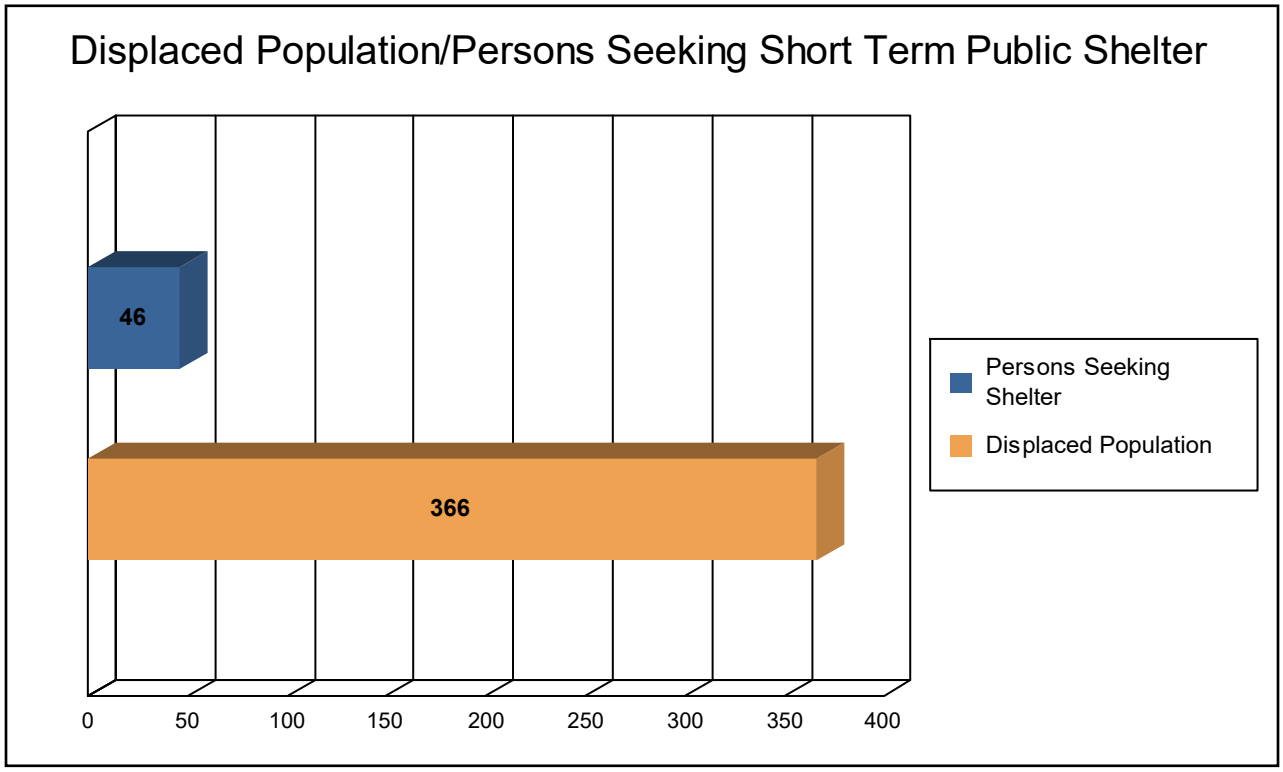


The model estimates that a total of 4,191 tons of debris will be generated. Of the total amount, Finishes comprises 25% of the total, Structure comprises 40% of the total, and Foundation comprises 35%. If the debris tonnage is converted into an estimated number of truckloads, it will require 168 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 122 households (or 366 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 46 people (out of a total population of 10,124) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 184.13 million dollars, which represents 20.77 % of the total replacement value of the scenario buildings.

Building-Related Losses

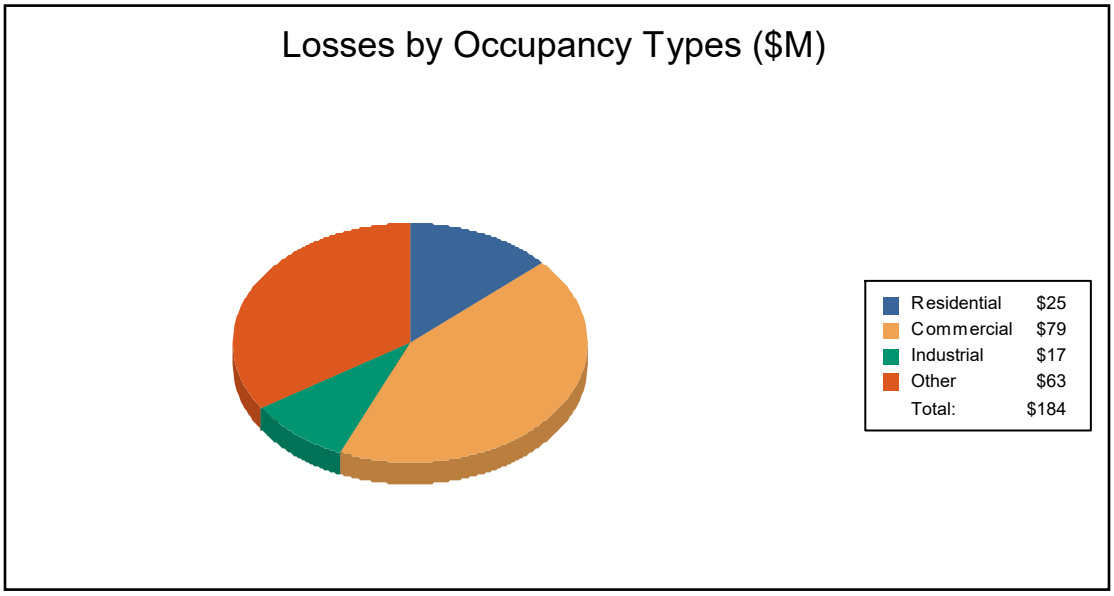
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 92.25 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.46% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	12.52	13.85	4.50	4.32	35.19
	Content	6.98	23.97	10.67	9.64	51.25
	Inventory	0.00	3.89	1.33	0.59	5.81
	Subtotal	**19.50**	**41.72**	**16.49**	**14.54**	**92.25**
Business Interruption						
	Income	0.55	17.44	0.19	1.87	20.05
	Relocation	1.87	4.17	0.21	1.84	8.10
	Rental Income	1.58	3.22	0.06	0.53	5.39
	Wage	1.29	12.57	0.33	44.16	58.35
	Subtotal	**5.29**	**37.40**	**0.79**	**48.40**	**91.88**
ALL	**Total**	**24.79**	**79.12**	**17.28**	**62.94**	**184.13**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,178	674,647	2,155,825
Total	**10,124**	**1,481,178**	**674,647**	**2,155,825**
Total Study Region	**10,124**	**1,481,178**	**674,647**	**2,155,825**

Hazus: Flood Global Risk Report

Region Name: Canton_FL

Flood Scenario: Canton_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 3 square miles and contains 143 census blocks. The region contains over 4 thousand households and has a total population of 10,124 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,901 buildings in the region with a total building replacement value (excluding contents) of 2,156 million dollars. Approximately 84.03% of the buildings (and 68.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,901 buildings in the region which have an aggregate total replacement value of 2,156 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,481,178	68.7%
Commercial	415,279	19.3%
Industrial	72,246	3.4%
Agricultural	5,101	0.2%
Religion	19,251	0.9%
Government	76,031	3.5%
Education	86,739	4.0%
Total	**2,155,825**	**100%**

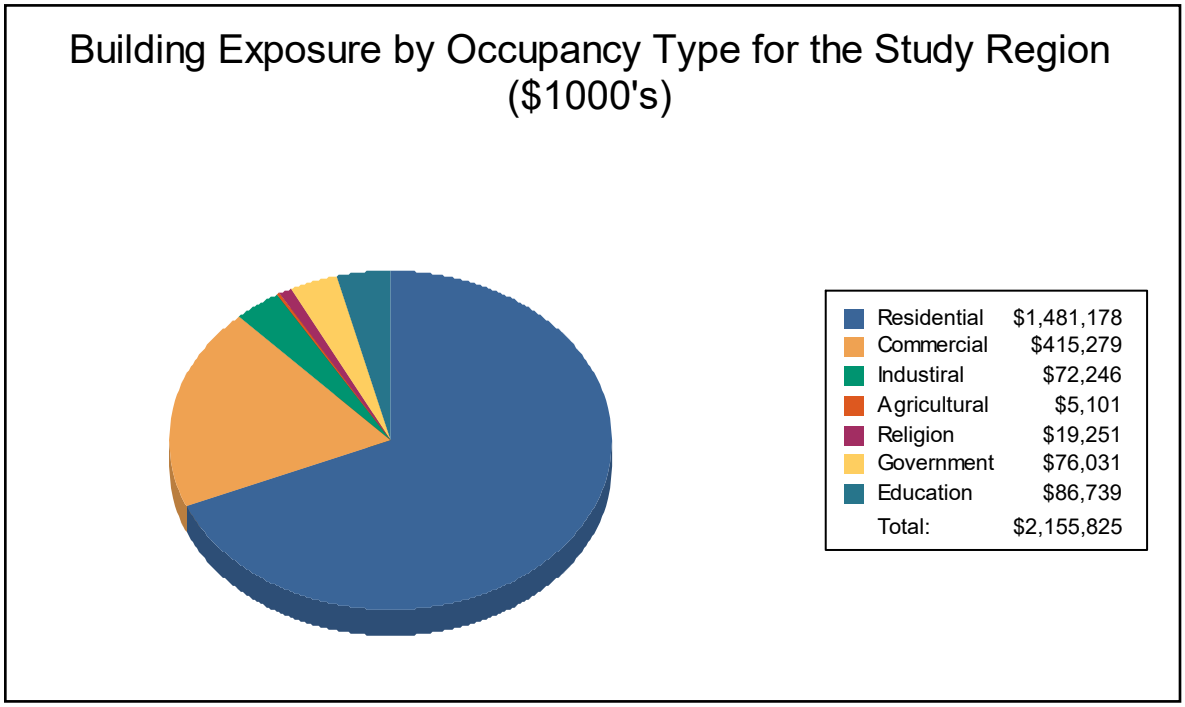
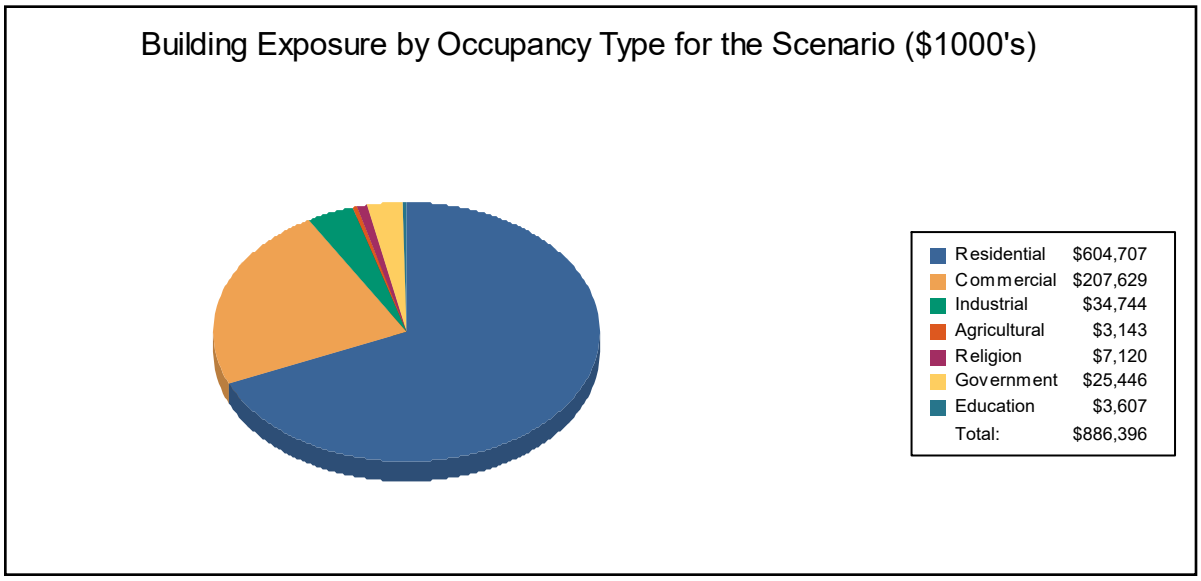


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	604,707	68.2%
Commercial	207,629	23.4%
Industrial	34,744	3.9%
Agricultural	3,143	0.4%
Religion	7,120	0.8%
Government	25,446	2.9%
Education	3,607	0.4%
Total	**886,396**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

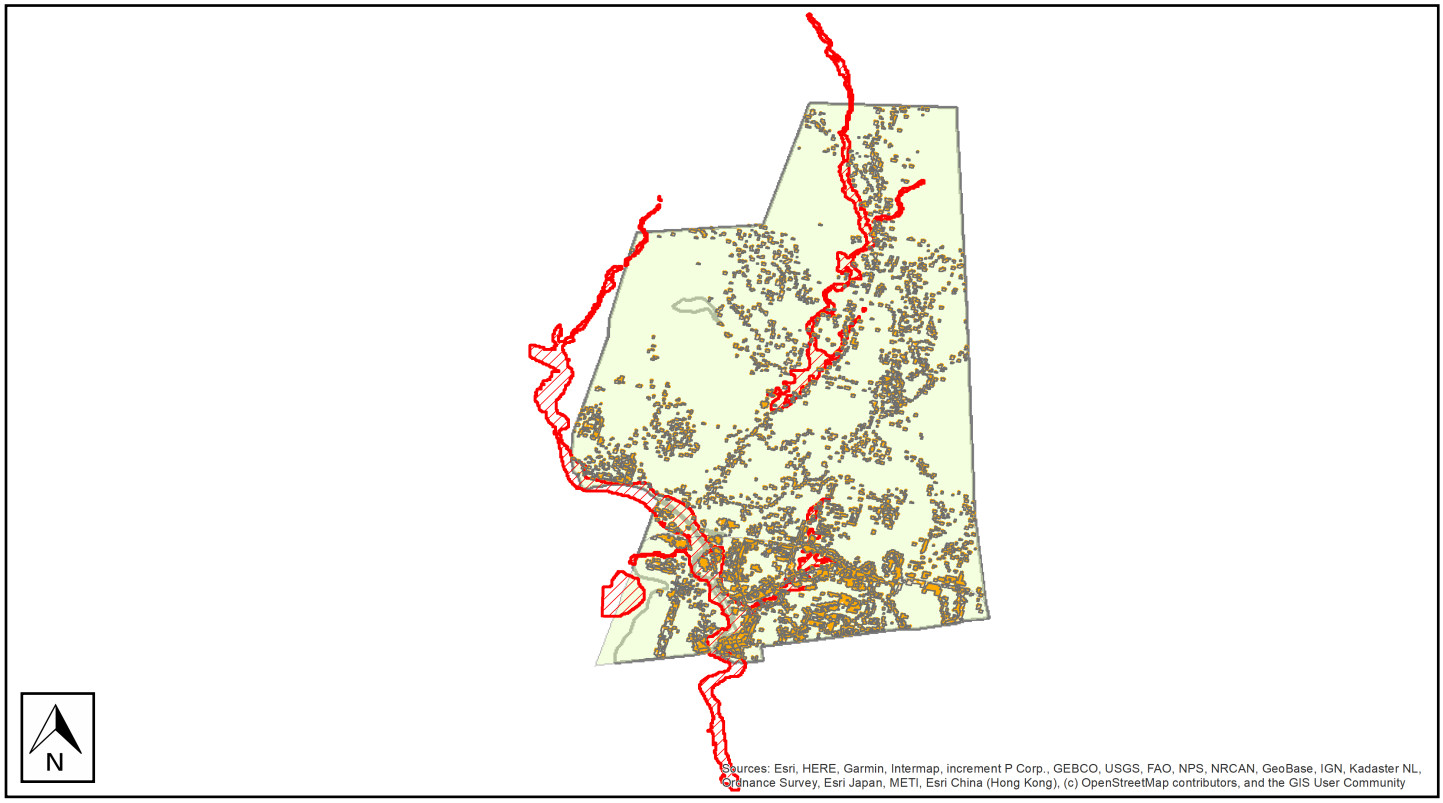
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Canton_FL
Scenario Name:	Canton_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 21 buildings will be at least moderately damaged. This is over 26% of the total number of buildings in the scenario. There are an estimated 9 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

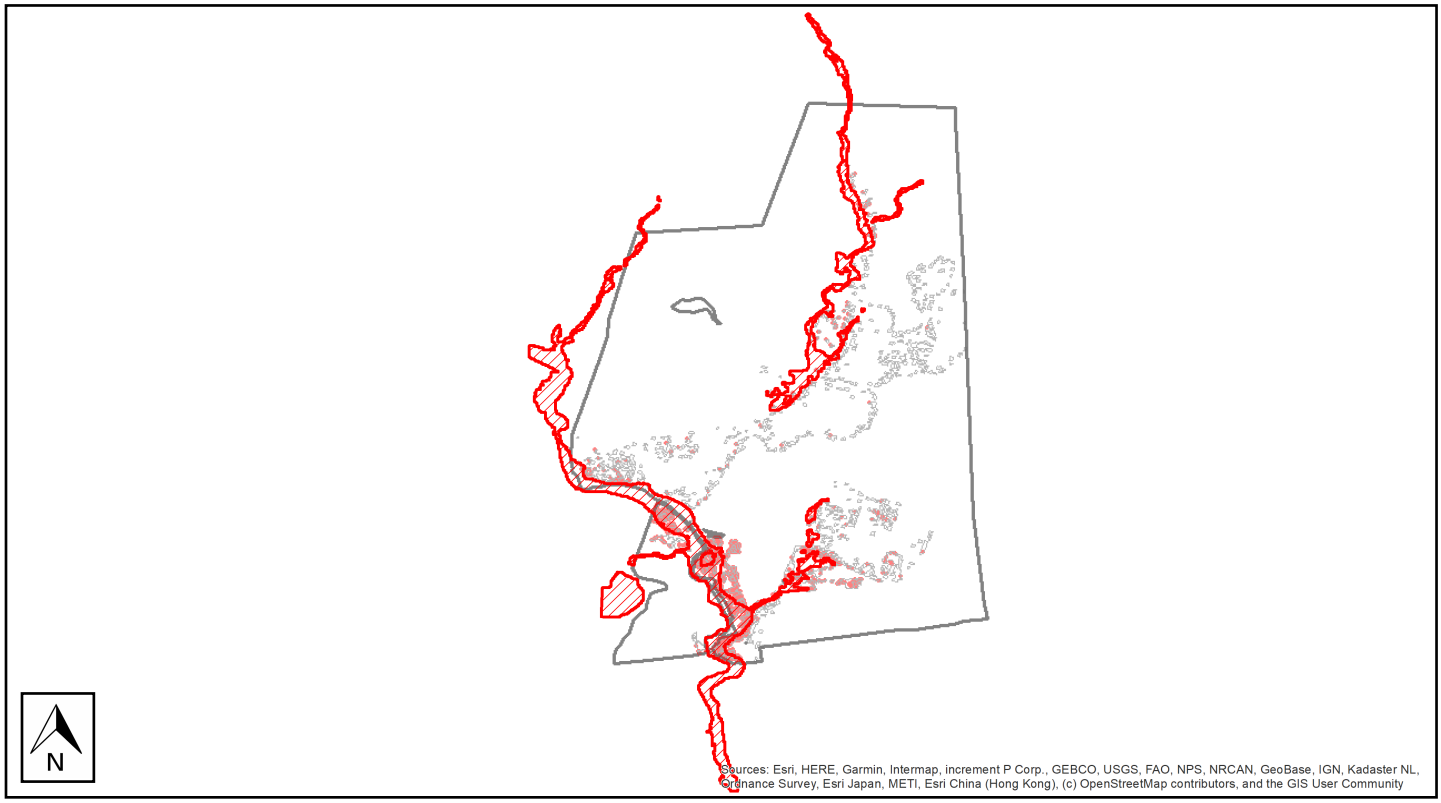


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	1	33	2	67	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	2	50	1	25	1	25
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	13	3	19	1	6	0	0	2	13	8	50
Total	**2**		**3**		**1**		**3**		**5**		**9**	

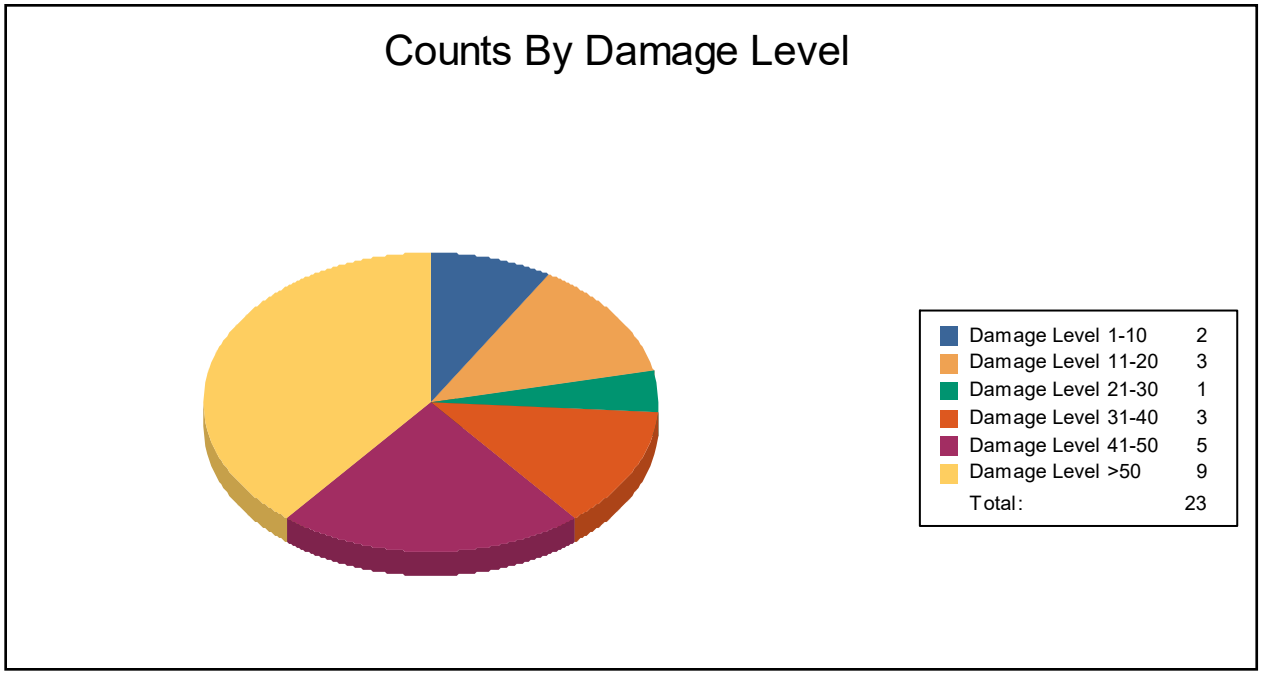


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	1	20	2	40	2	40
Steel	0	0	0	0	0	0	2	40	2	40	1	20
Wood	2	14	3	21	1	7	0	0	2	14	6	43

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

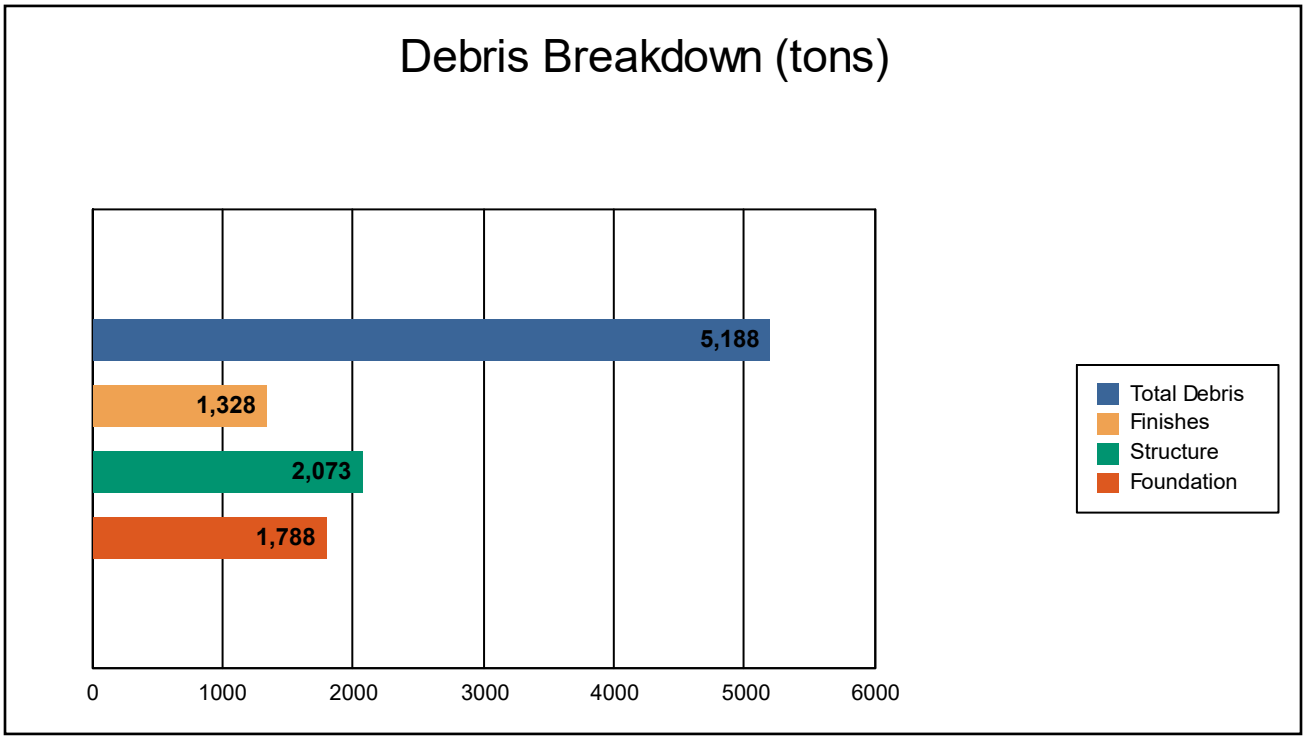
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

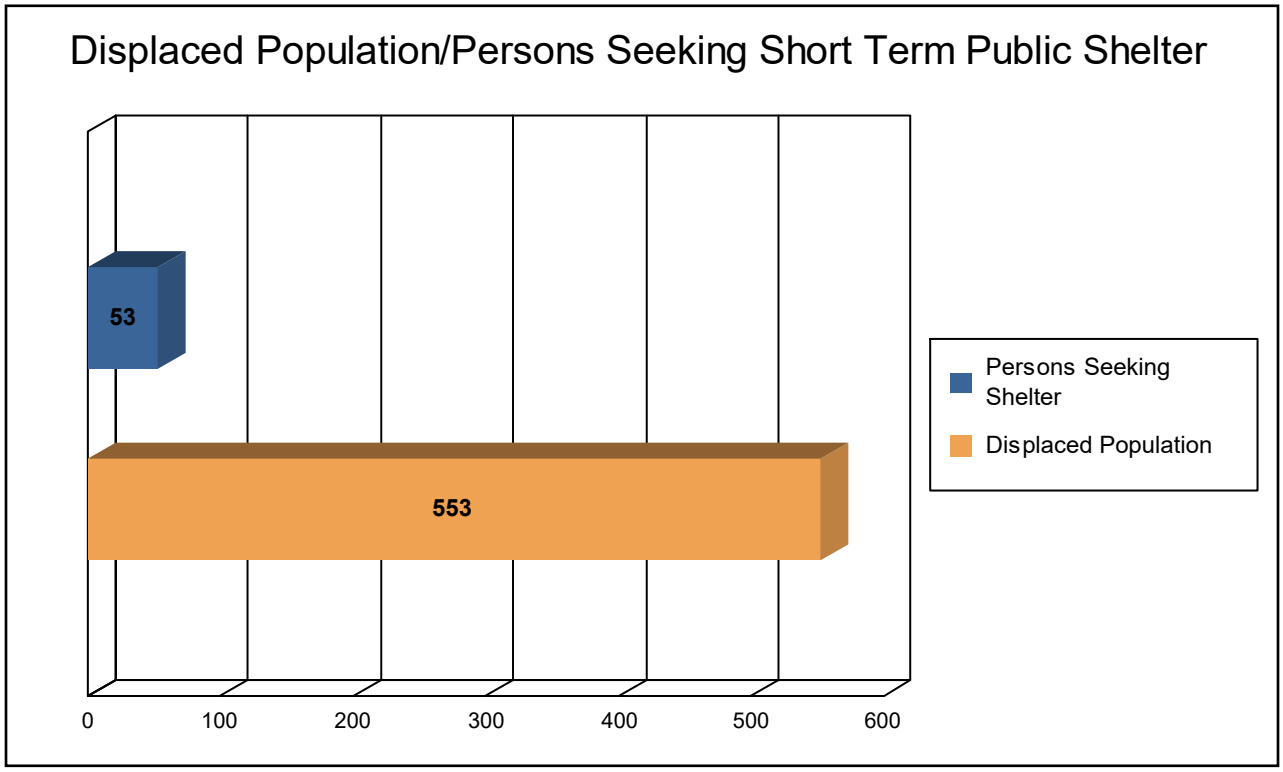


The model estimates that a total of 5,188 tons of debris will be generated. Of the total amount, Finishes comprises 26% of the total, Structure comprises 40% of the total, and Foundation comprises 34%. If the debris tonnage is converted into an estimated number of truckloads, it will require 208 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 184 households (or 553 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 53 people (out of a total population of 10,124) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 227.41 million dollars, which represents 25.66 % of the total replacement value of the scenario buildings.

Building-Related Losses

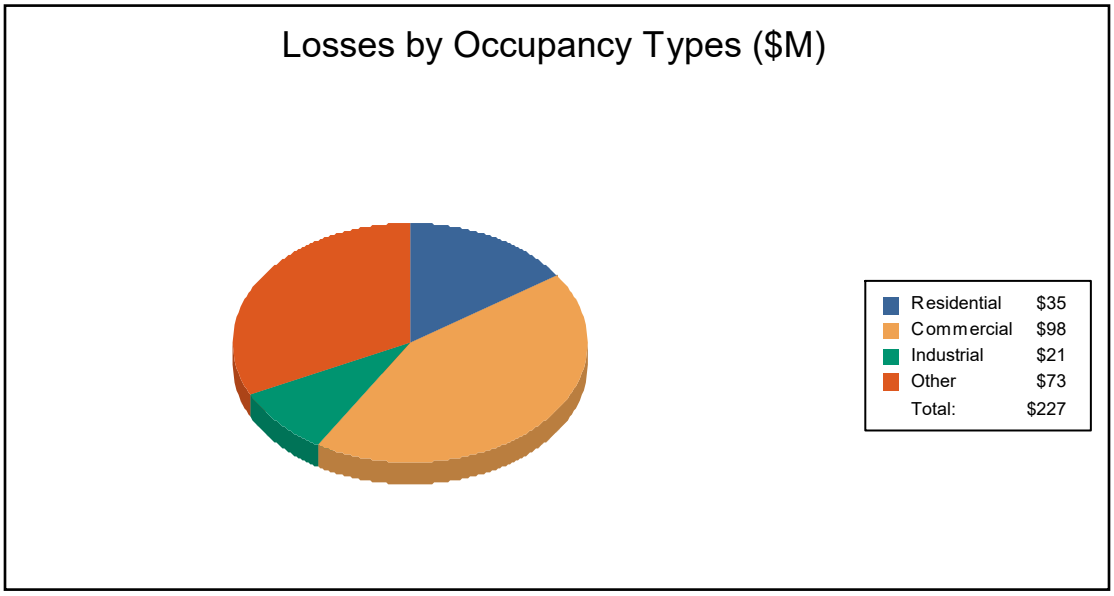
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 118.38 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 15.59% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	17.48	17.19	5.67	5.60	45.94
	Content	9.88	30.36	12.80	12.32	65.36
	Inventory	0.00	4.84	1.60	0.65	7.09
	Subtotal	**27.36**	**52.39**	**20.06**	**18.57**	**118.38**
Business Interruption						
	Income	1.03	20.82	0.22	2.07	24.14
	Relocation	2.56	4.88	0.23	2.01	9.68
	Rental Income	2.08	3.78	0.07	0.58	6.51
	Wage	2.42	15.90	0.37	50.01	68.70
	Subtotal	**8.09**	**45.38**	**0.89**	**54.68**	**109.03**
ALL	**Total**	**35.45**	**97.77**	**20.95**	**73.25**	**227.41**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,178	674,647	2,155,825
Total	**10,124**	**1,481,178**	**674,647**	**2,155,825**
Total Study Region	**10,124**	**1,481,178**	**674,647**	**2,155,825**

Hazus: Flood Global Risk Report

Region Name: Columbia_FL

Flood Scenario: Columbia_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 72 census blocks. The region contains over 2 thousand households and has a total population of 5,272 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,447 buildings in the region with a total building replacement value (excluding contents) of 1,082 million dollars. Approximately 91.87% of the buildings (and 75.59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,447 buildings in the region which have an aggregate total replacement value of 1,082 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	817,735	75.6%
Commercial	124,704	11.5%
Industrial	38,527	3.6%
Agricultural	1,477	0.1%
Religion	6,000	0.6%
Government	63,222	5.8%
Education	30,144	2.8%
Total	**1,081,809**	**100%**

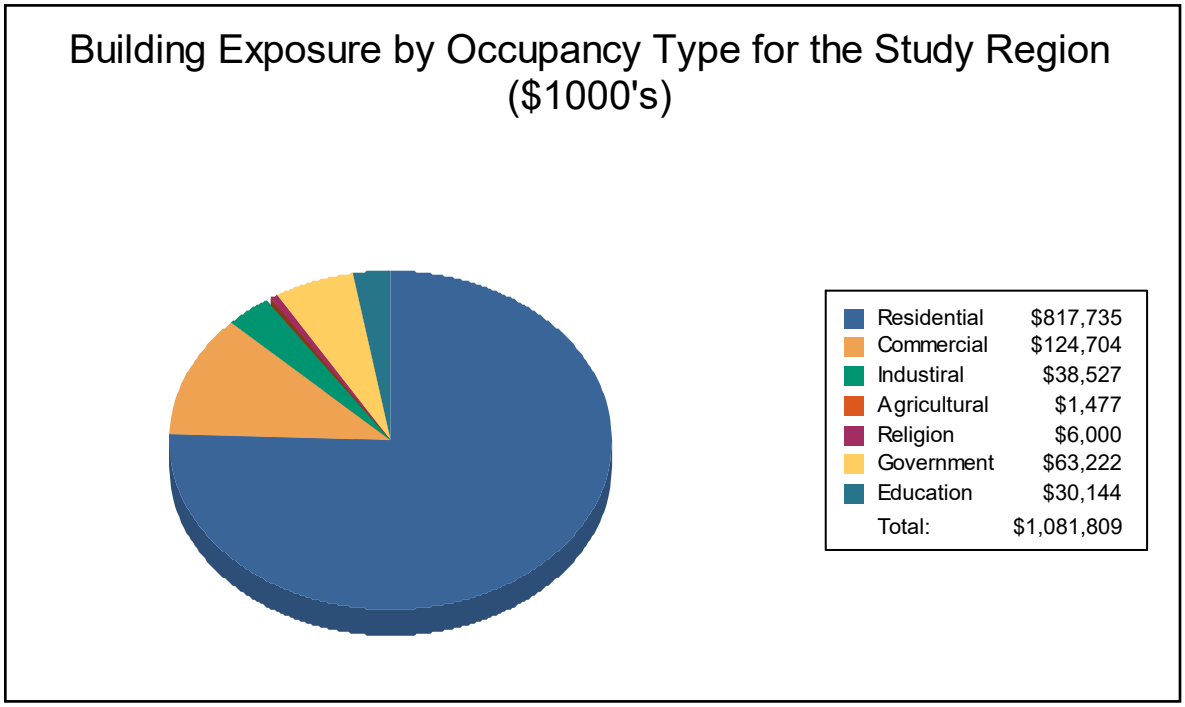
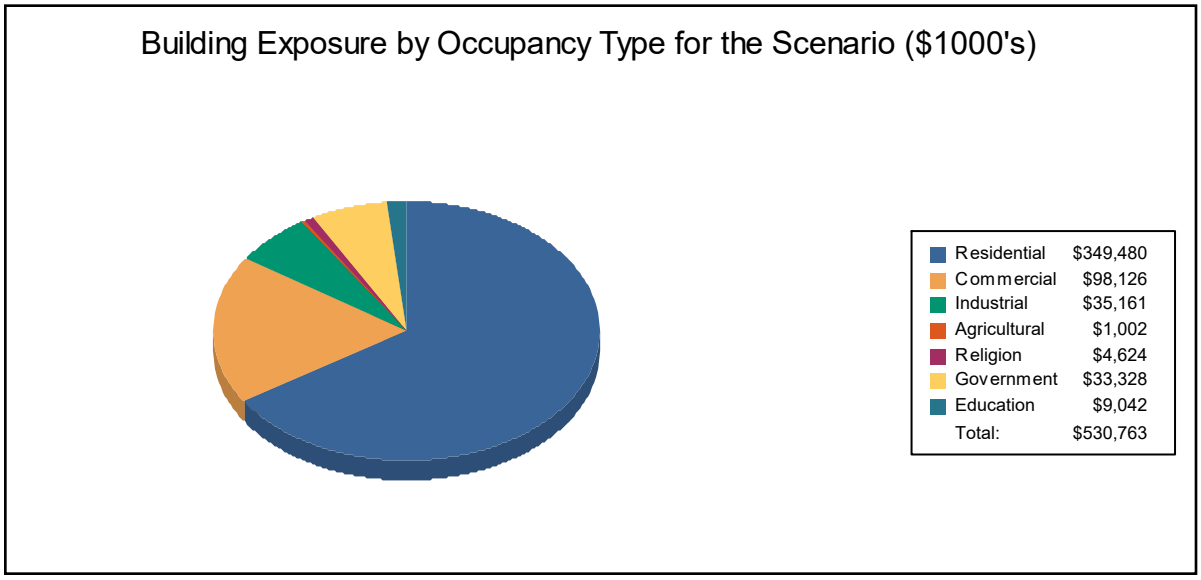


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	349,480	65.8%
Commercial	98,126	18.5%
Industrial	35,161	6.6%
Agricultural	1,002	0.2%
Religion	4,624	0.9%
Government	33,328	6.3%
Education	9,042	1.7%
Total	**530,763**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, no police stations and 1 emergency operation center.

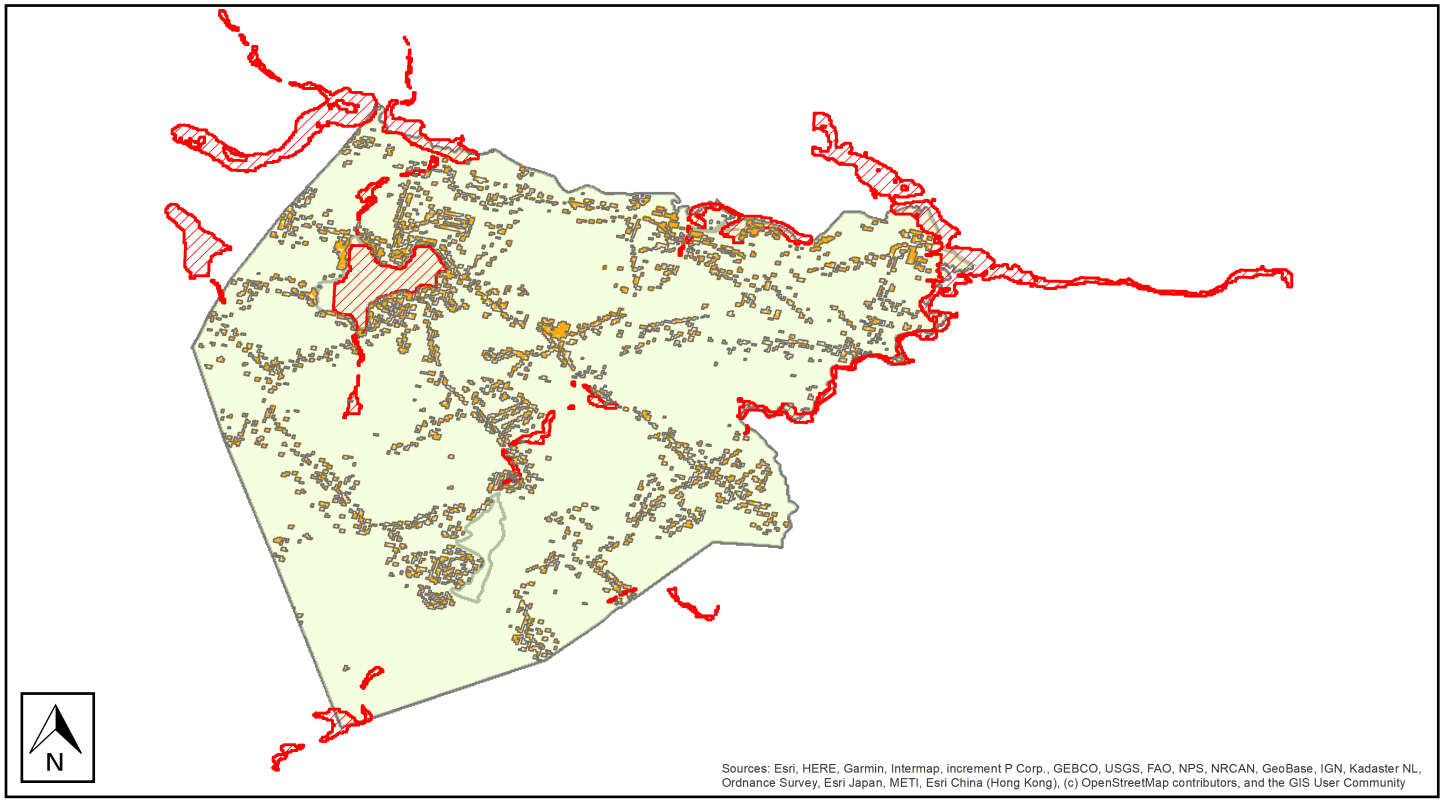
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Columbia_FL
Scenario Name:	Columbia_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

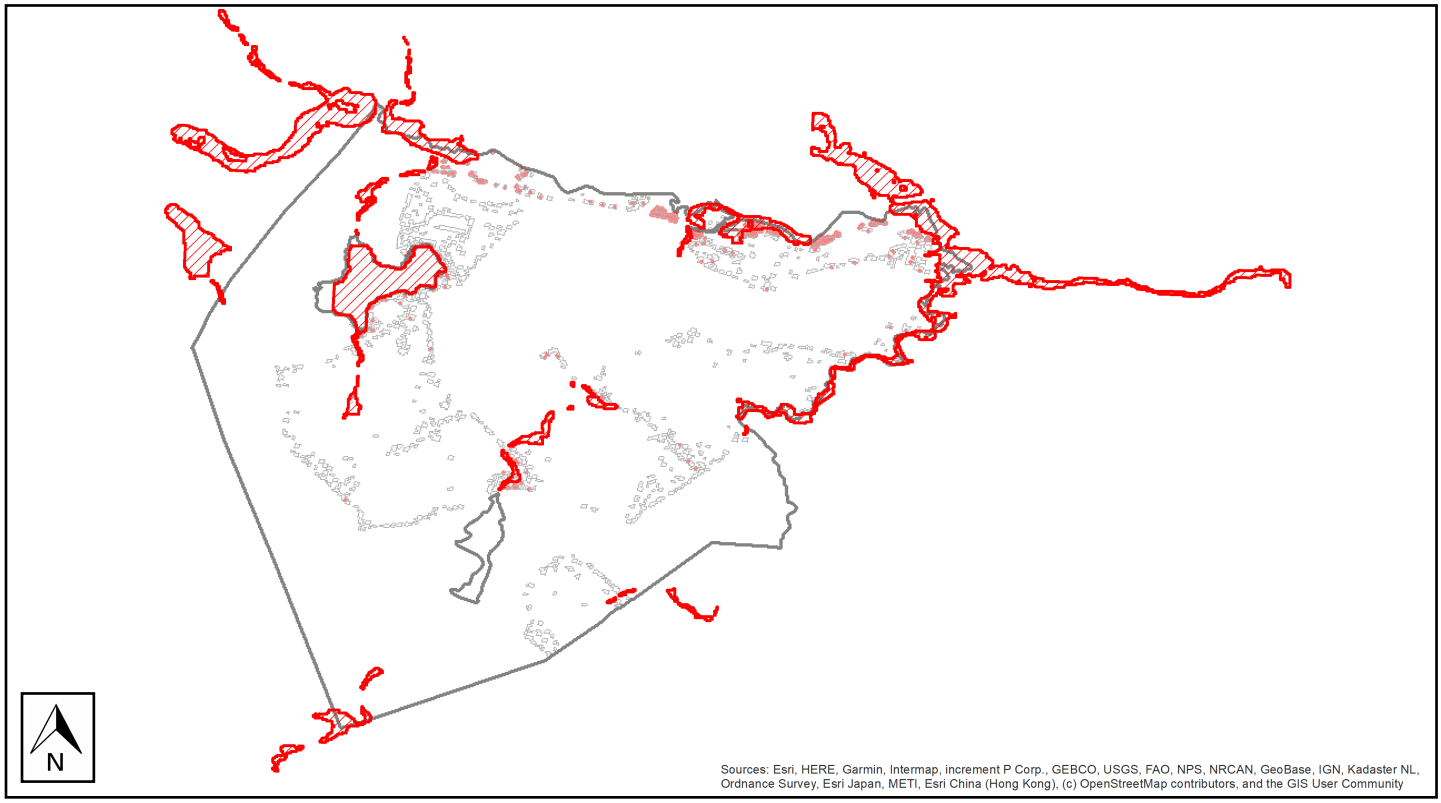


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	100	0	0	0	0	0	0	0	0	0	0
Total	**2**		**0**		**0**		**0**		**0**		**0**	

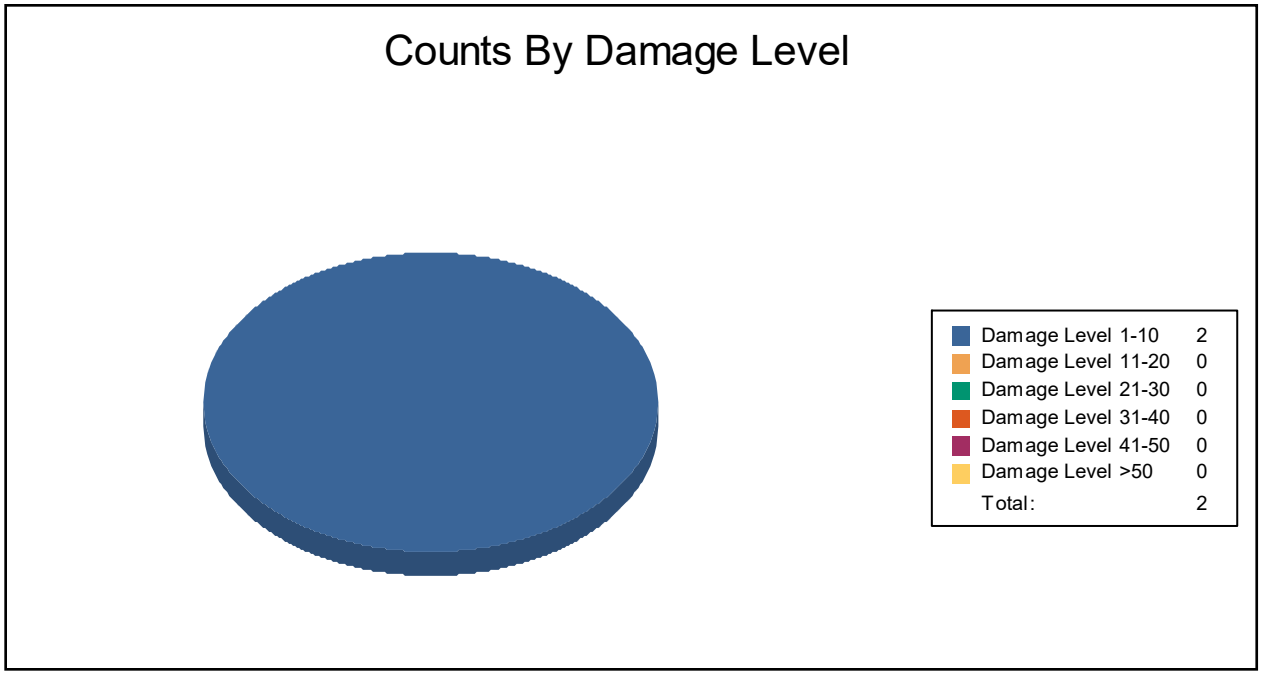


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

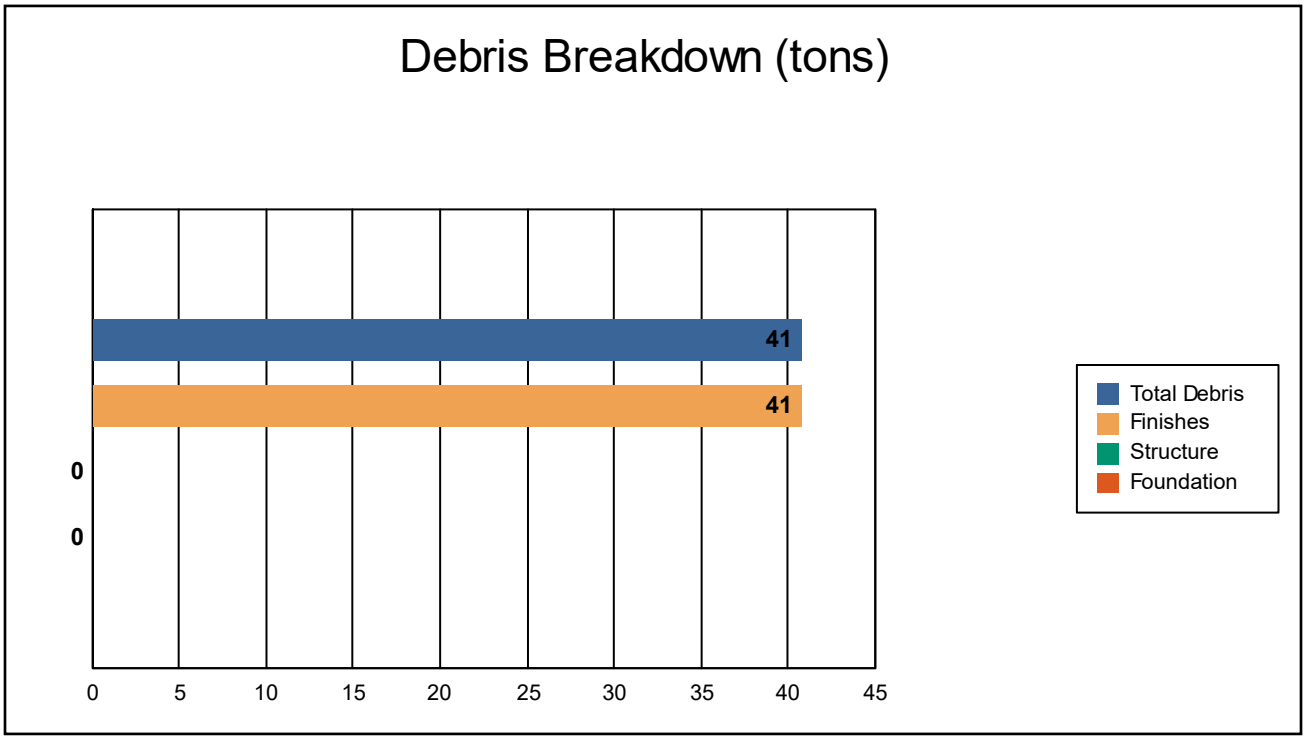
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

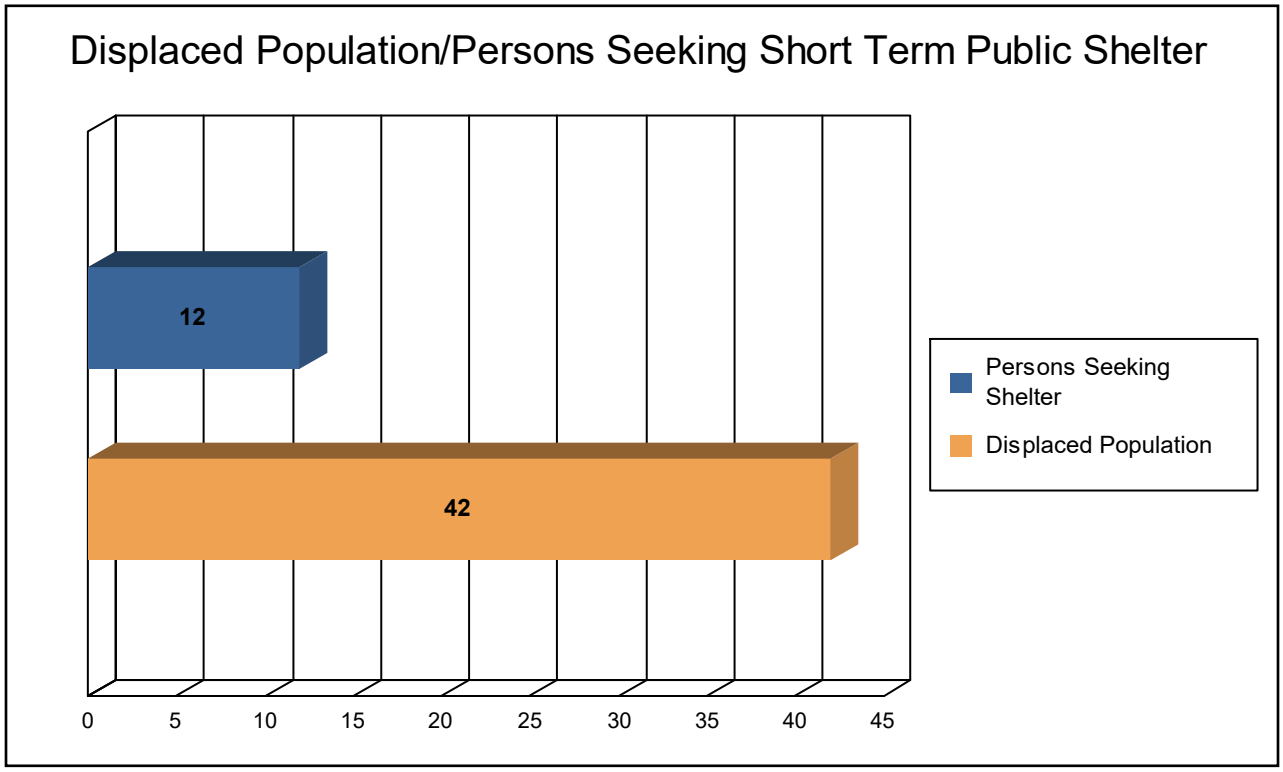


The model estimates that a total of 41 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 14 households (or 42 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 12 people (out of a total population of 5,272) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 123.35 million dollars, which represents 23.24 % of the total replacement value of the scenario buildings.

Building-Related Losses

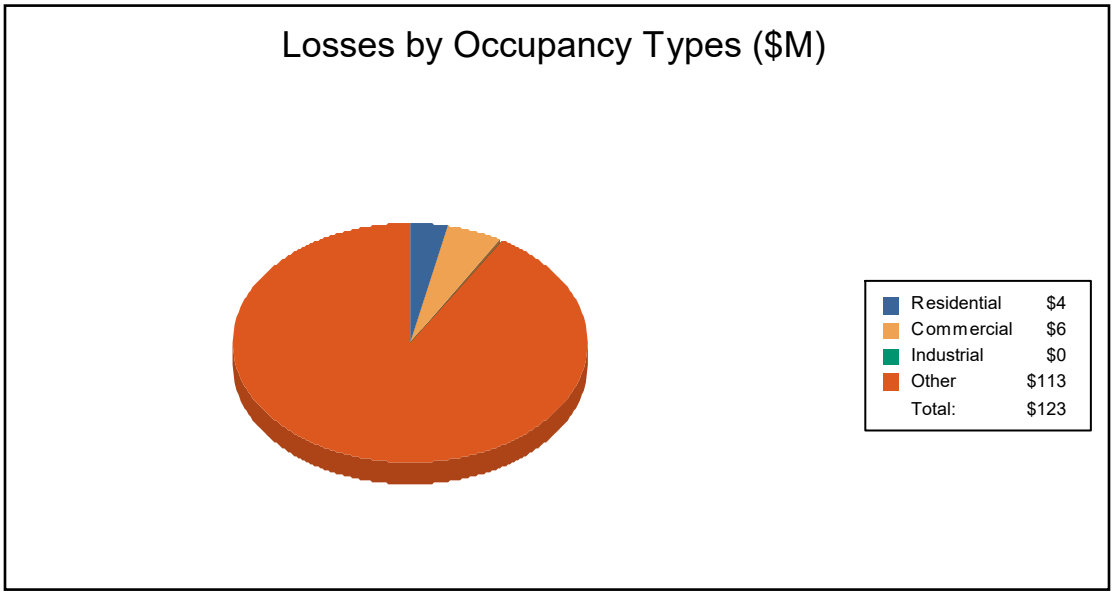
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 9.77 million dollars. 92% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 3.45% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.69	0.38	0.03	0.91	2.02
	Content	0.59	1.78	0.09	5.17	7.62
	Inventory	0.00	0.10	0.01	0.01	0.12
	Subtotal	**1.28**	**2.26**	**0.13**	**6.09**	**9.77**
Business Interruption						
	Income	0.51	1.42	0.00	0.37	2.30
	Relocation	0.29	0.25	0.00	1.23	1.77
	Rental Income	0.97	0.17	0.00	0.06	1.20
	Wage	1.21	2.02	0.00	105.10	108.32
	Subtotal	**2.97**	**3.85**	**0.00**	**106.76**	**113.58**
ALL	**Total**	**4.25**	**6.12**	**0.13**	**112.85**	**123.35**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,735	264,074	1,081,809
Total	**5,272**	**817,735**	**264,074**	**1,081,809**
Total Study Region	**5,272**	**817,735**	**264,074**	**1,081,809**

Hazus: Flood Global Risk Report

Region Name:	Columbia_FL
Flood Scenario:	Columbia_Flood
Print Date:	Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 72 census blocks. The region contains over 2 thousand households and has a total population of 5,272 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,447 buildings in the region with a total building replacement value (excluding contents) of 1,082 million dollars. Approximately 91.87% of the buildings (and 75.59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,447 buildings in the region which have an aggregate total replacement value of 1,082 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	817,735	75.6%
Commercial	124,704	11.5%
Industrial	38,527	3.6%
Agricultural	1,477	0.1%
Religion	6,000	0.6%
Government	63,222	5.8%
Education	30,144	2.8%
Total	**1,081,809**	**100%**

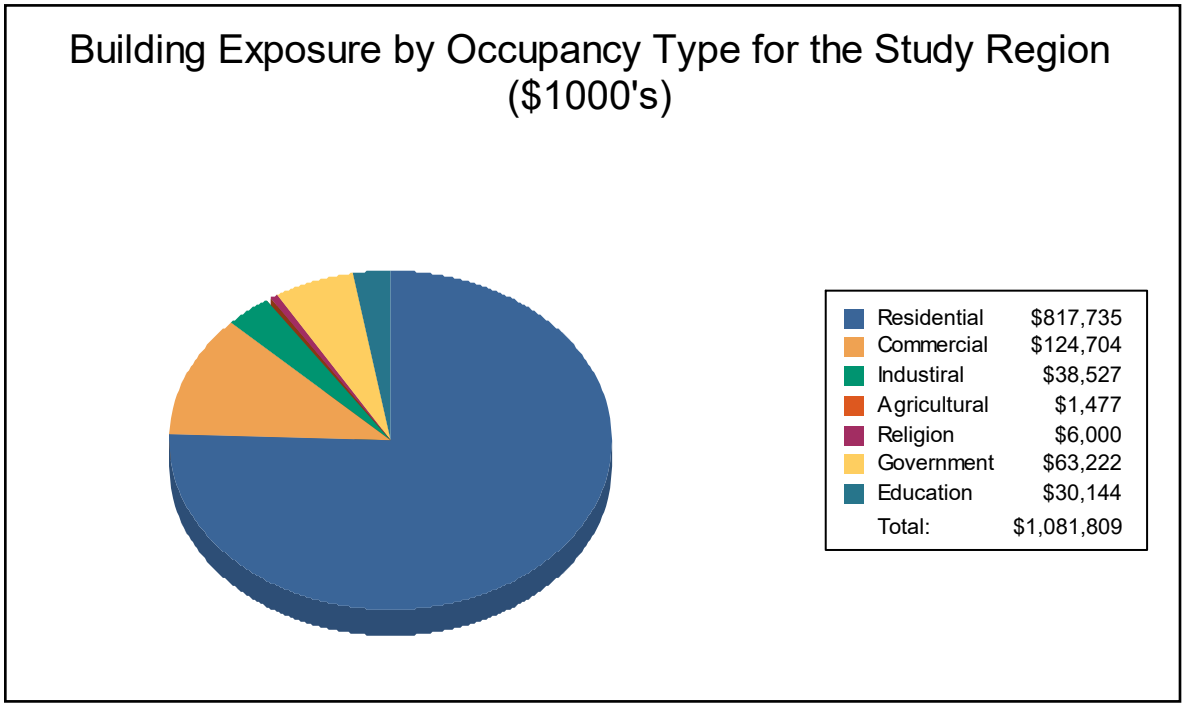
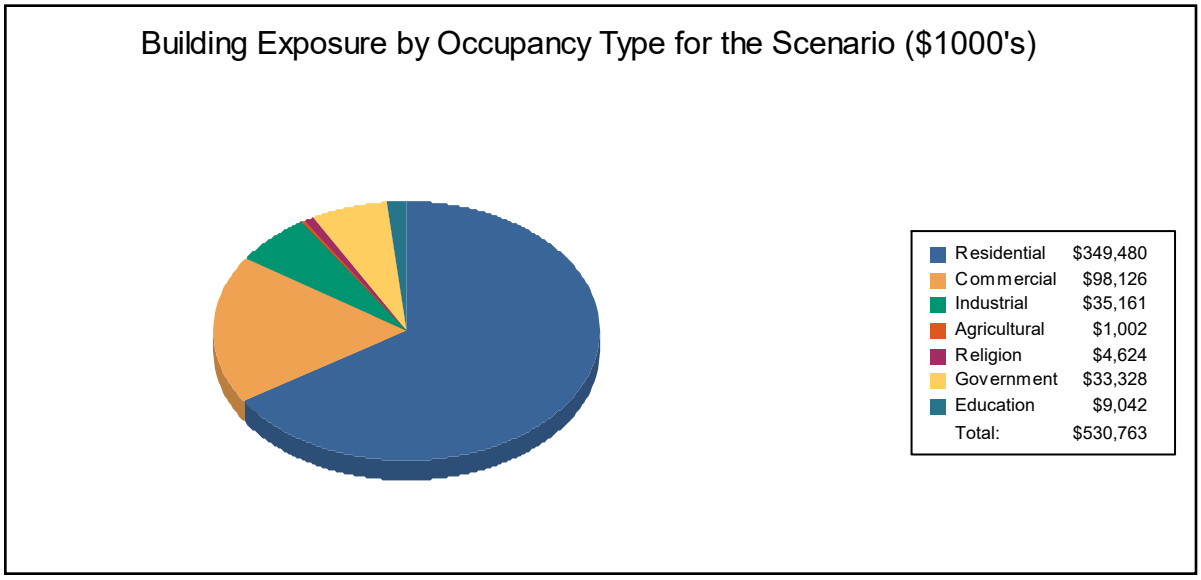


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	349,480	65.8%
Commercial	98,126	18.5%
Industrial	35,161	6.6%
Agricultural	1,002	0.2%
Religion	4,624	0.9%
Government	33,328	6.3%
Education	9,042	1.7%
Total	**530,763**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, no police stations and 1 emergency operation center.

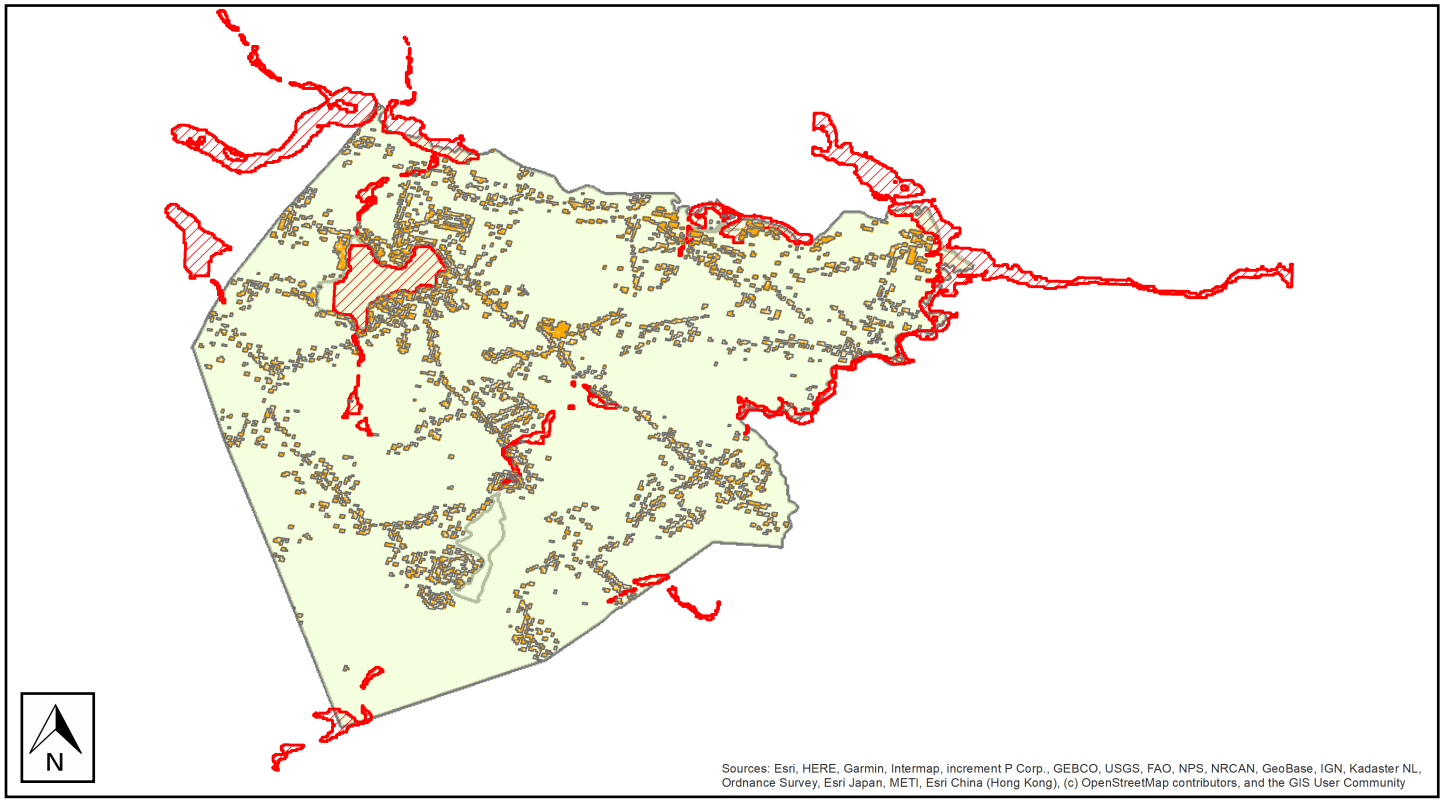
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Columbia_FL
Scenario Name:	Columbia_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 75% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

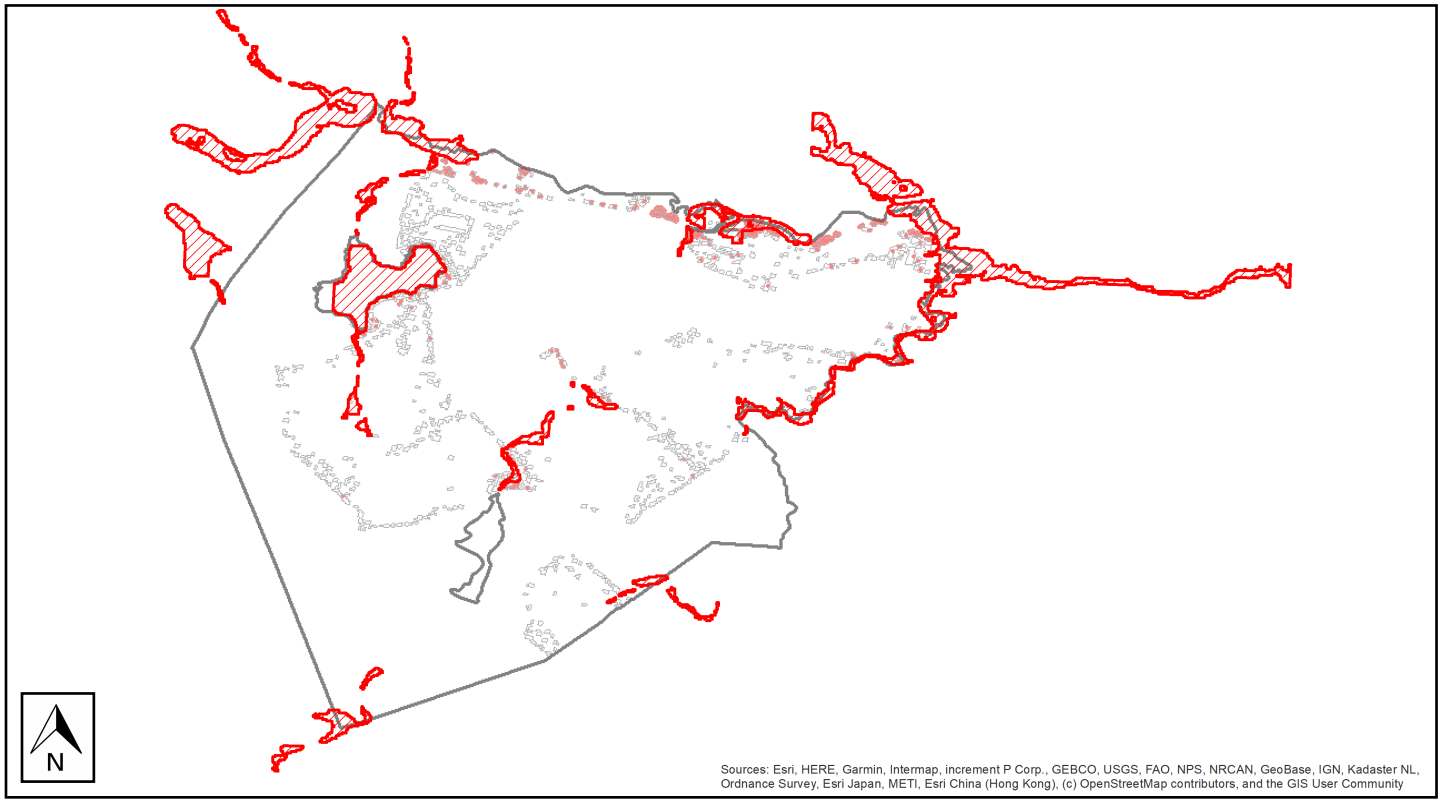


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	100	0	0	0	0	0	0	0	0	0	0
Total	**3**		**0**		**0**		**0**		**0**		**0**	

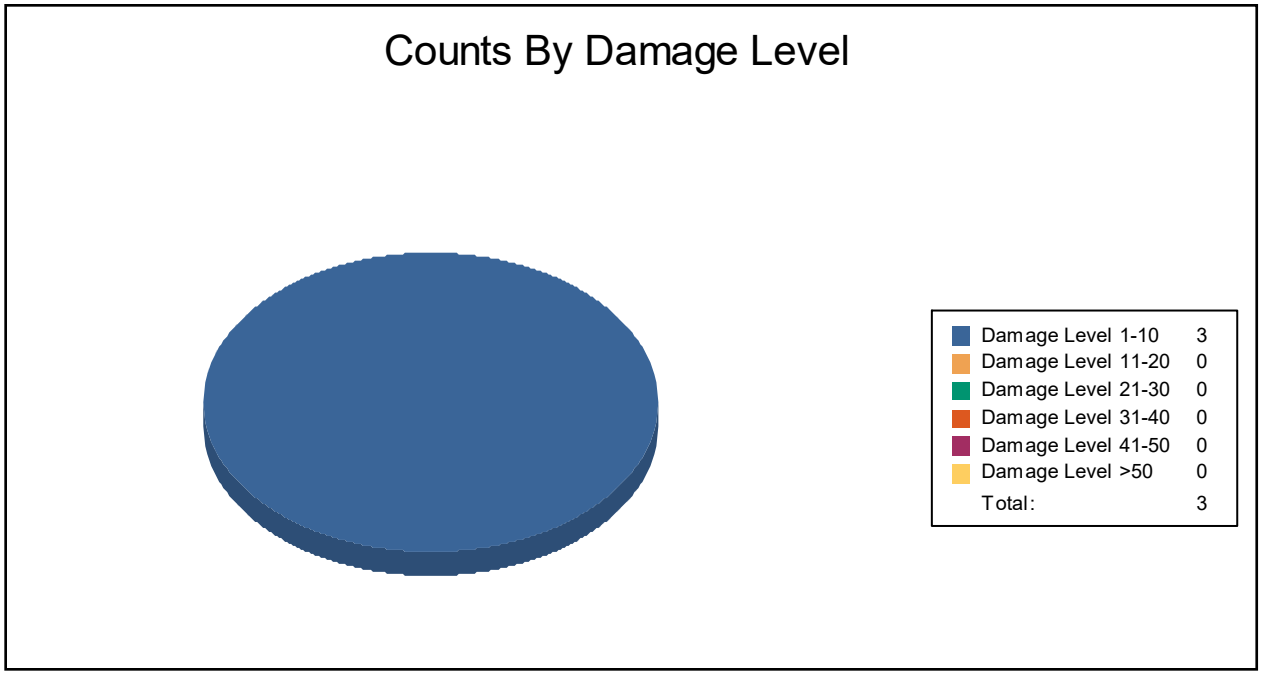


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

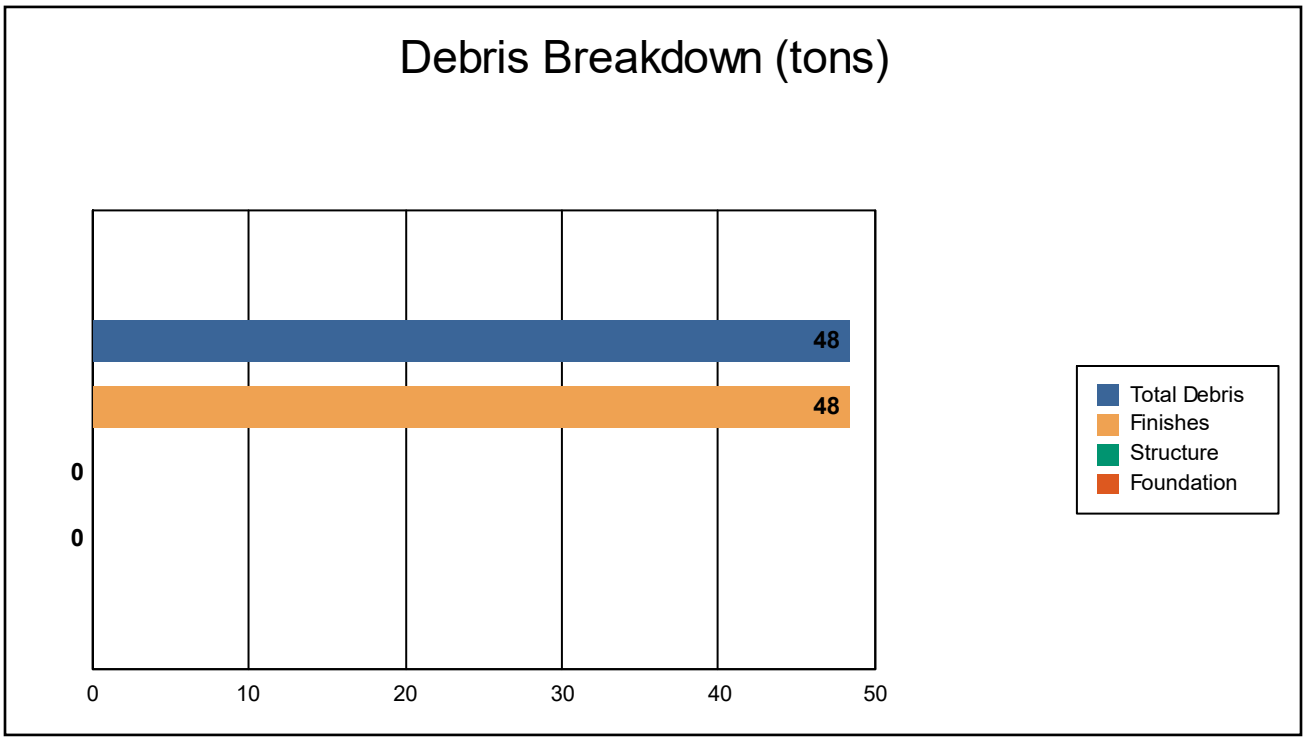
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

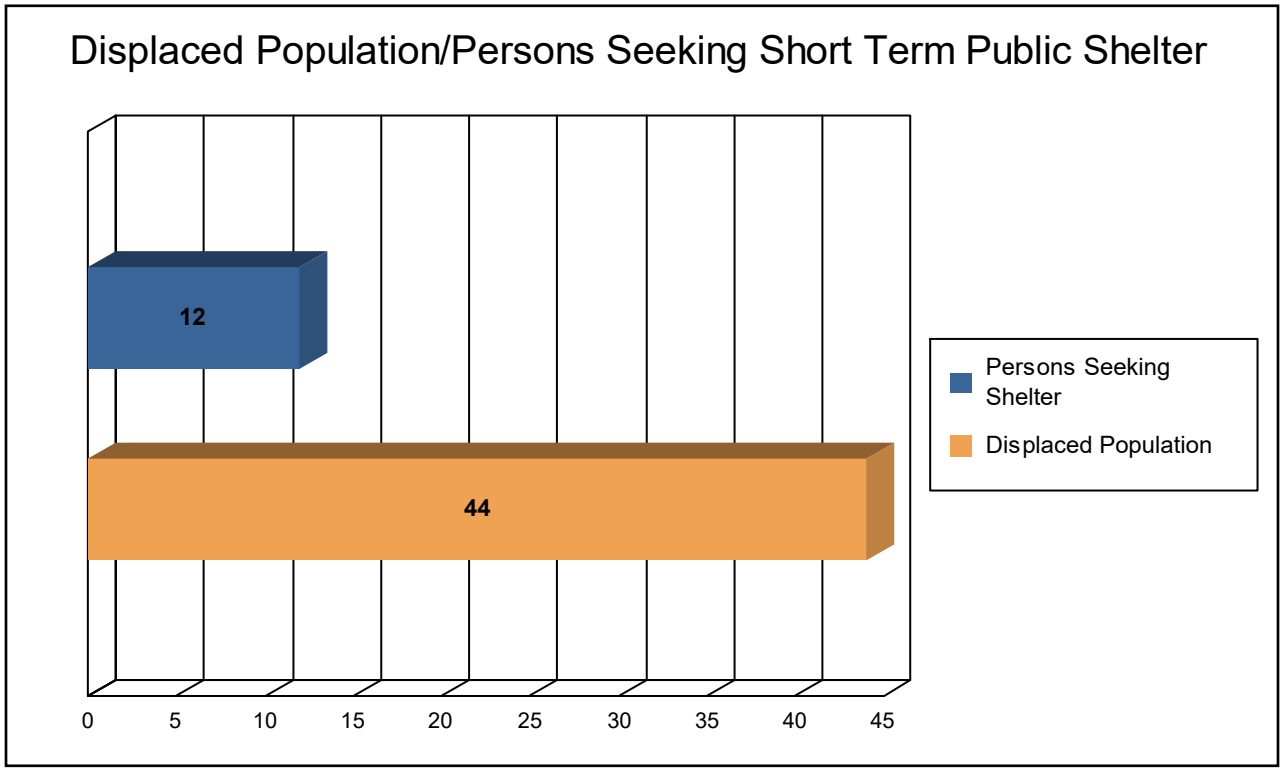


The model estimates that a total of 48 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 15 households (or 44 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 12 people (out of a total population of 5,272) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 139.70 million dollars, which represents 26.32 % of the total replacement value of the scenario buildings.

Building-Related Losses

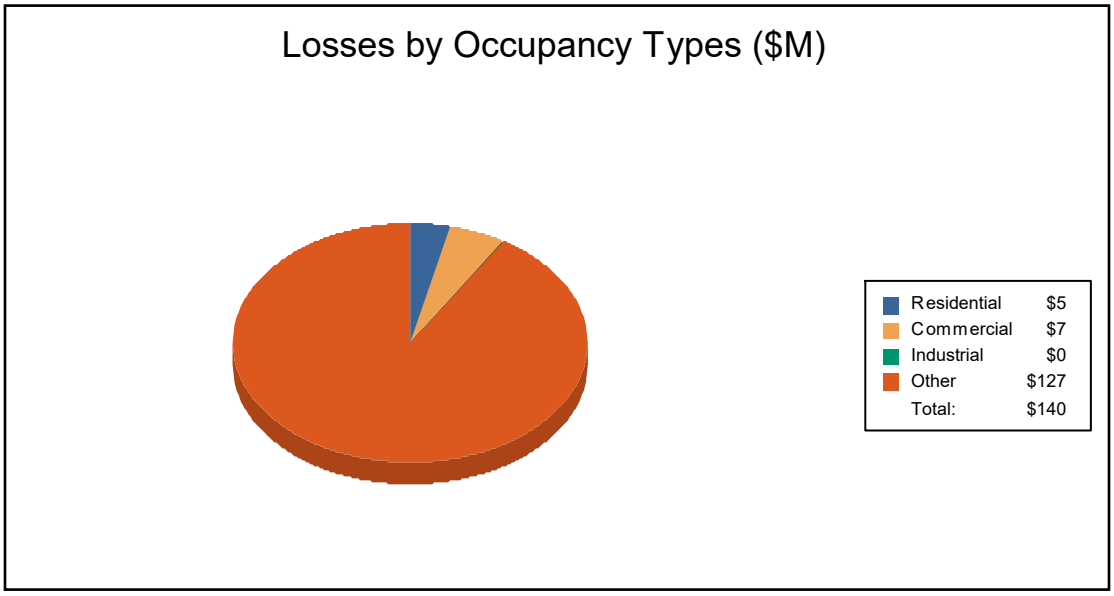
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 11.60 million dollars. 92% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 3.52% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.78	0.47	0.04	1.16	2.46
	Content	0.70	2.16	0.11	6.02	9.00
	Inventory	0.00	0.12	0.01	0.01	0.15
	Subtotal	**1.49**	**2.76**	**0.16**	**7.20**	**11.60**
Business Interruption						
	Income	0.60	1.65	0.00	0.54	2.78
	Relocation	0.31	0.30	0.00	1.44	2.05
	Rental Income	1.12	0.20	0.00	0.07	1.39
	Wage	1.41	2.33	0.00	118.13	121.88
	Subtotal	**3.43**	**4.48**	**0.00**	**120.18**	**128.10**
ALL	**Total**	**4.92**	**7.24**	**0.16**	**127.38**	**139.70**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,735	264,074	1,081,809
Total	**5,272**	**817,735**	**264,074**	**1,081,809**
Total Study Region	**5,272**	**817,735**	**264,074**	**1,081,809**

Hazus: Flood Global Risk Report

Region Name: Columbia_FL

Flood Scenario: Columbia_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 72 census blocks. The region contains over 2 thousand households and has a total population of 5,272 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,447 buildings in the region with a total building replacement value (excluding contents) of 1,082 million dollars. Approximately 91.87% of the buildings (and 75.59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,447 buildings in the region which have an aggregate total replacement value of 1,082 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	817,735	75.6%
Commercial	124,704	11.5%
Industrial	38,527	3.6%
Agricultural	1,477	0.1%
Religion	6,000	0.6%
Government	63,222	5.8%
Education	30,144	2.8%
Total	**1,081,809**	**100%**

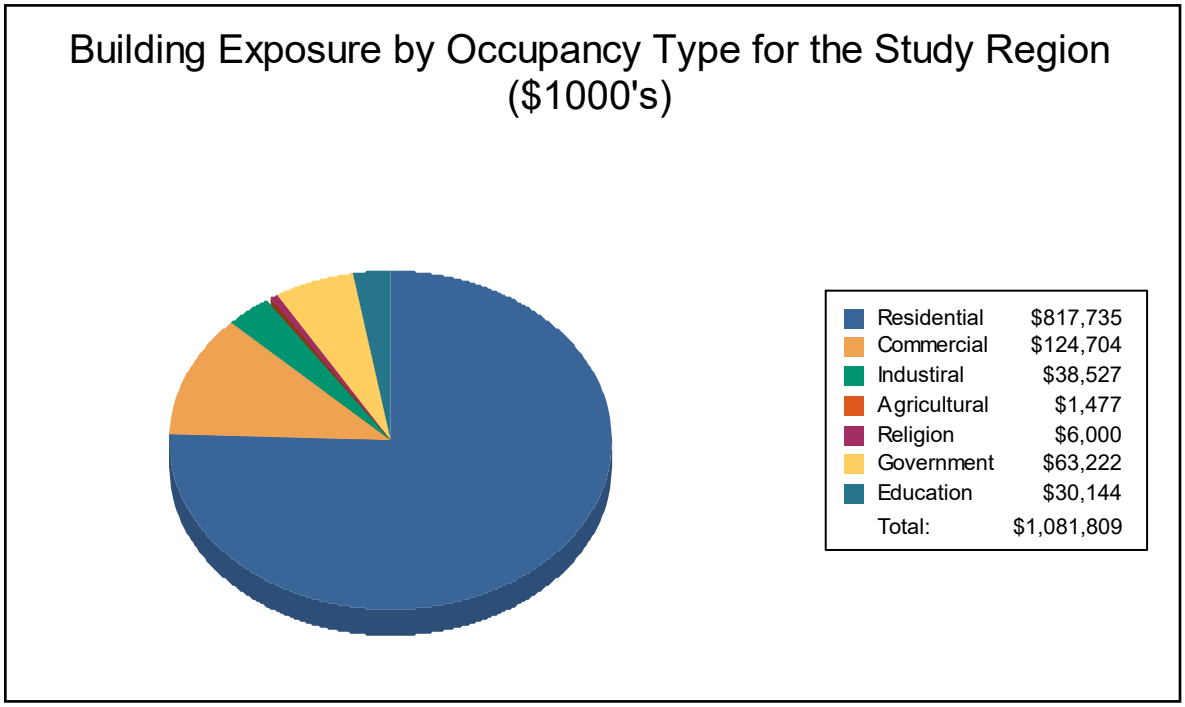
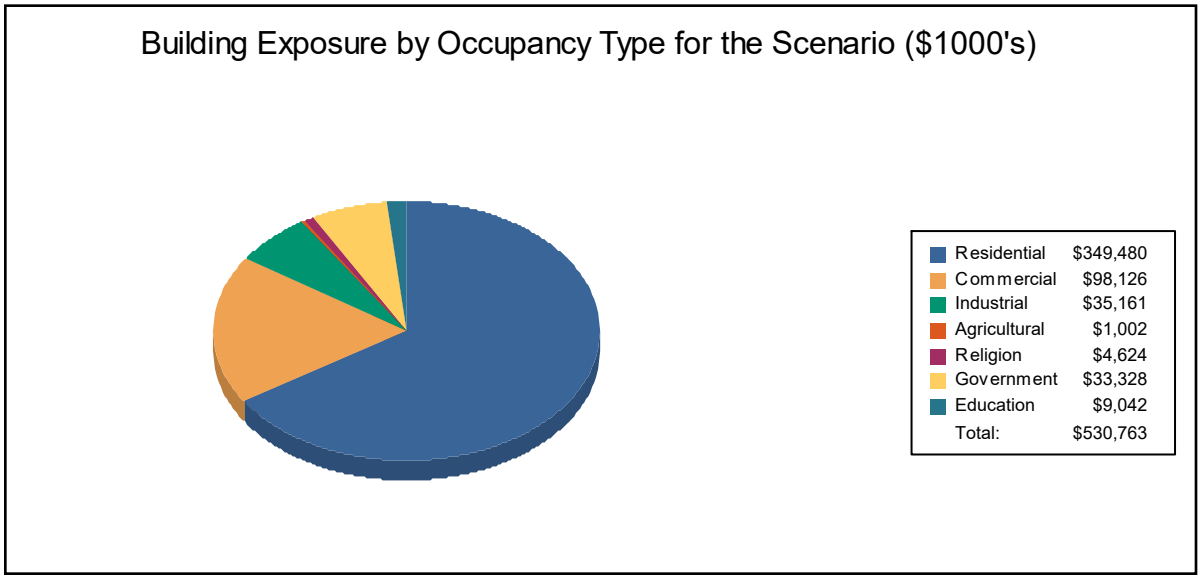


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	349,480	65.8%
Commercial	98,126	18.5%
Industrial	35,161	6.6%
Agricultural	1,002	0.2%
Religion	4,624	0.9%
Government	33,328	6.3%
Education	9,042	1.7%
Total	**530,763**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, no police stations and 1 emergency operation center.

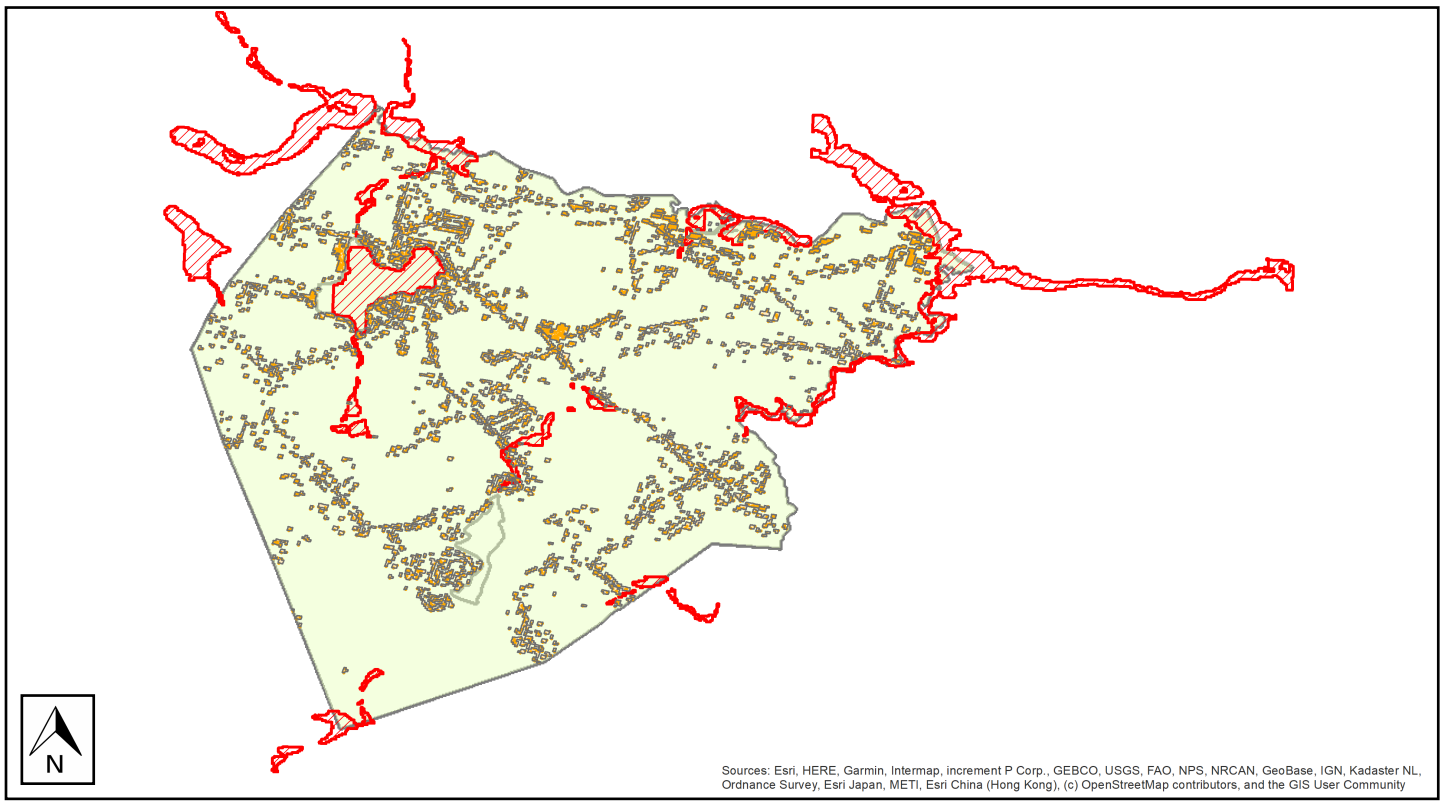
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Columbia_FL
Scenario Name:	Columbia_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 75% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

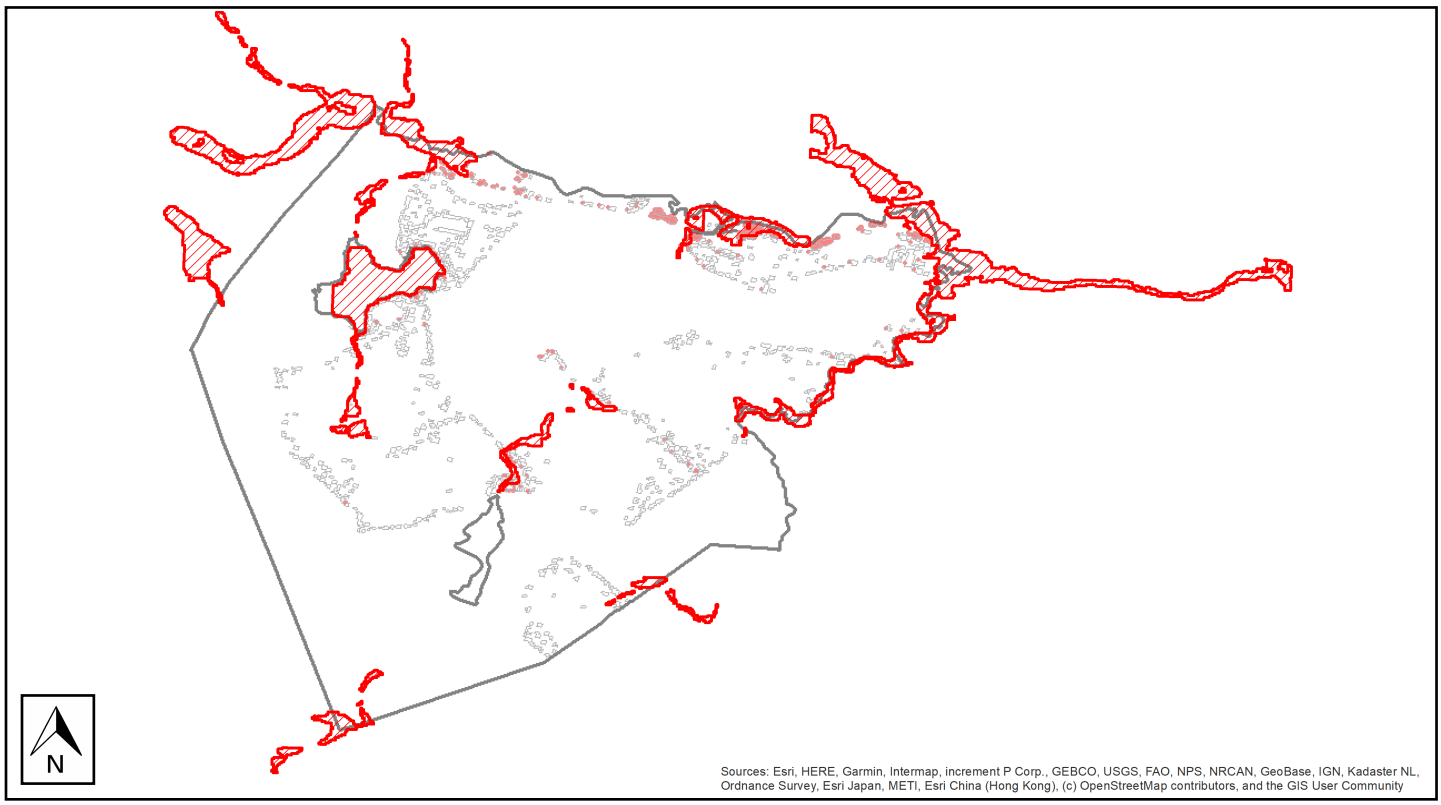


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	100	0	0	0	0	0	0	0	0	0	0
Total	**3**		**0**		**0**		**0**		**0**		**0**	

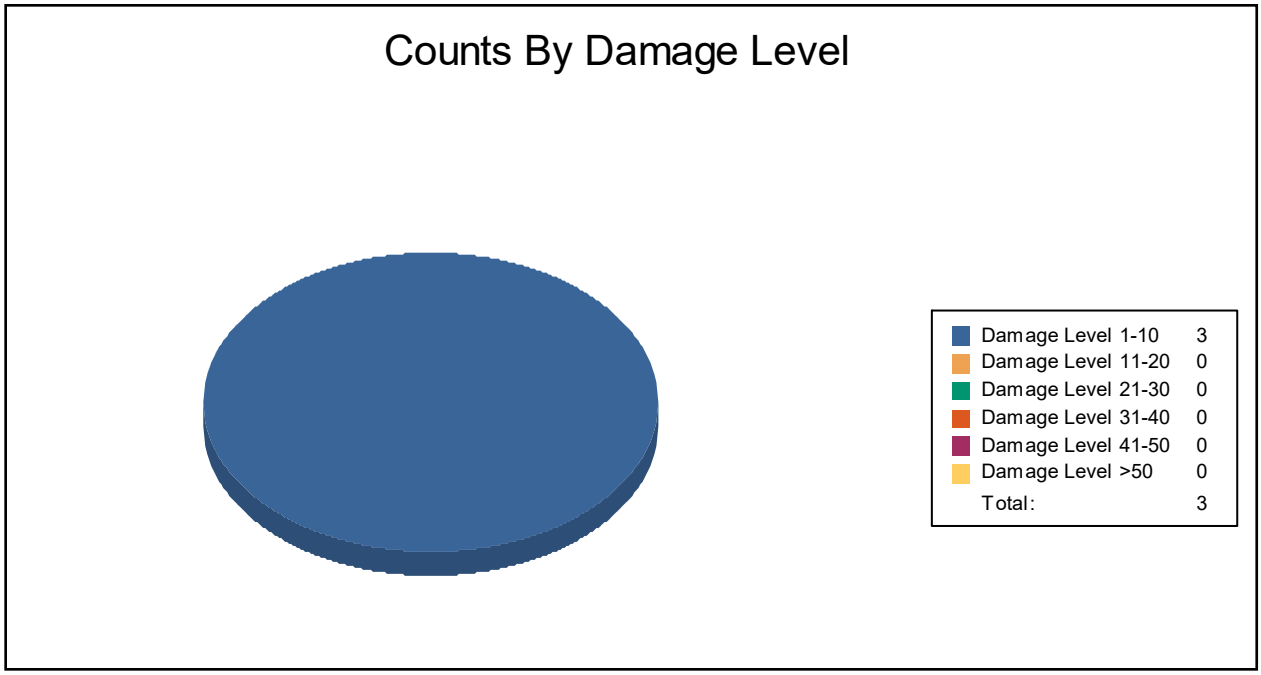


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

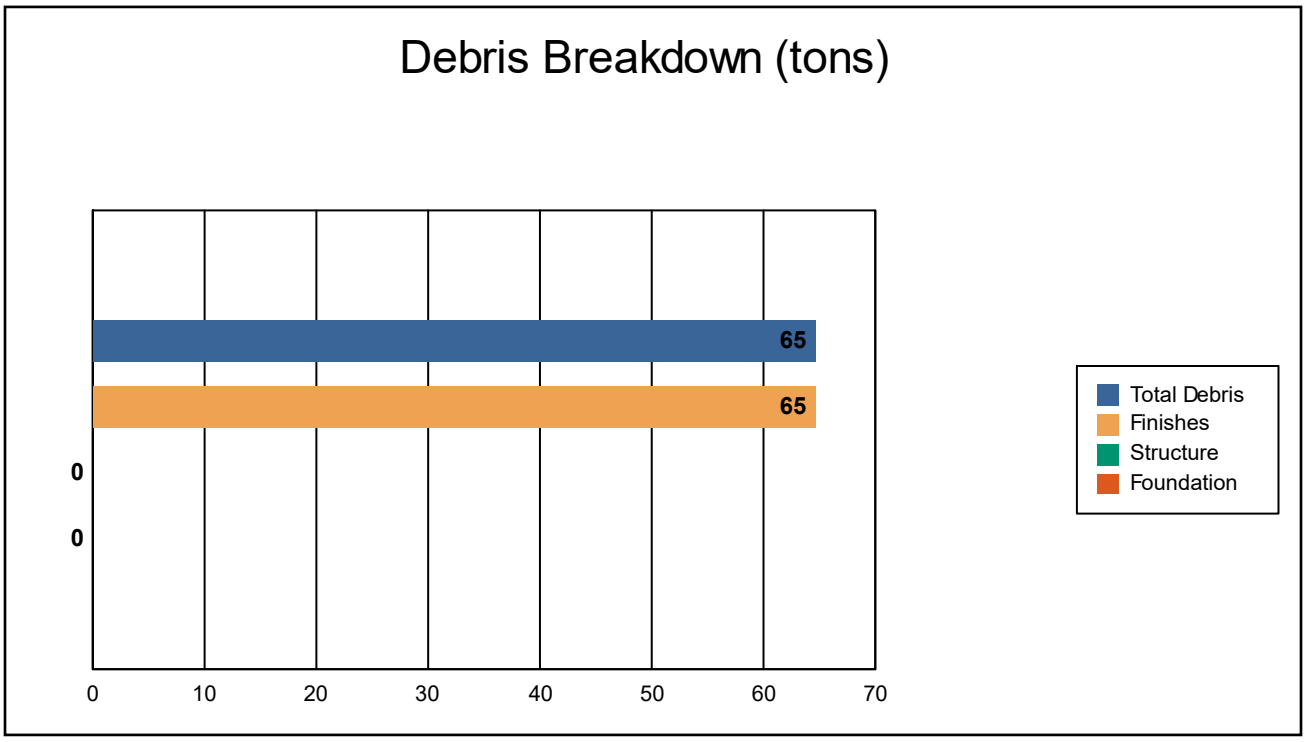
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

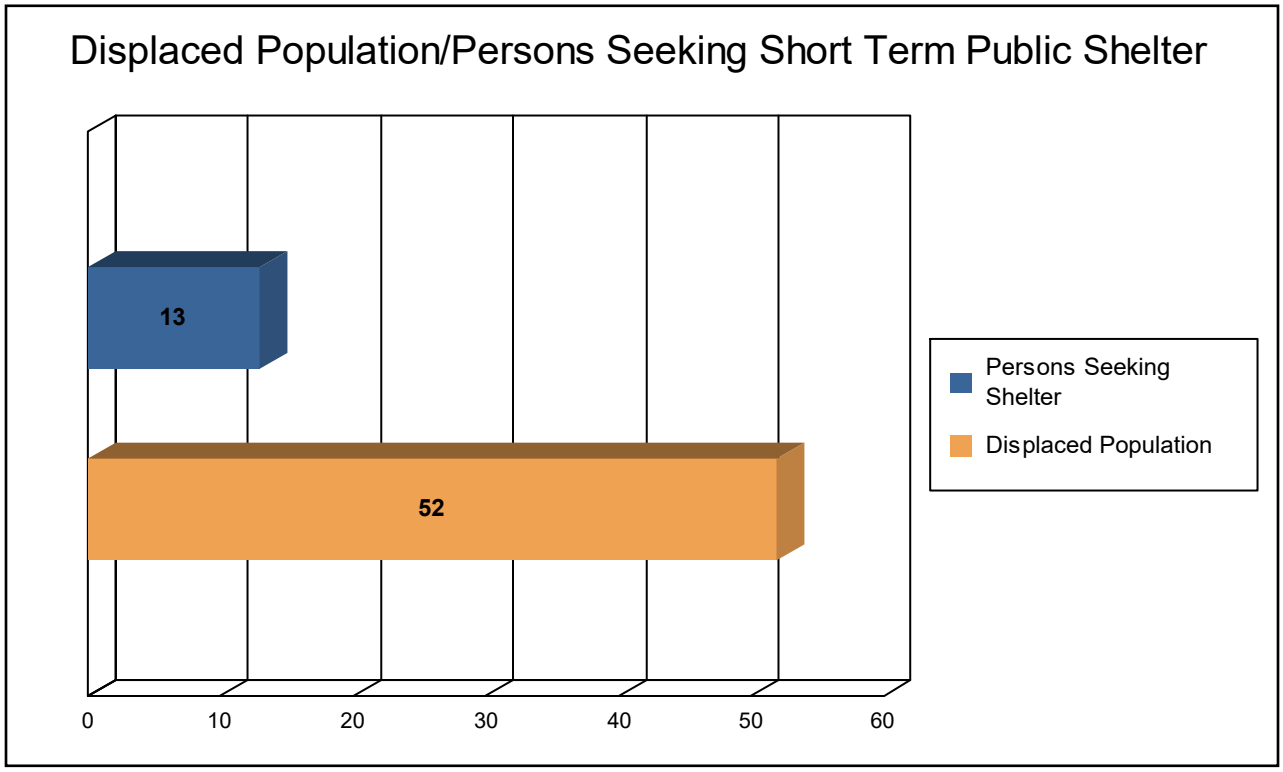


The model estimates that a total of 65 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 17 households (or 52 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 13 people (out of a total population of 5,272) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 252.71 million dollars, which represents 47.61 % of the total replacement value of the scenario buildings.

Building-Related Losses

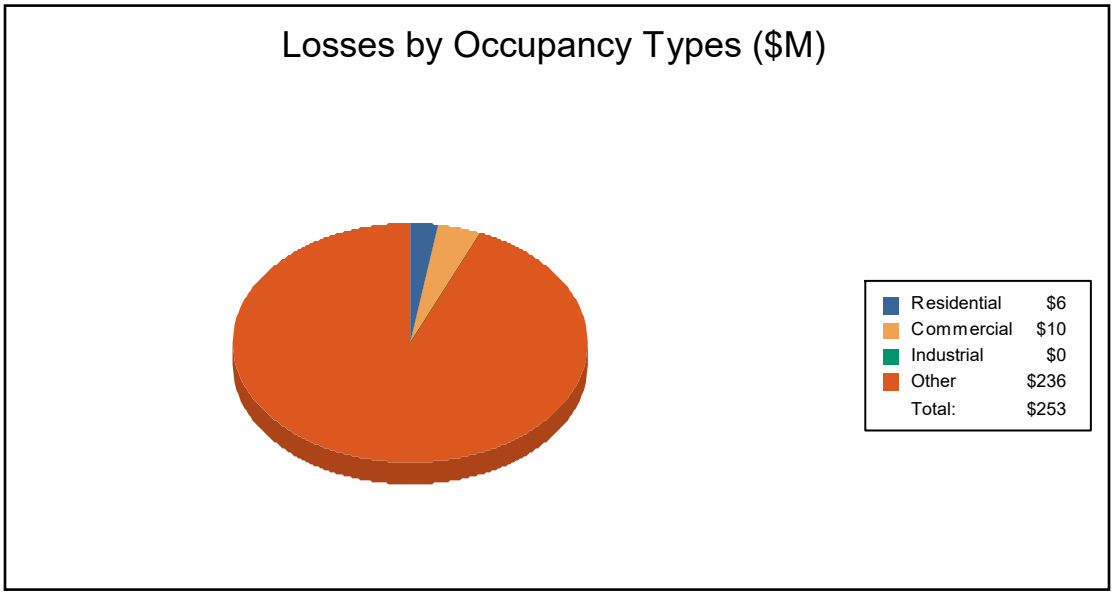
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 16.32 million dollars. 94% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 2.38% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.04	0.71	0.06	1.80	3.61
	Content	0.95	3.05	0.15	8.38	12.52
	Inventory	0.00	0.16	0.02	0.02	0.19
	Subtotal	**1.98**	**3.91**	**0.23**	**10.19**	**16.32**
Business Interruption						
	Income	0.70	2.22	0.00	0.58	3.50
	Relocation	0.35	0.42	0.00	2.50	3.27
	Rental Income	1.31	0.28	0.00	0.13	1.72
	Wage	1.66	3.41	0.00	222.84	227.91
	Subtotal	**4.02**	**6.32**	**0.00**	**226.04**	**236.39**
ALL	**Total**	**6.01**	**10.24**	**0.23**	**236.23**	**252.71**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,735	264,074	1,081,809
Total	**5,272**	**817,735**	**264,074**	**1,081,809**
Total Study Region	**5,272**	**817,735**	**264,074**	**1,081,809**

Hazus: Flood Global Risk Report

Region Name: Columbia_FL

Flood Scenario: Columbia_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 72 census blocks. The region contains over 2 thousand households and has a total population of 5,272 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,447 buildings in the region with a total building replacement value (excluding contents) of 1,082 million dollars. Approximately 91.87% of the buildings (and 75.59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,447 buildings in the region which have an aggregate total replacement value of 1,082 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	817,735	75.6%
Commercial	124,704	11.5%
Industrial	38,527	3.6%
Agricultural	1,477	0.1%
Religion	6,000	0.6%
Government	63,222	5.8%
Education	30,144	2.8%
Total	**1,081,809**	**100%**

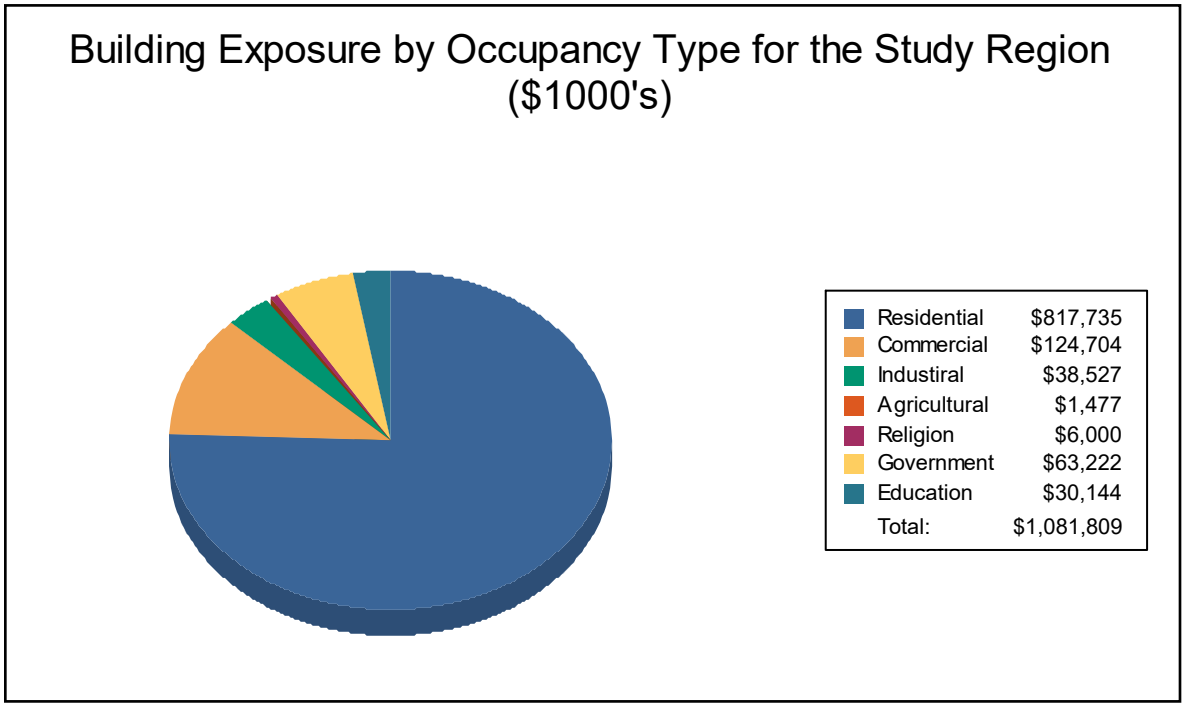
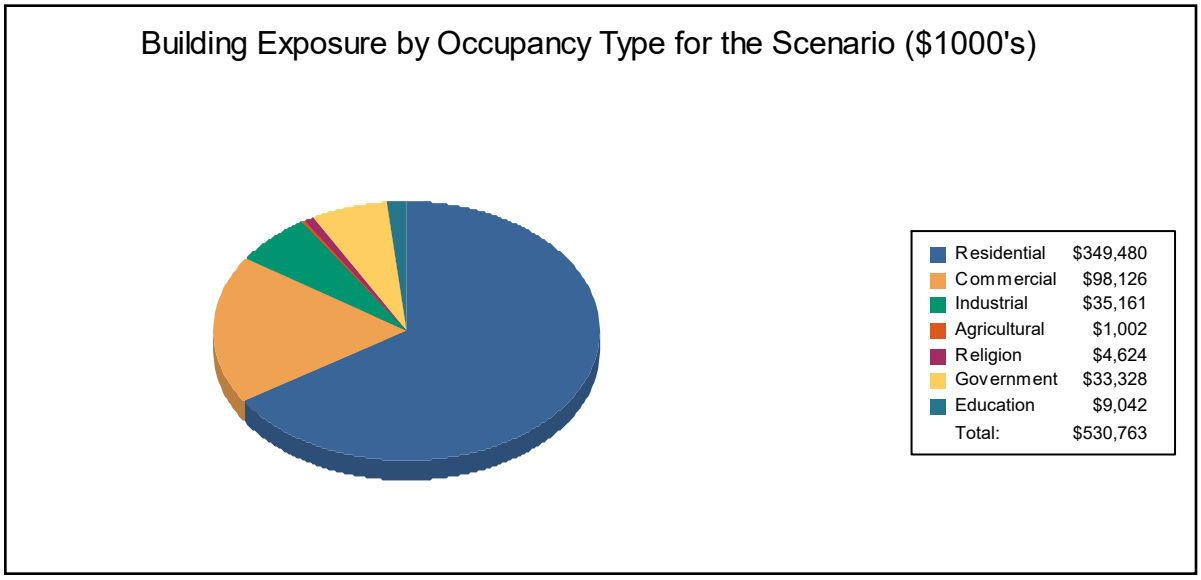


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	349,480	65.8%
Commercial	98,126	18.5%
Industrial	35,161	6.6%
Agricultural	1,002	0.2%
Religion	4,624	0.9%
Government	33,328	6.3%
Education	9,042	1.7%
Total	**530,763**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, no police stations and 1 emergency operation center.

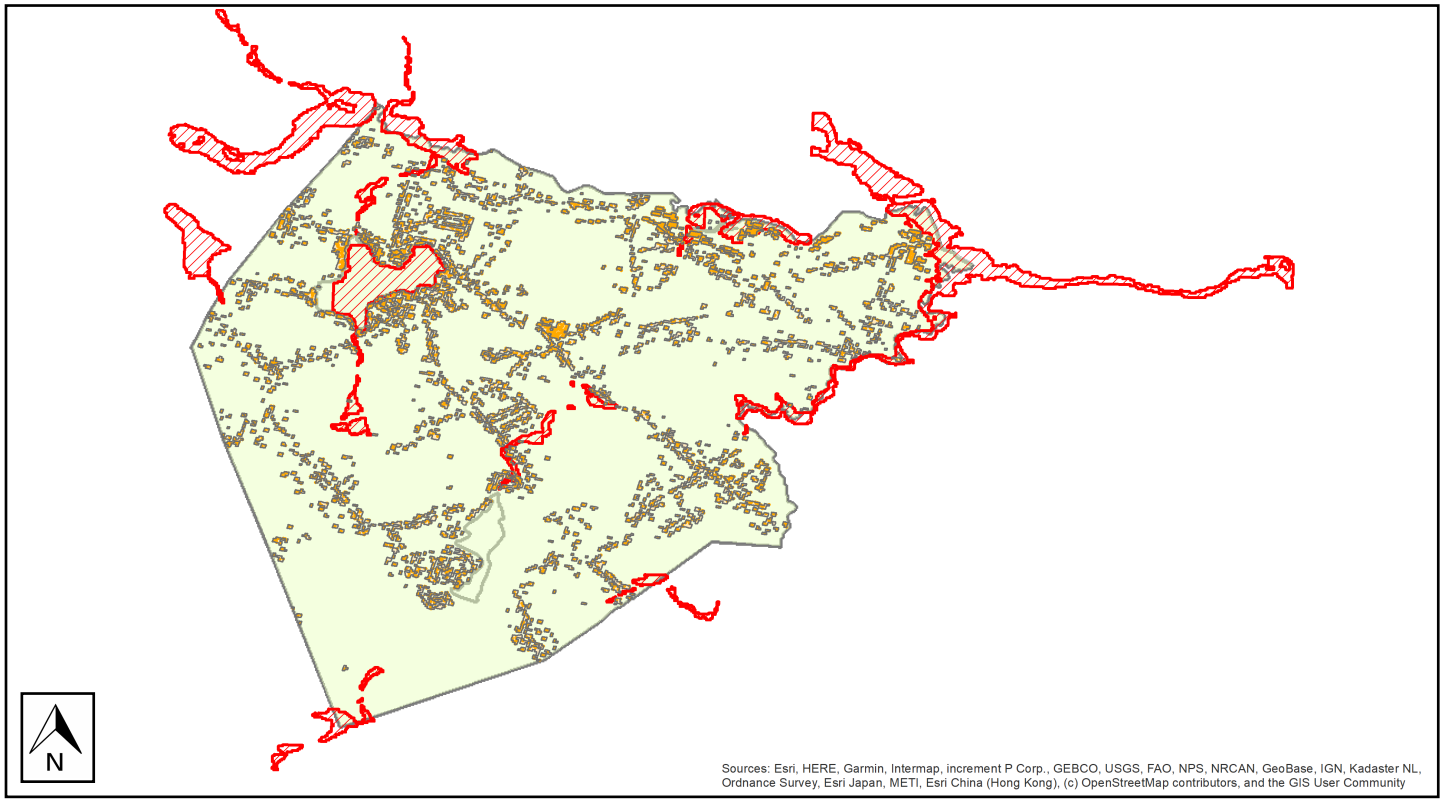
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Columbia_FL
Scenario Name:	Columbia_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 75% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

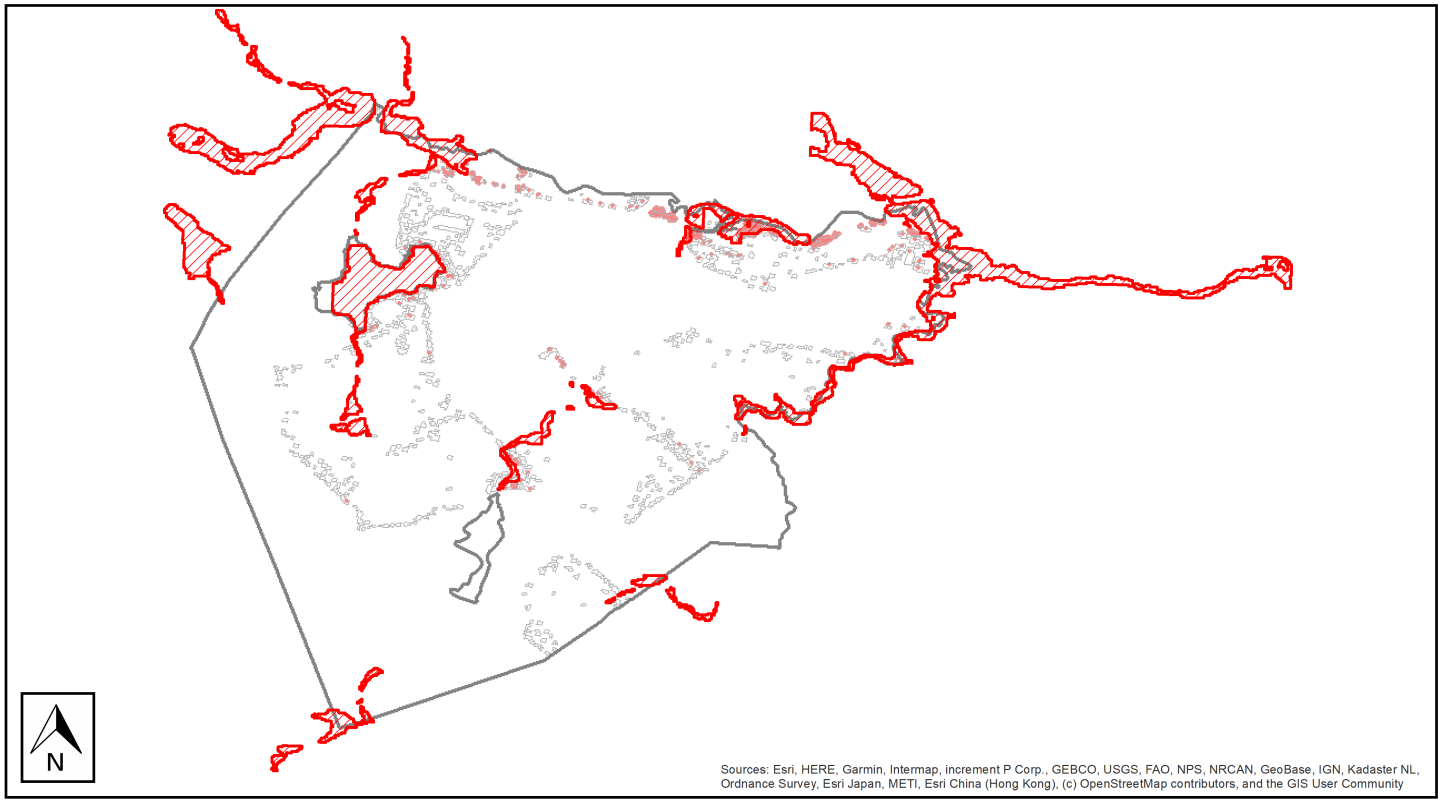


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	100	0	0	0	0	0	0	0	0	0	0
Total	**3**		**0**		**0**		**0**		**0**		**0**	

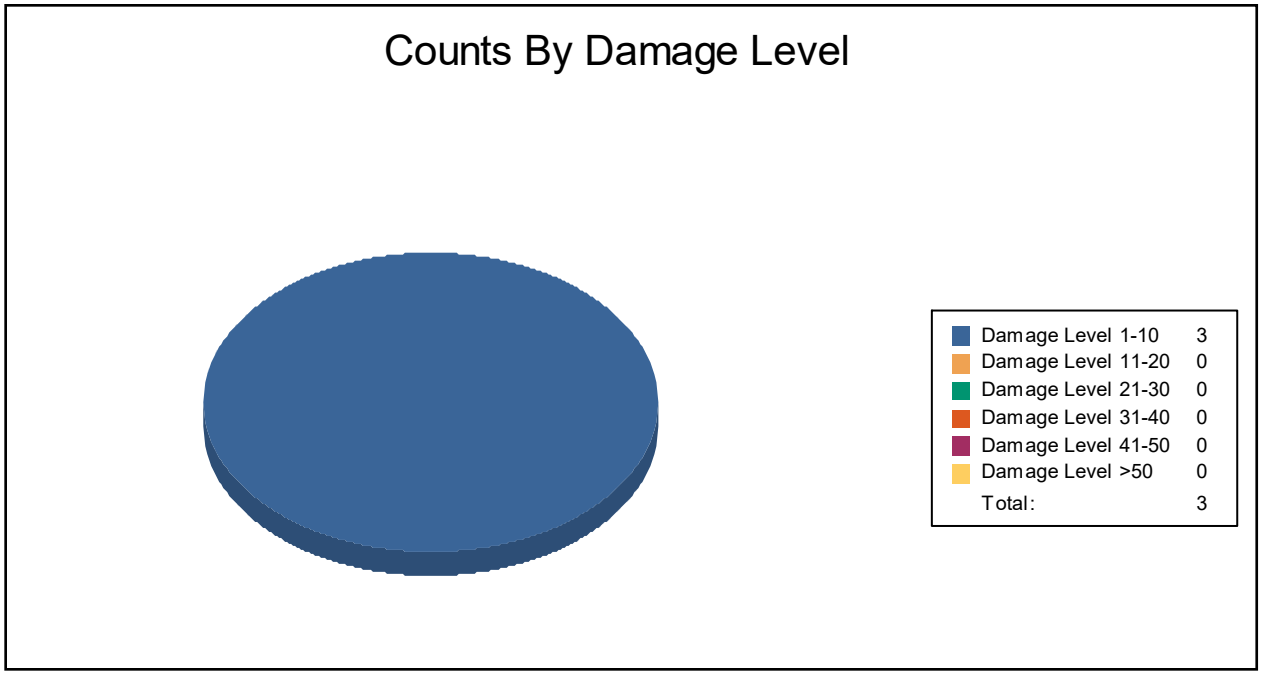


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

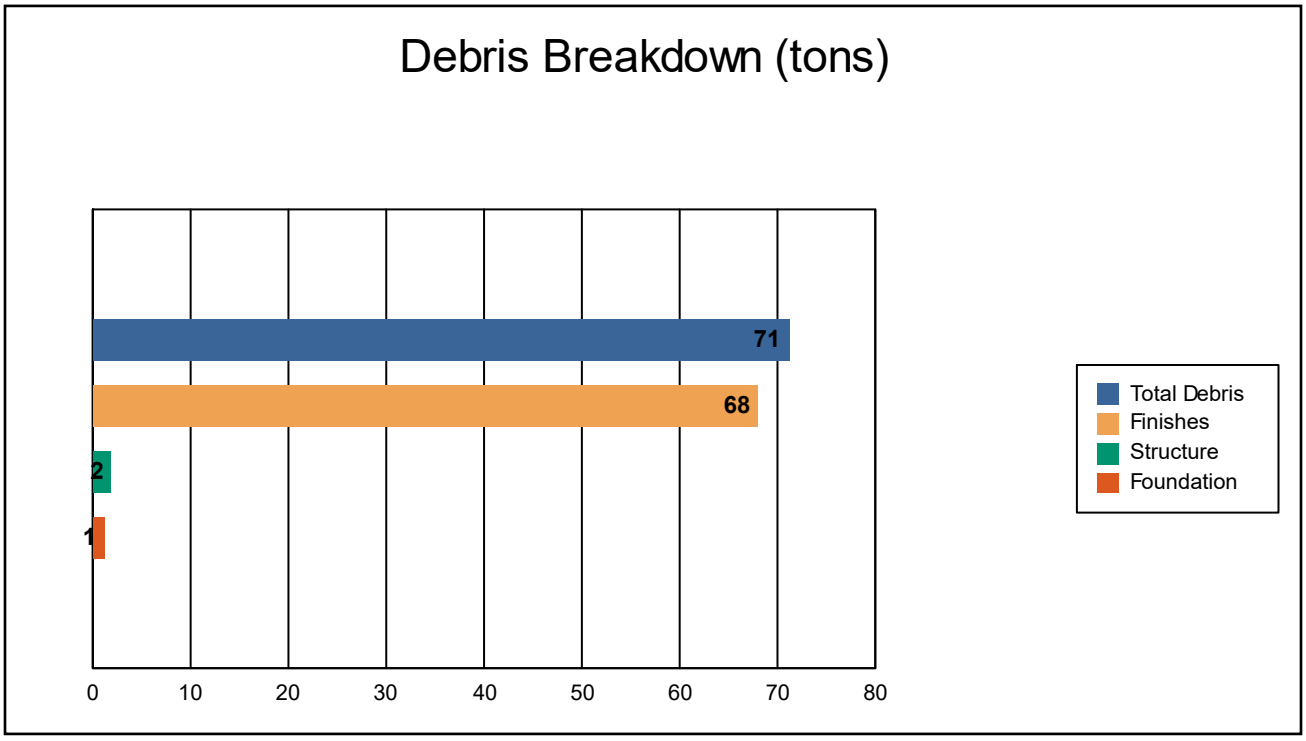
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

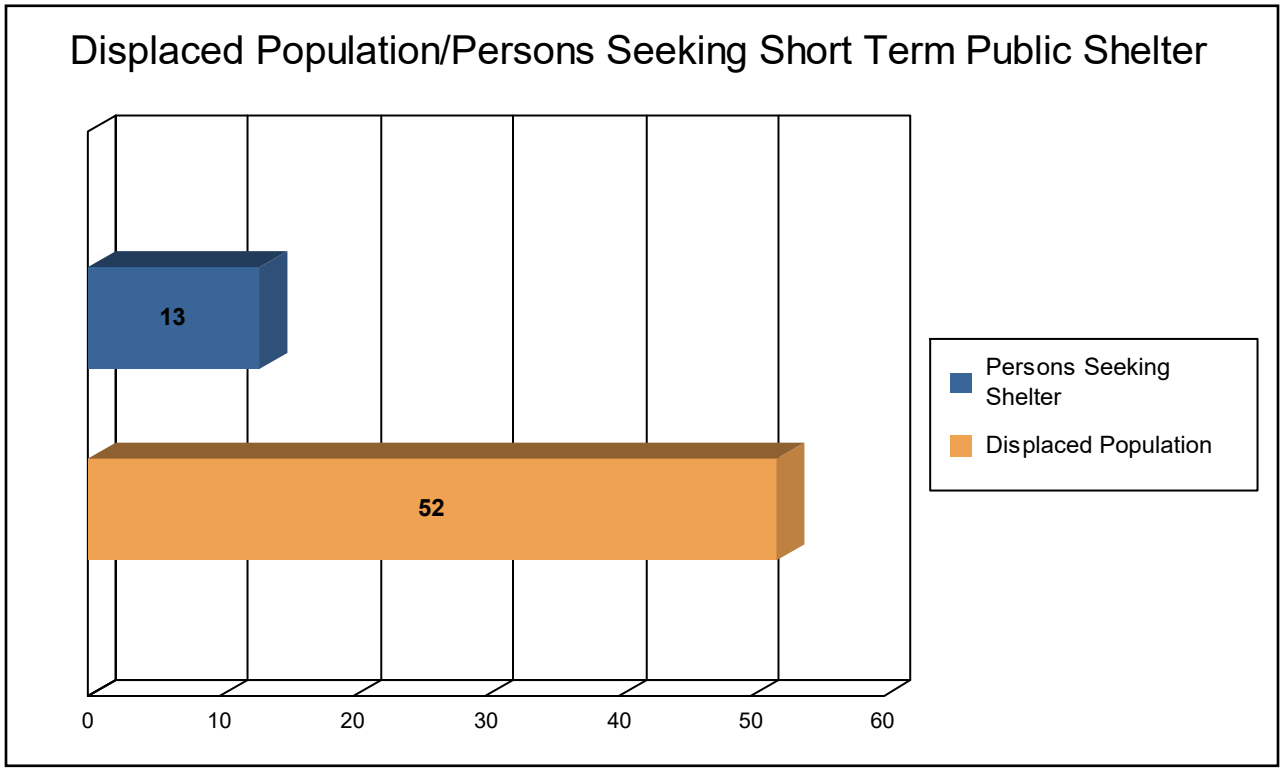


The model estimates that a total of 71 tons of debris will be generated. Of the total amount, Finishes comprises 95% of the total, Structure comprises 3% of the total, and Foundation comprises 2%. If the debris tonnage is converted into an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 17 households (or 52 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 13 people (out of a total population of 5,272) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 260.72 million dollars, which represents 49.12 % of the total replacement value of the scenario buildings.

Building-Related Losses

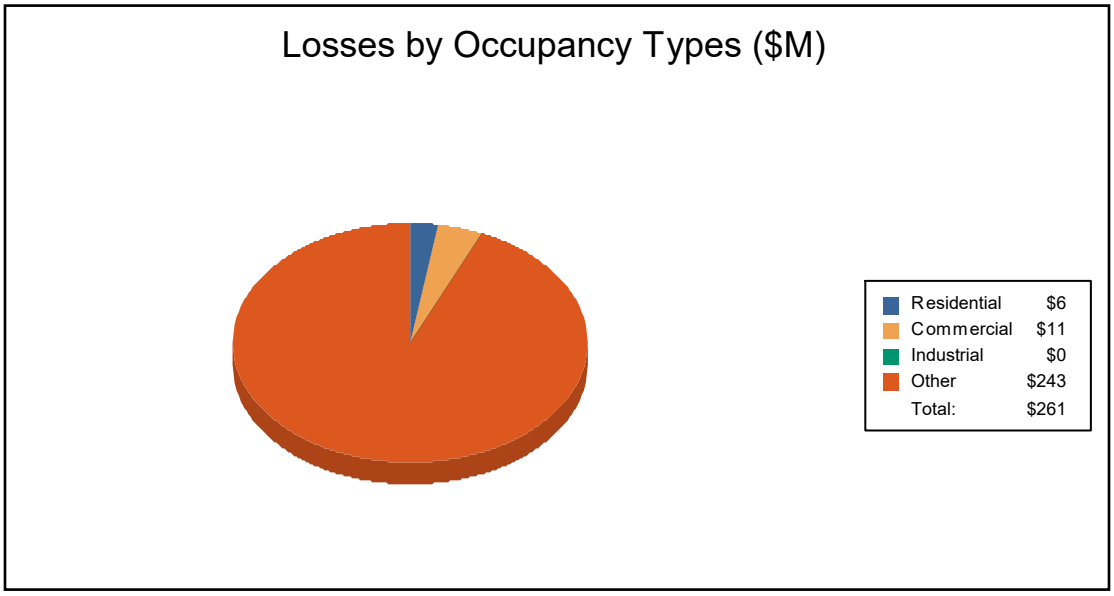
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 18.70 million dollars. 93% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 2.44% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.14	0.80	0.07	2.09	4.10
	Content	1.06	3.45	0.16	9.71	14.39
	Inventory	0.00	0.17	0.02	0.02	0.21
	Subtotal	**2.20**	**4.43**	**0.25**	**11.82**	**18.70**
Business Interruption						
	Income	0.73	2.28	0.00	0.58	3.60
	Relocation	0.36	0.43	0.00	2.55	3.34
	Rental Income	1.36	0.29	0.00	0.13	1.78
	Wage	1.72	3.50	0.00	228.08	233.31
	Subtotal	**4.17**	**6.50**	**0.00**	**231.34**	**242.02**
ALL	**Total**	**6.37**	**10.93**	**0.25**	**243.17**	**260.72**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,735	264,074	1,081,809
Total	**5,272**	**817,735**	**264,074**	**1,081,809**
Total Study Region	**5,272**	**817,735**	**264,074**	**1,081,809**

Hazus: Flood Global Risk Report

Region Name: Columbia_FL

Flood Scenario: Columbia_Flood

Print Date: Thursday, April 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 72 census blocks. The region contains over 2 thousand households and has a total population of 5,272 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,447 buildings in the region with a total building replacement value (excluding contents) of 1,082 million dollars. Approximately 91.87% of the buildings (and 75.59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,447 buildings in the region which have an aggregate total replacement value of 1,082 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	817,735	75.6%
Commercial	124,704	11.5%
Industrial	38,527	3.6%
Agricultural	1,477	0.1%
Religion	6,000	0.6%
Government	63,222	5.8%
Education	30,144	2.8%
Total	**1,081,809**	**100%**

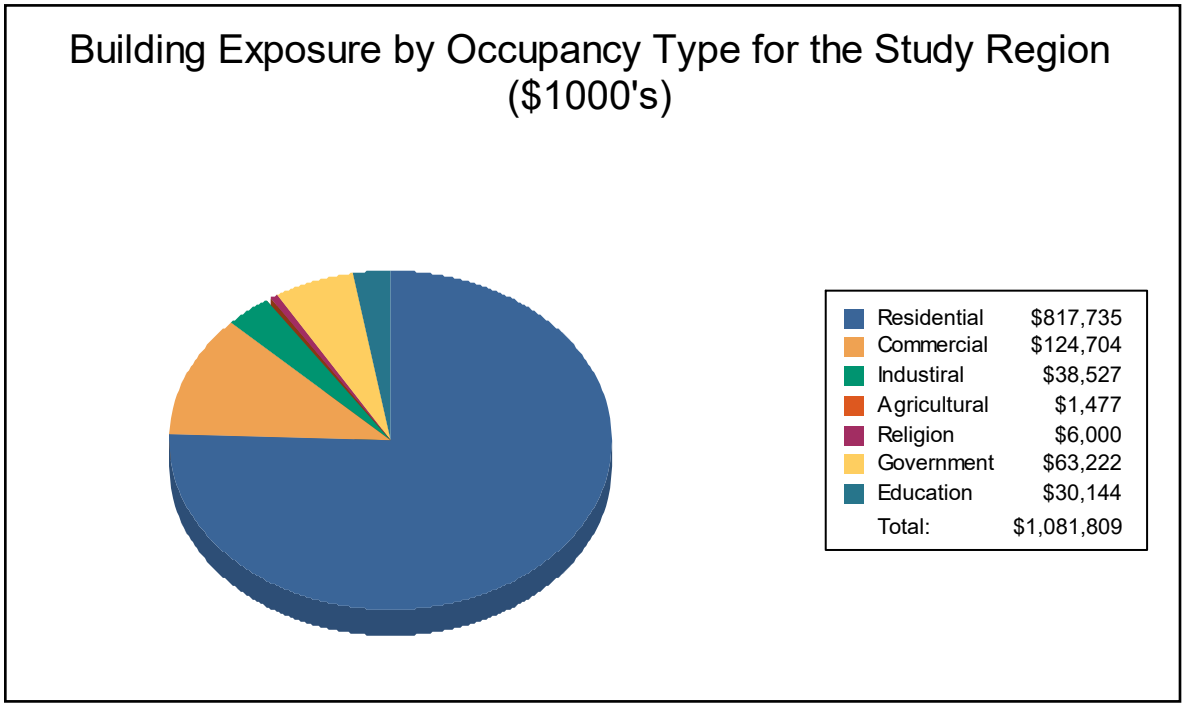
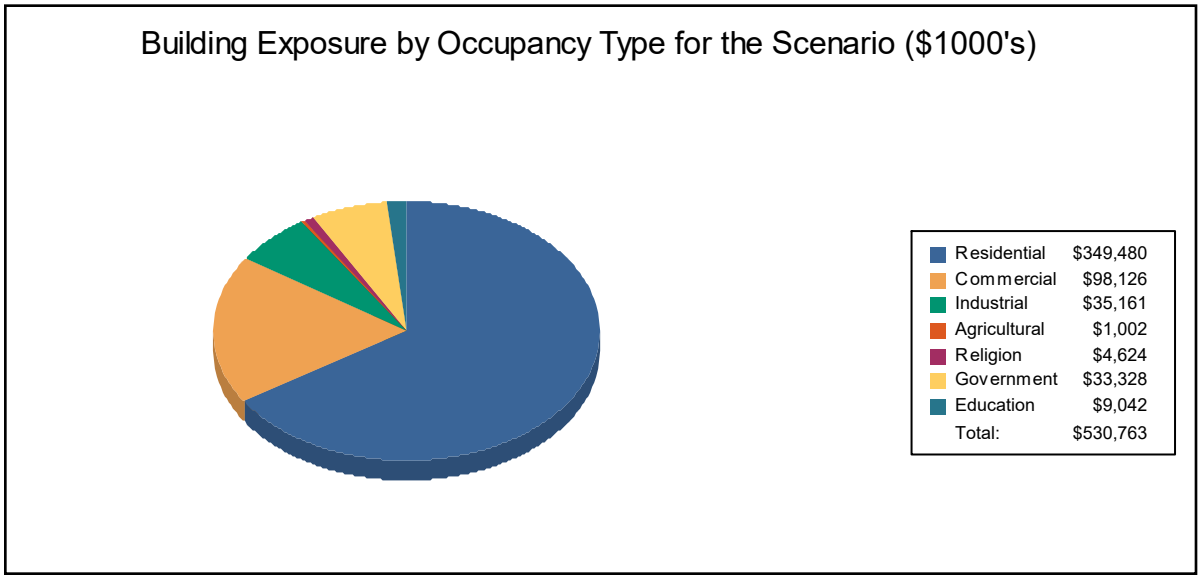


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	349,480	65.8%
Commercial	98,126	18.5%
Industrial	35,161	6.6%
Agricultural	1,002	0.2%
Religion	4,624	0.9%
Government	33,328	6.3%
Education	9,042	1.7%
Total	**530,763**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, no police stations and 1 emergency operation center.

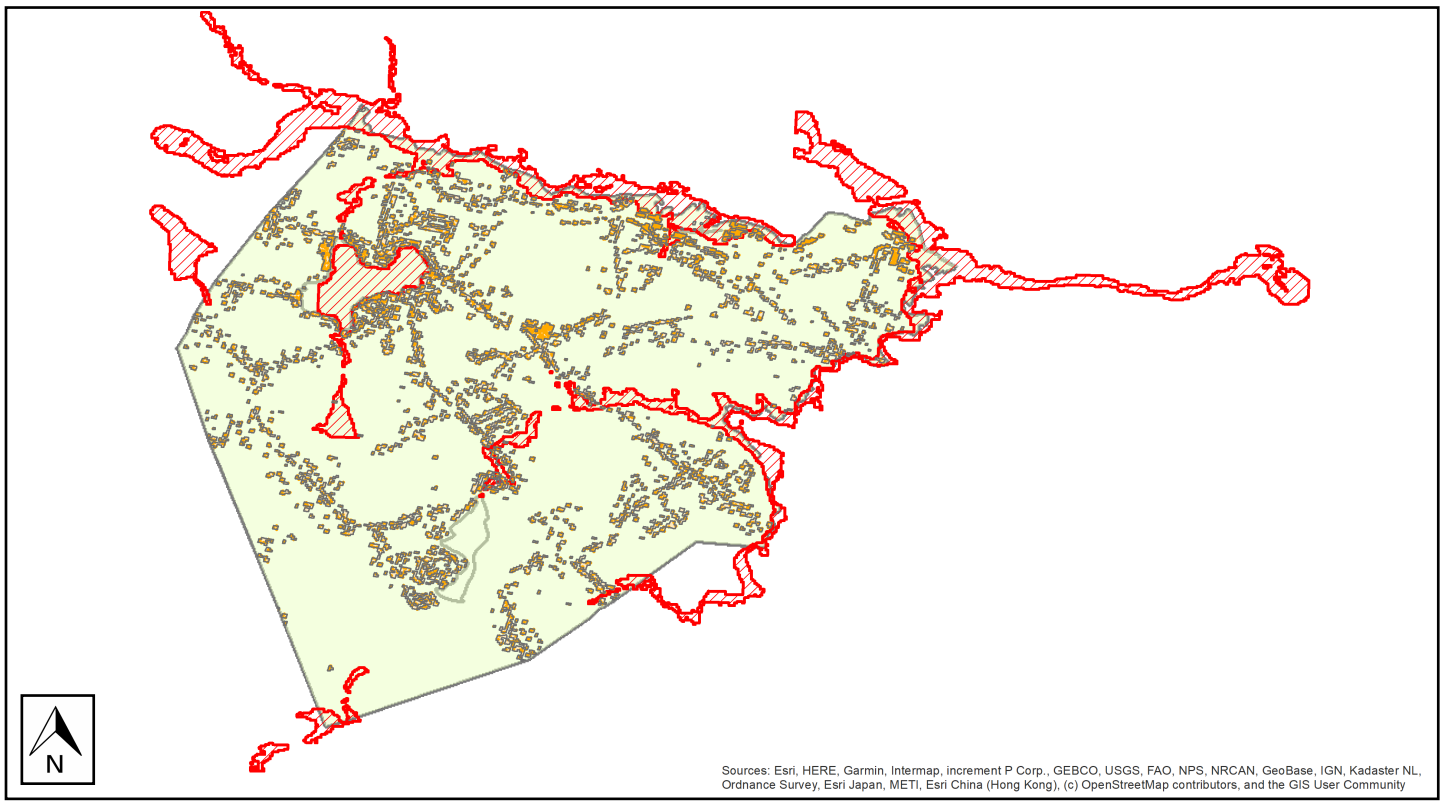
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Columbia_FL
Scenario Name:	Columbia_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 78% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

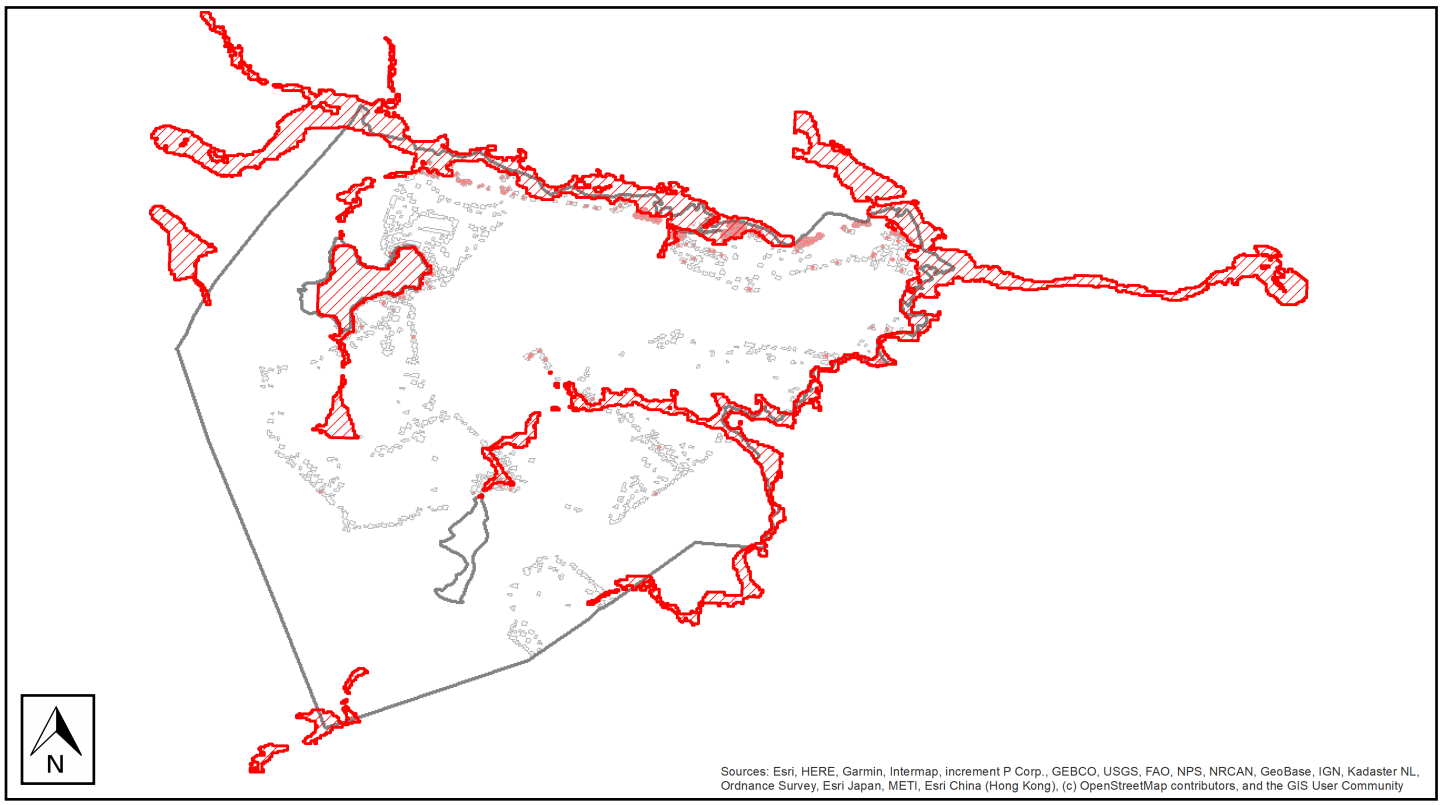


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	6	86	1	14	0	0	0	0	0	0	0	0
Total	**6**		**1**		**0**		**0**		**0**		**0**	

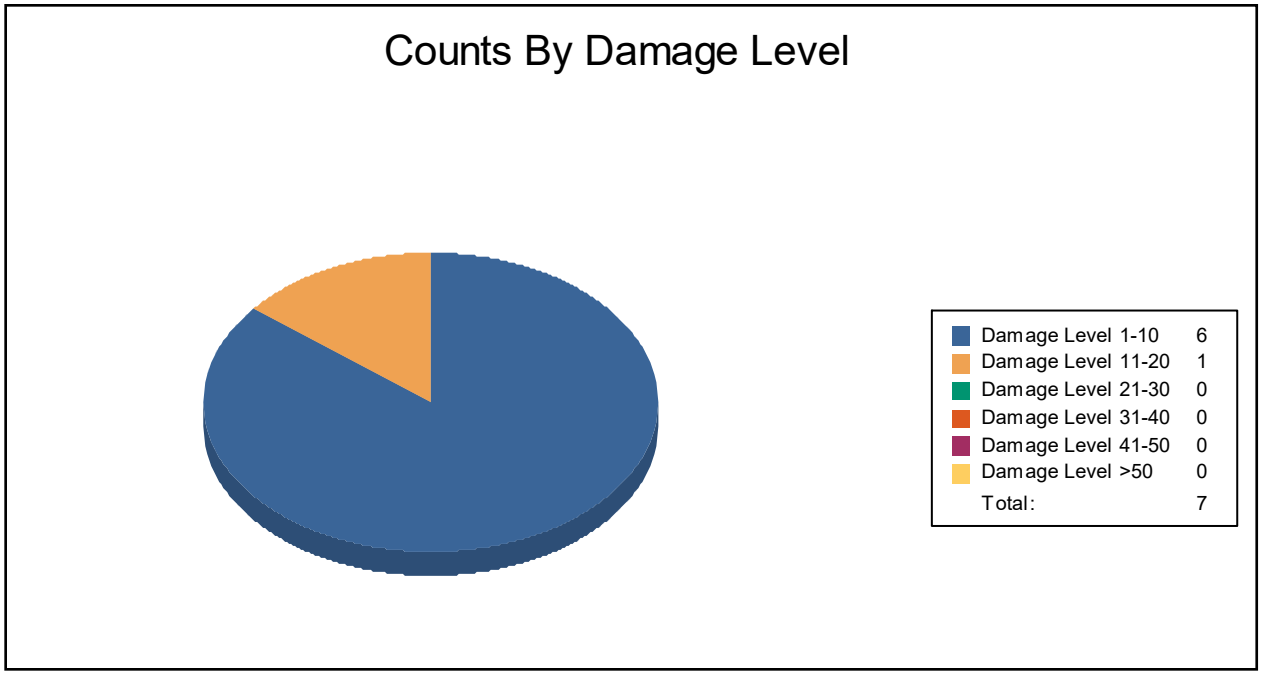


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	6	86	1	14	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

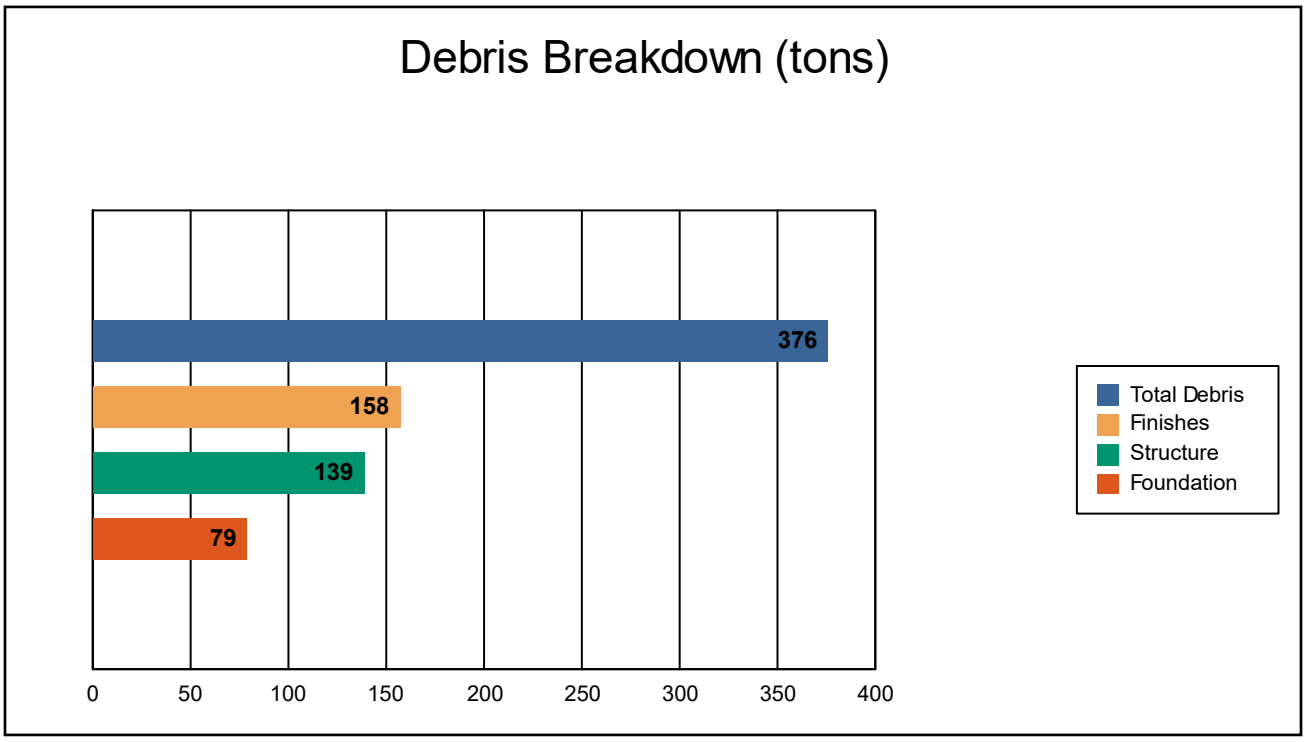
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

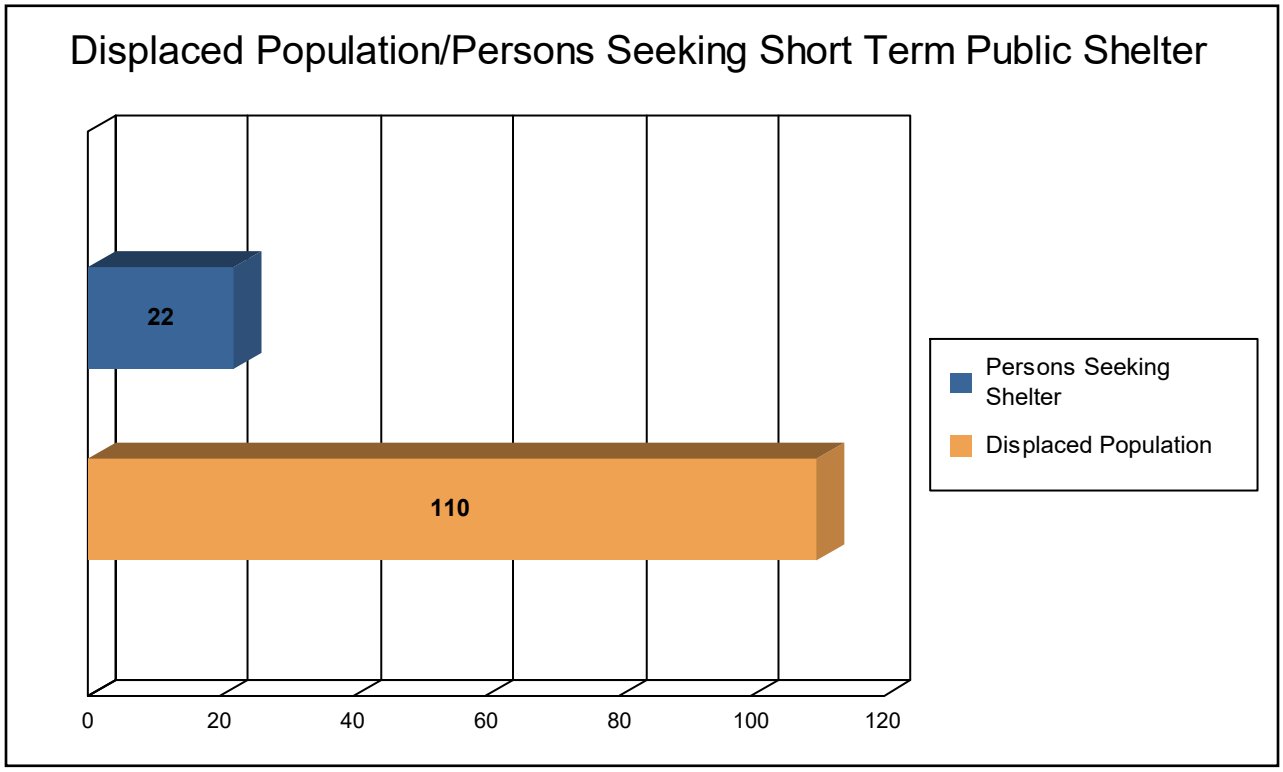


The model estimates that a total of 376 tons of debris will be generated. Of the total amount, Finishes comprises 42% of the total, Structure comprises 37% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 16 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 37 households (or 110 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 22 people (out of a total population of 5,272) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 378.87 million dollars, which represents 71.38 % of the total replacement value of the scenario buildings.

Building-Related Losses

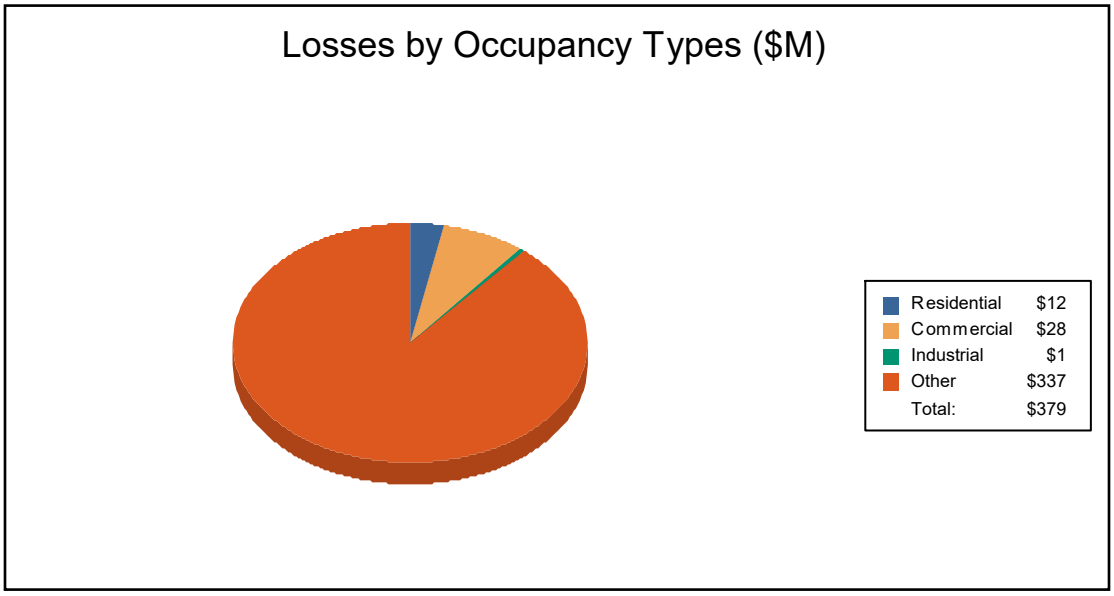
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 46.79 million dollars. 88% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 3.15% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.03	2.59	0.46	4.11	10.19
	Content	2.51	9.63	0.80	23.01	35.95
	Inventory	0.00	0.50	0.12	0.04	0.65
	Subtotal	**5.54**	**12.72**	**1.38**	**27.16**	**46.79**
Business Interruption						
	Income	1.10	5.83	0.02	0.63	7.57
	Relocation	0.63	1.28	0.01	3.32	5.24
	Rental Income	2.09	0.91	0.00	0.19	3.19
	Wage	2.59	7.73	0.03	305.72	316.08
	Subtotal	**6.41**	**15.75**	**0.06**	**309.85**	**332.08**
ALL	**Total**	**11.95**	**28.47**	**1.44**	**337.01**	**378.87**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,735	264,074	1,081,809
Total	**5,272**	**817,735**	**264,074**	**1,081,809**
Total Study Region	**5,272**	**817,735**	**264,074**	**1,081,809**

Hazus: Flood Global Risk Report

Region Name: Coventry_FL

Flood Scenario: Coventry_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 209 census blocks. The region contains over 5 thousand households and has a total population of 12,235 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,181 buildings in the region with a total building replacement value (excluding contents) of 2,160 million dollars. Approximately 91.41% of the buildings (and 75.62% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,181 buildings in the region which have an aggregate total replacement value of 2,160 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,633,512	75.6%
Commercial	263,565	12.2%
Industrial	42,290	2.0%
Agricultural	5,272	0.2%
Religion	10,397	0.5%
Government	99,995	4.6%
Education	105,242	4.9%
Total	**2,160,273**	**100%**

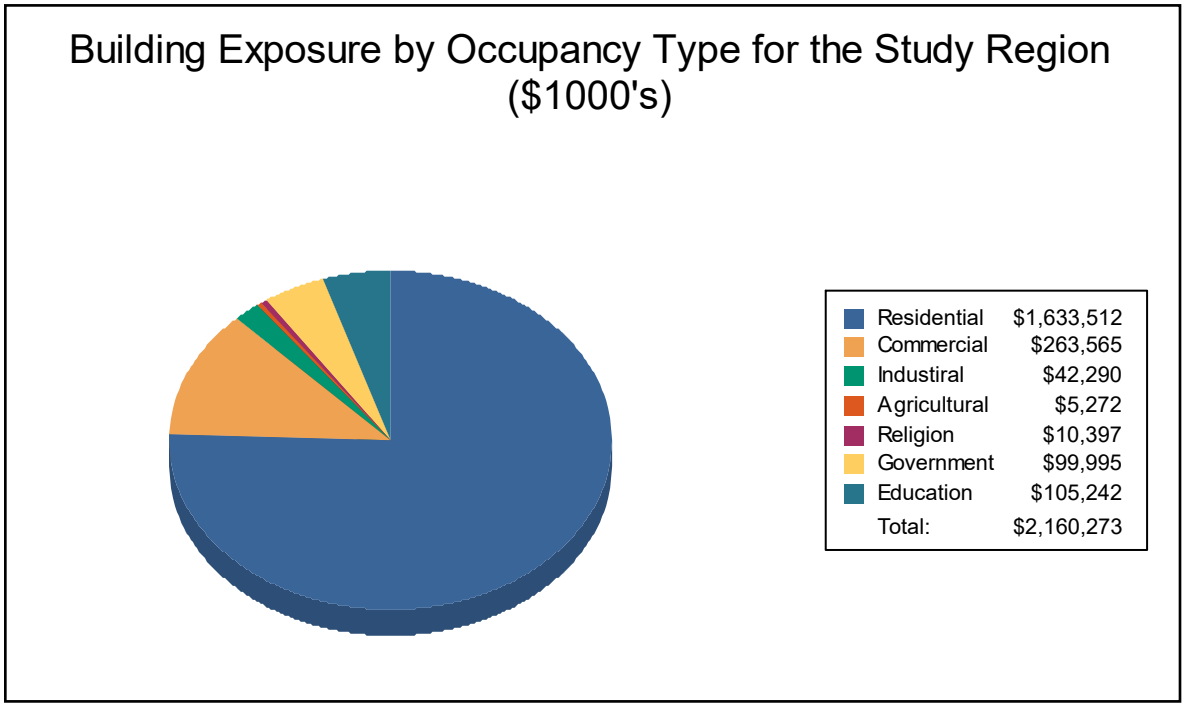
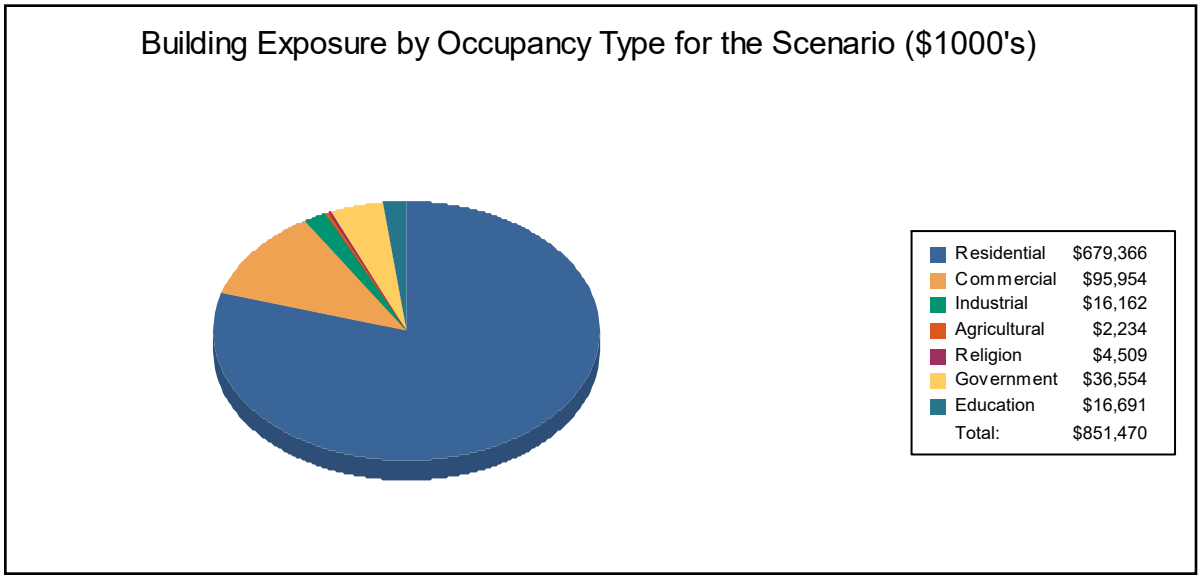


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	679,366	79.8%
Commercial	95,954	11.3%
Industrial	16,162	1.9%
Agricultural	2,234	0.3%
Religion	4,509	0.5%
Government	36,554	4.3%
Education	16,691	2.0%
Total	**851,470**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

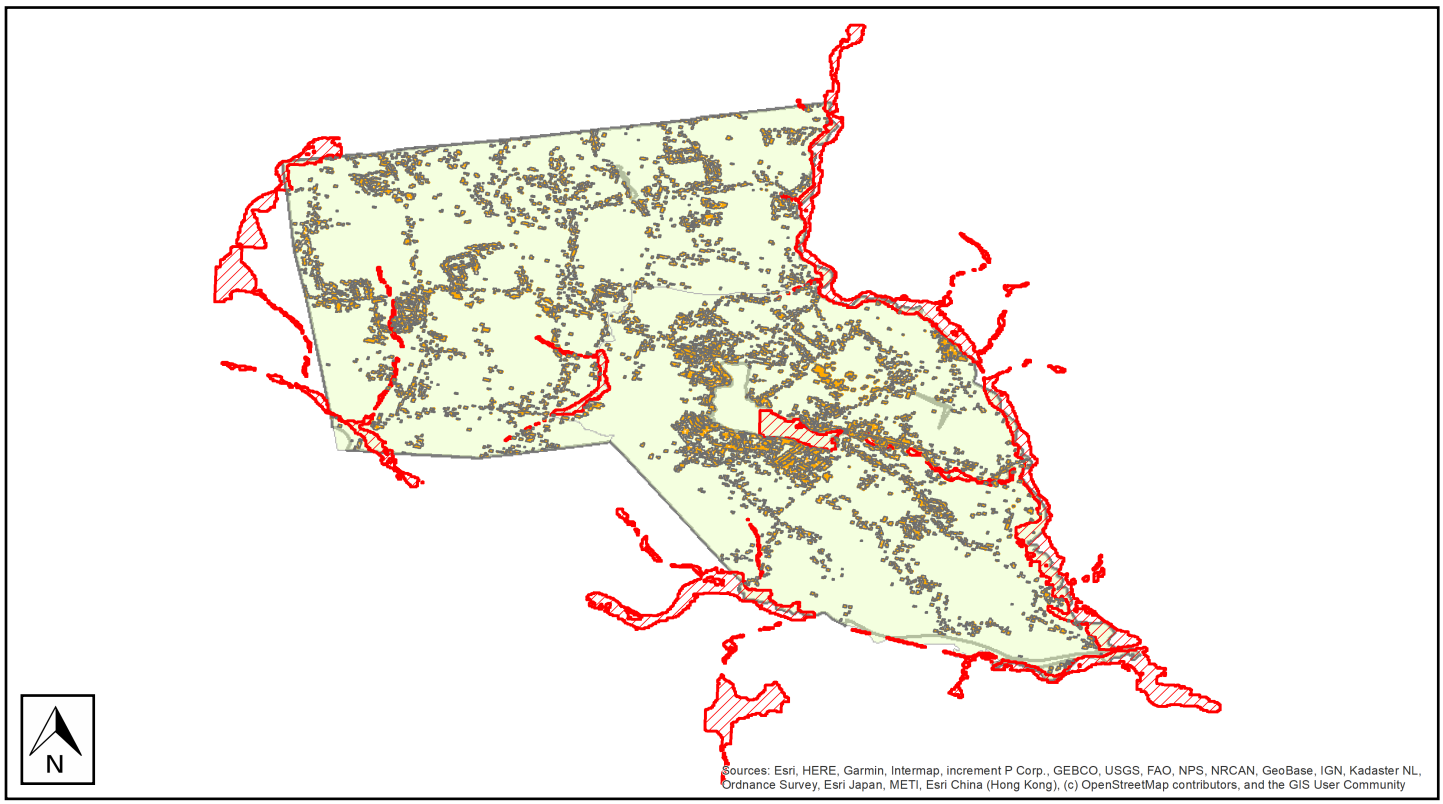
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Coventry_FL
Scenario Name:	Coventry_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

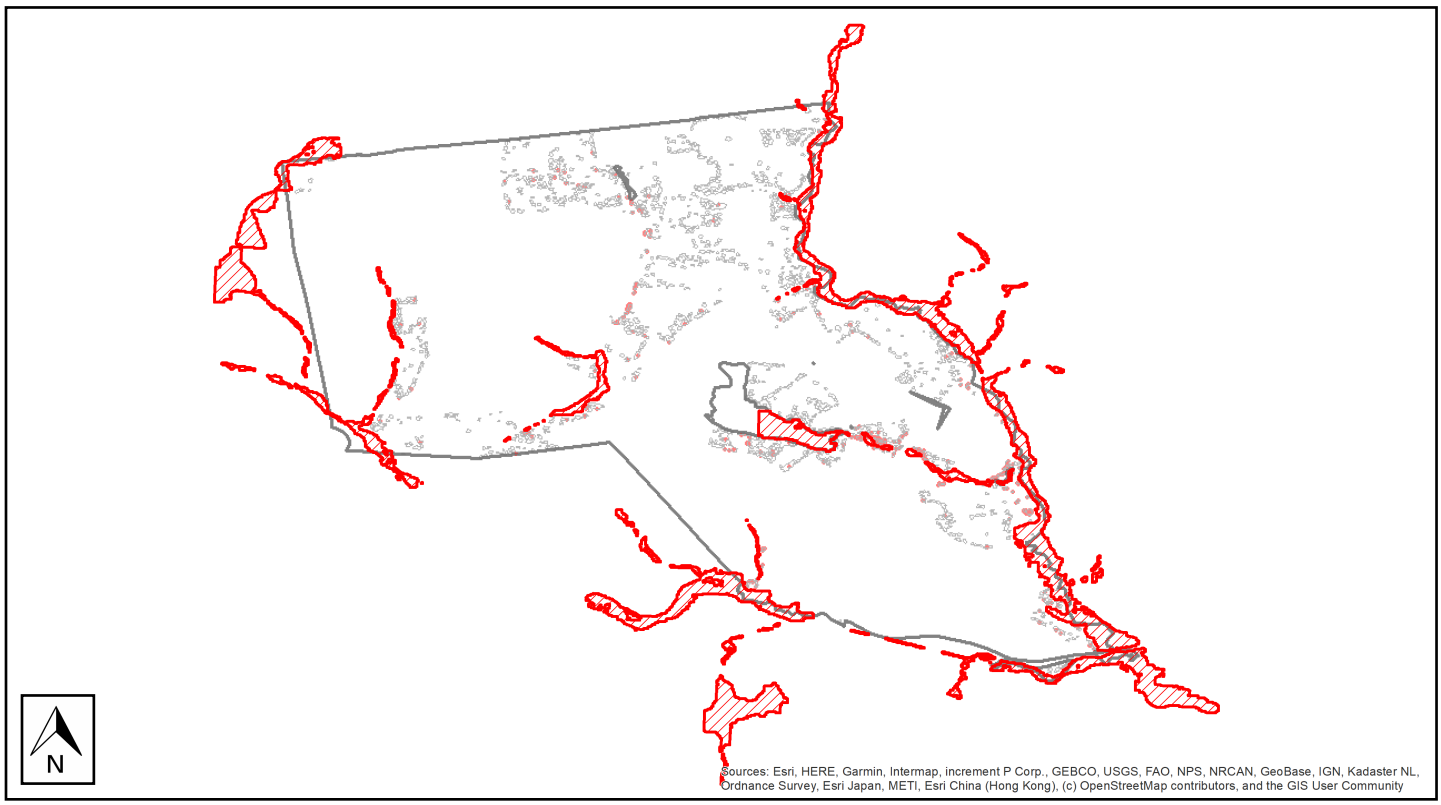


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	100	0	0	0	0	0	0	0	0	0	0
Total	**1**		**0**		**0**		**0**		**0**		**0**	

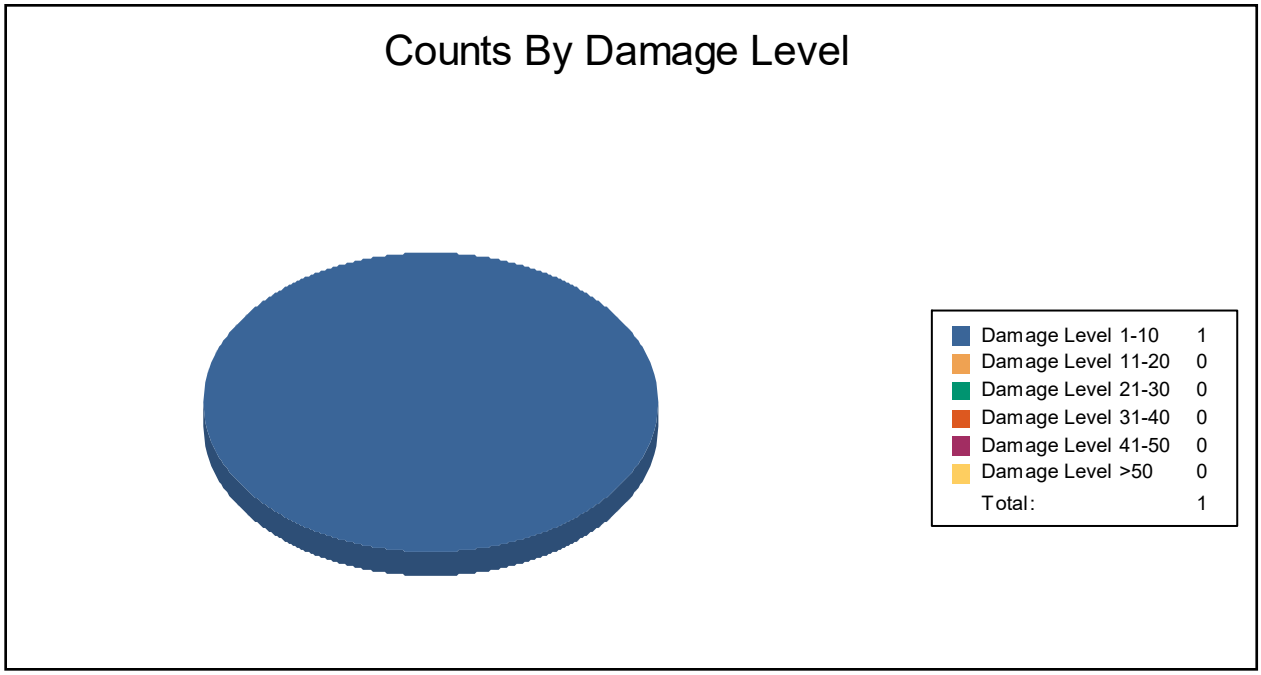


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

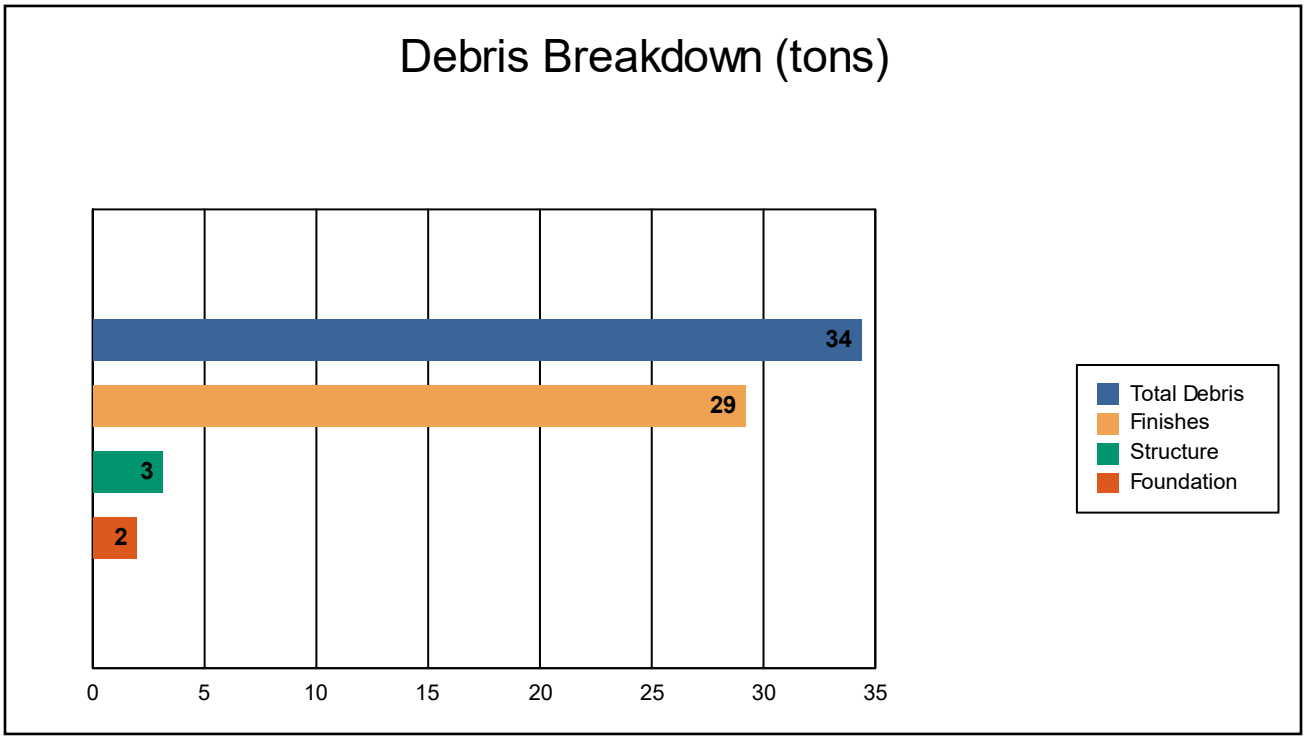
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

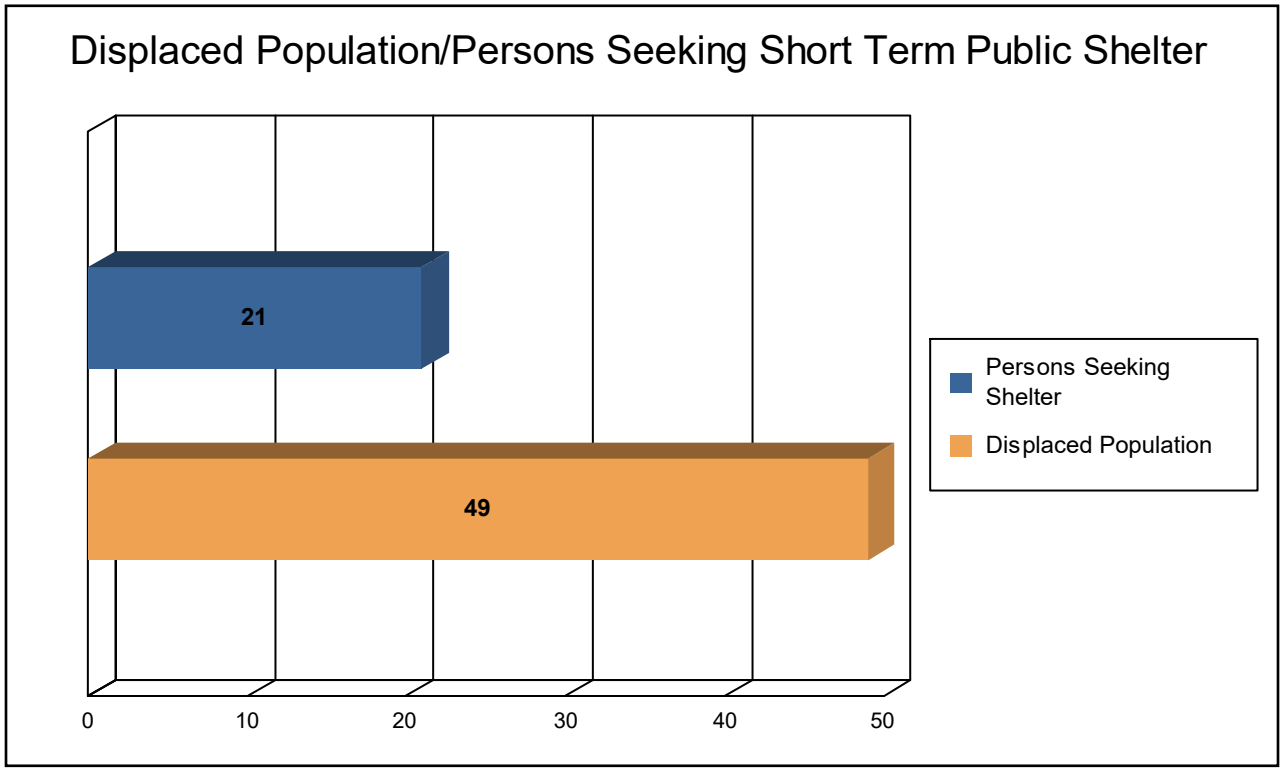


The model estimates that a total of 34 tons of debris will be generated. Of the total amount, Finishes comprises 85% of the total, Structure comprises 9% of the total, and Foundation comprises 6%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 16 households (or 49 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 21 people (out of a total population of 12,235) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 7.74 million dollars, which represents 0.91 % of the total replacement value of the scenario buildings.

Building-Related Losses

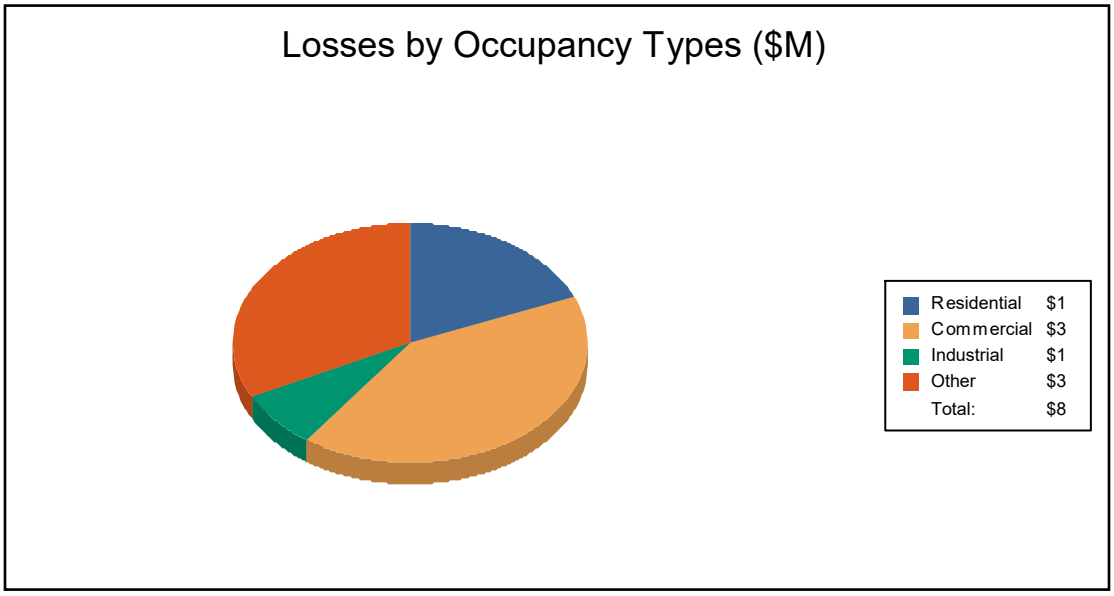
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 3.72 million dollars. 52% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 18.53% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.77	0.34	0.16	0.06	1.33
	Content	0.33	0.99	0.34	0.45	2.11
	Inventory	0.00	0.24	0.05	0.00	0.29
	Subtotal	**1.09**	**1.57**	**0.55**	**0.51**	**3.72**
Business Interruption						
	Income	0.00	0.65	0.01	0.13	0.79
	Relocation	0.26	0.17	0.01	0.09	0.51
	Rental Income	0.09	0.12	0.00	0.03	0.24
	Wage	0.00	0.69	0.02	1.76	2.47
	Subtotal	**0.34**	**1.63**	**0.05**	**2.00**	**4.02**
ALL	**Total**	**1.43**	**3.20**	**0.59**	**2.51**	**7.74**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,512	526,761	2,160,273
Total	**12,235**	**1,633,512**	**526,761**	**2,160,273**
Total Study Region	**12,235**	**1,633,512**	**526,761**	**2,160,273**

Hazus: Flood Global Risk Report

Region Name: Coventry_FL

Flood Scenario: Coventry_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 209 census blocks. The region contains over 5 thousand households and has a total population of 12,235 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,181 buildings in the region with a total building replacement value (excluding contents) of 2,160 million dollars. Approximately 91.41% of the buildings (and 75.62% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,181 buildings in the region which have an aggregate total replacement value of 2,160 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,633,512	75.6%
Commercial	263,565	12.2%
Industrial	42,290	2.0%
Agricultural	5,272	0.2%
Religion	10,397	0.5%
Government	99,995	4.6%
Education	105,242	4.9%
Total	**2,160,273**	**100%**

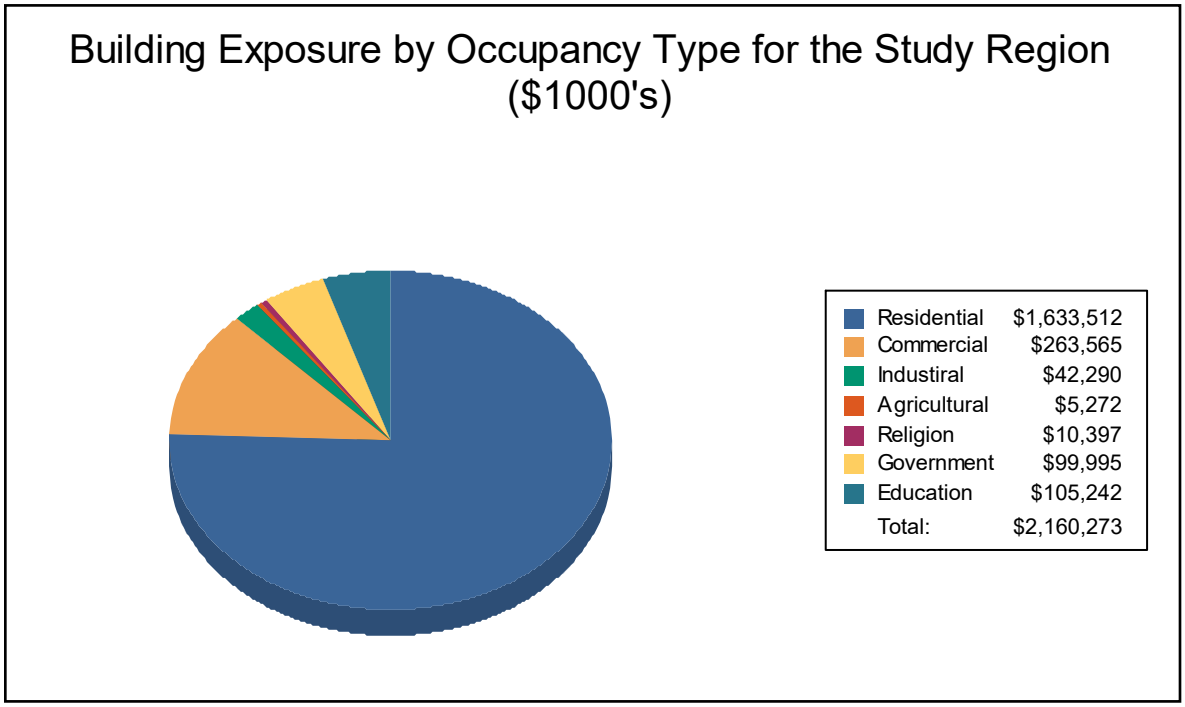
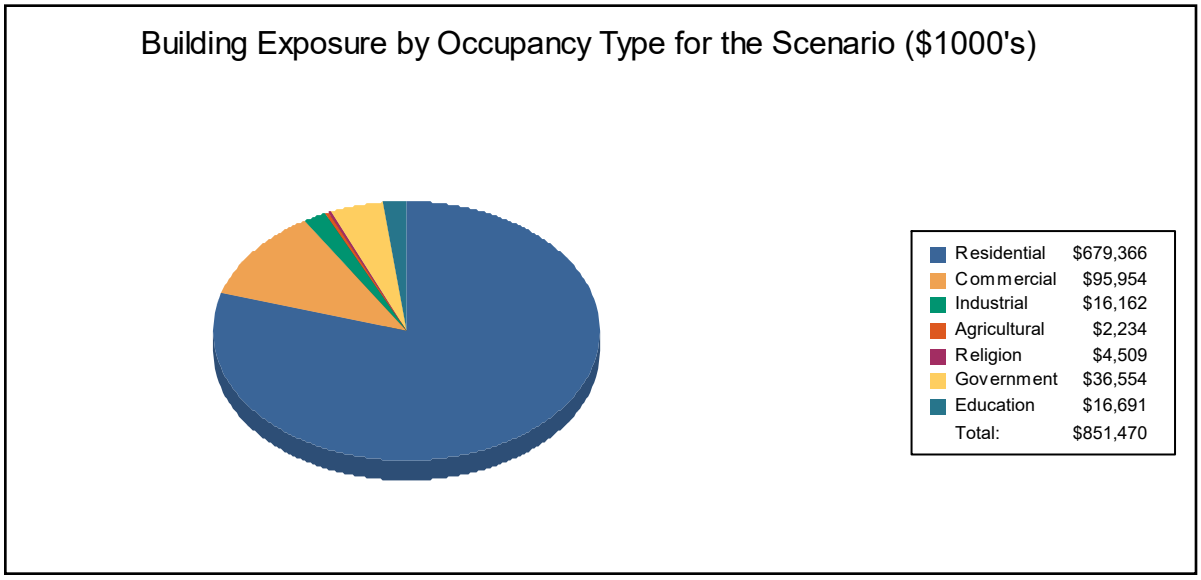


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	679,366	79.8%
Commercial	95,954	11.3%
Industrial	16,162	1.9%
Agricultural	2,234	0.3%
Religion	4,509	0.5%
Government	36,554	4.3%
Education	16,691	2.0%
Total	**851,470**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

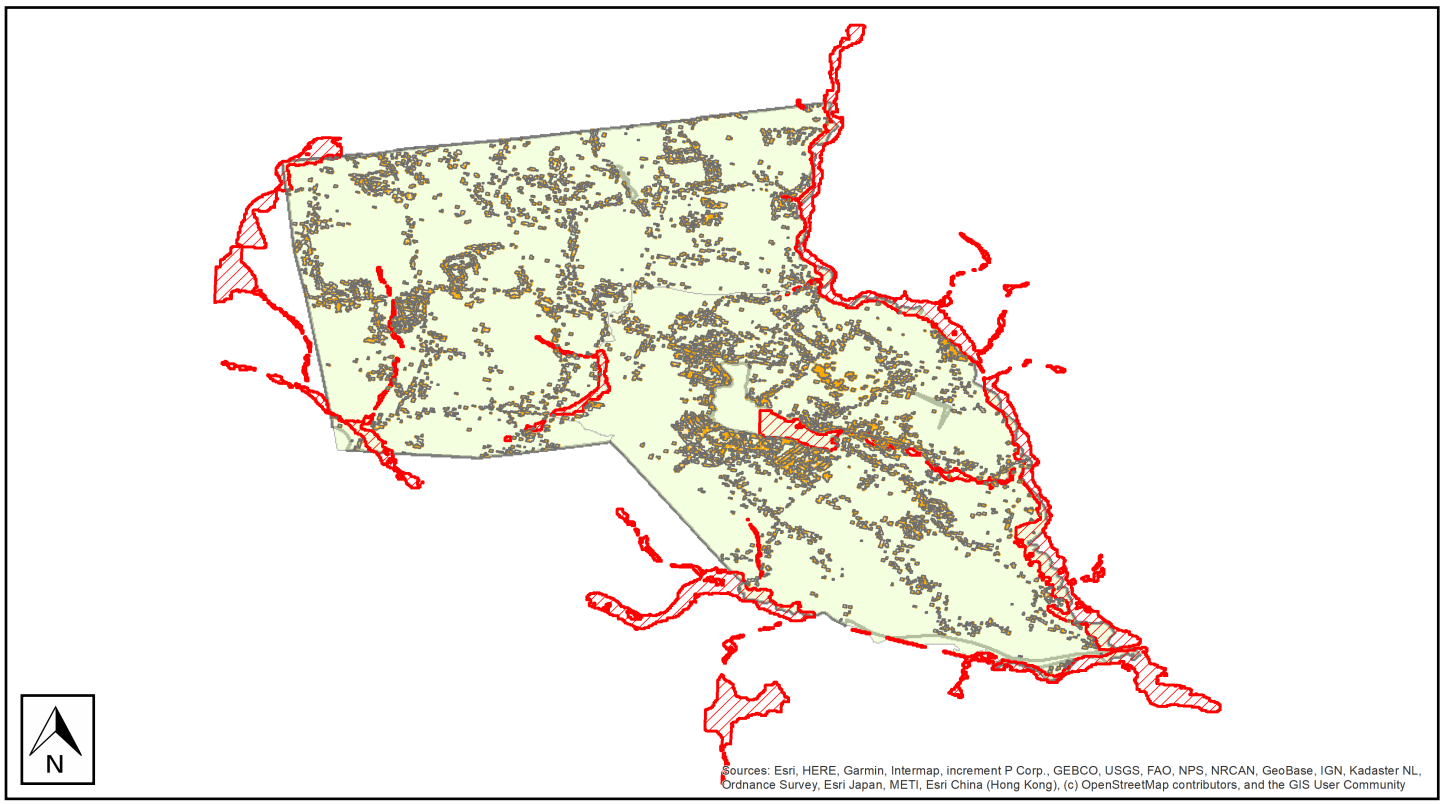
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Coventry_FL
Scenario Name:	Coventry_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

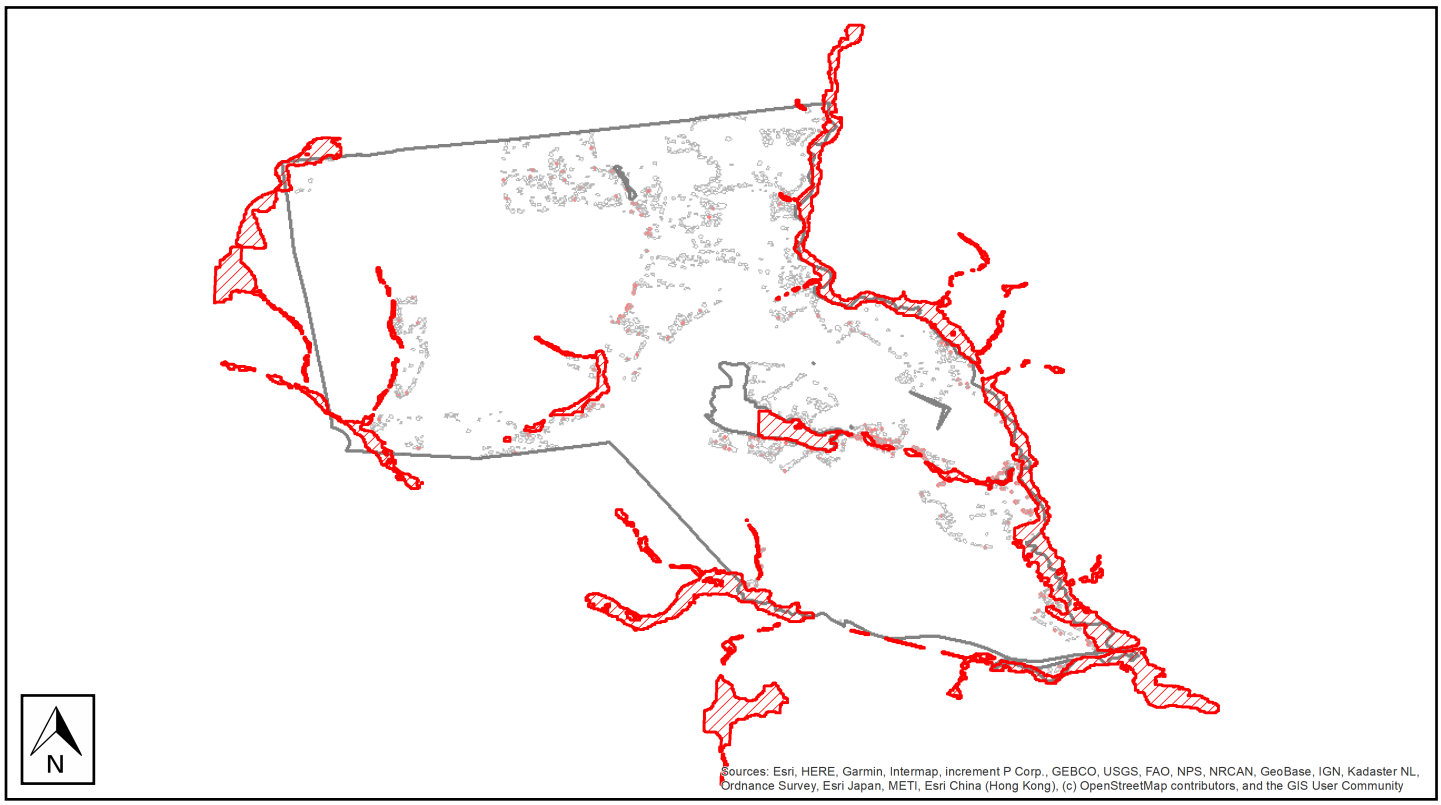


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	100	0	0	0	0	0	0	0	0	0	0
Total	**1**		**0**		**0**		**0**		**0**		**0**	

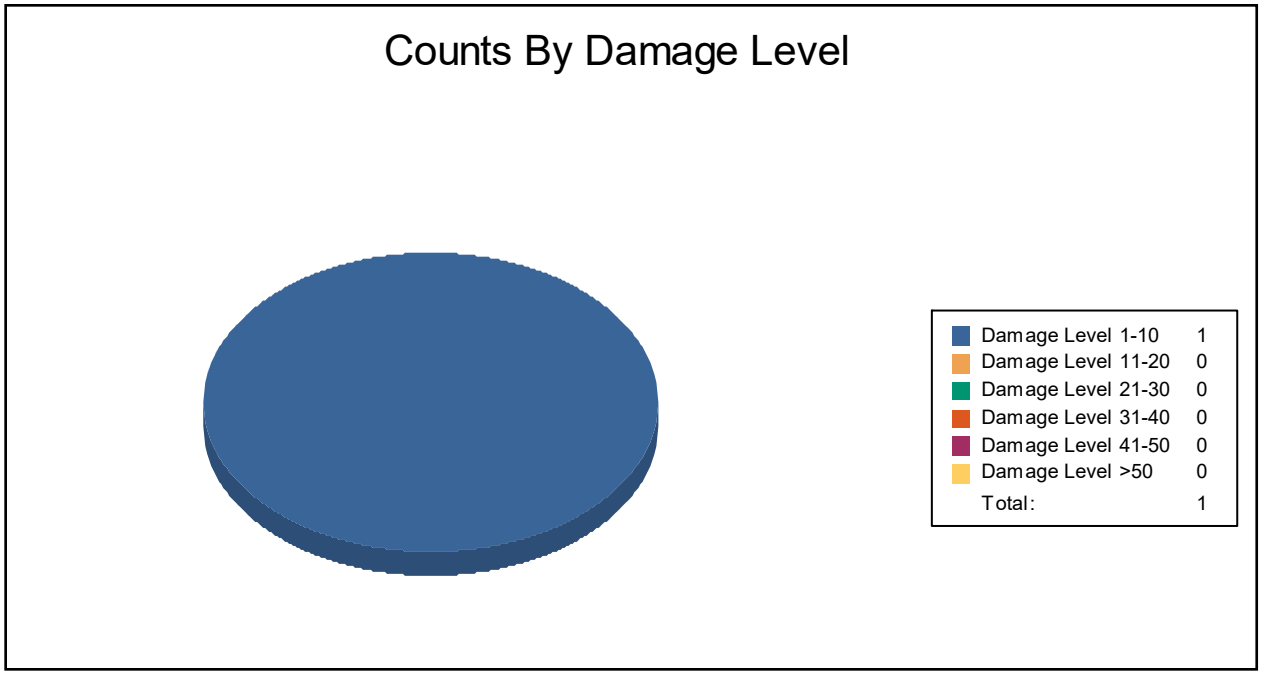


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

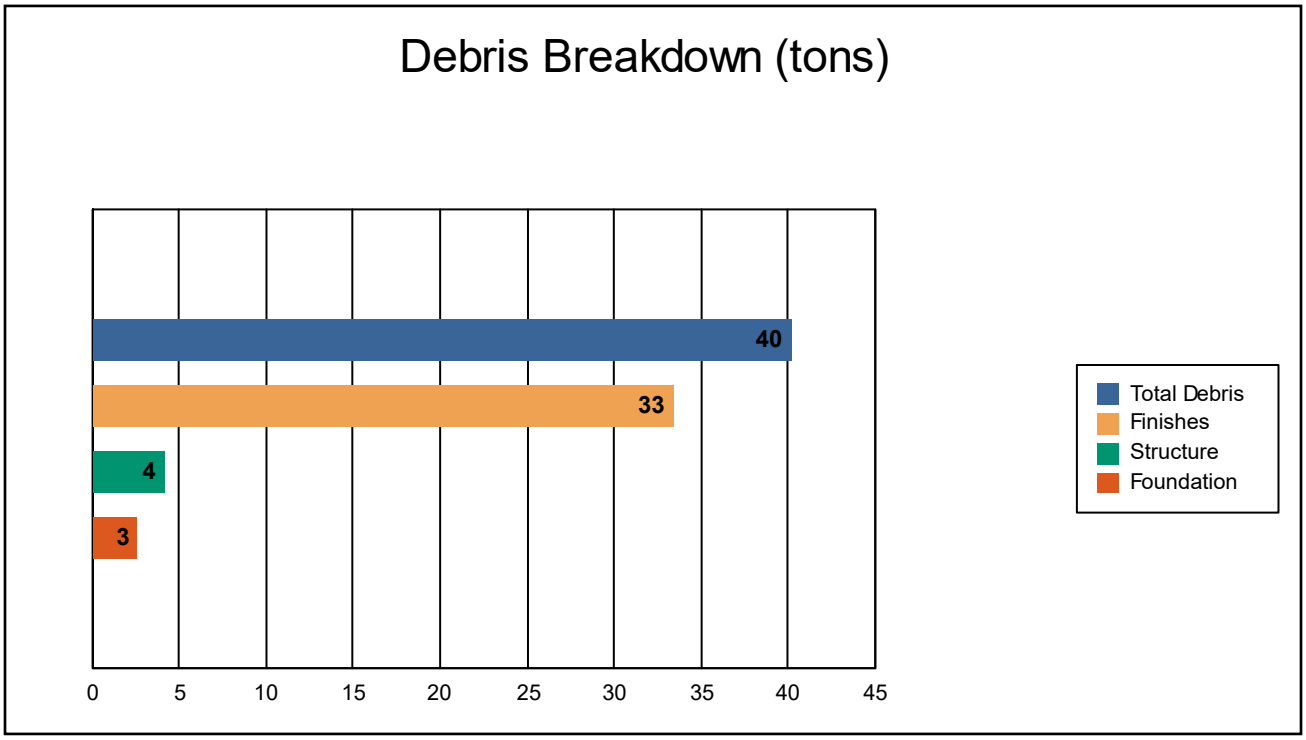
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

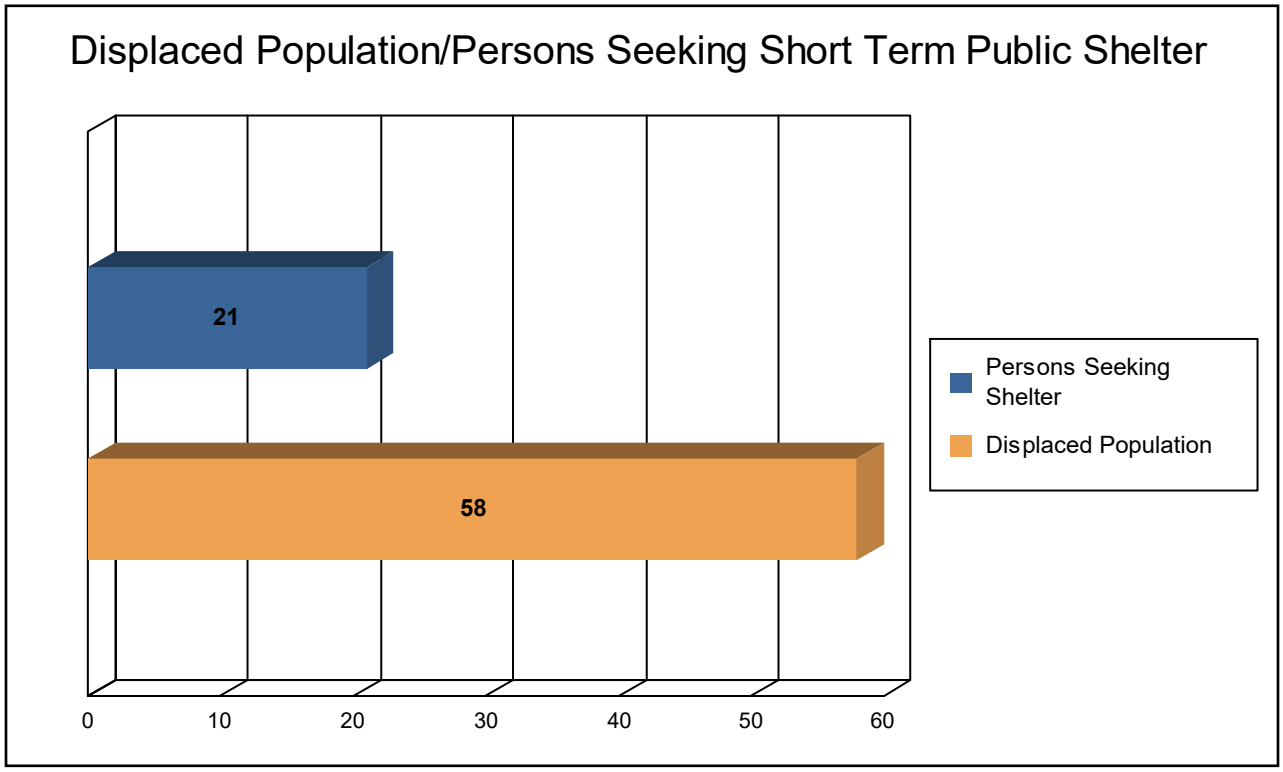


The model estimates that a total of 40 tons of debris will be generated. Of the total amount, Finishes comprises 83% of the total, Structure comprises 10% of the total, and Foundation comprises 6%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 19 households (or 58 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 21 people (out of a total population of 12,235) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 8.55 million dollars, which represents 1.00 % of the total replacement value of the scenario buildings.

Building-Related Losses

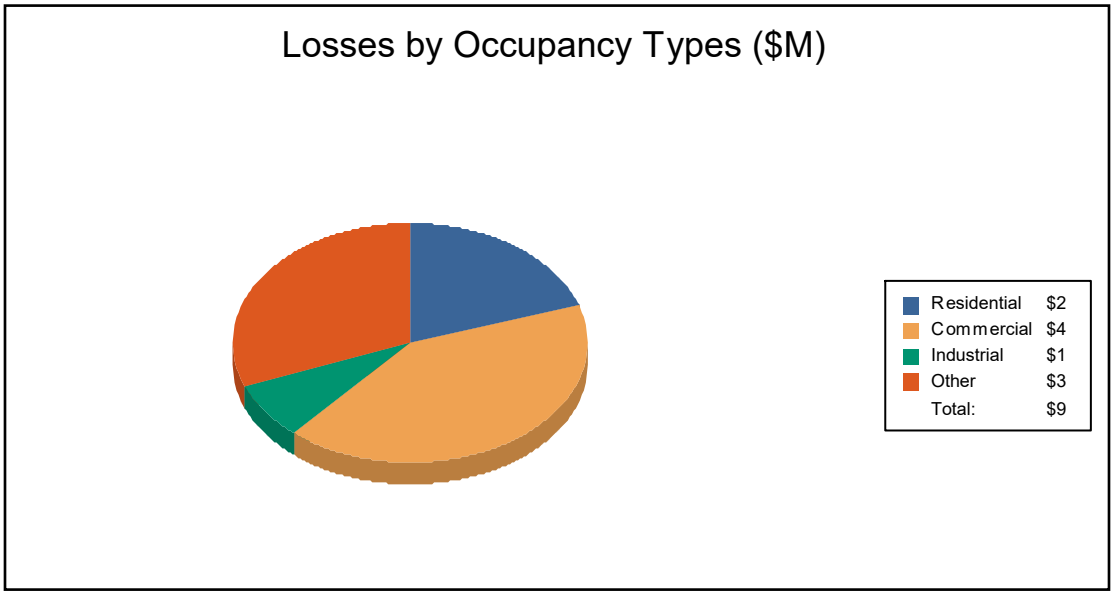
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 4.30 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 20.04% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.93	0.38	0.18	0.07	1.56
	Content	0.39	1.14	0.38	0.50	2.41
	Inventory	0.00	0.28	0.05	0.00	0.33
	Subtotal	**1.32**	**1.79**	**0.62**	**0.56**	**4.30**
Business Interruption						
	Income	0.00	0.71	0.01	0.13	0.85
	Relocation	0.29	0.17	0.01	0.09	0.55
	Rental Income	0.11	0.13	0.00	0.03	0.26
	Wage	0.00	0.74	0.03	1.83	2.60
	Subtotal	**0.39**	**1.75**	**0.05**	**2.07**	**4.25**
ALL	**Total**	**1.71**	**3.54**	**0.67**	**2.63**	**8.55**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,512	526,761	2,160,273
Total	**12,235**	**1,633,512**	**526,761**	**2,160,273**
Total Study Region	**12,235**	**1,633,512**	**526,761**	**2,160,273**

Hazus: Flood Global Risk Report

Region Name: Coventry_FL

Flood Scenario: Coventry_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 209 census blocks. The region contains over 5 thousand households and has a total population of 12,235 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,181 buildings in the region with a total building replacement value (excluding contents) of 2,160 million dollars. Approximately 91.41% of the buildings (and 75.62% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,181 buildings in the region which have an aggregate total replacement value of 2,160 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,633,512	75.6%
Commercial	263,565	12.2%
Industrial	42,290	2.0%
Agricultural	5,272	0.2%
Religion	10,397	0.5%
Government	99,995	4.6%
Education	105,242	4.9%
Total	**2,160,273**	**100%**

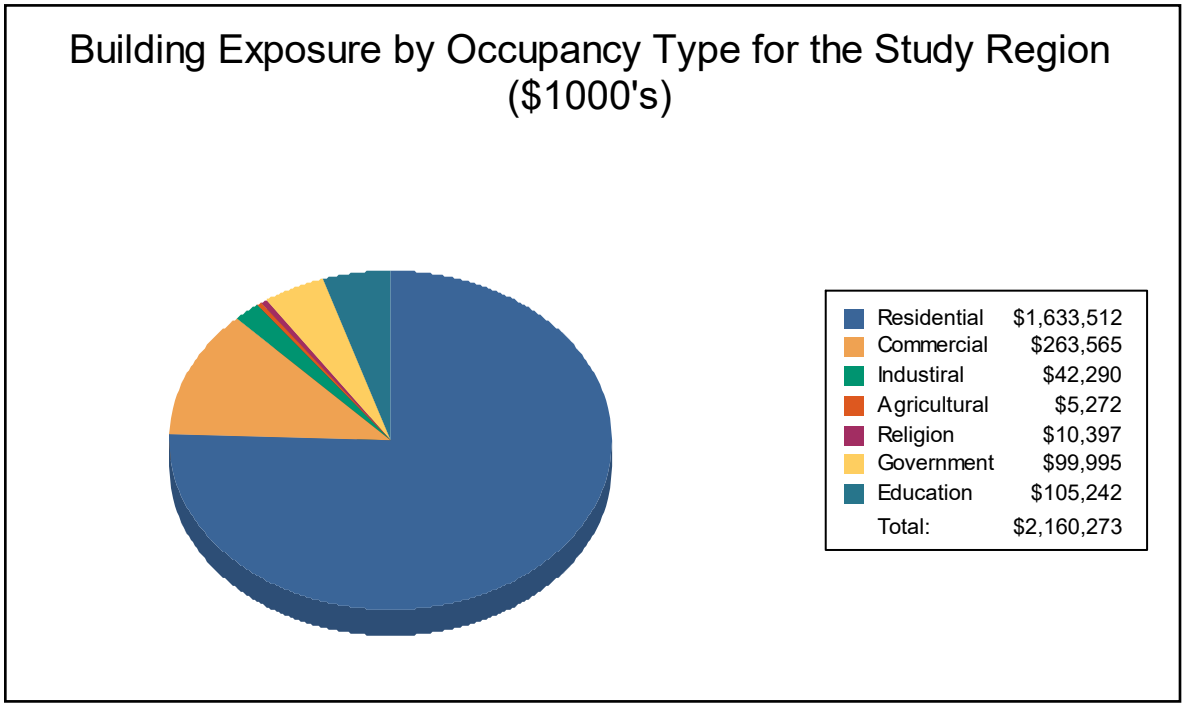
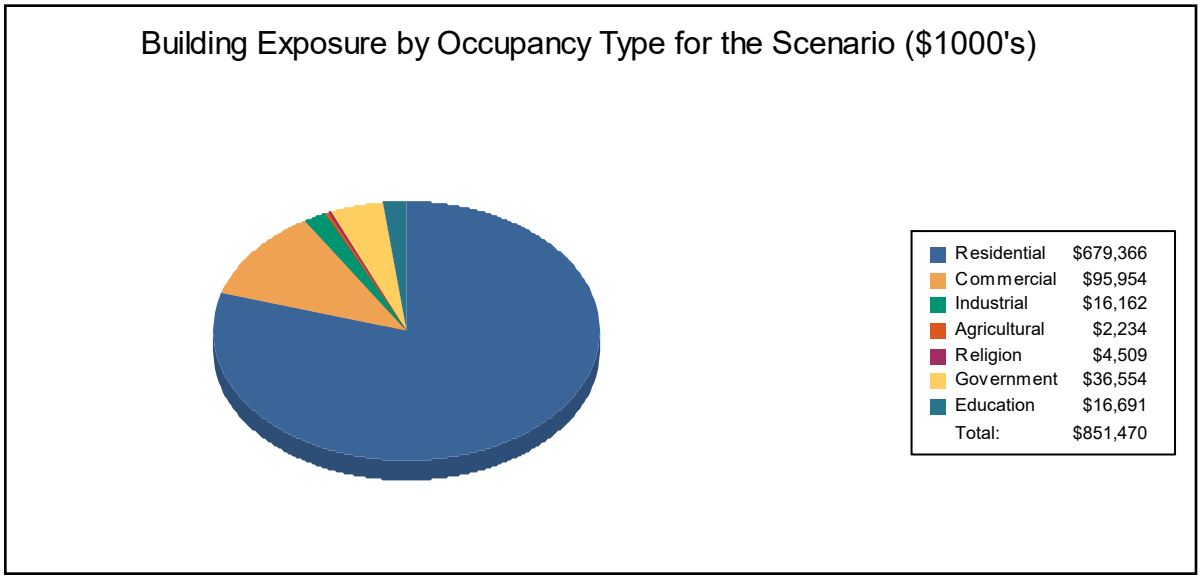


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	679,366	79.8%
Commercial	95,954	11.3%
Industrial	16,162	1.9%
Agricultural	2,234	0.3%
Religion	4,509	0.5%
Government	36,554	4.3%
Education	16,691	2.0%
Total	**851,470**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

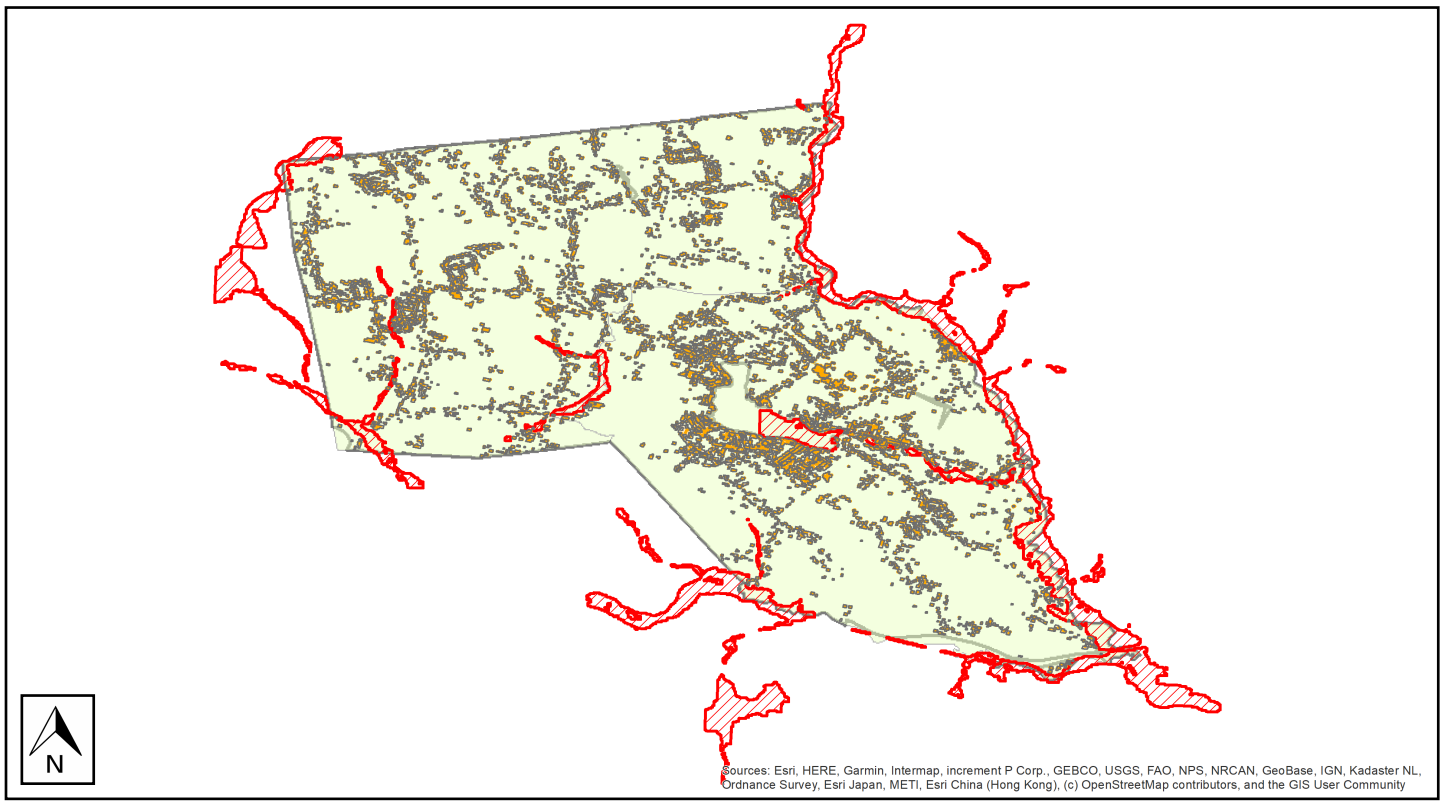
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Coventry_FL
Scenario Name:	Coventry_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 50% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

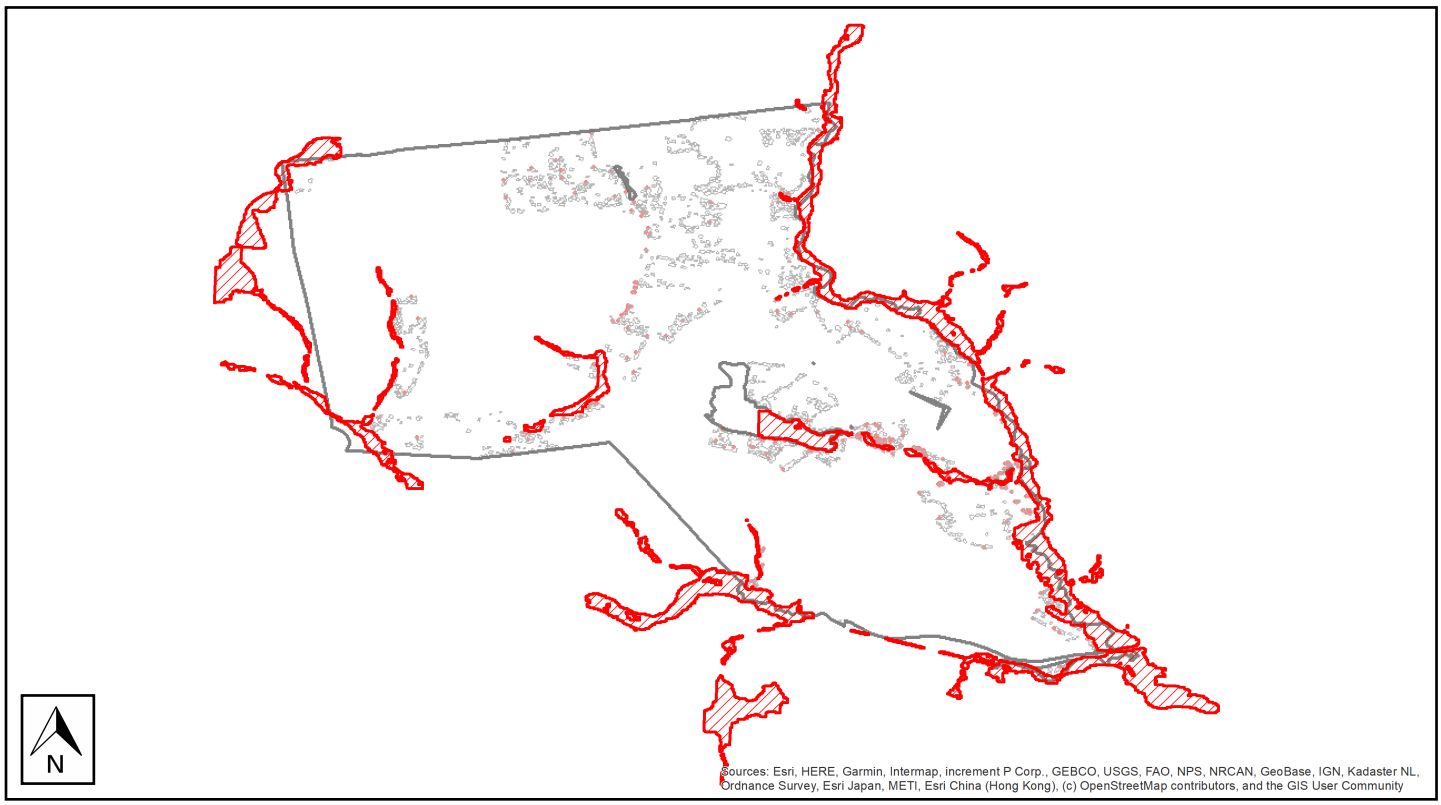


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	100	0	0	0	0	0	0	0	0	0	0
Total	**1**		**0**		**0**		**0**		**0**		**0**	

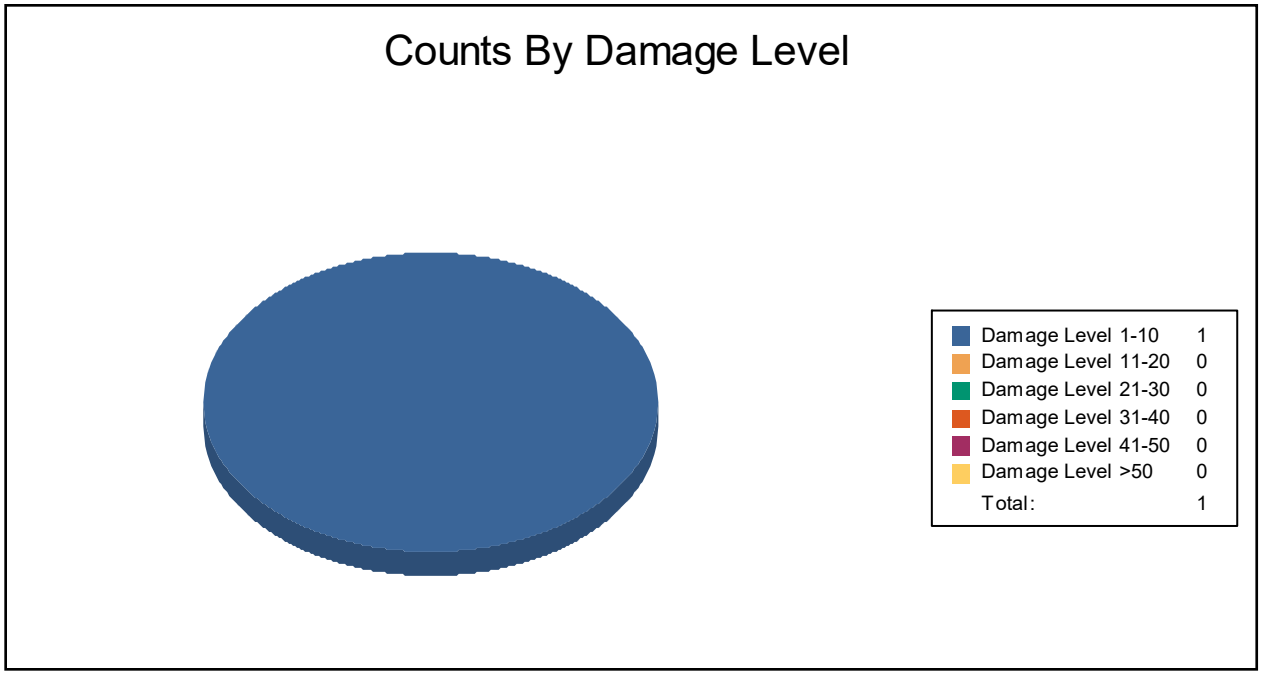


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

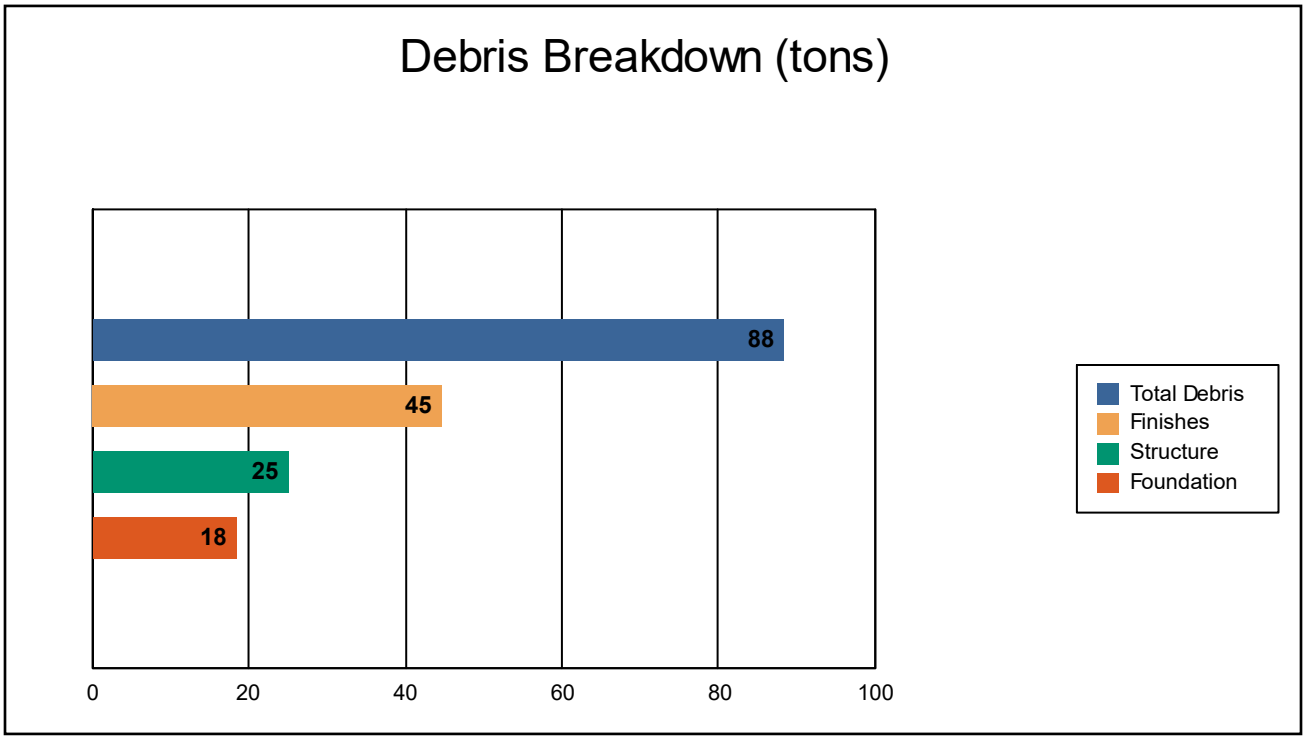
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

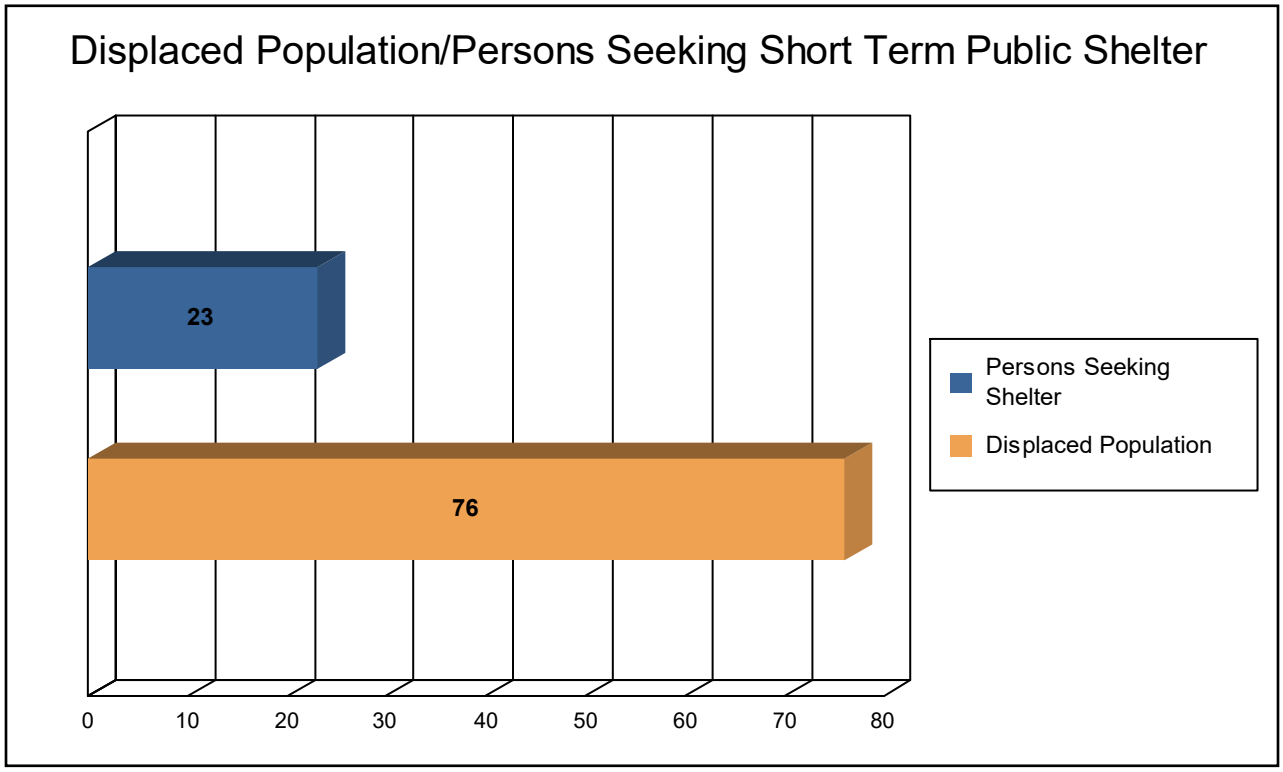


The model estimates that a total of 88 tons of debris will be generated. Of the total amount, Finishes comprises 51% of the total, Structure comprises 28% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 25 households (or 76 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 23 people (out of a total population of 12,235) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 10.20 million dollars, which represents 1.20 % of the total replacement value of the scenario buildings.

Building-Related Losses

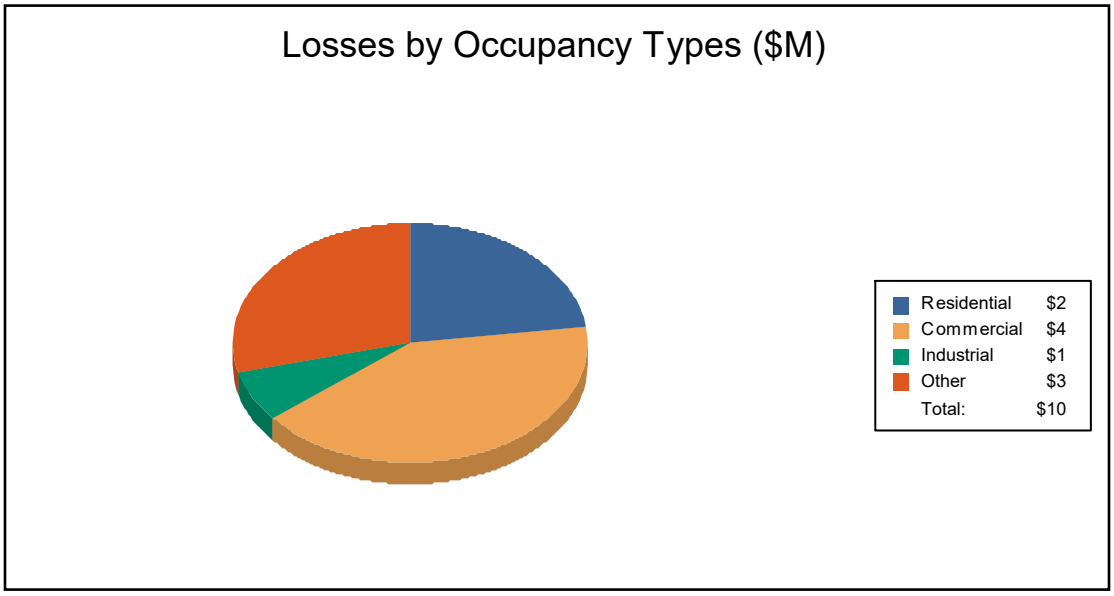
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 5.07 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.83% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.23	0.46	0.20	0.08	1.96
	Content	0.54	1.28	0.40	0.54	2.76
	Inventory	0.00	0.30	0.06	0.00	0.35
	Subtotal	**1.77**	**2.03**	**0.65**	**0.61**	**5.07**
Business Interruption						
	Income	0.00	0.90	0.01	0.14	1.05
	Relocation	0.40	0.22	0.01	0.09	0.72
	Rental Income	0.16	0.17	0.00	0.03	0.35
	Wage	0.00	0.90	0.03	2.09	3.01
	Subtotal	**0.55**	**2.18**	**0.05**	**2.34**	**5.13**
ALL	**Total**	**2.33**	**4.22**	**0.70**	**2.95**	**10.20**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,512	526,761	2,160,273
Total	**12,235**	**1,633,512**	**526,761**	**2,160,273**
Total Study Region	**12,235**	**1,633,512**	**526,761**	**2,160,273**

Hazus: Flood Global Risk Report

Region Name: Coventry_FL

Flood Scenario: Coventry_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 209 census blocks. The region contains over 5 thousand households and has a total population of 12,235 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,181 buildings in the region with a total building replacement value (excluding contents) of 2,160 million dollars. Approximately 91.41% of the buildings (and 75.62% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,181 buildings in the region which have an aggregate total replacement value of 2,160 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,633,512	75.6%
Commercial	263,565	12.2%
Industrial	42,290	2.0%
Agricultural	5,272	0.2%
Religion	10,397	0.5%
Government	99,995	4.6%
Education	105,242	4.9%
Total	**2,160,273**	**100%**

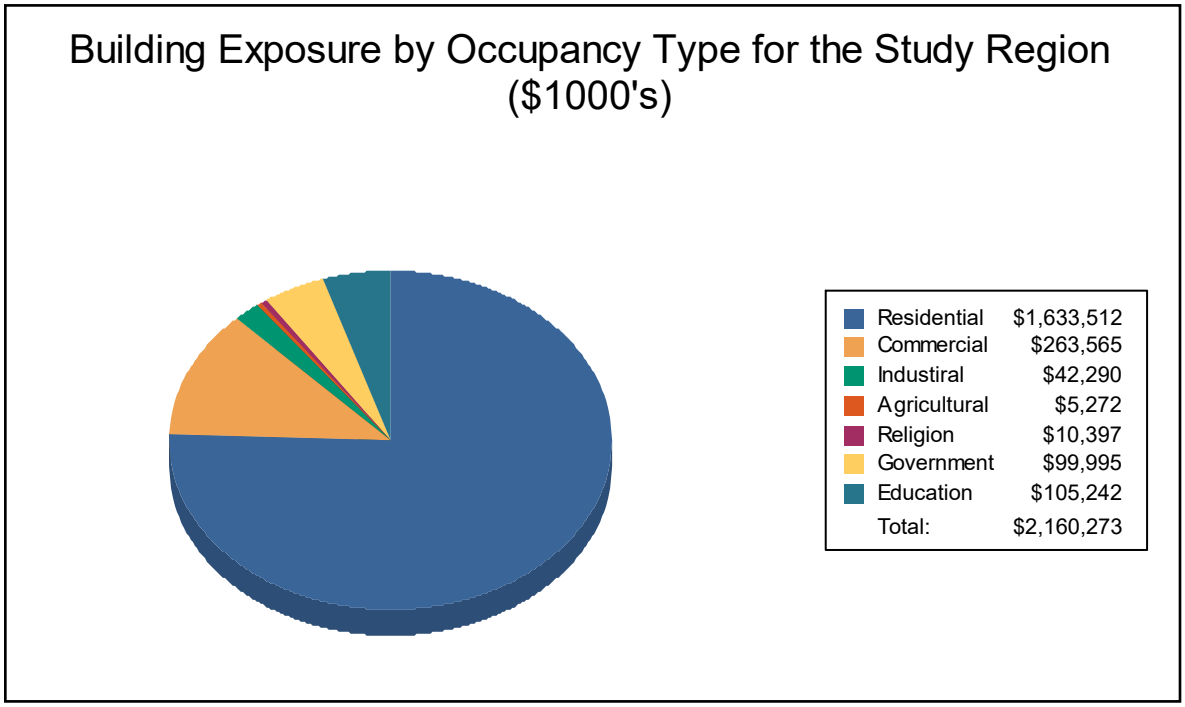
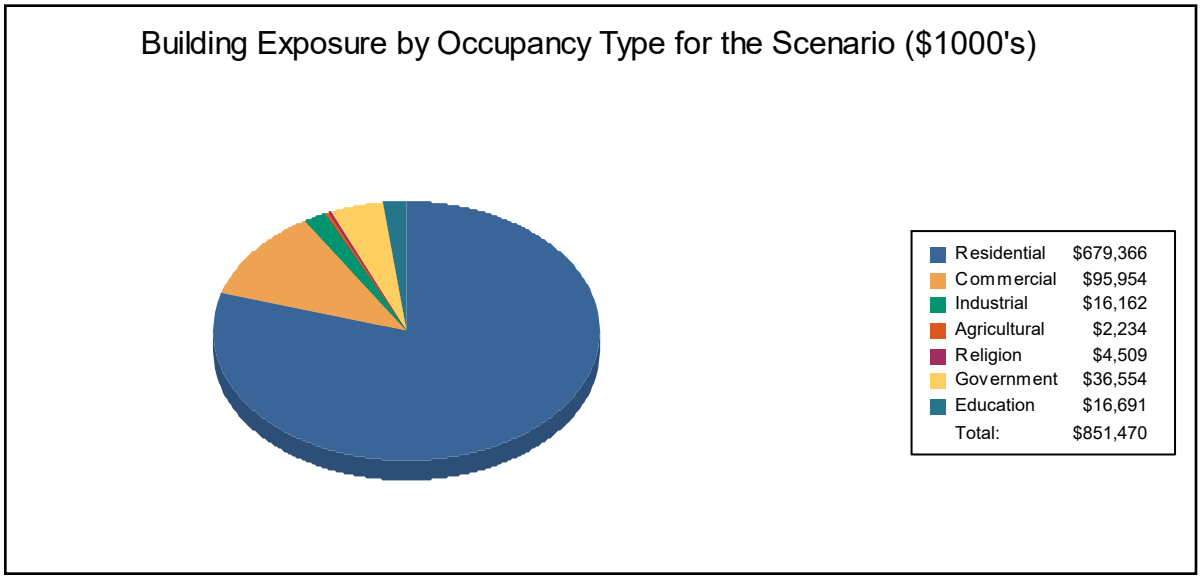


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	679,366	79.8%
Commercial	95,954	11.3%
Industrial	16,162	1.9%
Agricultural	2,234	0.3%
Religion	4,509	0.5%
Government	36,554	4.3%
Education	16,691	2.0%
Total	**851,470**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

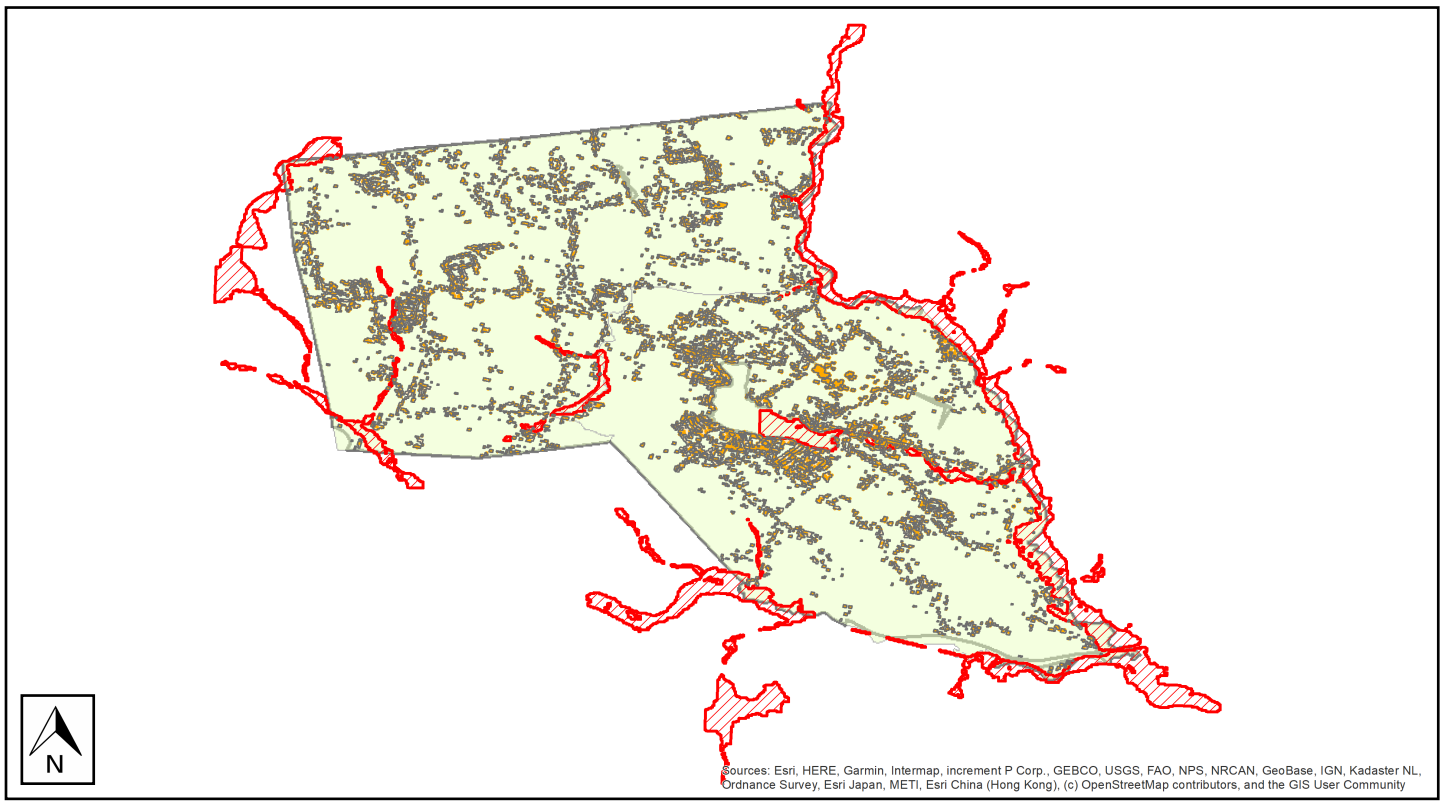
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Coventry_FL
Scenario Name:	Coventry_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 50% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

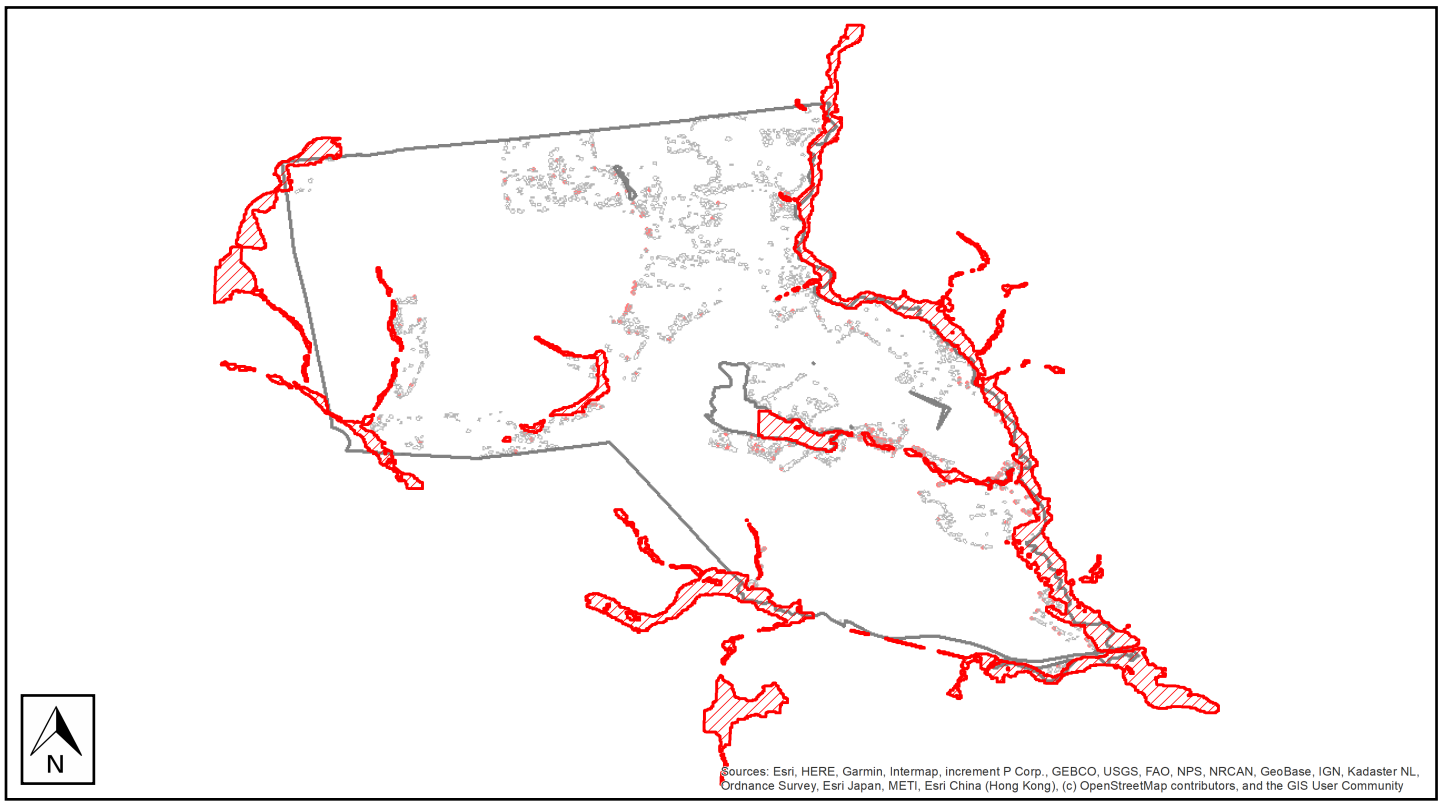


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	100	0	0	0	0	0	0	0	0	0	0
Total	**1**		**0**		**0**		**0**		**0**		**0**	

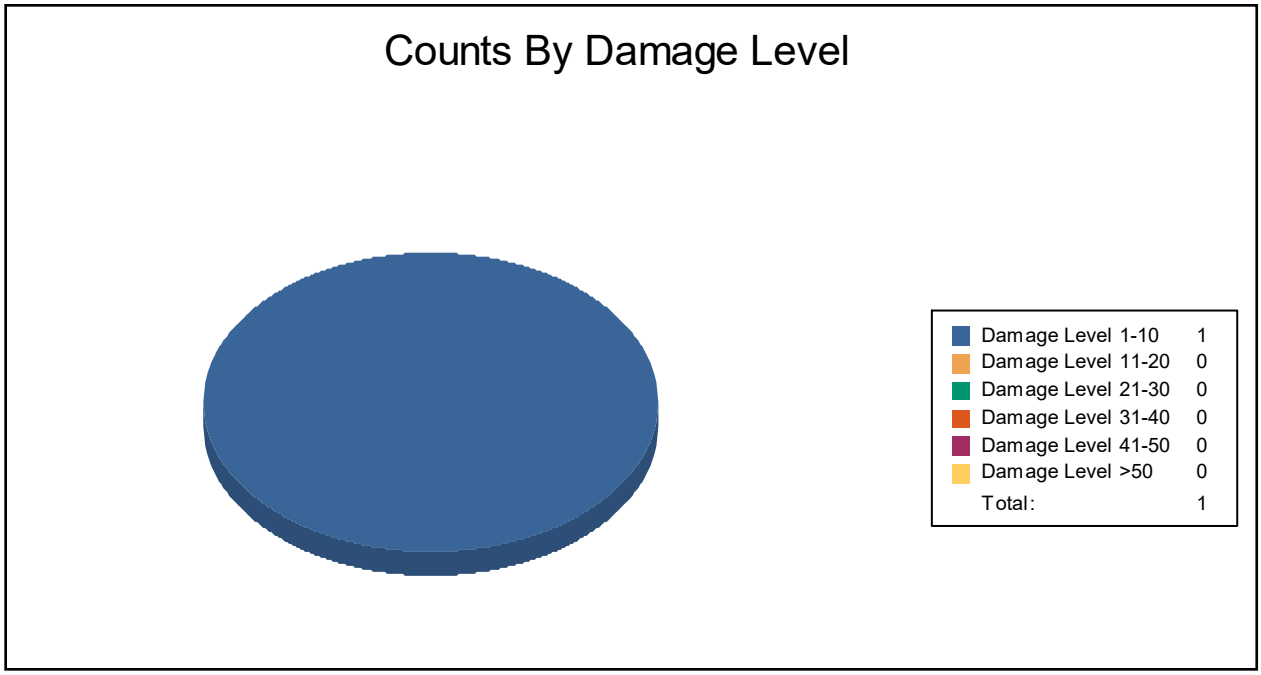


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

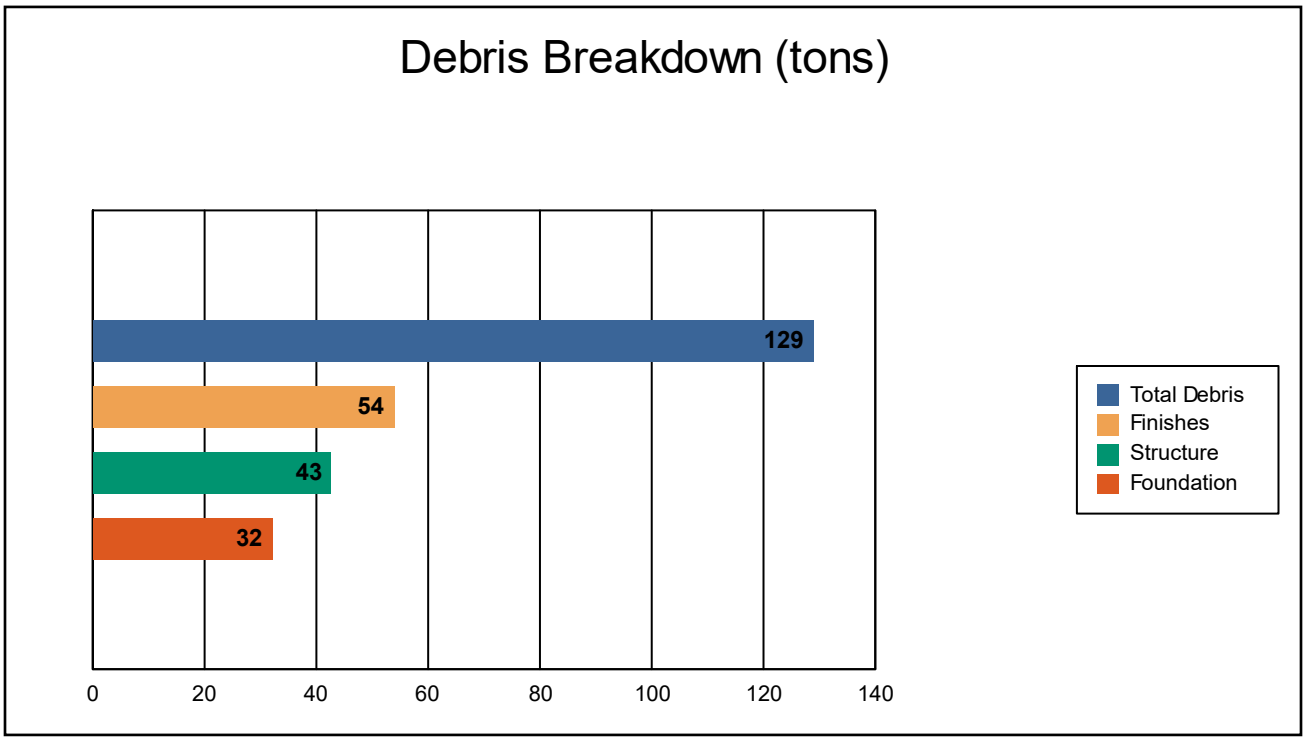
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

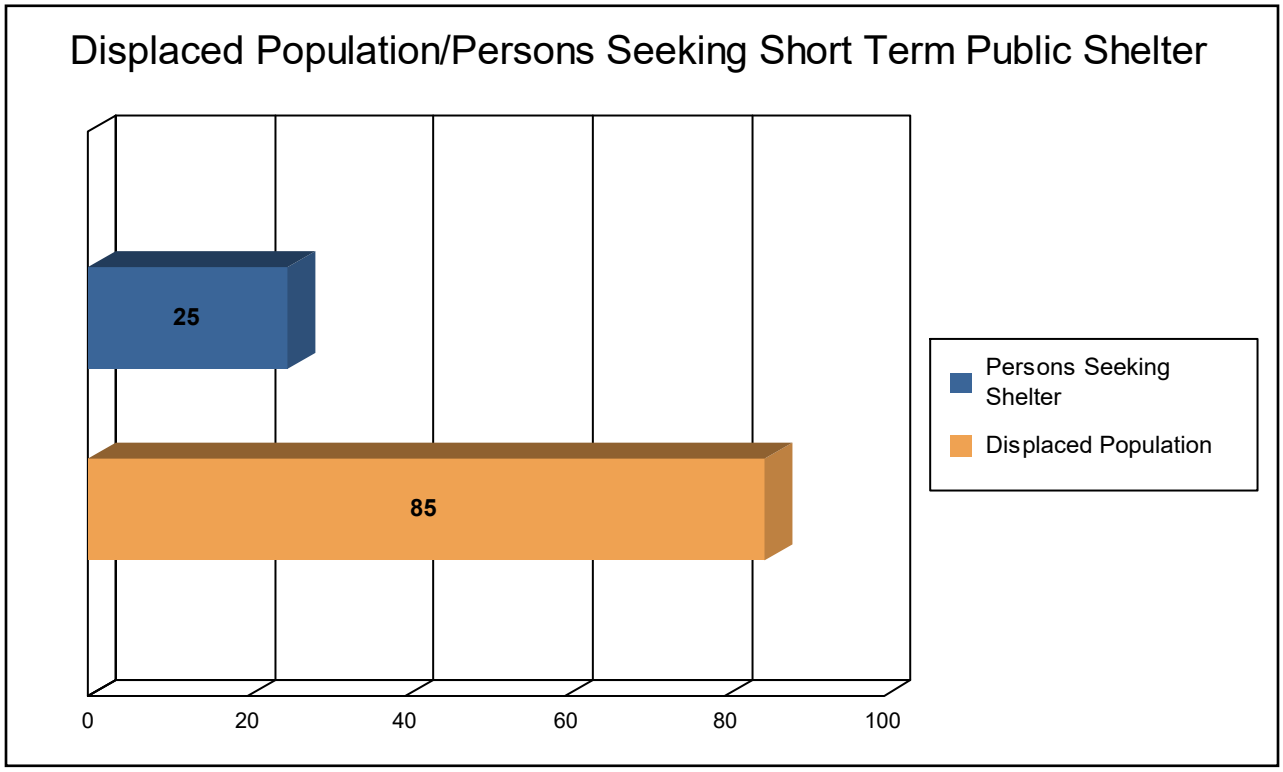


The model estimates that a total of 129 tons of debris will be generated. Of the total amount, Finishes comprises 42% of the total, Structure comprises 33% of the total, and Foundation comprises 25%. If the debris tonnage is converted into an estimated number of truckloads, it will require 6 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 28 households (or 85 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 25 people (out of a total population of 12,235) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 11.20 million dollars, which represents 1.32 % of the total replacement value of the scenario buildings.

Building-Related Losses

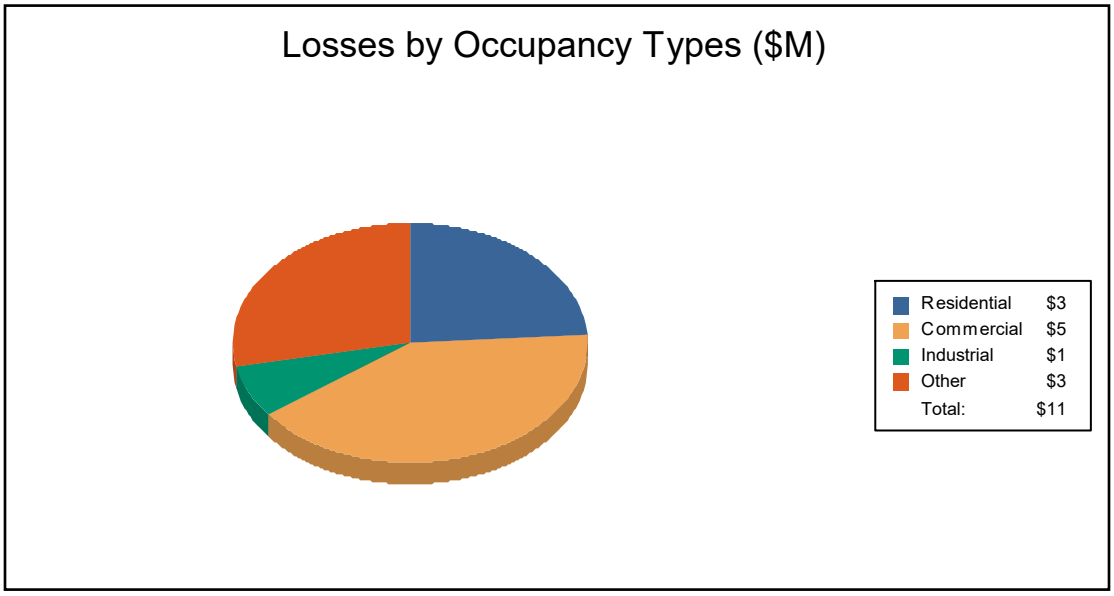
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 5.76 million dollars. 49% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 23.94% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.44	0.53	0.21	0.09	2.27
	Content	0.63	1.44	0.45	0.60	3.12
	Inventory	0.00	0.32	0.06	0.00	0.38
	Subtotal	**2.06**	**2.29**	**0.72**	**0.69**	**5.76**
Business Interruption						
	Income	0.00	0.95	0.01	0.15	1.11
	Relocation	0.44	0.23	0.01	0.09	0.77
	Rental Income	0.17	0.17	0.00	0.03	0.38
	Wage	0.00	0.94	0.03	2.22	3.19
	Subtotal	**0.62**	**2.29**	**0.05**	**2.48**	**5.44**
ALL	**Total**	**2.68**	**4.58**	**0.77**	**3.17**	**11.20**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,512	526,761	2,160,273
Total	**12,235**	**1,633,512**	**526,761**	**2,160,273**
Total Study Region	**12,235**	**1,633,512**	**526,761**	**2,160,273**

Hazus: Flood Global Risk Report

Region Name: Coventry_FL

Flood Scenario: Coventry_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 209 census blocks. The region contains over 5 thousand households and has a total population of 12,235 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,181 buildings in the region with a total building replacement value (excluding contents) of 2,160 million dollars. Approximately 91.41% of the buildings (and 75.62% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,181 buildings in the region which have an aggregate total replacement value of 2,160 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,633,512	75.6%
Commercial	263,565	12.2%
Industrial	42,290	2.0%
Agricultural	5,272	0.2%
Religion	10,397	0.5%
Government	99,995	4.6%
Education	105,242	4.9%
Total	**2,160,273**	**100%**

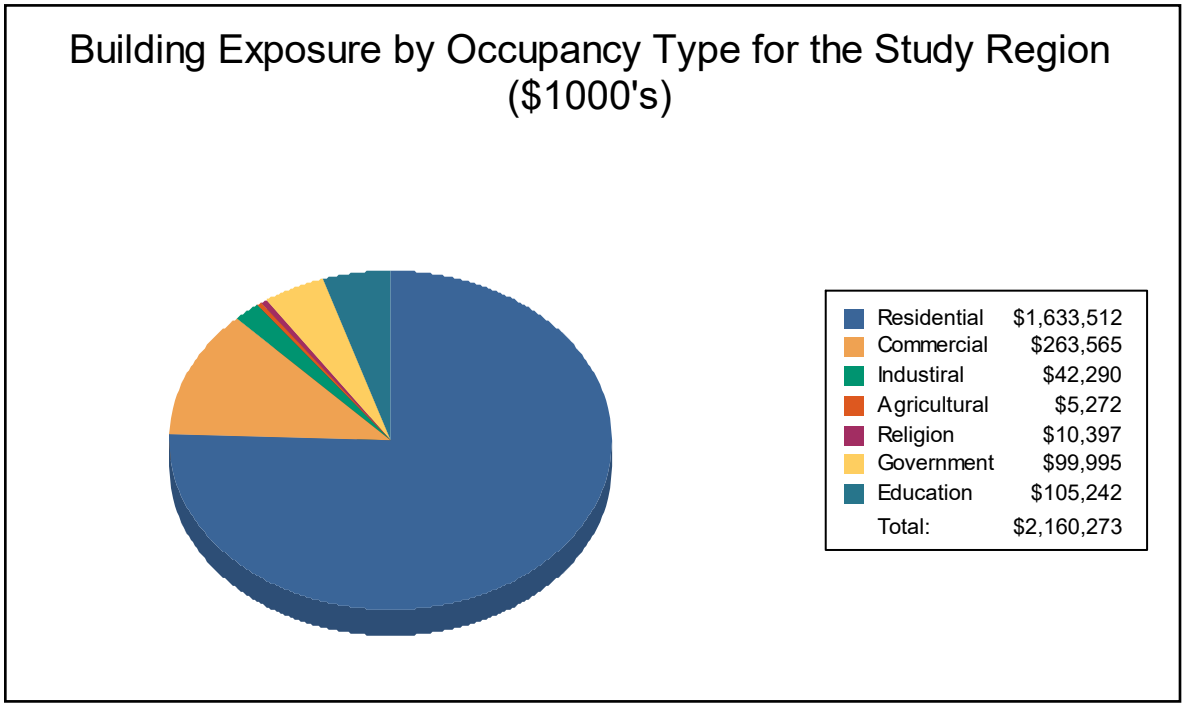
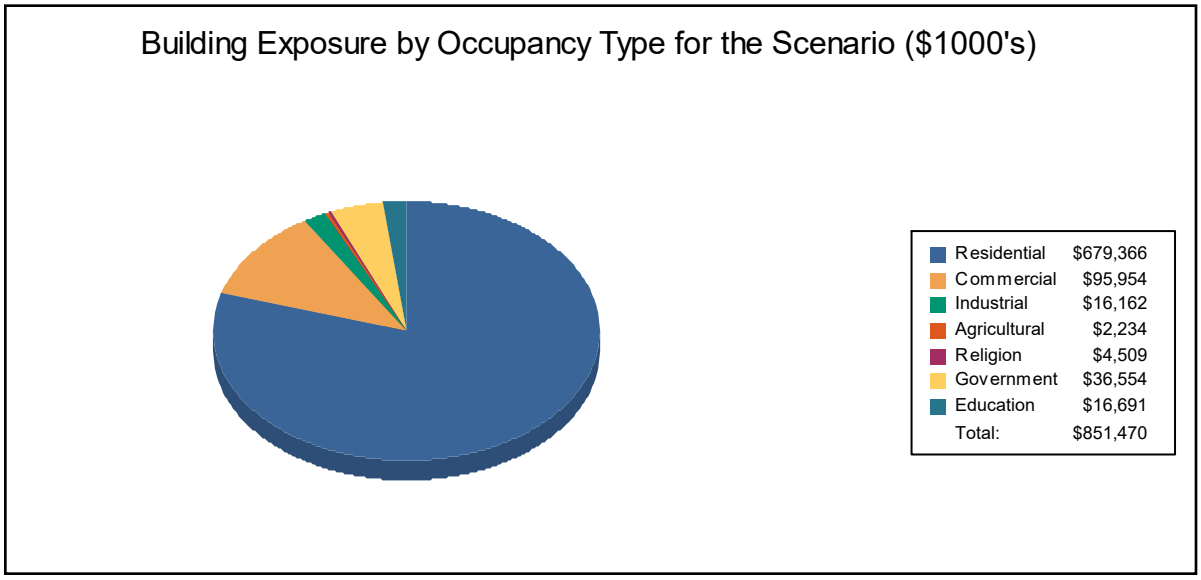


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	679,366	79.8%
Commercial	95,954	11.3%
Industrial	16,162	1.9%
Agricultural	2,234	0.3%
Religion	4,509	0.5%
Government	36,554	4.3%
Education	16,691	2.0%
Total	**851,470**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

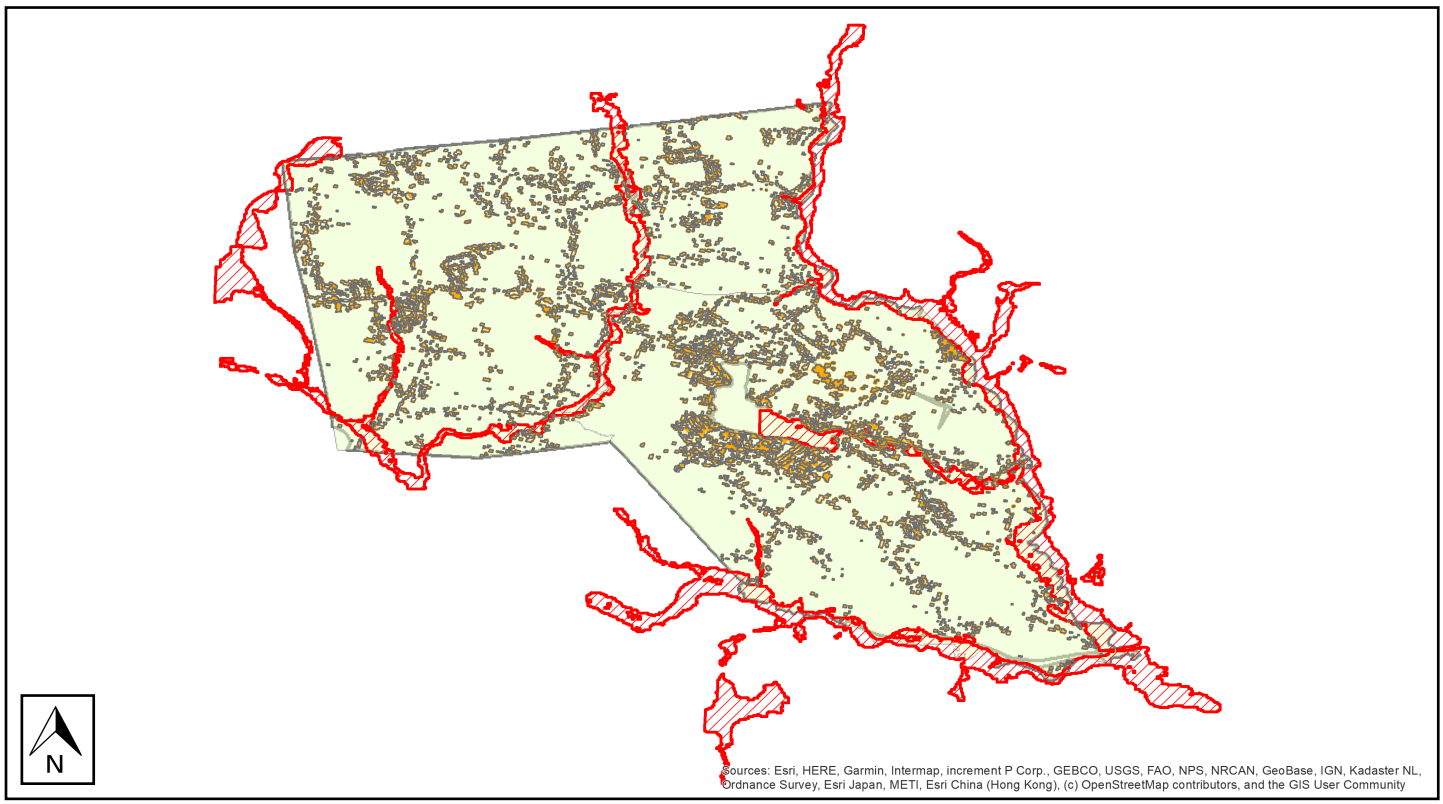
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Coventry_FL
Scenario Name:	Coventry_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

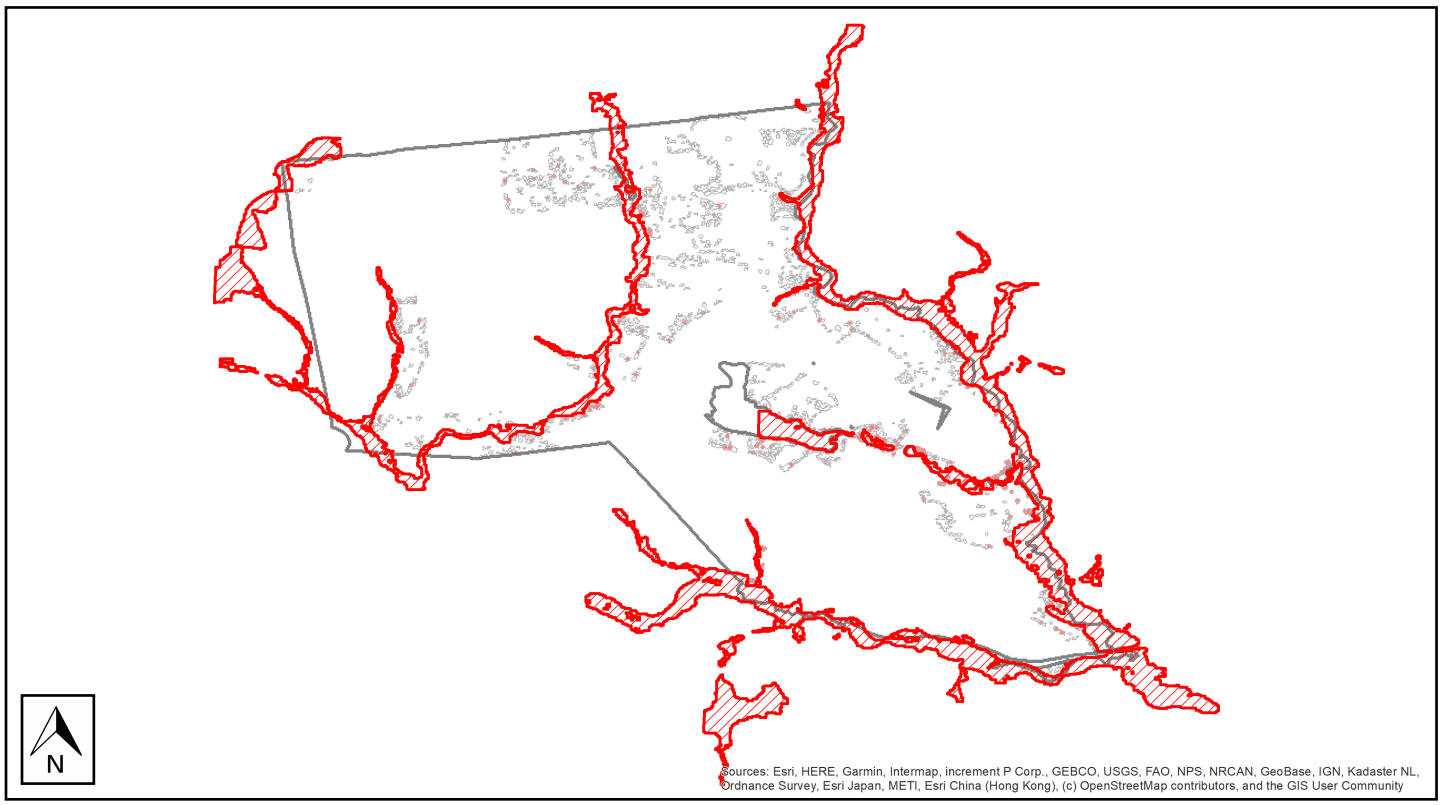


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	4	80	0	0	1	20	0	0	0	0	0	0
Total	**4**		**0**		**1**		**0**		**0**		**0**	

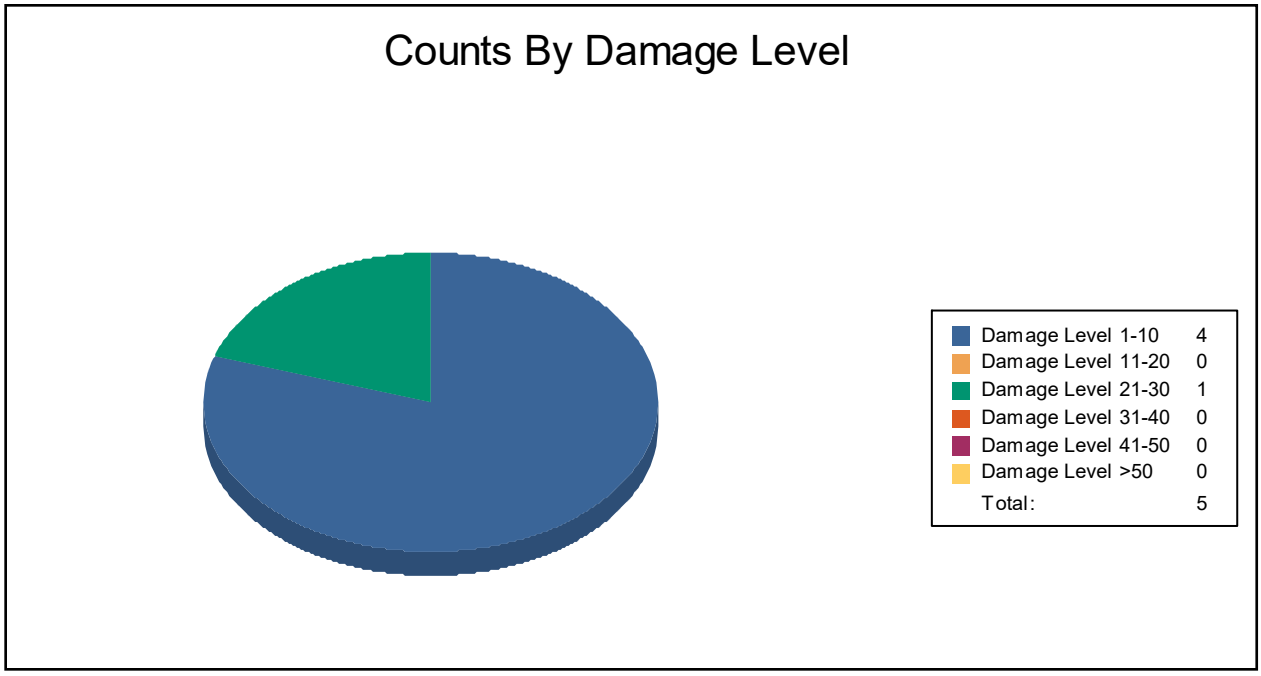


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	4	80	0	0	1	20	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

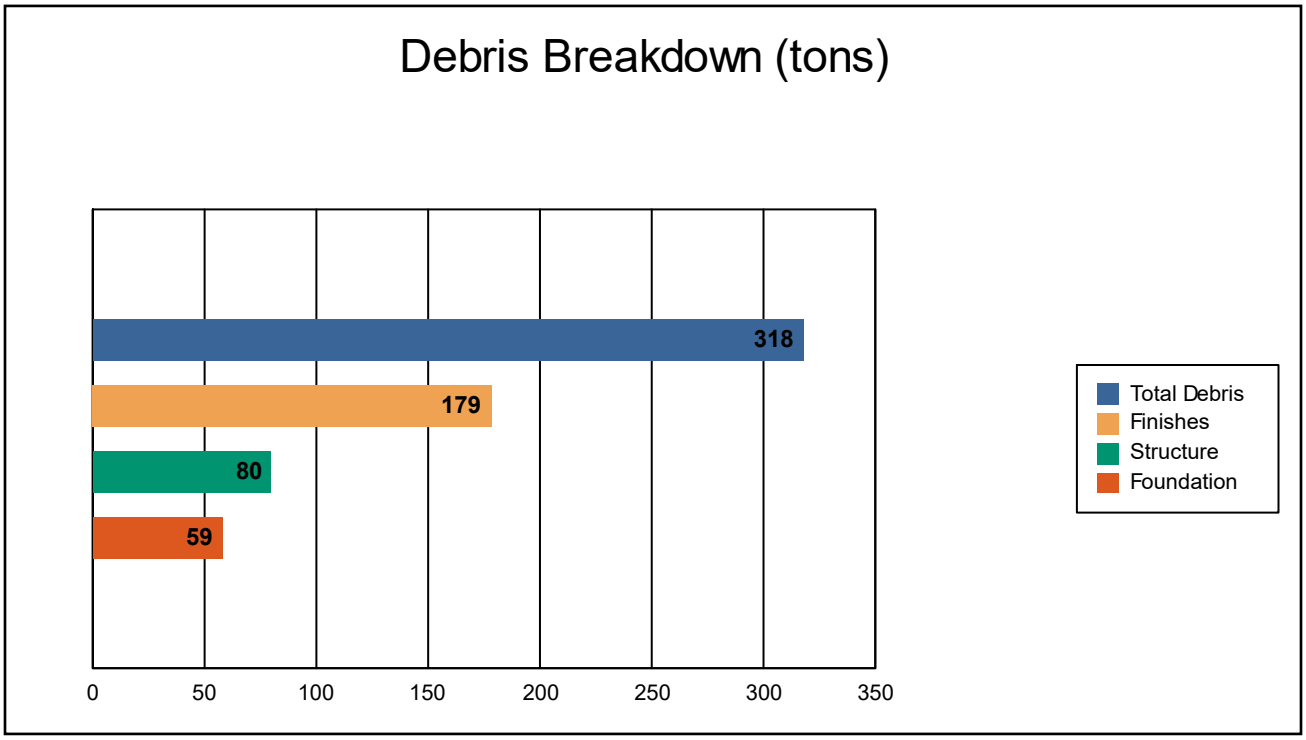
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

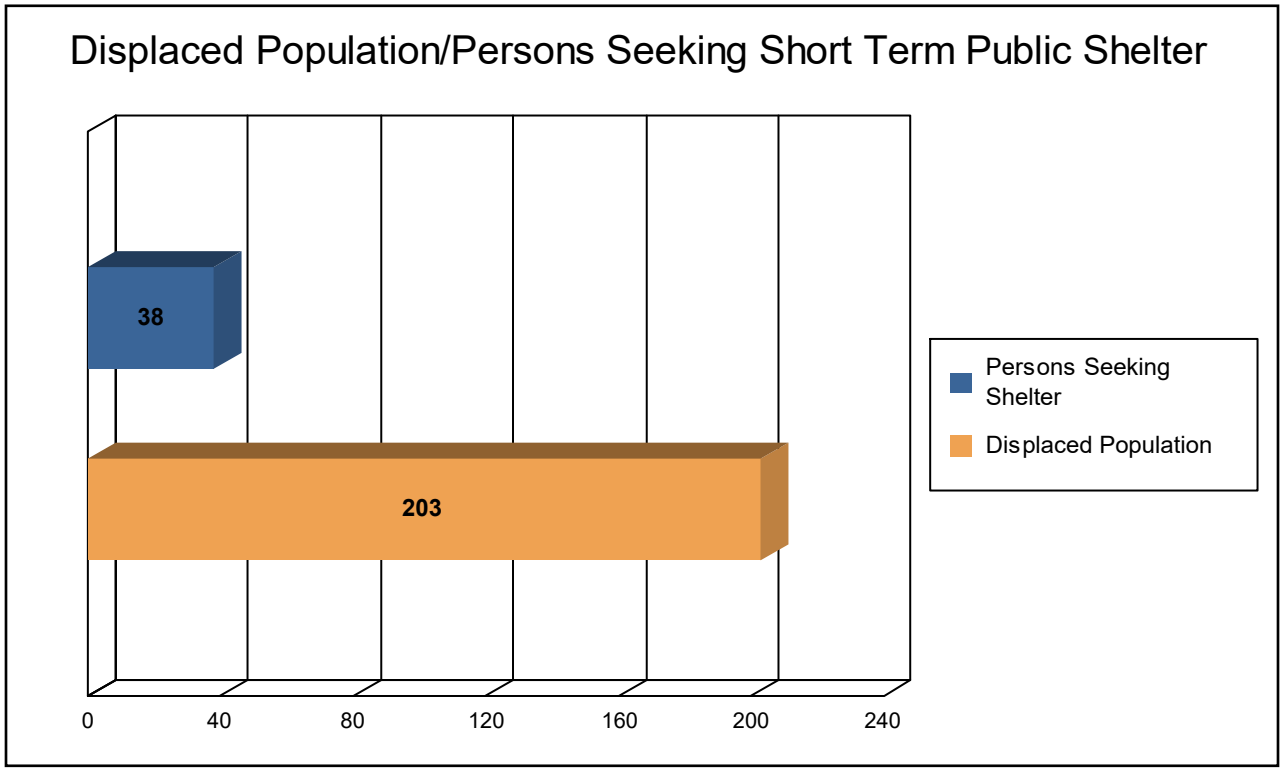


The model estimates that a total of 318 tons of debris will be generated. Of the total amount, Finishes comprises 56% of the total, Structure comprises 25% of the total, and Foundation comprises 18%. If the debris tonnage is converted into an estimated number of truckloads, it will require 13 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 68 households (or 203 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 38 people (out of a total population of 12,235) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 26.45 million dollars, which represents 3.11 % of the total replacement value of the scenario buildings.

Building-Related Losses

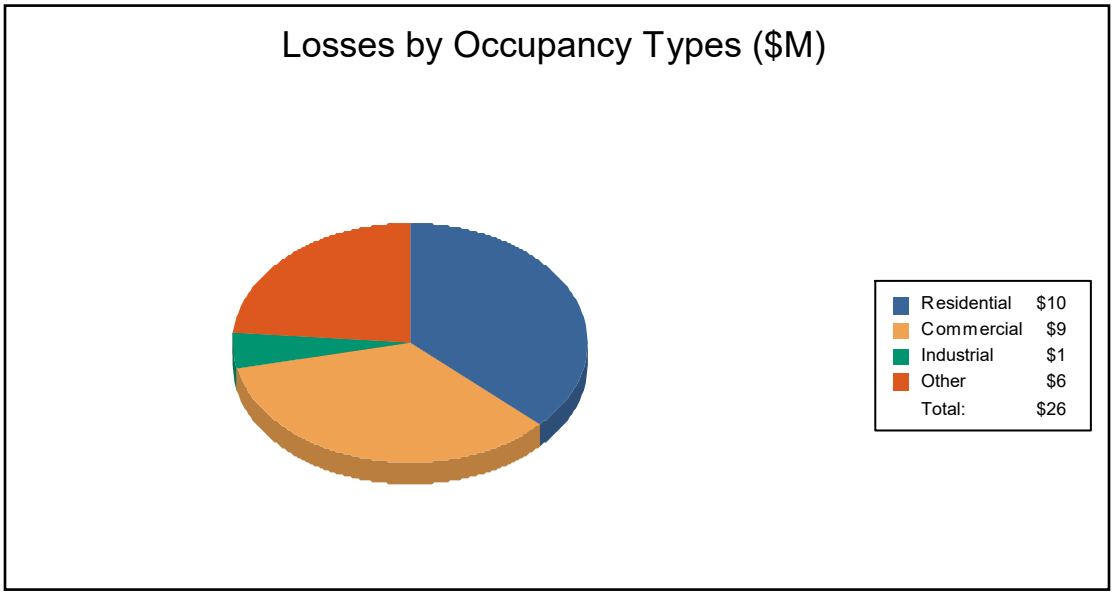
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 14.67 million dollars. 45% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 36.99% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.45	0.97	0.41	0.24	7.06
	Content	2.48	2.47	0.72	1.40	7.08
	Inventory	0.00	0.39	0.10	0.04	0.53
	Subtotal	**7.93**	**3.82**	**1.24**	**1.68**	**14.67**
Business Interruption						
	Income	0.02	2.29	0.02	0.35	2.69
	Relocation	1.27	0.46	0.01	0.19	1.93
	Rental Income	0.51	0.35	0.01	0.04	0.90
	Wage	0.06	2.18	0.05	3.98	6.26
	Subtotal	**1.86**	**5.28**	**0.09**	**4.57**	**11.79**
ALL	**Total**	**9.79**	**9.10**	**1.32**	**6.24**	**26.45**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,512	526,761	2,160,273
Total	**12,235**	**1,633,512**	**526,761**	**2,160,273**
Total Study Region	**12,235**	**1,633,512**	**526,761**	**2,160,273**

Hazus: Flood Global Risk Report

Region Name: East_Granby_FL

Flood Scenario: East_Granby_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 74 census blocks. The region contains over 2 thousand households and has a total population of 5,214 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,335 buildings in the region with a total building replacement value (excluding contents) of 1,623 million dollars. Approximately 84.93% of the buildings (and 48.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,335 buildings in the region which have an aggregate total replacement value of 1,623 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	790,475	48.7%
Commercial	386,190	23.8%
Industrial	299,844	18.5%
Agricultural	5,269	0.3%
Religion	29,625	1.8%
Government	66,693	4.1%
Education	44,587	2.7%
Total	**1,622,683**	**100%**

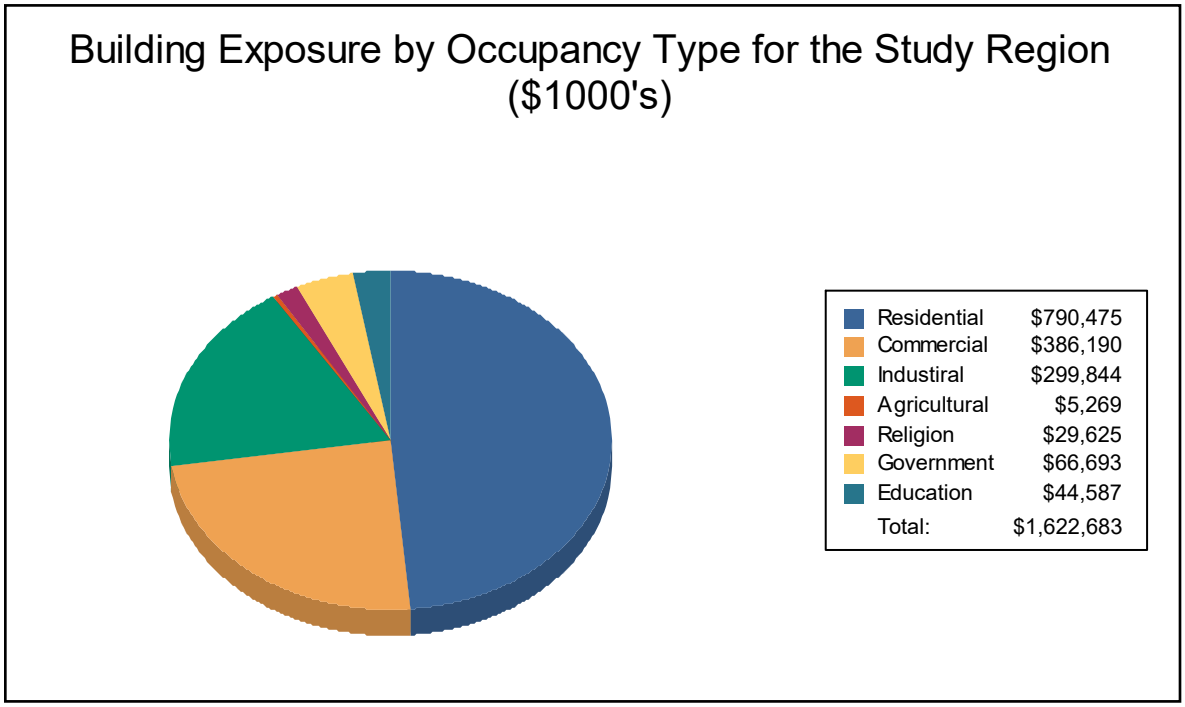
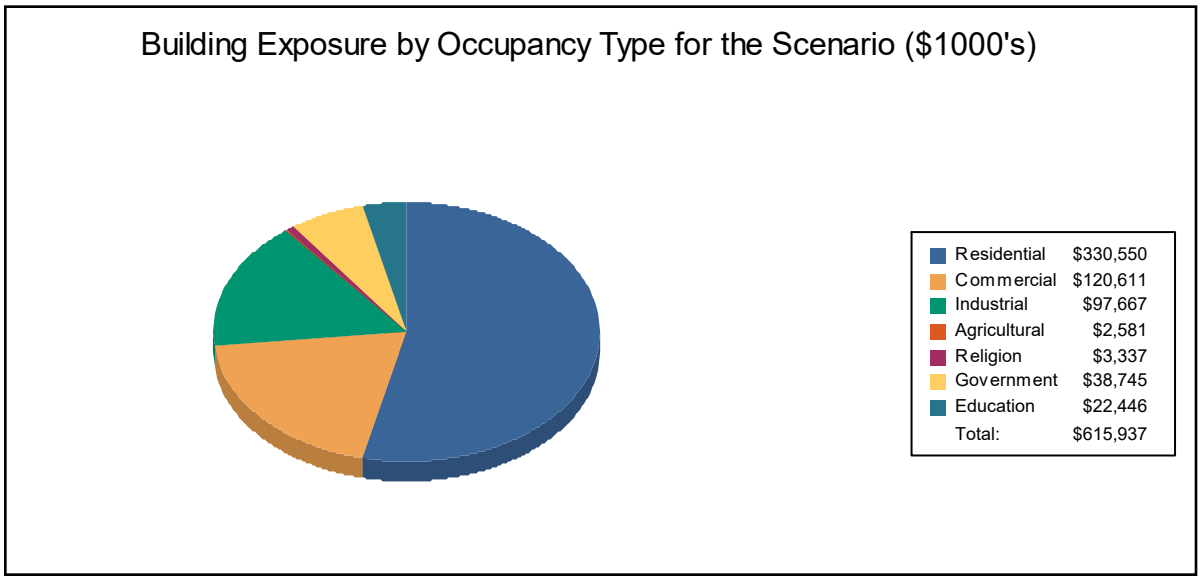


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	330,550	53.7%
Commercial	120,611	19.6%
Industrial	97,667	15.9%
Agricultural	2,581	0.4%
Religion	3,337	0.5%
Government	38,745	6.3%
Education	22,446	3.6%
Total	**615,937**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

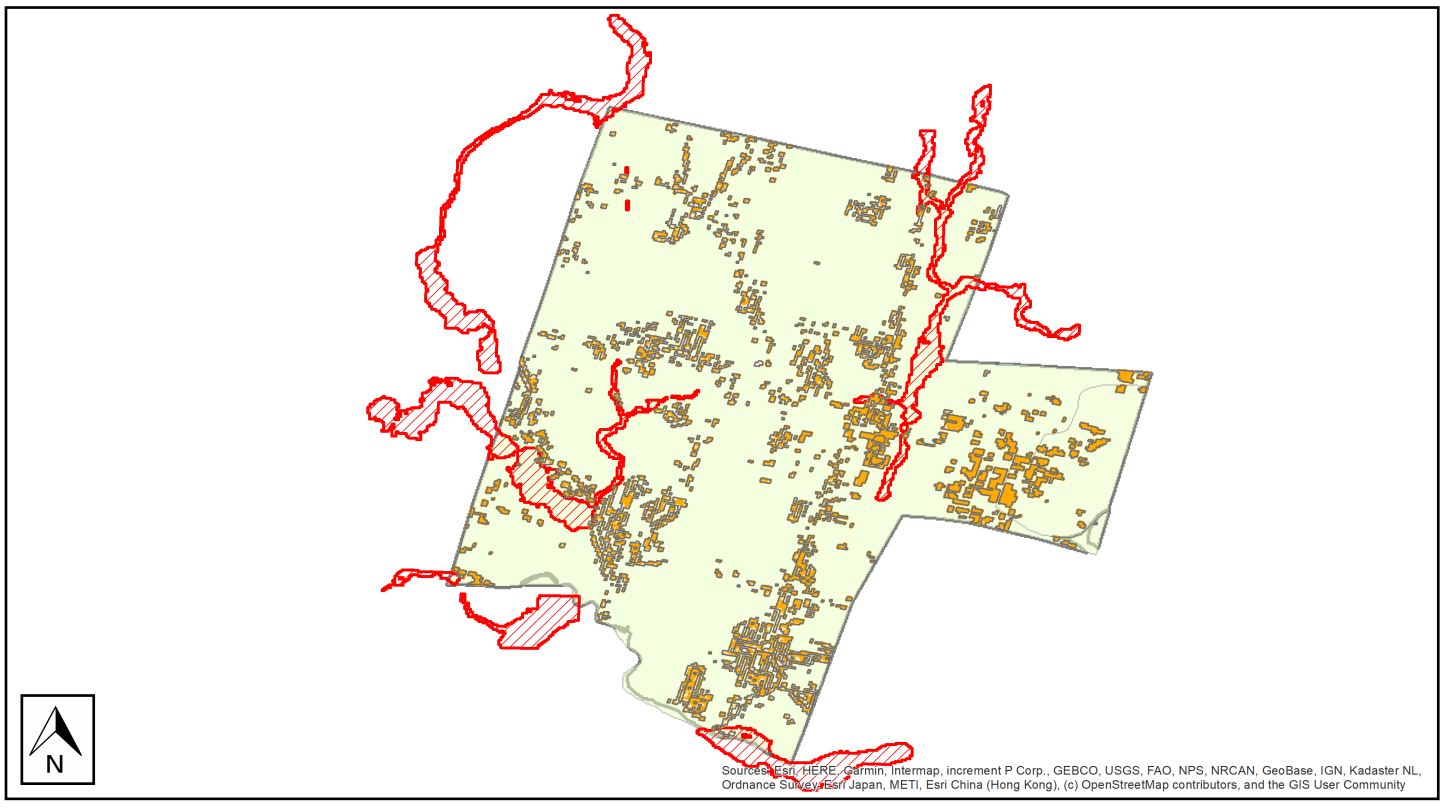
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Granby_FL
Scenario Name:	East_Granby_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

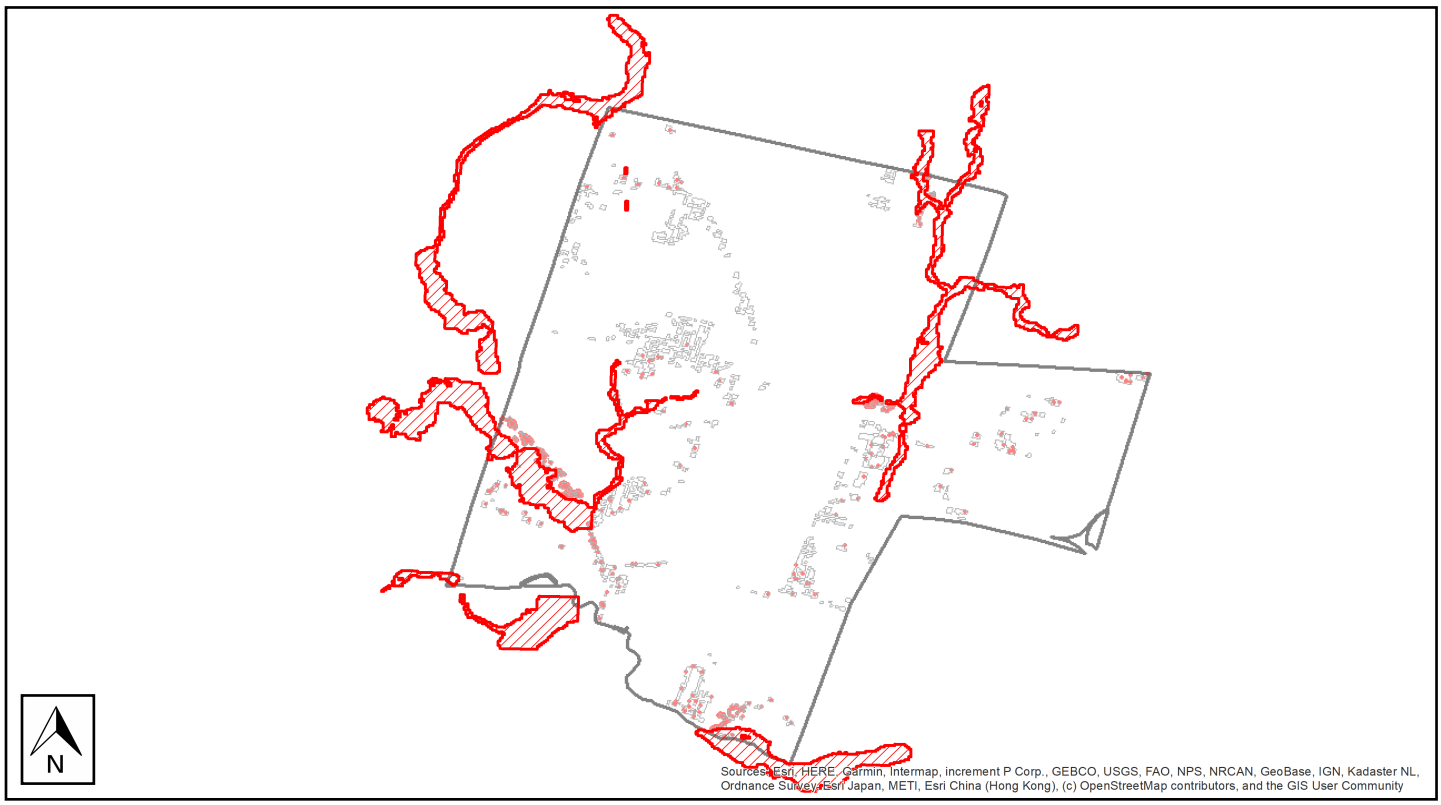


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	1	100	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

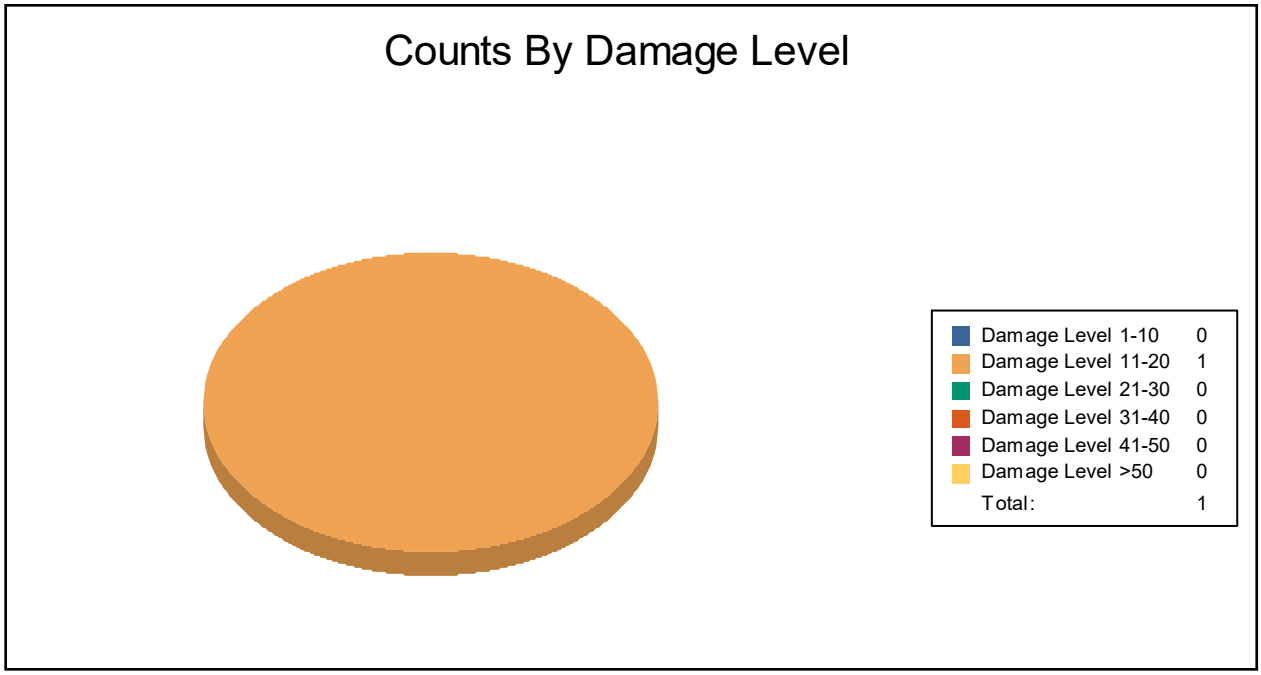


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	1	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

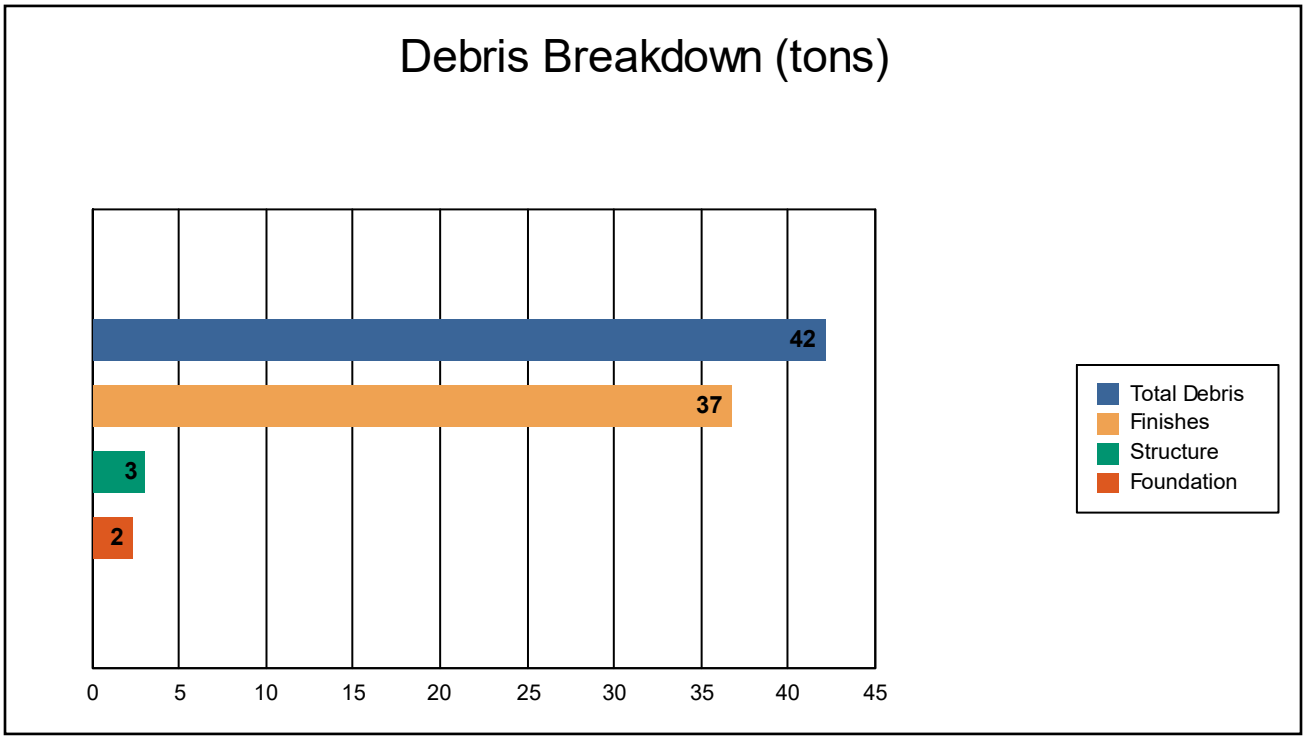
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

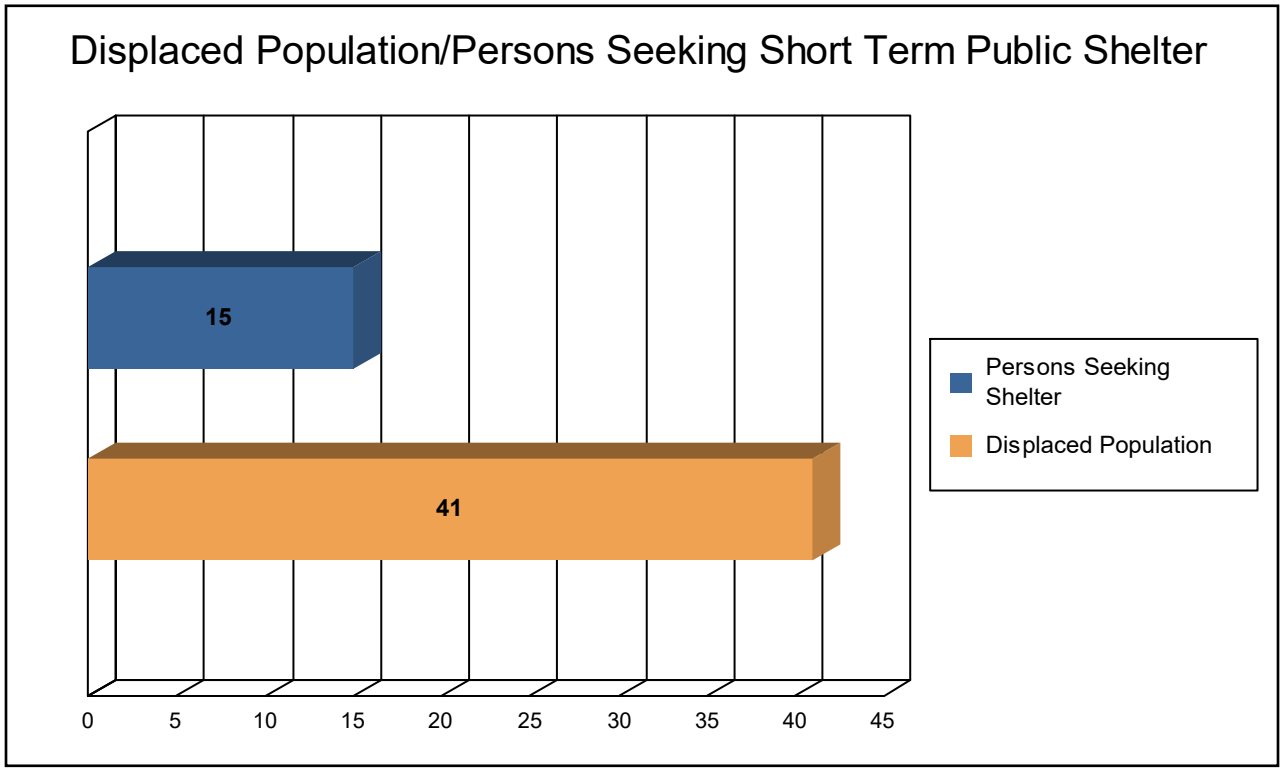


The model estimates that a total of 42 tons of debris will be generated. Of the total amount, Finishes comprises 87% of the total, Structure comprises 7% of the total, and Foundation comprises 5%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 14 households (or 41 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 15 people (out of a total population of 5,214) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 5.94 million dollars, which represents 0.96 % of the total replacement value of the scenario buildings.

Building-Related Losses

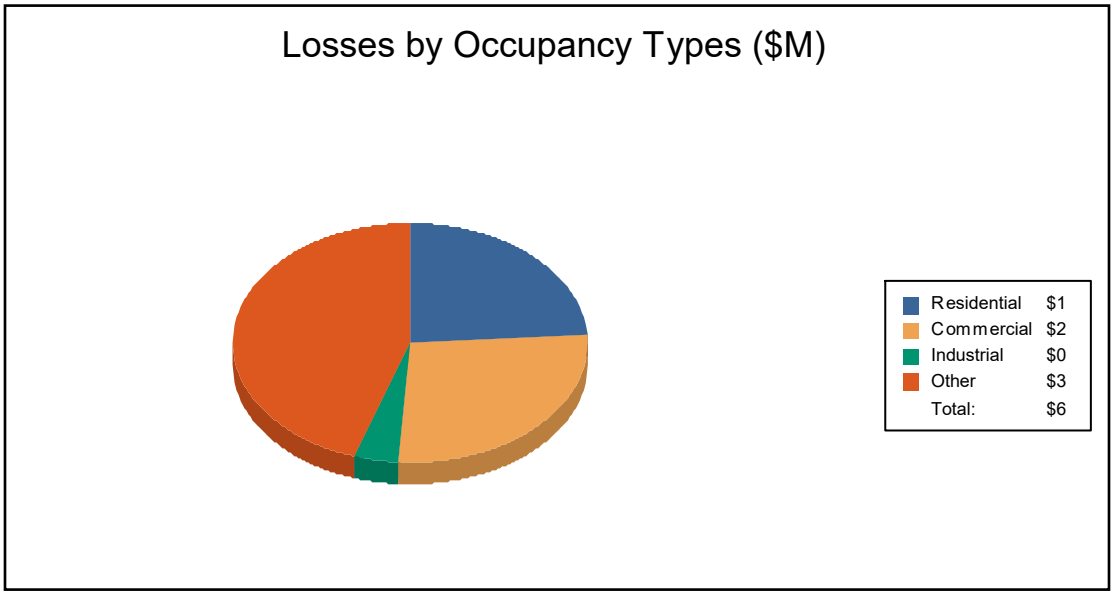
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 2.23 million dollars. 62% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 23.90% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.80	0.08	0.05	0.07	1.00
	Content	0.35	0.23	0.14	0.44	1.16
	Inventory	0.00	0.06	0.02	0.00	0.08
	Subtotal	**1.15**	**0.37**	**0.21**	**0.51**	**2.23**
Business Interruption						
	Income	0.00	0.39	0.01	0.09	0.49
	Relocation	0.20	0.11	0.00	0.11	0.42
	Rental Income	0.07	0.07	0.00	0.04	0.18
	Wage	0.00	0.67	0.01	1.94	2.62
	Subtotal	**0.27**	**1.24**	**0.02**	**2.17**	**3.70**
ALL	**Total**	**1.42**	**1.61**	**0.23**	**2.68**	**5.94**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,475	832,208	1,622,683
Total	**5,214**	**790,475**	**832,208**	**1,622,683**
Total Study Region	**5,214**	**790,475**	**832,208**	**1,622,683**

Hazus: Flood Global Risk Report

Region Name: East_Granby_FL

Flood Scenario: East_Granby_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 74 census blocks. The region contains over 2 thousand households and has a total population of 5,214 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,335 buildings in the region with a total building replacement value (excluding contents) of 1,623 million dollars. Approximately 84.93% of the buildings (and 48.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,335 buildings in the region which have an aggregate total replacement value of 1,623 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
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Occupancy	Exposure ($1000)	Percent of Total
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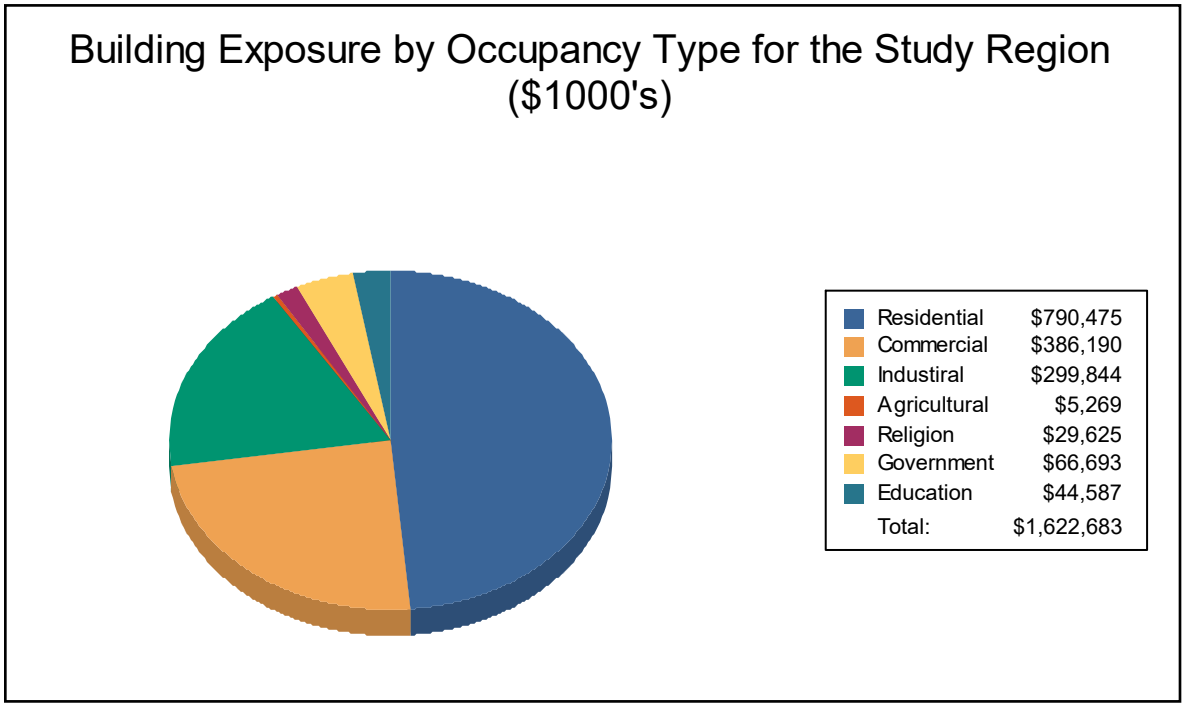

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Building Exposure by Occupancy Type for the Scenario

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Residential	330,550	53.7%
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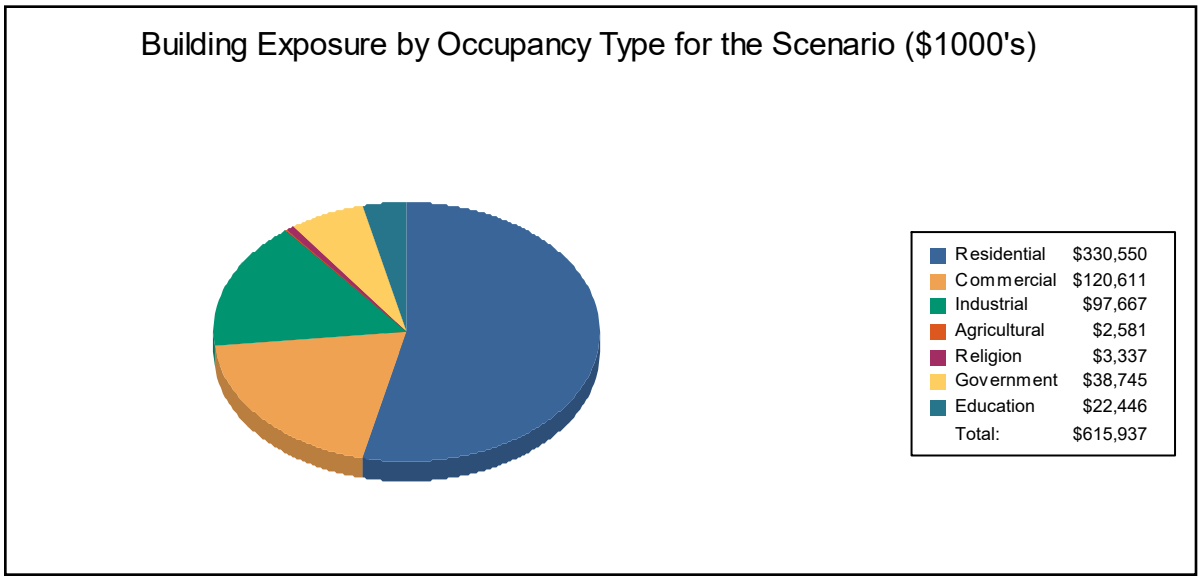
Industrial	97,667	15.9%
Agricultural	2,581	0.4%
Religion	3,337	0.5%
Government	38,745	6.3%
Education	22,446	3.6%
Total	**615,937**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

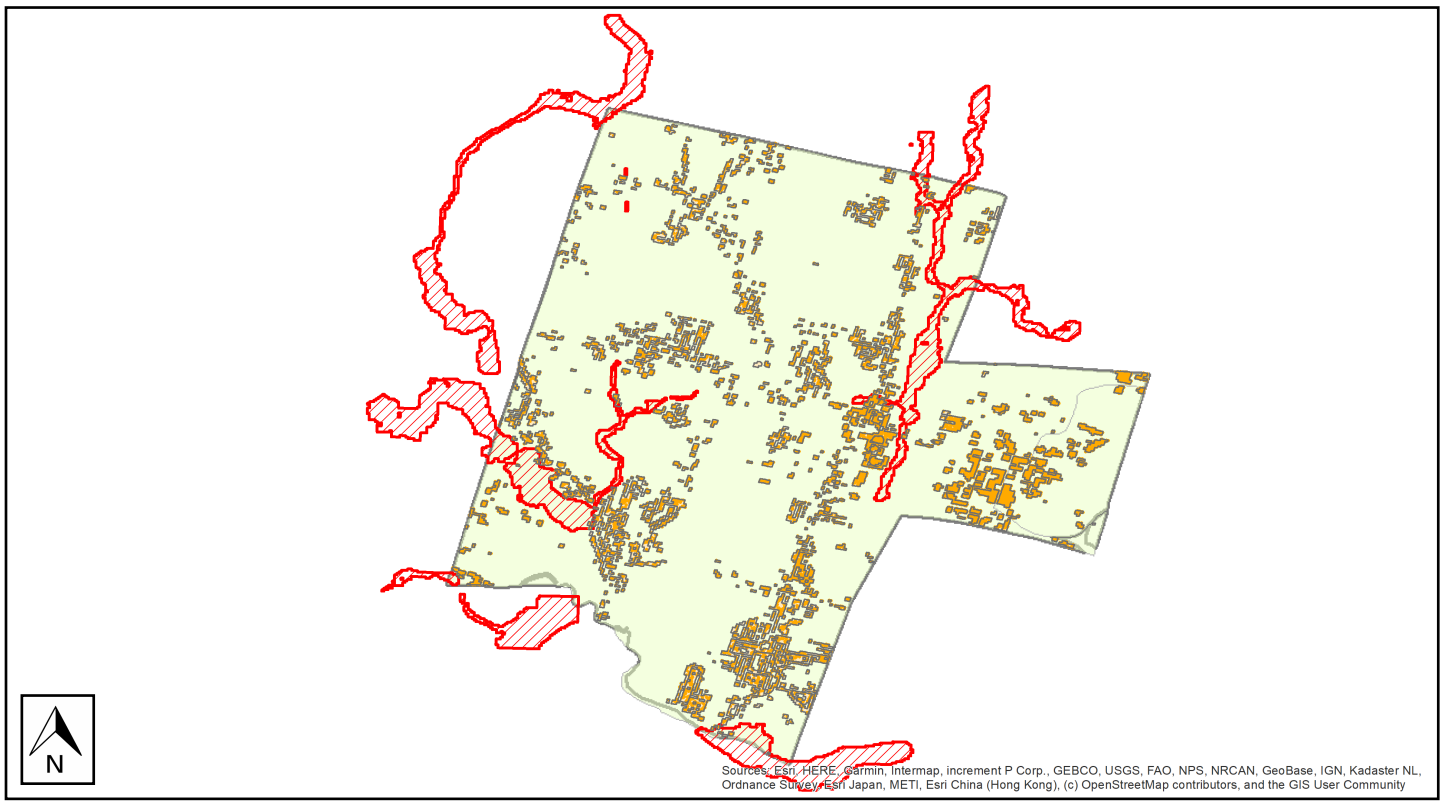
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Granby_FL
Scenario Name:	East_Granby_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

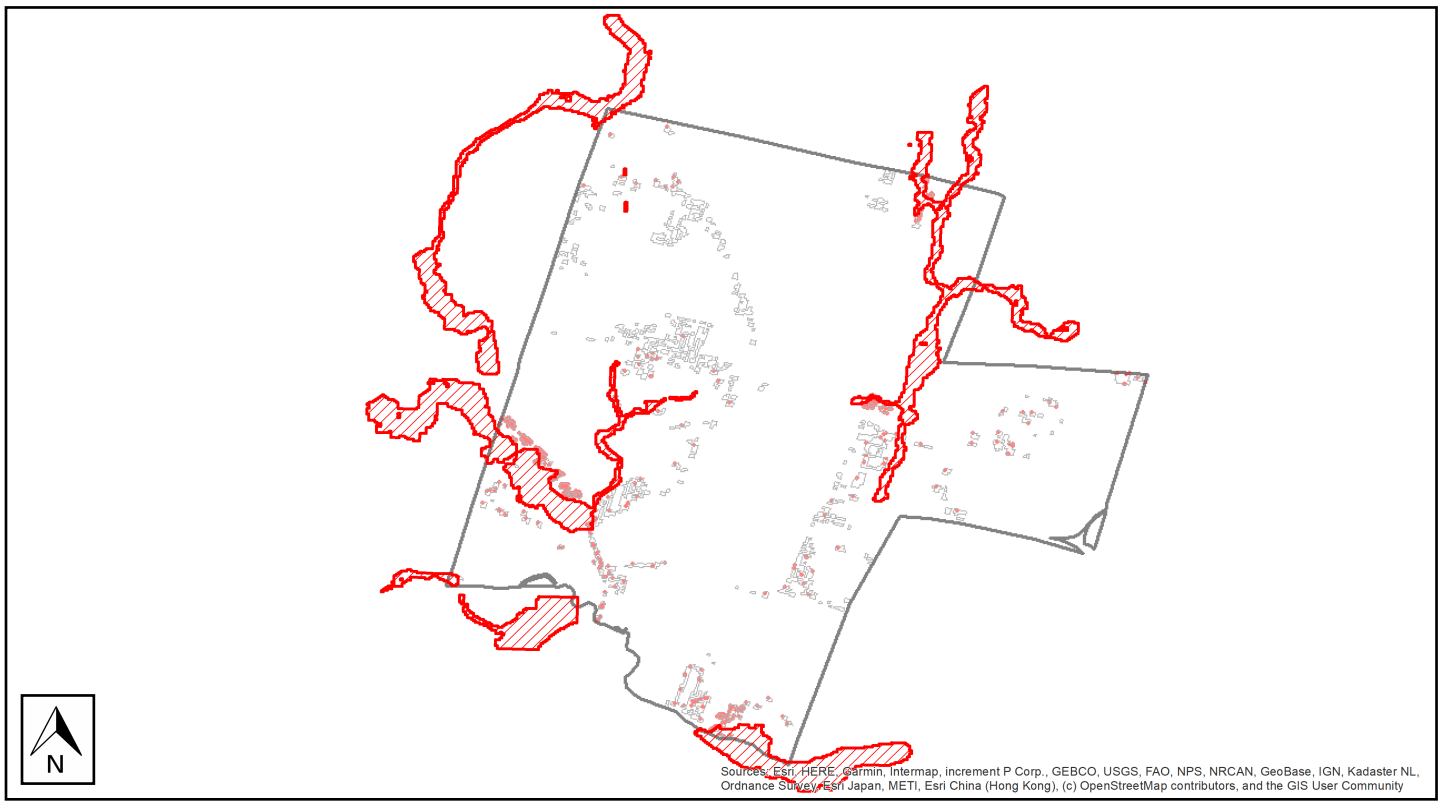


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	1	100	0	0	0	0	0	0
Total	**0**		**0**		**1**		**0**		**0**		**0**	

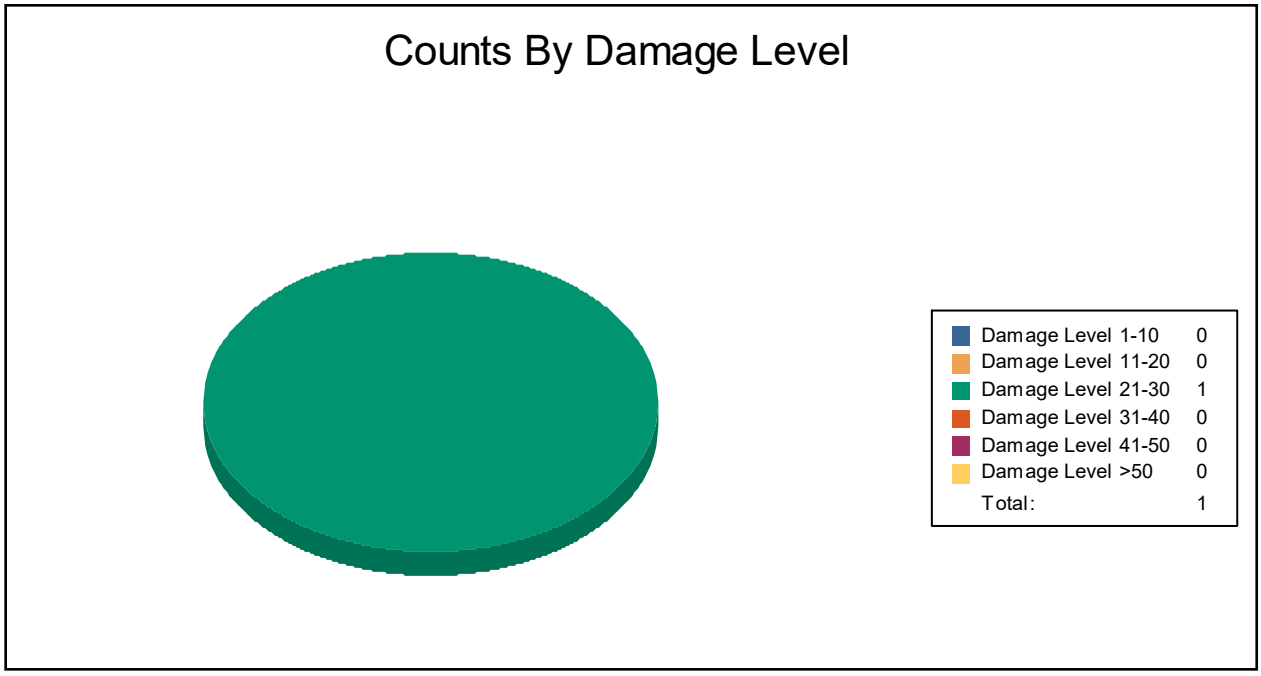


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	1	100	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

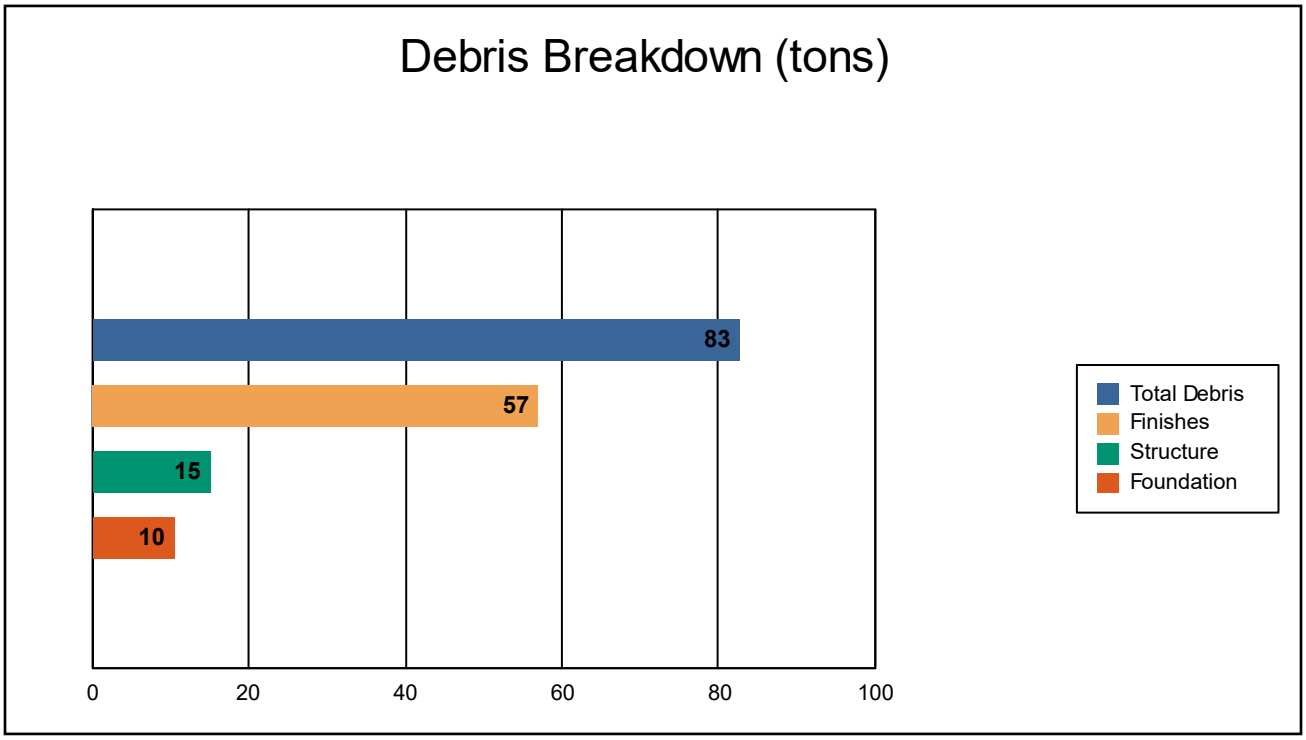
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

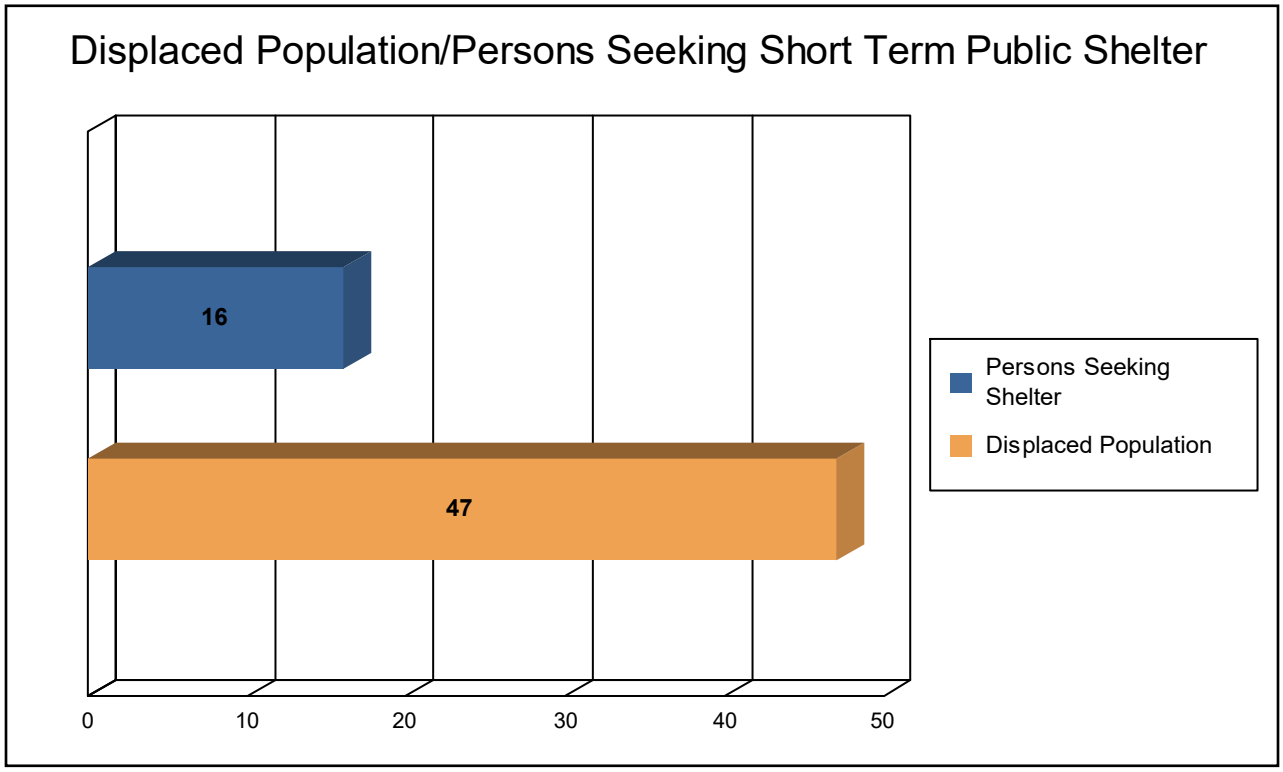


The model estimates that a total of 83 tons of debris will be generated. Of the total amount, Finishes comprises 69% of the total, Structure comprises 18% of the total, and Foundation comprises 13%. If the debris tonnage is converted into an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 16 households (or 47 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 16 people (out of a total population of 5,214) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 8.30 million dollars, which represents 1.35 % of the total replacement value of the scenario buildings.

Building-Related Losses

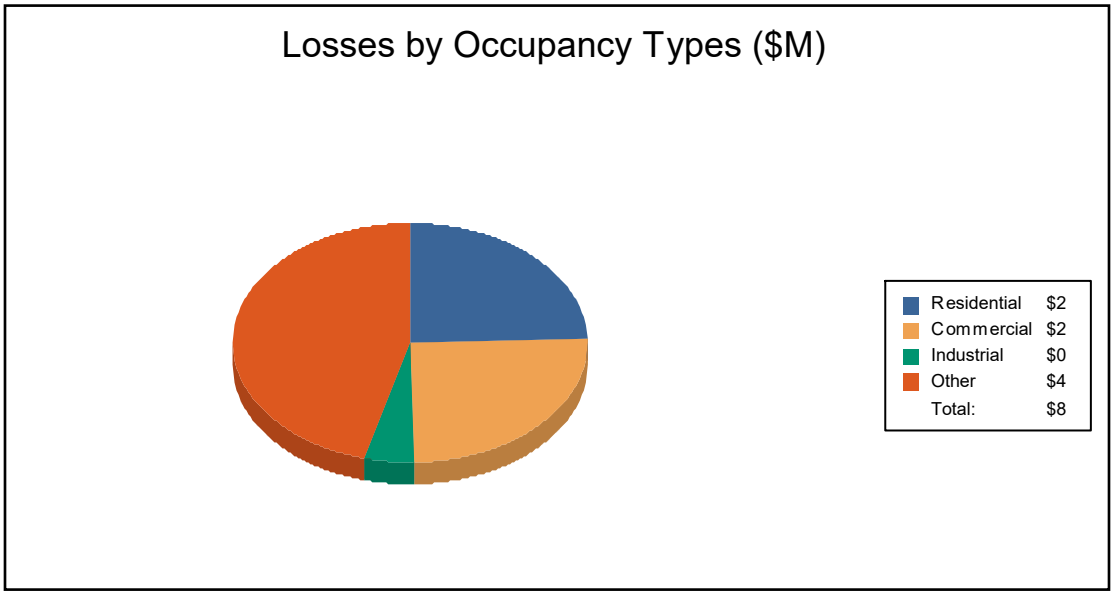
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 3.71 million dollars. 55% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 24.52% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.17	0.16	0.09	0.12	1.54
	Content	0.53	0.51	0.22	0.78	2.03
	Inventory	0.00	0.11	0.03	0.00	0.14
	Subtotal	**1.70**	**0.77**	**0.34**	**0.90**	**3.71**
Business Interruption						
	Income	0.00	0.41	0.01	0.12	0.54
	Relocation	0.25	0.12	0.00	0.14	0.51
	Rental Income	0.09	0.07	0.00	0.05	0.22
	Wage	0.00	0.72	0.01	2.59	3.32
	Subtotal	**0.34**	**1.32**	**0.03**	**2.91**	**4.60**
ALL	**Total**	**2.04**	**2.10**	**0.37**	**3.80**	**8.30**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,475	832,208	1,622,683
Total	**5,214**	**790,475**	**832,208**	**1,622,683**
Total Study Region	**5,214**	**790,475**	**832,208**	**1,622,683**

Hazus: Flood Global Risk Report

Region Name: East_Granby_FL

Flood Scenario: East_Granby_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 74 census blocks. The region contains over 2 thousand households and has a total population of 5,214 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,335 buildings in the region with a total building replacement value (excluding contents) of 1,623 million dollars. Approximately 84.93% of the buildings (and 48.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,335 buildings in the region which have an aggregate total replacement value of 1,623 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	790,475	48.7%
Commercial	386,190	23.8%
Industrial	299,844	18.5%
Agricultural	5,269	0.3%
Religion	29,625	1.8%
Government	66,693	4.1%
Education	44,587	2.7%
Total	**1,622,683**	**100%**

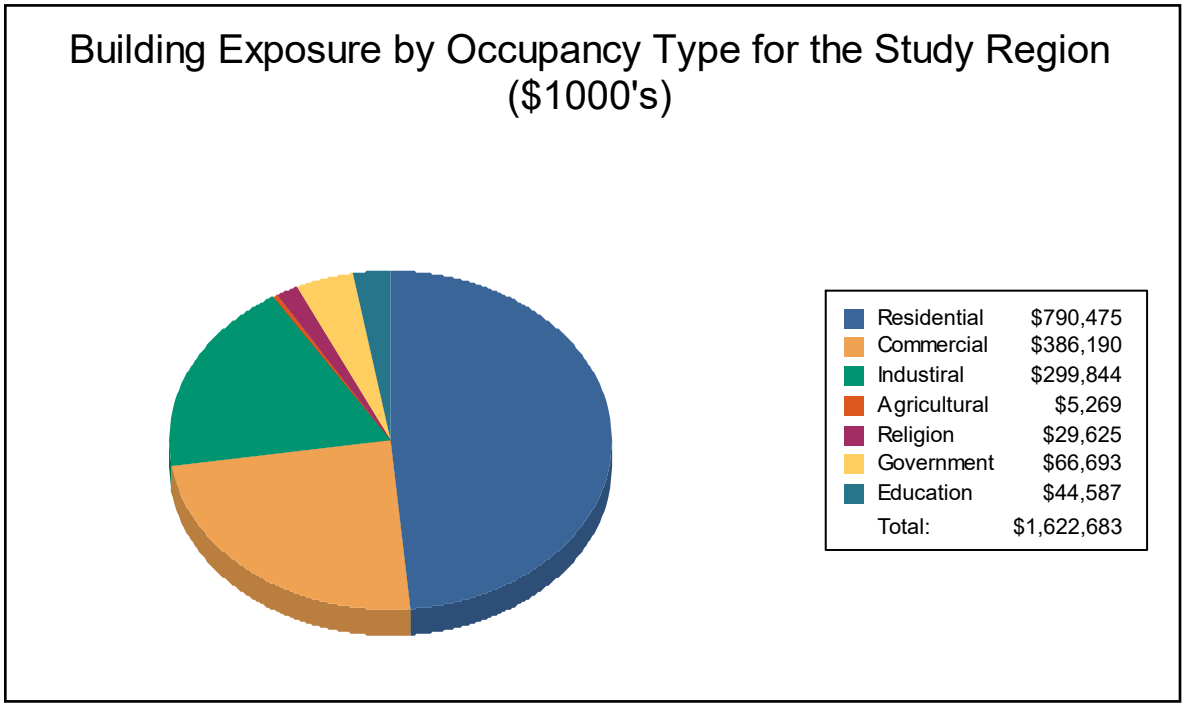
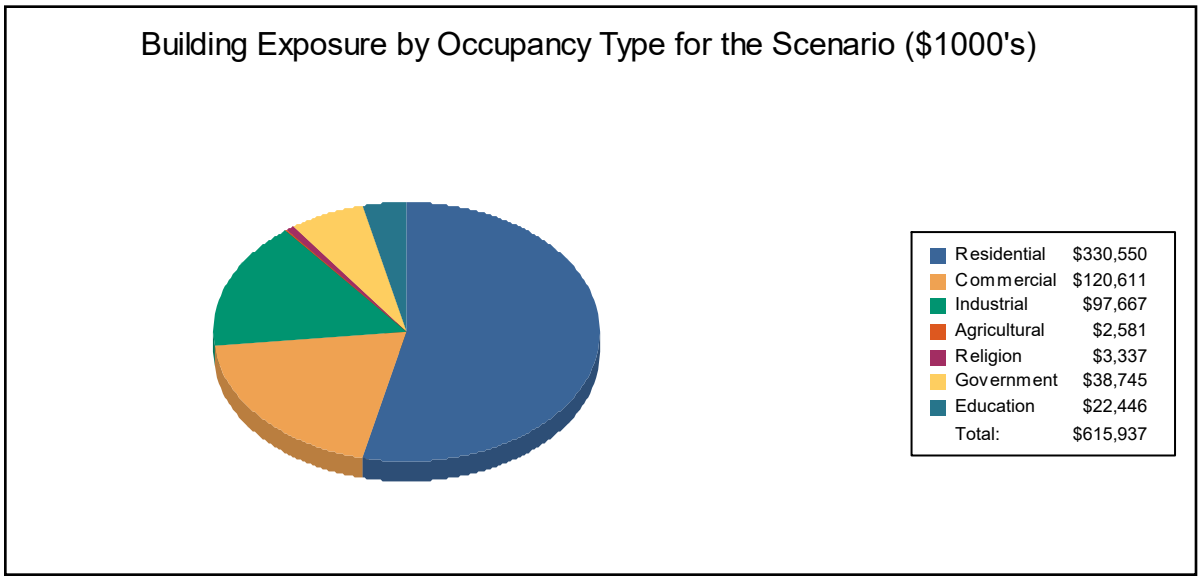


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	330,550	53.7%
Commercial	120,611	19.6%
Industrial	97,667	15.9%
Agricultural	2,581	0.4%
Religion	3,337	0.5%
Government	38,745	6.3%
Education	22,446	3.6%
Total	**615,937**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

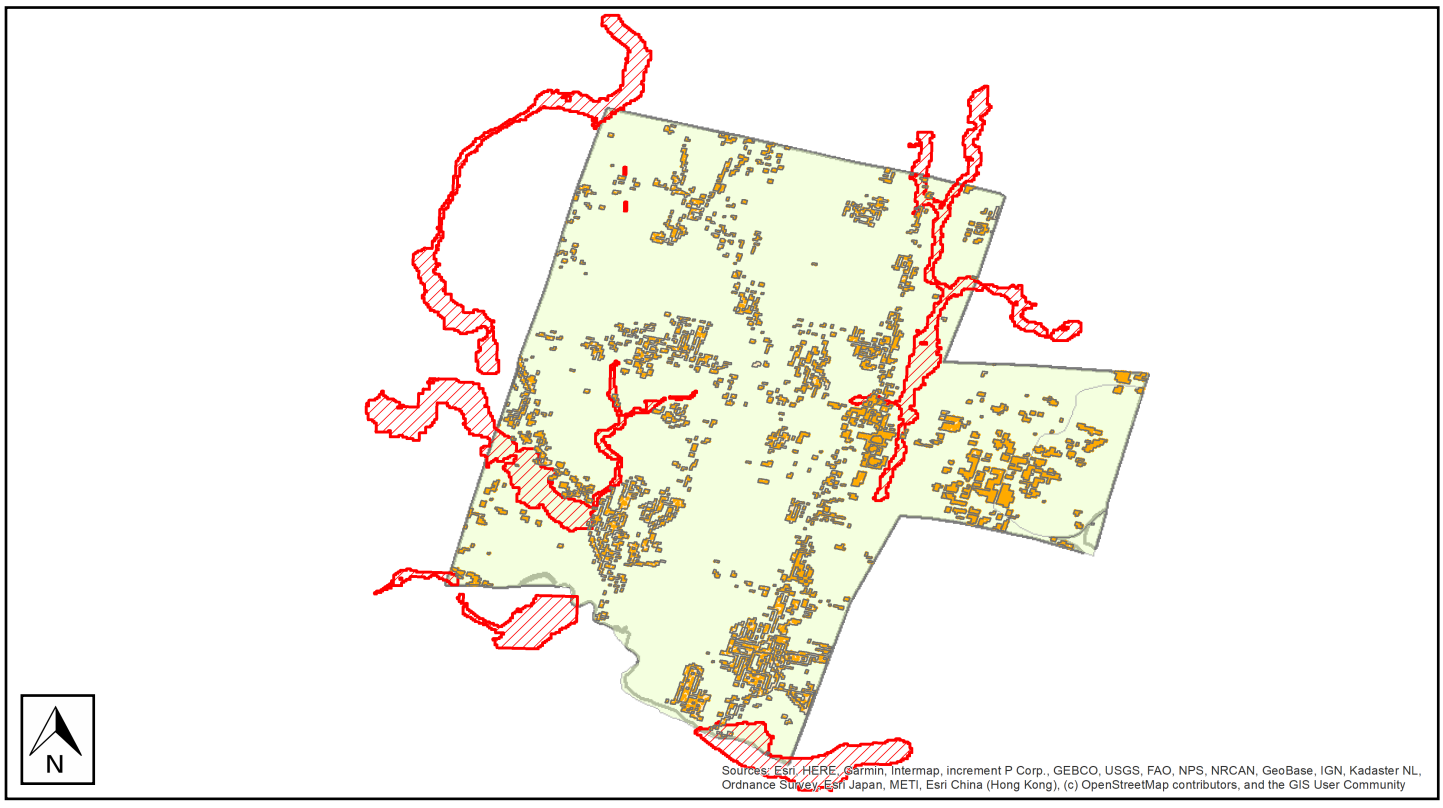
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Granby_FL
Scenario Name:	East_Granby_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

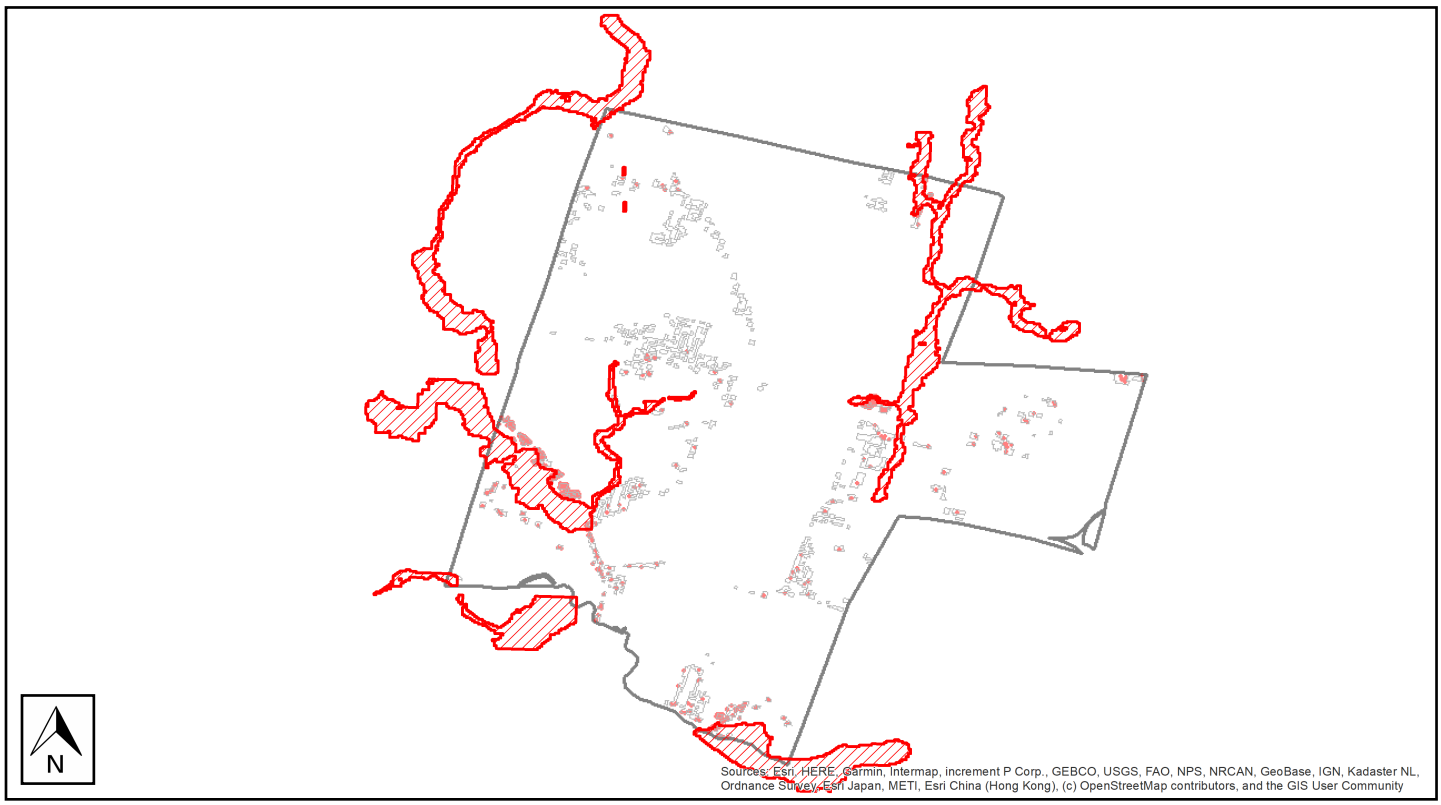


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	1	100	0	0	0	0	0	0
Total	**0**		**0**		**1**		**0**		**0**		**0**	

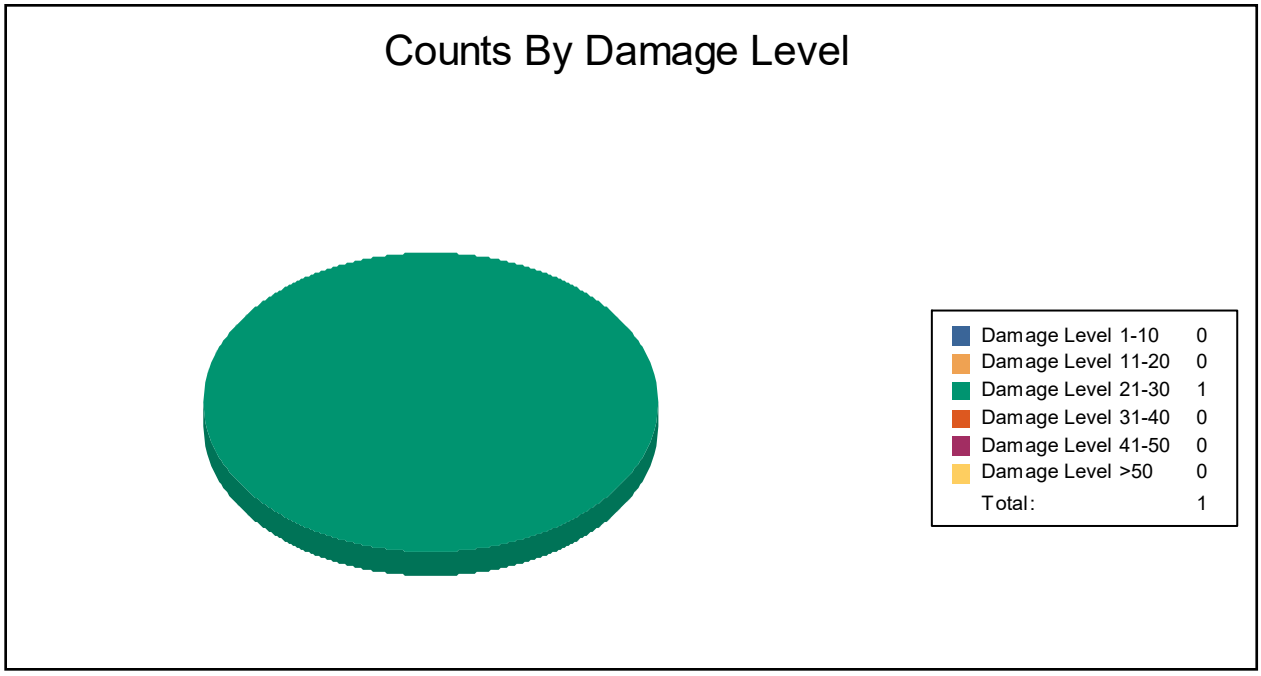


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	1	100	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

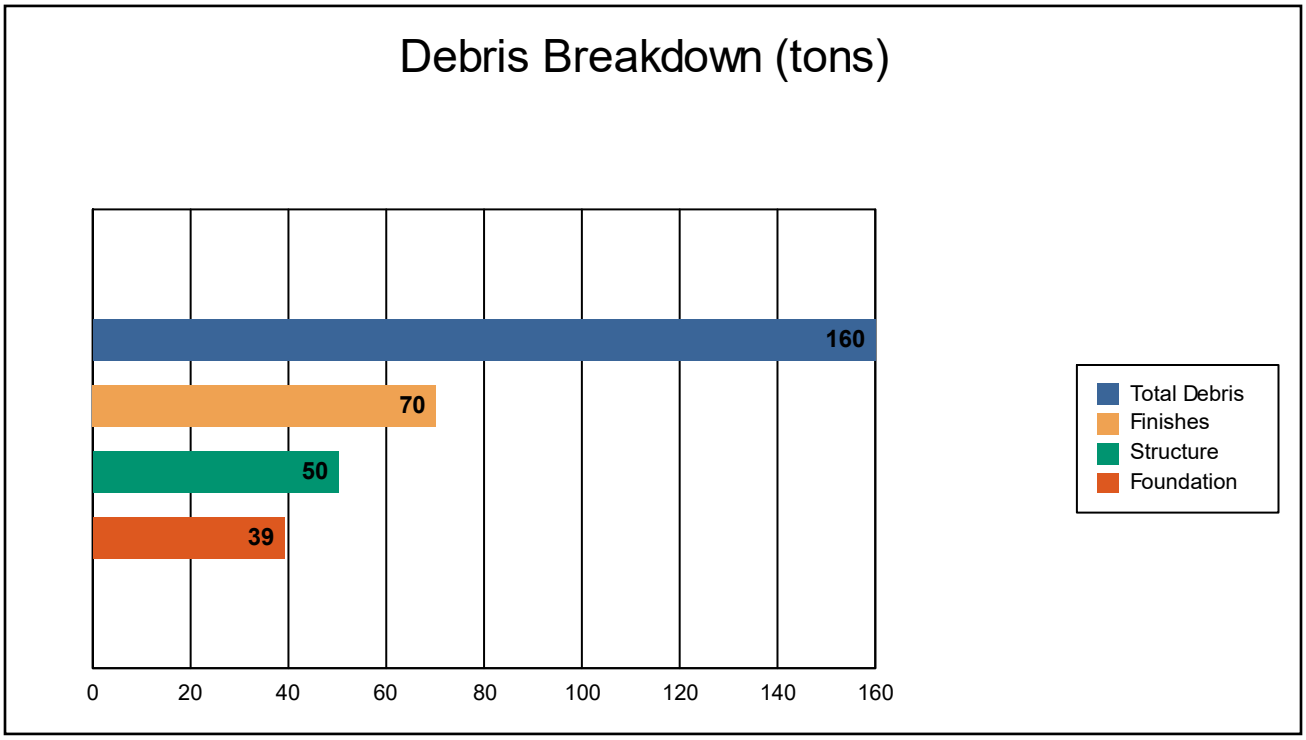
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

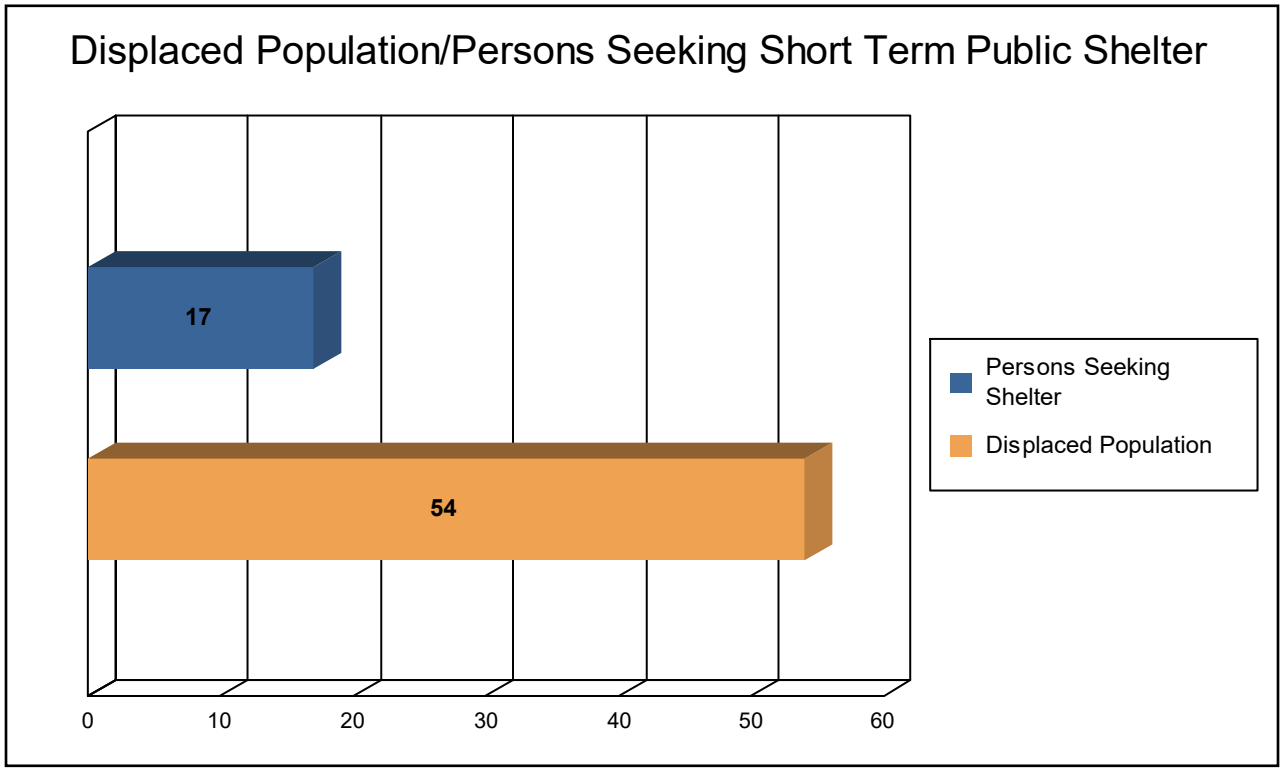


The model estimates that a total of 160 tons of debris will be generated. Of the total amount, Finishes comprises 44% of the total, Structure comprises 32% of the total, and Foundation comprises 25%. If the debris tonnage is converted into an estimated number of truckloads, it will require 7 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 18 households (or 54 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 17 people (out of a total population of 5,214) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 12.19 million dollars, which represents 1.98 % of the total replacement value of the scenario buildings.

Building-Related Losses

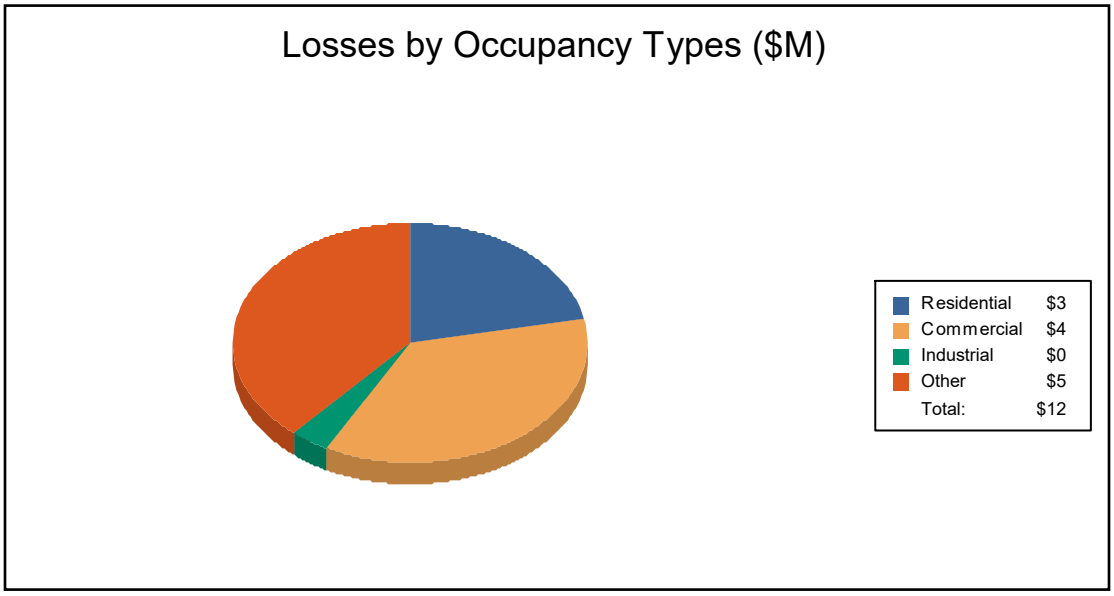
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 5.77 million dollars. 53% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 21.55% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.51	0.44	0.10	0.15	2.20
	Content	0.68	1.49	0.27	0.97	3.39
	Inventory	0.00	0.14	0.04	0.00	0.18
	Subtotal	**2.19**	**2.07**	**0.41**	**1.11**	**5.77**
Business Interruption						
	Income	0.00	0.85	0.01	0.16	1.01
	Relocation	0.32	0.28	0.01	0.19	0.79
	Rental Income	0.12	0.14	0.00	0.07	0.33
	Wage	0.00	1.09	0.02	3.19	4.29
	Subtotal	**0.44**	**2.35**	**0.03**	**3.60**	**6.42**
ALL	**Total**	**2.63**	**4.42**	**0.44**	**4.71**	**12.19**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,475	832,208	1,622,683
Total	**5,214**	**790,475**	**832,208**	**1,622,683**
Total Study Region	**5,214**	**790,475**	**832,208**	**1,622,683**

Hazus: Flood Global Risk Report

Region Name: East_Granby_FL

Flood Scenario: East_Granby_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 74 census blocks. The region contains over 2 thousand households and has a total population of 5,214 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,335 buildings in the region with a total building replacement value (excluding contents) of 1,623 million dollars. Approximately 84.93% of the buildings (and 48.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,335 buildings in the region which have an aggregate total replacement value of 1,623 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
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Education	44,587	2.7%
Total	**1,622,683**	**100%**

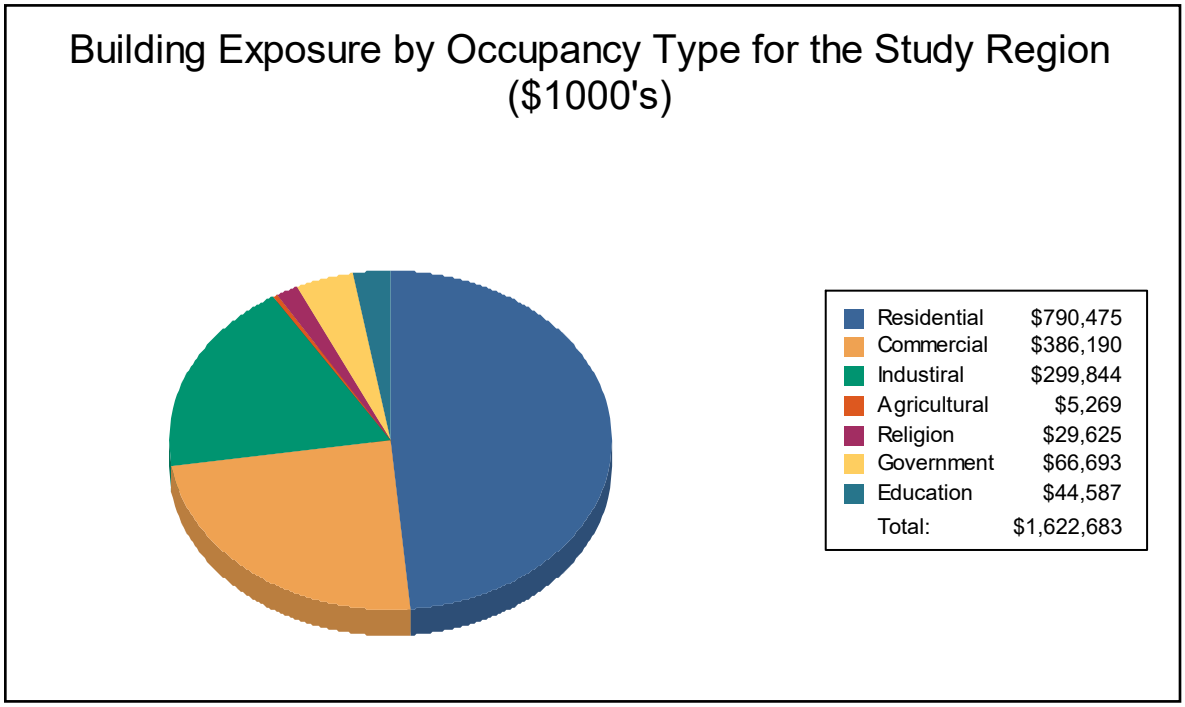

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	330,550	53.7%
Commercial	120,611	19.6%
Industrial	97,667	15.9%
Agricultural	2,581	0.4%
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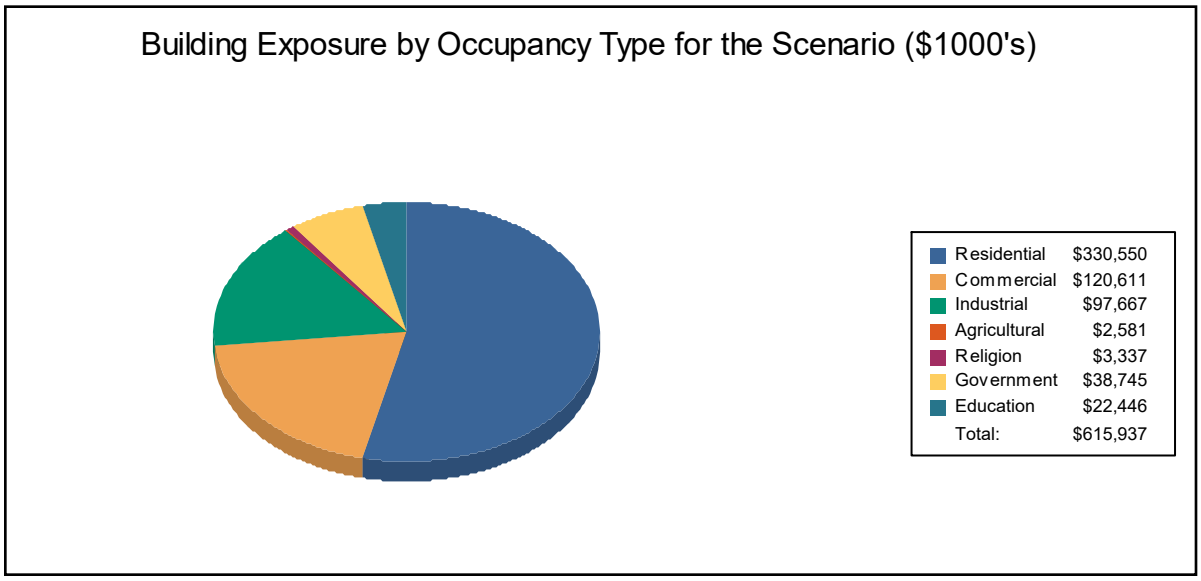
Government	38,745	6.3%
Education	22,446	3.6%
Total	**615,937**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

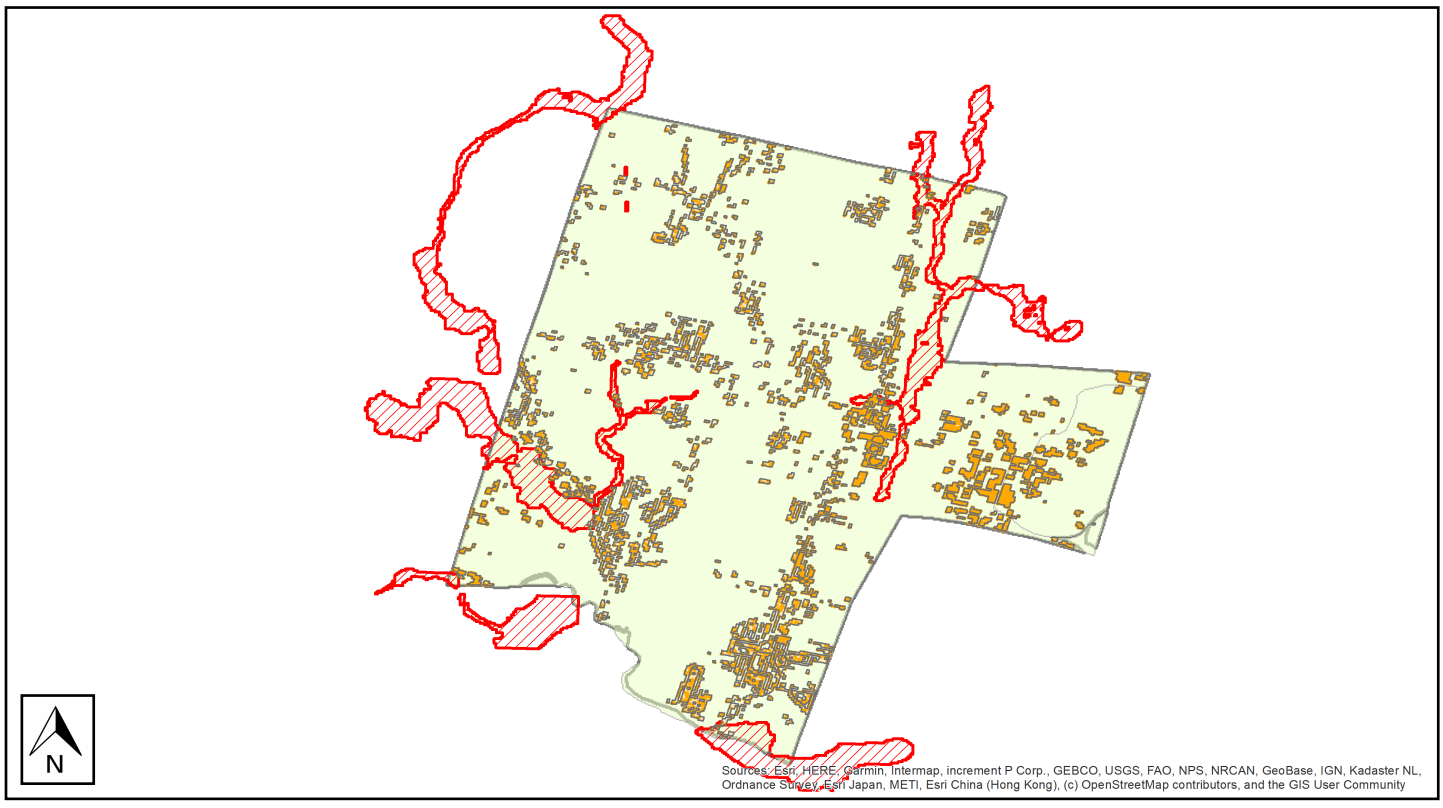
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Granby_FL
Scenario Name:	East_Granby_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

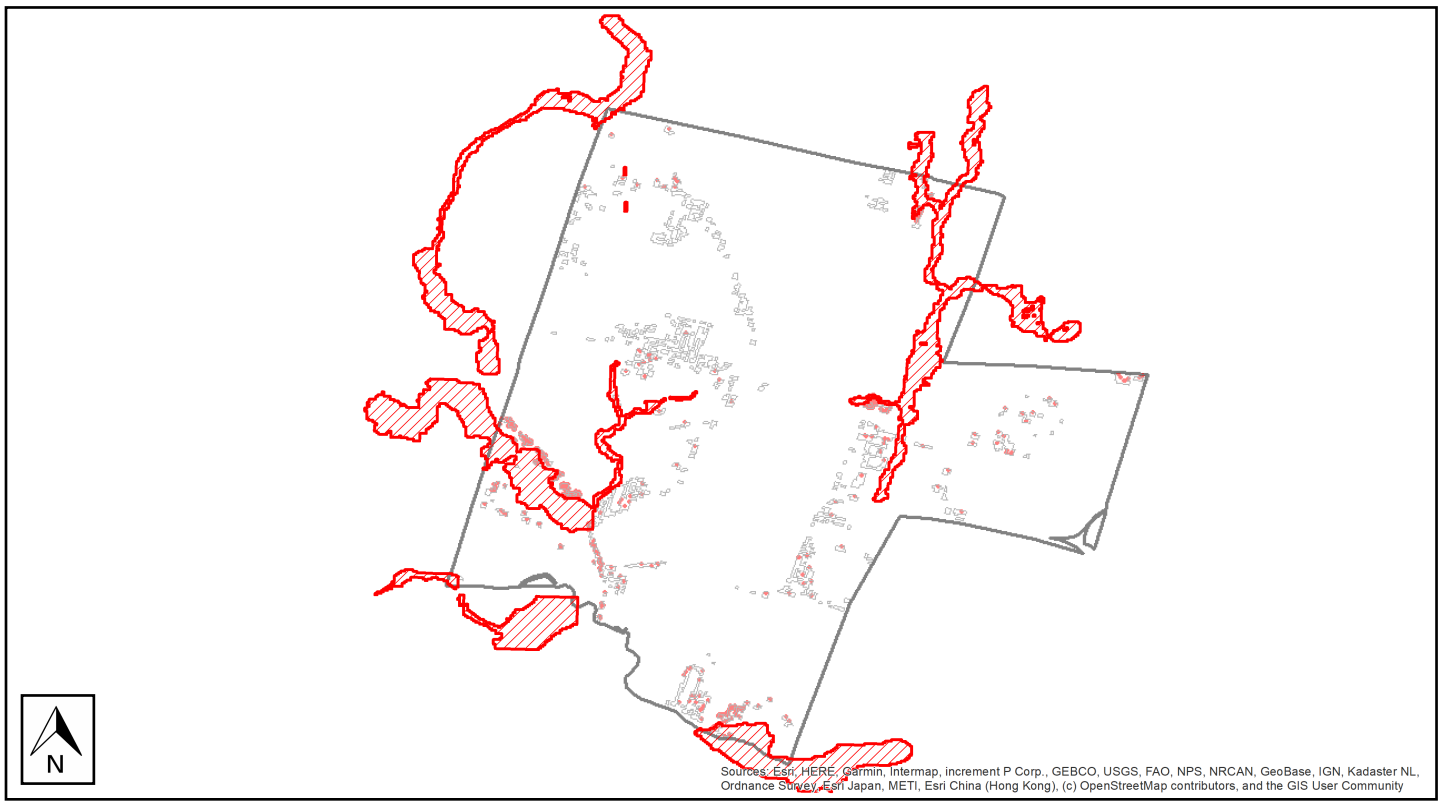


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	2	100	0	0	0	0	0	0
Total	**0**		**0**		**2**		**0**		**0**		**0**	

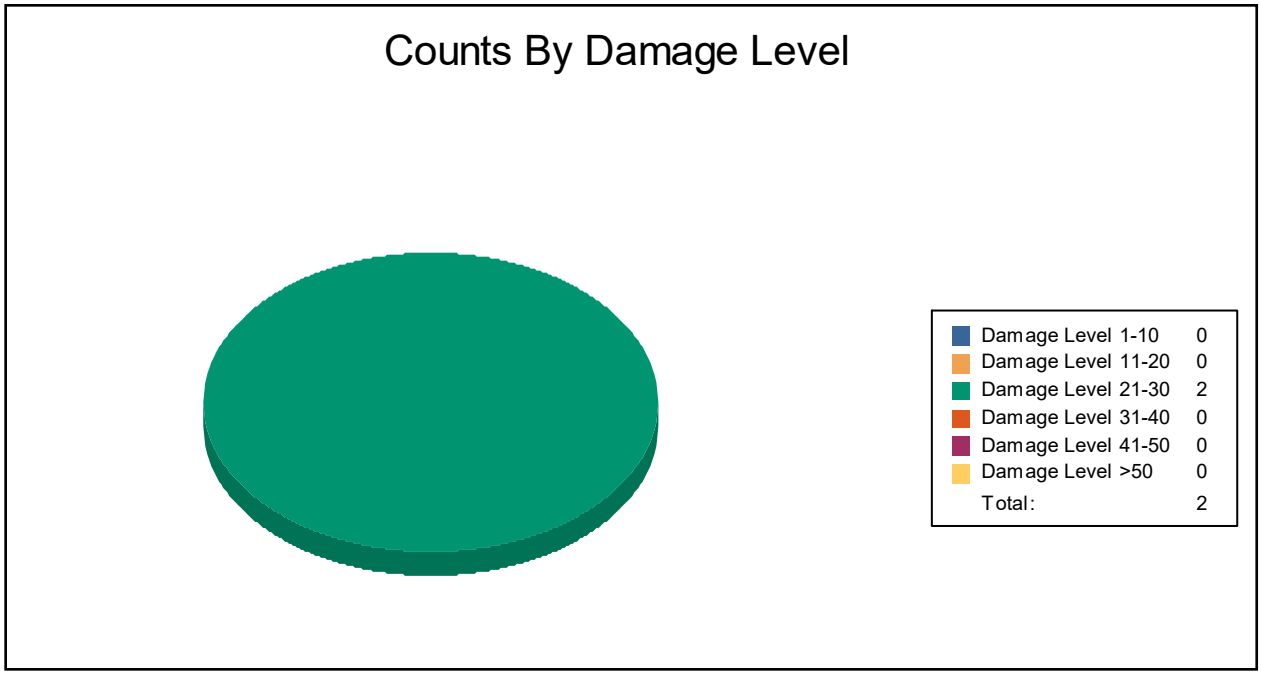


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	2	100	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

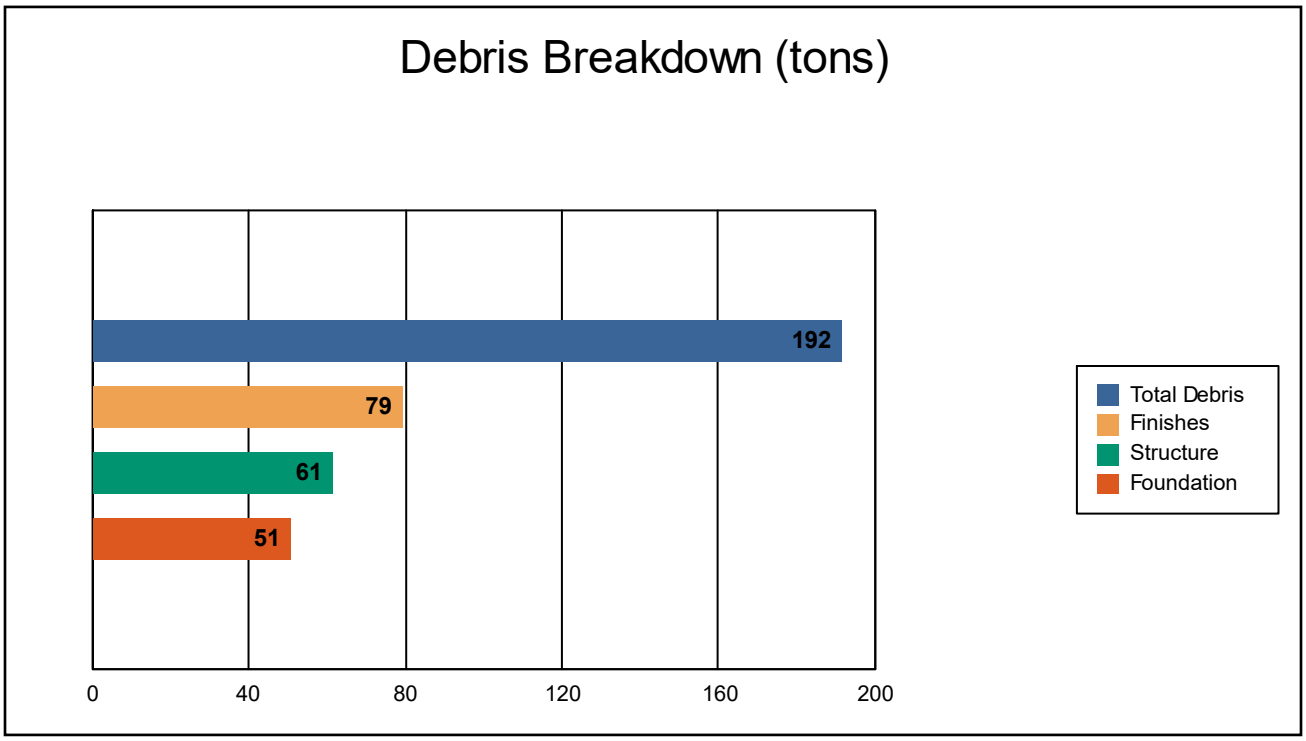
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

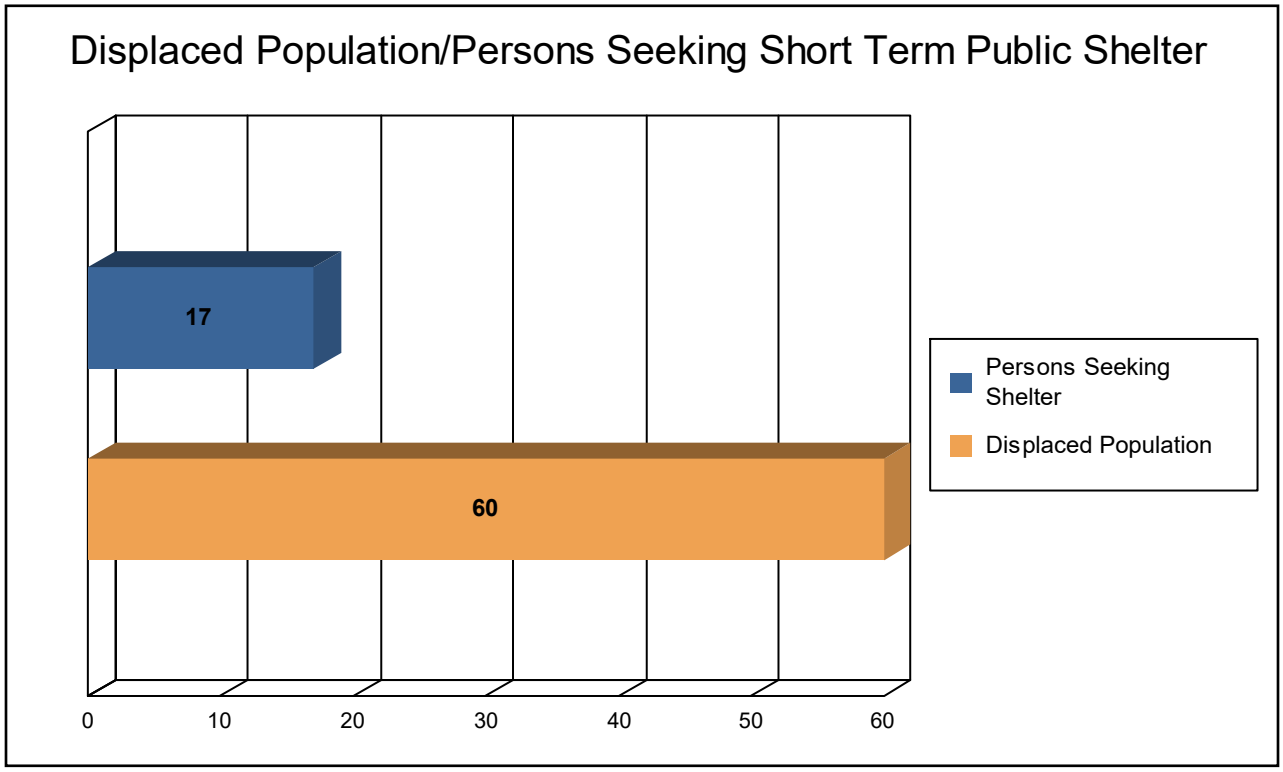


The model estimates that a total of 192 tons of debris will be generated. Of the total amount, Finishes comprises 41% of the total, Structure comprises 32% of the total, and Foundation comprises 27%. If the debris tonnage is converted into an estimated number of truckloads, it will require 8 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 20 households (or 60 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 17 people (out of a total population of 5,214) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 14.76 million dollars, which represents 2.40 % of the total replacement value of the scenario buildings.

Building-Related Losses

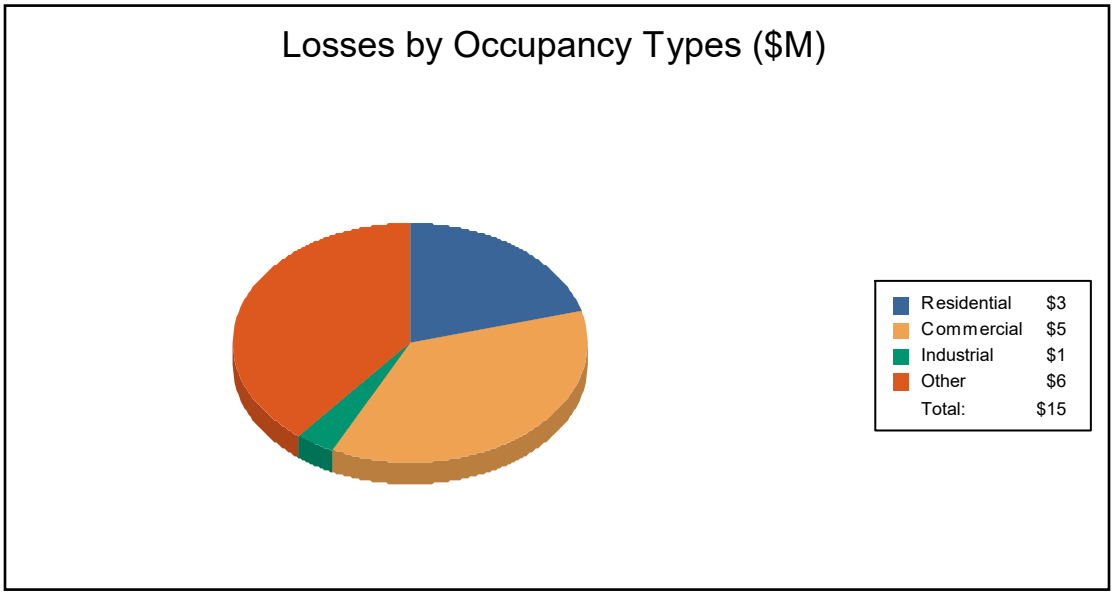
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 7.19 million dollars. 51% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 20.72% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.78	0.63	0.13	0.19	2.73
	Content	0.79	1.91	0.31	1.22	4.23
	Inventory	0.00	0.20	0.04	0.00	0.24
	Subtotal	**2.57**	**2.74**	**0.47**	**1.41**	**7.19**
Business Interruption						
	Income	0.00	0.95	0.01	0.19	1.14
	Relocation	0.35	0.31	0.01	0.23	0.90
	Rental Income	0.13	0.16	0.00	0.08	0.37
	Wage	0.00	1.24	0.02	3.90	5.16
	Subtotal	**0.49**	**2.66**	**0.03**	**4.39**	**7.57**
ALL	**Total**	**3.06**	**5.40**	**0.51**	**5.80**	**14.76**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,475	832,208	1,622,683
Total	**5,214**	**790,475**	**832,208**	**1,622,683**
Total Study Region	**5,214**	**790,475**	**832,208**	**1,622,683**

Hazus: Flood Global Risk Report

Region Name: East_Granby_FL

Flood Scenario: East_Granby_Flood

Print Date: Friday, April 7, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 74 census blocks. The region contains over 2 thousand households and has a total population of 5,214 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,335 buildings in the region with a total building replacement value (excluding contents) of 1,623 million dollars. Approximately 84.93% of the buildings (and 48.71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,335 buildings in the region which have an aggregate total replacement value of 1,623 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	790,475	48.7%
Commercial	386,190	23.8%
Industrial	299,844	18.5%
Agricultural	5,269	0.3%
Religion	29,625	1.8%
Government	66,693	4.1%
Education	44,587	2.7%
Total	**1,622,683**	**100%**

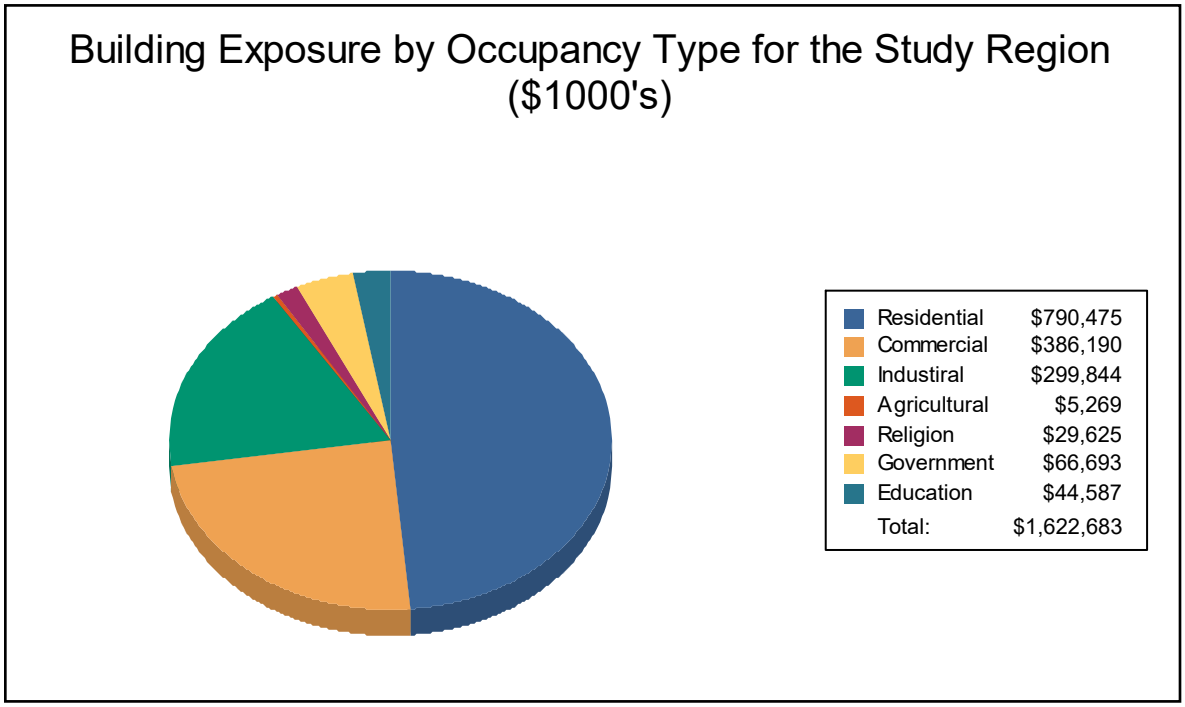
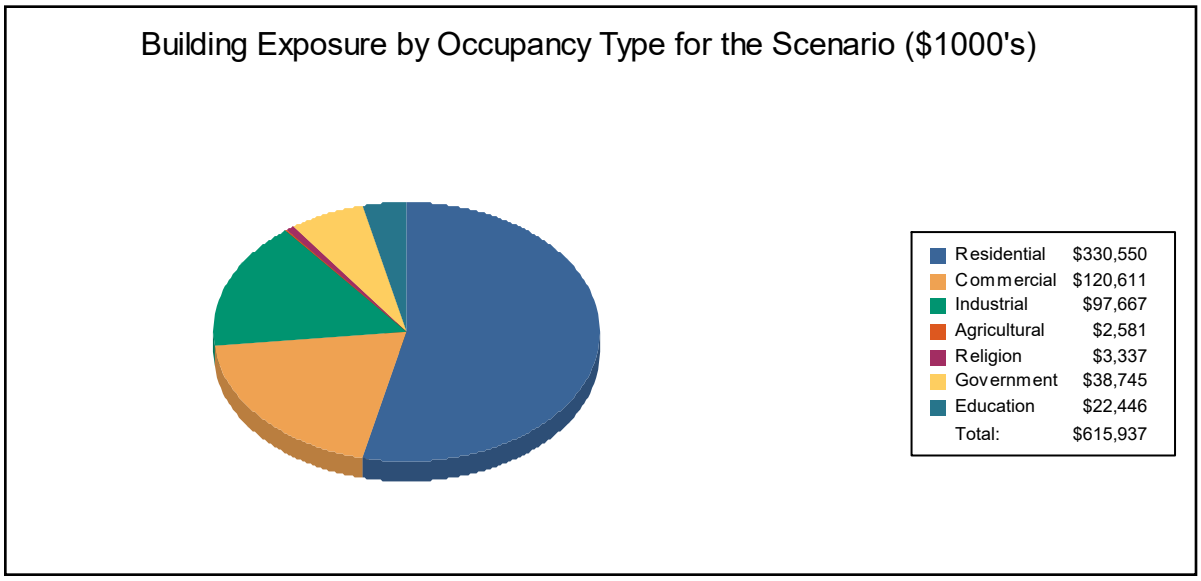


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	330,550	53.7%
Commercial	120,611	19.6%
Industrial	97,667	15.9%
Agricultural	2,581	0.4%
Religion	3,337	0.5%
Government	38,745	6.3%
Education	22,446	3.6%
Total	**615,937**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

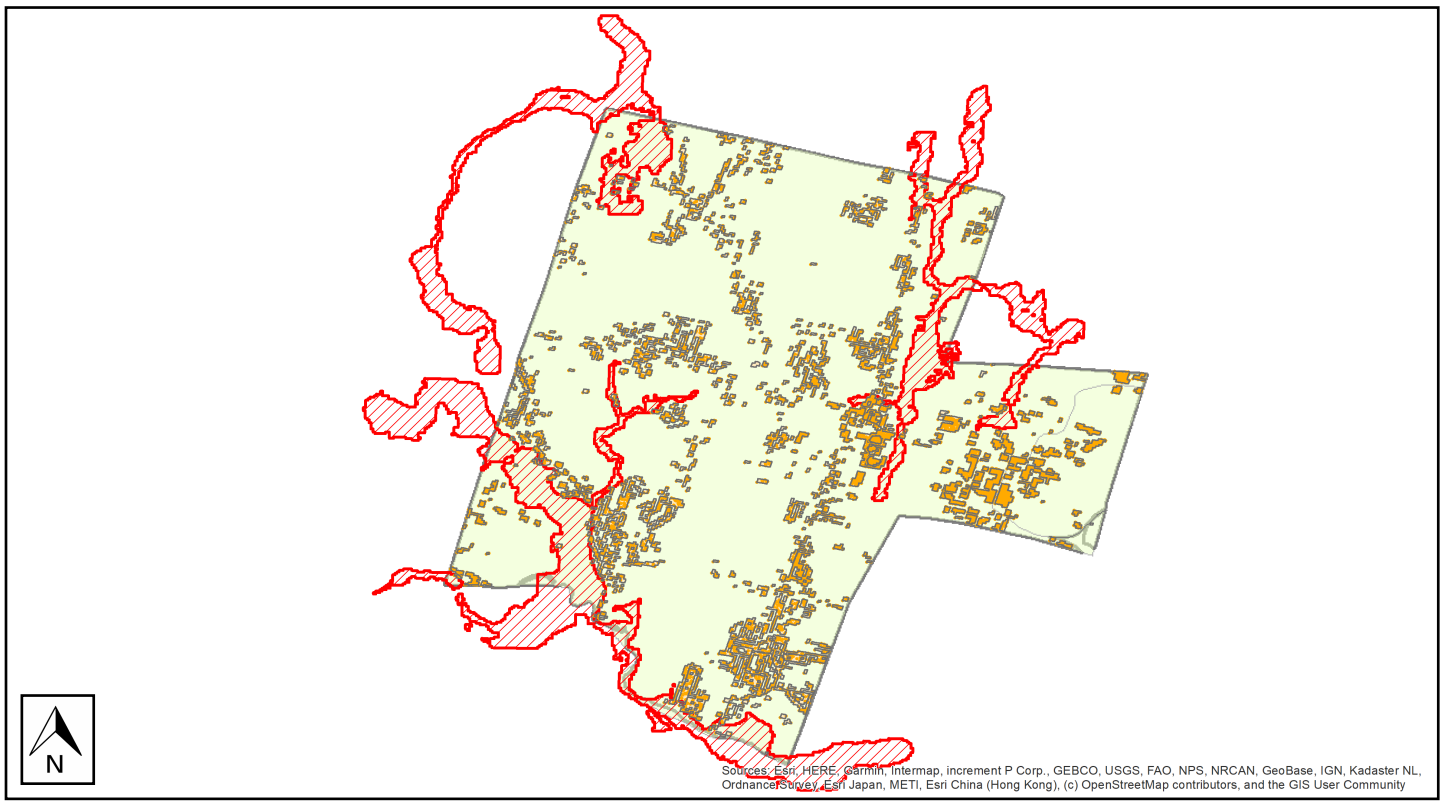
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Granby_FL
Scenario Name:	East_Granby_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

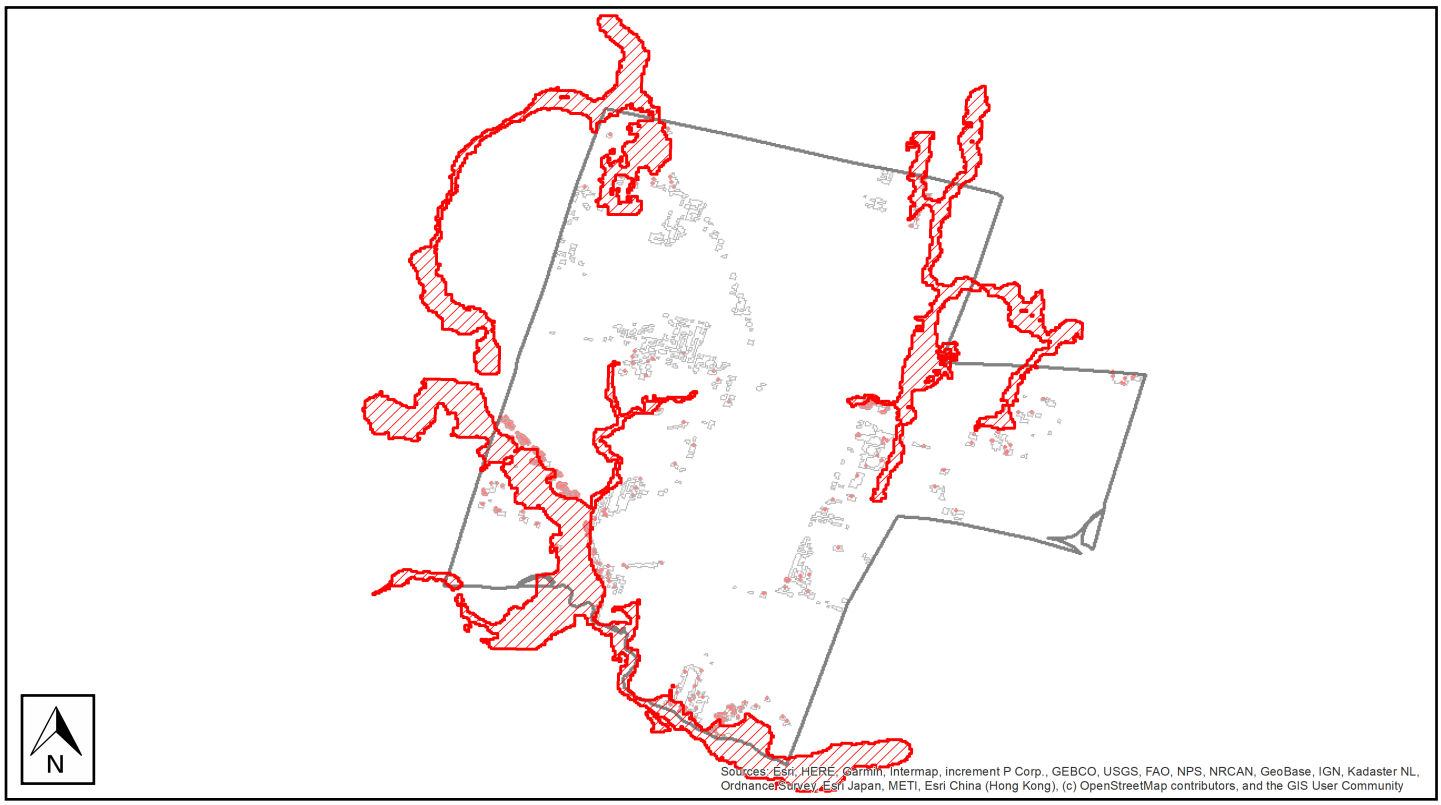


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	2	50	2	50	0	0	0	0	0	0
Total	**0**		**2**		**2**		**0**		**0**		**0**	

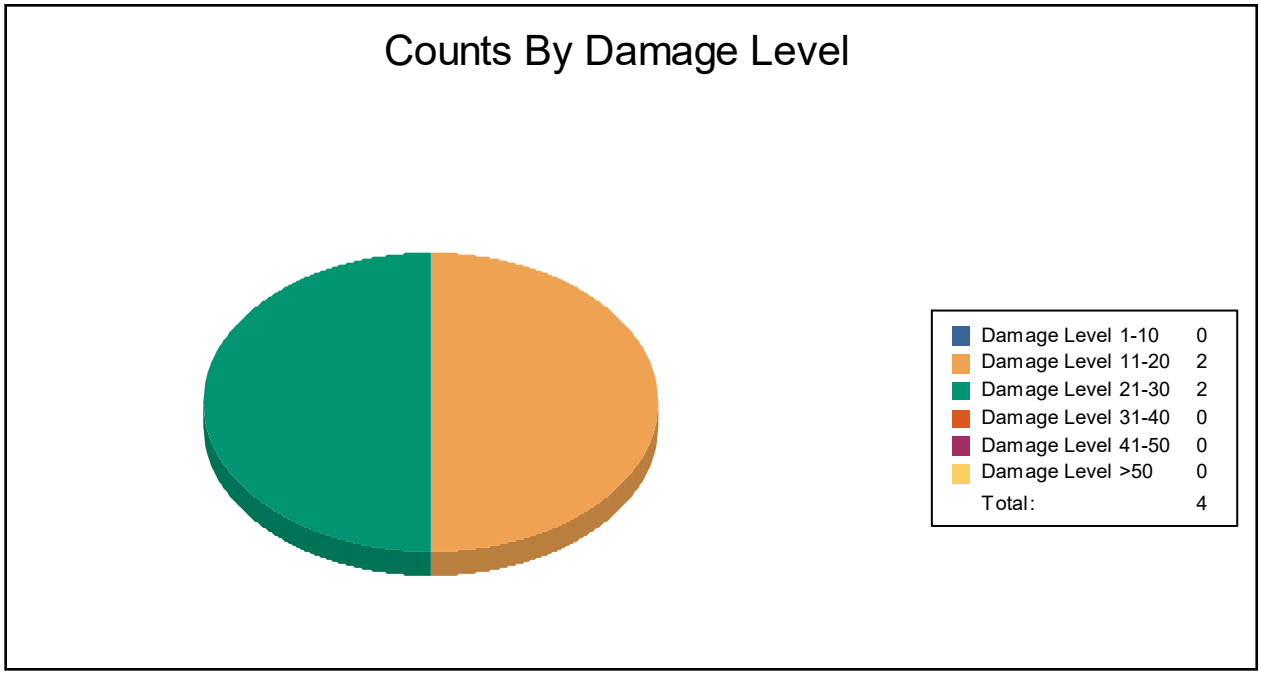


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	2	50	2	50	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

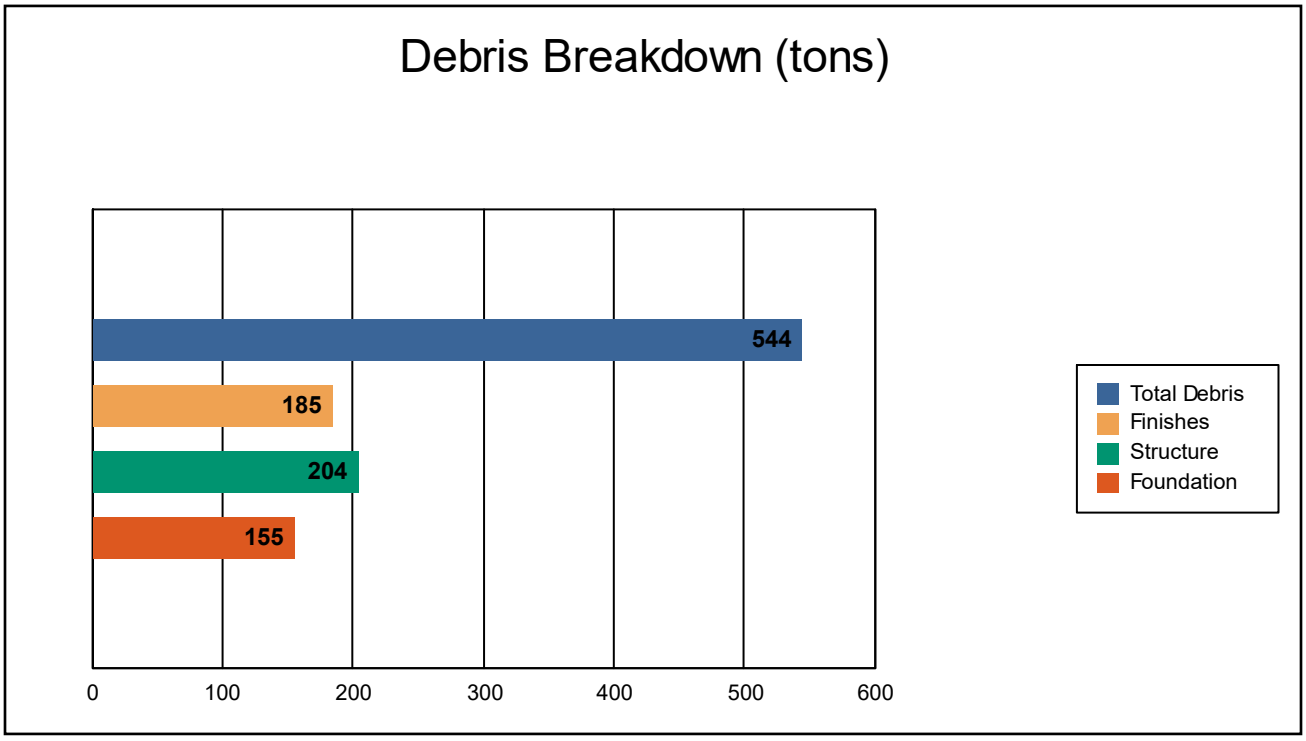
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

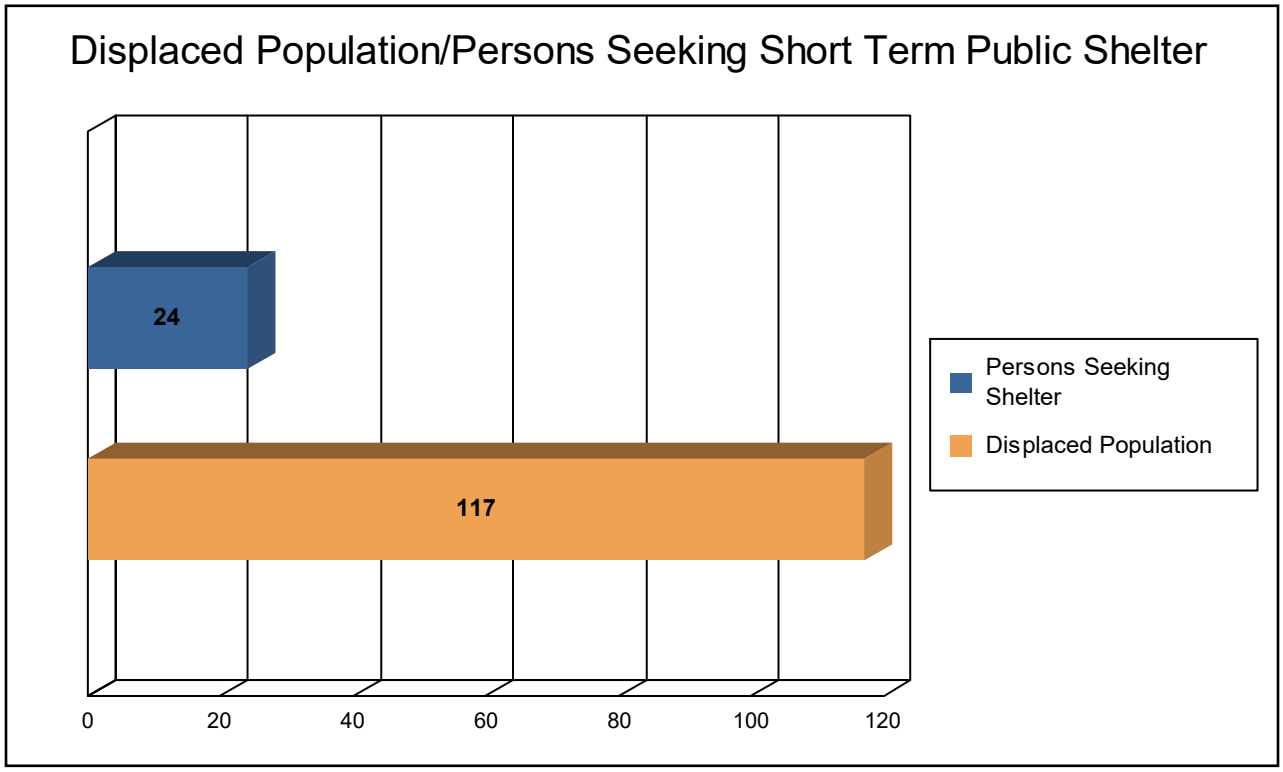


The model estimates that a total of 544 tons of debris will be generated. Of the total amount, Finishes comprises 34% of the total, Structure comprises 38% of the total, and Foundation comprises 29%. If the debris tonnage is converted into an estimated number of truckloads, it will require 22 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 39 households (or 117 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 24 people (out of a total population of 5,214) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 25.57 million dollars, which represents 4.15 % of the total replacement value of the scenario buildings.

Building-Related Losses

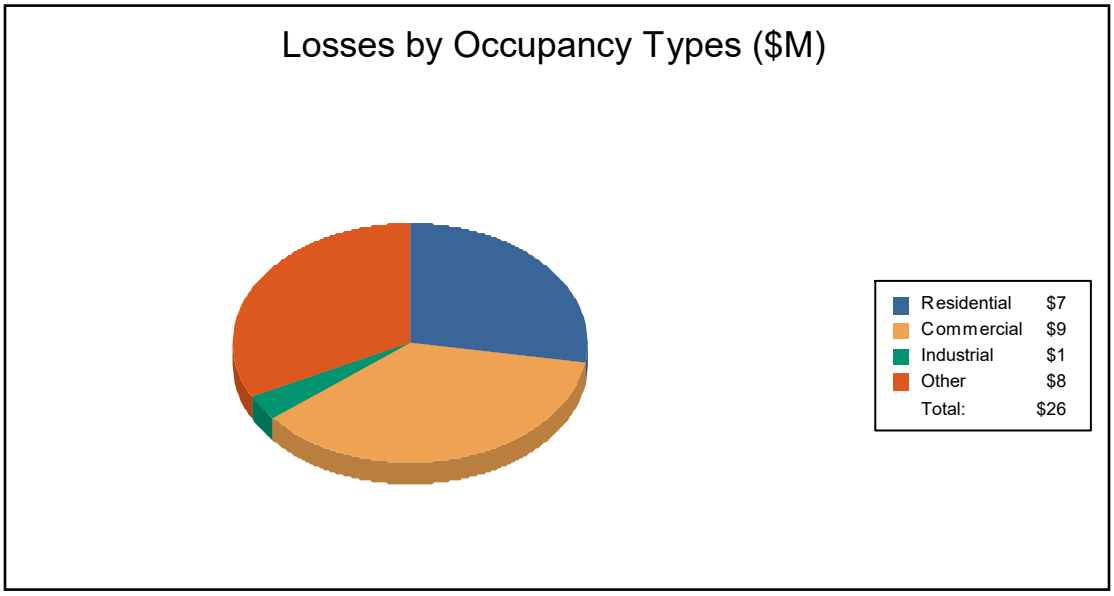
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 13.38 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 27.87% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.24	1.22	0.24	0.32	6.02
	Content	1.87	2.80	0.51	1.78	6.96
	Inventory	0.00	0.29	0.07	0.05	0.40
	Subtotal	**6.10**	**4.31**	**0.81**	**2.15**	**13.38**
Business Interruption						
	Income	0.00	1.73	0.01	0.30	2.04
	Relocation	0.75	0.53	0.01	0.31	1.58
	Rental Income	0.28	0.27	0.00	0.11	0.66
	Wage	0.00	2.46	0.02	5.42	7.91
	Subtotal	**1.02**	**4.99**	**0.04**	**6.14**	**12.19**
ALL	**Total**	**7.13**	**9.30**	**0.85**	**8.29**	**25.57**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,475	832,208	1,622,683
Total	**5,214**	**790,475**	**832,208**	**1,622,683**
Total Study Region	**5,214**	**790,475**	**832,208**	**1,622,683**

Hazus: Flood Global Risk Report

Region Name: East_Hartford_FL

Flood Scenario: East_Hartford_Flood

Print Date: Friday, April 7, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 530 census blocks. The region contains over 20 thousand households and has a total population of 51,045 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 13,221 buildings in the region with a total building replacement value (excluding contents) of 8,590 million dollars. Approximately 89.31% of the buildings (and 54.48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of 8,590 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,679,875	54.5%
Commercial	2,245,595	26.1%
Industrial	643,216	7.5%
Agricultural	22,916	0.3%
Religion	217,116	2.5%
Government	180,299	2.1%
Education	601,170	7.0%
Total	**8,590,187**	**100%**

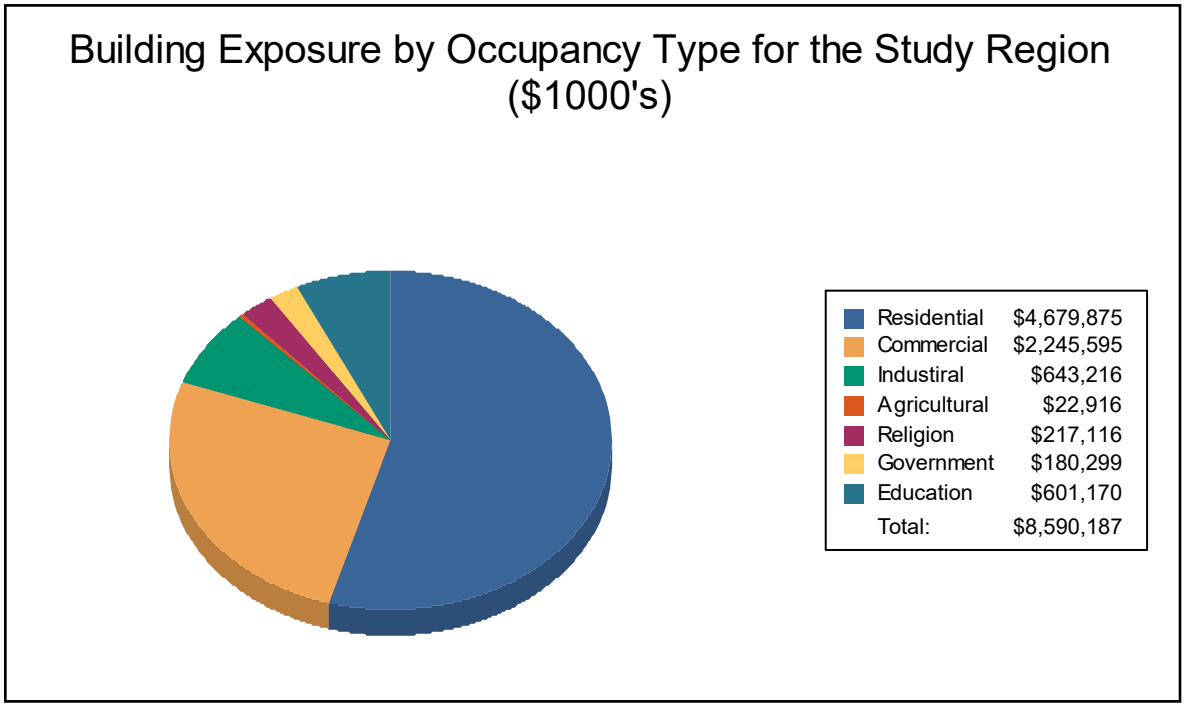
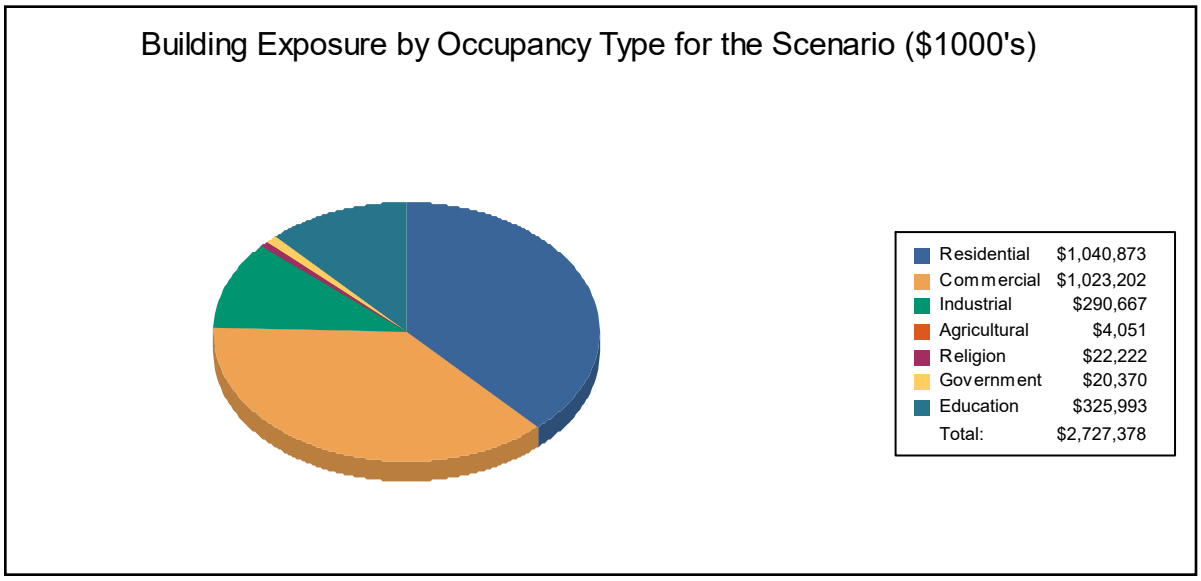


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,040,873	38.2%
Commercial	1,023,202	37.5%
Industrial	290,667	10.7%
Agricultural	4,051	0.1%
Religion	22,222	0.8%
Government	20,370	0.7%
Education	325,993	12.0%
Total	**2,727,378**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 20 schools, 5 fire stations, 1 police station and 1 emergency operation center.

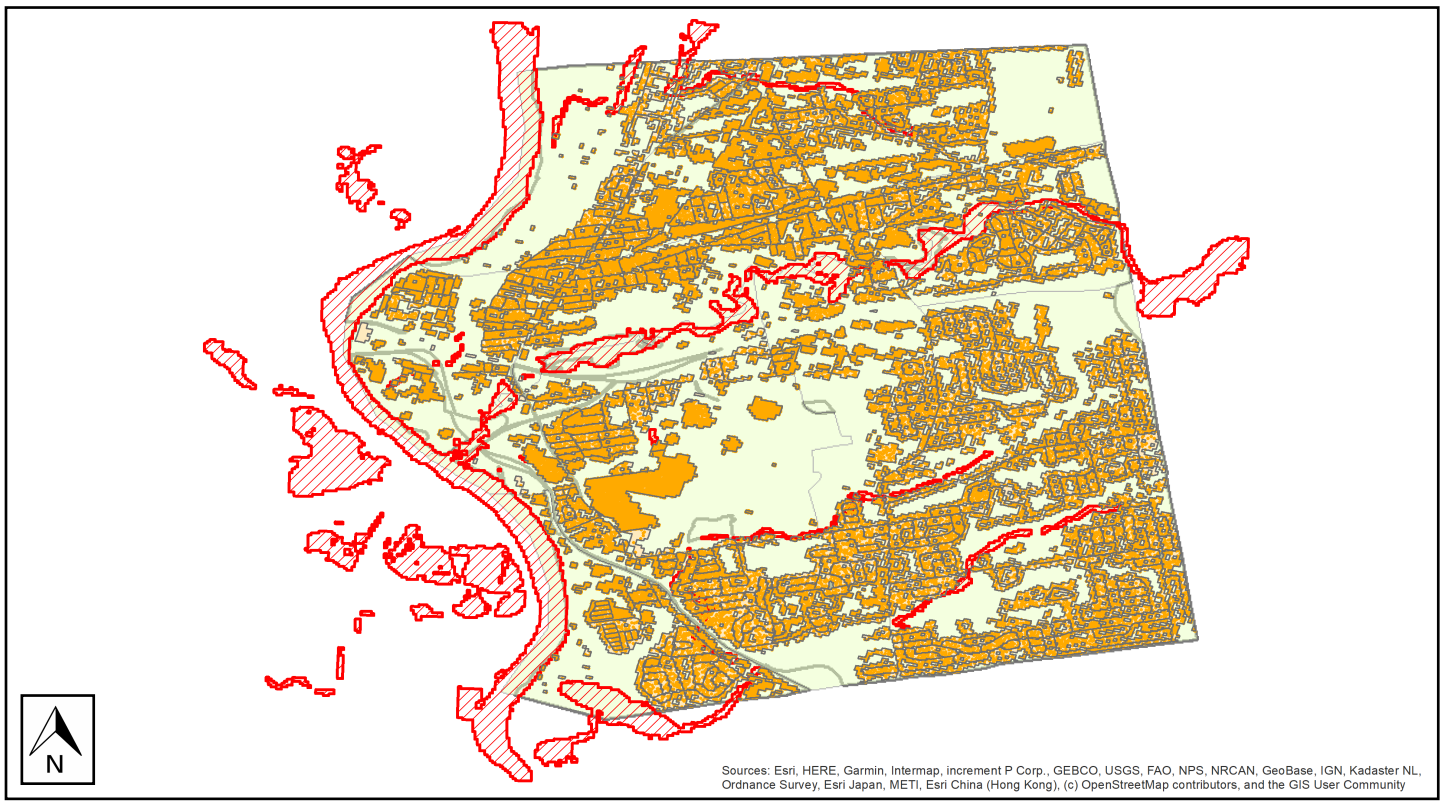
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Hartford_FL
Scenario Name:	East_Hartford_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 13 buildings will be at least moderately damaged. This is over 83% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

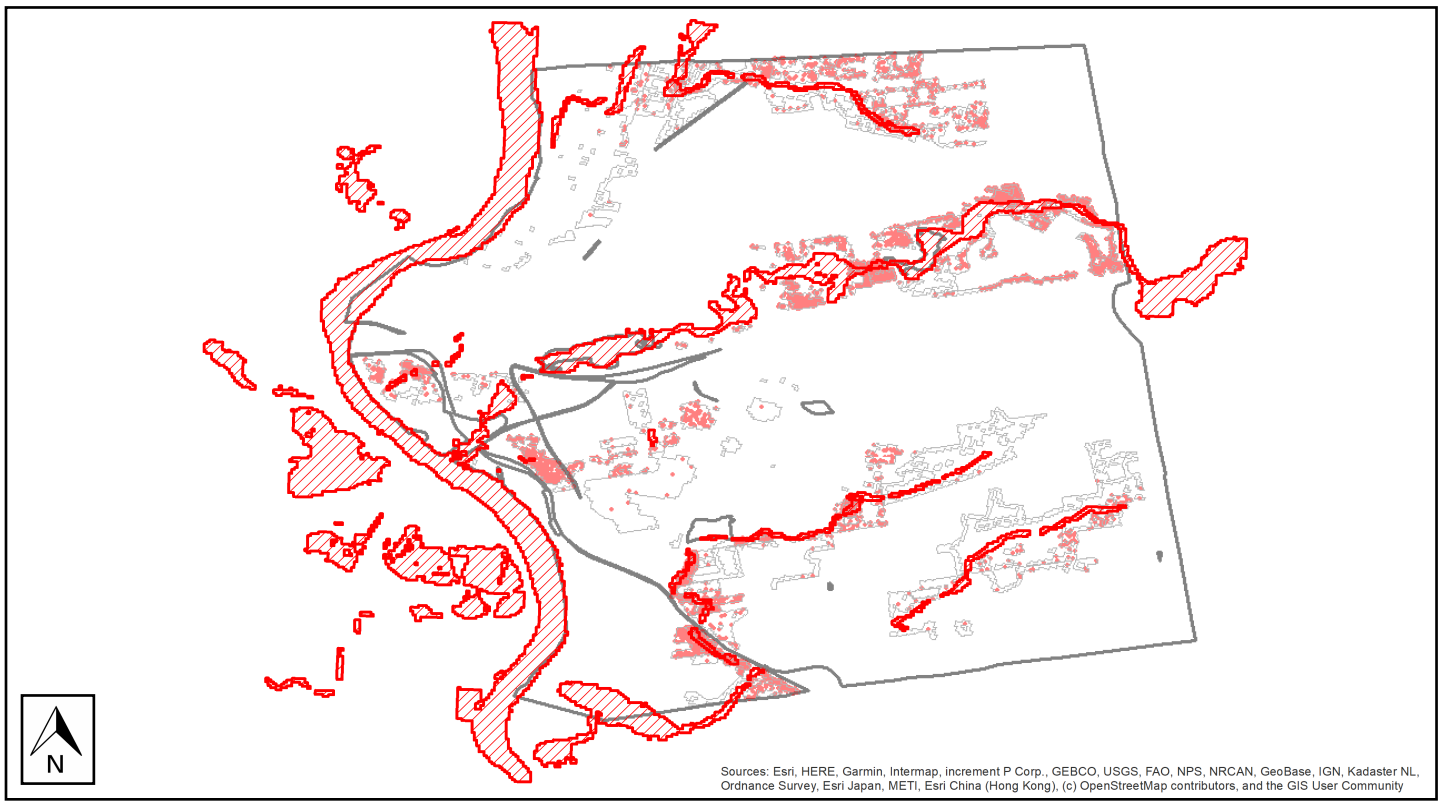


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	29	69	8	19	3	7	2	5	0	0	0	0
Total	**29**		**8**		**3**		**2**		**0**		**0**	

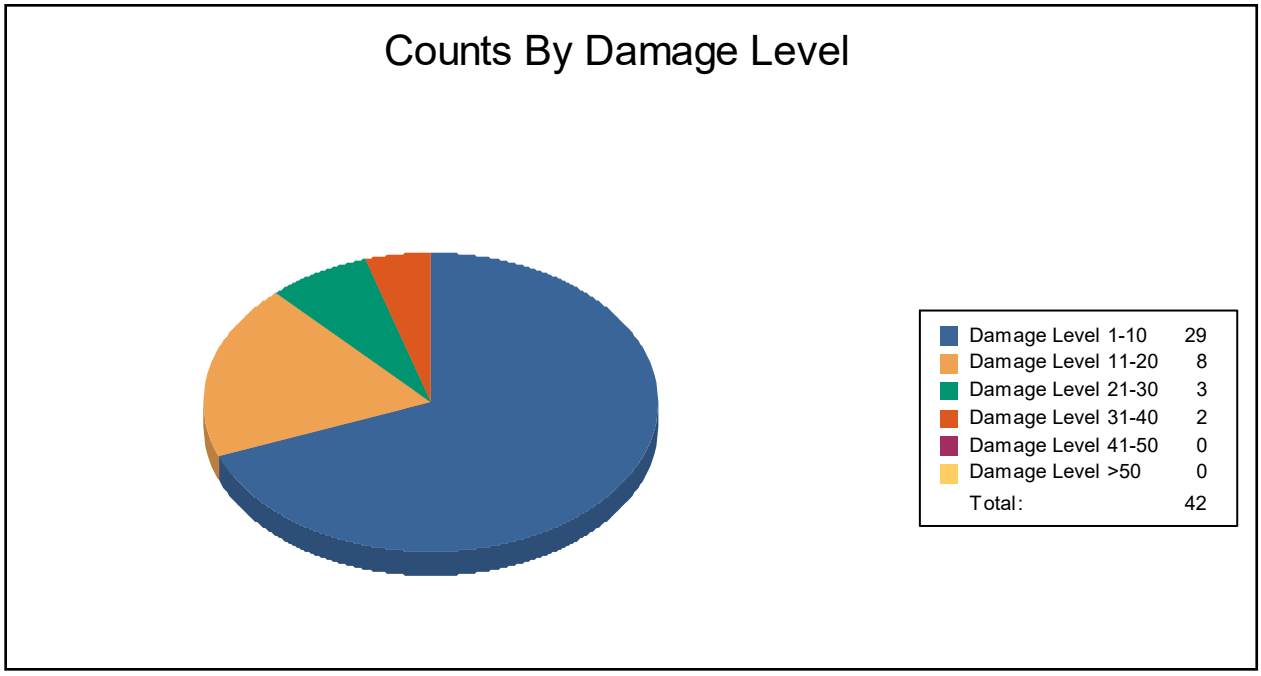


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	29	69	8	19	3	7	2	5	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	20	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

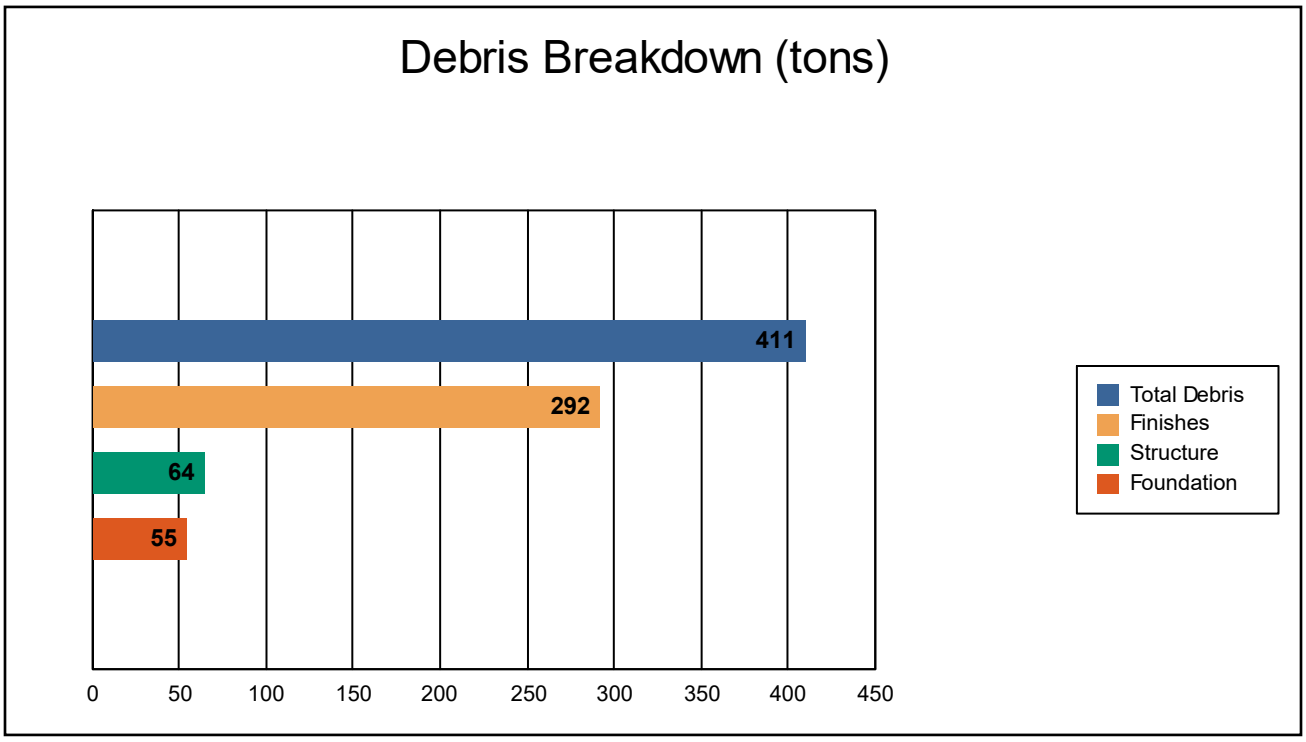
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

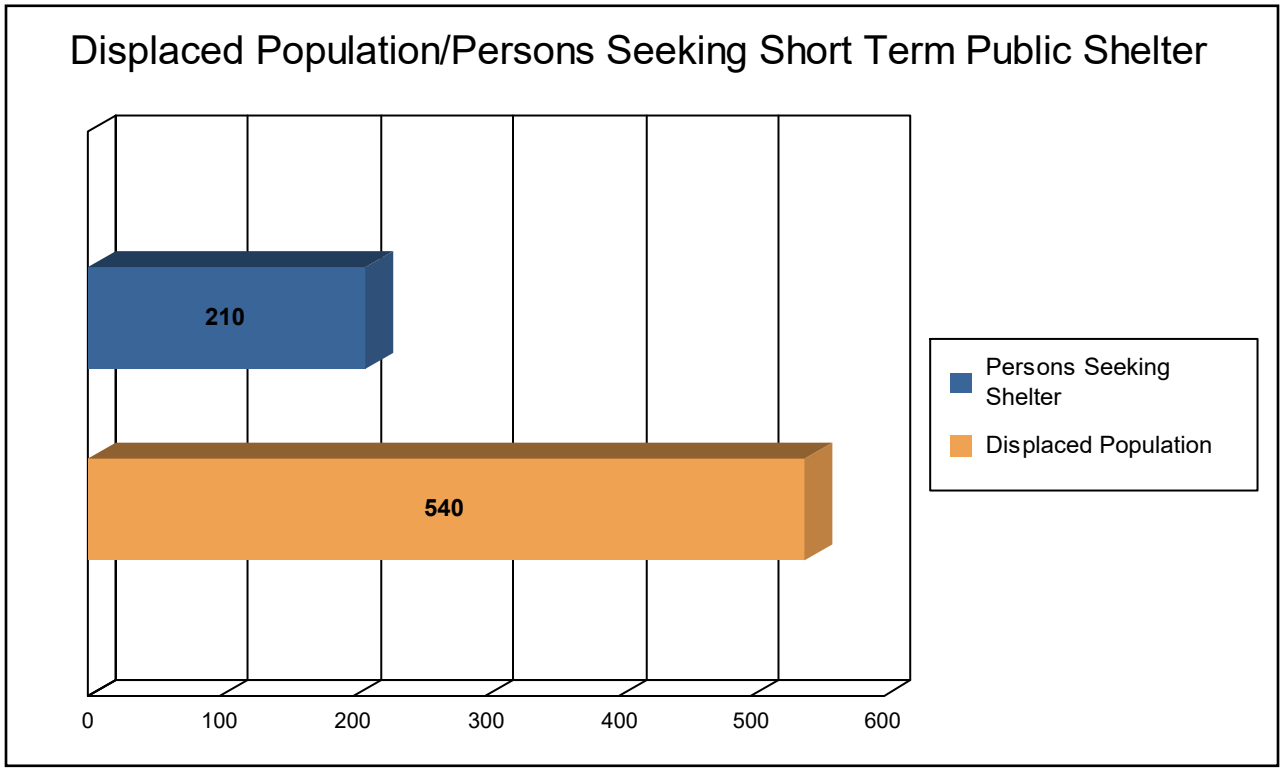


The model estimates that a total of 411 tons of debris will be generated. Of the total amount, Finishes comprises 71% of the total, Structure comprises 16% of the total, and Foundation comprises 13%. If the debris tonnage is converted into an estimated number of truckloads, it will require 17 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 180 households (or 540 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 210 people (out of a total population of 51,045) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 40.49 million dollars, which represents 1.48 % of the total replacement value of the scenario buildings.

Building-Related Losses

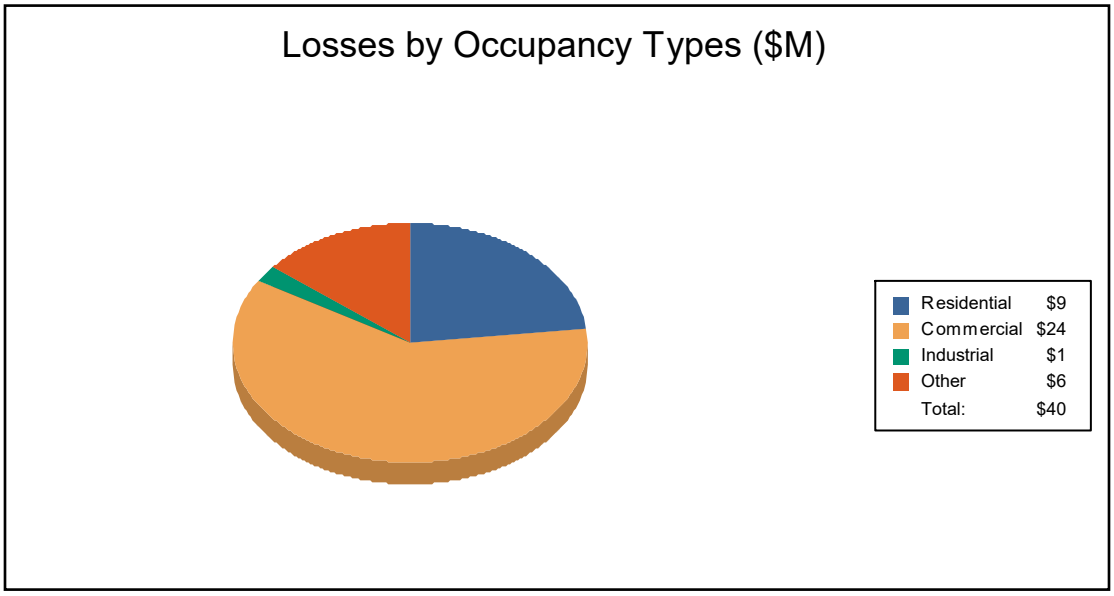
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 17.07 million dollars. 58% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 23.16% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.13	1.87	0.27	0.21	6.48
	Content	2.01	5.67	0.57	1.02	9.27
	Inventory	0.00	1.22	0.07	0.02	1.32
	Subtotal	**6.15**	**8.76**	**0.92**	**1.25**	**17.07**
Business Interruption						
	Income	0.13	6.25	0.02	0.70	7.10
	Relocation	1.76	1.64	0.02	0.34	3.76
	Rental Income	1.04	1.13	0.00	0.05	2.22
	Wage	0.31	6.65	0.04	3.36	10.36
	Subtotal	**3.23**	**15.67**	**0.08**	**4.45**	**23.43**
ALL	**Total**	**9.38**	**24.43**	**0.99**	**5.70**	**40.49**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,679,875	3,910,312	8,590,187
Total	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**
Total Study Region	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**

Hazus: Flood Global Risk Report

Region Name: East_Hartford_FL

Flood Scenario: East_Hartford_Flood

Print Date: Friday, April 7, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 530 census blocks. The region contains over 20 thousand households and has a total population of 51,045 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 13,221 buildings in the region with a total building replacement value (excluding contents) of 8,590 million dollars. Approximately 89.31% of the buildings (and 54.48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of 8,590 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,679,875	54.5%
Commercial	2,245,595	26.1%
Industrial	643,216	7.5%
Agricultural	22,916	0.3%
Religion	217,116	2.5%
Government	180,299	2.1%
Education	601,170	7.0%
Total	**8,590,187**	**100%**

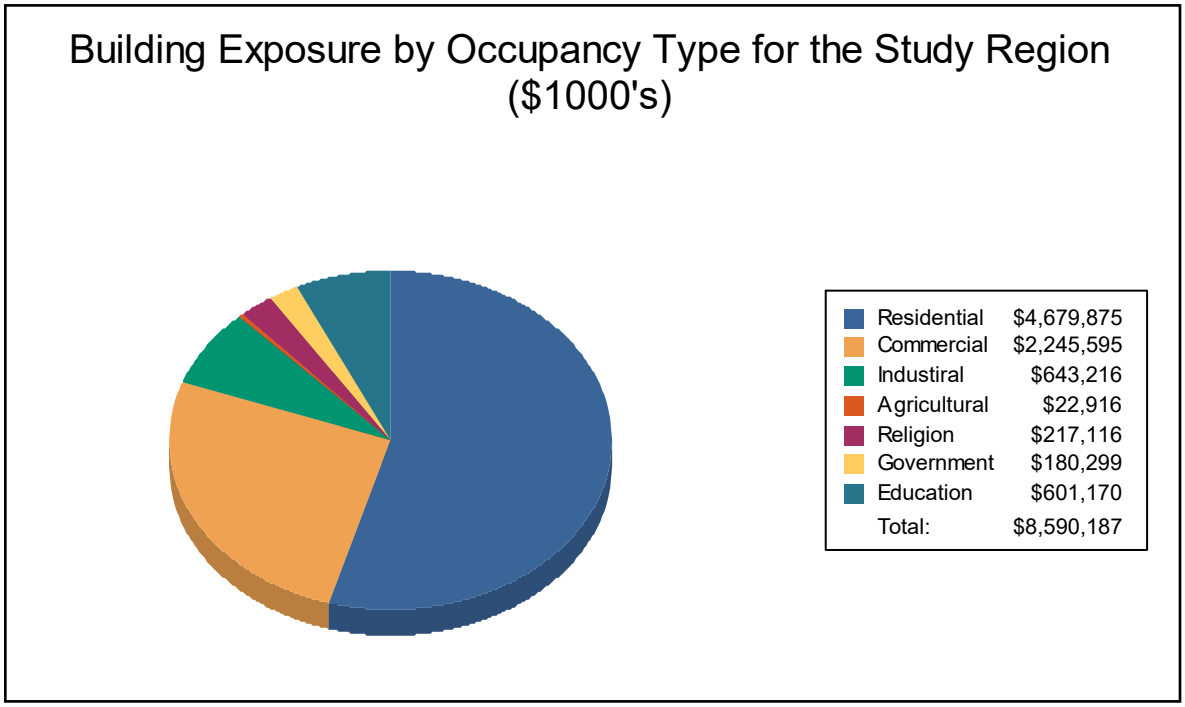
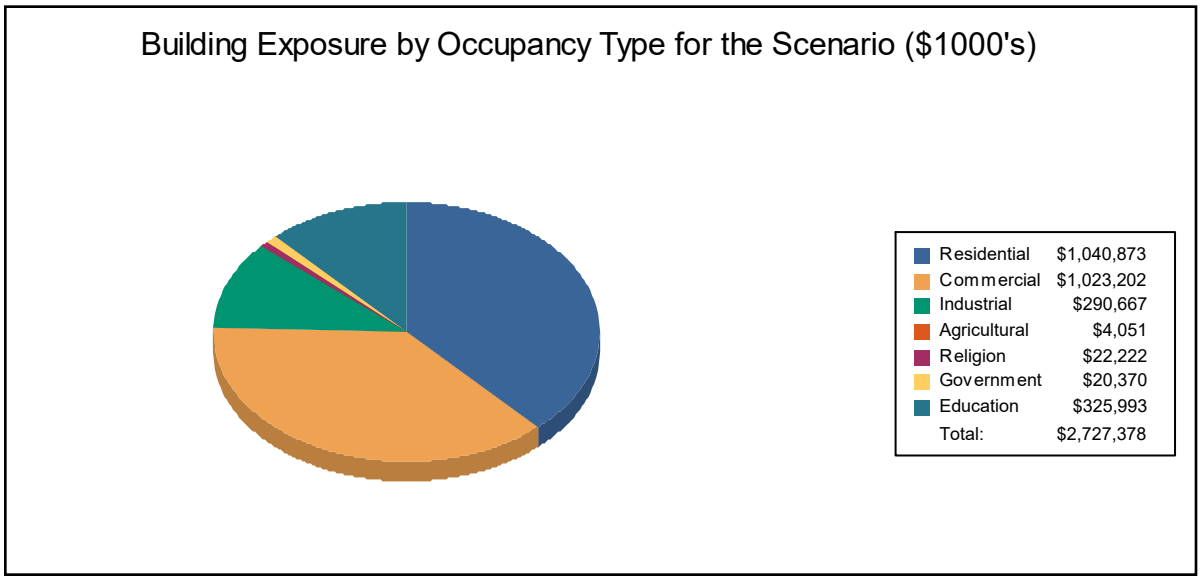


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,040,873	38.2%
Commercial	1,023,202	37.5%
Industrial	290,667	10.7%
Agricultural	4,051	0.1%
Religion	22,222	0.8%
Government	20,370	0.7%
Education	325,993	12.0%
Total	**2,727,378**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 20 schools, 5 fire stations, 1 police station and 1 emergency operation center.

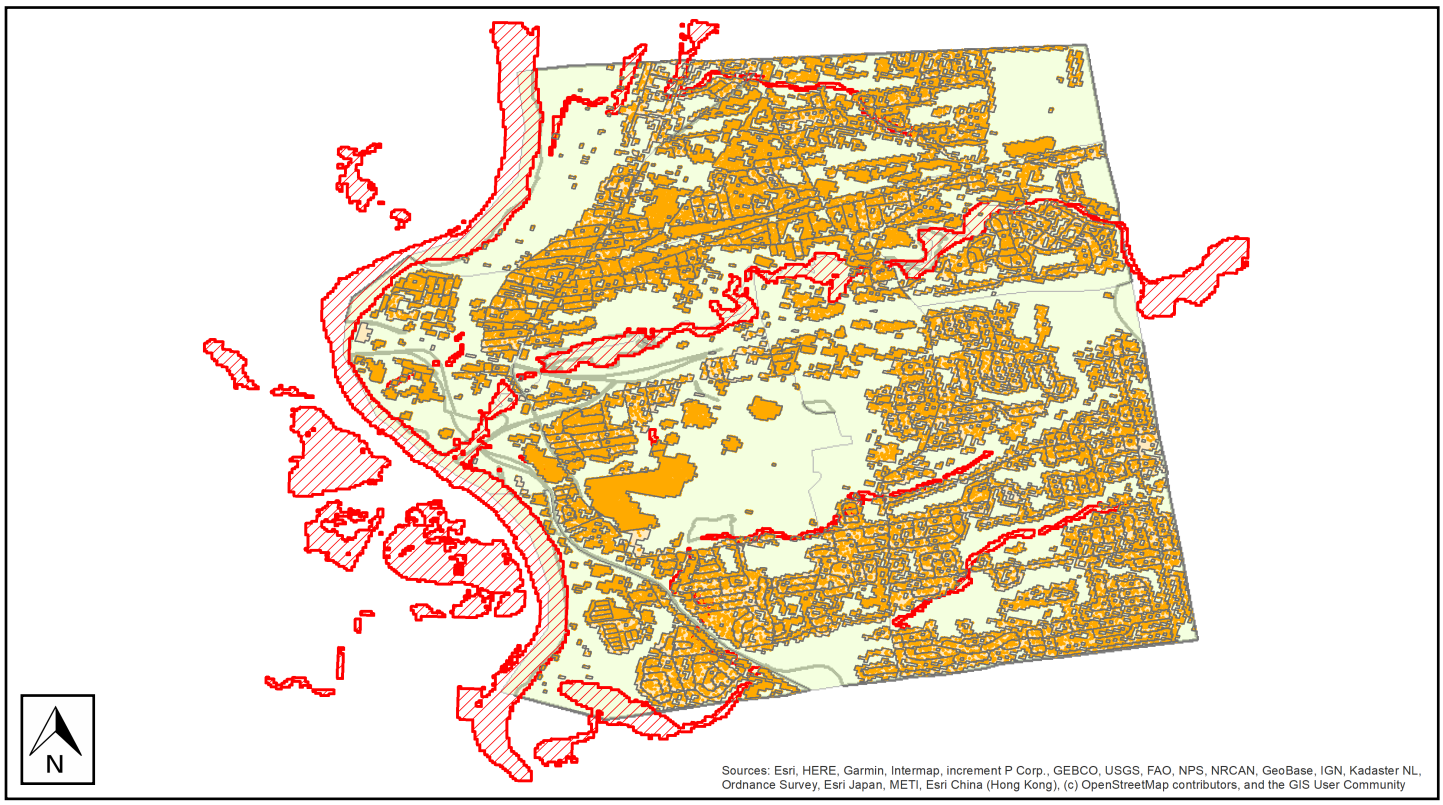
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Hartford_FL
Scenario Name:	East_Hartford_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 18 buildings will be at least moderately damaged. This is over 82% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

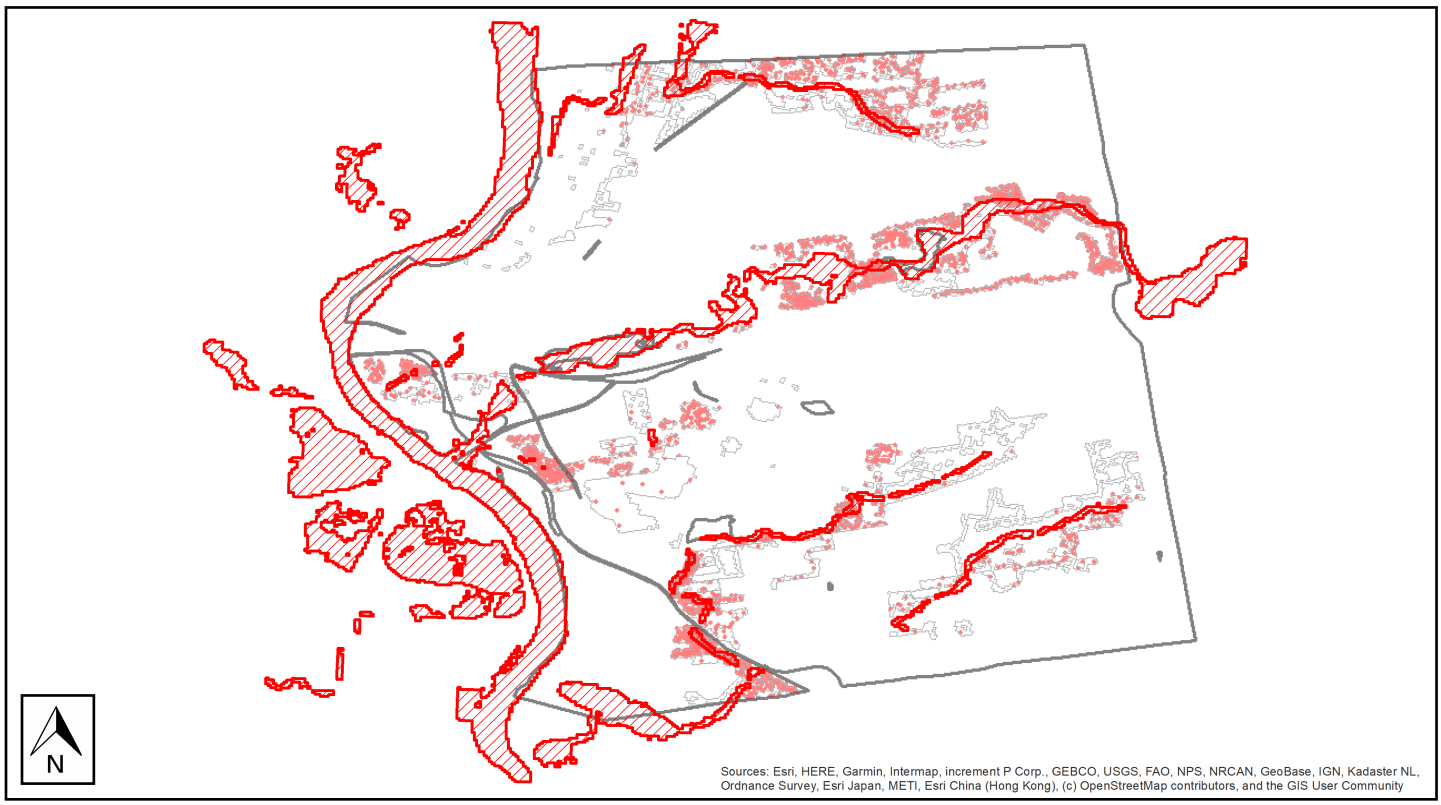


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	33	65	10	20	4	8	3	6	1	2	0	0
Total	**33**		**10**		**4**		**3**		**1**		**0**	

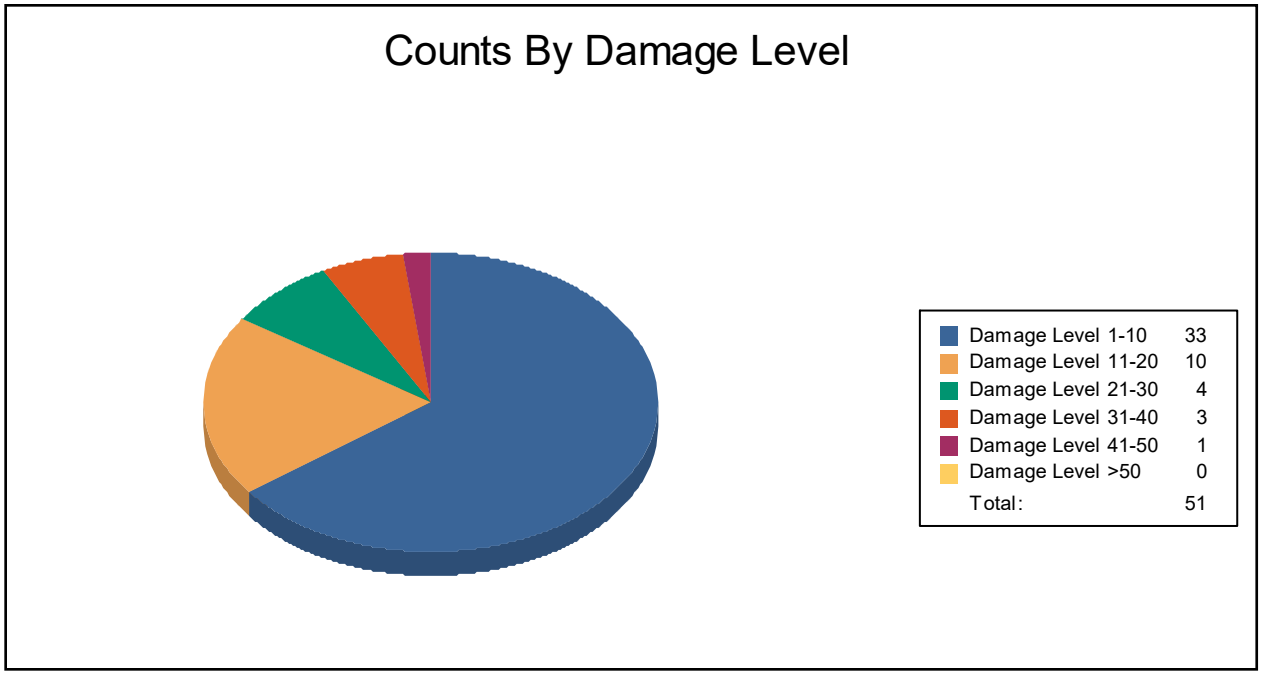


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	32	64	10	20	4	8	3	6	1	2	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	20	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

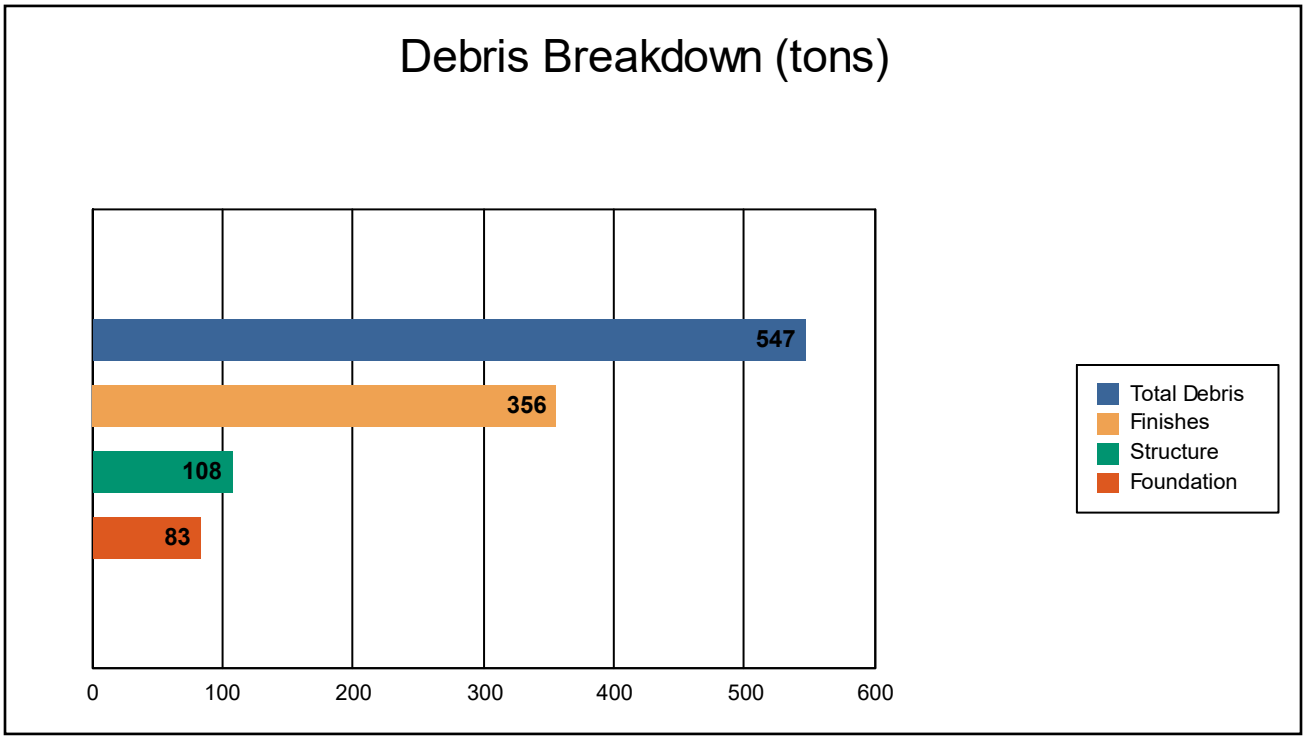
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

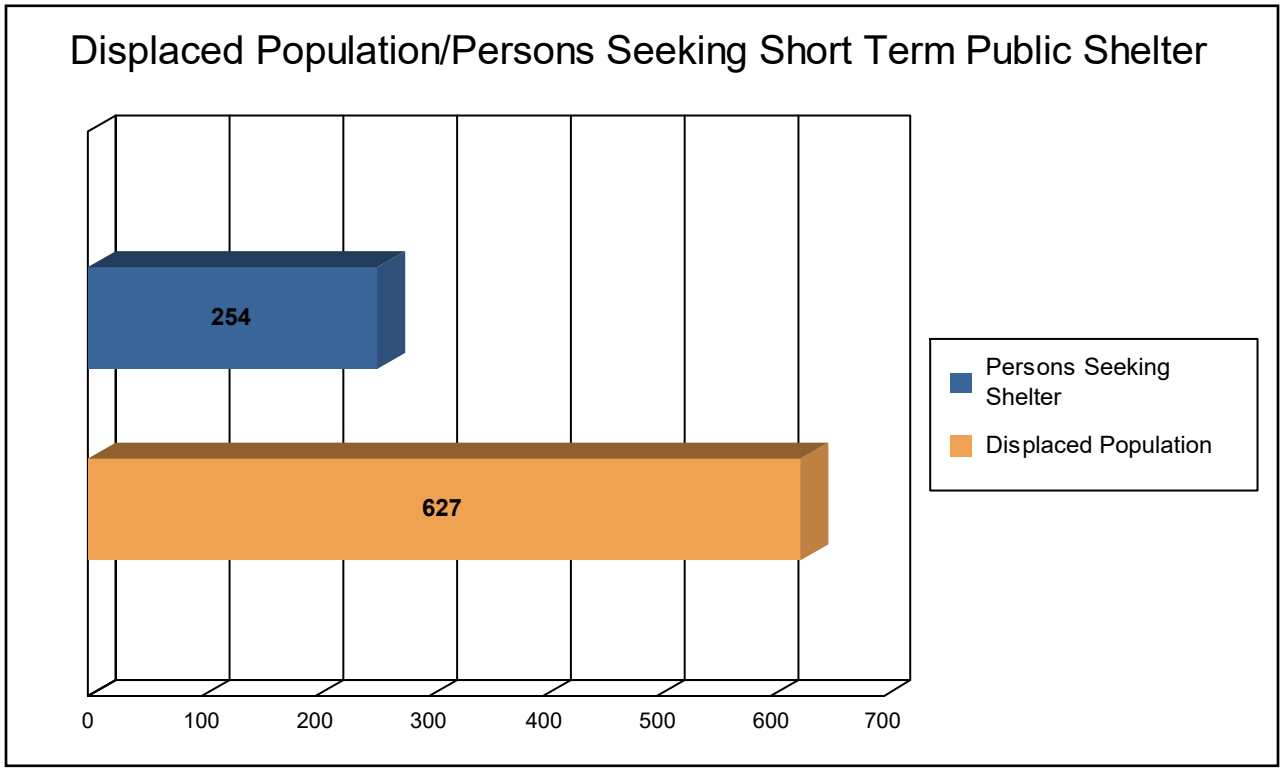


The model estimates that a total of 547 tons of debris will be generated. Of the total amount, Finishes comprises 65% of the total, Structure comprises 20% of the total, and Foundation comprises 15%. If the debris tonnage is converted into an estimated number of truckloads, it will require 22 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 209 households (or 627 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 254 people (out of a total population of 51,045) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 49.55 million dollars, which represents 1.82 % of the total replacement value of the scenario buildings.

Building-Related Losses

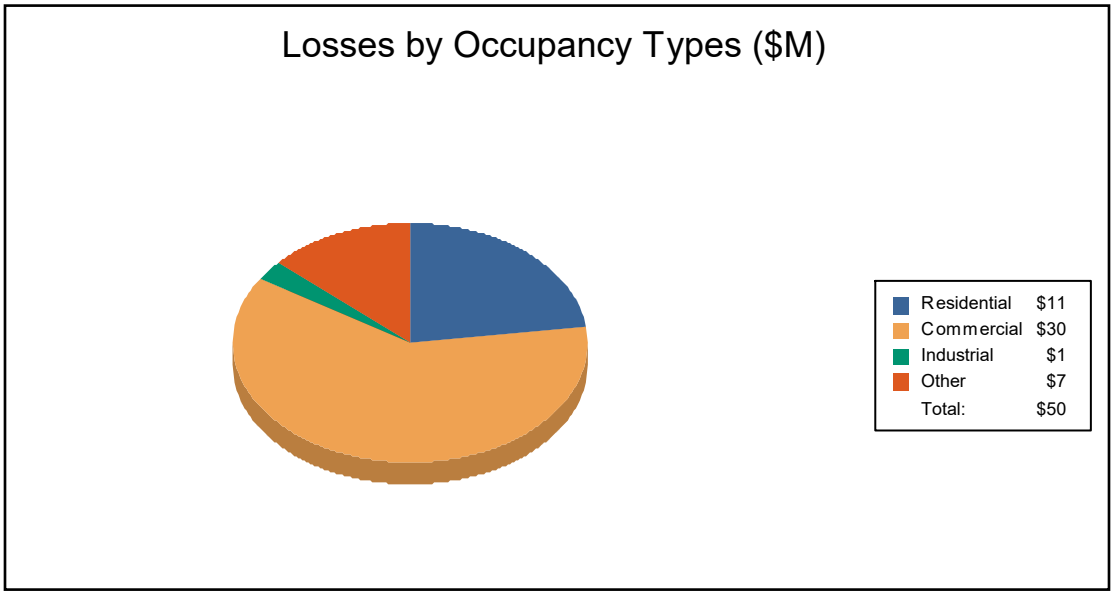
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 21.11 million dollars. 57% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.64% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.01	2.31	0.38	0.25	7.94
	Content	2.44	6.97	0.75	1.29	11.46
	Inventory	0.00	1.58	0.10	0.03	1.71
	Subtotal	**7.45**	**10.85**	**1.23**	**1.57**	**21.11**
Business Interruption						
	Income	0.16	7.71	0.02	0.85	8.73
	Relocation	2.00	2.03	0.02	0.40	4.45
	Rental Income	1.23	1.40	0.00	0.06	2.68
	Wage	0.38	8.39	0.05	3.75	12.57
	Subtotal	**3.77**	**19.53**	**0.10**	**5.05**	**28.44**
ALL	**Total**	**11.22**	**30.38**	**1.33**	**6.62**	**49.55**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,679,875	3,910,312	8,590,187
Total	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**
Total Study Region	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**

Hazus: Flood Global Risk Report

Region Name: East_Hartford_FL

Flood Scenario: East_Hartford_Flood

Print Date: Friday, April 7, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 530 census blocks. The region contains over 20 thousand households and has a total population of 51,045 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 13,221 buildings in the region with a total building replacement value (excluding contents) of 8,590 million dollars. Approximately 89.31% of the buildings (and 54.48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of 8,590 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,679,875	54.5%
Commercial	2,245,595	26.1%
Industrial	643,216	7.5%
Agricultural	22,916	0.3%
Religion	217,116	2.5%
Government	180,299	2.1%
Education	601,170	7.0%
Total	**8,590,187**	**100%**

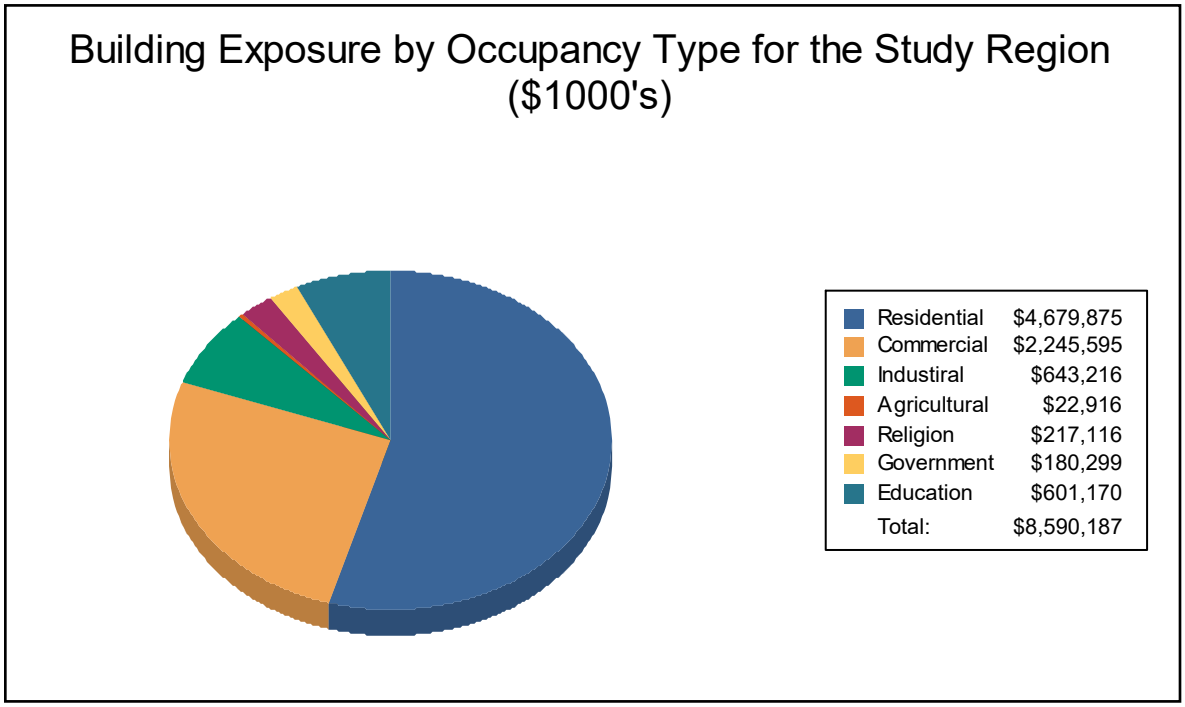
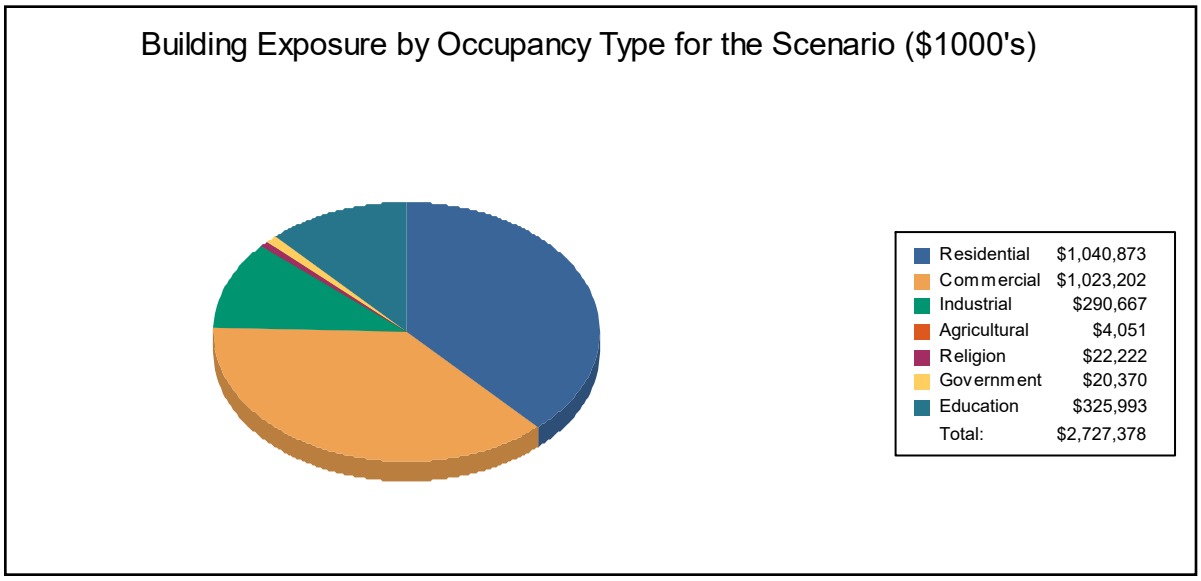


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,040,873	38.2%
Commercial	1,023,202	37.5%
Industrial	290,667	10.7%
Agricultural	4,051	0.1%
Religion	22,222	0.8%
Government	20,370	0.7%
Education	325,993	12.0%
Total	**2,727,378**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 20 schools, 5 fire stations, 1 police station and 1 emergency operation center.

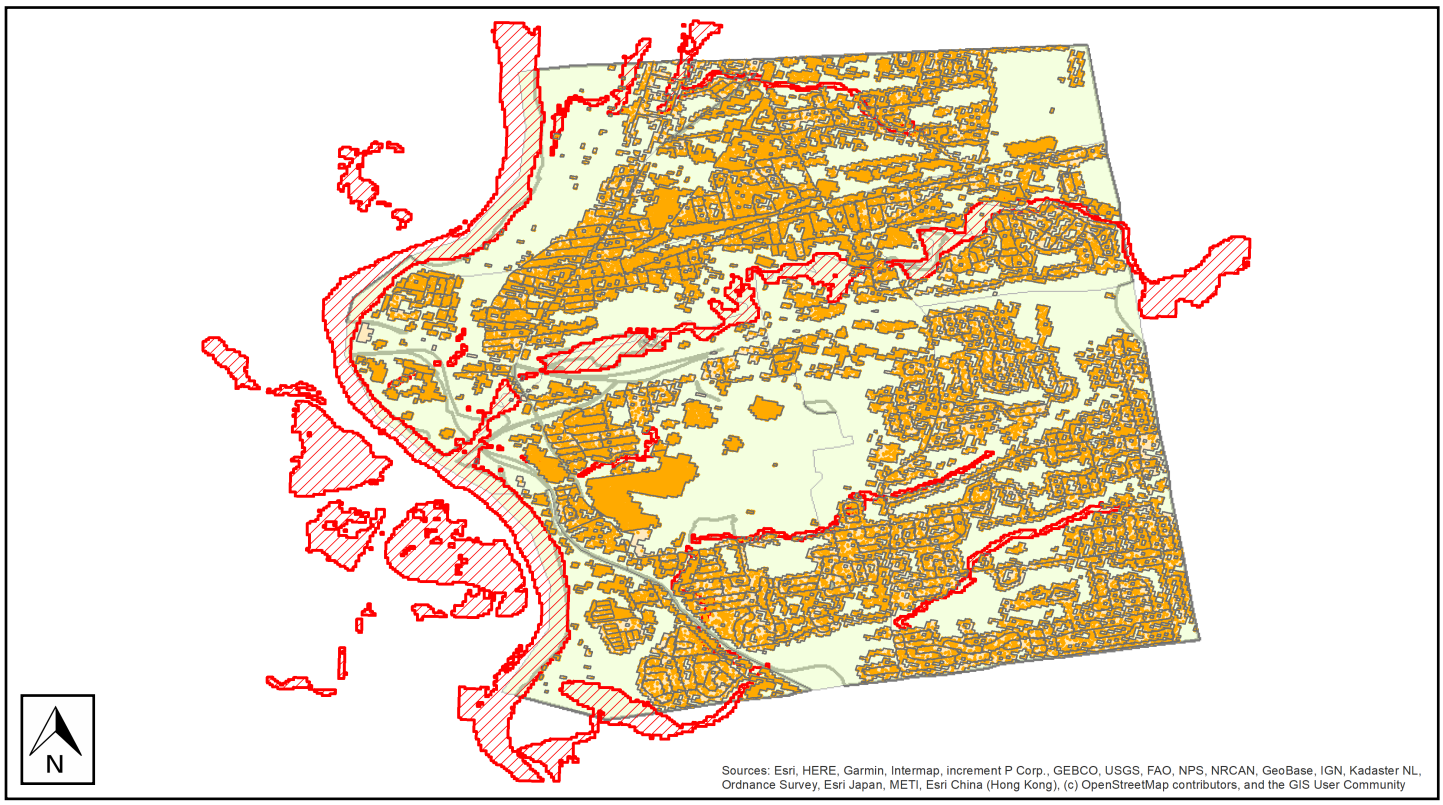
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Hartford_FL
Scenario Name:	East_Hartford_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 28 buildings will be at least moderately damaged. This is over 88% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

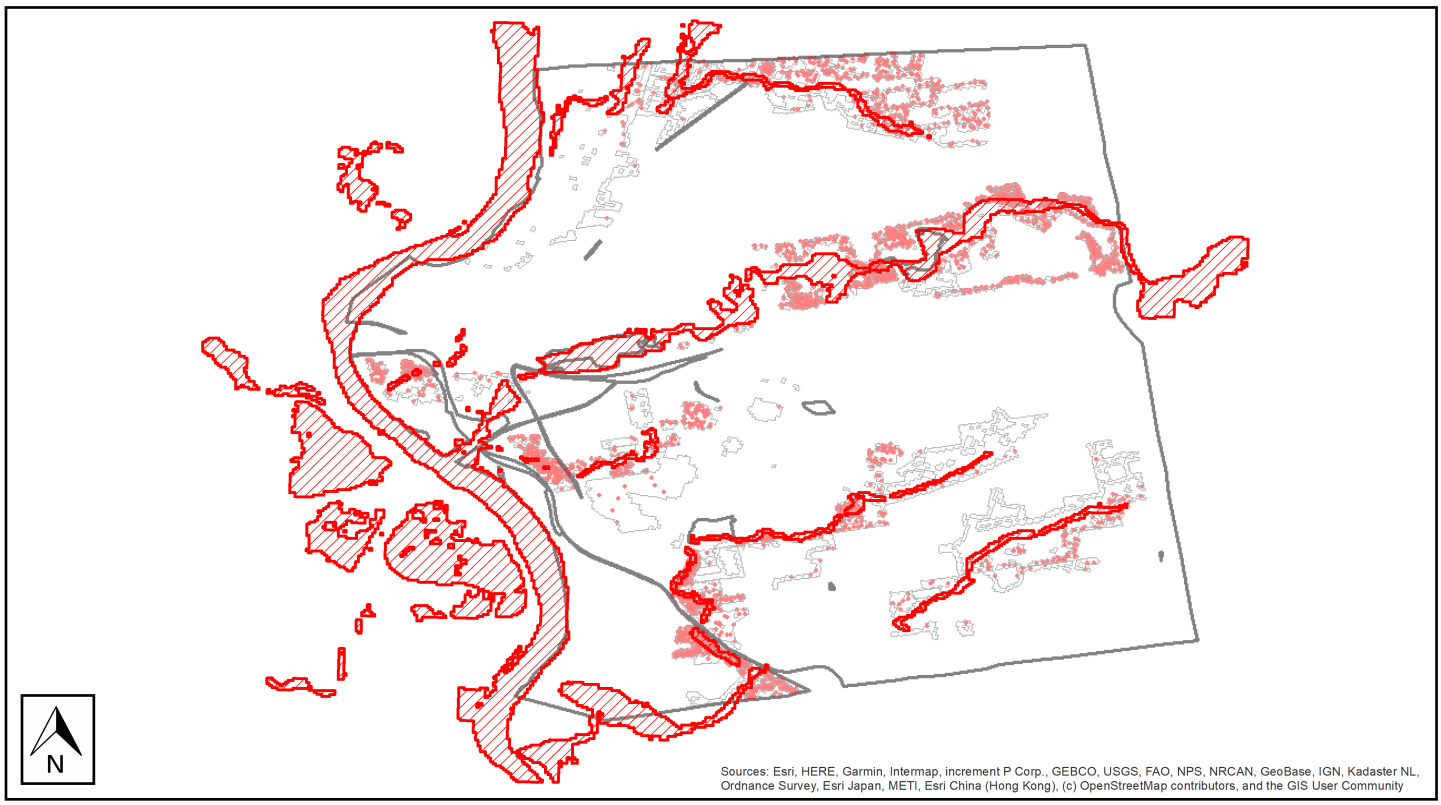


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	37	57	19	29	5	8	2	3	1	2	1	2
Total	**37**		**19**		**5**		**2**		**1**		**1**	

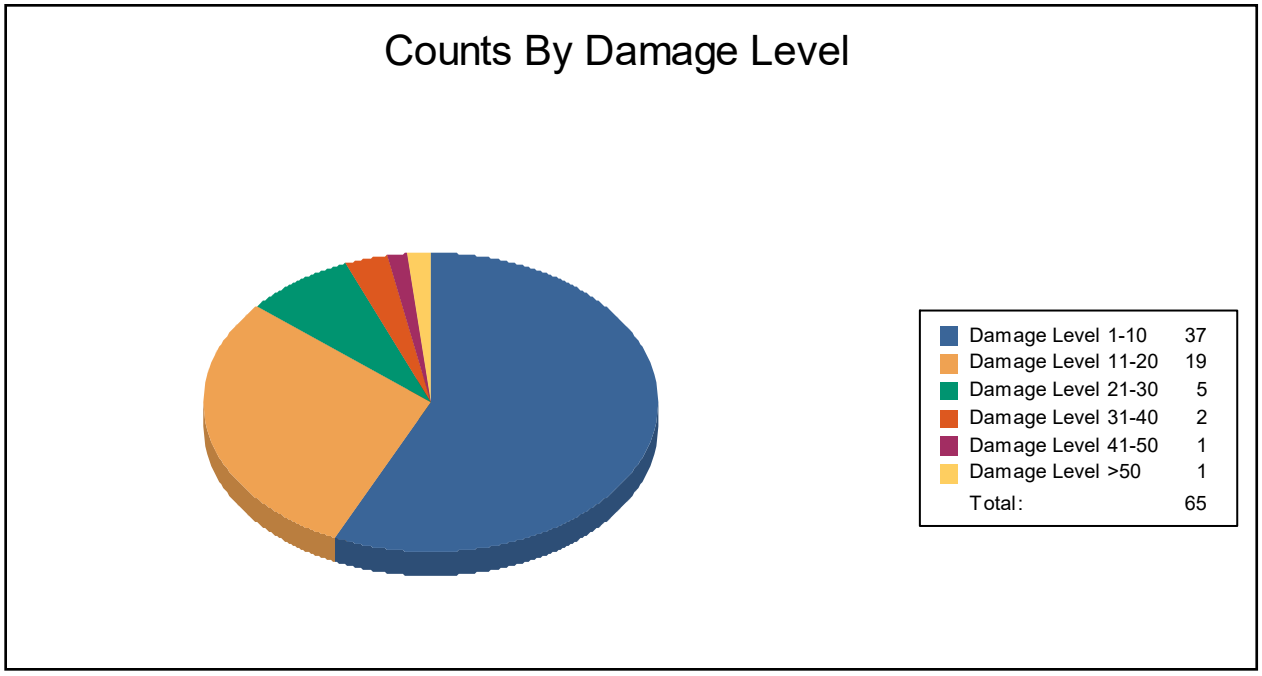


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	36	56	19	30	5	8	2	3	1	2	1	2

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	20	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

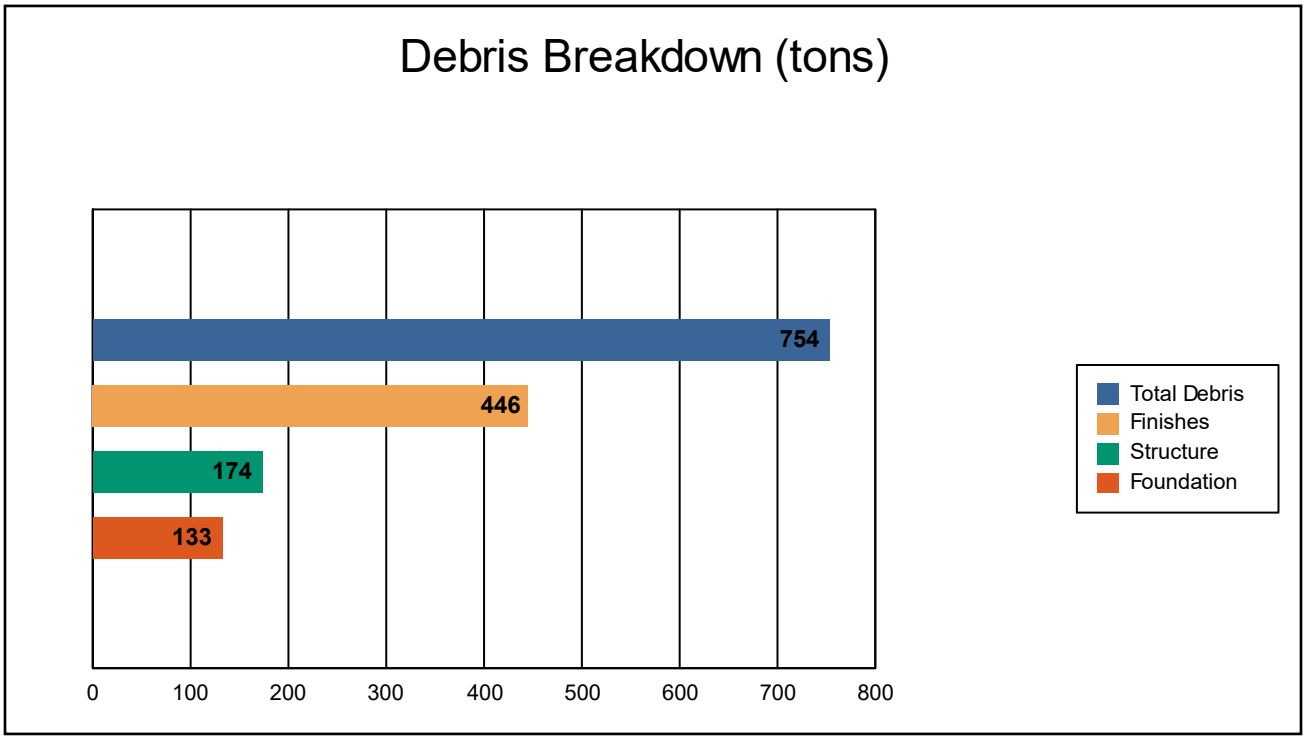
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

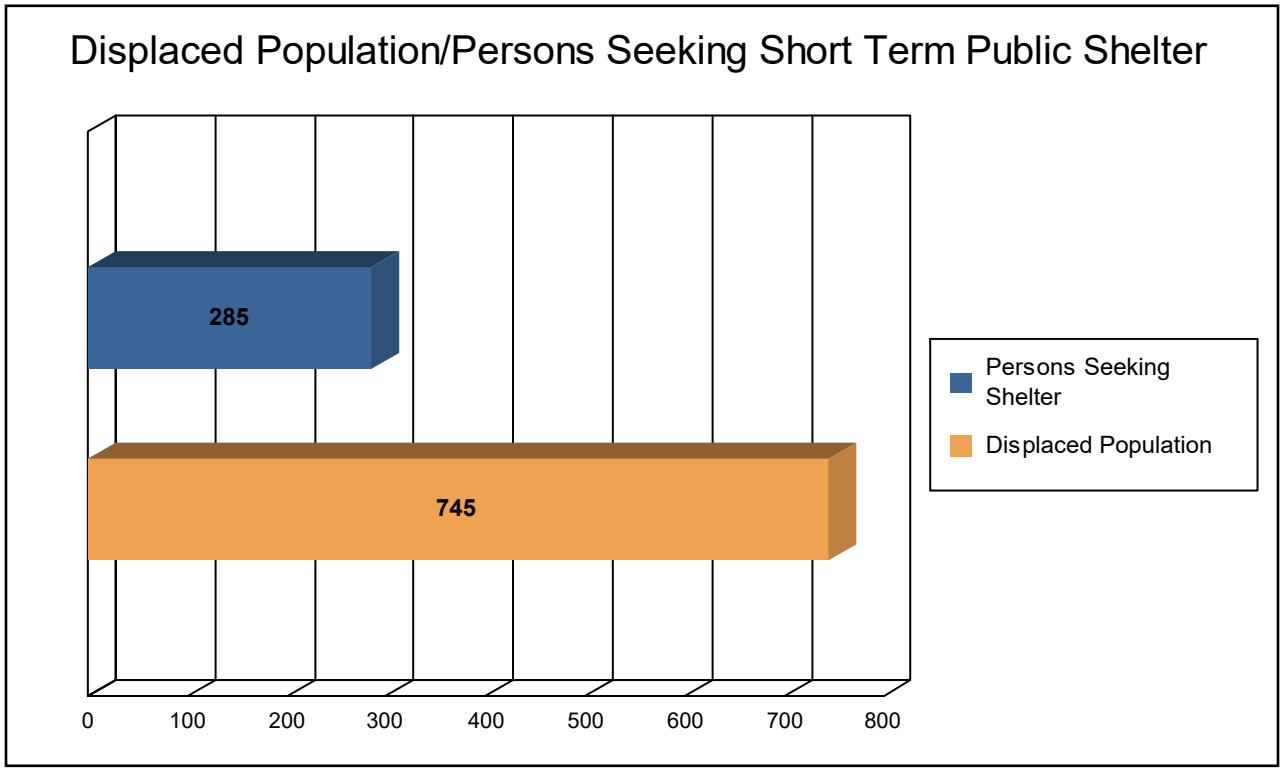


The model estimates that a total of 754 tons of debris will be generated. Of the total amount, Finishes comprises 59% of the total, Structure comprises 23% of the total, and Foundation comprises 18%. If the debris tonnage is converted into an estimated number of truckloads, it will require 31 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 248 households (or 745 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 285 people (out of a total population of 51,045) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 65.97 million dollars, which represents 2.42 % of the total replacement value of the scenario buildings.

Building-Related Losses

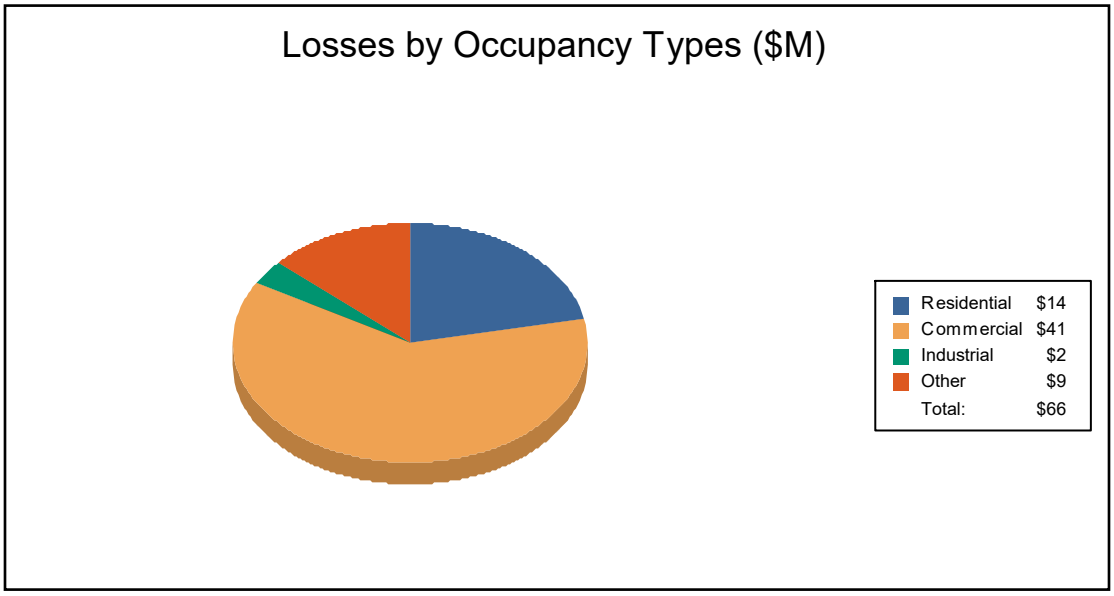
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 28.86 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 21.80% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6.53	3.23	0.62	0.32	10.71
	Content	3.17	9.58	1.16	1.72	15.63
	Inventory	0.00	2.32	0.17	0.04	2.52
	Subtotal	**9.70**	**15.13**	**1.95**	**2.09**	**28.86**
Business Interruption						
	Income	0.22	10.22	0.04	0.98	11.45
	Relocation	2.40	2.87	0.03	0.51	5.81
	Rental Income	1.55	2.00	0.00	0.08	3.63
	Wage	0.52	10.40	0.08	5.22	16.22
	Subtotal	**4.68**	**25.49**	**0.15**	**6.79**	**37.11**
ALL	**Total**	**14.38**	**40.61**	**2.10**	**8.88**	**65.97**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,679,875	3,910,312	8,590,187
Total	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**
Total Study Region	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**

Hazus: Flood Global Risk Report

Region Name: East_Hartford_FL

Flood Scenario: East_Hartford_Flood

Print Date: Friday, April 7, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 530 census blocks. The region contains over 20 thousand households and has a total population of 51,045 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 13,221 buildings in the region with a total building replacement value (excluding contents) of 8,590 million dollars. Approximately 89.31% of the buildings (and 54.48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of 8,590 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,679,875	54.5%
Commercial	2,245,595	26.1%
Industrial	643,216	7.5%
Agricultural	22,916	0.3%
Religion	217,116	2.5%
Government	180,299	2.1%
Education	601,170	7.0%
Total	**8,590,187**	**100%**

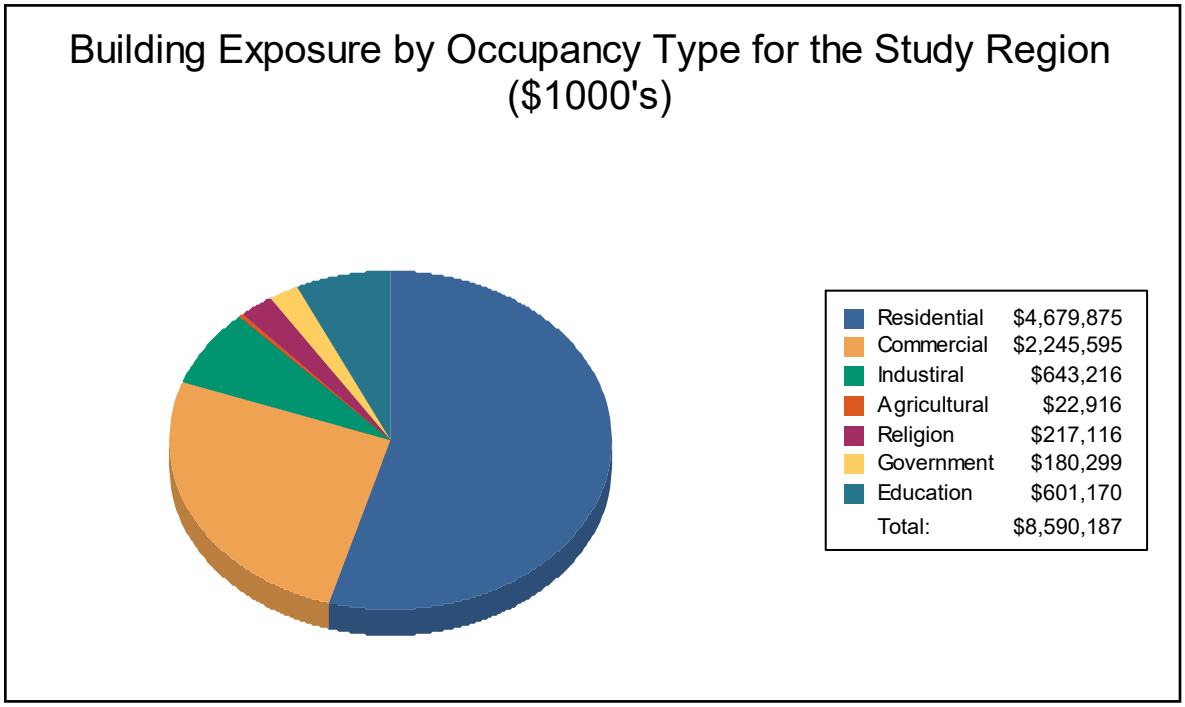
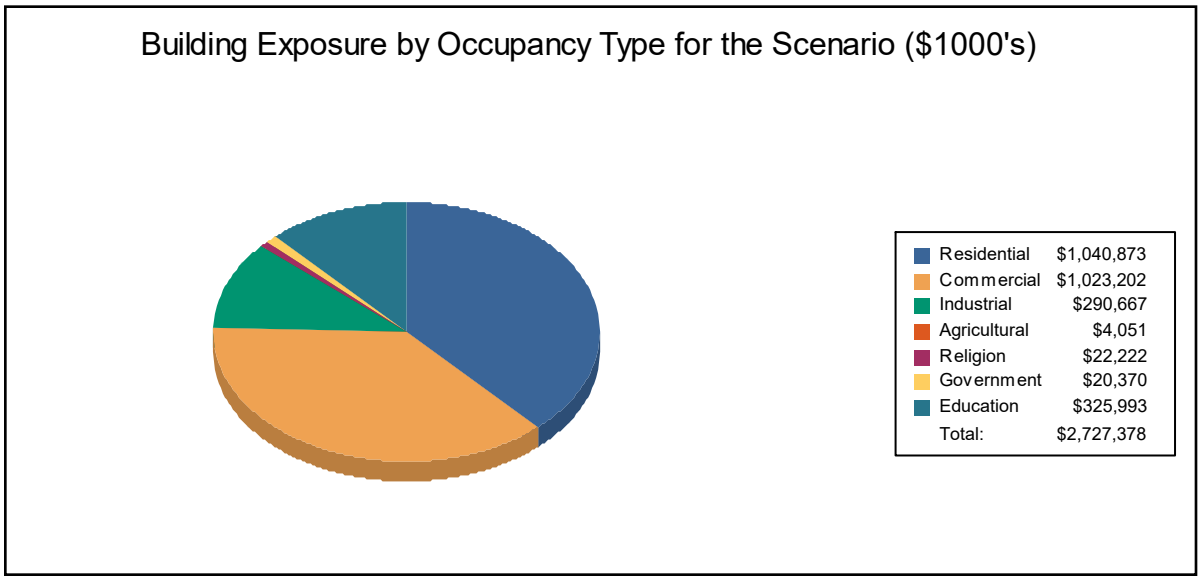


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,040,873	38.2%
Commercial	1,023,202	37.5%
Industrial	290,667	10.7%
Agricultural	4,051	0.1%
Religion	22,222	0.8%
Government	20,370	0.7%
Education	325,993	12.0%
Total	**2,727,378**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 20 schools, 5 fire stations, 1 police station and 1 emergency operation center.

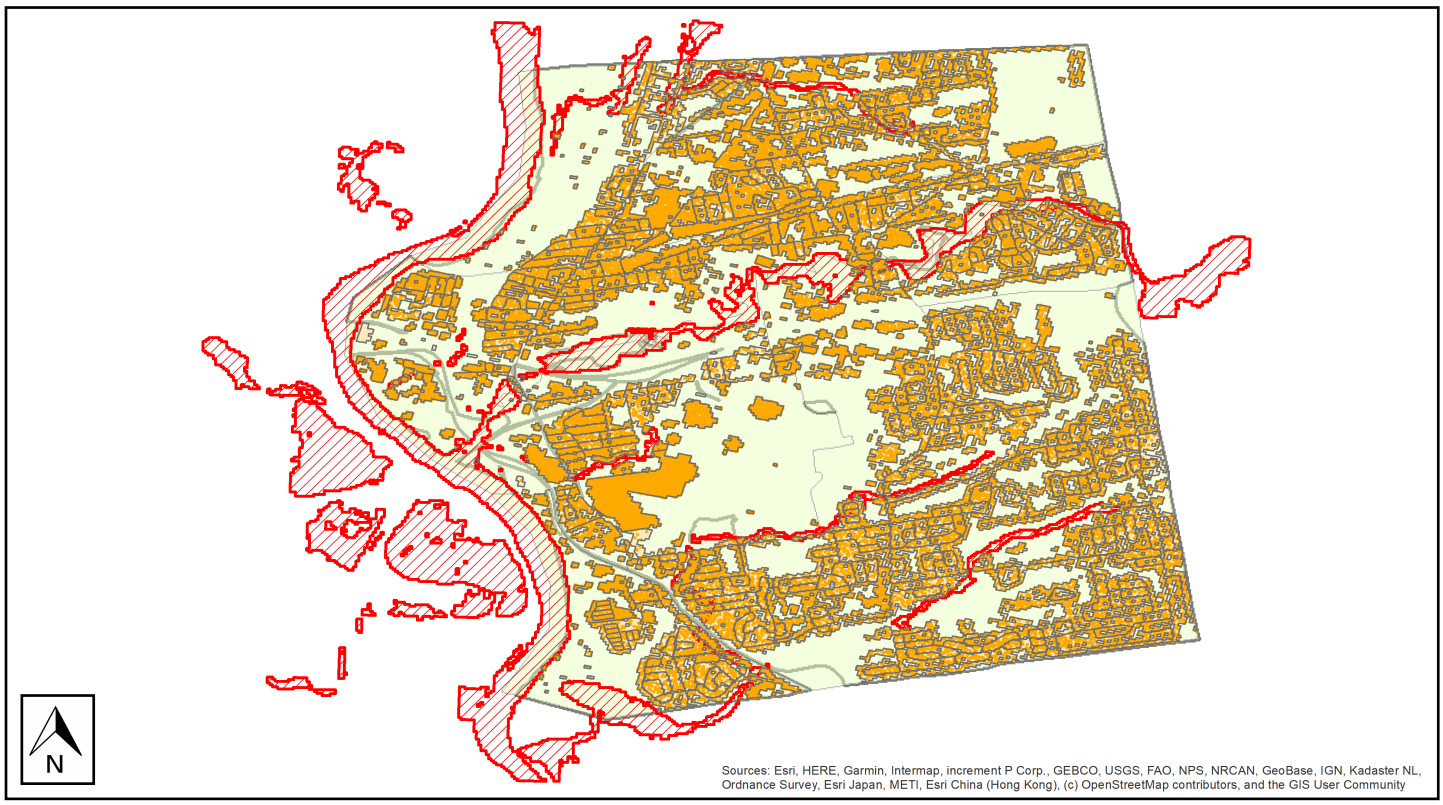
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Hartford_FL
Scenario Name:	East_Hartford_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 29 buildings will be at least moderately damaged. This is over 86% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

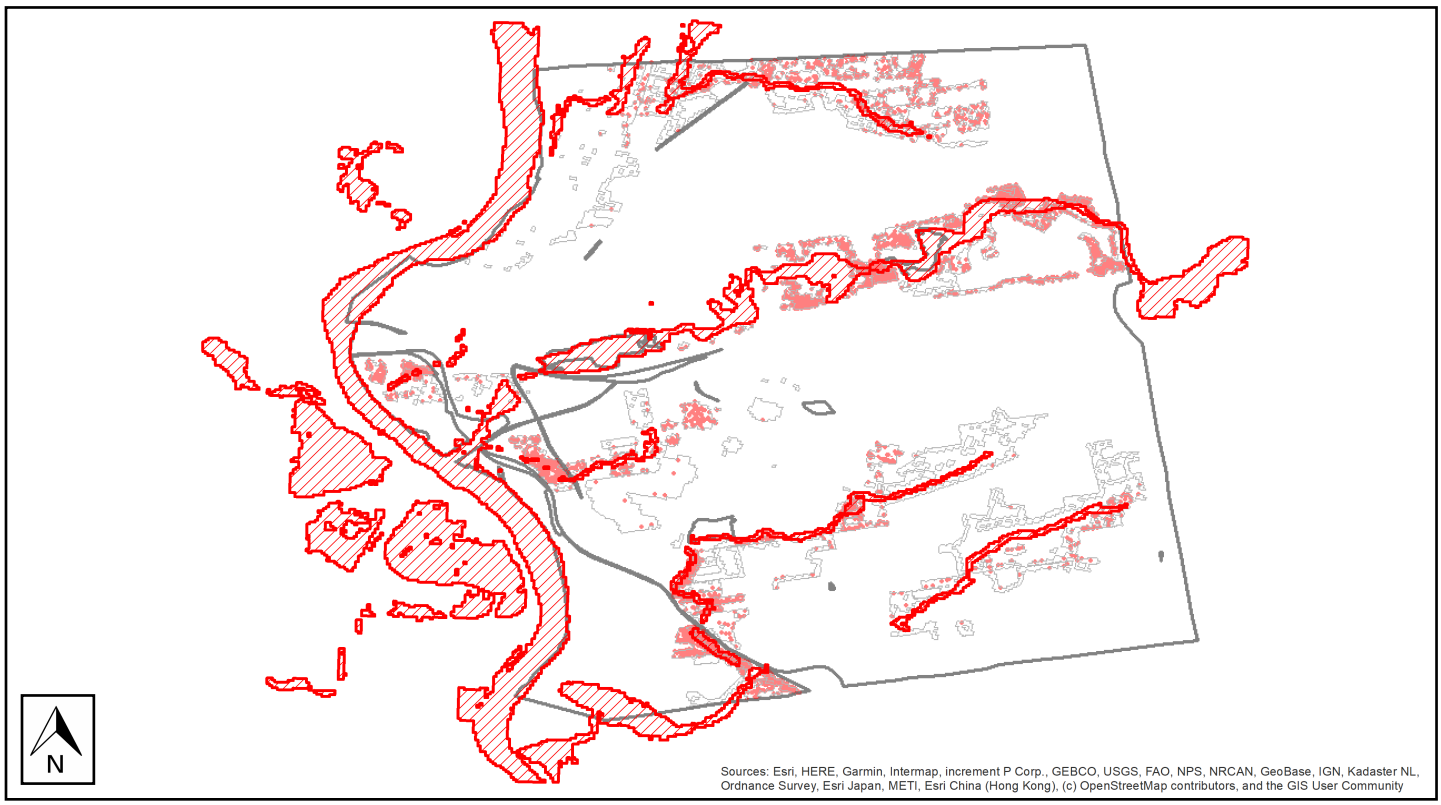


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	38	57	20	30	3	4	3	4	2	3	1	1
Total	**38**		**20**		**3**		**3**		**2**		**1**	

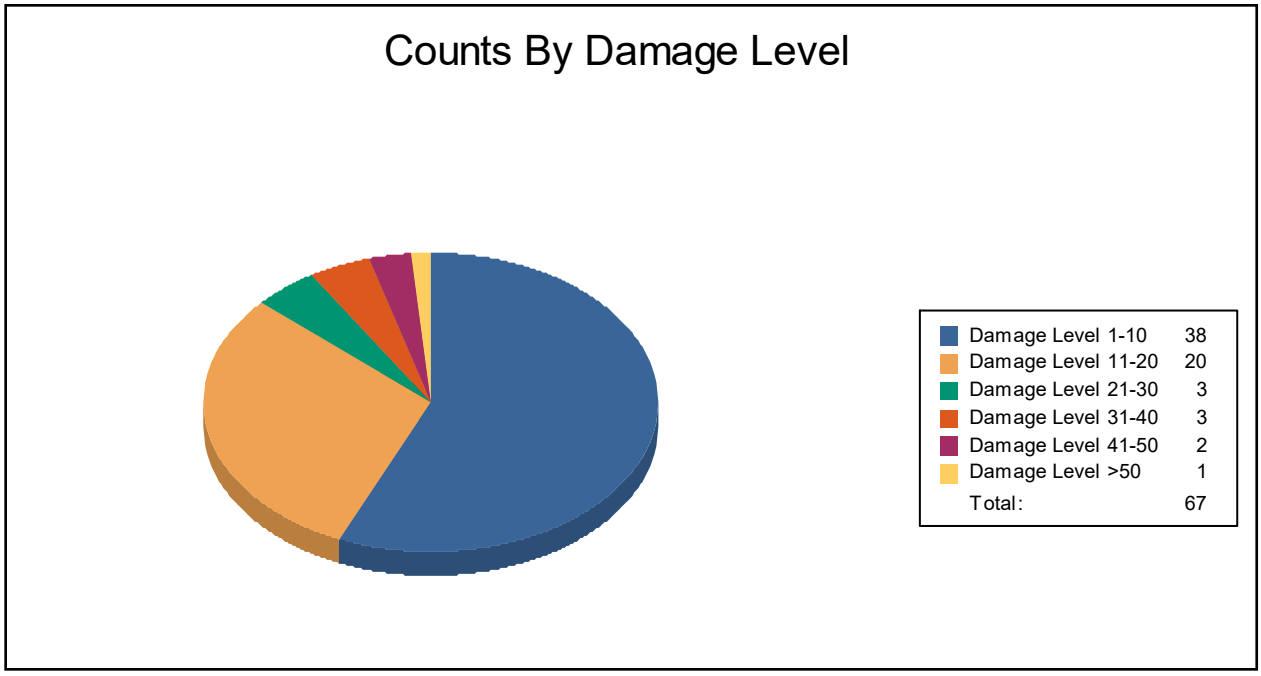


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	37	56	20	30	3	5	3	5	2	3	1	2

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	20	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

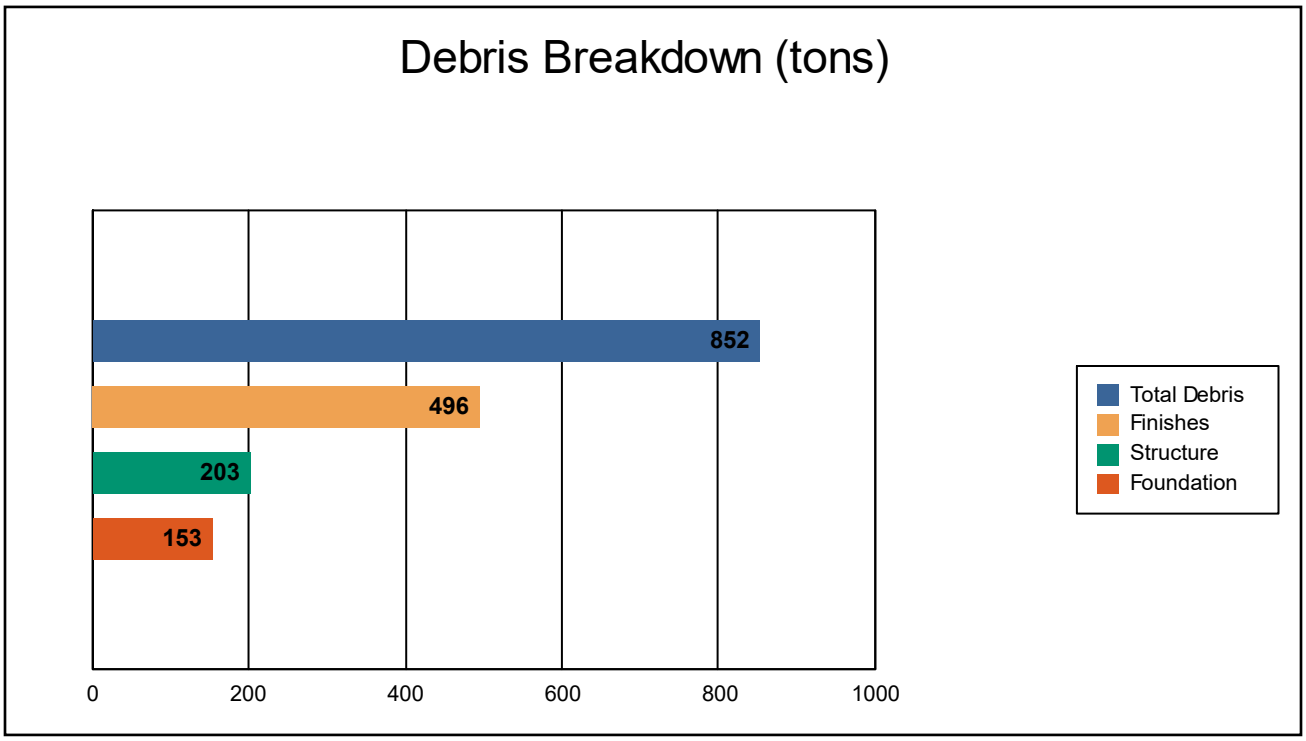
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

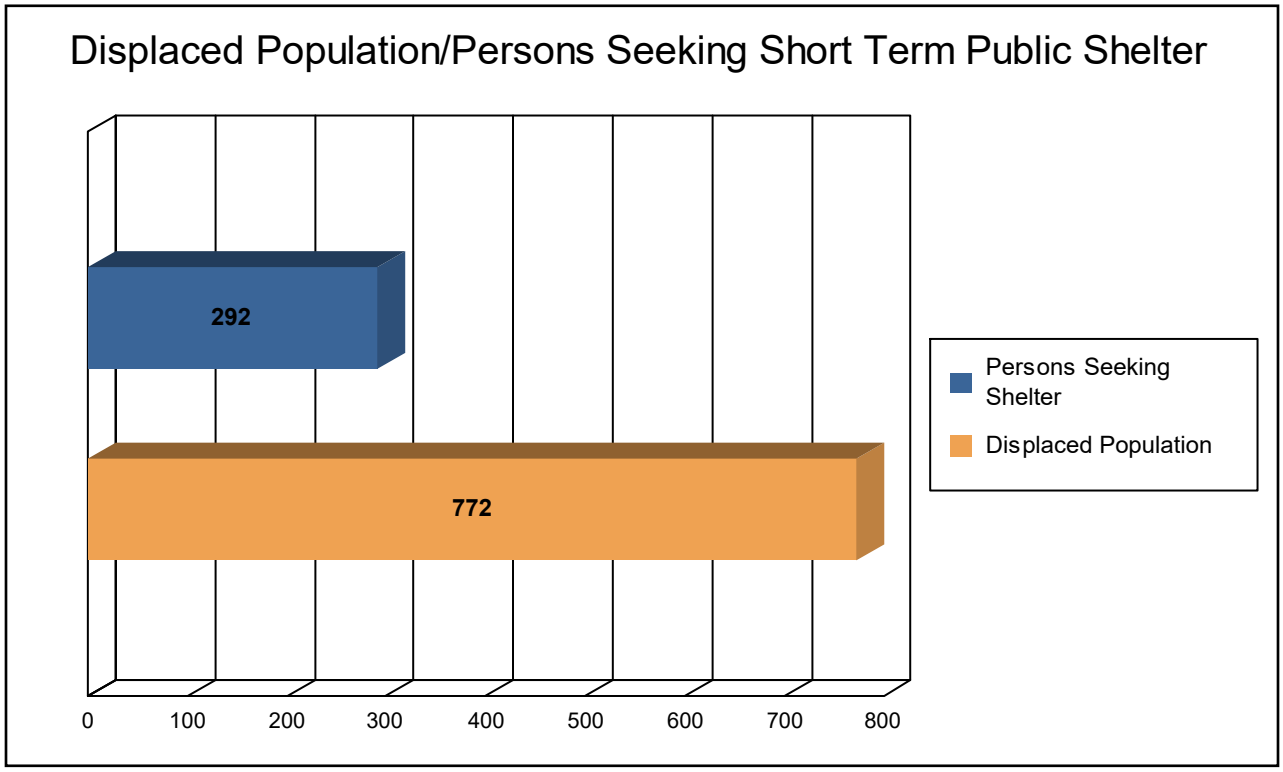


The model estimates that a total of 852 tons of debris will be generated. Of the total amount, Finishes comprises 58% of the total, Structure comprises 24% of the total, and Foundation comprises 18%. If the debris tonnage is converted into an estimated number of truckloads, it will require 35 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 257 households (or 772 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 292 people (out of a total population of 51,045) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 71.45 million dollars, which represents 2.62 % of the total replacement value of the scenario buildings.

Building-Related Losses

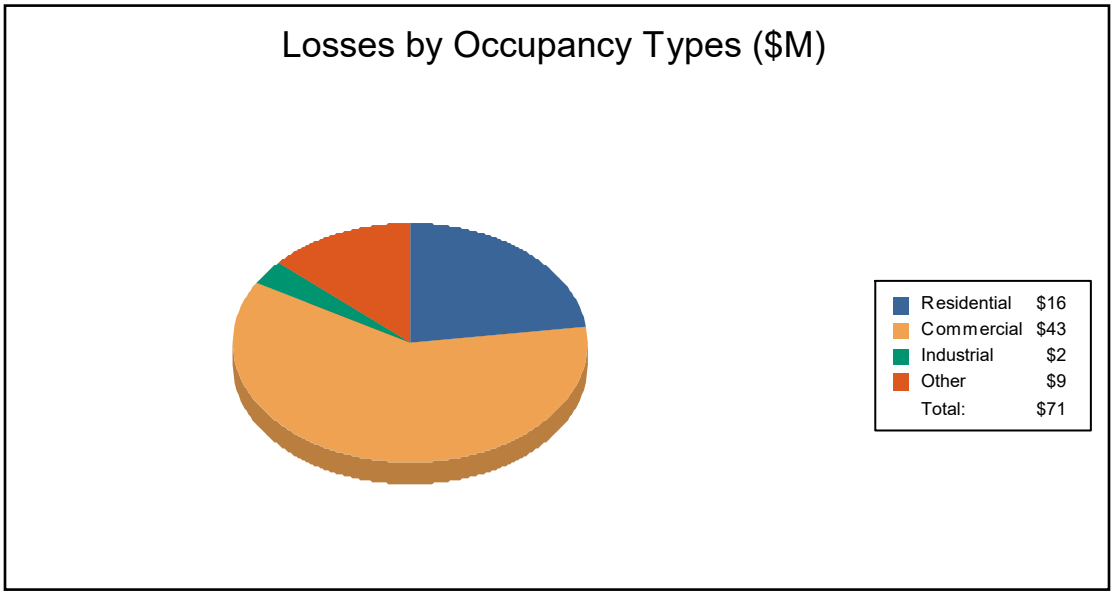
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 31.72 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.72% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.11	3.54	0.72	0.35	11.72
	Content	3.49	10.49	1.36	1.88	17.22
	Inventory	0.00	2.54	0.20	0.04	2.79
	Subtotal	**10.59**	**16.58**	**2.28**	**2.27**	**31.72**
Business Interruption						
	Income	0.37	10.68	0.04	1.02	12.11
	Relocation	2.53	3.02	0.04	0.55	6.14
	Rental Income	1.86	2.11	0.00	0.09	4.07
	Wage	0.88	10.93	0.09	5.53	17.42
	Subtotal	**5.64**	**26.74**	**0.16**	**7.19**	**39.73**
ALL	**Total**	**16.23**	**43.31**	**2.44**	**9.46**	**71.45**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,679,875	3,910,312	8,590,187
Total	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**
Total Study Region	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**

Hazus: Flood Global Risk Report

Region Name: East_Hartford_FL

Flood Scenario: East_Hartford_Flood

Print Date: Friday, April 7, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 530 census blocks. The region contains over 20 thousand households and has a total population of 51,045 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 13,221 buildings in the region with a total building replacement value (excluding contents) of 8,590 million dollars. Approximately 89.31% of the buildings (and 54.48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of 8,590 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,679,875	54.5%
Commercial	2,245,595	26.1%
Industrial	643,216	7.5%
Agricultural	22,916	0.3%
Religion	217,116	2.5%
Government	180,299	2.1%
Education	601,170	7.0%
Total	**8,590,187**	**100%**

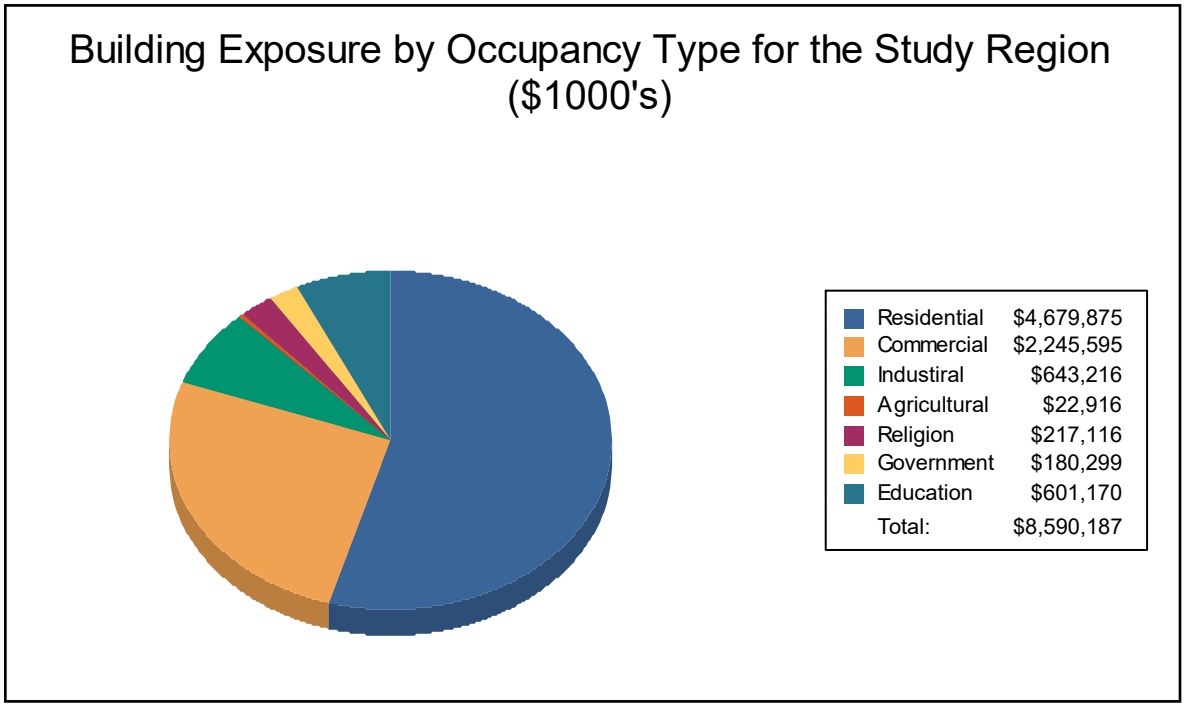
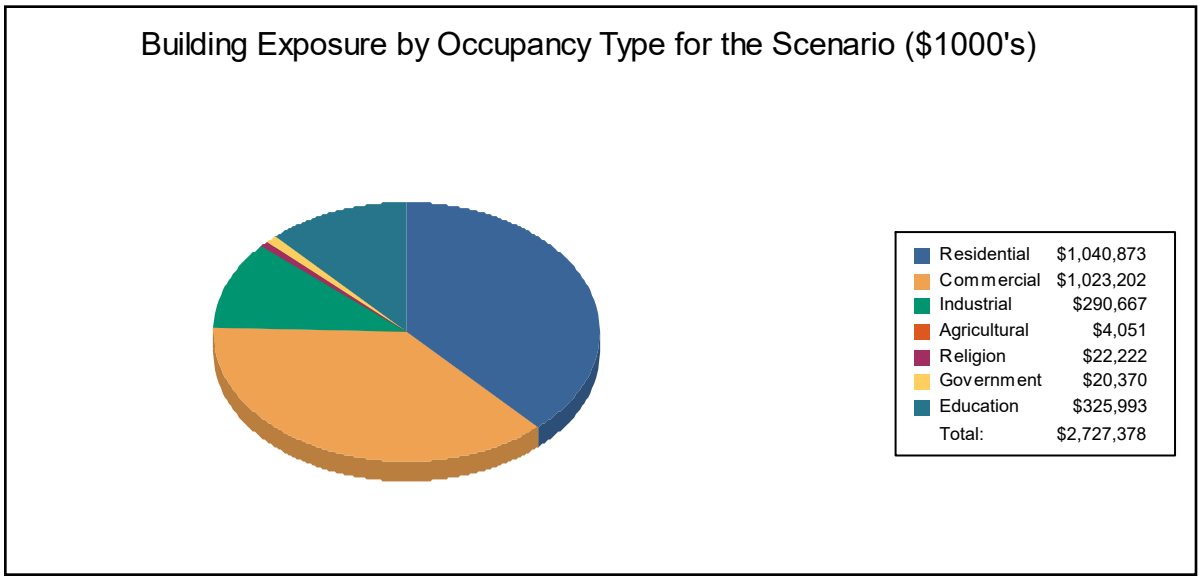


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,040,873	38.2%
Commercial	1,023,202	37.5%
Industrial	290,667	10.7%
Agricultural	4,051	0.1%
Religion	22,222	0.8%
Government	20,370	0.7%
Education	325,993	12.0%
Total	**2,727,378**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 20 schools, 5 fire stations, 1 police station and 1 emergency operation center.

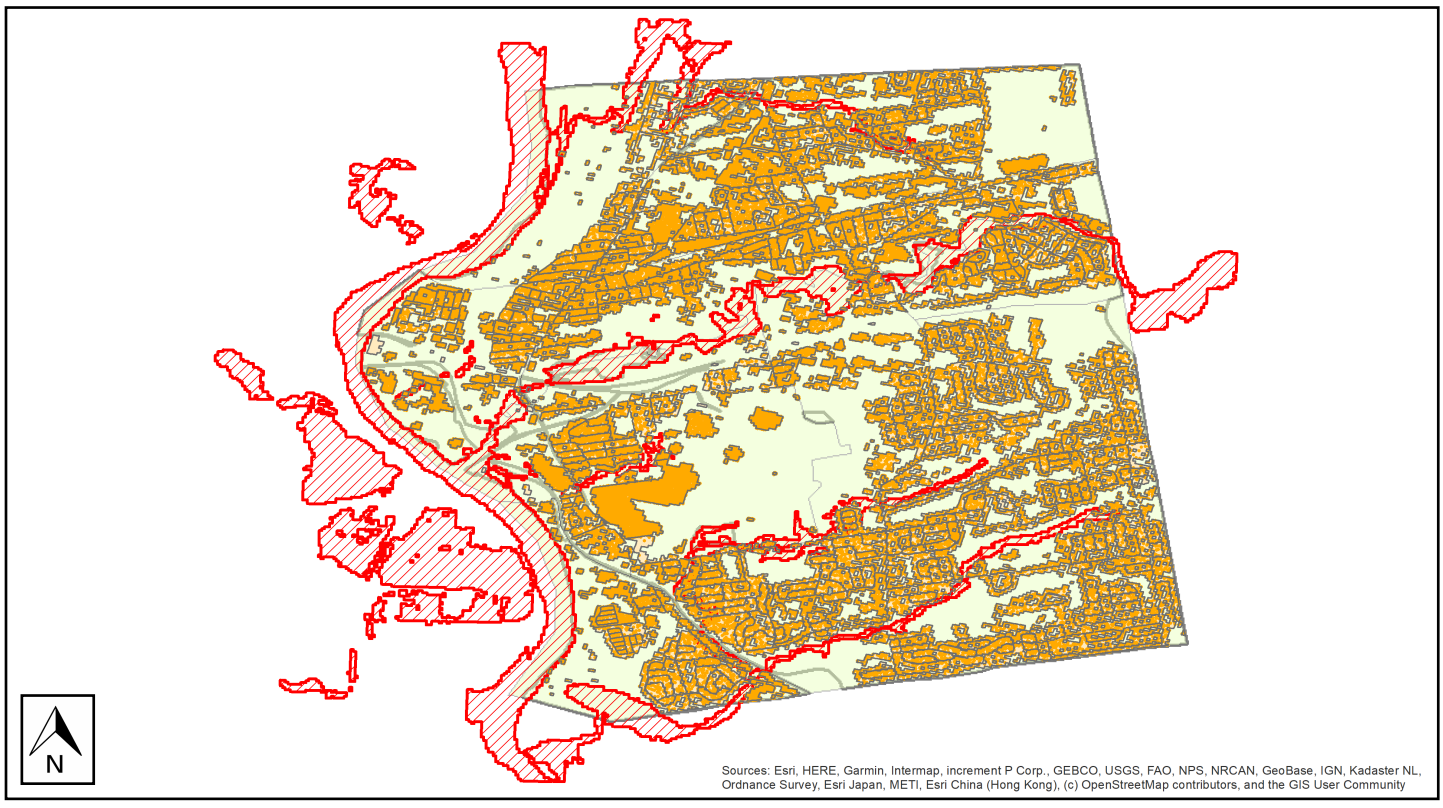
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Hartford_FL
Scenario Name:	East_Hartford_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 36 buildings will be at least moderately damaged. This is over 86% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

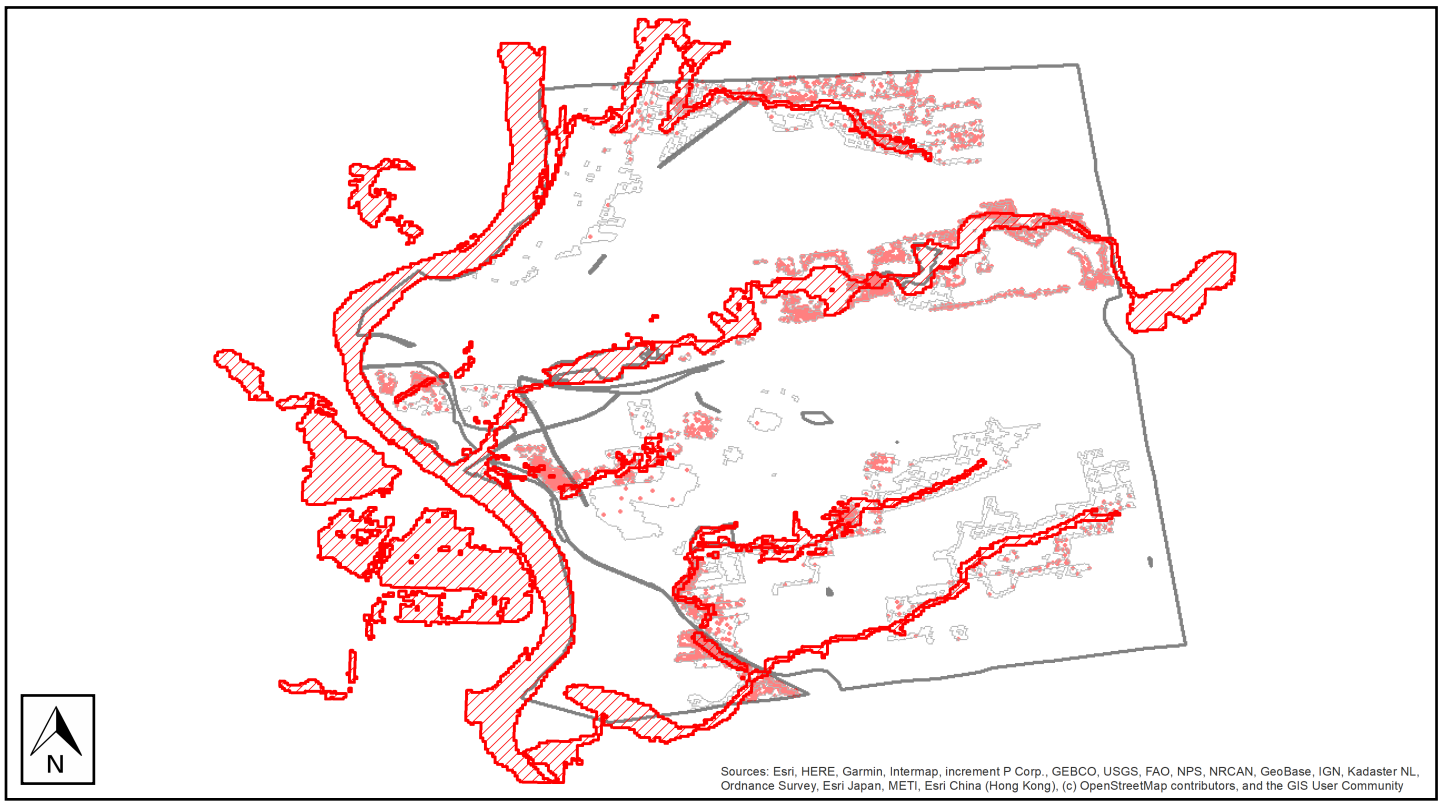


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	2	67	0	0	1	33	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	44	56	28	35	4	5	2	3	1	1	0	0
Total	**46**		**28**		**5**		**2**		**1**		**0**	

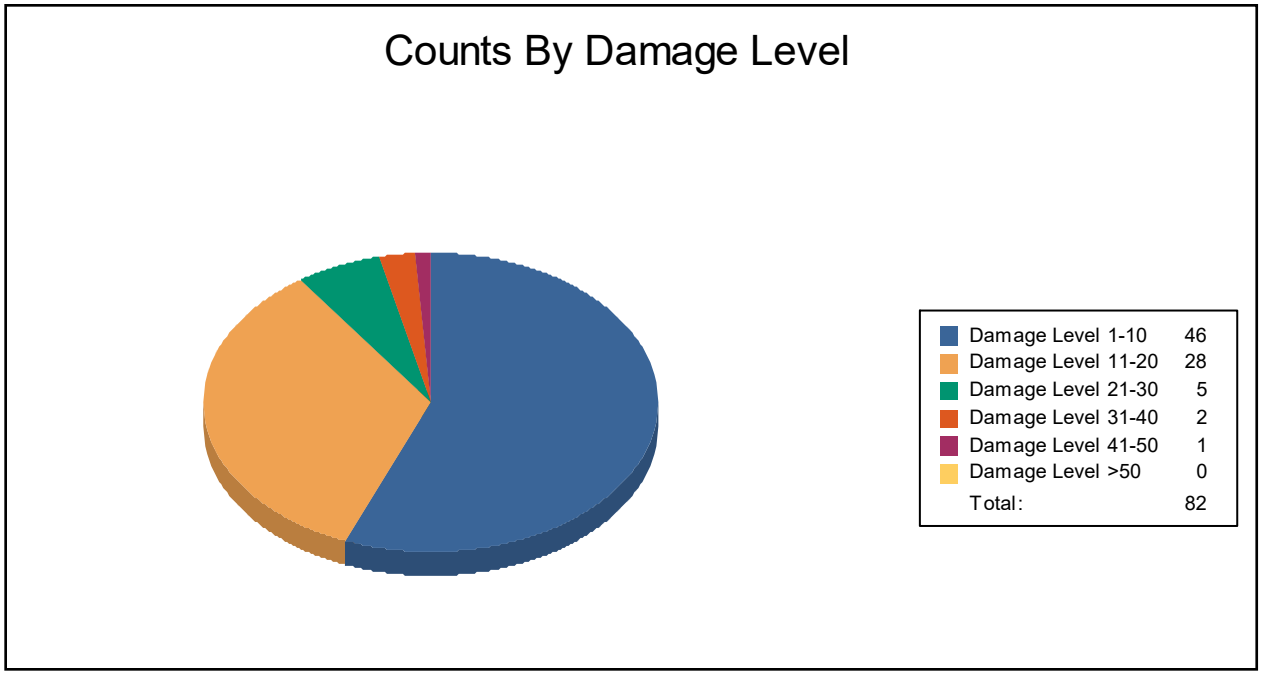


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	3	100	0	0	0	0	0	0	0	0	0	0
Steel	1	50	0	0	1	50	0	0	0	0	0	0
Wood	42	55	28	36	4	5	2	3	1	1	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	20	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

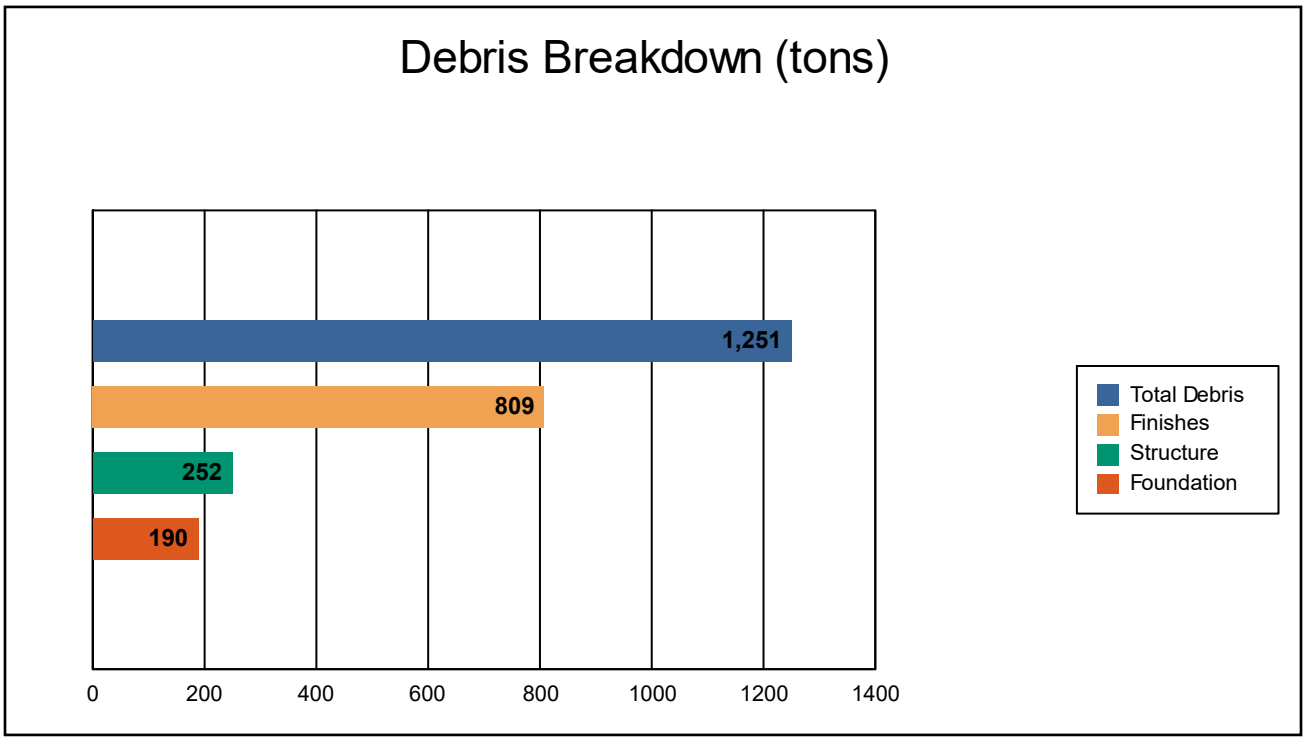
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

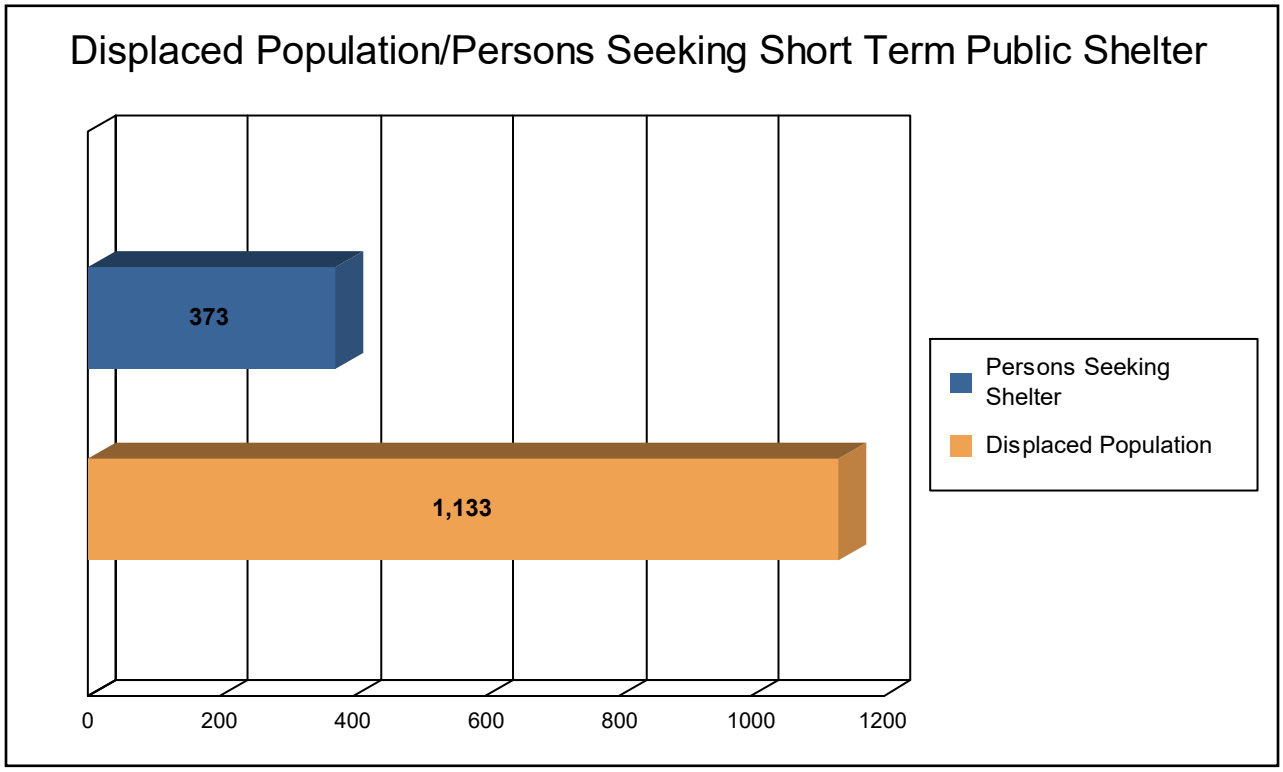


The model estimates that a total of 1,251 tons of debris will be generated. Of the total amount, Finishes comprises 65% of the total, Structure comprises 20% of the total, and Foundation comprises 15%. If the debris tonnage is converted into an estimated number of truckloads, it will require 51 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 378 households (or 1,133 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 373 people (out of a total population of 51,045) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 118.19 million dollars, which represents 4.33 % of the total replacement value of the scenario buildings.

Building-Related Losses

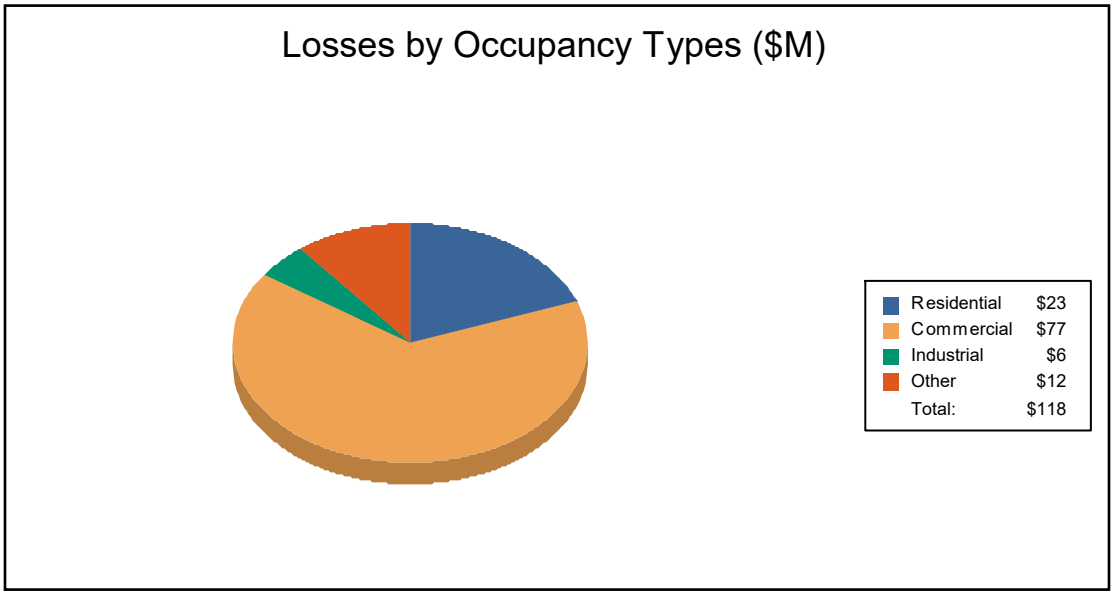
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 56.14 million dollars. 53% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.37% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.27	7.53	1.52	0.55	18.87
	Content	4.82	20.56	3.24	2.98	31.61
	Inventory	0.00	5.08	0.51	0.08	5.66
	Subtotal	**14.09**	**33.17**	**5.27**	**3.61**	**56.14**
Business Interruption						
	Income	0.73	16.96	0.10	1.39	19.17
	Relocation	3.28	5.17	0.11	0.69	9.25
	Rental Income	3.06	3.66	0.02	0.10	6.84
	Wage	1.73	18.35	0.18	6.54	26.79
	Subtotal	**8.81**	**44.13**	**0.42**	**8.70**	**62.06**
ALL	**Total**	**22.89**	**77.31**	**5.68**	**12.31**	**118.19**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,679,875	3,910,312	8,590,187
Total	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**
Total Study Region	**51,045**	**4,679,875**	**3,910,312**	**8,590,187**

Hazus: Flood Global Risk Report

Region Name: East_Windsor_FL

Flood Scenario: East_Windsor_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 185 census blocks. The region contains over 5 thousand households and has a total population of 11,190 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,216 buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 81.85% of the buildings (and 48.11% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,216 buildings in the region which have an aggregate total replacement value of 2,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,367,572	48.1%
Commercial	982,302	34.6%
Industrial	234,430	8.2%
Agricultural	17,116	0.6%
Religion	22,922	0.8%
Government	97,615	3.4%
Education	120,913	4.3%
Total	**2,842,870**	**100%**

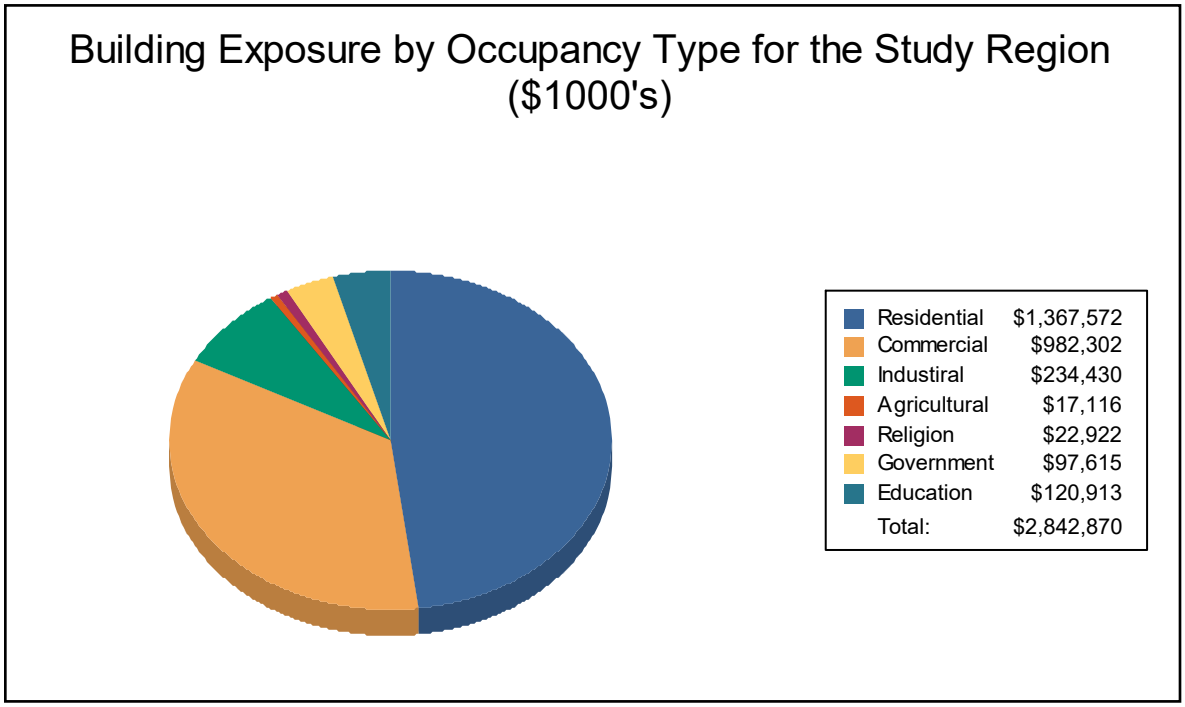
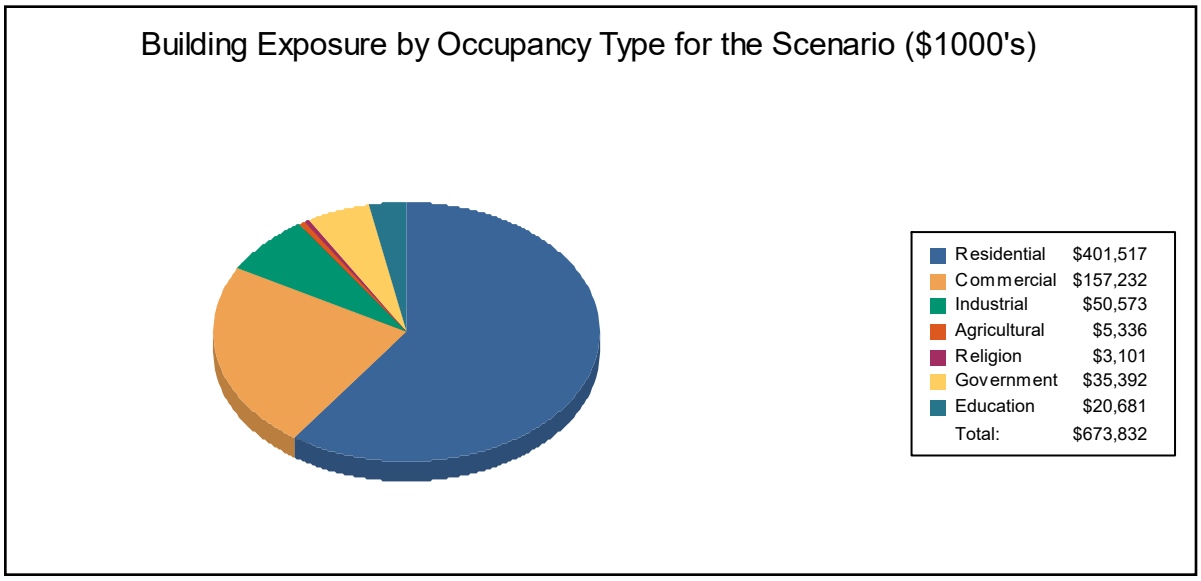


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	401,517	59.6%
Commercial	157,232	23.3%
Industrial	50,573	7.5%
Agricultural	5,336	0.8%
Religion	3,101	0.5%
Government	35,392	5.3%
Education	20,681	3.1%
Total	**673,832**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

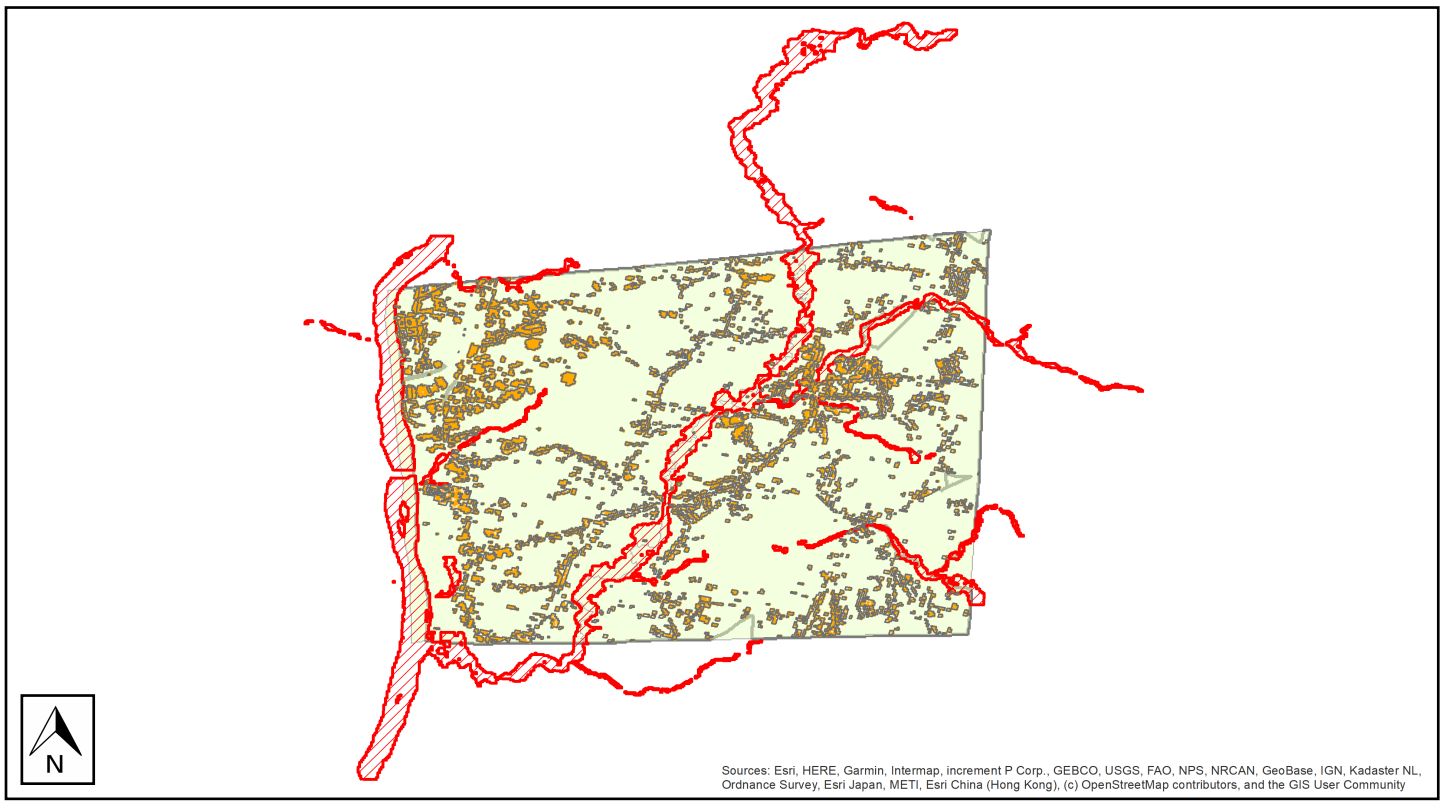
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Windsor_FL
Scenario Name:	East_Windsor_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

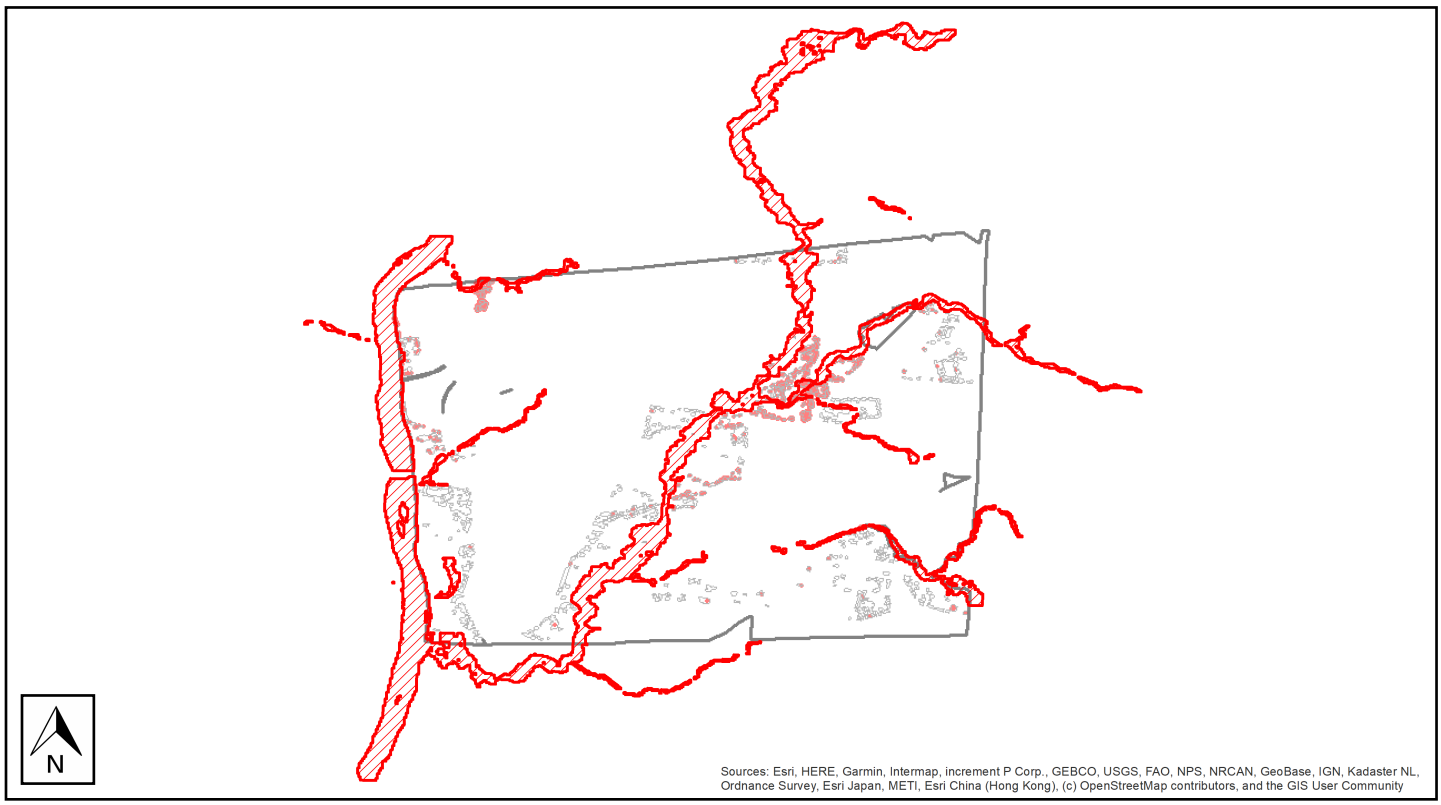


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	1	50	1	50
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	1	100	0	0	0	0
Total	**0**		**0**		**0**		**1**		**1**		**1**	

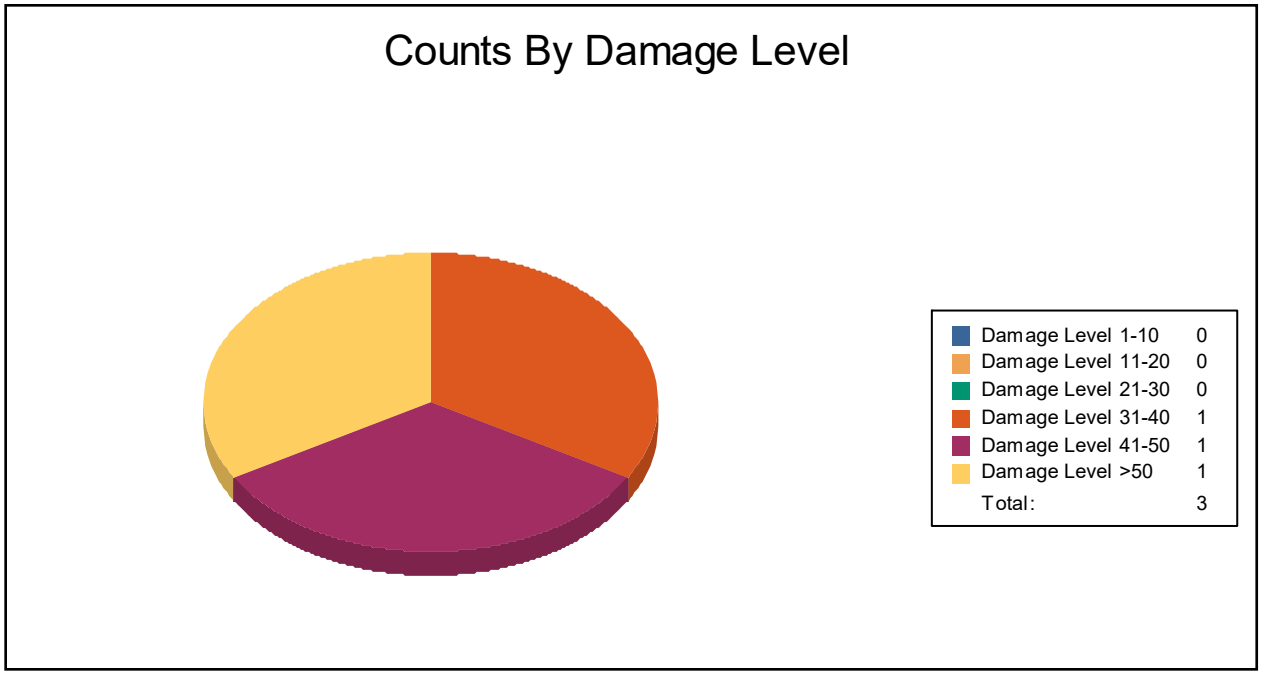


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	1	50	1	50
Wood	0	0	0	0	0	0	1	100	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

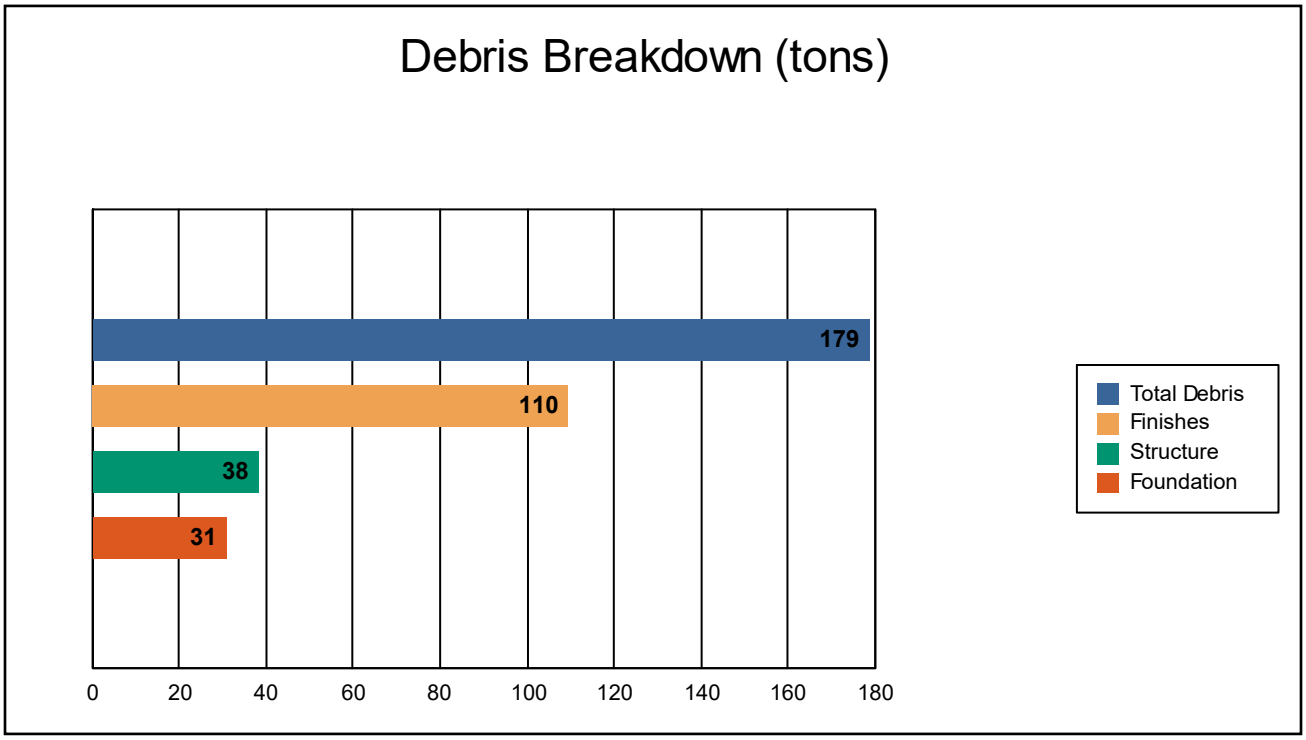
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

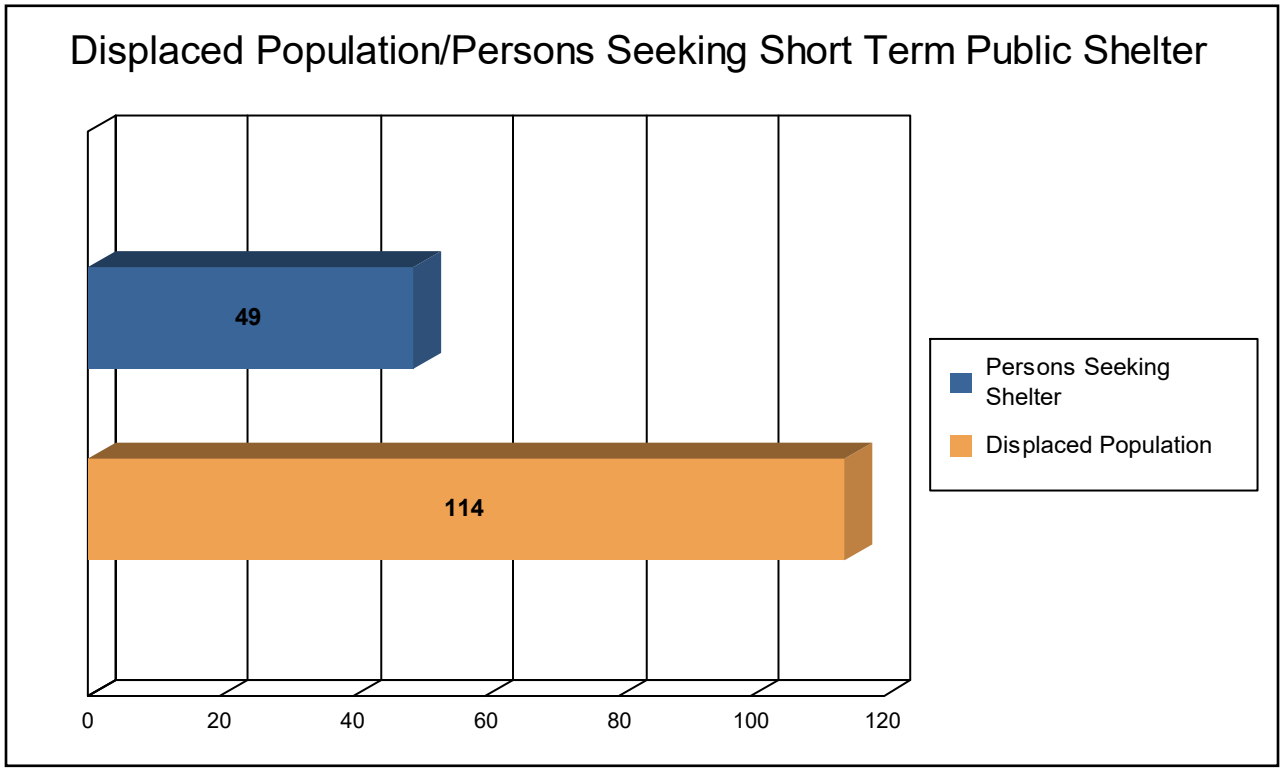


The model estimates that a total of 179 tons of debris will be generated. Of the total amount, Finishes comprises 61% of the total, Structure comprises 21% of the total, and Foundation comprises 17%. If the debris tonnage is converted into an estimated number of truckloads, it will require 8 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 38 households (or 114 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 49 people (out of a total population of 11,190) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 46.74 million dollars, which represents 6.94 % of the total replacement value of the scenario buildings.

Building-Related Losses

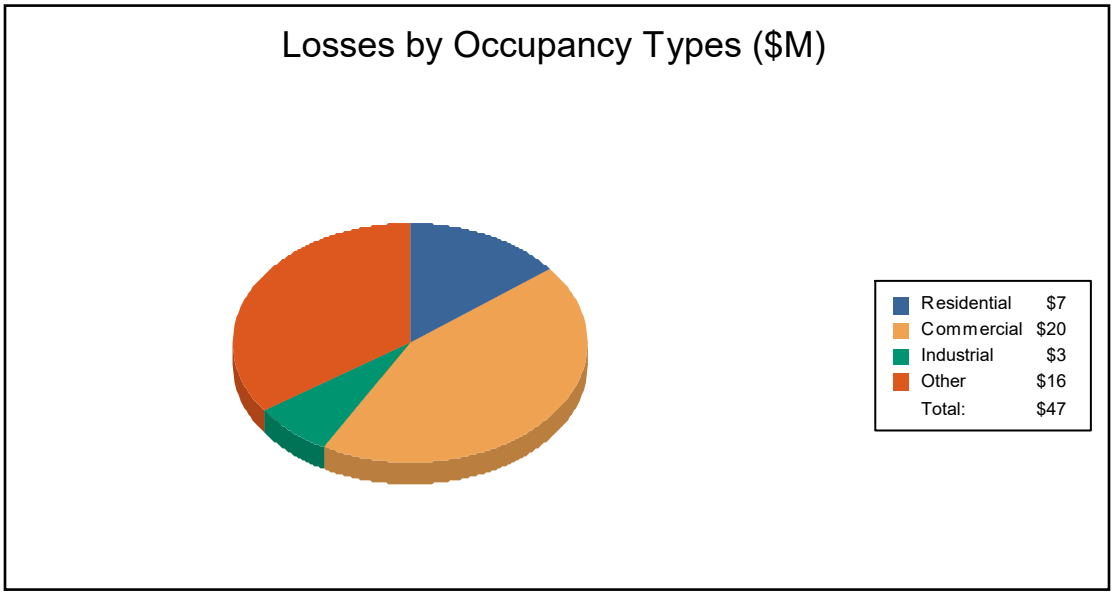
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 22.37 million dollars. 52% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 14.56% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.44	2.08	0.98	0.74	7.24
	Content	1.71	6.27	2.11	3.78	13.87
	Inventory	0.00	1.03	0.21	0.02	1.26
	Subtotal	**5.15**	**9.38**	**3.30**	**4.54**	**22.37**
Business Interruption						
	Income	0.15	4.81	0.05	0.73	5.73
	Relocation	0.59	1.04	0.04	0.60	2.27
	Rental Income	0.57	0.75	0.01	0.18	1.51
	Wage	0.35	4.34	0.04	10.13	14.86
	Subtotal	**1.66**	**10.94**	**0.14**	**11.64**	**24.37**
ALL	**Total**	**6.81**	**20.32**	**3.44**	**16.18**	**46.74**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,572	1,475,298	2,842,870
Total	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**
Total Study Region	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**

Hazus: Flood Global Risk Report

Region Name: East_Windsor_FL

Flood Scenario: East_Windsor_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 185 census blocks. The region contains over 5 thousand households and has a total population of 11,190 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,216 buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 81.85% of the buildings (and 48.11% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,216 buildings in the region which have an aggregate total replacement value of 2,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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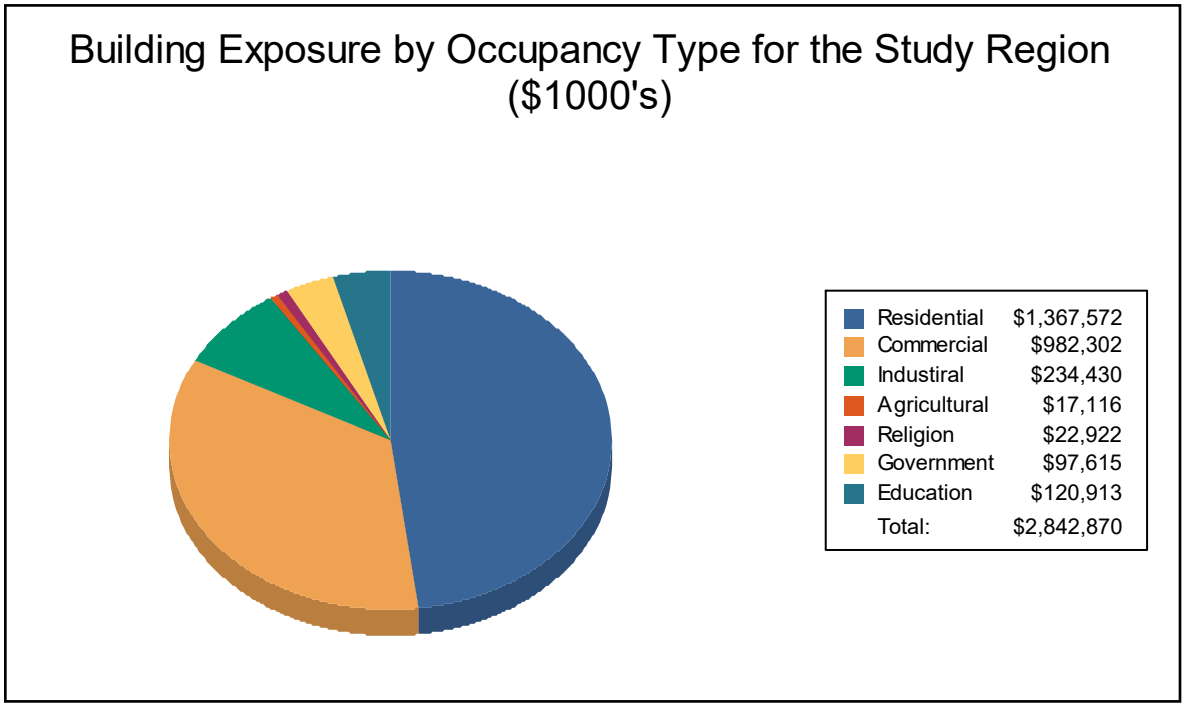

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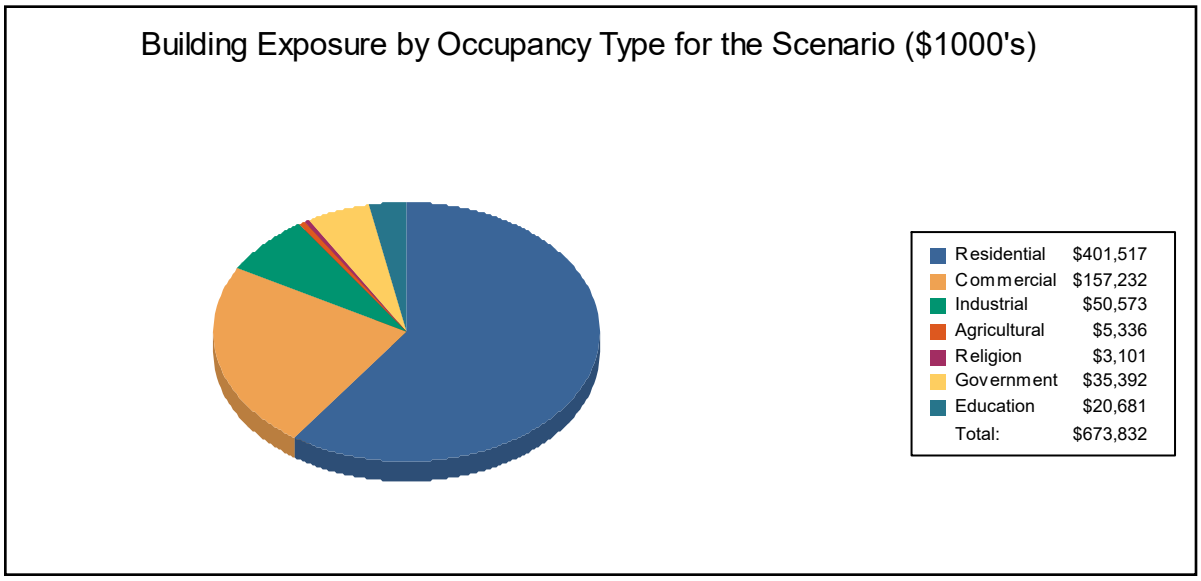
Education	20,681	3.1%
Total	**673,832**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

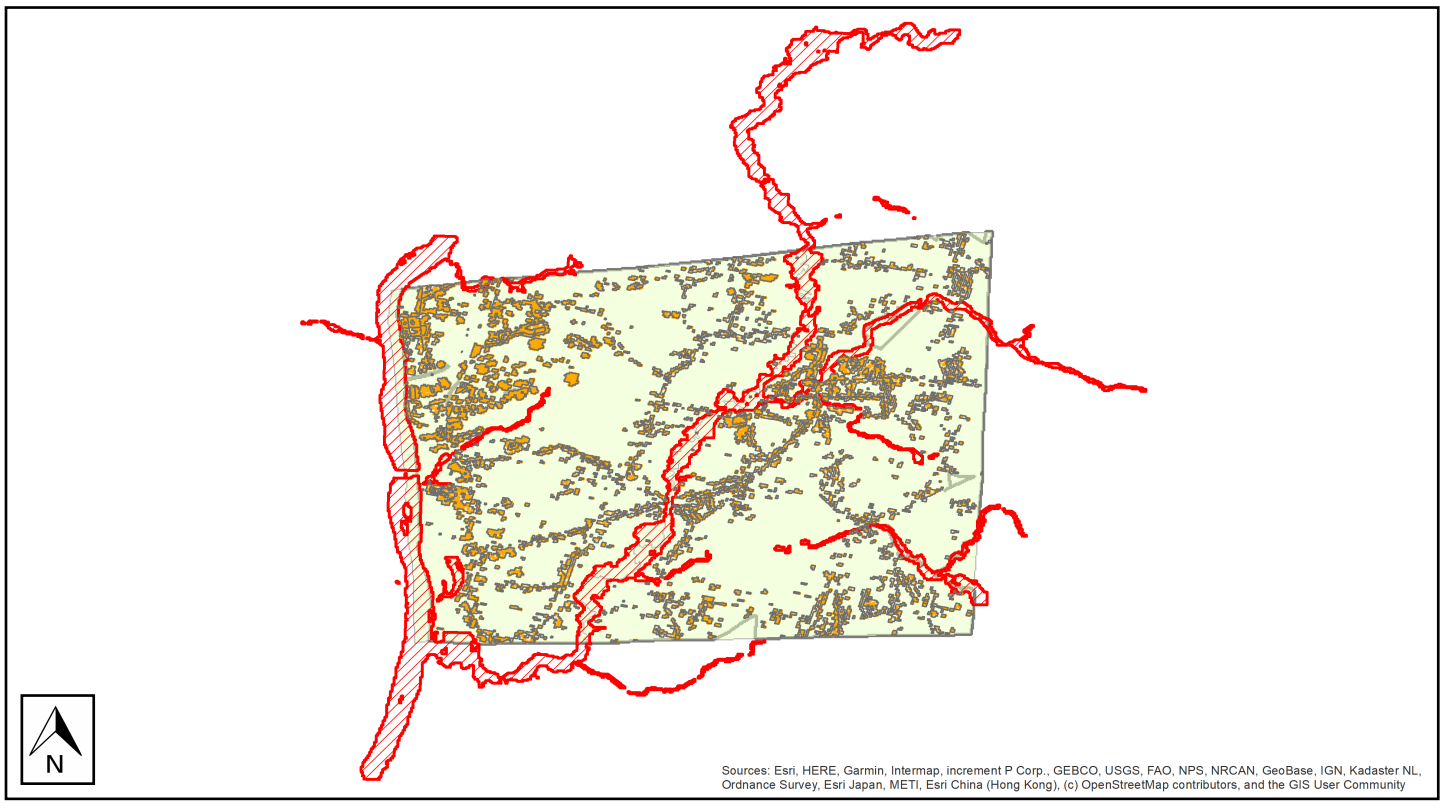
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Windsor_FL
Scenario Name:	East_Windsor_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

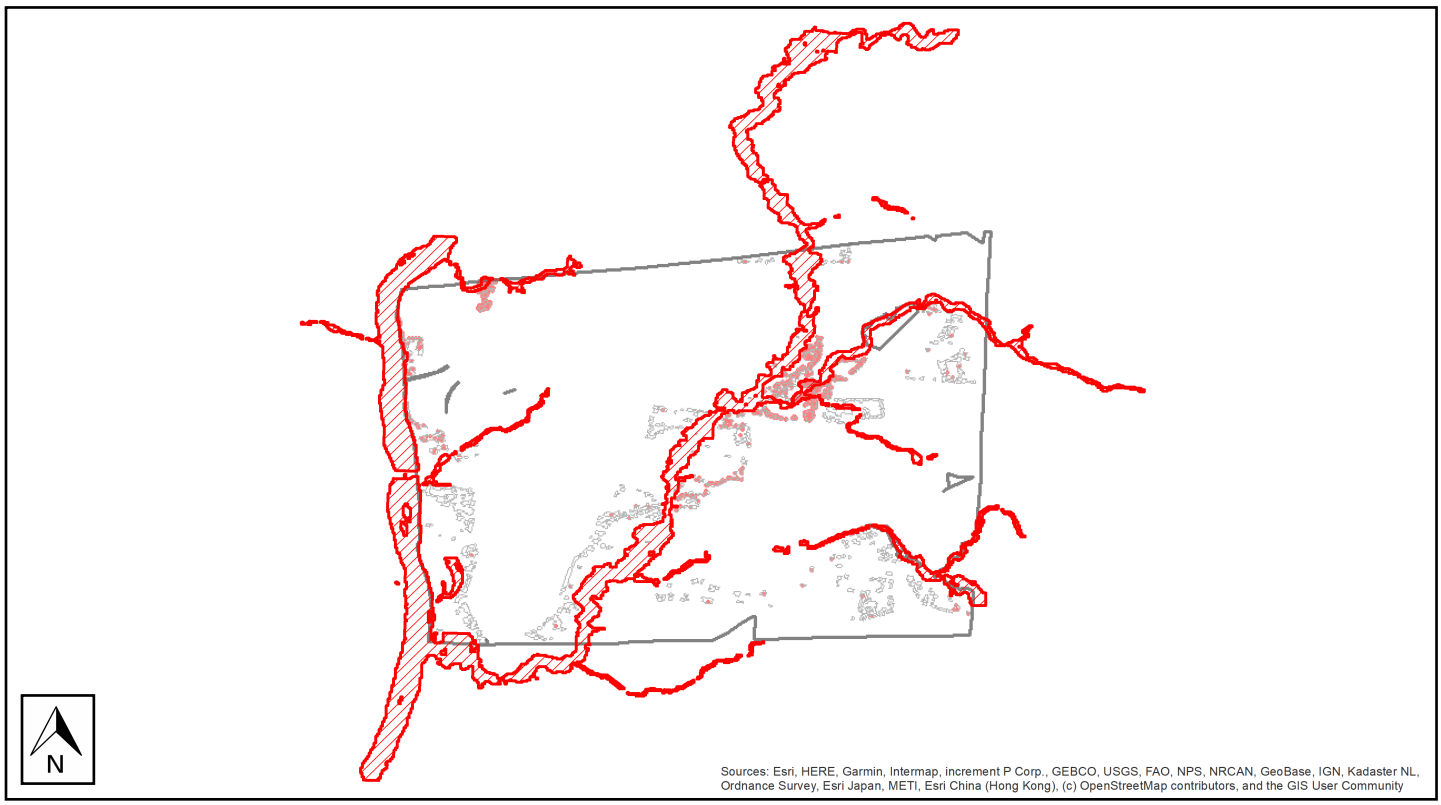


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	1	50	1	50
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	1	100	0	0
Total	**0**		**0**		**0**		**0**		**2**		**1**	

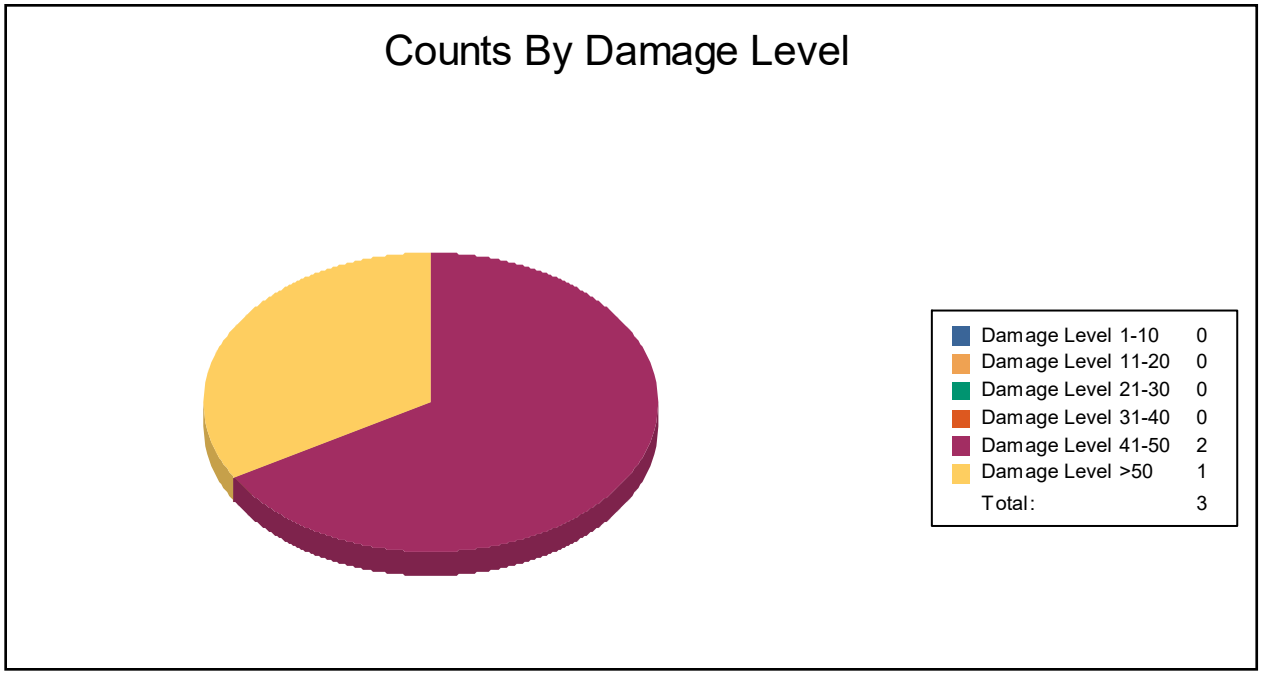


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	1	50	1	50
Wood	0	0	0	0	0	0	0	0	1	100	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

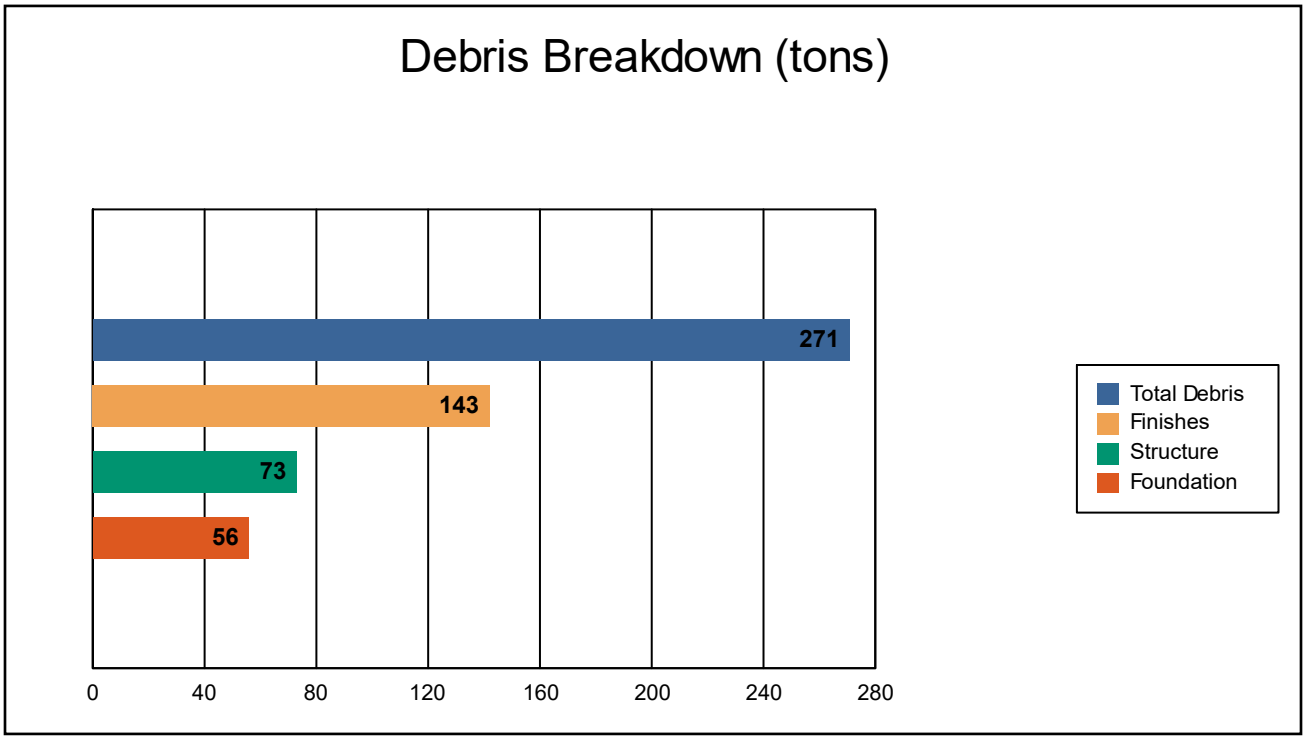
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

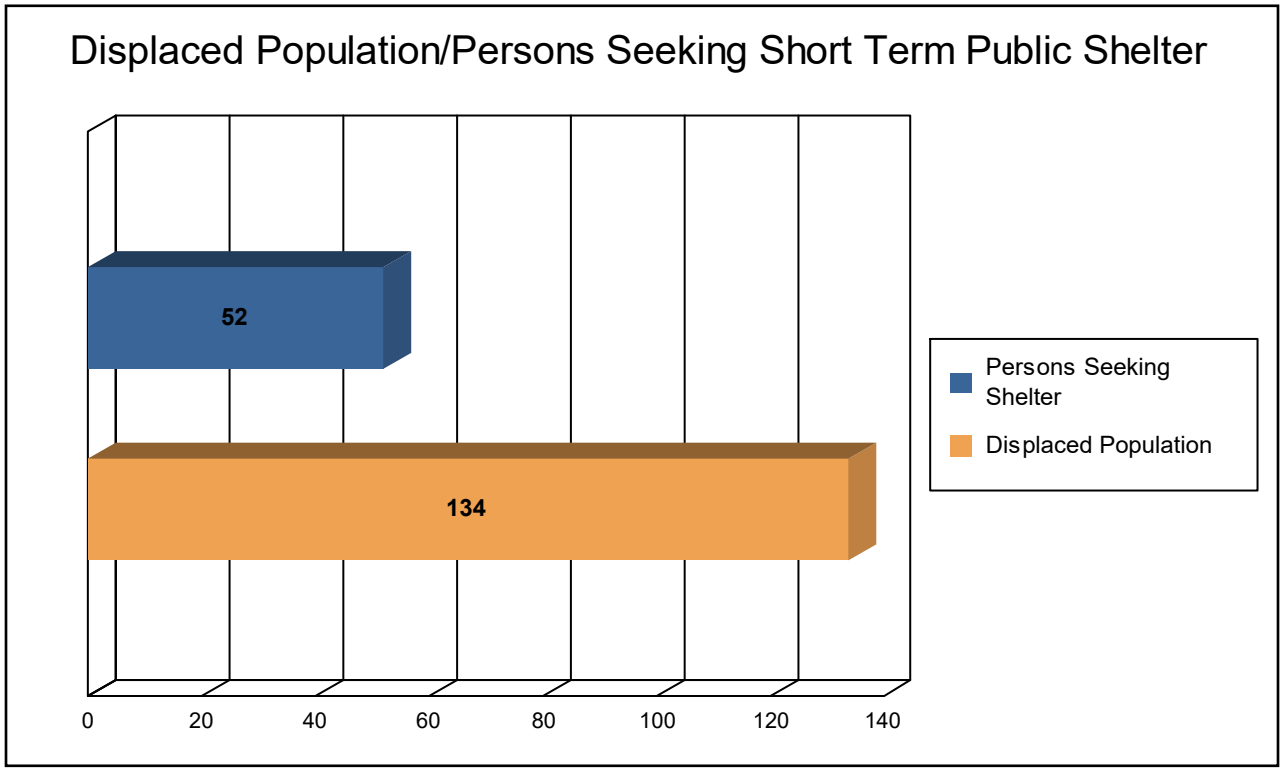


The model estimates that a total of 271 tons of debris will be generated. Of the total amount, Finishes comprises 53% of the total, Structure comprises 27% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 11 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 45 households (or 134 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 52 people (out of a total population of 11,190) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 52.16 million dollars, which represents 7.74 % of the total replacement value of the scenario buildings.

Building-Related Losses

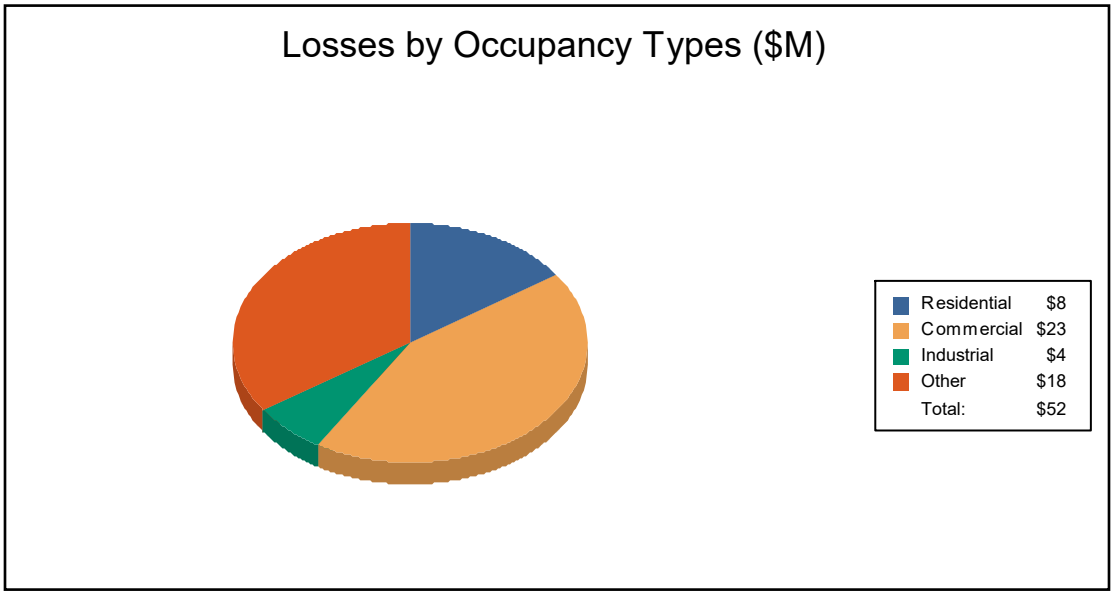
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 25.80 million dollars. 51% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 15.37% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.13	2.41	1.06	0.92	8.52
	Content	2.04	7.13	2.25	4.39	15.81
	Inventory	0.00	1.22	0.22	0.03	1.48
	Subtotal	**6.17**	**10.77**	**3.53**	**5.33**	**25.80**
Business Interruption						
	Income	0.16	5.16	0.06	0.80	6.18
	Relocation	0.67	1.12	0.04	0.65	2.48
	Rental Income	0.64	0.80	0.01	0.20	1.64
	Wage	0.38	4.70	0.05	10.94	16.06
	Subtotal	**1.85**	**11.77**	**0.15**	**12.59**	**26.36**
ALL	**Total**	**8.02**	**22.54**	**3.68**	**17.92**	**52.16**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,572	1,475,298	2,842,870
Total	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**
Total Study Region	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**

Hazus: Flood Global Risk Report

Region Name: East_Windsor_FL

Flood Scenario: East_Windsor_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 185 census blocks. The region contains over 5 thousand households and has a total population of 11,190 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,216 buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 81.85% of the buildings (and 48.11% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,216 buildings in the region which have an aggregate total replacement value of 2,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,367,572	48.1%
Commercial	982,302	34.6%
Industrial	234,430	8.2%
Agricultural	17,116	0.6%
Religion	22,922	0.8%
Government	97,615	3.4%
Education	120,913	4.3%
Total	**2,842,870**	**100%**

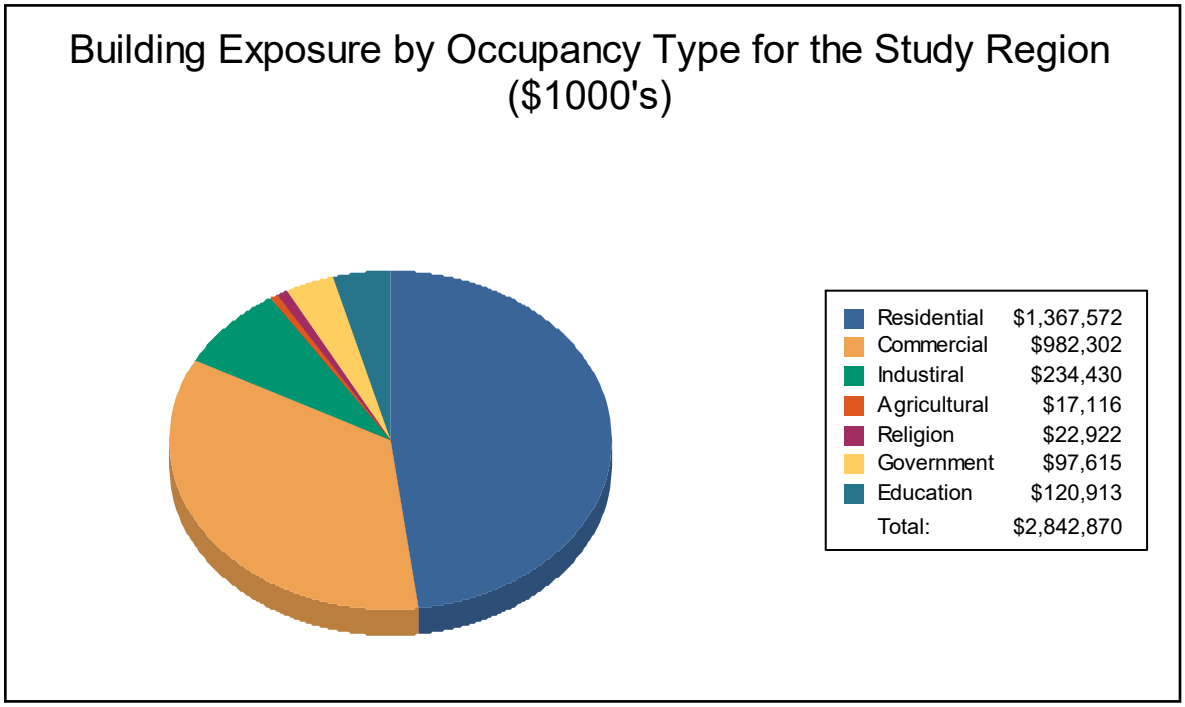
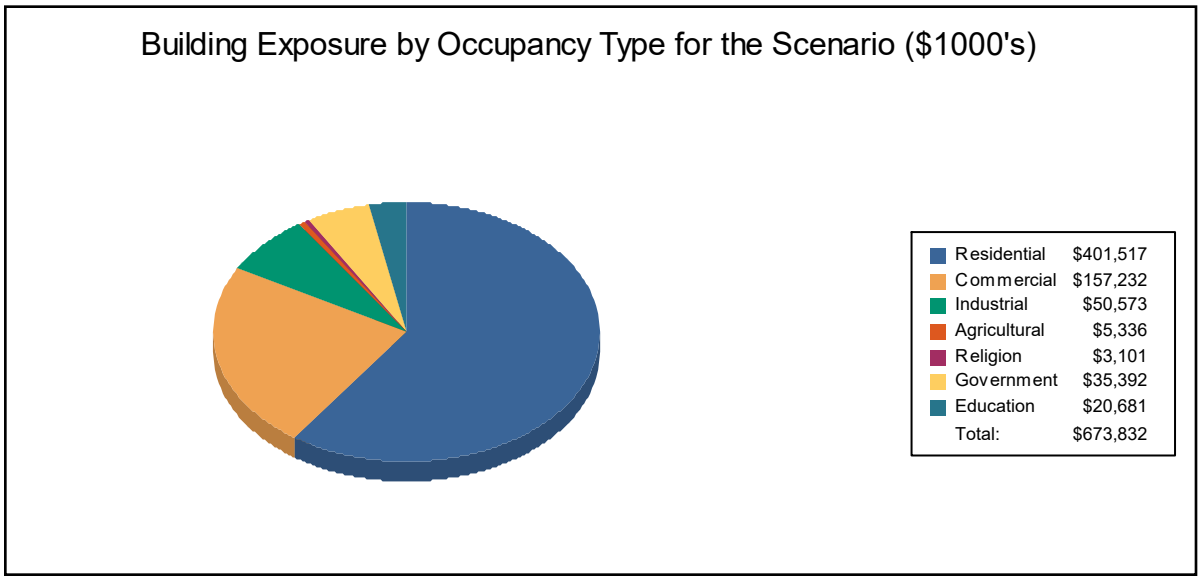


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	401,517	59.6%
Commercial	157,232	23.3%
Industrial	50,573	7.5%
Agricultural	5,336	0.8%
Religion	3,101	0.5%
Government	35,392	5.3%
Education	20,681	3.1%
Total	**673,832**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

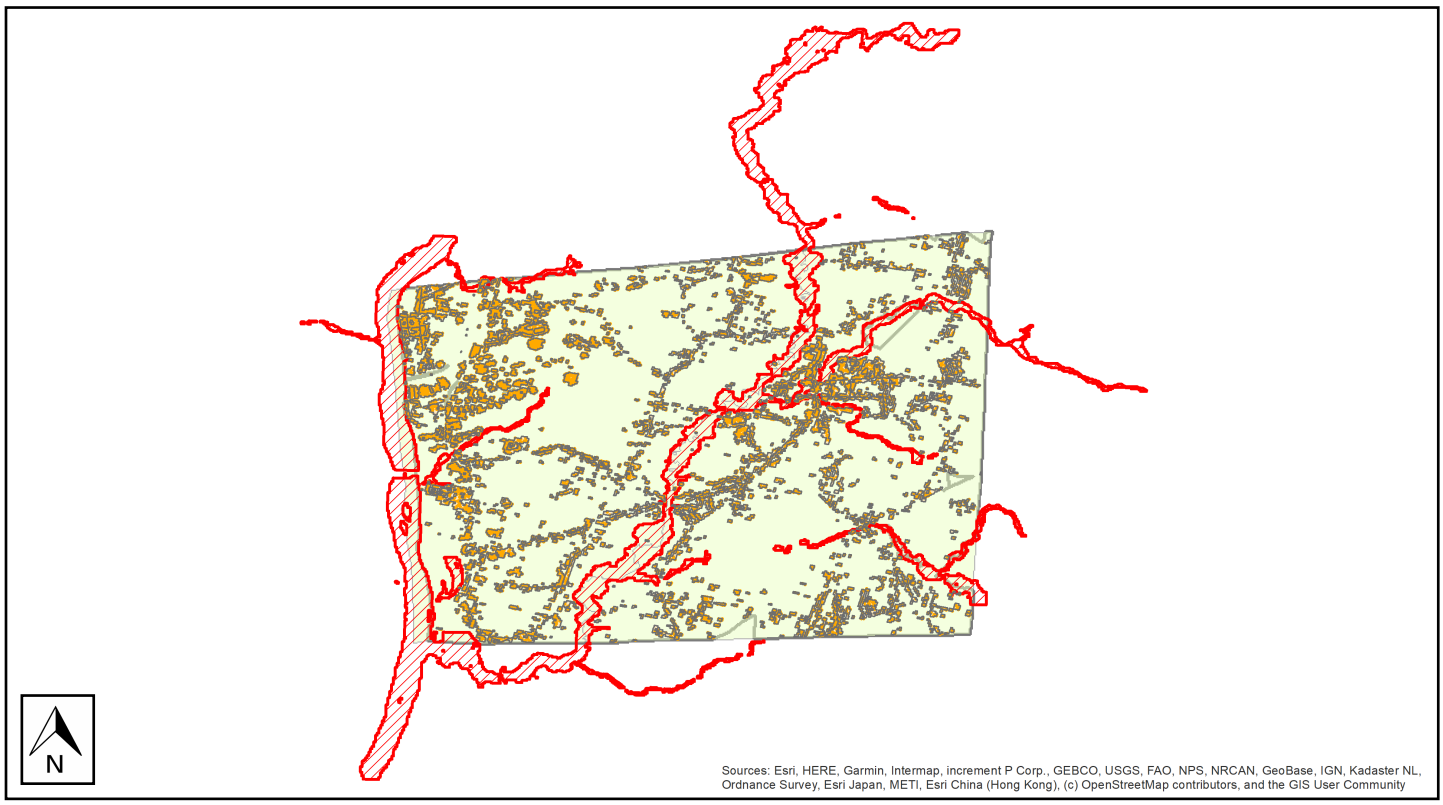
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Windsor_FL
Scenario Name:	East_Windsor_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

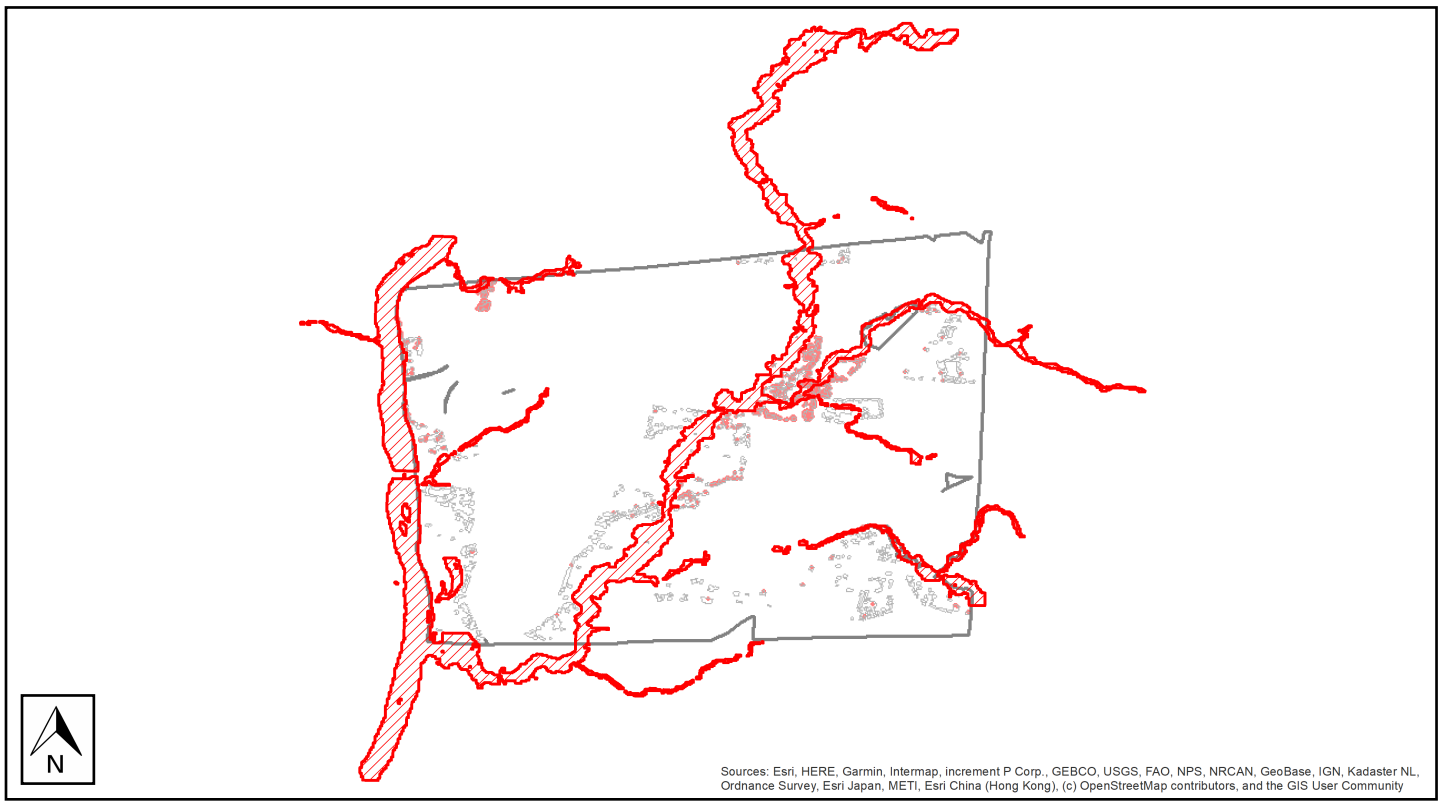


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	1	50	1	50
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	1	100	0	0
Total	**0**		**0**		**0**		**0**		**2**		**1**	

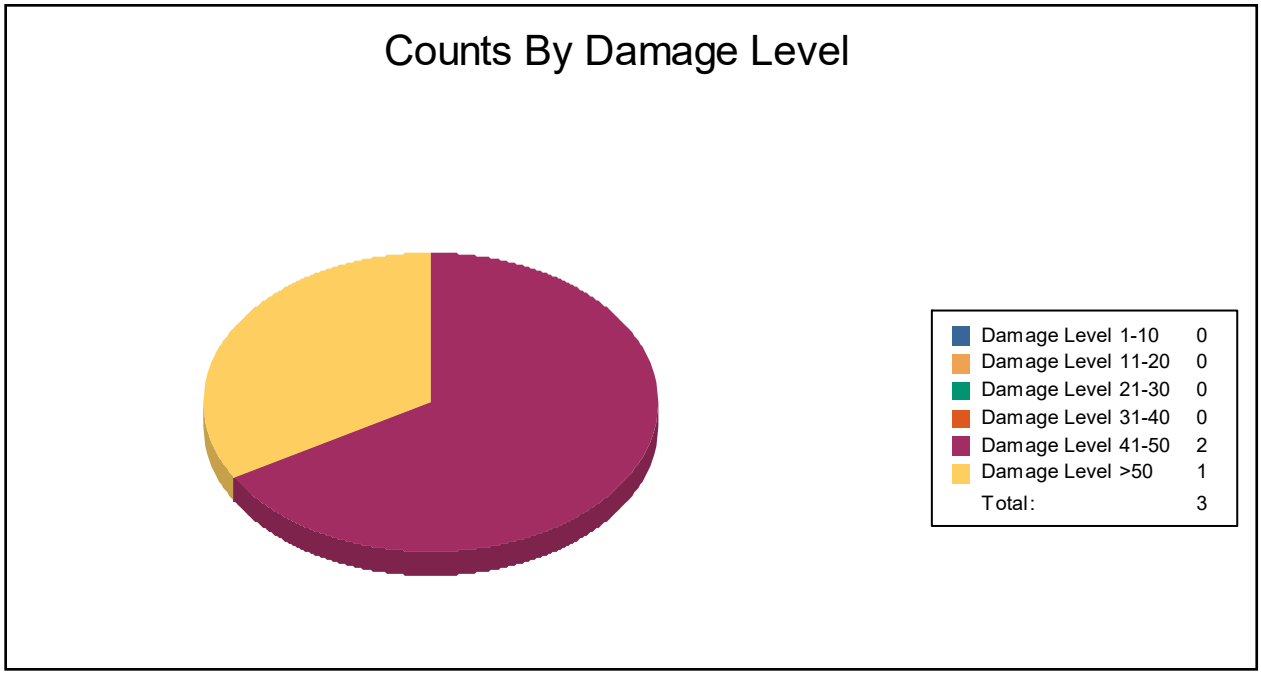


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	1	50	1	50
Wood	0	0	0	0	0	0	0	0	1	100	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

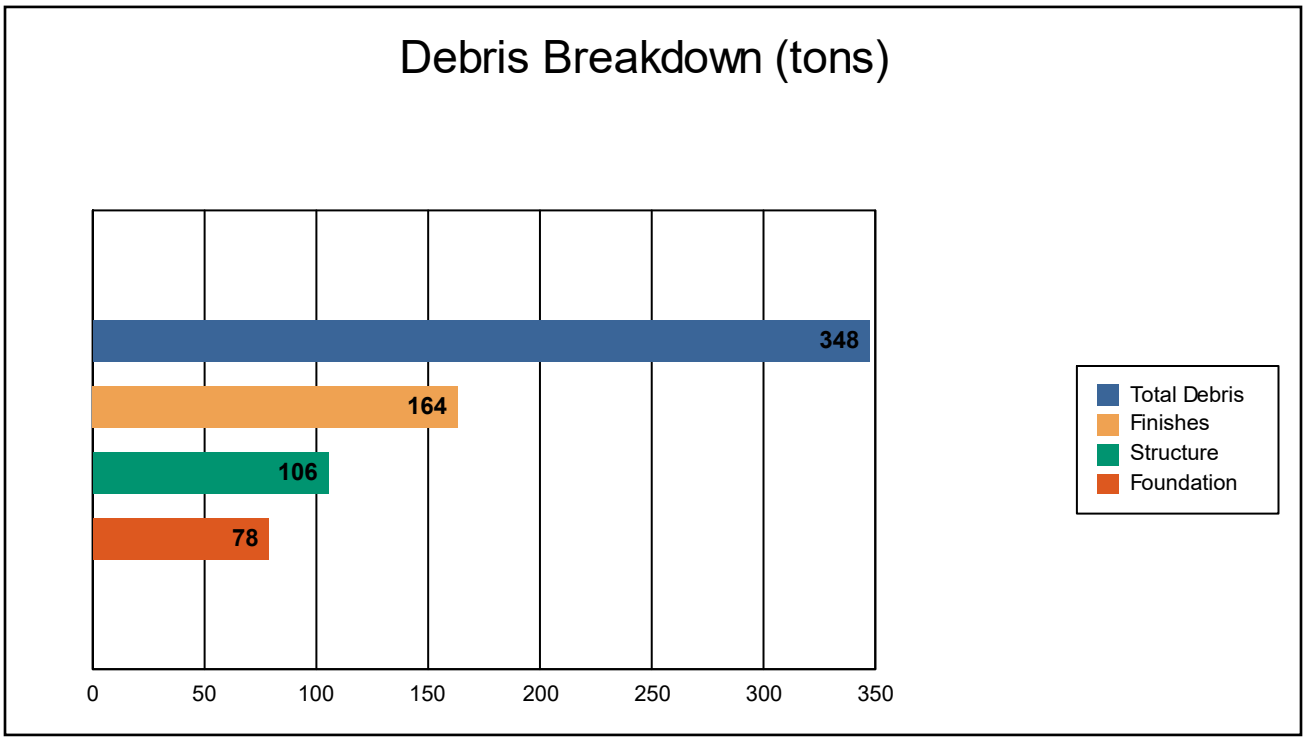
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

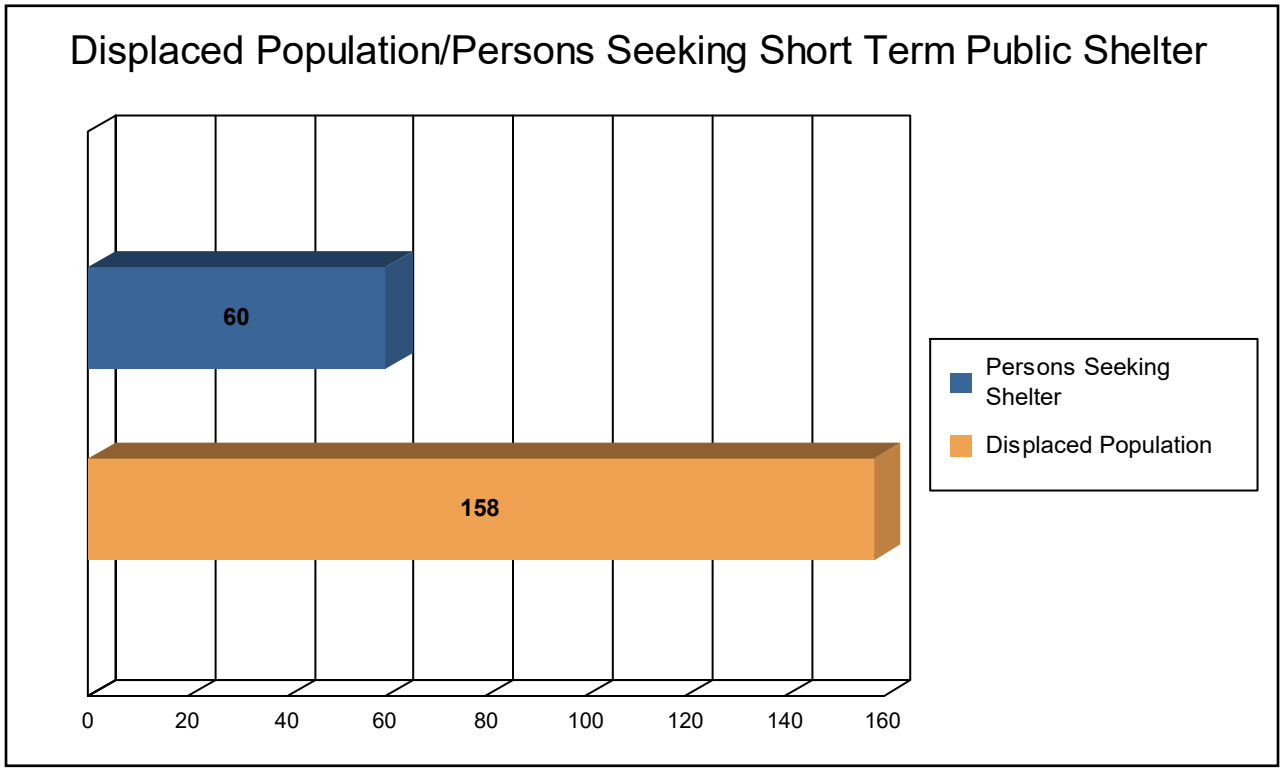


The model estimates that a total of 348 tons of debris will be generated. Of the total amount, Finishes comprises 47% of the total, Structure comprises 30% of the total, and Foundation comprises 23%. If the debris tonnage is converted into an estimated number of truckloads, it will require 14 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 53 households (or 158 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 60 people (out of a total population of 11,190) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 56.86 million dollars, which represents 8.44 % of the total replacement value of the scenario buildings.

Building-Related Losses

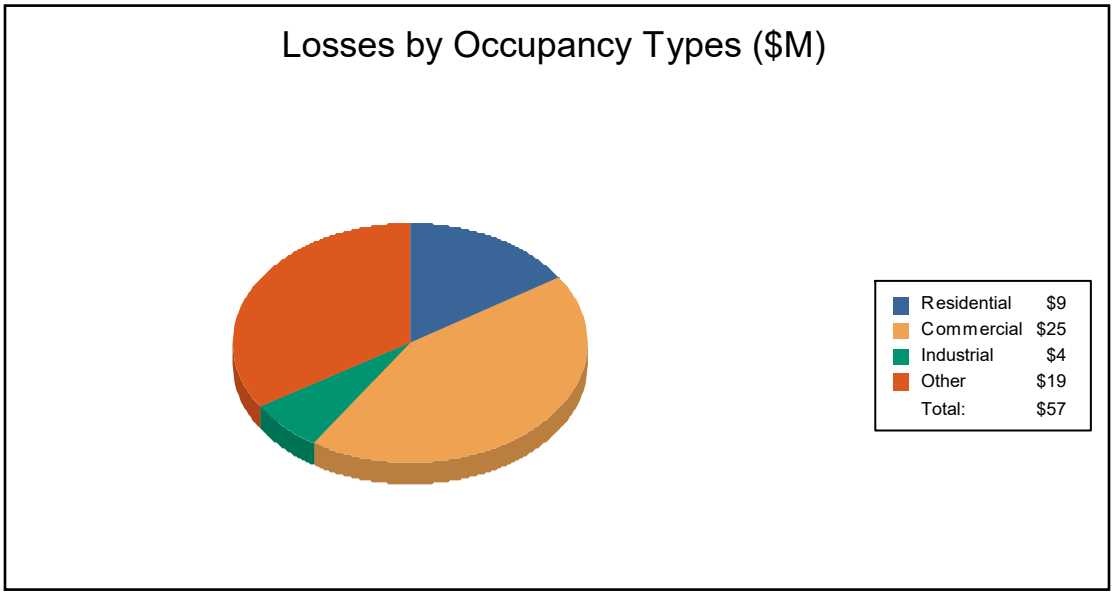
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 28.13 million dollars. 51% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 15.92% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.67	2.64	1.12	1.02	9.46
	Content	2.31	7.70	2.37	4.69	17.07
	Inventory	0.00	1.33	0.24	0.03	1.60
	Subtotal	**6.98**	**11.68**	**3.73**	**5.75**	**28.13**
Business Interruption						
	Income	0.18	5.67	0.06	0.84	6.75
	Relocation	0.75	1.22	0.05	0.71	2.73
	Rental Income	0.73	0.88	0.01	0.22	1.83
	Wage	0.42	5.13	0.05	11.82	17.42
	Subtotal	**2.07**	**12.89**	**0.17**	**13.59**	**28.73**
ALL	**Total**	**9.05**	**24.57**	**3.90**	**19.34**	**56.86**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,572	1,475,298	2,842,870
Total	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**
Total Study Region	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**

Hazus: Flood Global Risk Report

Region Name: East_Windsor_FL

Flood Scenario: East_Windsor_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 185 census blocks. The region contains over 5 thousand households and has a total population of 11,190 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,216 buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 81.85% of the buildings (and 48.11% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,216 buildings in the region which have an aggregate total replacement value of 2,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,367,572	48.1%
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Education	120,913	4.3%
Total	**2,842,870**	**100%**

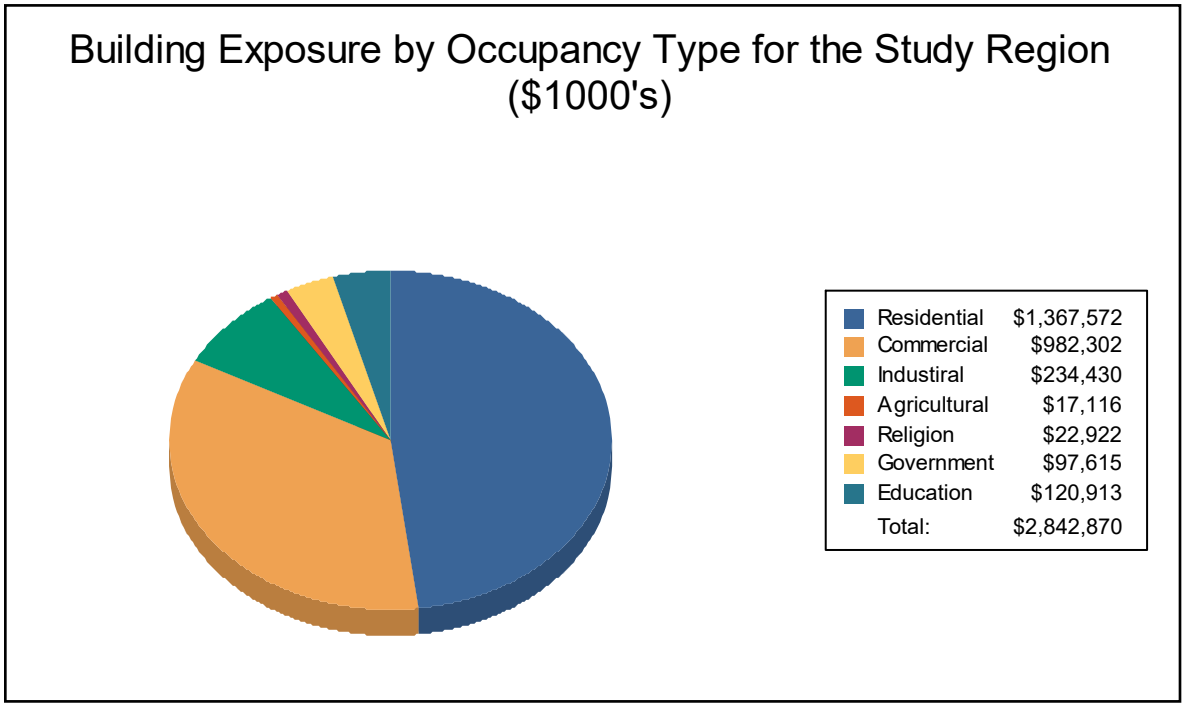
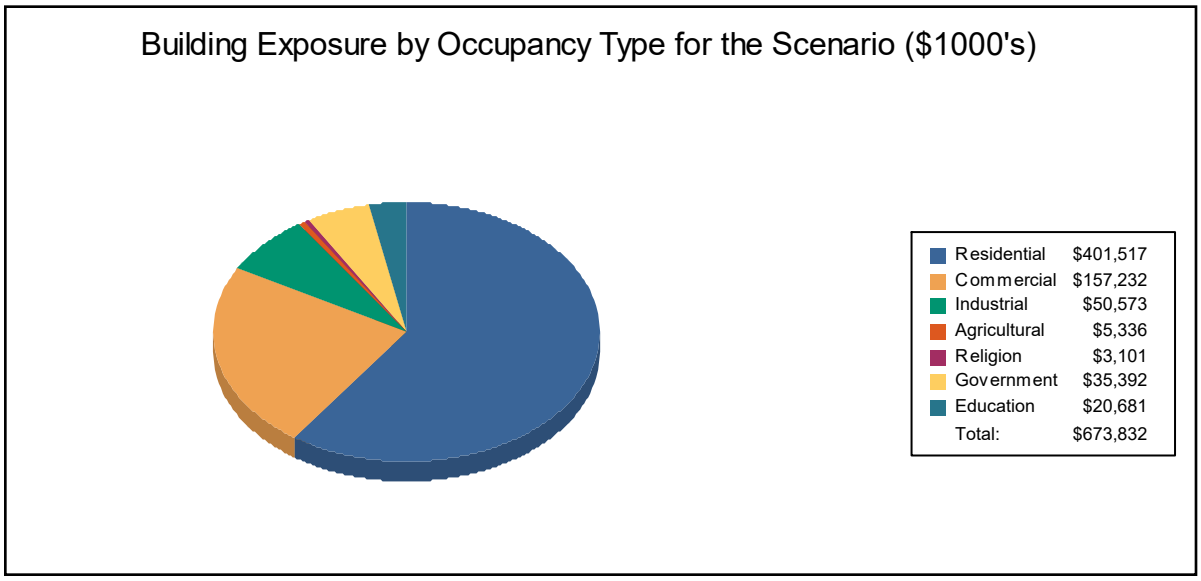


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	401,517	59.6%
Commercial	157,232	23.3%
Industrial	50,573	7.5%
Agricultural	5,336	0.8%
Religion	3,101	0.5%
Government	35,392	5.3%
Education	20,681	3.1%
Total	**673,832**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

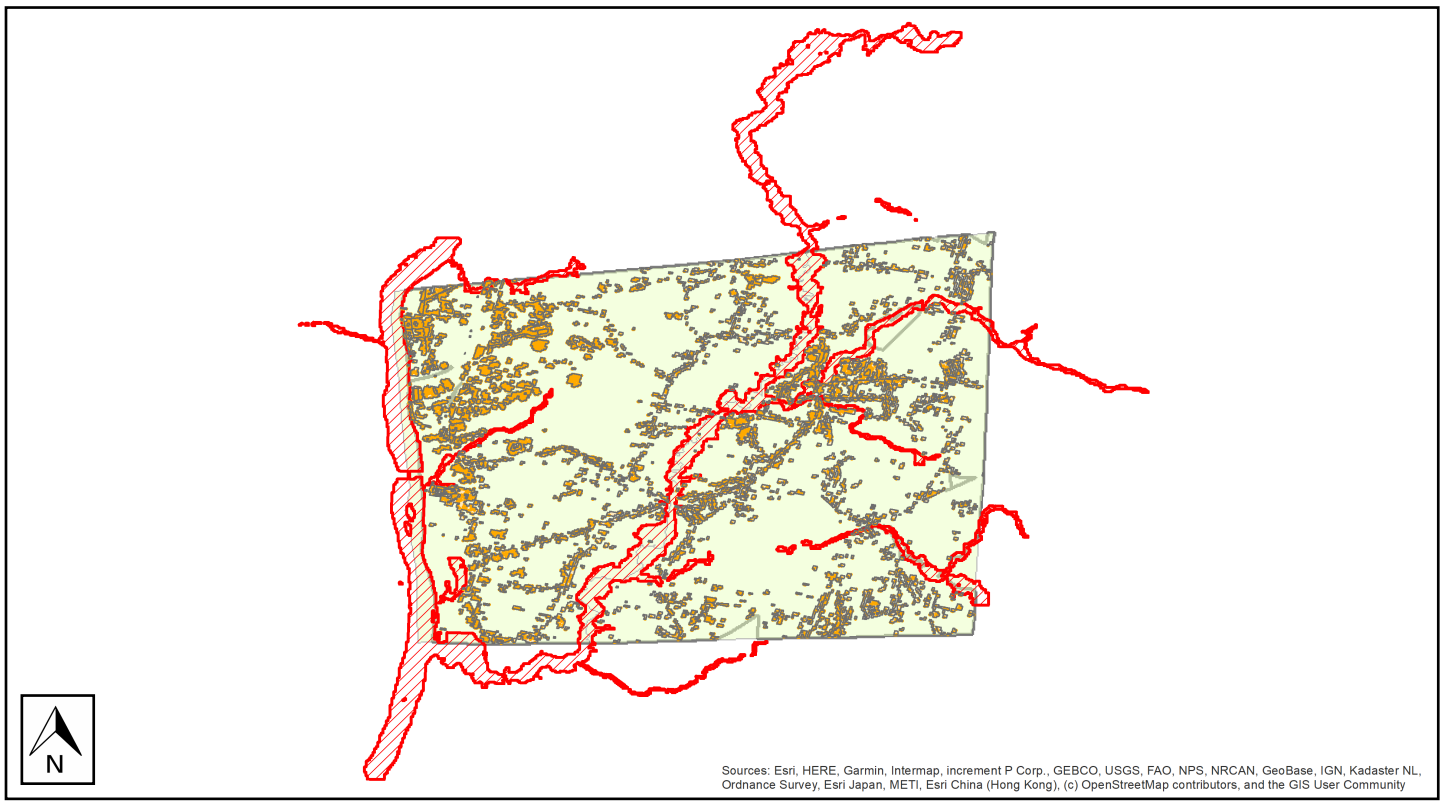
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Windsor_FL
Scenario Name:	East_Windsor_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

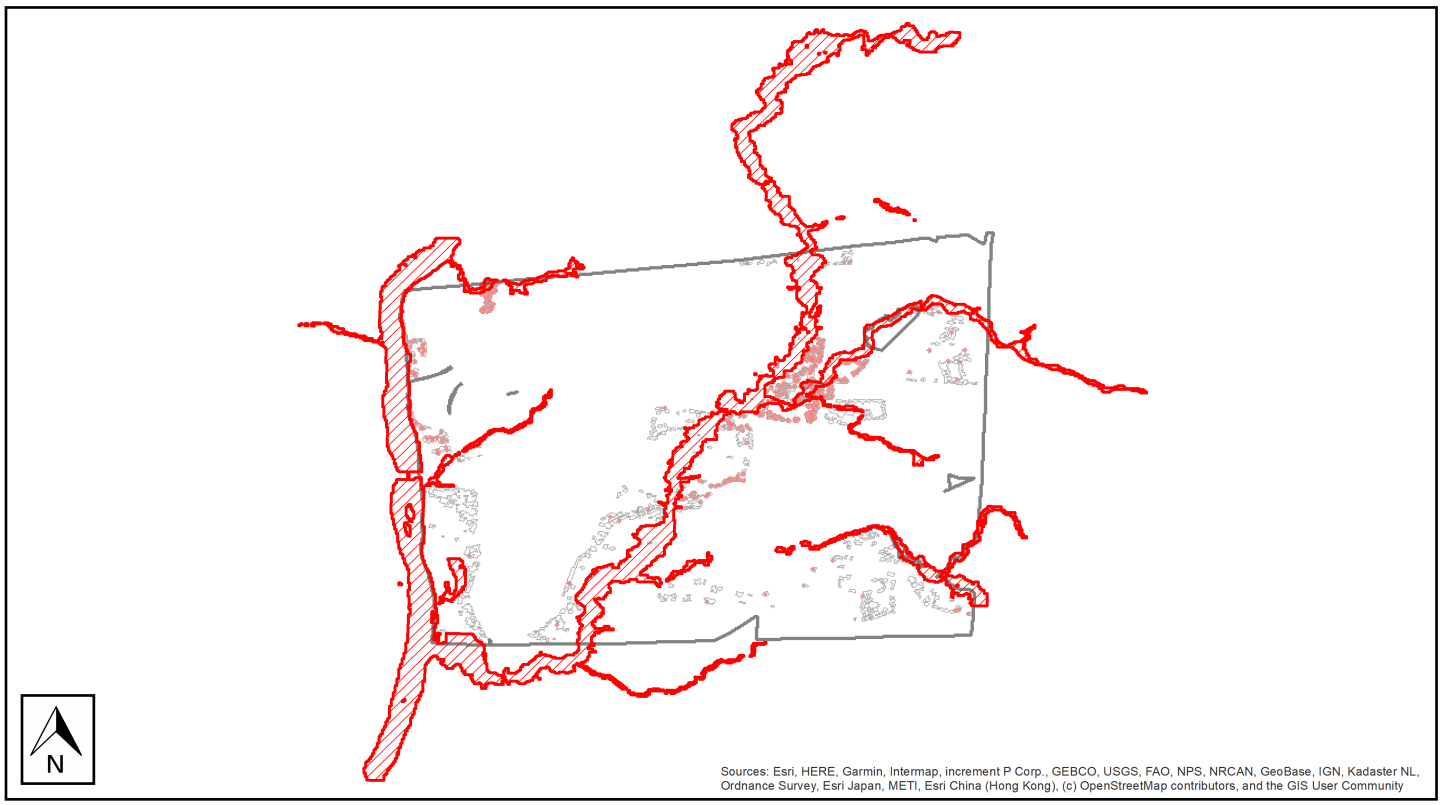


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	1	33	2	67
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	1	100	0	0
Total	**0**		**0**		**0**		**0**		**2**		**2**	

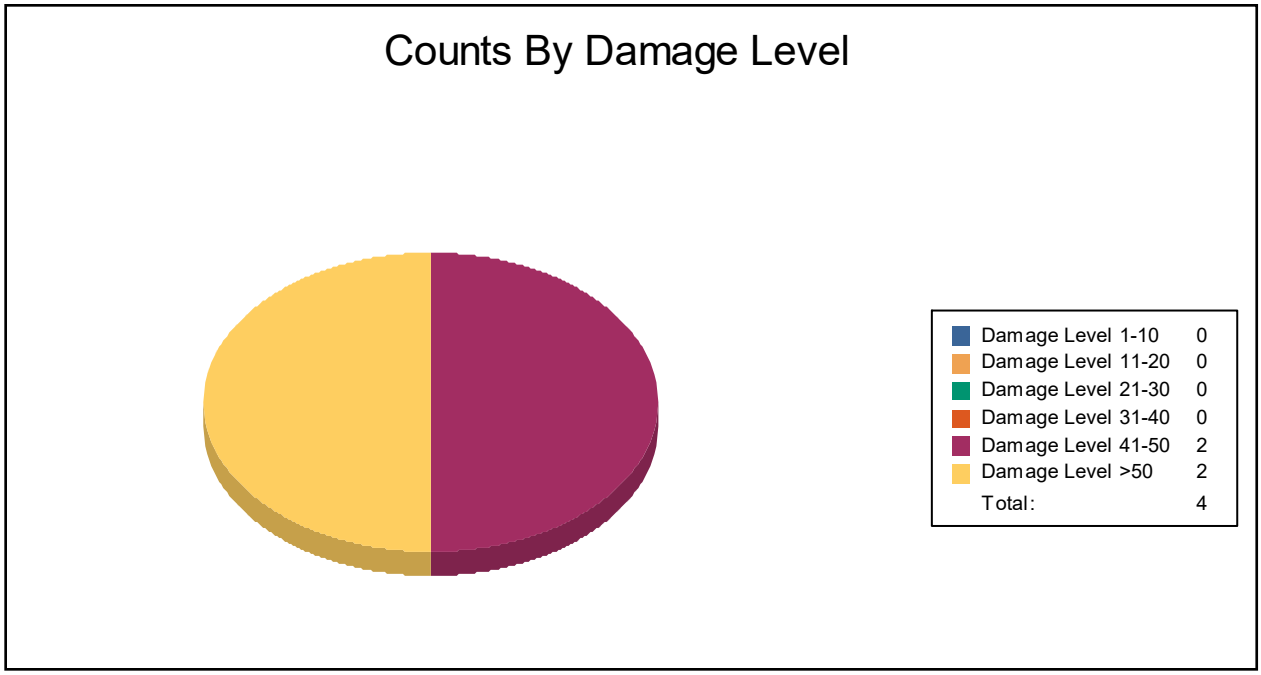


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	1	100
Steel	0	0	0	0	0	0	0	0	1	50	1	50
Wood	0	0	0	0	0	0	0	0	1	100	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

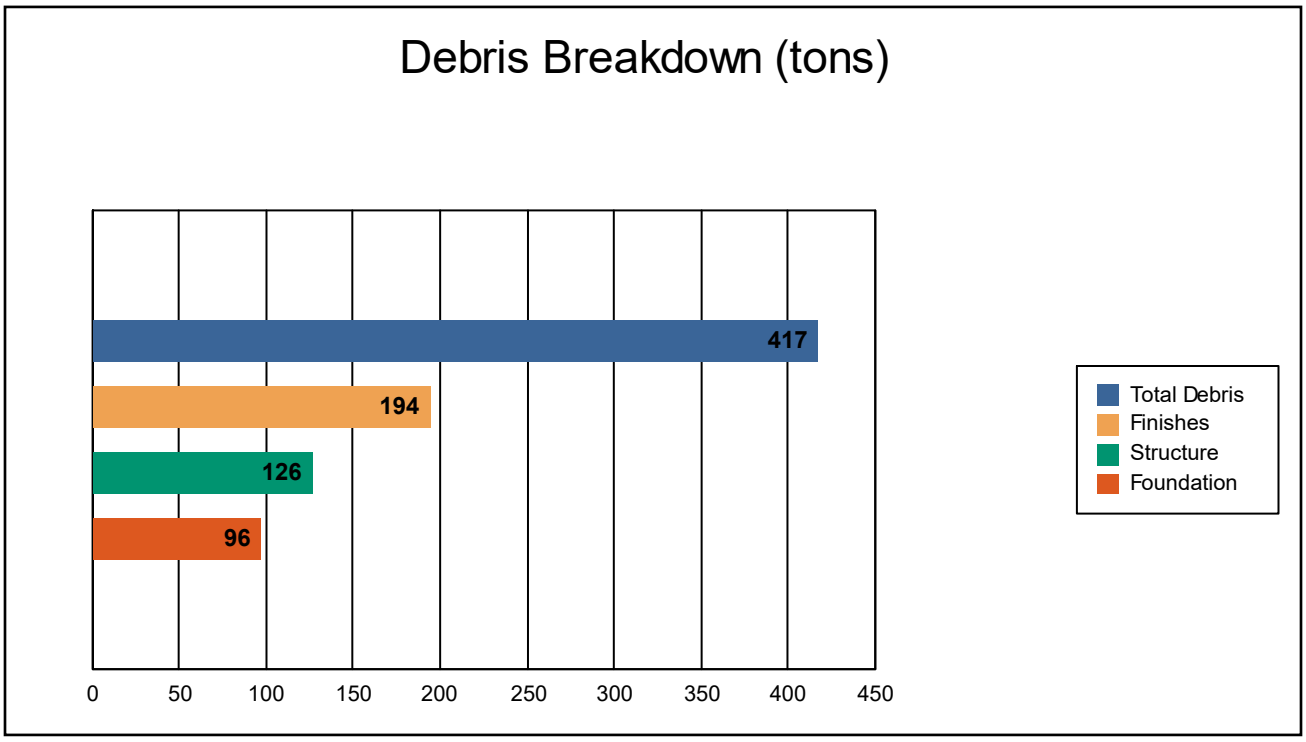
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

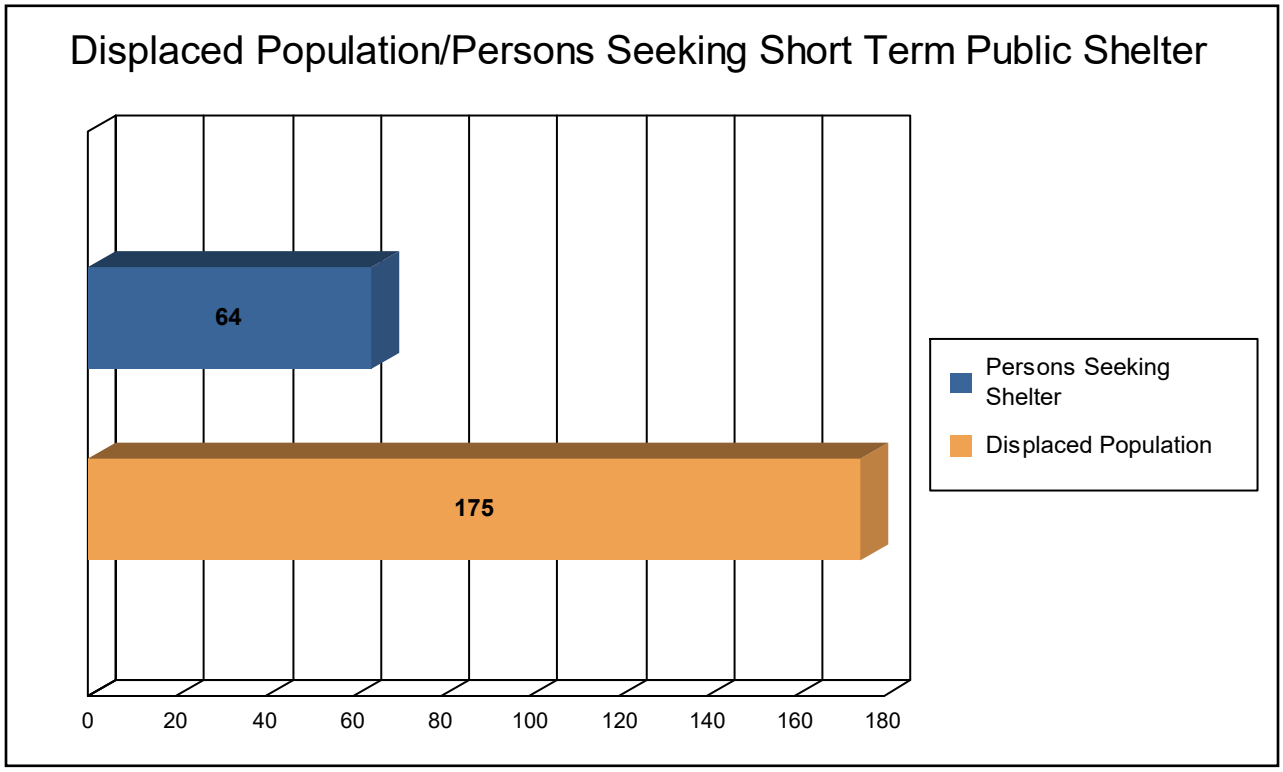


The model estimates that a total of 417 tons of debris will be generated. Of the total amount, Finishes comprises 47% of the total, Structure comprises 30% of the total, and Foundation comprises 23%. If the debris tonnage is converted into an estimated number of truckloads, it will require 17 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 58 households (or 175 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 64 people (out of a total population of 11,190) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 62.37 million dollars, which represents 9.26 % of the total replacement value of the scenario buildings.

Building-Related Losses

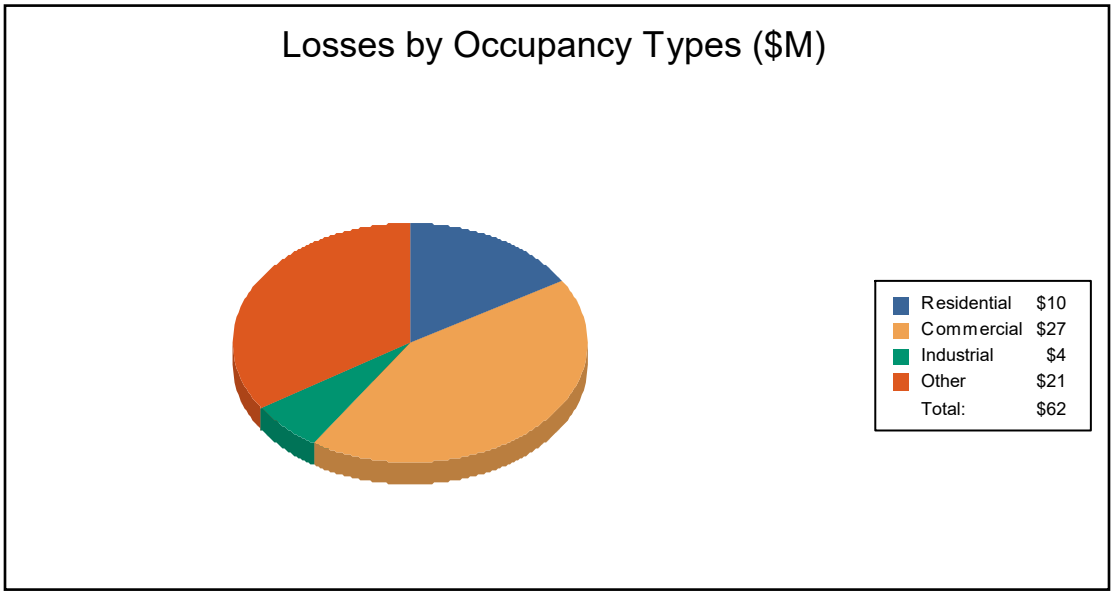
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 31.29 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 16.45% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.37	2.93	1.21	1.17	10.67
	Content	2.67	8.51	2.53	5.13	18.84
	Inventory	0.00	1.49	0.25	0.04	1.78
	Subtotal	**8.04**	**12.92**	**3.99**	**6.34**	**31.29**
Business Interruption						
	Income	0.18	6.04	0.08	0.94	7.24
	Relocation	0.82	1.29	0.05	0.78	2.95
	Rental Income	0.79	0.93	0.01	0.24	1.97
	Wage	0.44	5.47	0.06	12.96	18.93
	Subtotal	**2.23**	**13.74**	**0.20**	**14.92**	**31.08**
ALL	**Total**	**10.26**	**26.66**	**4.19**	**21.26**	**62.37**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,572	1,475,298	2,842,870
Total	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**
Total Study Region	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**

Hazus: Flood Global Risk Report

Region Name: East_Windsor_FL

Flood Scenario: East_Windsor_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 185 census blocks. The region contains over 5 thousand households and has a total population of 11,190 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,216 buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 81.85% of the buildings (and 48.11% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,216 buildings in the region which have an aggregate total replacement value of 2,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,367,572	48.1%
Commercial	982,302	34.6%
Industrial	234,430	8.2%
Agricultural	17,116	0.6%
Religion	22,922	0.8%
Government	97,615	3.4%
Education	120,913	4.3%
Total	**2,842,870**	**100%**

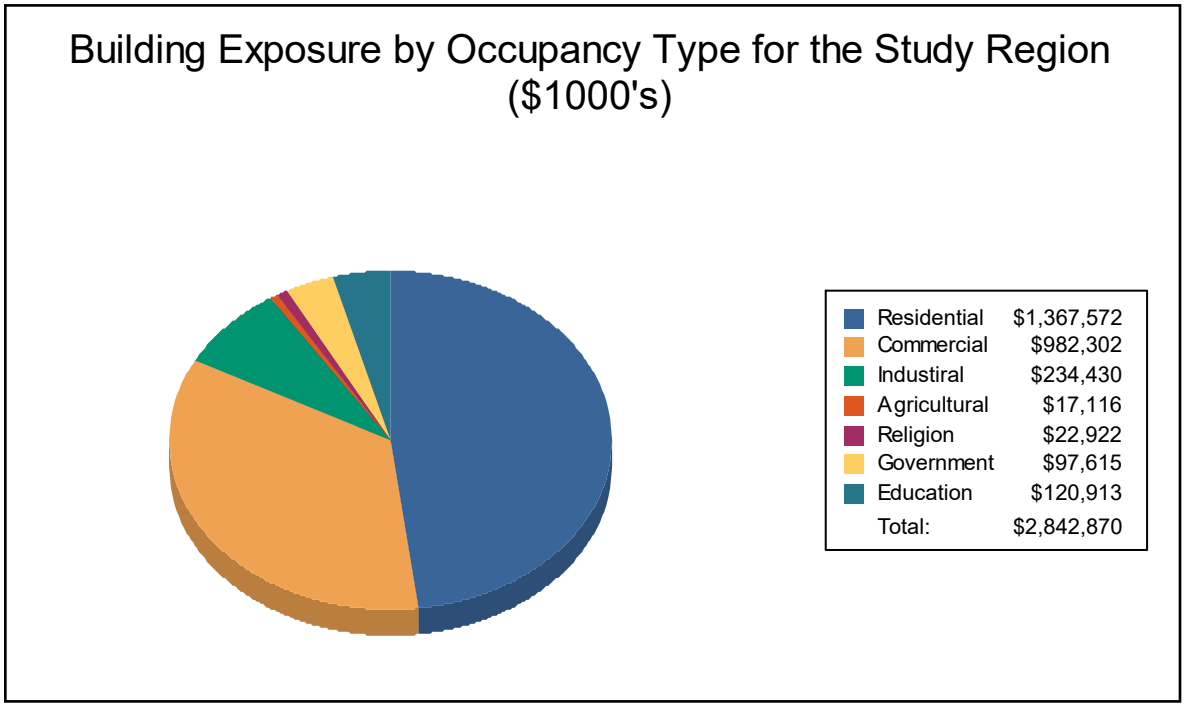
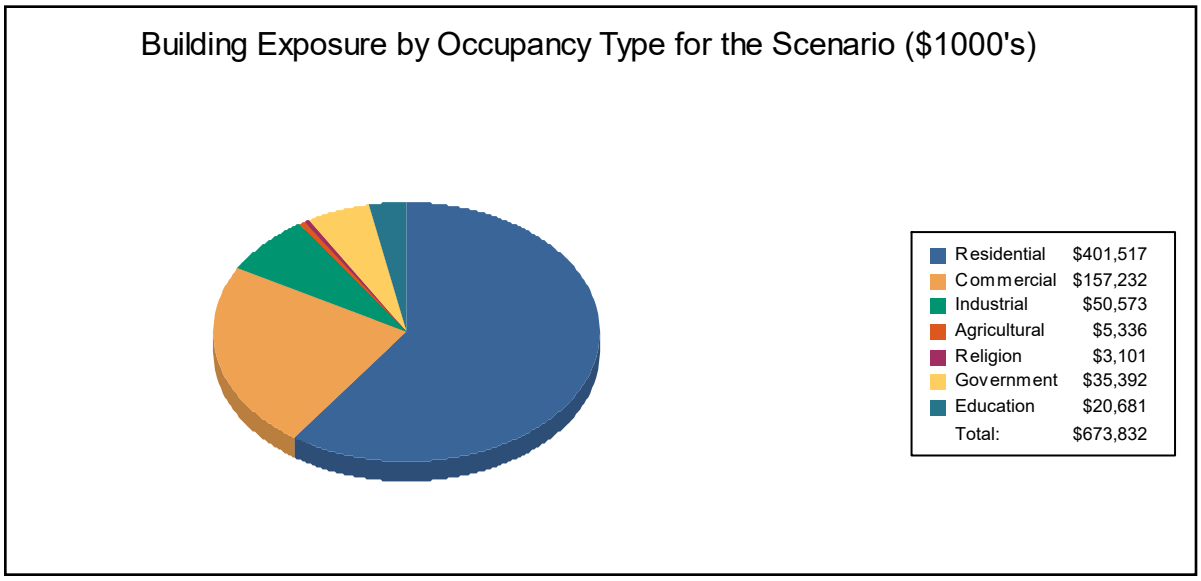


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	401,517	59.6%
Commercial	157,232	23.3%
Industrial	50,573	7.5%
Agricultural	5,336	0.8%
Religion	3,101	0.5%
Government	35,392	5.3%
Education	20,681	3.1%
Total	**673,832**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

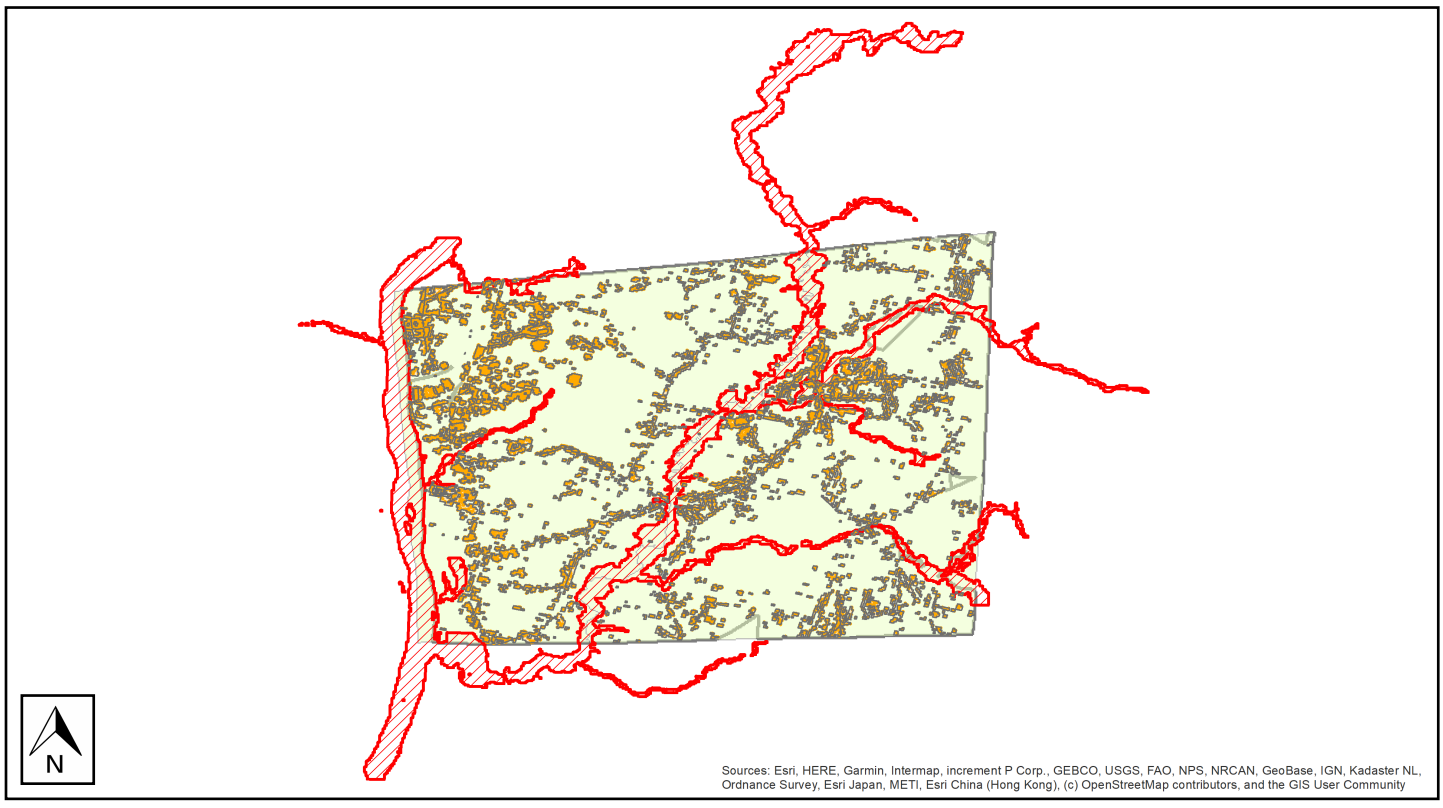
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	East_Windsor_FL
Scenario Name:	East_Windsor_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

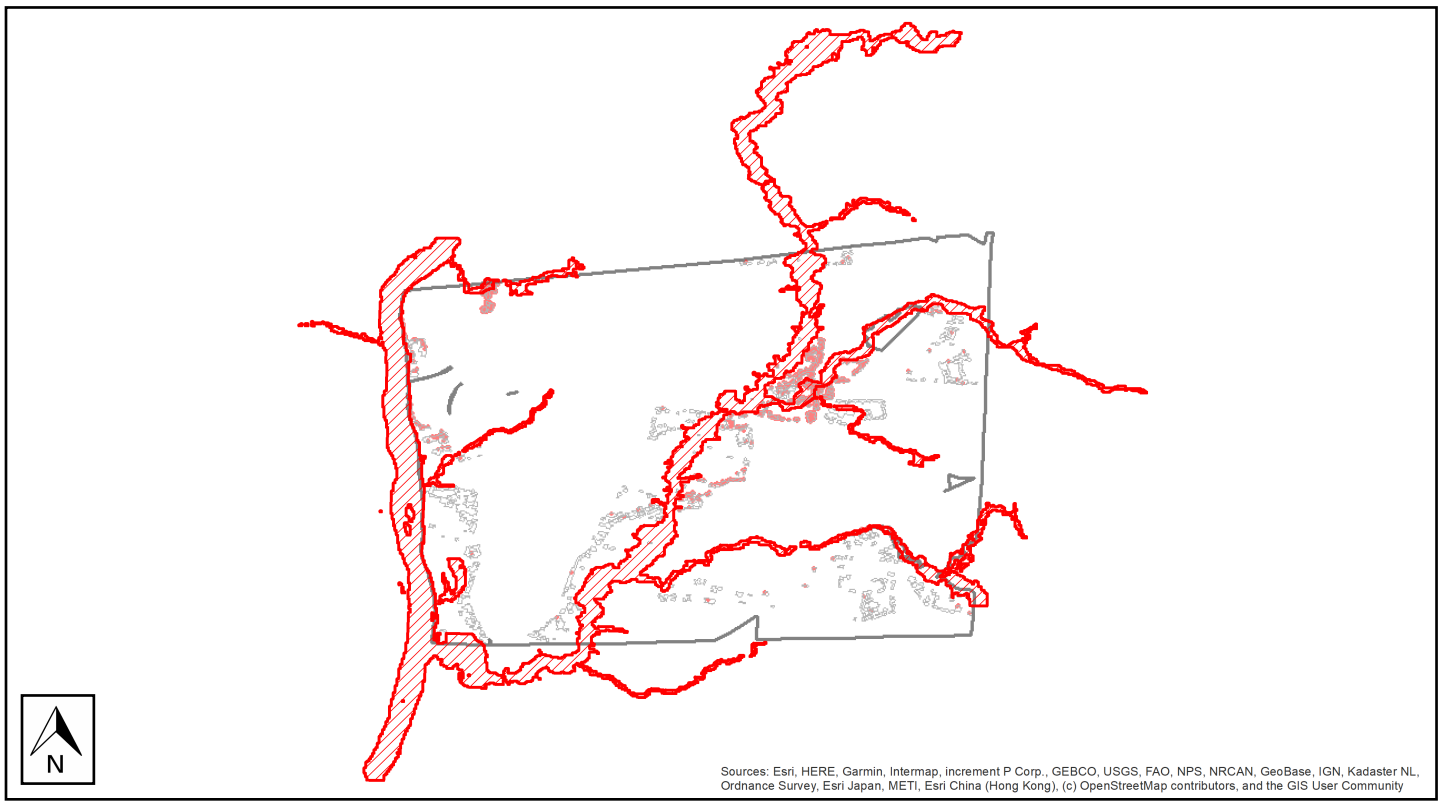


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	3	100
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	1	100
Total	**0**		**0**		**0**		**0**		**0**		**4**	

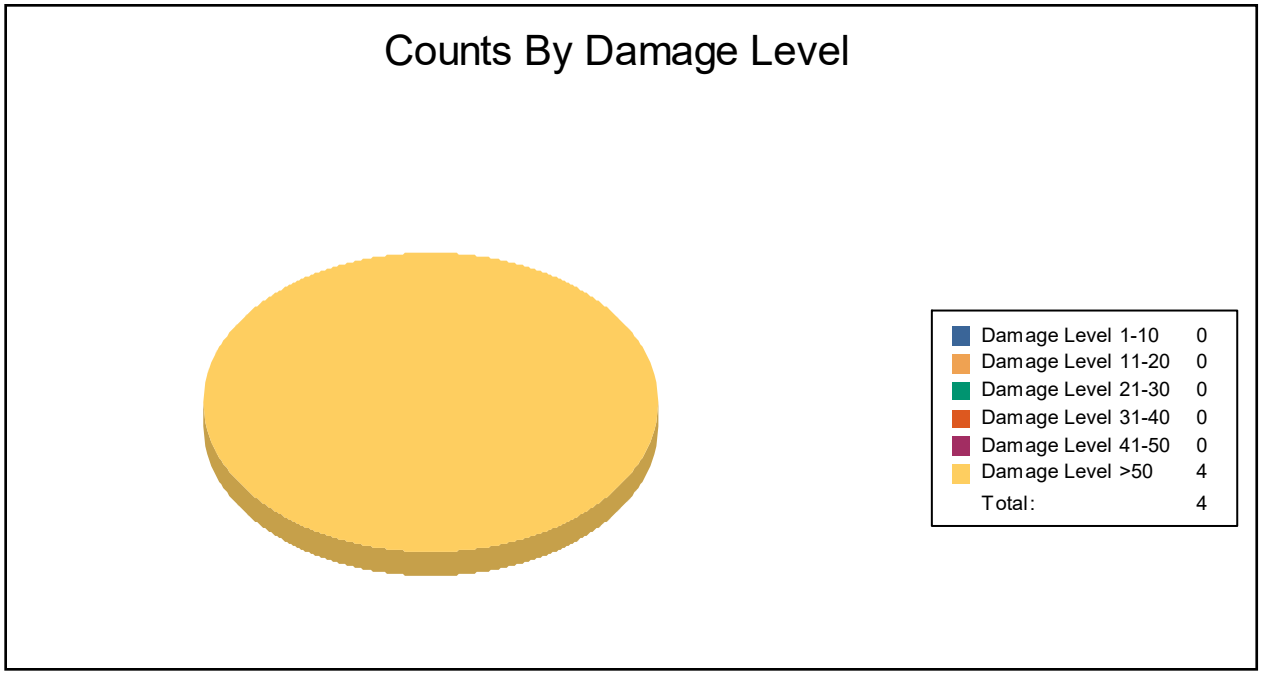


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	1	100
Steel	0	0	0	0	0	0	0	0	0	0	2	100
Wood	0	0	0	0	0	0	0	0	0	0	1	100

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

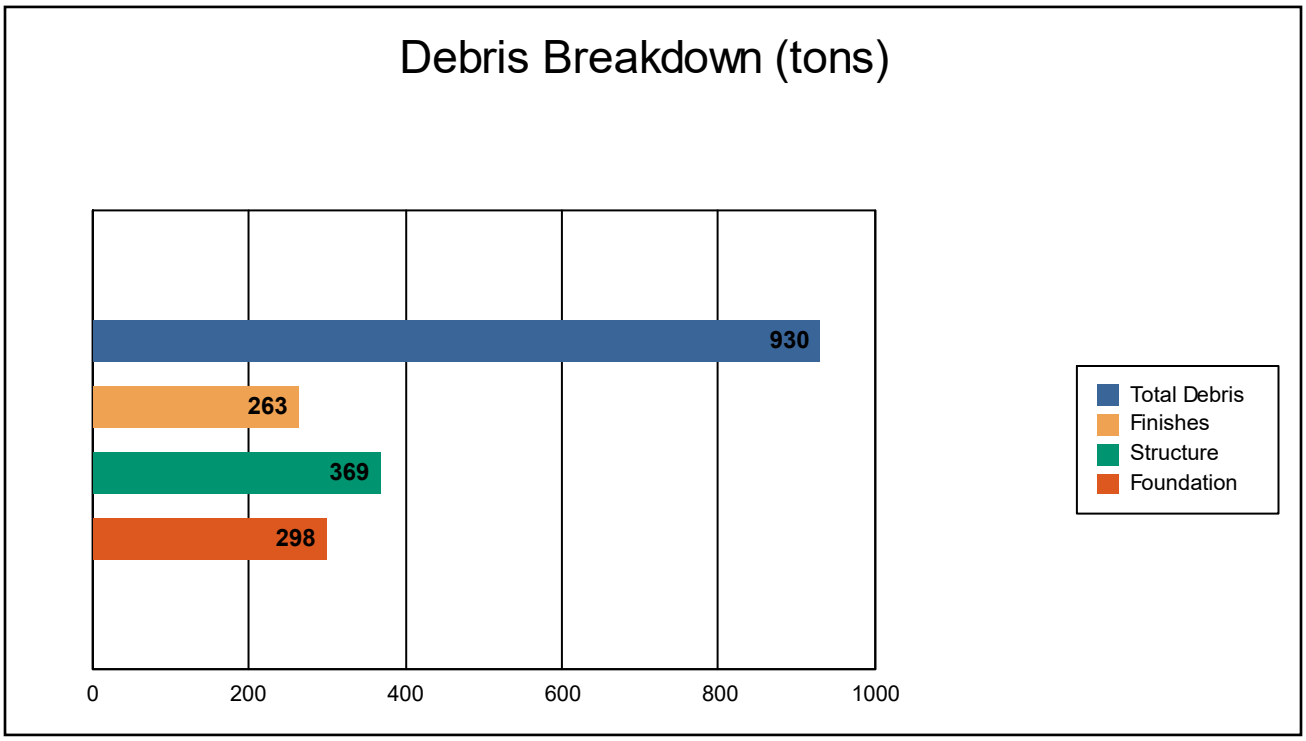
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

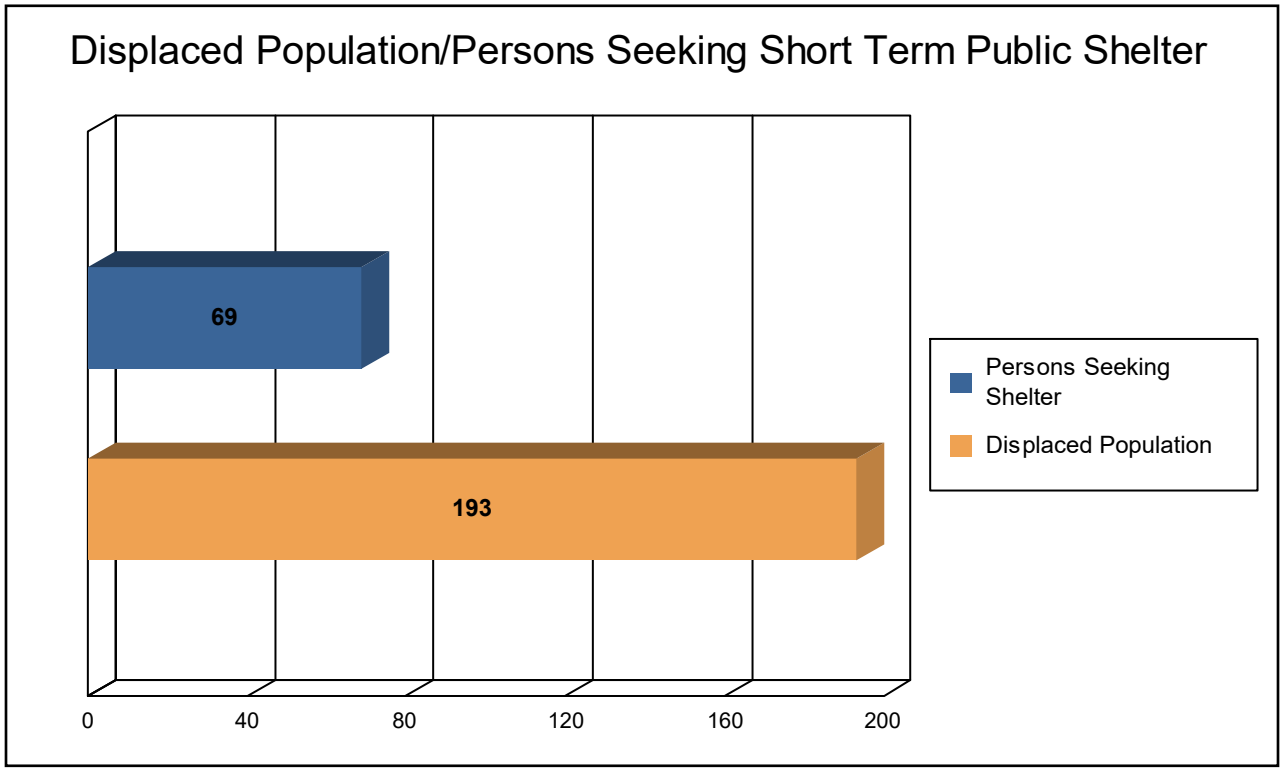


The model estimates that a total of 930 tons of debris will be generated. Of the total amount, Finishes comprises 28% of the total, Structure comprises 40% of the total, and Foundation comprises 32%. If the debris tonnage is converted into an estimated number of truckloads, it will require 38 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 64 households (or 193 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 69 people (out of a total population of 11,190) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 76.90 million dollars, which represents 11.41 % of the total replacement value of the scenario buildings.

Building-Related Losses

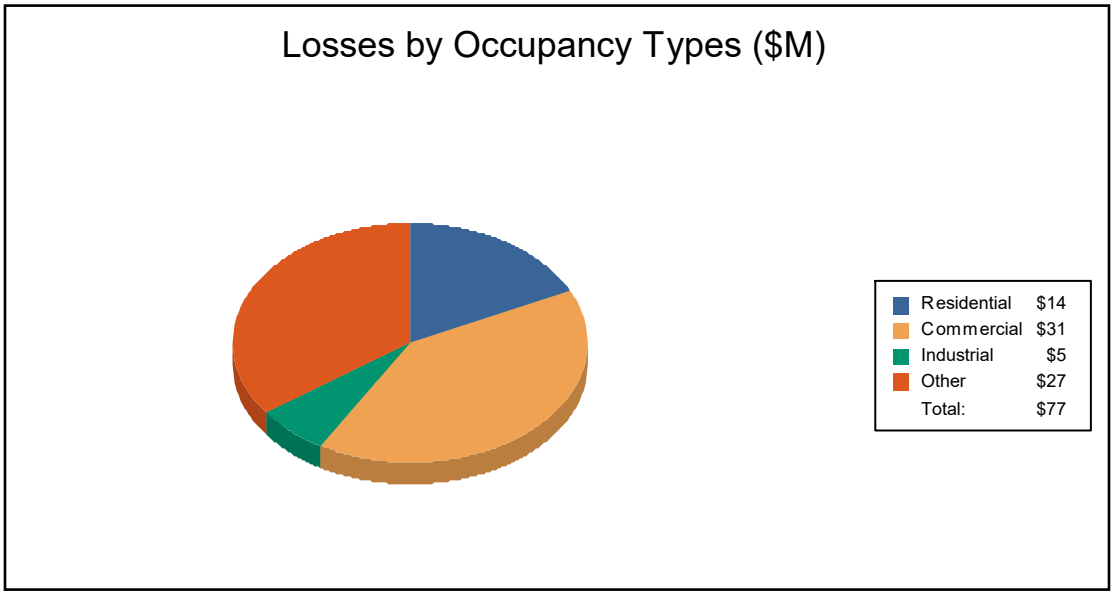
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 39.89 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 17.70% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.42	3.83	1.51	2.87	15.63
	Content	3.52	9.81	3.03	5.81	22.17
	Inventory	0.00	1.73	0.31	0.05	2.09
	Subtotal	**10.94**	**15.37**	**4.85**	**8.74**	**39.89**
Business Interruption						
	Income	0.23	7.01	0.10	1.14	8.47
	Relocation	0.98	1.50	0.06	0.95	3.50
	Rental Income	0.93	1.09	0.01	0.30	2.33
	Wage	0.54	6.36	0.07	15.76	22.72
	Subtotal	**2.68**	**15.95**	**0.24**	**18.14**	**37.01**
ALL	**Total**	**13.61**	**31.32**	**5.09**	**26.88**	**76.90**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,572	1,475,298	2,842,870
Total	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**
Total Study Region	**11,190**	**1,367,572**	**1,475,298**	**2,842,870**

Hazus: Flood Global Risk Report

Region Name: Ellington_FL

Flood Scenario: Ellington_Flood

Print Date: Monday, April 10, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 223 census blocks. The region contains over 7 thousand households and has a total population of 16,426 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,578 buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90.03% of the buildings (and 72.69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,578 buildings in the region which have an aggregate total replacement value of 3,421 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,486,849	72.7%
Commercial	518,201	15.1%
Industrial	192,463	5.6%
Agricultural	4,976	0.1%
Religion	20,768	0.6%
Government	63,569	1.9%
Education	134,204	3.9%
Total	**3,421,030**	**100%**

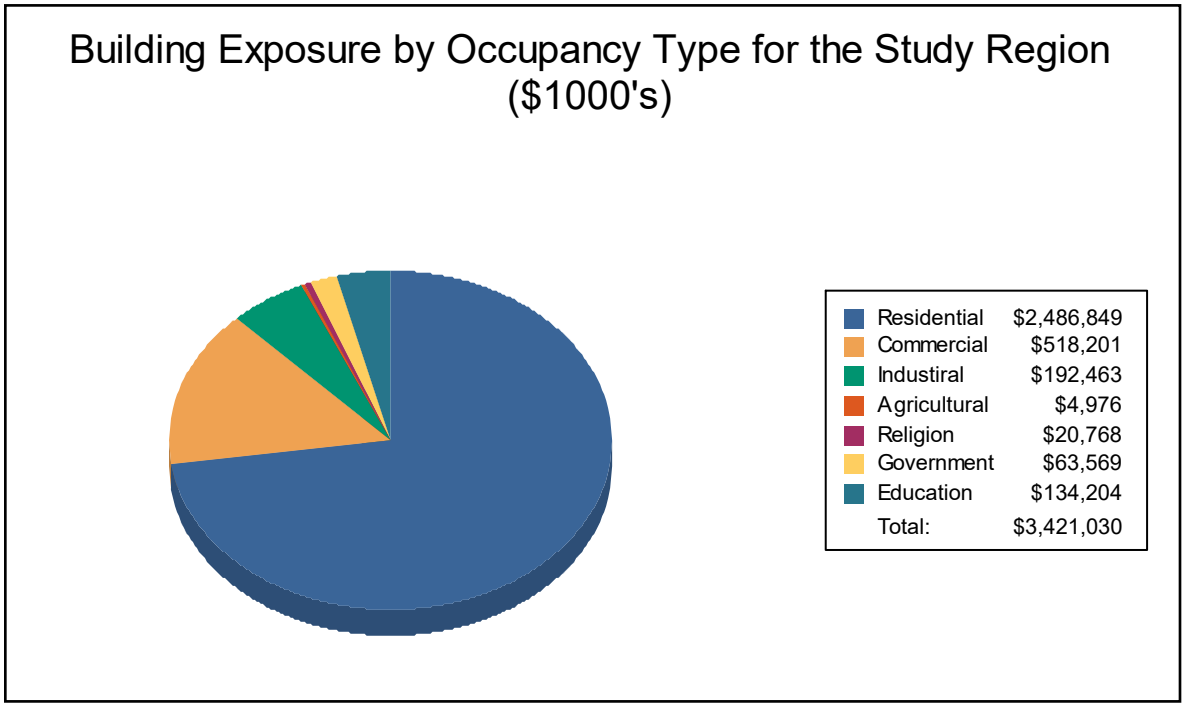
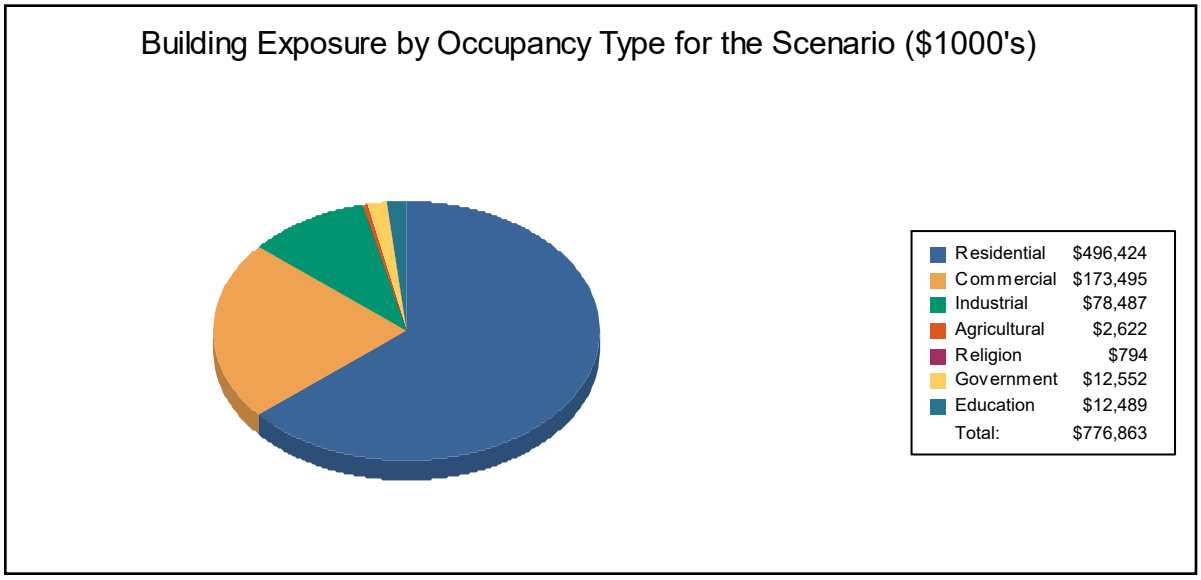


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	496,424	63.9%
Commercial	173,495	22.3%
Industrial	78,487	10.1%
Agricultural	2,622	0.3%
Religion	794	0.1%
Government	12,552	1.6%
Education	12,489	1.6%
Total	**776,863**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 2 fire stations, 1 police station and 1 emergency operation center.

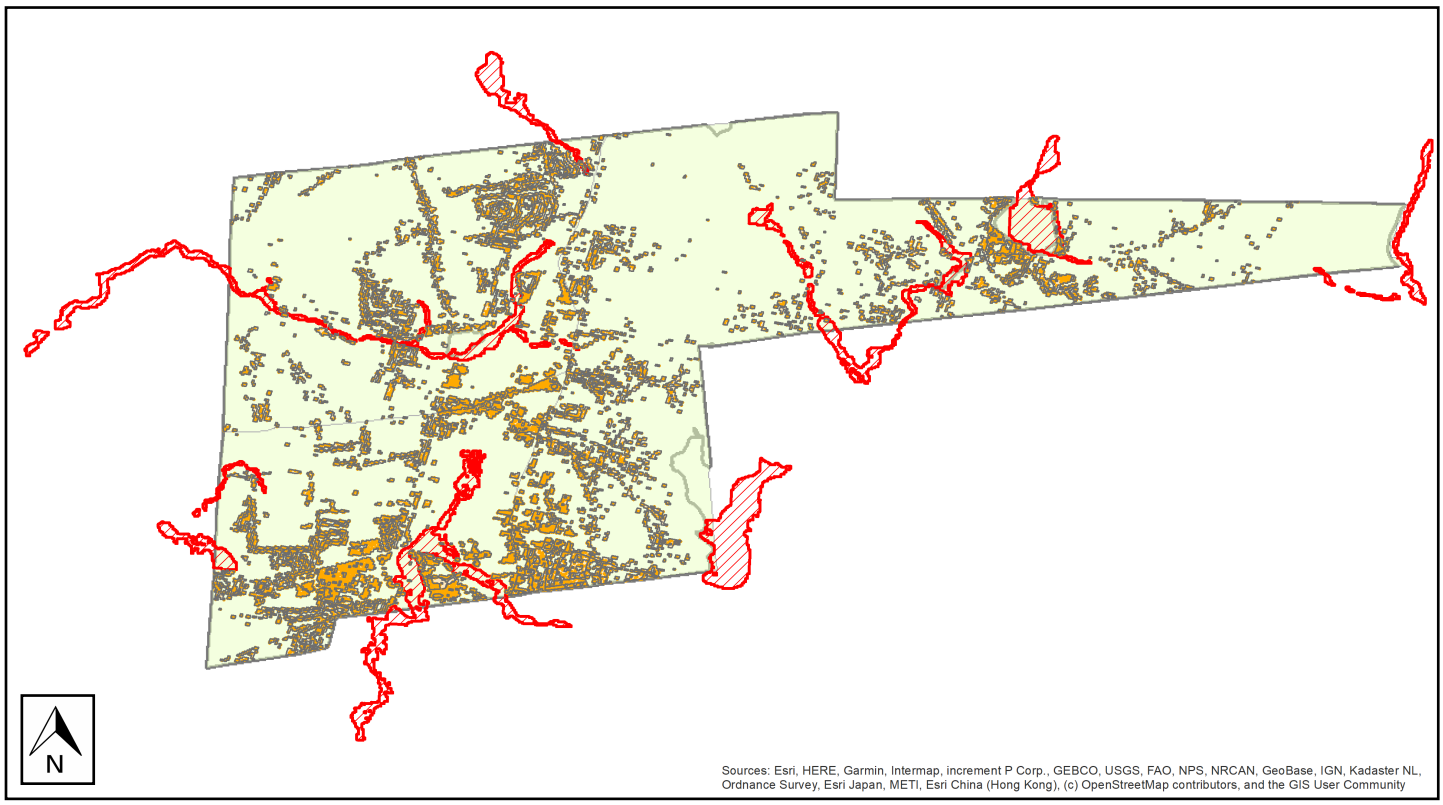
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Ellington_FL
Scenario Name:	Ellington_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 7 buildings will be at least moderately damaged. This is over 76% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

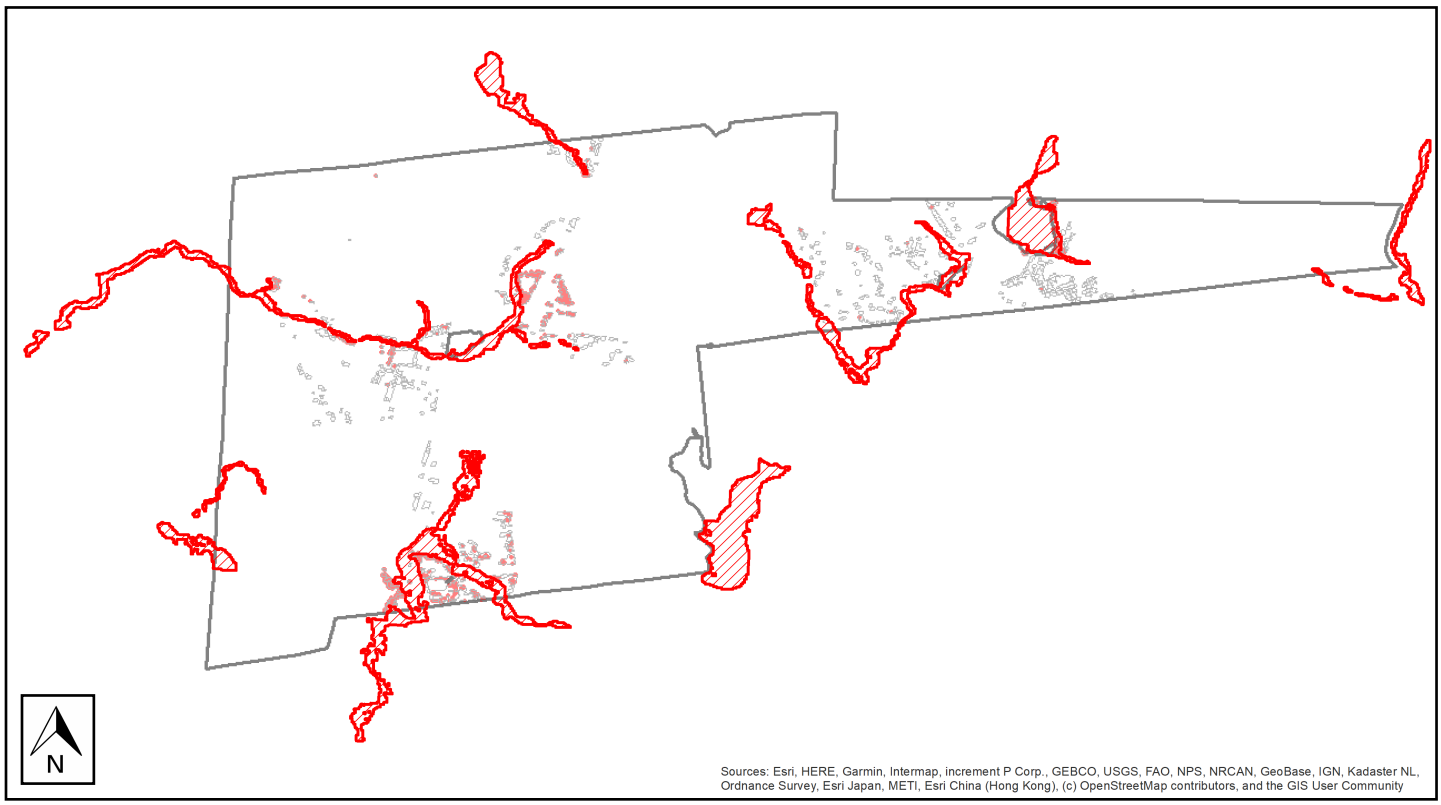


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	15	68	7	32	0	0	0	0	0	0	0	0
Total	**15**		**7**		**0**		**0**		**0**		**0**	

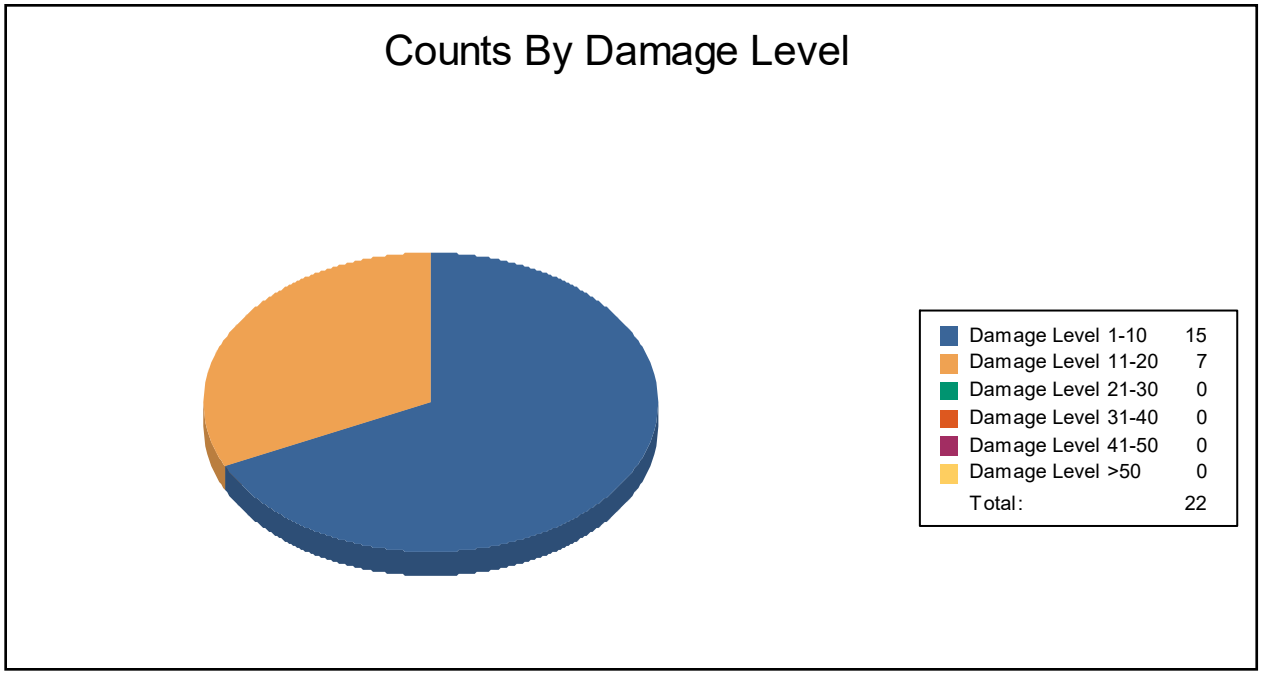


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	15	68	7	32	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

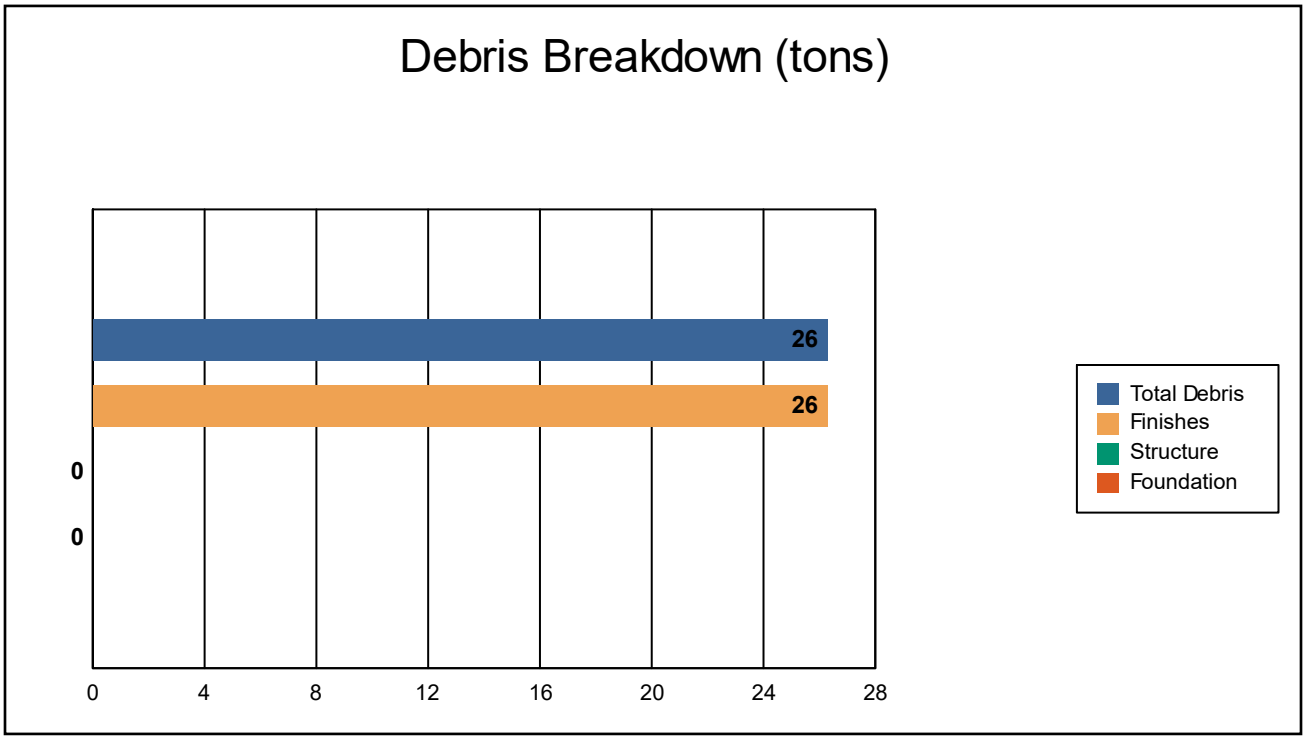
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

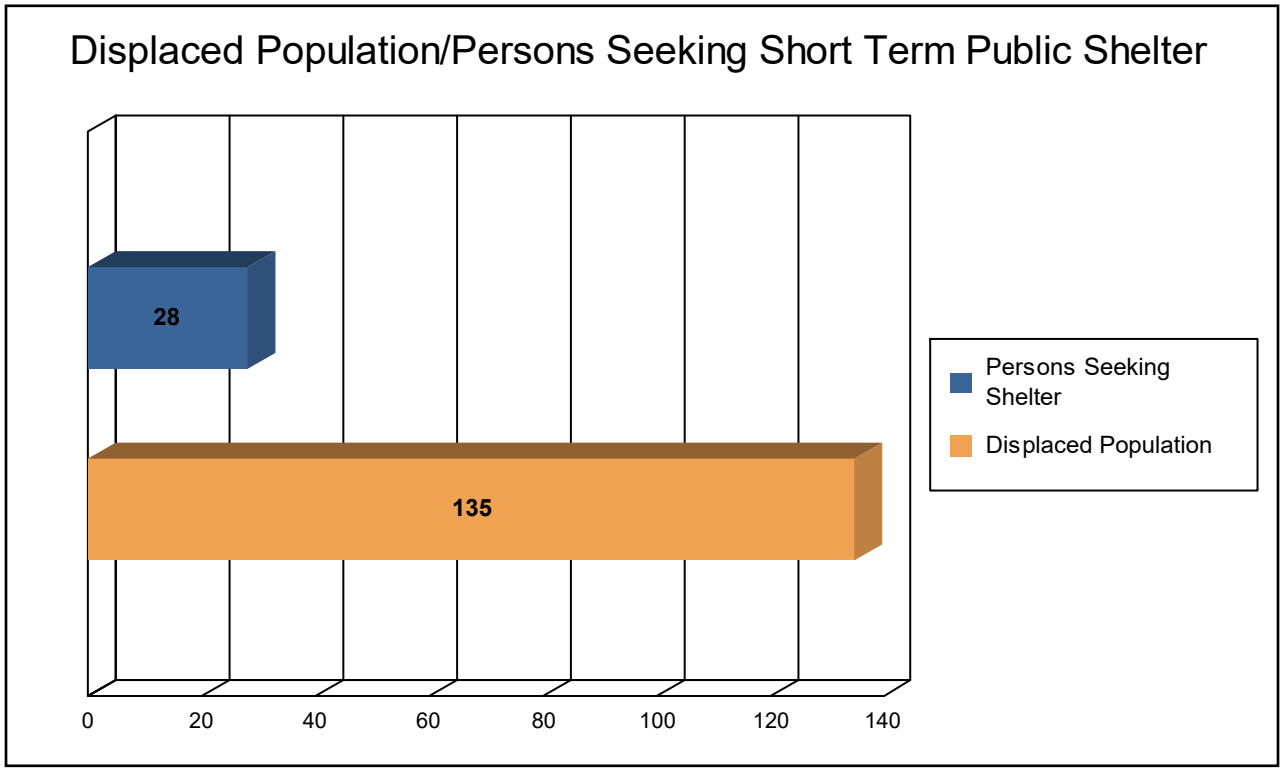


The model estimates that a total of 26 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 45 households (or 135 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 28 people (out of a total population of 16,426) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 10.35 million dollars, which represents 1.33 % of the total replacement value of the scenario buildings.

Building-Related Losses

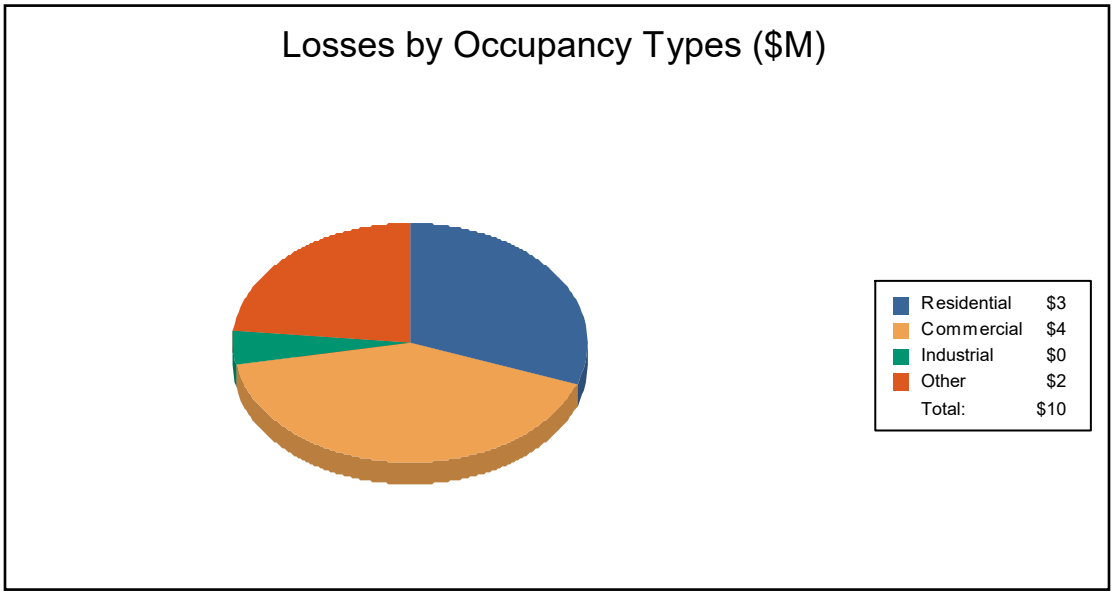
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 3.74 million dollars. 64% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 30.42% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.32	0.17	0.13	0.06	1.68
	Content	0.64	0.67	0.30	0.37	1.99
	Inventory	0.00	0.04	0.04	0.00	0.08
	Subtotal	**1.96**	**0.88**	**0.47**	**0.43**	**3.74**
Business Interruption						
	Income	0.00	1.21	0.01	0.17	1.39
	Relocation	0.85	0.21	0.01	0.11	1.18
	Rental Income	0.34	0.13	0.00	0.02	0.50
	Wage	0.00	1.87	0.02	1.67	3.55
	Subtotal	**1.19**	**3.42**	**0.03**	**1.98**	**6.61**
ALL	**Total**	**3.15**	**4.30**	**0.50**	**2.41**	**10.35**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,486,849	934,181	3,421,030
Total	**16,426**	**2,486,849**	**934,181**	**3,421,030**
Total Study Region	**16,426**	**2,486,849**	**934,181**	**3,421,030**

Hazus: Flood Global Risk Report

Region Name: Ellington_FL

Flood Scenario: Ellington_Flood

Print Date: Monday, April 10, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 223 census blocks. The region contains over 7 thousand households and has a total population of 16,426 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,578 buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90.03% of the buildings (and 72.69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,578 buildings in the region which have an aggregate total replacement value of 3,421 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,486,849	72.7%
Commercial	518,201	15.1%
Industrial	192,463	5.6%
Agricultural	4,976	0.1%
Religion	20,768	0.6%
Government	63,569	1.9%
Education	134,204	3.9%
Total	**3,421,030**	**100%**

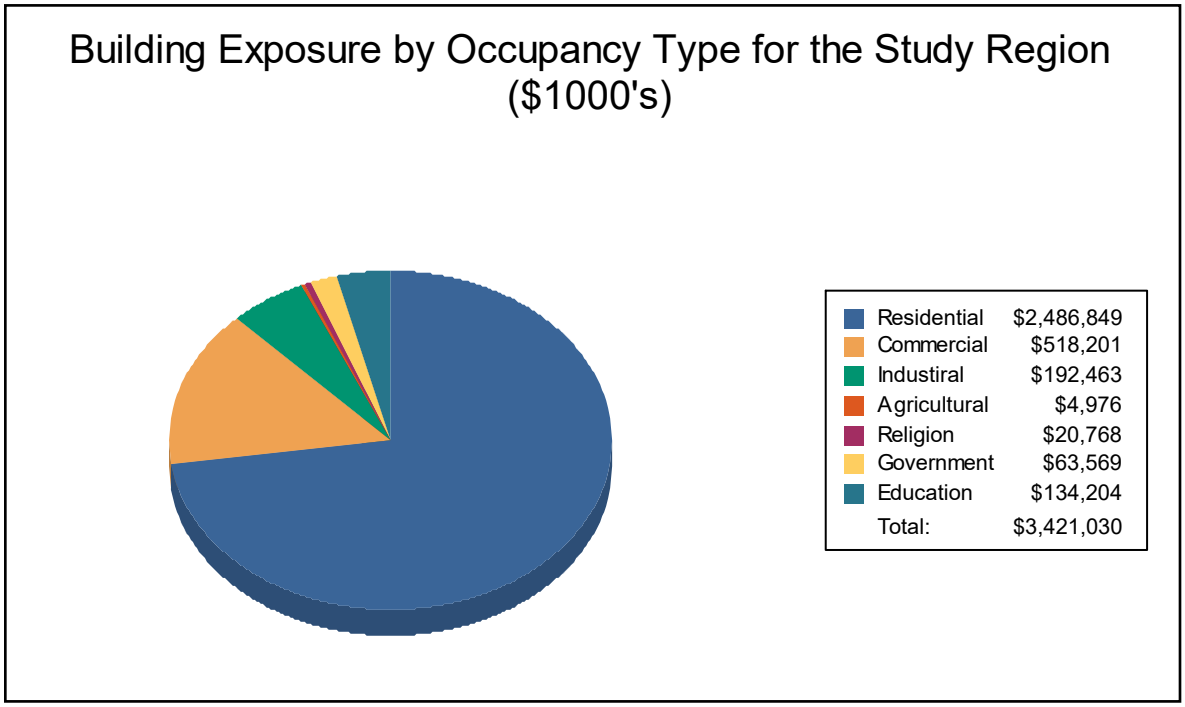
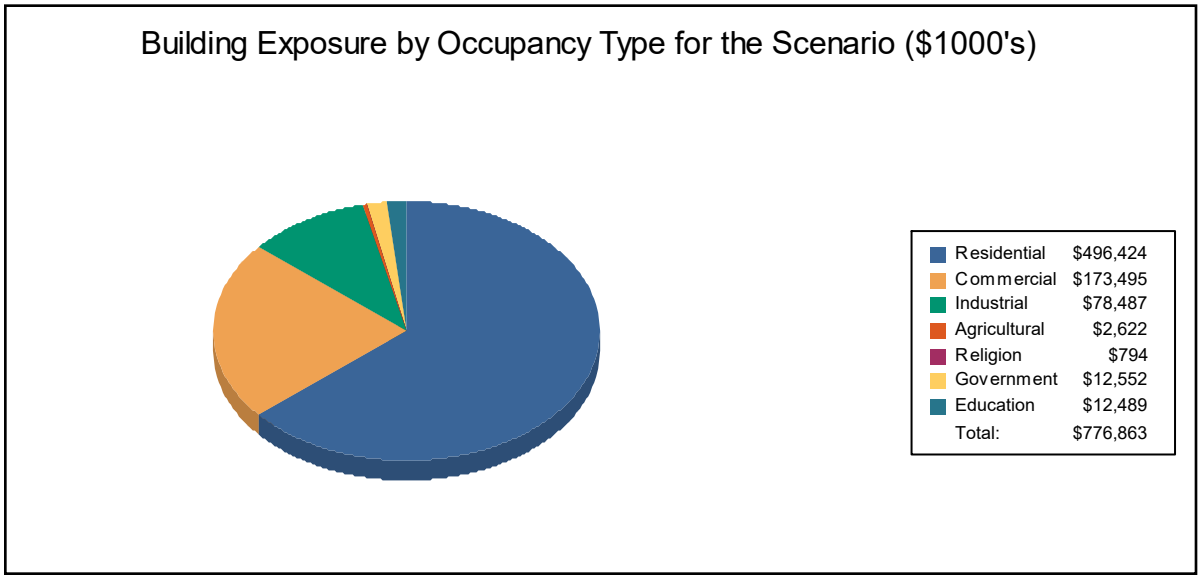


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	496,424	63.9%
Commercial	173,495	22.3%
Industrial	78,487	10.1%
Agricultural	2,622	0.3%
Religion	794	0.1%
Government	12,552	1.6%
Education	12,489	1.6%
Total	**776,863**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 2 fire stations, 1 police station and 1 emergency operation center.

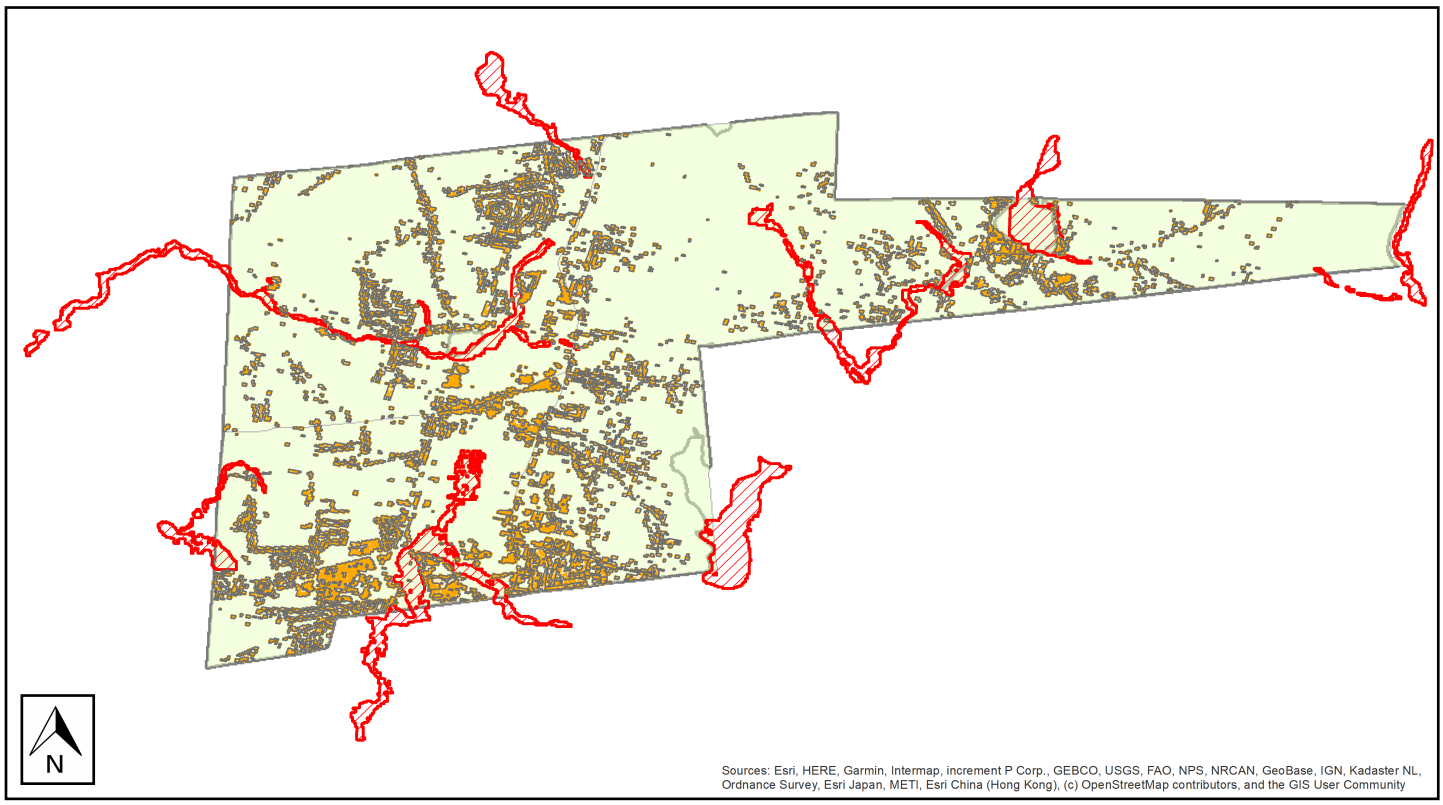
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Ellington_FL
Scenario Name:	Ellington_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 83% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

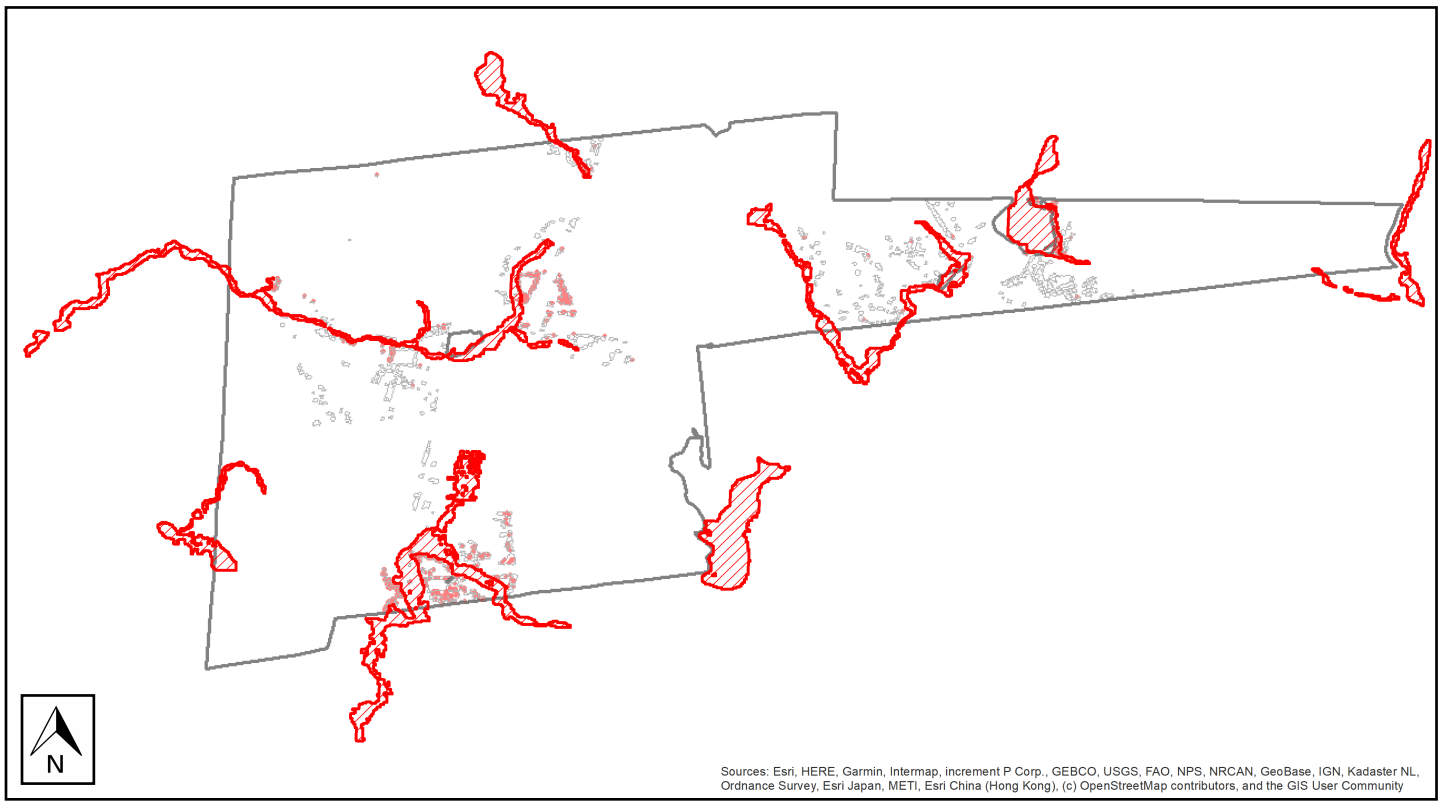


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	15	63	9	38	0	0	0	0	0	0	0	0
Total	**15**		**9**		**0**		**0**		**0**		**0**	

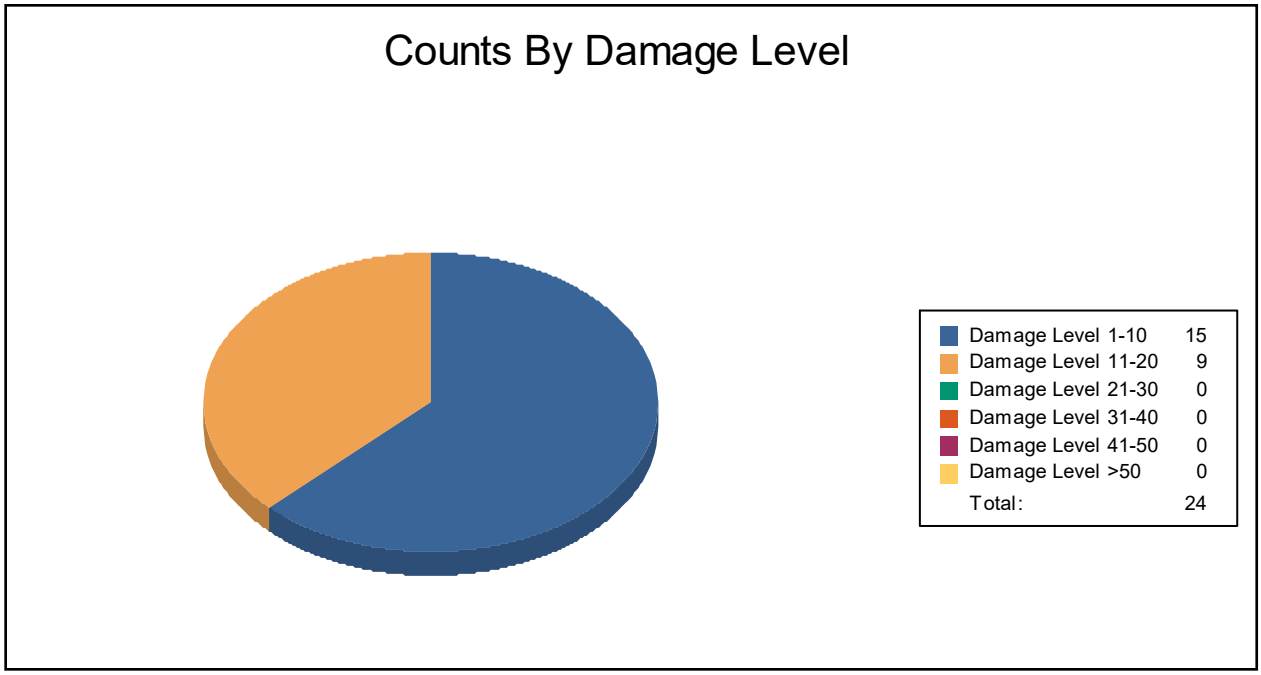


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	15	63	9	38	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

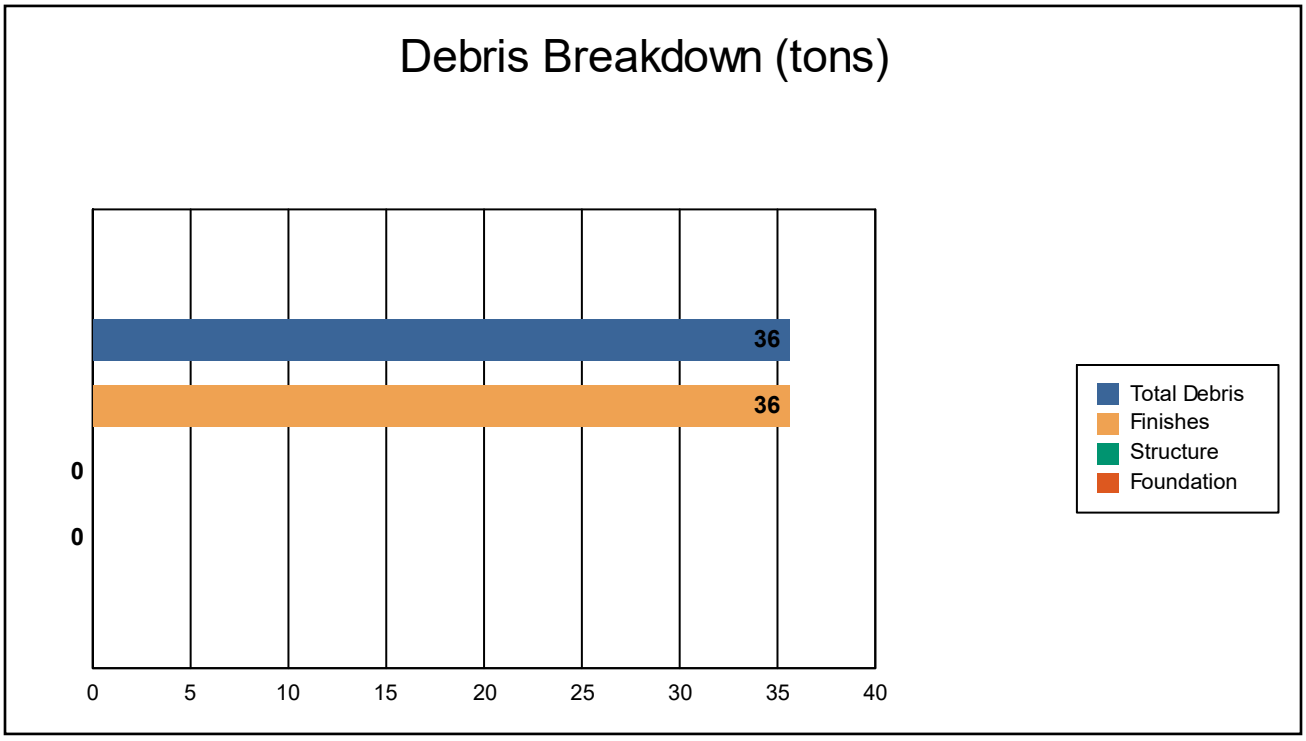
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

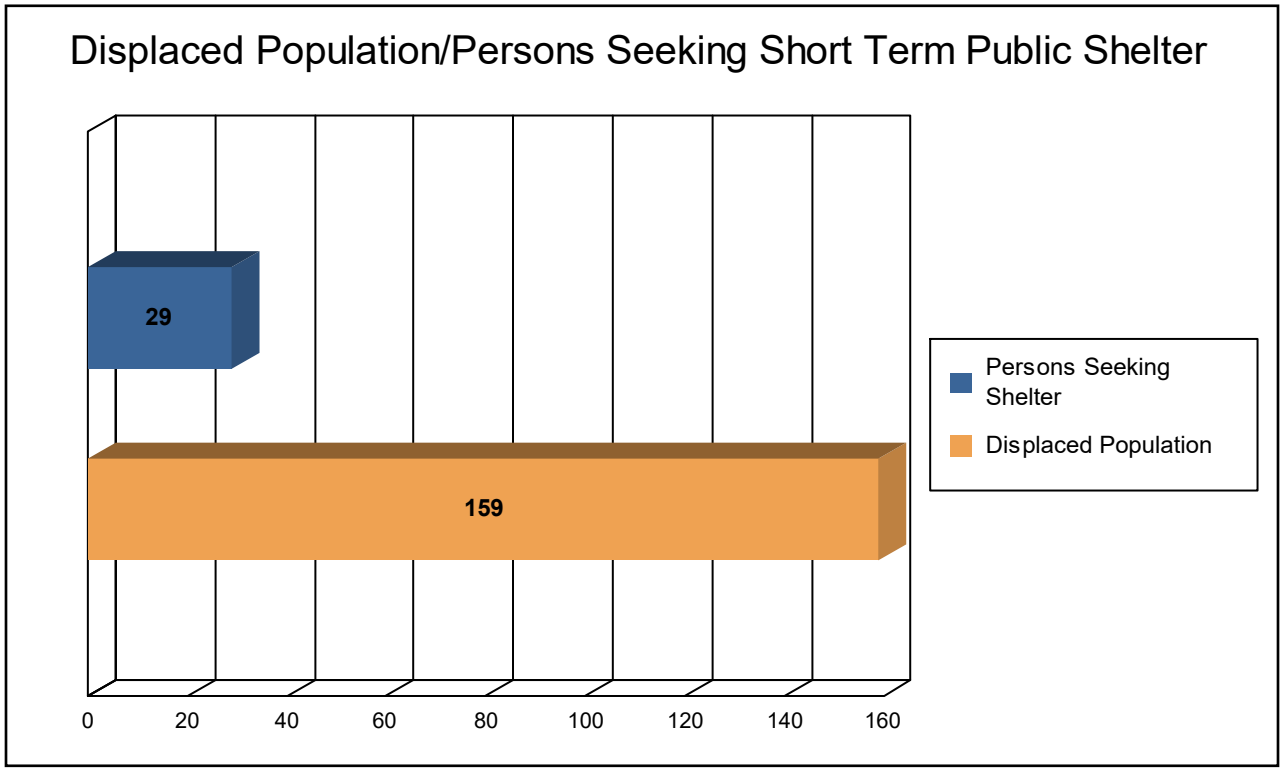


The model estimates that a total of 36 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 53 households (or 159 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 29 people (out of a total population of 16,426) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 13.25 million dollars, which represents 1.71 % of the total replacement value of the scenario buildings.

Building-Related Losses

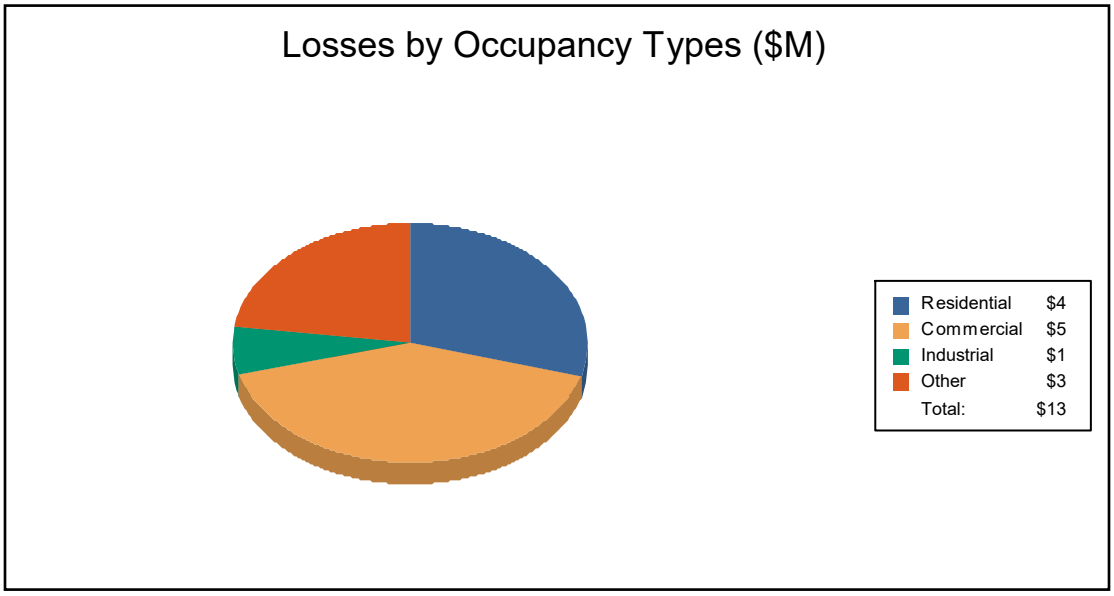
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 5.32 million dollars. 60% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 29.58% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.77	0.24	0.21	0.08	2.30
	Content	0.84	1.05	0.50	0.51	2.89
	Inventory	0.00	0.06	0.07	0.00	0.13
	Subtotal	**2.60**	**1.35**	**0.78**	**0.59**	**5.32**
Business Interruption						
	Income	0.00	1.53	0.02	0.22	1.76
	Relocation	0.94	0.25	0.02	0.14	1.34
	Rental Income	0.38	0.16	0.00	0.03	0.57
	Wage	0.00	2.17	0.03	2.06	4.26
	Subtotal	**1.32**	**4.11**	**0.06**	**2.44**	**7.93**
ALL	**Total**	**3.92**	**5.46**	**0.84**	**3.03**	**13.25**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,486,849	934,181	3,421,030
Total	**16,426**	**2,486,849**	**934,181**	**3,421,030**
Total Study Region	**16,426**	**2,486,849**	**934,181**	**3,421,030**

Hazus: Flood Global Risk Report

Region Name: Ellington_FL

Flood Scenario: Ellington_Flood

Print Date: Monday, April 10, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 223 census blocks. The region contains over 7 thousand households and has a total population of 16,426 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,578 buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90.03% of the buildings (and 72.69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,578 buildings in the region which have an aggregate total replacement value of 3,421 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,486,849	72.7%
Commercial	518,201	15.1%
Industrial	192,463	5.6%
Agricultural	4,976	0.1%
Religion	20,768	0.6%
Government	63,569	1.9%
Education	134,204	3.9%
Total	**3,421,030**	**100%**

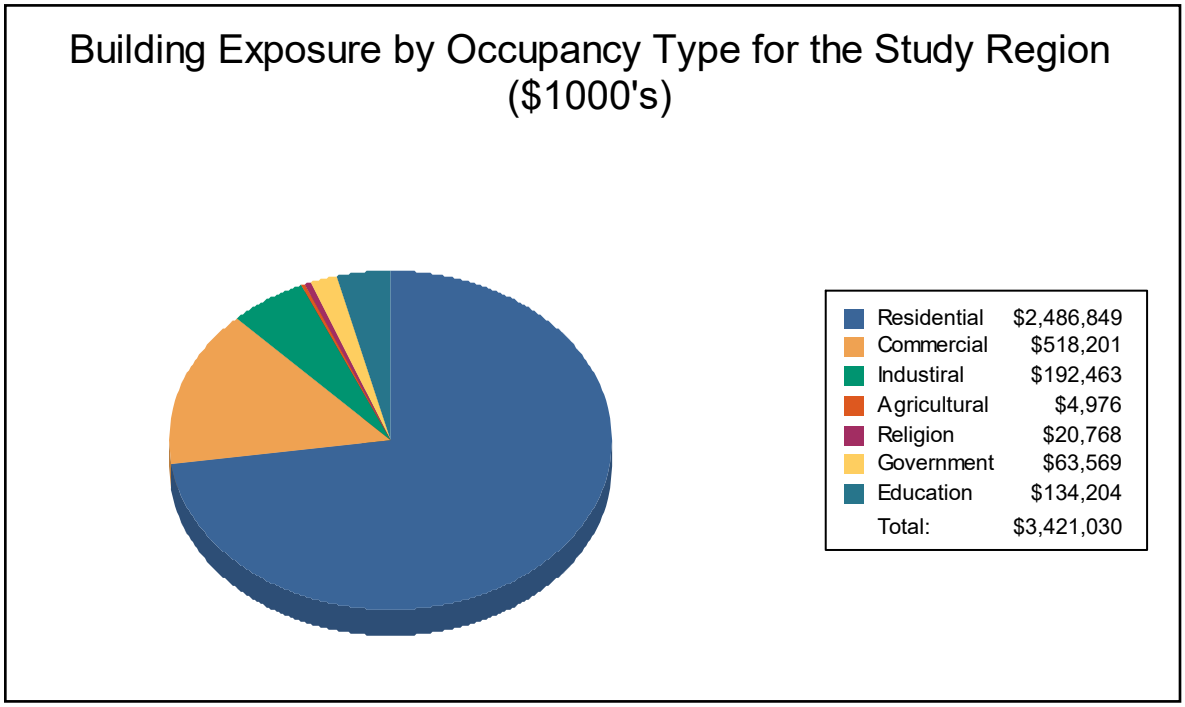
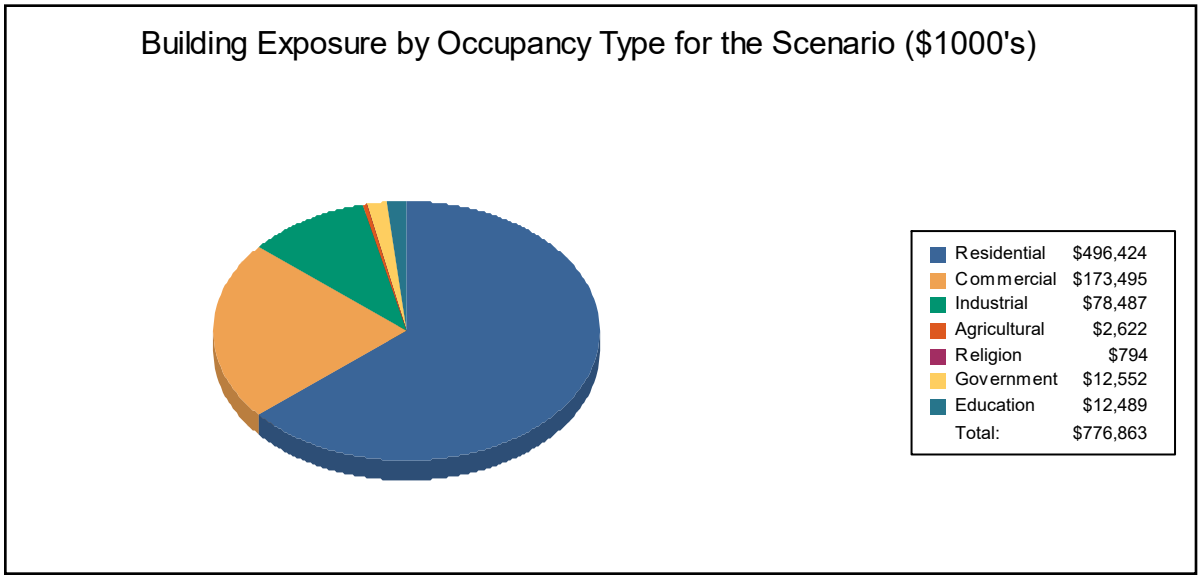


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	496,424	63.9%
Commercial	173,495	22.3%
Industrial	78,487	10.1%
Agricultural	2,622	0.3%
Religion	794	0.1%
Government	12,552	1.6%
Education	12,489	1.6%
Total	**776,863**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 2 fire stations, 1 police station and 1 emergency operation center.

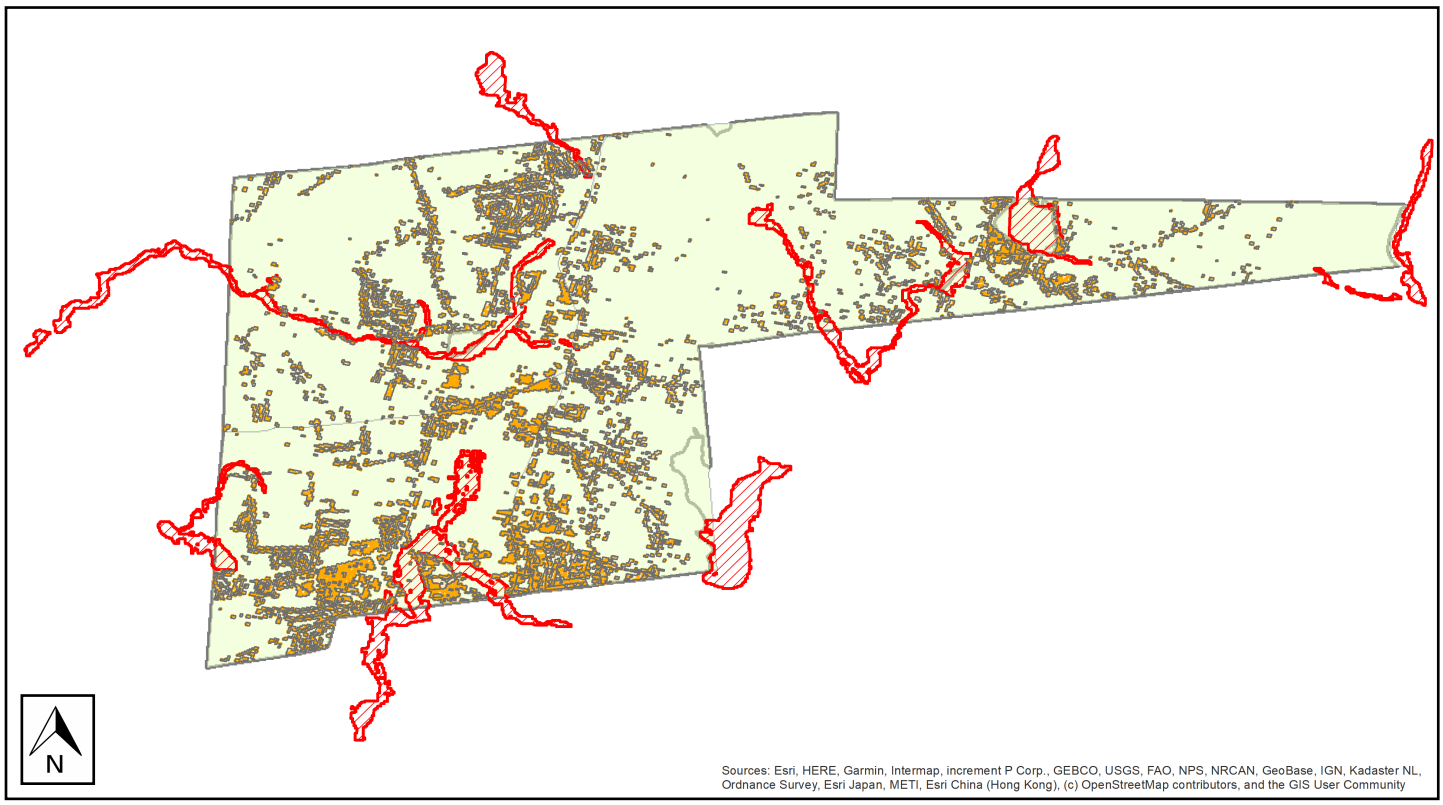
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Ellington_FL
Scenario Name:	Ellington_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 84% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

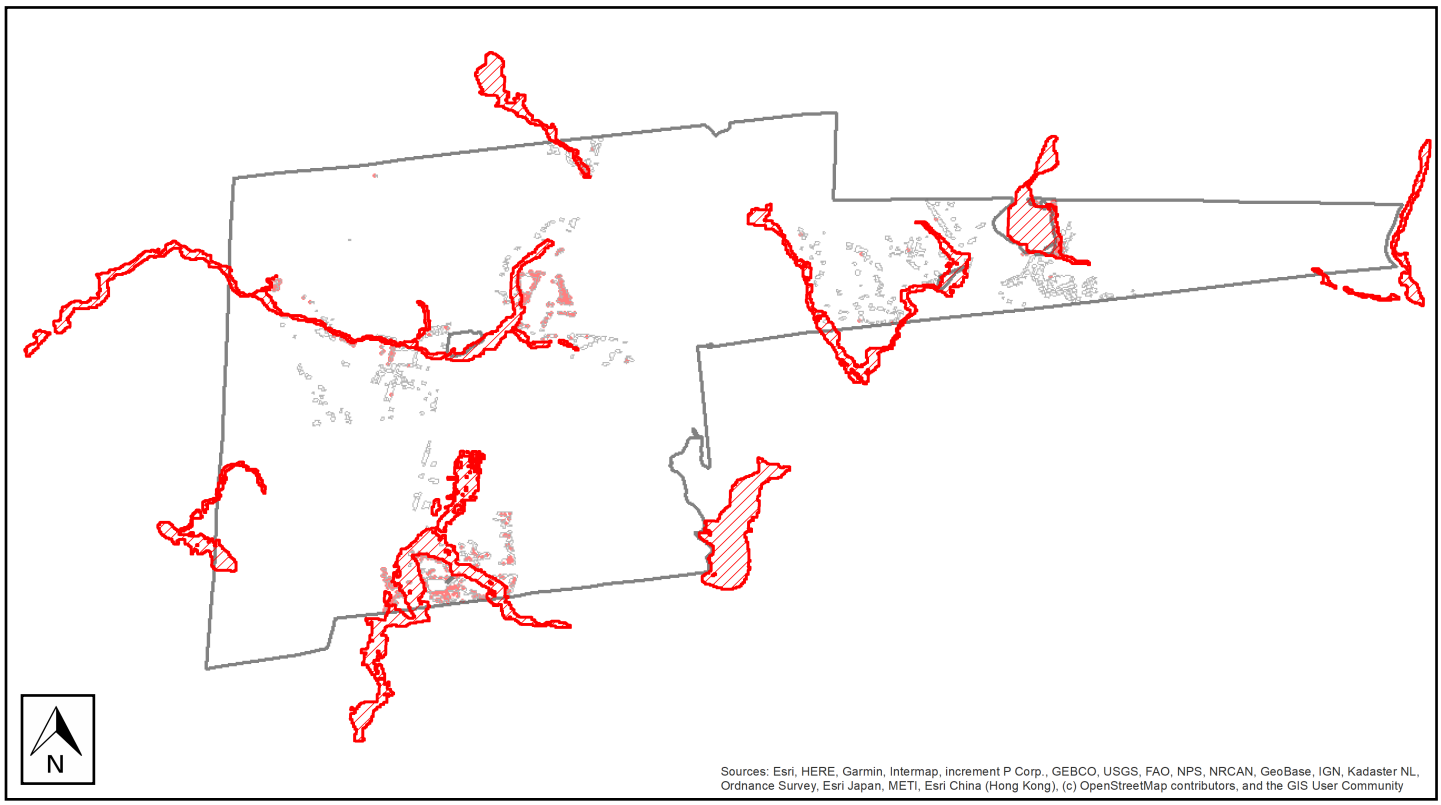


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	17	65	9	35	0	0	0	0	0	0	0	0
Total	**17**		**9**		**0**		**0**		**0**		**0**	

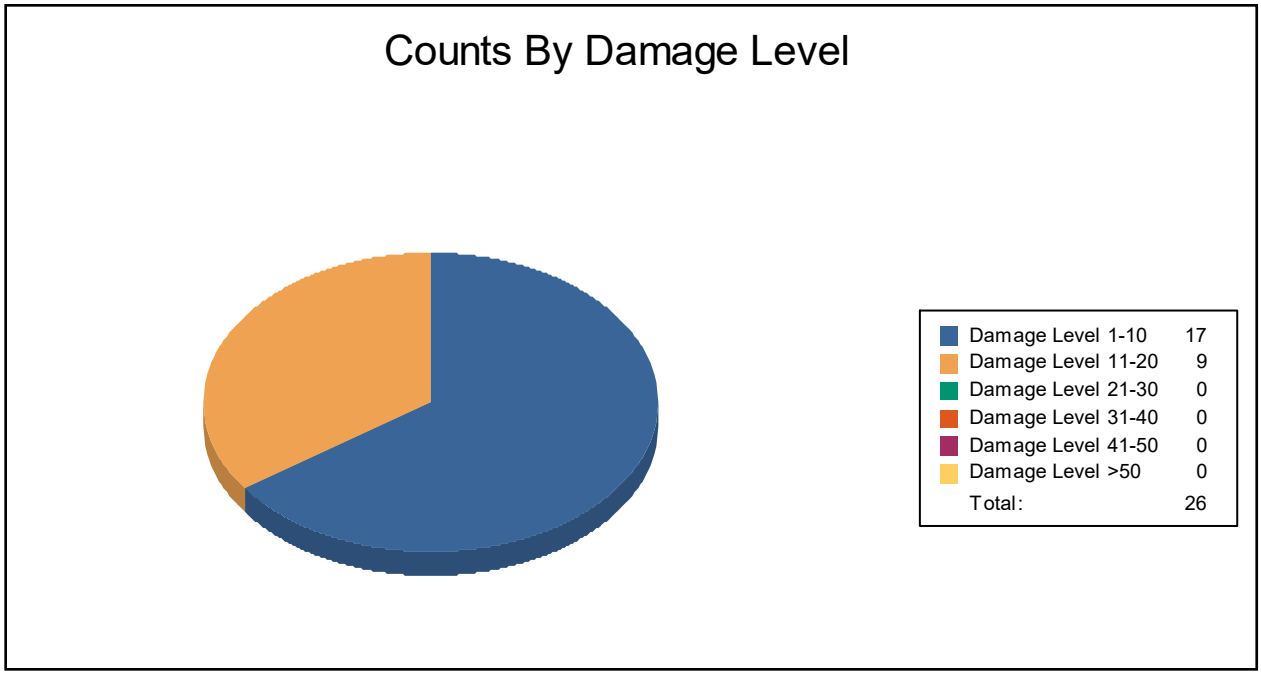


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	17	65	9	35	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

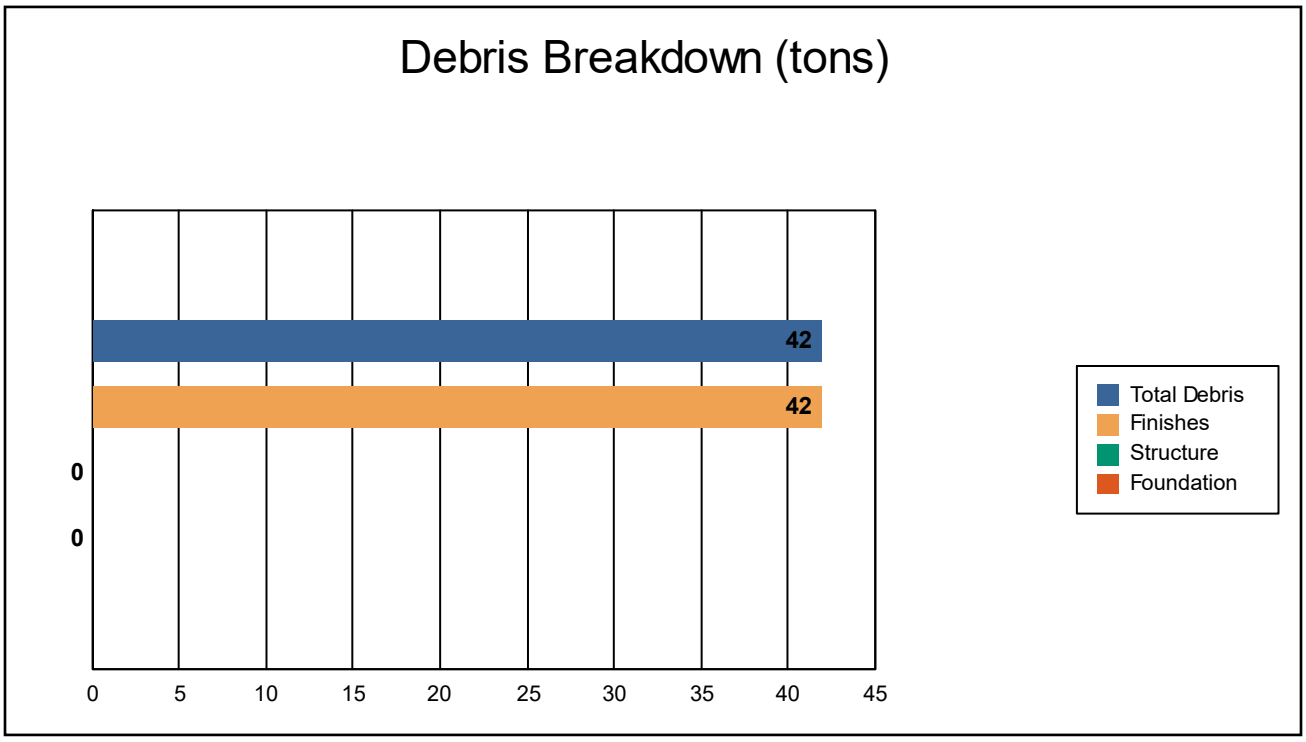
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

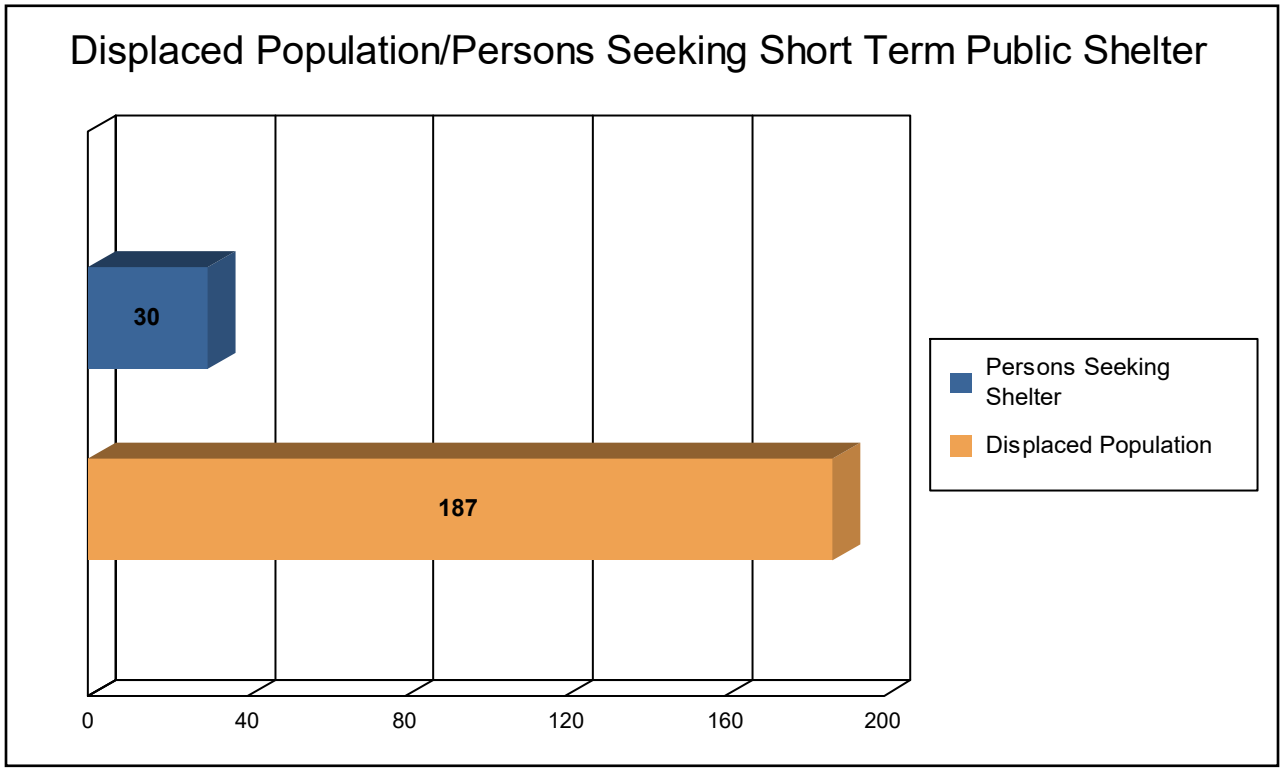


The model estimates that a total of 42 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 62 households (or 187 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 30 people (out of a total population of 16,426) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 17.09 million dollars, which represents 2.20 % of the total replacement value of the scenario buildings.

Building-Related Losses

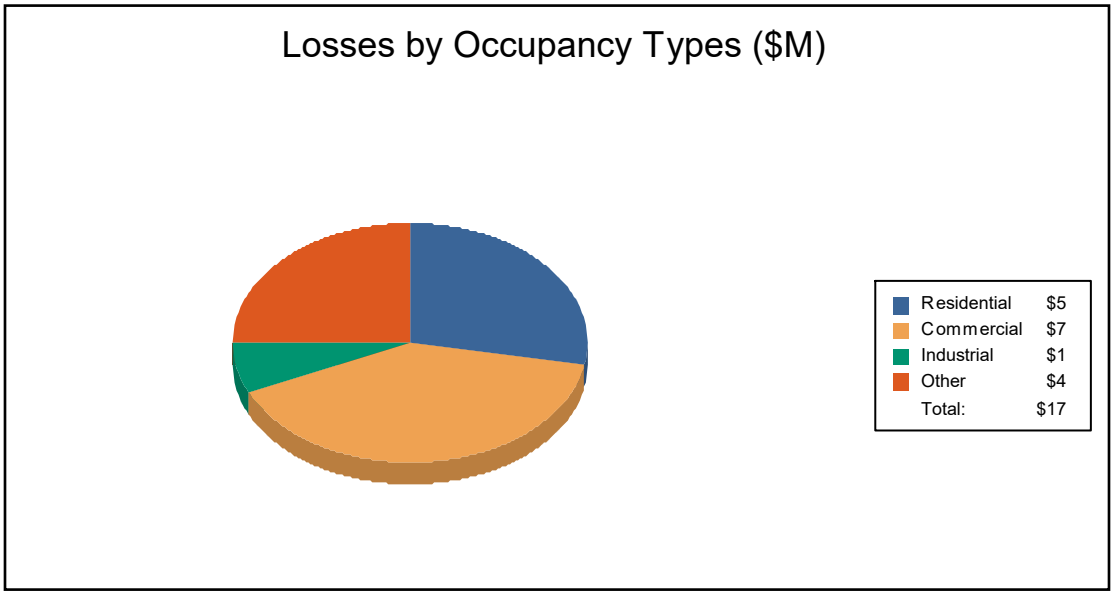
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 6.83 million dollars. 60% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 27.96% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.21	0.32	0.30	0.10	2.92
	Content	1.03	1.37	0.71	0.62	3.73
	Inventory	0.00	0.08	0.10	0.00	0.18
	Subtotal	**3.24**	**1.76**	**1.10**	**0.72**	**6.83**
Business Interruption						
	Income	0.00	1.90	0.02	0.28	2.20
	Relocation	1.08	0.32	0.02	0.20	1.62
	Rental Income	0.46	0.21	0.00	0.05	0.71
	Wage	0.00	2.66	0.04	3.02	5.73
	Subtotal	**1.54**	**5.09**	**0.09**	**3.55**	**10.26**
ALL	**Total**	**4.78**	**6.85**	**1.19**	**4.27**	**17.09**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,486,849	934,181	3,421,030
Total	**16,426**	**2,486,849**	**934,181**	**3,421,030**
Total Study Region	**16,426**	**2,486,849**	**934,181**	**3,421,030**

Hazus: Flood Global Risk Report

Region Name: Ellington_FL

Flood Scenario: Ellington_Flood

Print Date: Monday, April 10, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 223 census blocks. The region contains over 7 thousand households and has a total population of 16,426 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,578 buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90.03% of the buildings (and 72.69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,578 buildings in the region which have an aggregate total replacement value of 3,421 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,486,849	72.7%
Commercial	518,201	15.1%
Industrial	192,463	5.6%
Agricultural	4,976	0.1%
Religion	20,768	0.6%
Government	63,569	1.9%
Education	134,204	3.9%
Total	**3,421,030**	**100%**

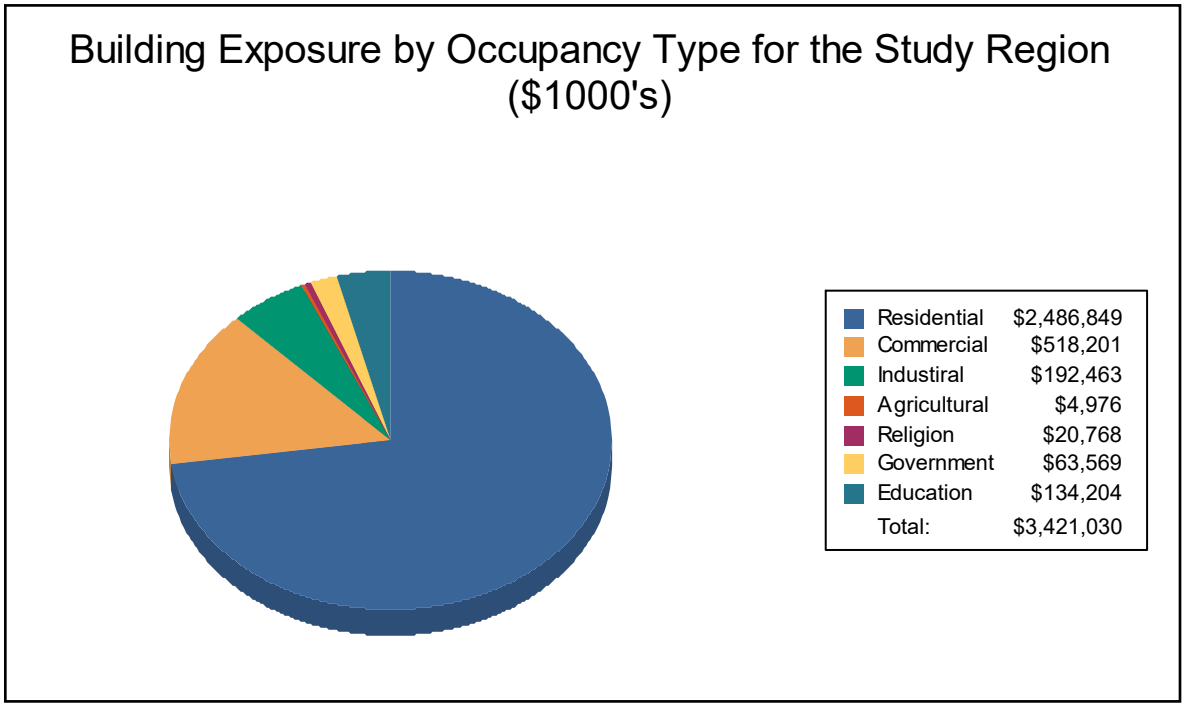
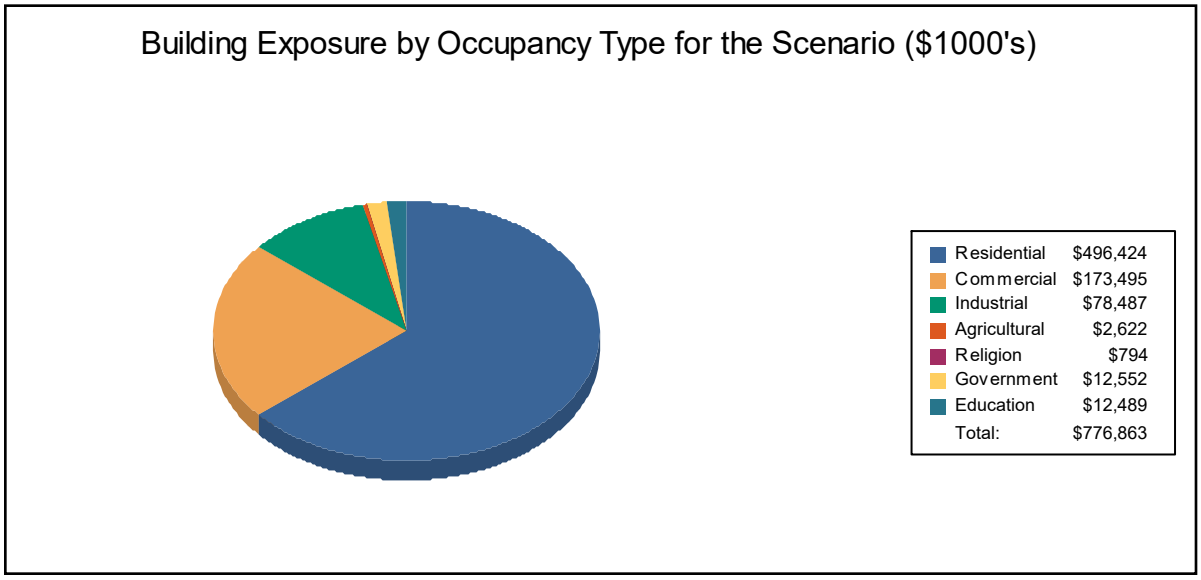


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	496,424	63.9%
Commercial	173,495	22.3%
Industrial	78,487	10.1%
Agricultural	2,622	0.3%
Religion	794	0.1%
Government	12,552	1.6%
Education	12,489	1.6%
Total	**776,863**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 2 fire stations, 1 police station and 1 emergency operation center.

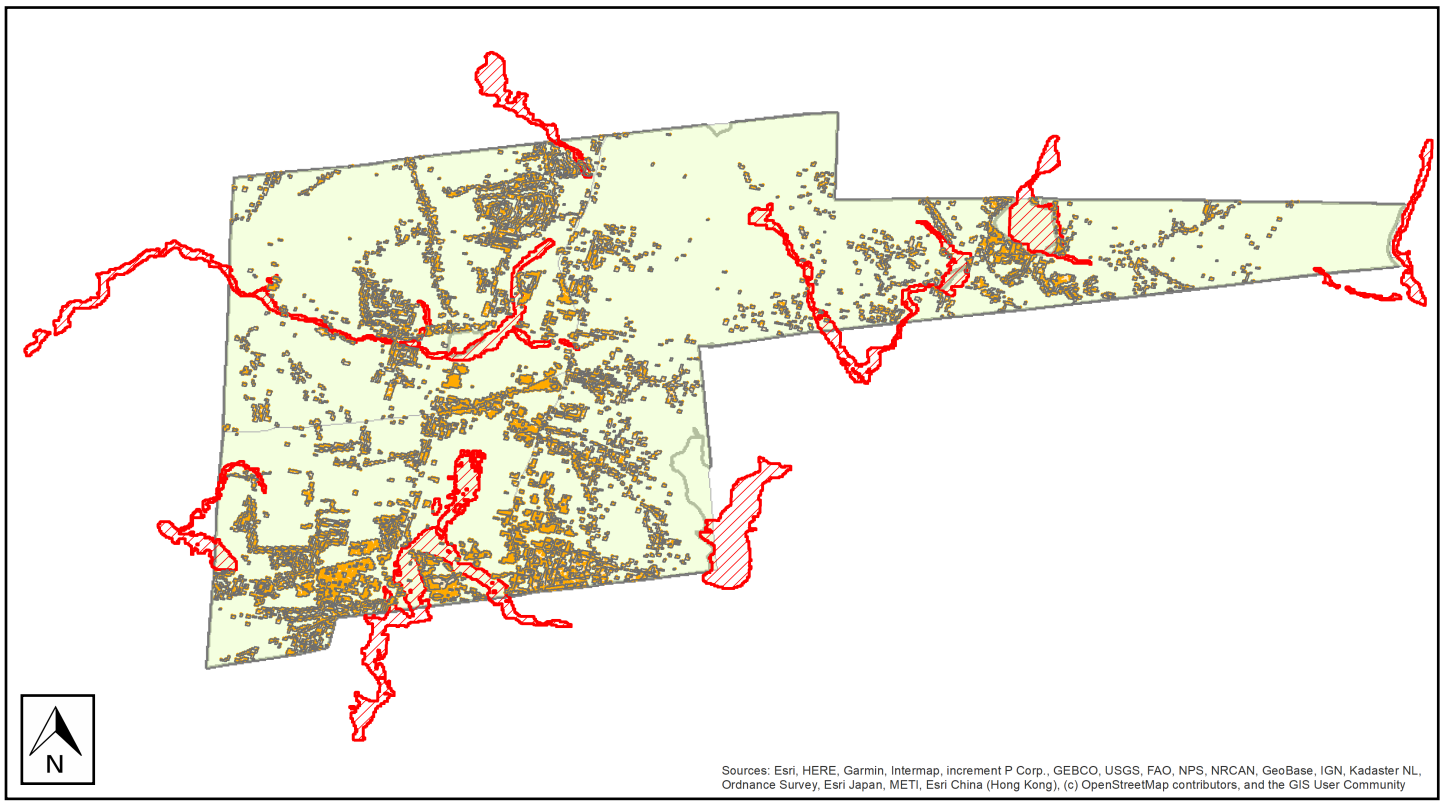
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Ellington_FL
Scenario Name:	Ellington_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 94% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

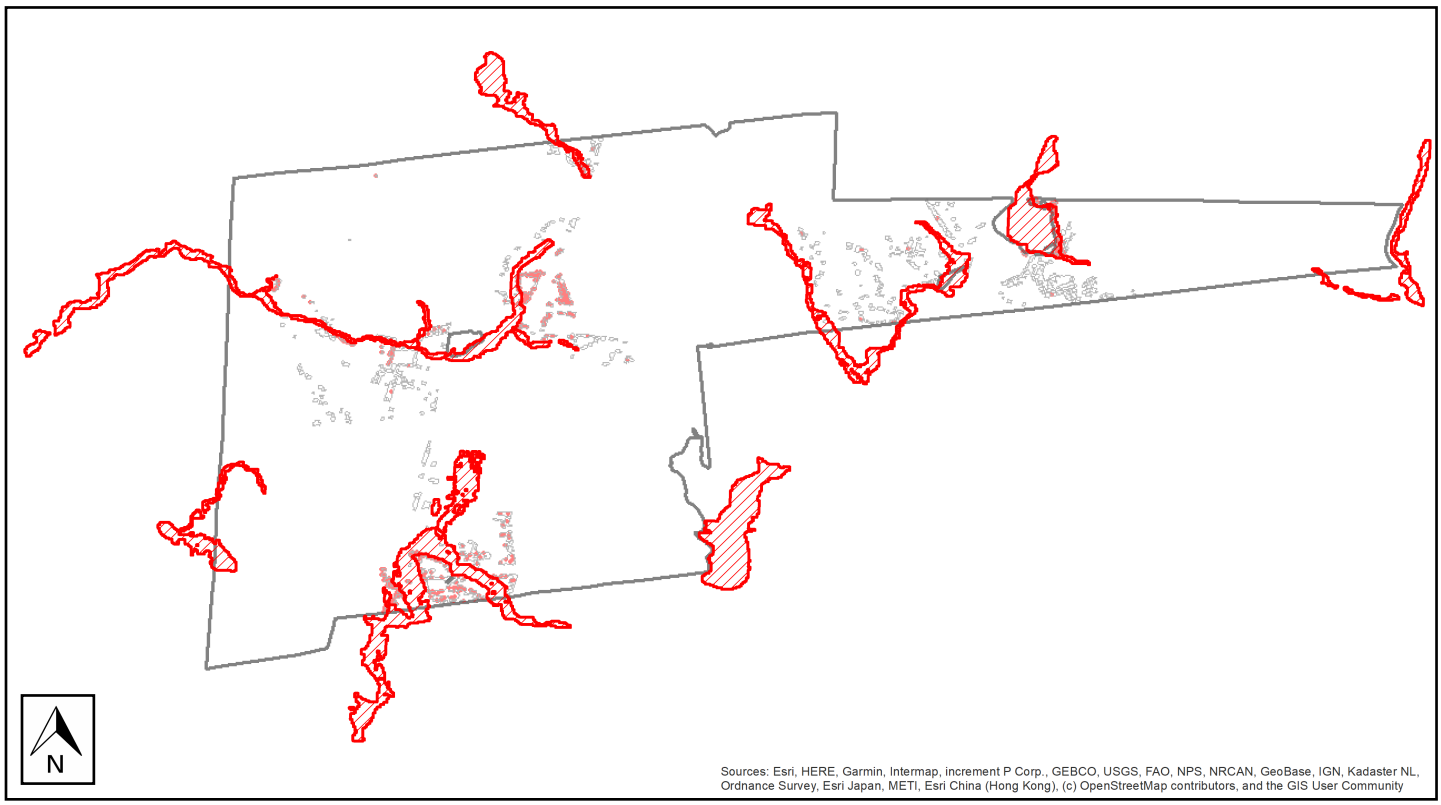


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	20	65	10	32	1	3	0	0	0	0	0	0
Total	**20**		**10**		**1**		**0**		**0**		**0**	

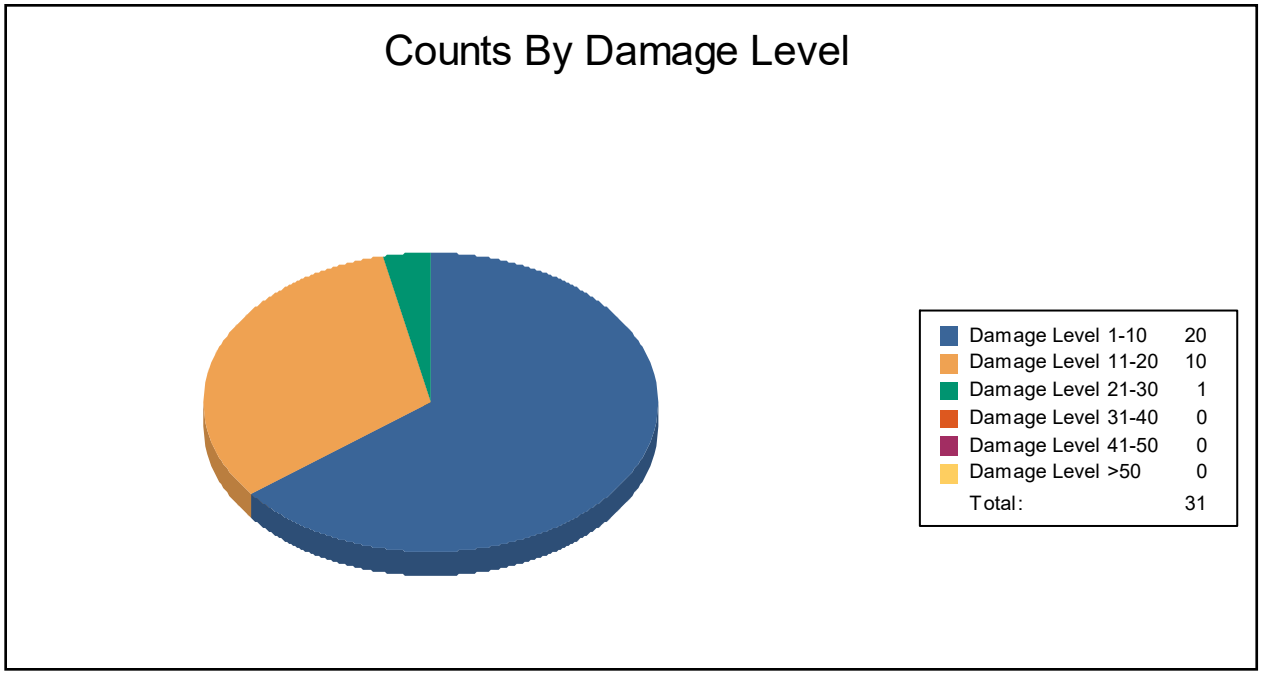


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	20	65	10	32	1	3	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

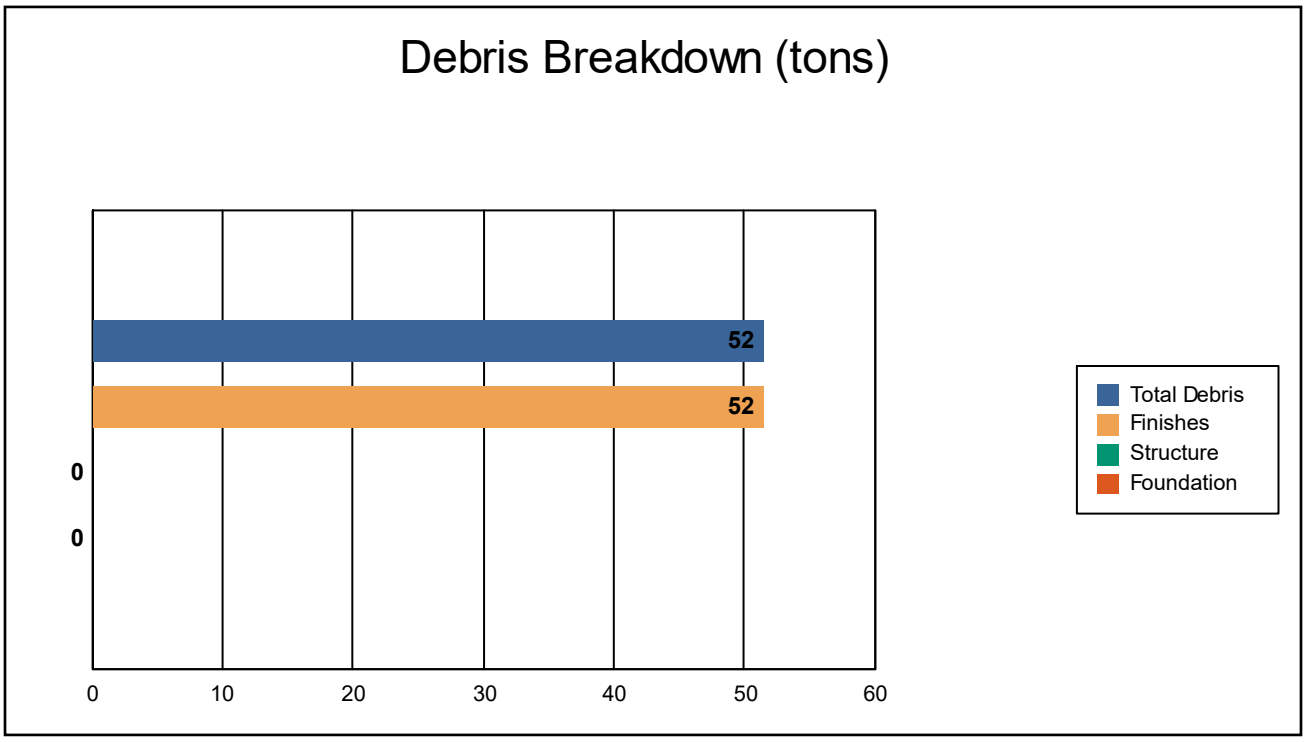
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

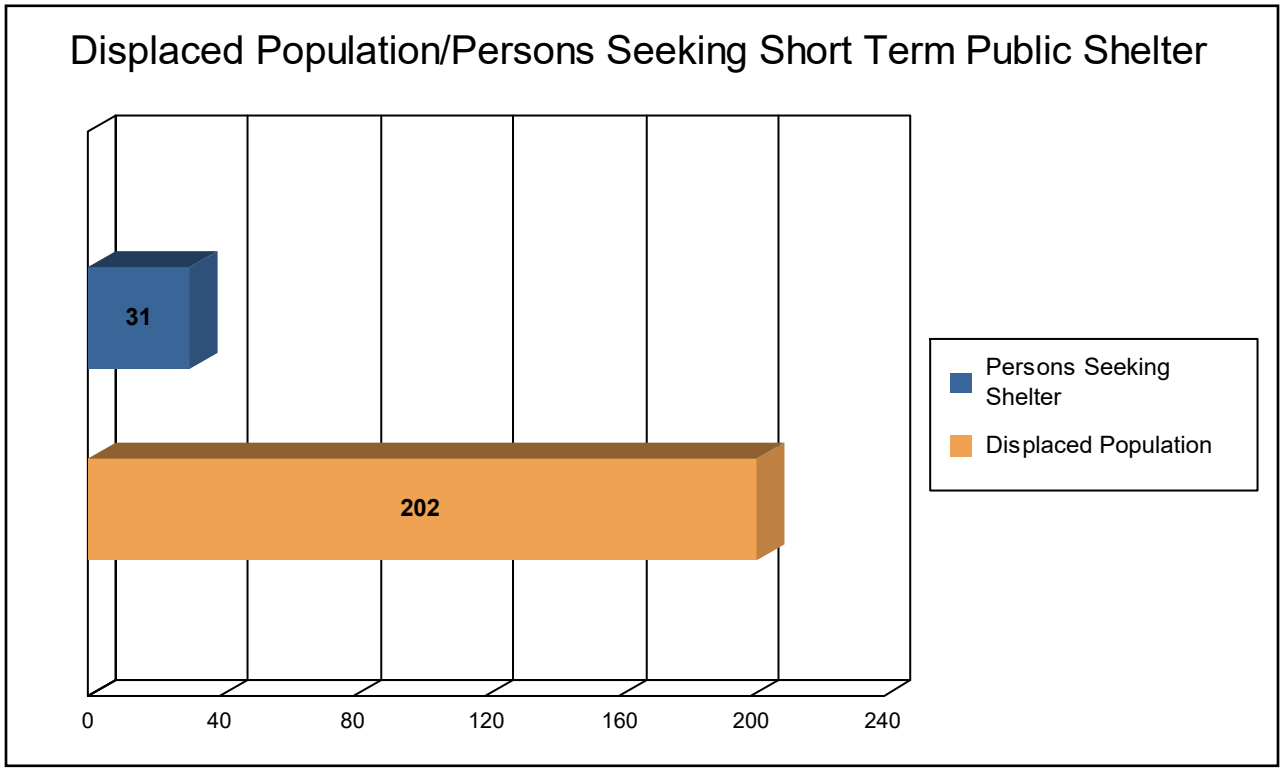


The model estimates that a total of 52 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 67 households (or 202 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 31 people (out of a total population of 16,426) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 19.75 million dollars, which represents 2.54 % of the total replacement value of the scenario buildings.

Building-Related Losses

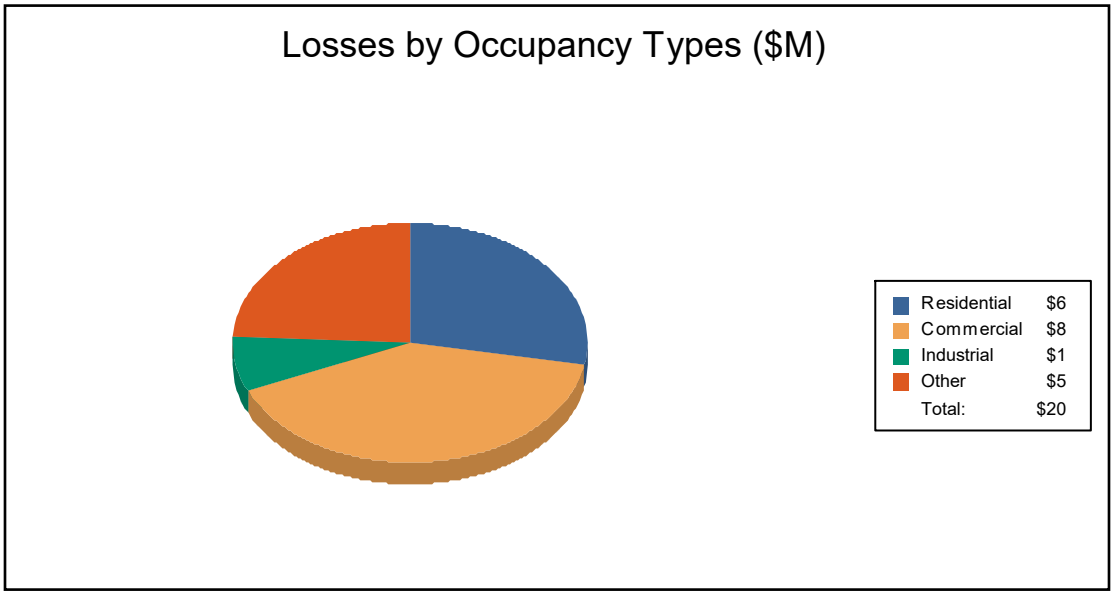
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 8.41 million dollars. 57% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 28.16% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.68	0.39	0.36	0.11	3.55
	Content	1.25	1.76	0.87	0.75	4.62
	Inventory	0.00	0.12	0.12	0.00	0.24
	Subtotal	**3.93**	**2.27**	**1.34**	**0.86**	**8.41**
Business Interruption						
	Income	0.00	2.07	0.03	0.30	2.40
	Relocation	1.14	0.38	0.03	0.21	1.75
	Rental Income	0.49	0.25	0.00	0.05	0.80
	Wage	0.00	2.99	0.05	3.36	6.40
	Subtotal	**1.63**	**5.69**	**0.11**	**3.92**	**11.34**
ALL	**Total**	**5.56**	**7.96**	**1.45**	**4.78**	**19.75**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,486,849	934,181	3,421,030
Total	**16,426**	**2,486,849**	**934,181**	**3,421,030**
Total Study Region	**16,426**	**2,486,849**	**934,181**	**3,421,030**

Hazus: Flood Global Risk Report

Region Name: Ellington_FL

Flood Scenario: Ellington_Flood

Print Date: Monday, April 10, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

RiskMAP
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 223 census blocks. The region contains over 7 thousand households and has a total population of 16,426 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,578 buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90.03% of the buildings (and 72.69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,578 buildings in the region which have an aggregate total replacement value of 3,421 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,486,849	72.7%
Commercial	518,201	15.1%
Industrial	192,463	5.6%
Agricultural	4,976	0.1%
Religion	20,768	0.6%
Government	63,569	1.9%
Education	134,204	3.9%
Total	**3,421,030**	**100%**

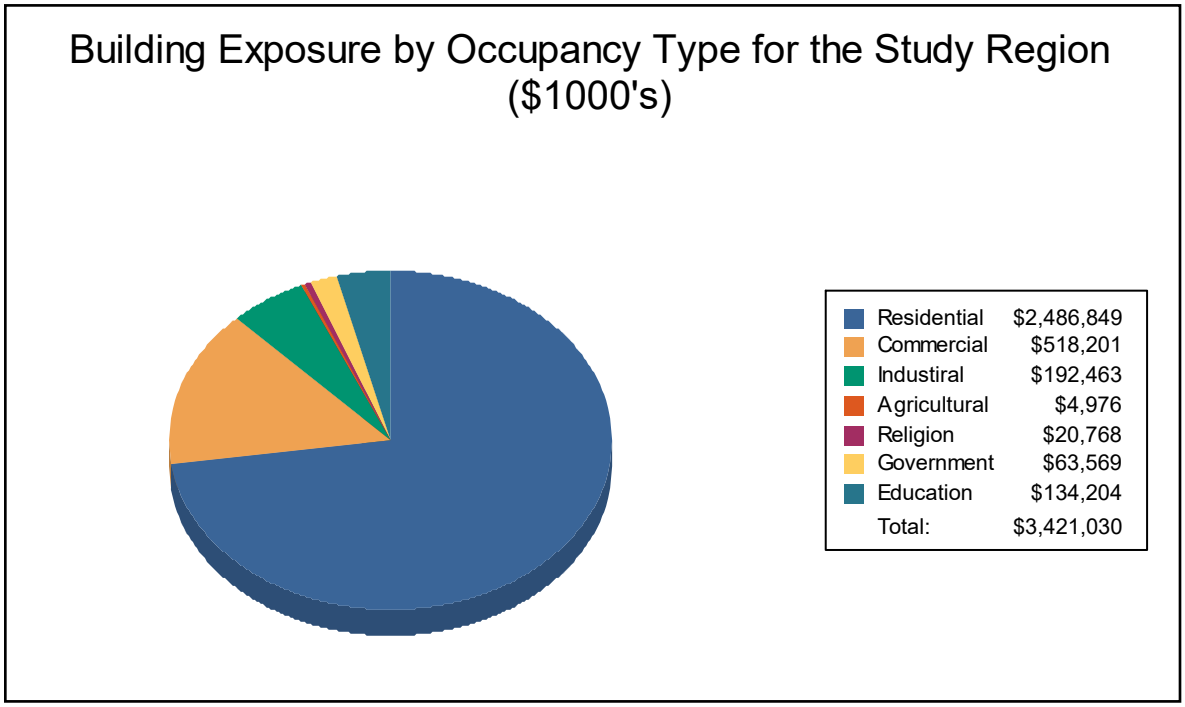
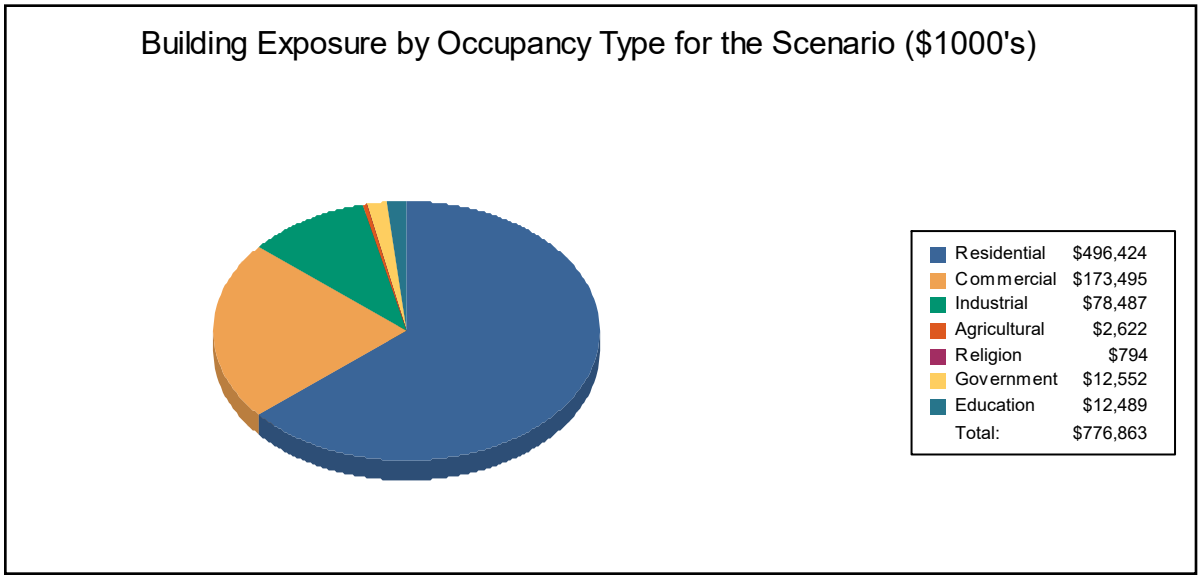


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	496,424	63.9%
Commercial	173,495	22.3%
Industrial	78,487	10.1%
Agricultural	2,622	0.3%
Religion	794	0.1%
Government	12,552	1.6%
Education	12,489	1.6%
Total	**776,863**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 5 schools, 2 fire stations, 1 police station and 1 emergency operation center.

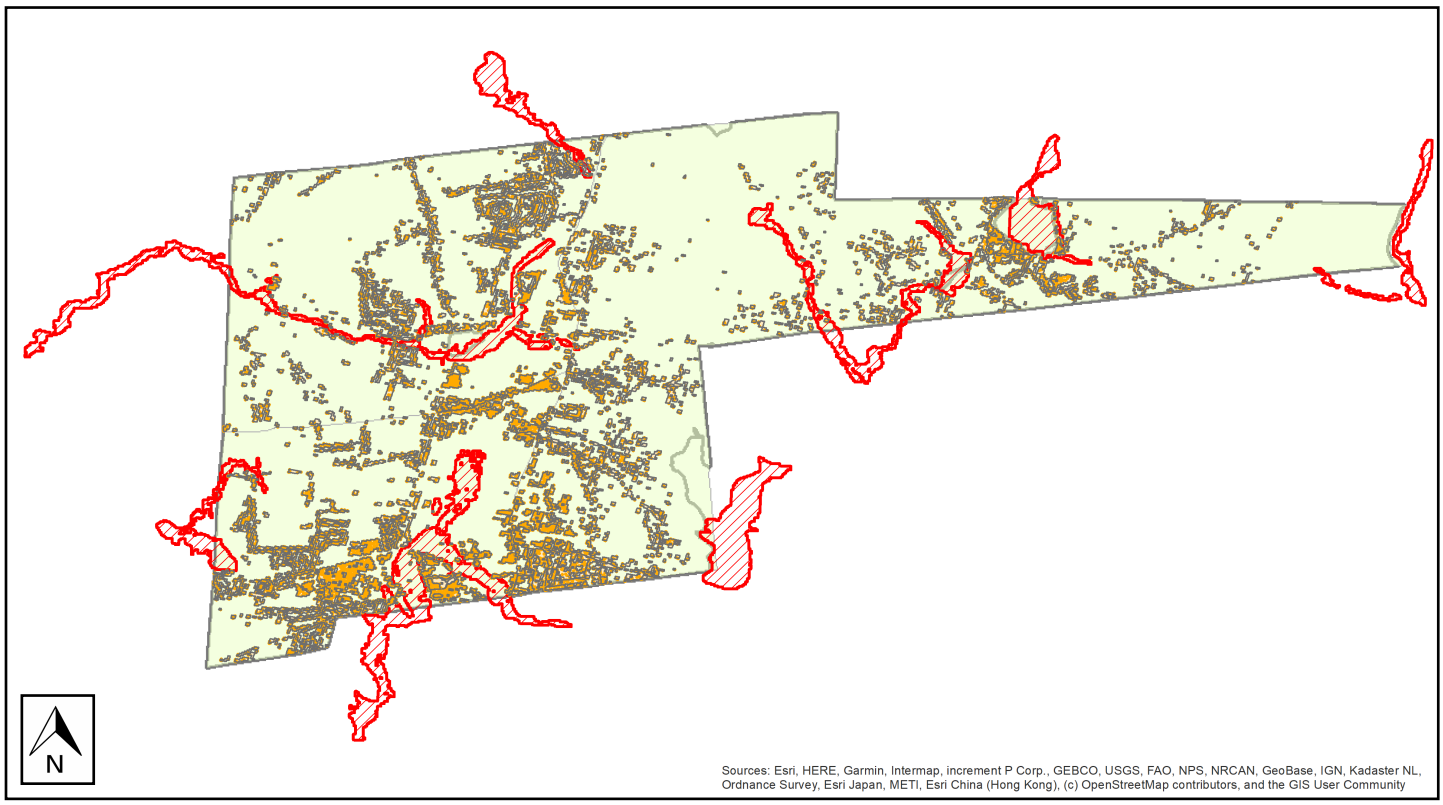
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Ellington_FL
Scenario Name:	Ellington_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 14 buildings will be at least moderately damaged. This is over 94% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

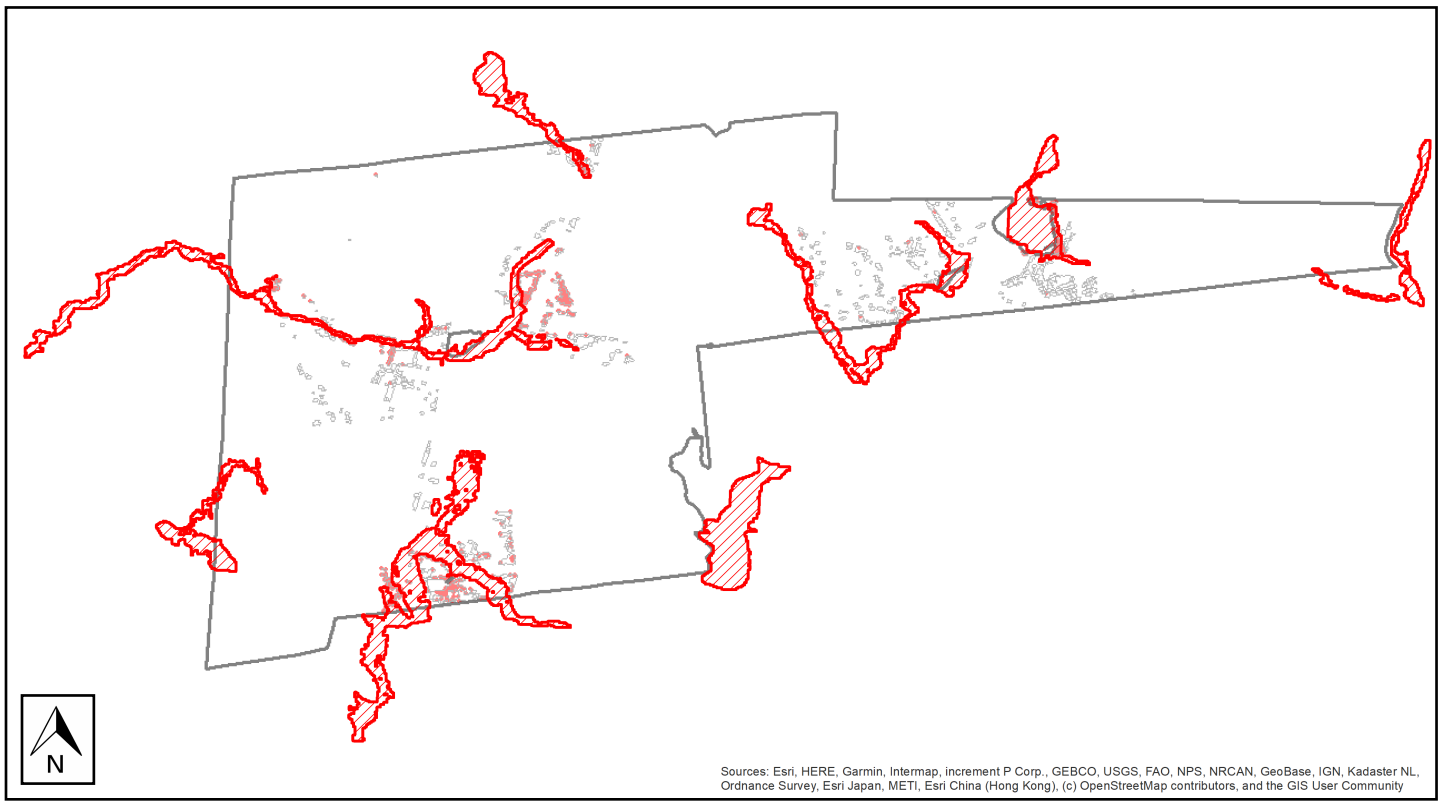


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	19	58	12	36	2	6	0	0	0	0	0	0
Total	**19**		**12**		**2**		**0**		**0**		**0**	

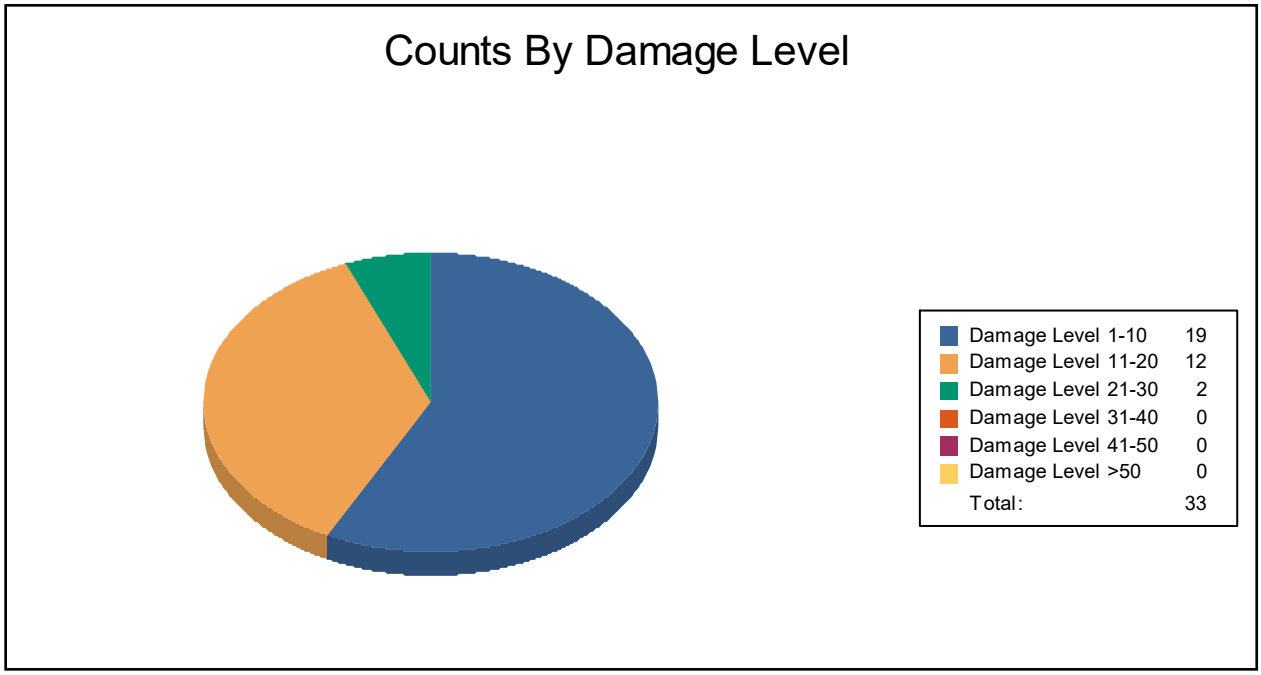


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	19	58	12	36	2	6	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

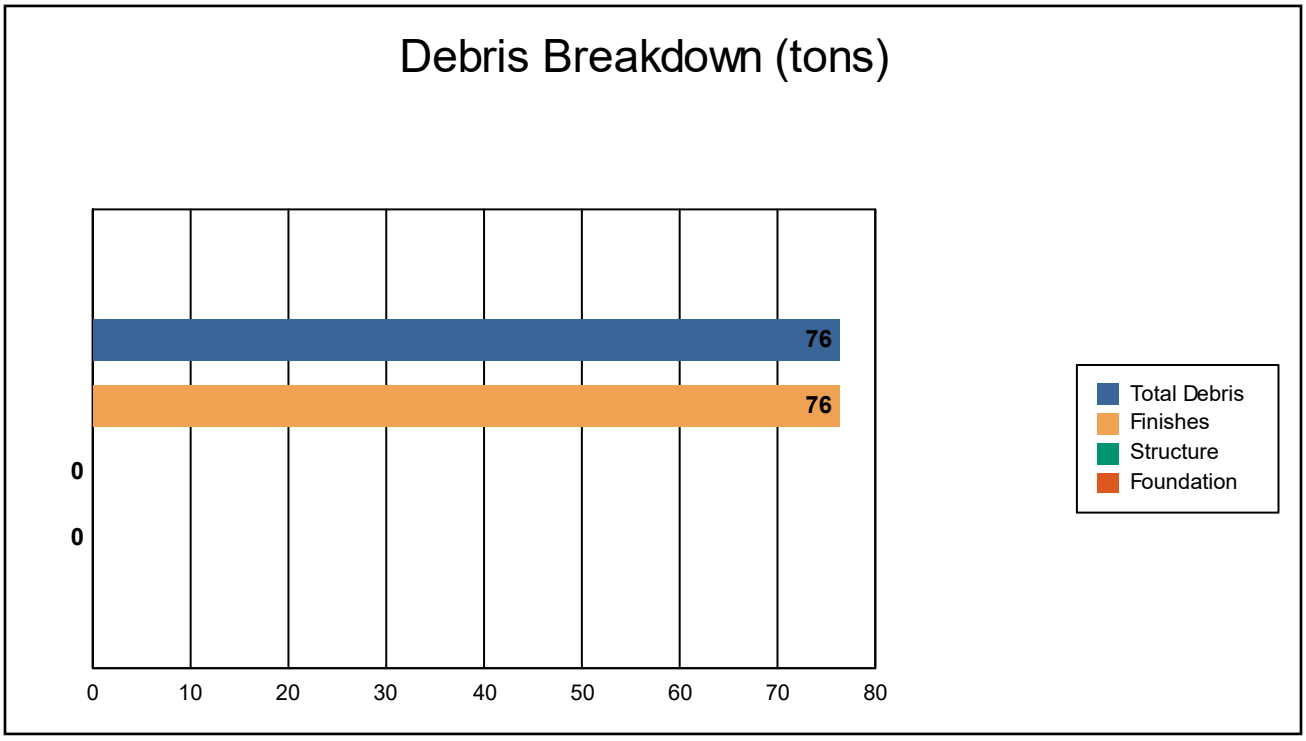
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

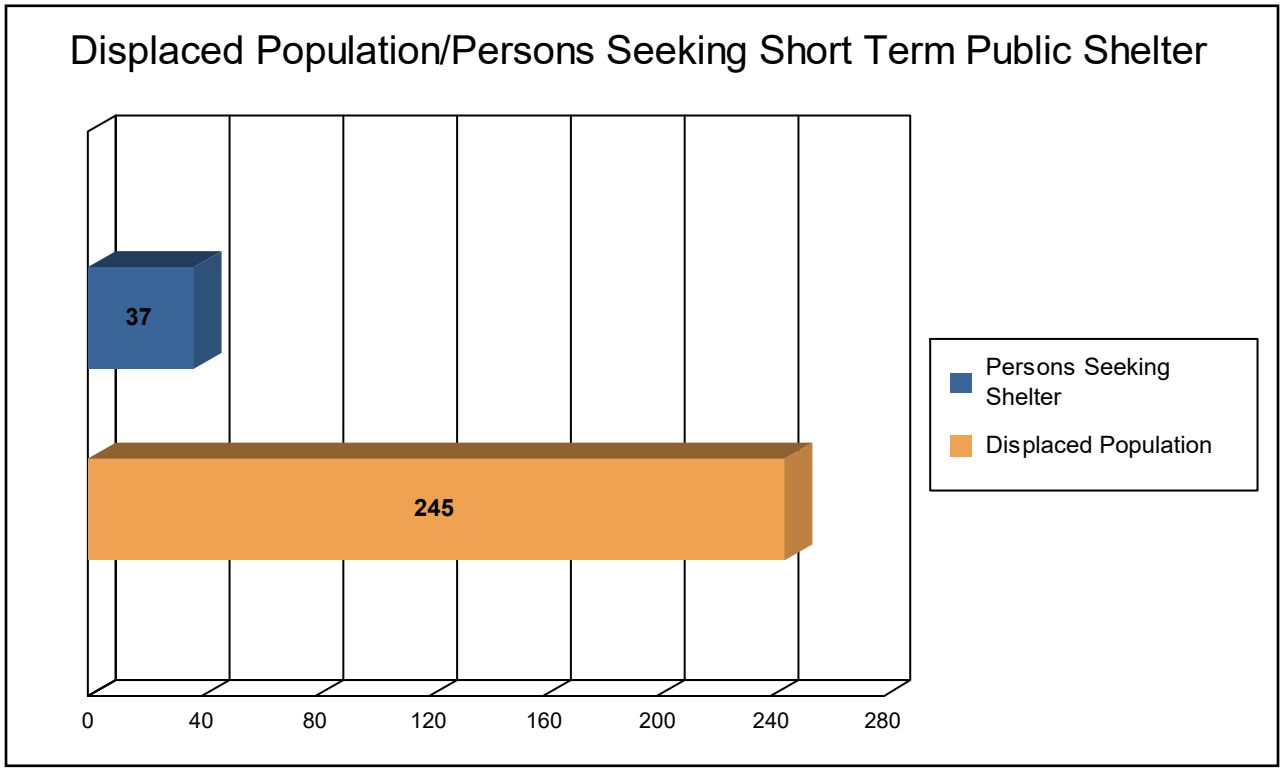


The model estimates that a total of 76 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 82 households (or 245 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 37 people (out of a total population of 16,426) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 26.53 million dollars, which represents 3.42 % of the total replacement value of the scenario buildings.

Building-Related Losses

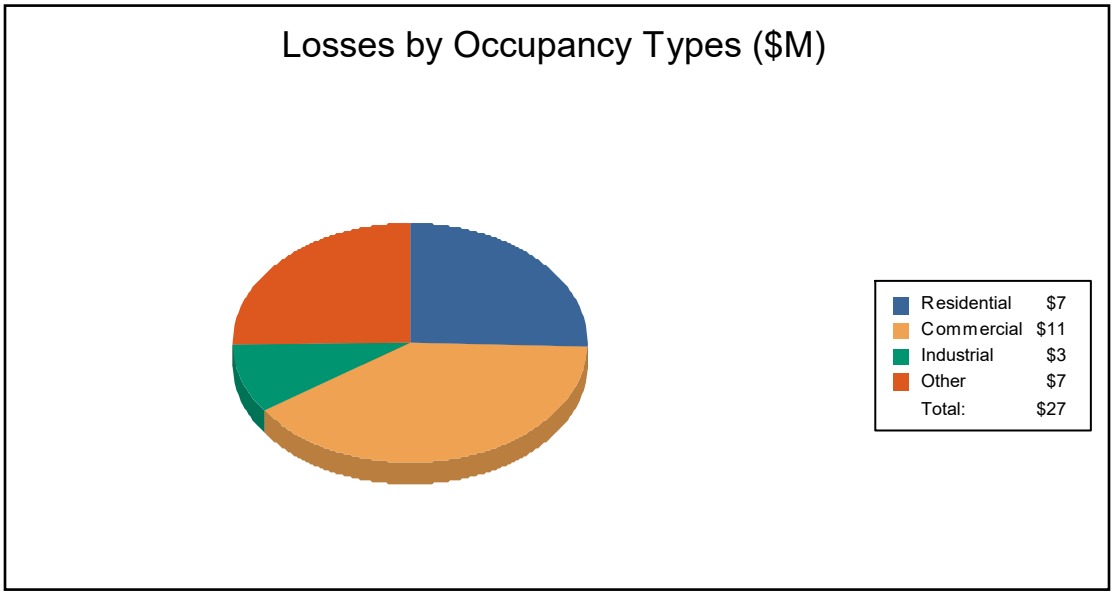
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 11.74 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 25.53% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.29	0.60	0.62	0.16	4.68
	Content	1.56	2.54	1.48	1.02	6.59
	Inventory	0.00	0.23	0.24	0.00	0.47
	Subtotal	**4.85**	**3.37**	**2.34**	**1.18**	**11.74**
Business Interruption						
	Income	0.00	2.58	0.05	0.36	2.98
	Relocation	1.32	0.54	0.05	0.29	2.19
	Rental Income	0.61	0.36	0.01	0.08	1.06
	Wage	0.00	3.72	0.08	4.77	8.57
	Subtotal	**1.93**	**7.19**	**0.18**	**5.50**	**14.79**
ALL	**Total**	**6.78**	**10.56**	**2.52**	**6.68**	**26.53**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,486,849	934,181	3,421,030
Total	**16,426**	**2,486,849**	**934,181**	**3,421,030**
Total Study Region	**16,426**	**2,486,849**	**934,181**	**3,421,030**

Hazus: Flood Global Risk Report

Region Name: Enfield_FL

Flood Scenario: Enfield_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 557 census blocks. The region contains over 17 thousand households and has a total population of 42,127 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 14,458 buildings in the region with a total building replacement value (excluding contents) of 7,872 million dollars. Approximately 89.78% of the buildings (and 55.90% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of 7,872 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,401,072	55.9%
Commercial	1,824,880	23.2%
Industrial	730,429	9.3%
Agricultural	11,901	0.2%
Religion	91,459	1.2%
Government	412,151	5.2%
Education	400,556	5.1%
Total	**7,872,448**	**100%**

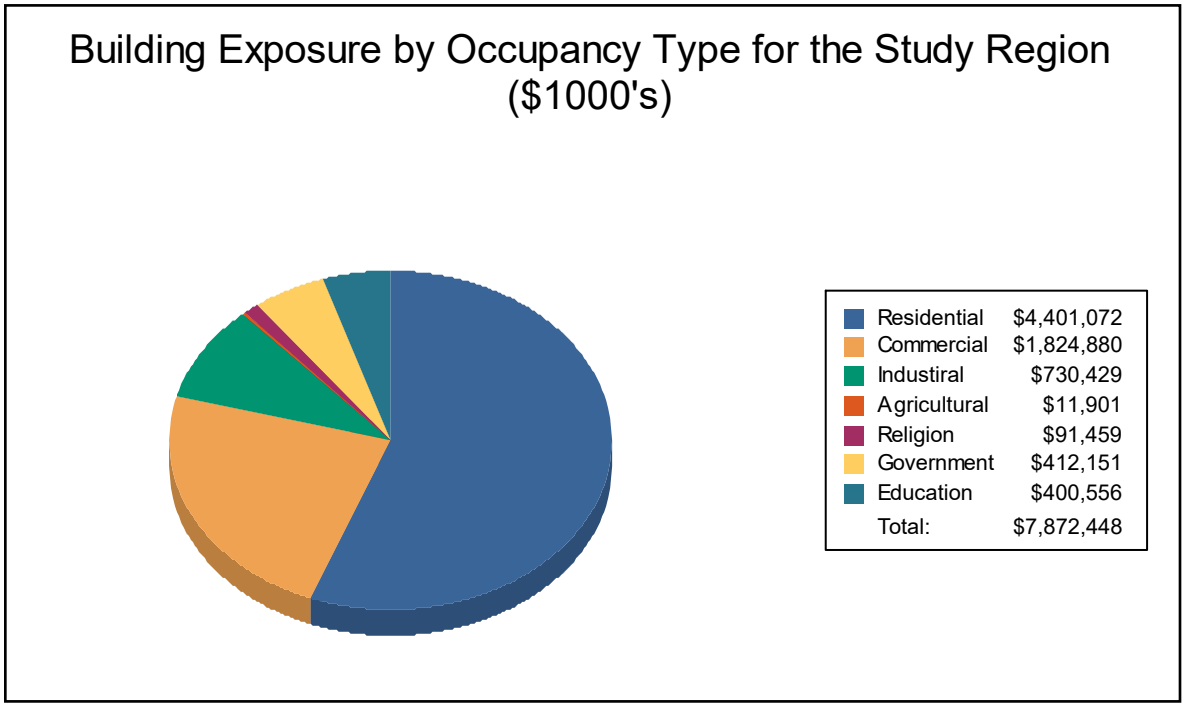
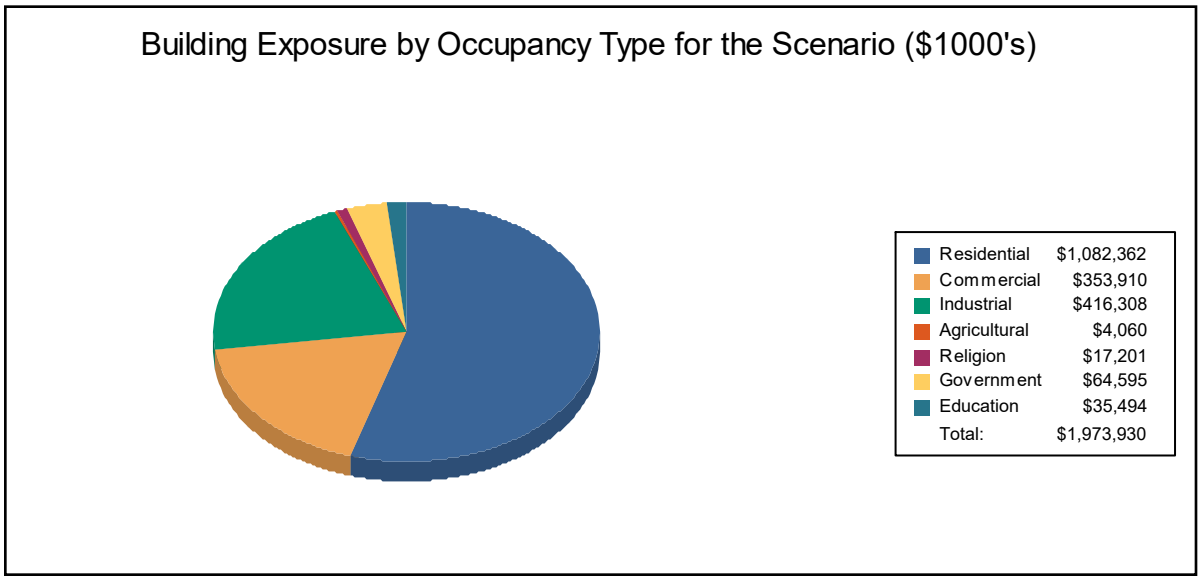


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,082,362	54.8%
Commercial	353,910	17.9%
Industrial	416,308	21.1%
Agricultural	4,060	0.2%
Religion	17,201	0.9%
Government	64,595	3.3%
Education	35,494	1.8%
Total	**1,973,930**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 14 schools, 6 fire stations, 1 police station and 1 emergency operation center.

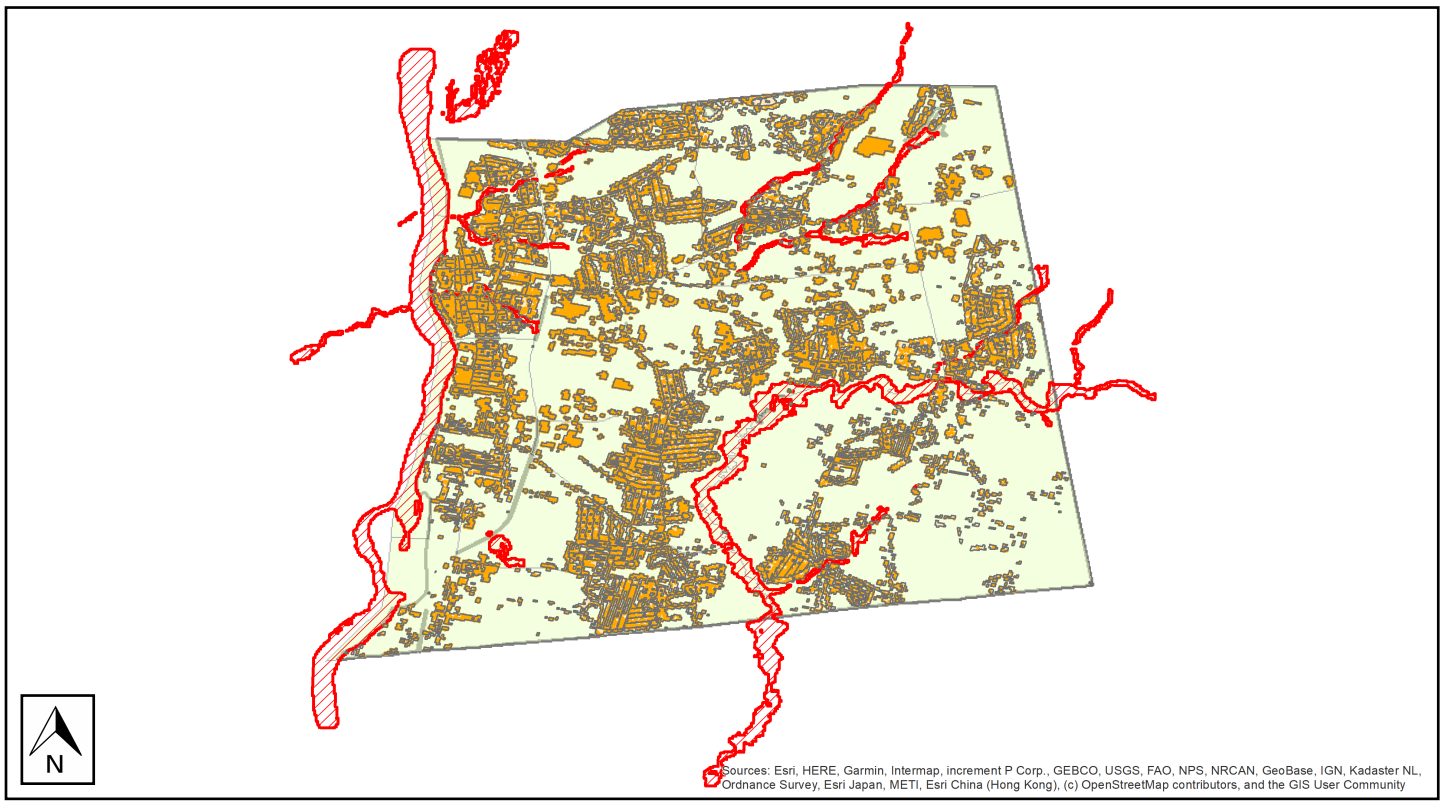
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Enfield_FL
Scenario Name:	Enfield_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 8 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

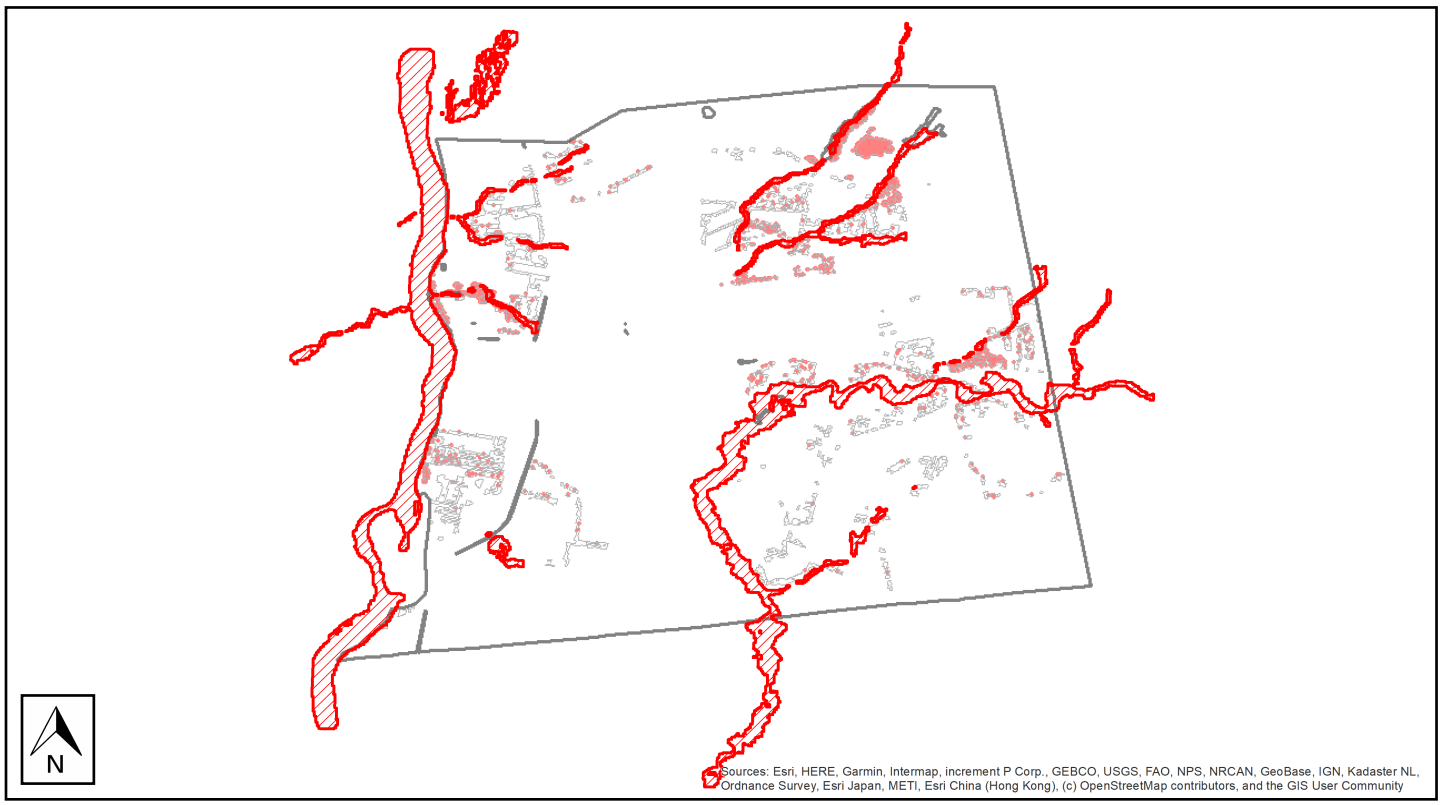


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	7	47	7	47	1	7	0	0	0	0	0	0
Total	**7**		**7**		**1**		**0**		**0**		**0**	

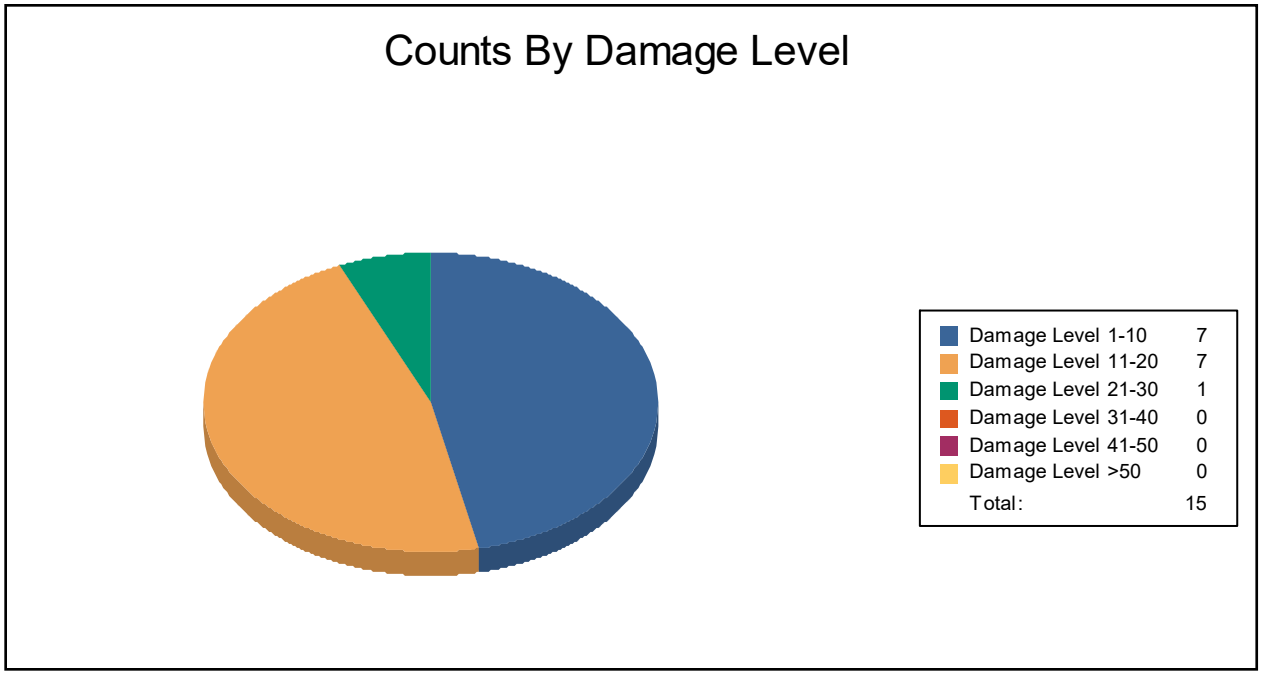


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	6	43	7	50	1	7	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	14	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

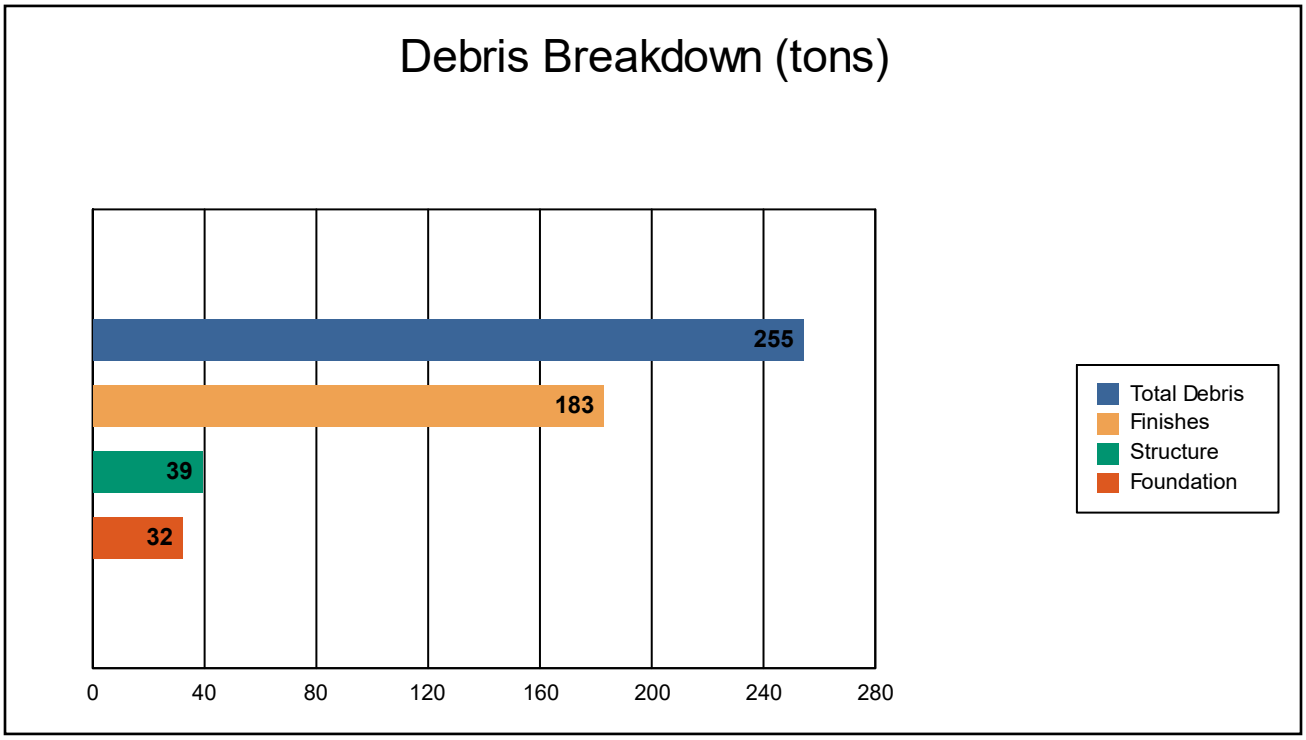
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

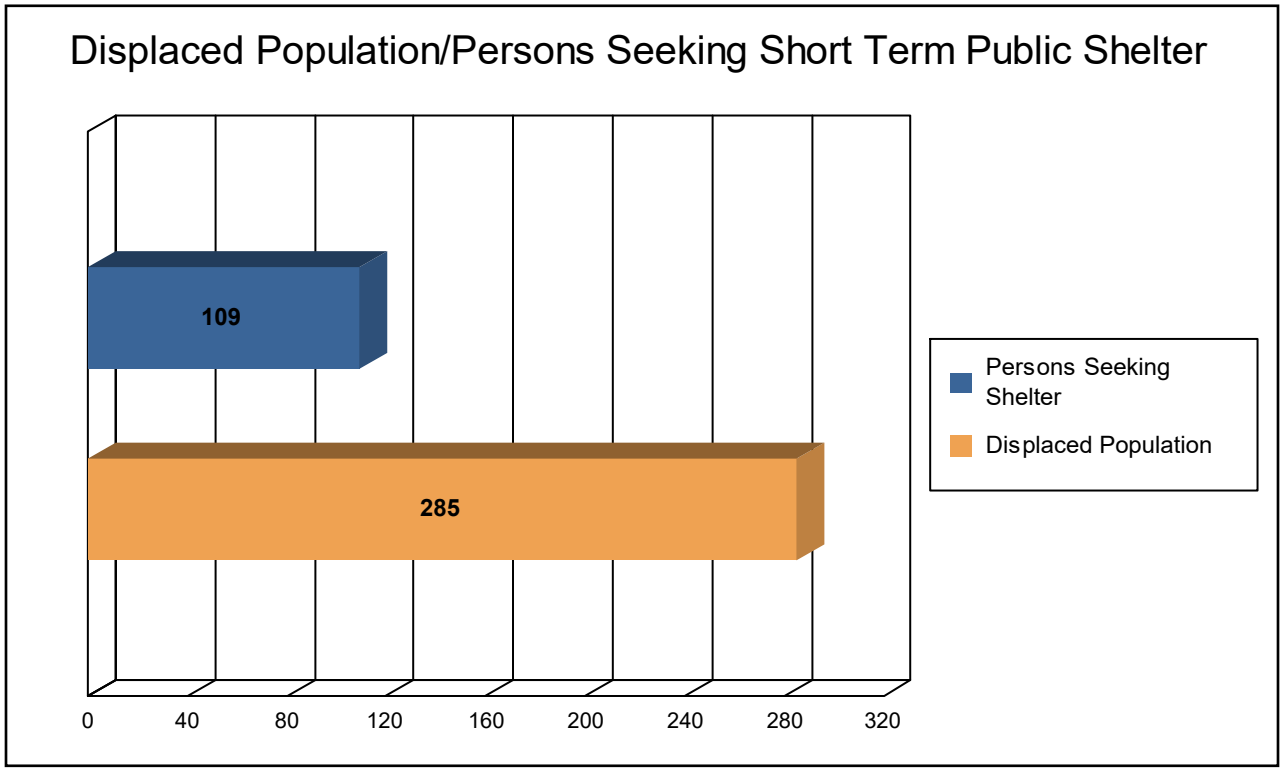


The model estimates that a total of 255 tons of debris will be generated. Of the total amount, Finishes comprises 72% of the total, Structure comprises 15% of the total, and Foundation comprises 13%. If the debris tonnage is converted into an estimated number of truckloads, it will require 11 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 95 households (or 285 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 109 people (out of a total population of 42,127) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 28.72 million dollars, which represents 1.45 % of the total replacement value of the scenario buildings.

Building-Related Losses

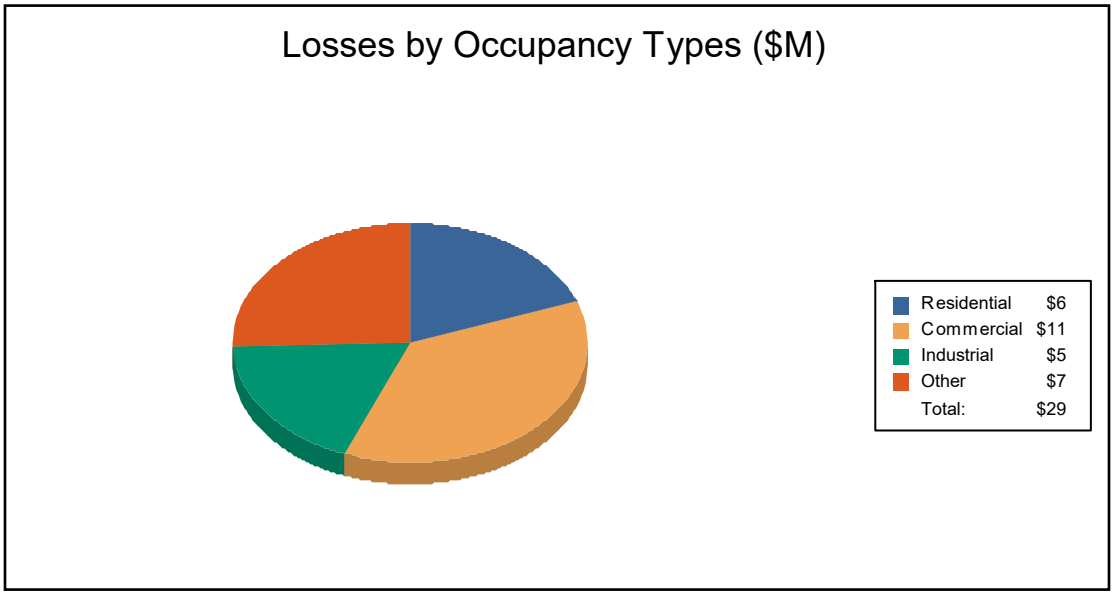
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 14.80 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.43% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.83	0.94	1.41	0.22	5.41
	Content	1.46	3.06	2.85	1.46	8.83
	Inventory	0.00	0.19	0.38	0.00	0.57
	Subtotal	**4.29**	**4.18**	**4.65**	**1.69**	**14.80**
Business Interruption						
	Income	0.00	2.69	0.11	0.36	3.16
	Relocation	0.77	0.54	0.27	0.32	1.90
	Rental Income	0.52	0.39	0.05	0.08	1.04
	Wage	0.00	2.70	0.19	4.93	7.82
	Subtotal	**1.29**	**6.32**	**0.62**	**5.68**	**13.91**
ALL	**Total**	**5.58**	**10.50**	**5.26**	**7.37**	**28.72**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	42,127	4,401,072	3,471,376	7,872,448
Total	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**
Total Study Region	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**

Hazus: Flood Global Risk Report

Region Name: Enfield_FL

Flood Scenario: Enfield_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 557 census blocks. The region contains over 17 thousand households and has a total population of 42,127 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 14,458 buildings in the region with a total building replacement value (excluding contents) of 7,872 million dollars. Approximately 89.78% of the buildings (and 55.90% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of 7,872 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,401,072	55.9%
Commercial	1,824,880	23.2%
Industrial	730,429	9.3%
Agricultural	11,901	0.2%
Religion	91,459	1.2%
Government	412,151	5.2%
Education	400,556	5.1%
Total	**7,872,448**	**100%**

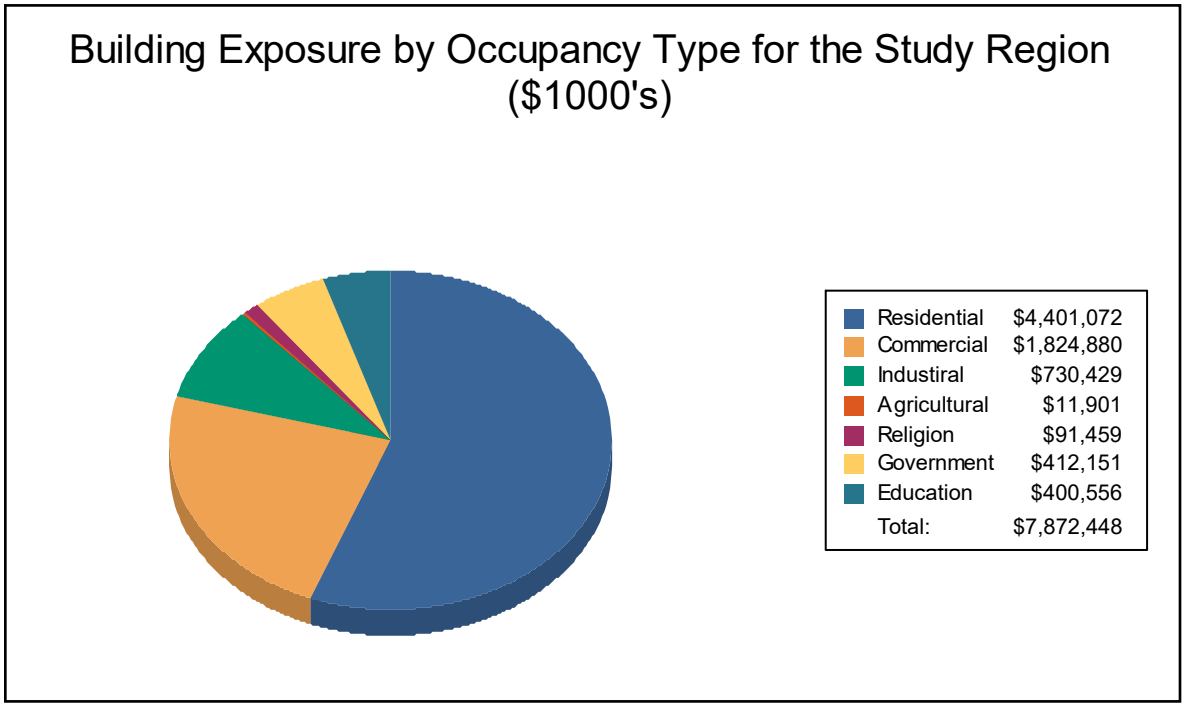
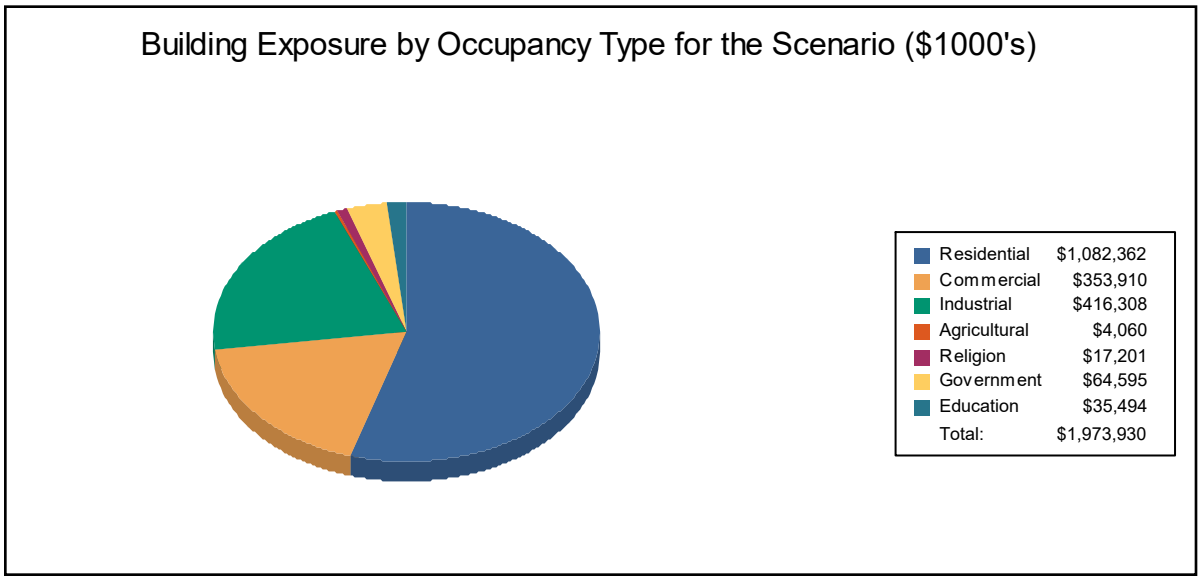


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,082,362	54.8%
Commercial	353,910	17.9%
Industrial	416,308	21.1%
Agricultural	4,060	0.2%
Religion	17,201	0.9%
Government	64,595	3.3%
Education	35,494	1.8%
Total	**1,973,930**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 14 schools, 6 fire stations, 1 police station and 1 emergency operation center.

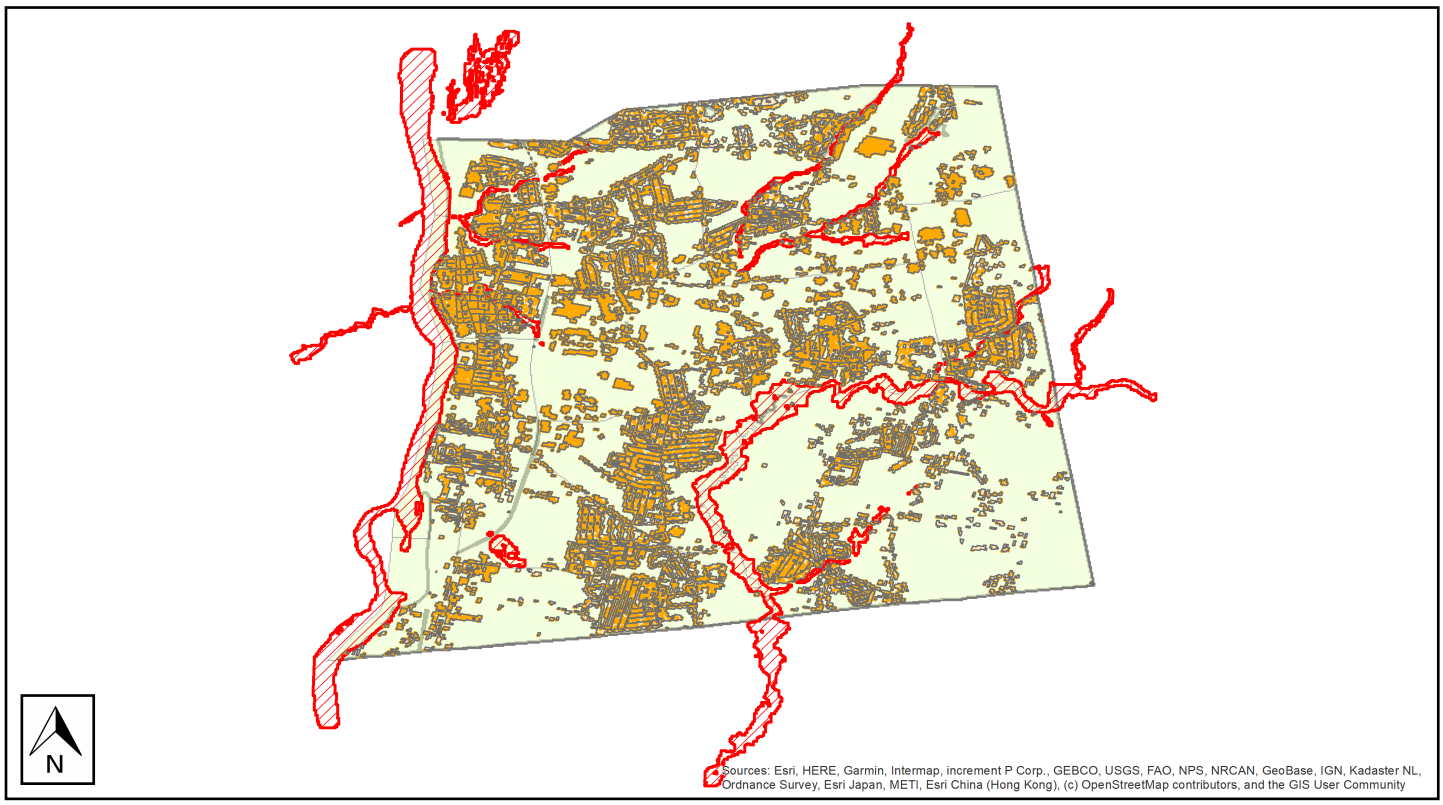
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Enfield_FL
Scenario Name:	Enfield_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 93% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

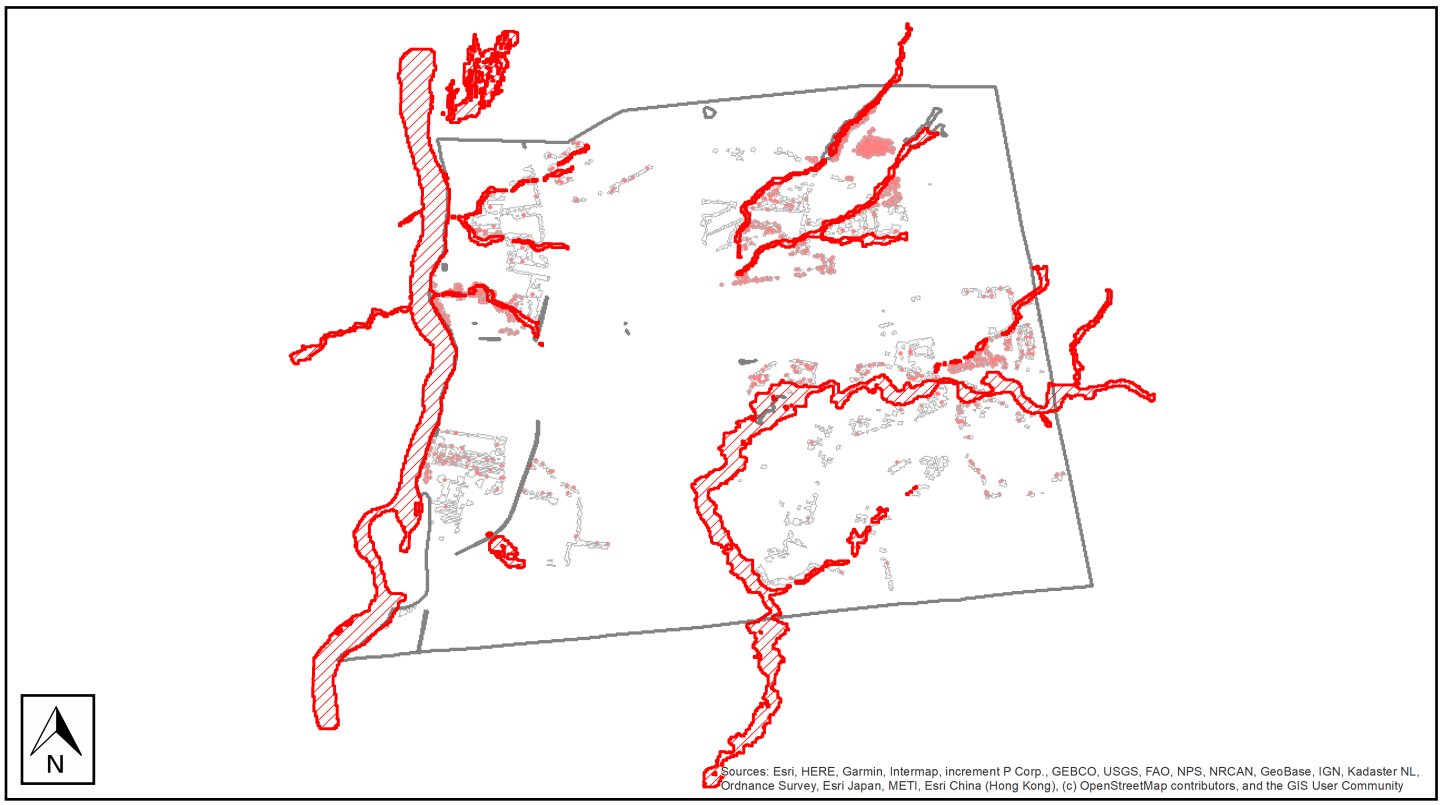


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	4	31	8	62	1	8	0	0	0	0	0	0
Total	**4**		**8**		**1**		**0**		**0**		**0**	

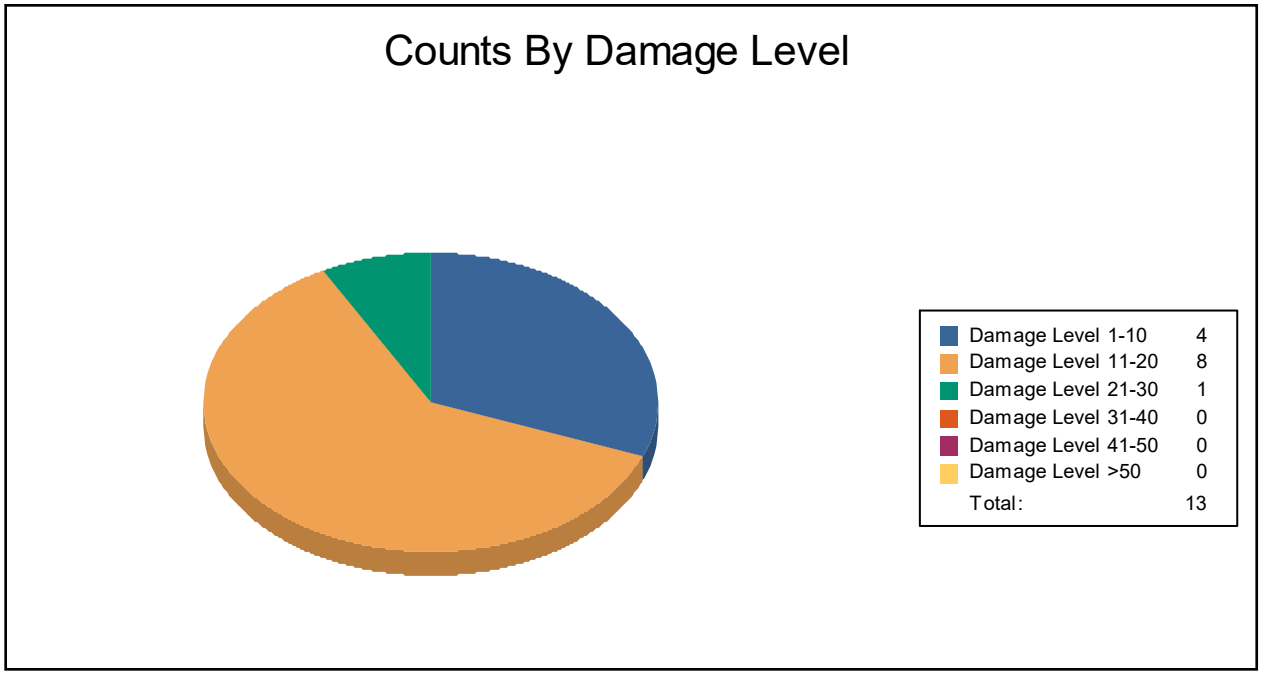


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	25	8	67	1	8	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	14	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

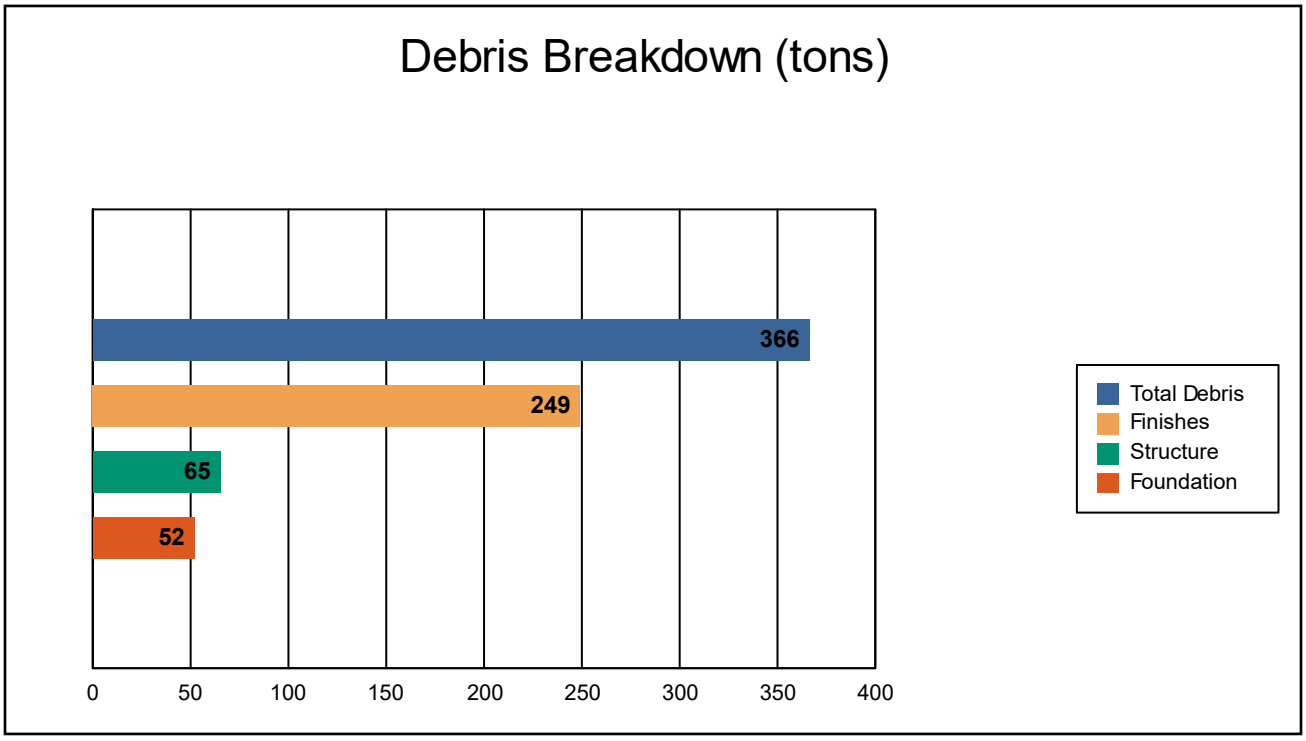
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

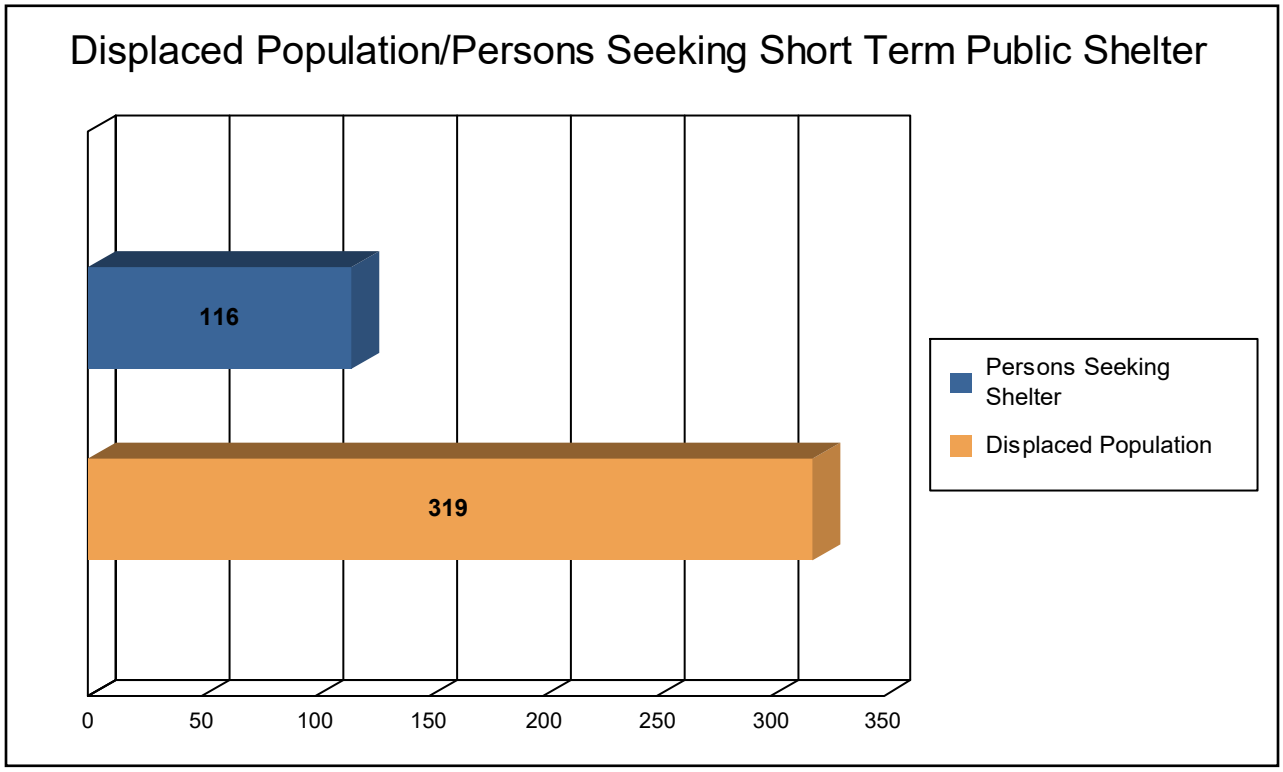


The model estimates that a total of 366 tons of debris will be generated. Of the total amount, Finishes comprises 68% of the total, Structure comprises 18% of the total, and Foundation comprises 14%. If the debris tonnage is converted into an estimated number of truckloads, it will require 15 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 106 households (or 319 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 116 people (out of a total population of 42,127) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 36.70 million dollars, which represents 1.86 % of the total replacement value of the scenario buildings.

Building-Related Losses

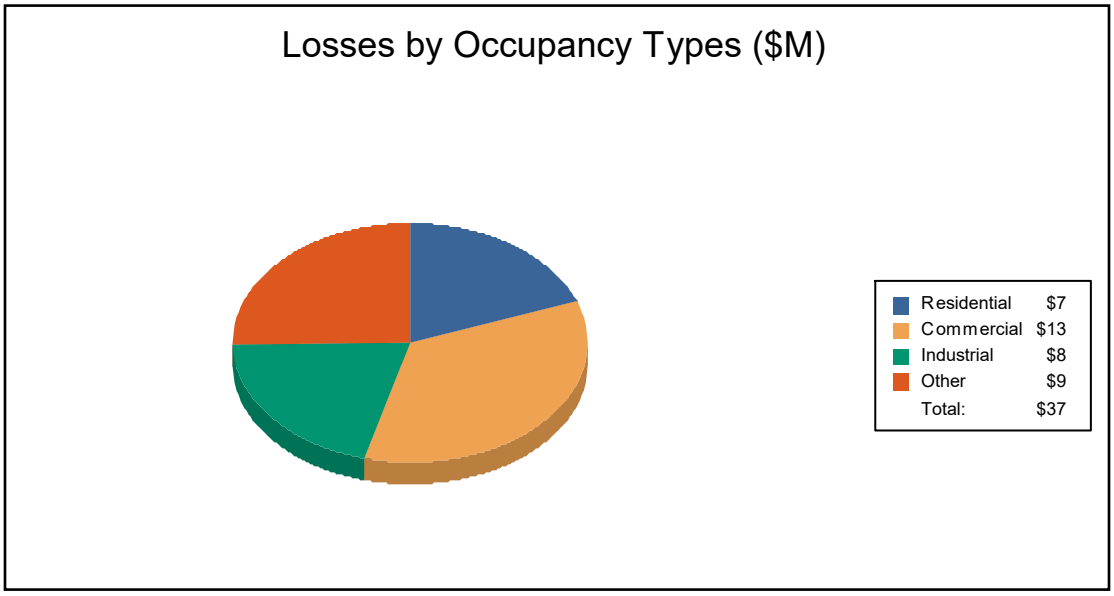
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 19.64 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.48% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.64	1.16	1.89	0.27	6.96
	Content	1.86	3.89	4.36	1.75	11.86
	Inventory	0.00	0.24	0.57	0.01	0.82
	Subtotal	**5.49**	**5.29**	**6.82**	**2.03**	**19.64**
Business Interruption						
	Income	0.03	3.19	0.13	0.44	3.78
	Relocation	0.91	0.61	0.30	0.39	2.21
	Rental Income	0.65	0.44	0.05	0.11	1.25
	Wage	0.07	3.20	0.22	6.34	9.82
	Subtotal	**1.66**	**7.45**	**0.69**	**7.27**	**17.06**
ALL	**Total**	**7.15**	**12.74**	**7.51**	**9.30**	**36.70**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	42,127	4,401,072	3,471,376	7,872,448
Total	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**
Total Study Region	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**

Hazus: Flood Global Risk Report

Region Name: Enfield_FL

Flood Scenario: Enfield_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 557 census blocks. The region contains over 17 thousand households and has a total population of 42,127 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 14,458 buildings in the region with a total building replacement value (excluding contents) of 7,872 million dollars. Approximately 89.78% of the buildings (and 55.90% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of 7,872 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,401,072	55.9%
Commercial	1,824,880	23.2%
Industrial	730,429	9.3%
Agricultural	11,901	0.2%
Religion	91,459	1.2%
Government	412,151	5.2%
Education	400,556	5.1%
Total	**7,872,448**	**100%**

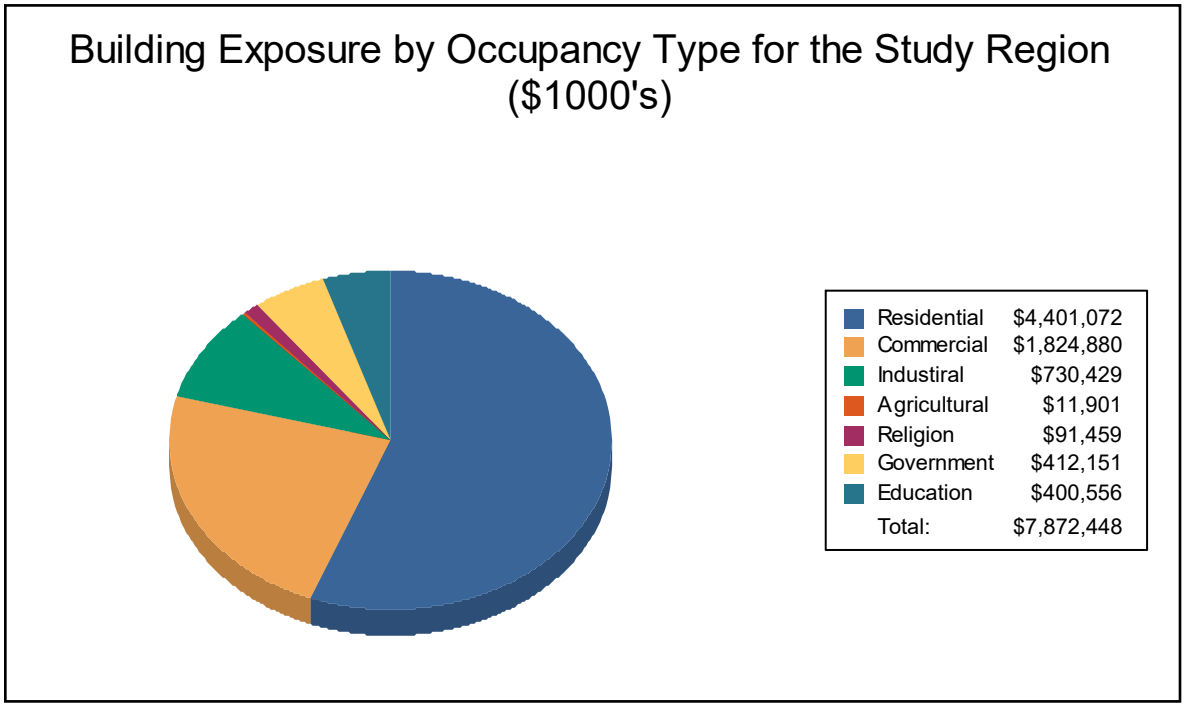
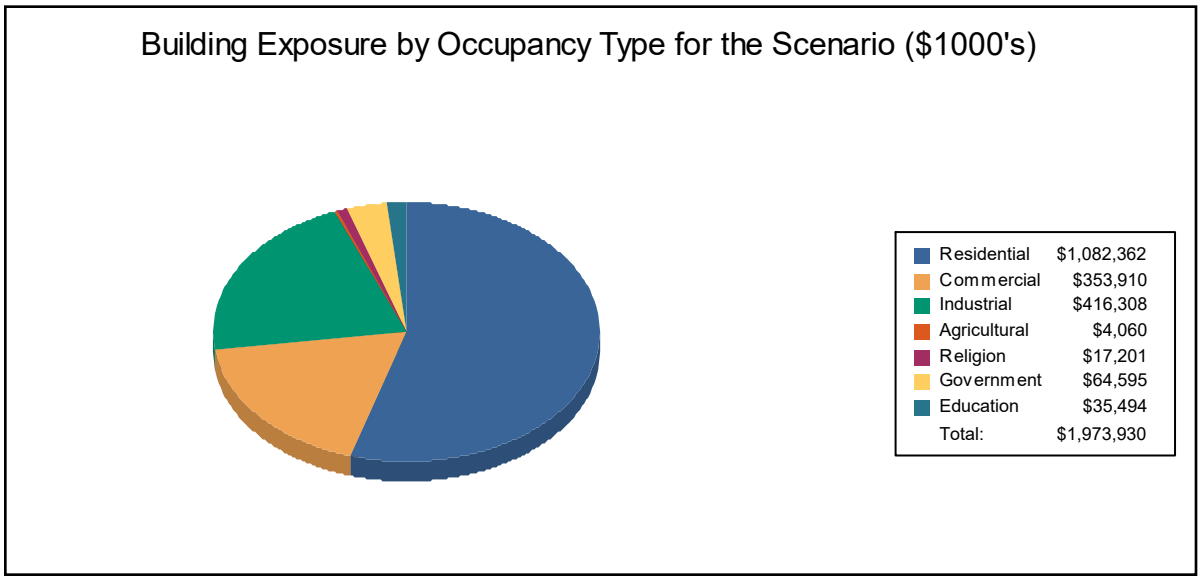


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,082,362	54.8%
Commercial	353,910	17.9%
Industrial	416,308	21.1%
Agricultural	4,060	0.2%
Religion	17,201	0.9%
Government	64,595	3.3%
Education	35,494	1.8%
Total	**1,973,930**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 14 schools, 6 fire stations, 1 police station and 1 emergency operation center.

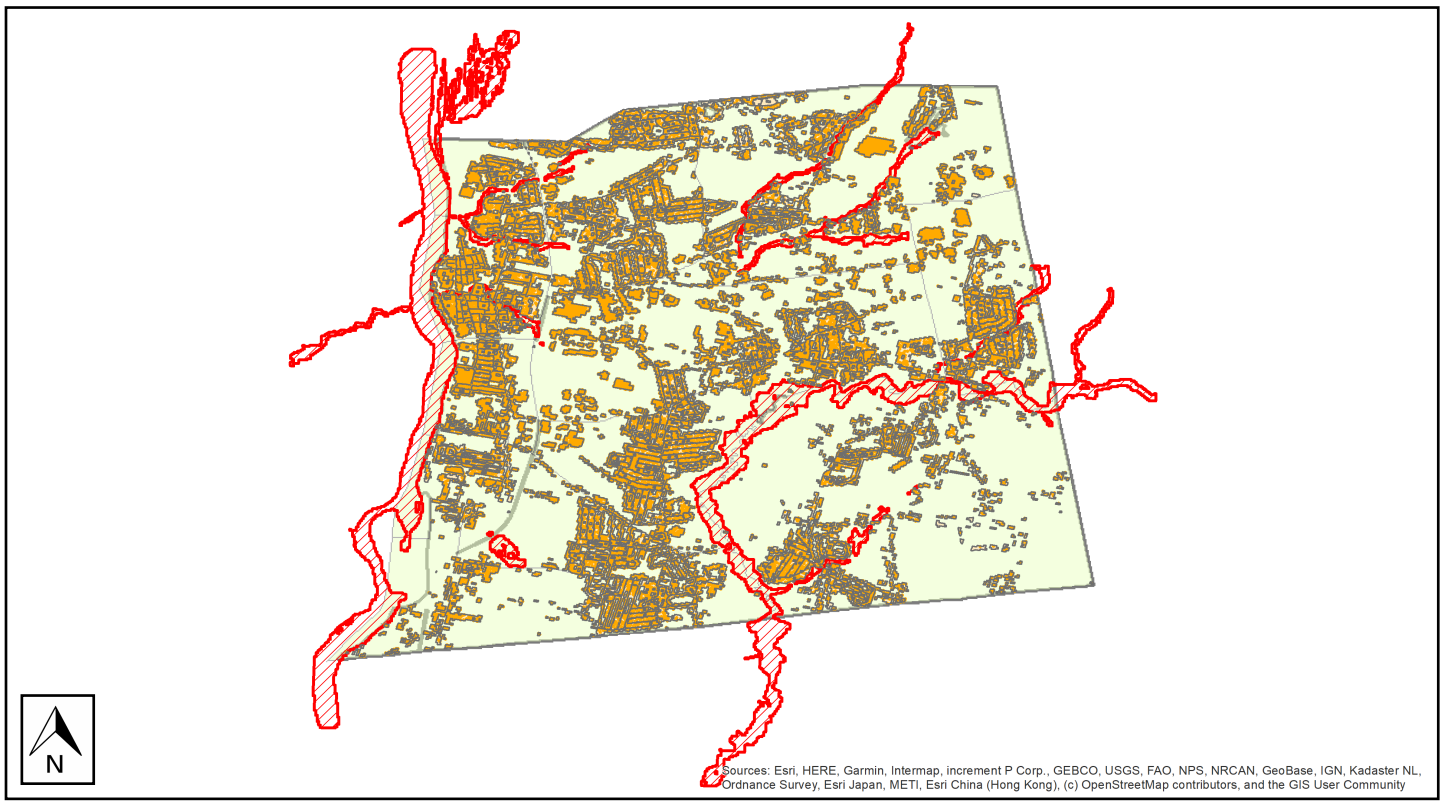
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Enfield_FL
Scenario Name:	Enfield_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 10 buildings will be at least moderately damaged. This is over 94% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

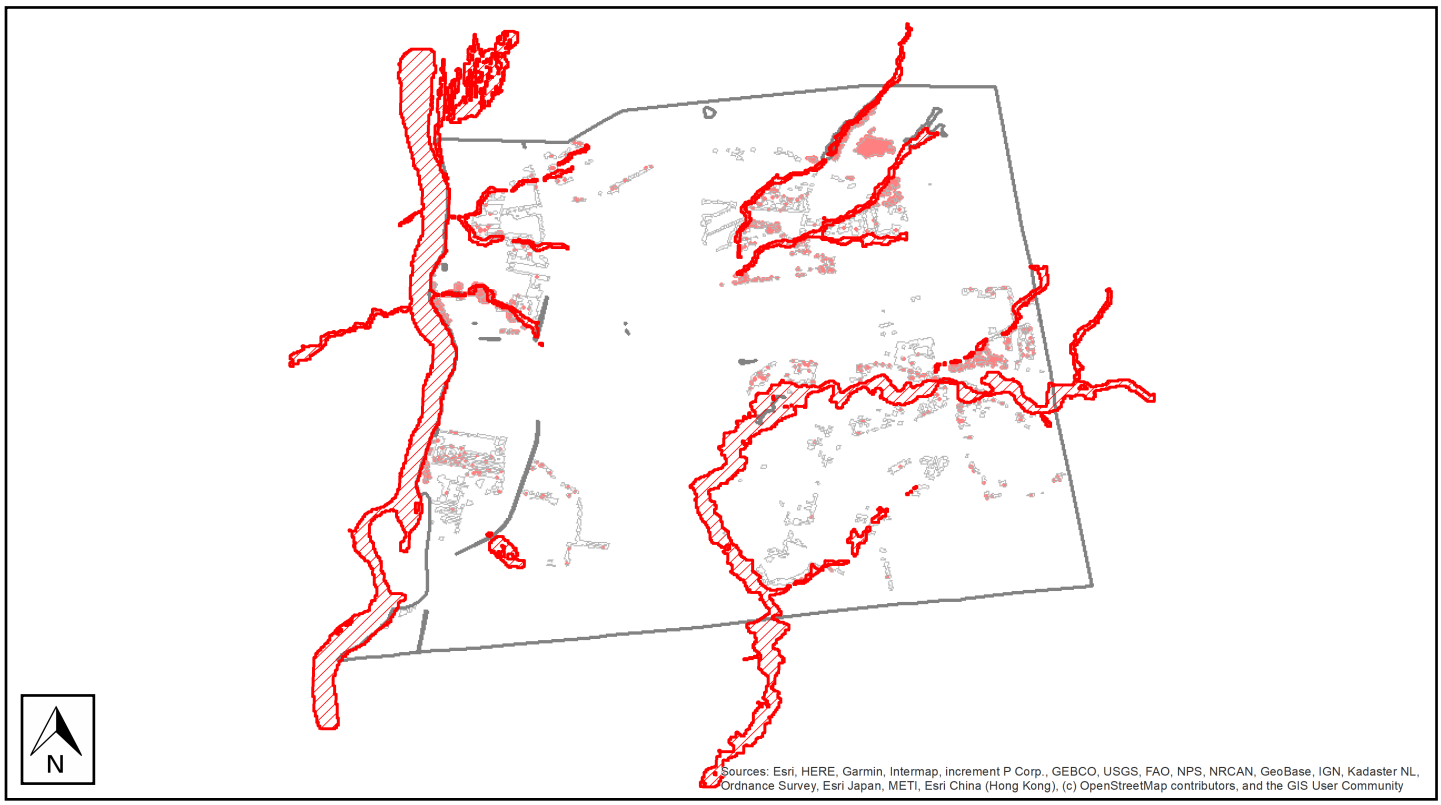


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	6	38	10	63	0	0	0	0	0	0	0	0
Total	**6**		**10**		**0**		**0**		**0**		**0**	

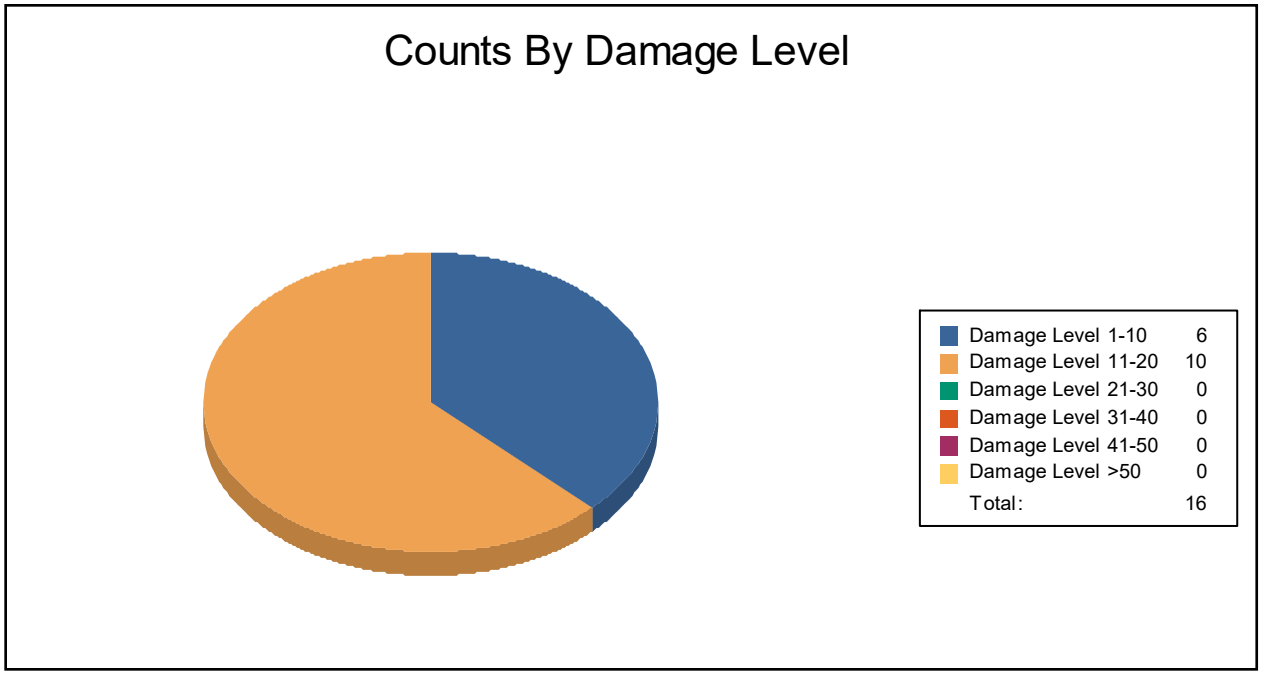


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	5	33	10	67	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	14	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

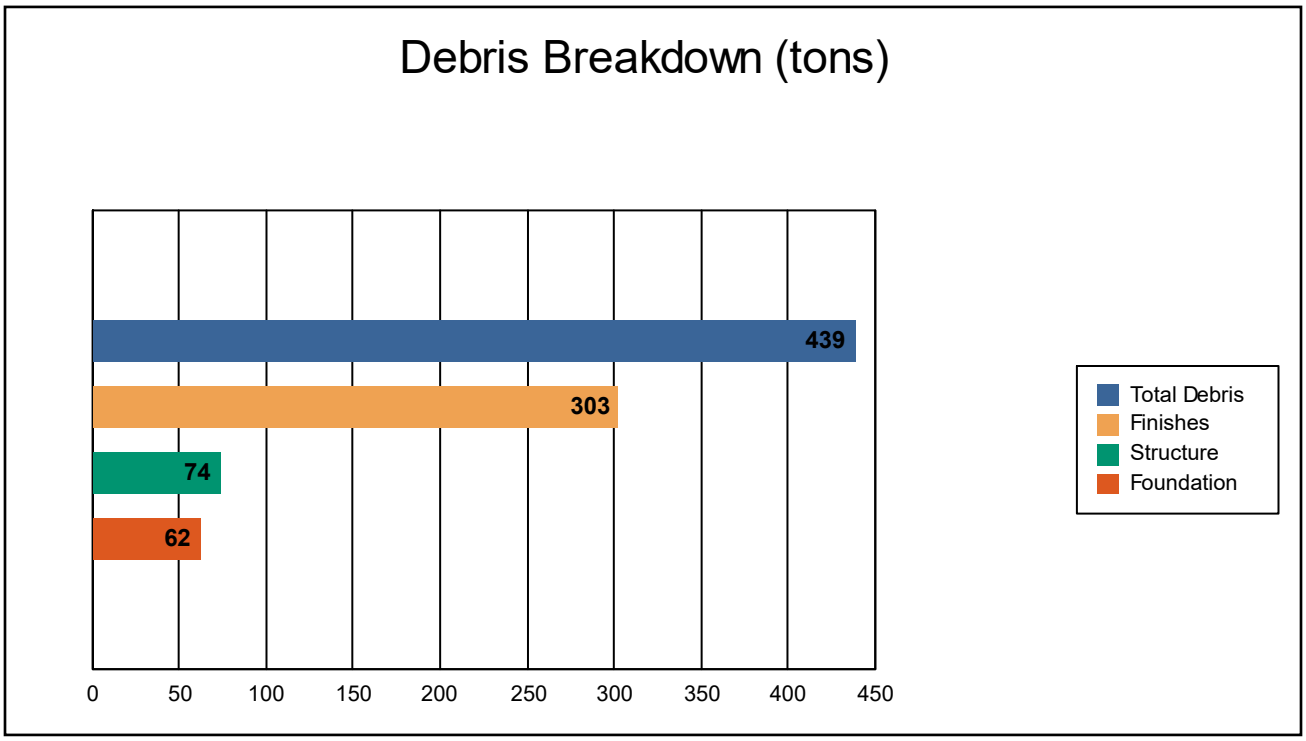
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

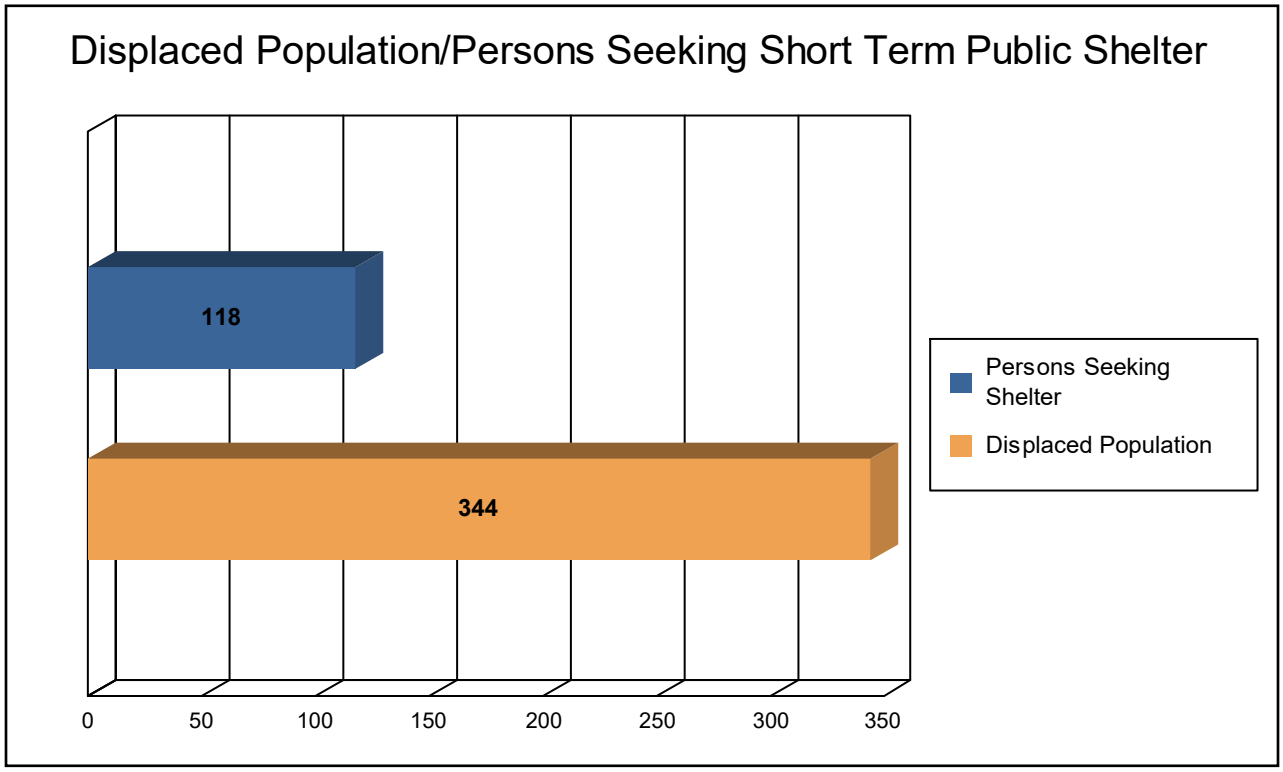


The model estimates that a total of 439 tons of debris will be generated. Of the total amount, Finishes comprises 69% of the total, Structure comprises 17% of the total, and Foundation comprises 14%. If the debris tonnage is converted into an estimated number of truckloads, it will require 18 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 115 households (or 344 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 118 people (out of a total population of 42,127) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 41.47 million dollars, which represents 2.10 % of the total replacement value of the scenario buildings.

Building-Related Losses

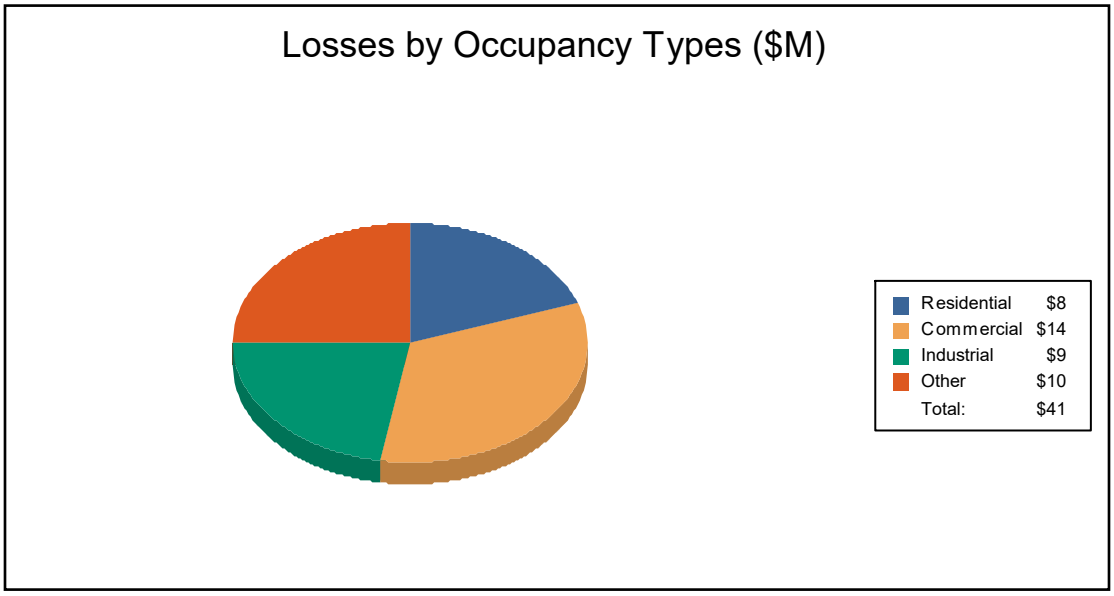
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 23.00 million dollars. 45% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.60% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.20	1.31	2.25	0.31	8.06
	Content	2.14	4.36	5.55	1.89	13.94
	Inventory	0.00	0.29	0.72	0.01	1.01
	Subtotal	**6.33**	**5.95**	**8.51**	**2.21**	**23.00**
Business Interruption						
	Income	0.03	3.32	0.13	0.47	3.95
	Relocation	0.99	0.65	0.30	0.43	2.37
	Rental Income	0.71	0.46	0.05	0.12	1.34
	Wage	0.07	3.35	0.22	7.18	10.82
	Subtotal	**1.80**	**7.78**	**0.70**	**8.19**	**18.47**
ALL	**Total**	**8.13**	**13.73**	**9.22**	**10.40**	**41.47**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	42,127	4,401,072	3,471,376	7,872,448
Total	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**
Total Study Region	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**

Hazus: Flood Global Risk Report

Region Name: Enfield_FL

Flood Scenario: Enfield_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 557 census blocks. The region contains over 17 thousand households and has a total population of 42,127 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 14,458 buildings in the region with a total building replacement value (excluding contents) of 7,872 million dollars. Approximately 89.78% of the buildings (and 55.90% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of 7,872 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,401,072	55.9%
Commercial	1,824,880	23.2%
Industrial	730,429	9.3%
Agricultural	11,901	0.2%
Religion	91,459	1.2%
Government	412,151	5.2%
Education	400,556	5.1%
Total	**7,872,448**	**100%**

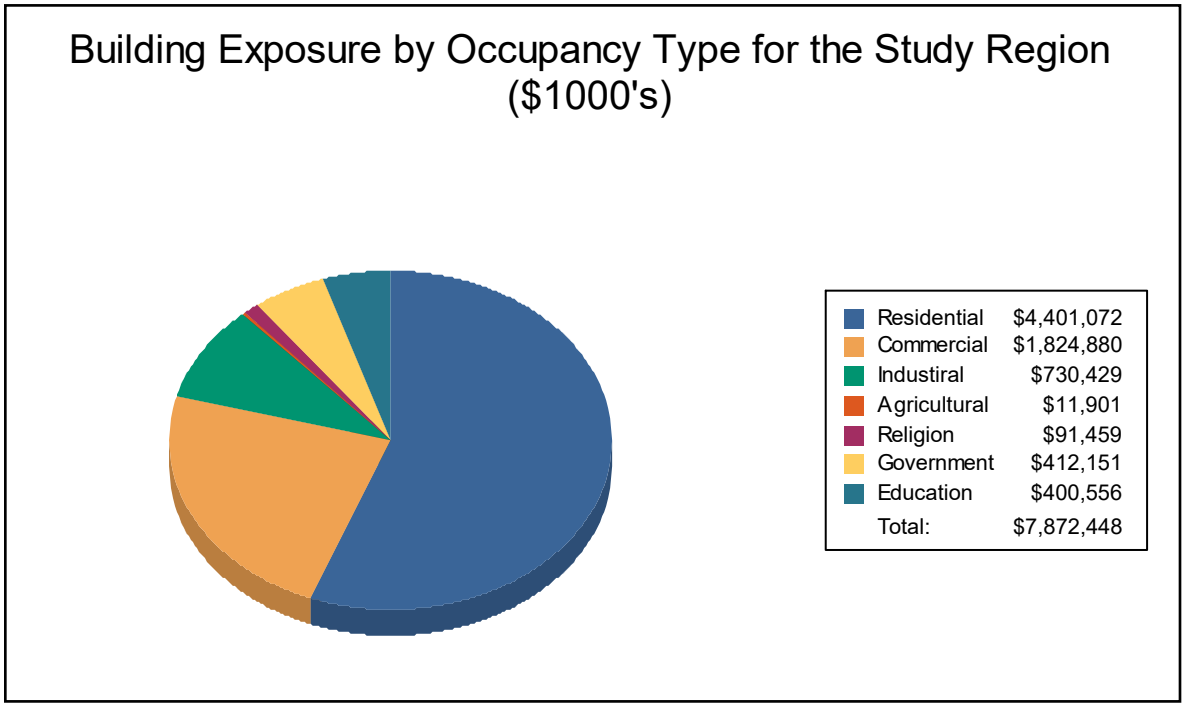
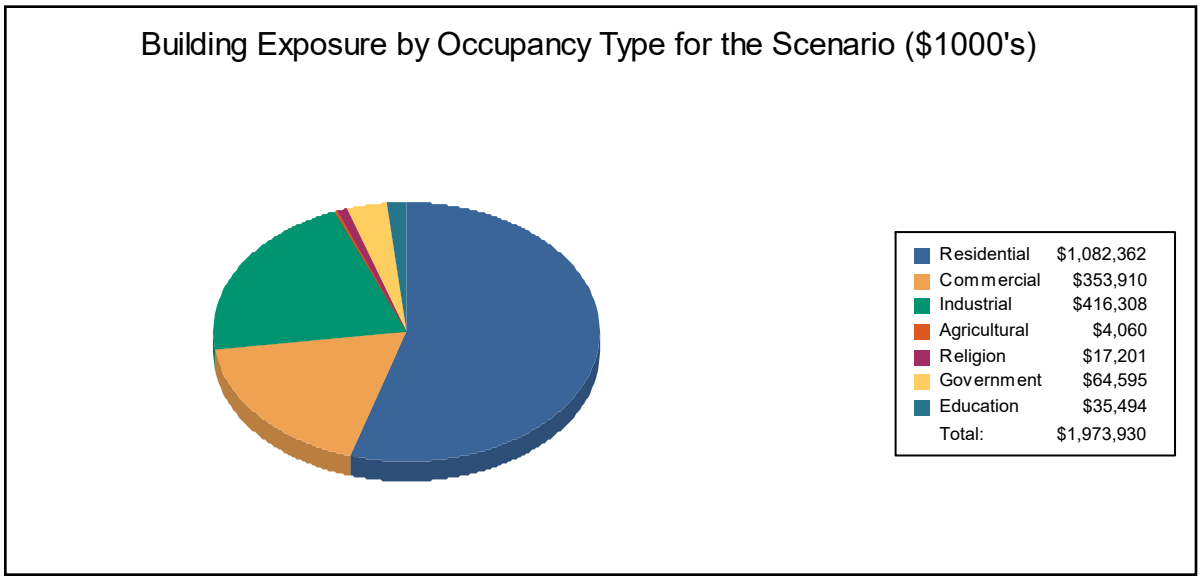


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,082,362	54.8%
Commercial	353,910	17.9%
Industrial	416,308	21.1%
Agricultural	4,060	0.2%
Religion	17,201	0.9%
Government	64,595	3.3%
Education	35,494	1.8%
Total	**1,973,930**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 14 schools, 6 fire stations, 1 police station and 1 emergency operation center.

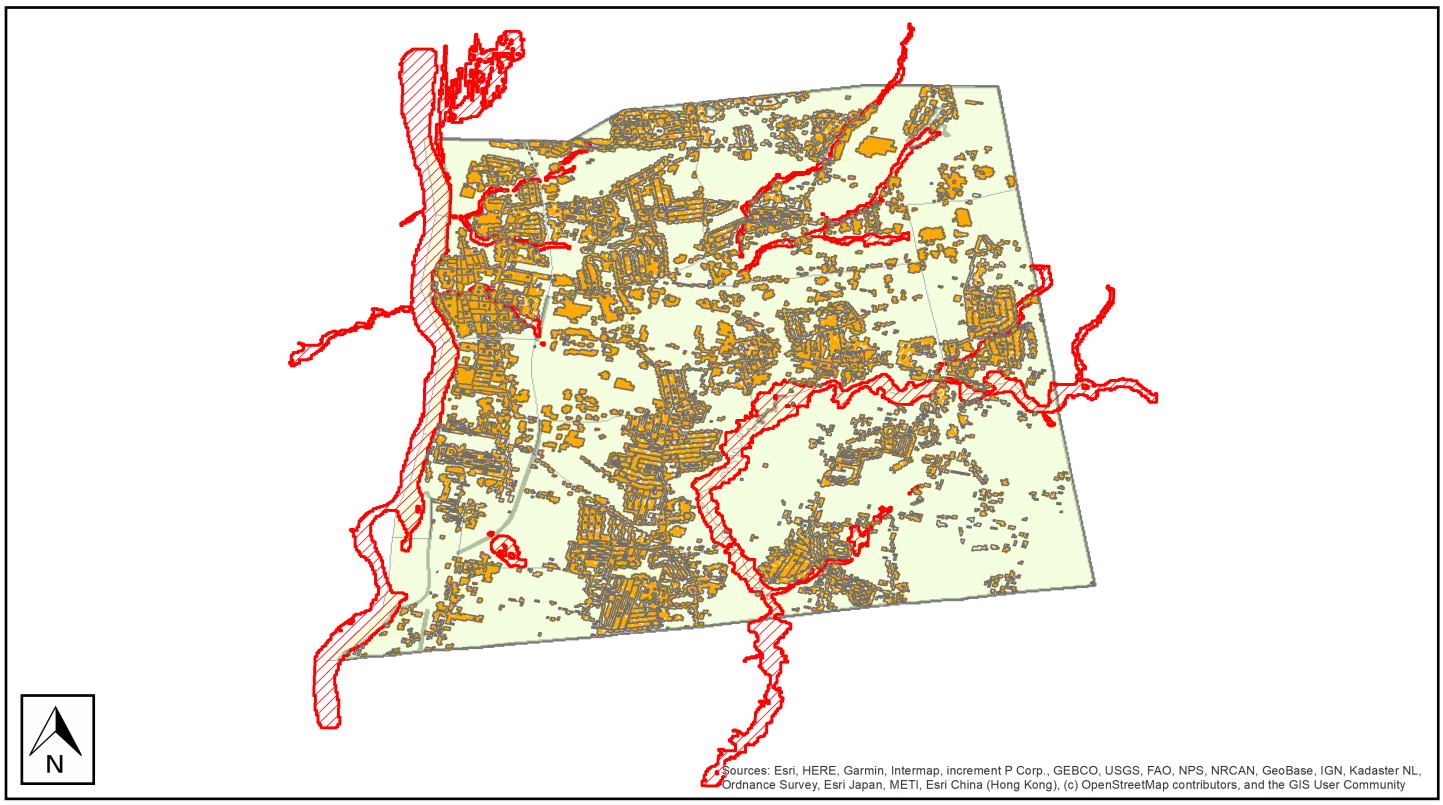
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Enfield_FL
Scenario Name:	Enfield_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 12 buildings will be at least moderately damaged. This is over 95% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

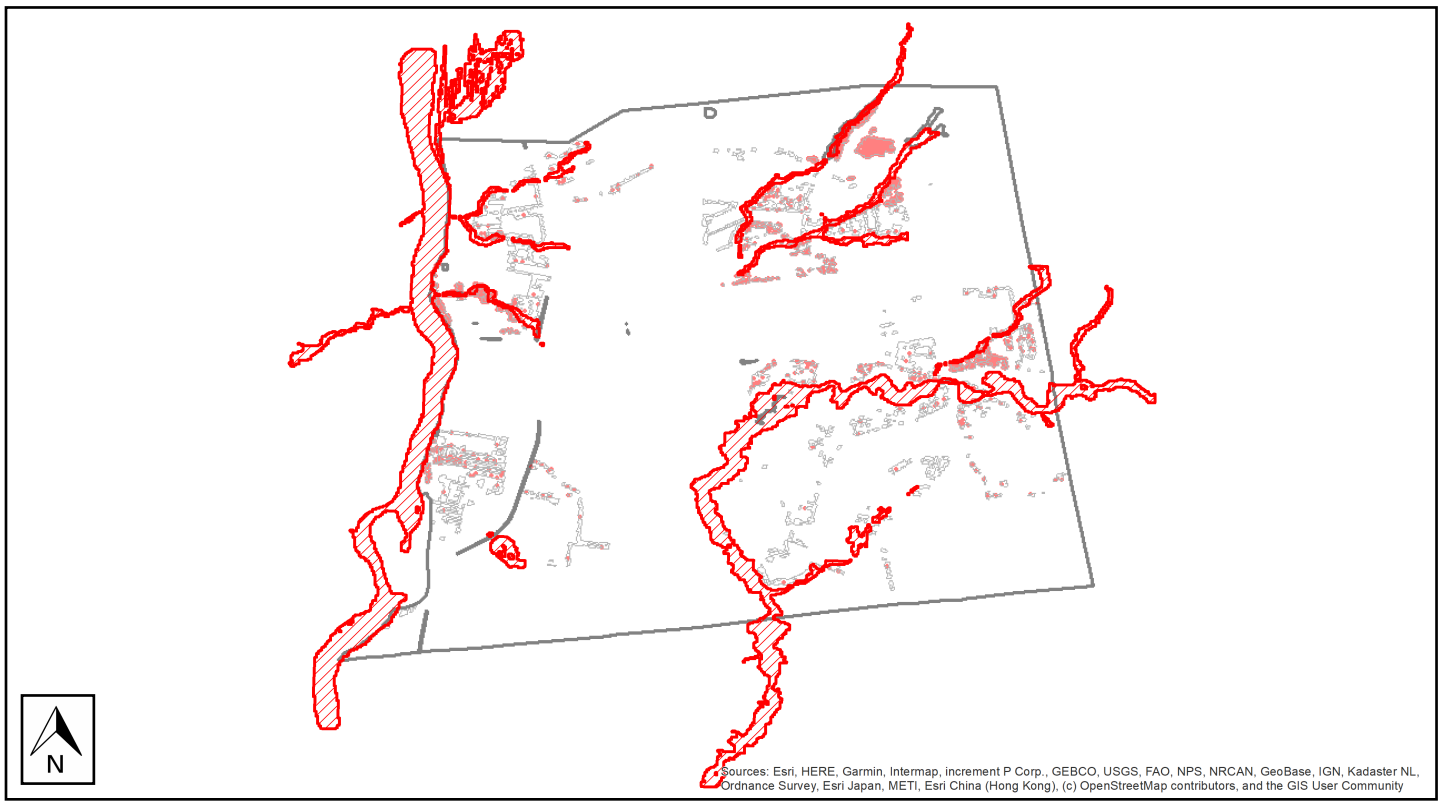


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	7	37	12	63	0	0	0	0	0	0	0	0
Total	**7**		**12**		**0**		**0**		**0**		**0**	

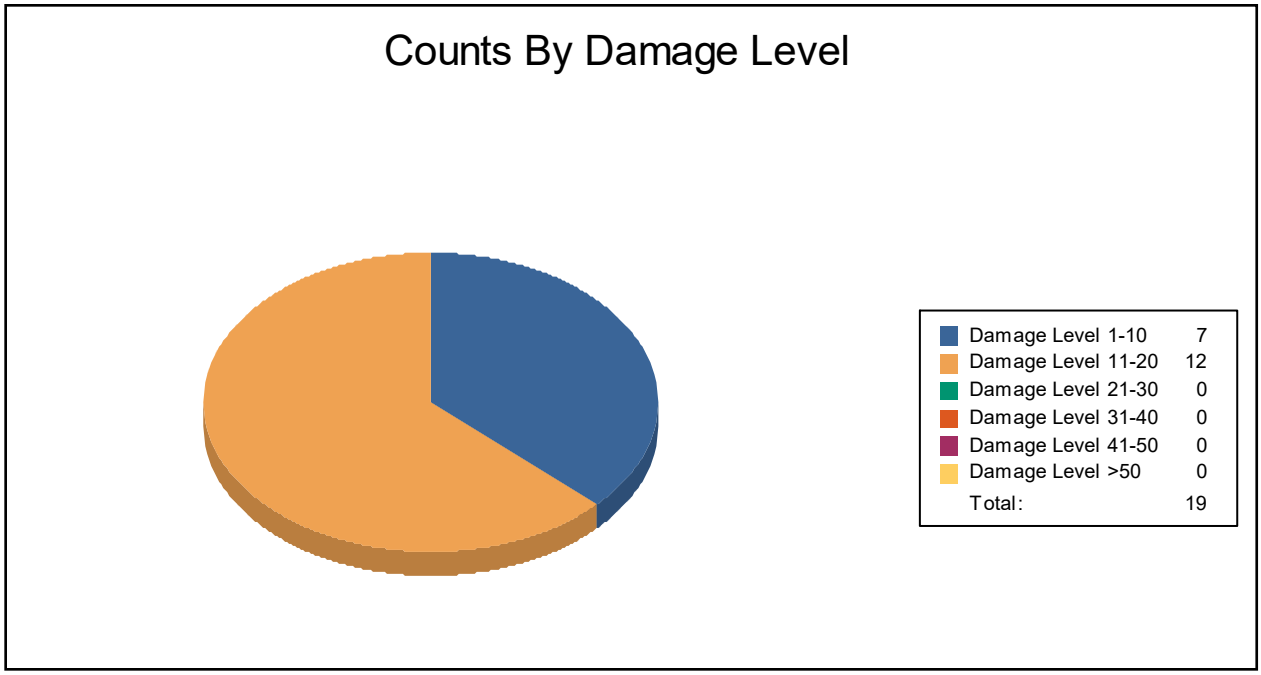


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	6	33	12	67	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	14	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

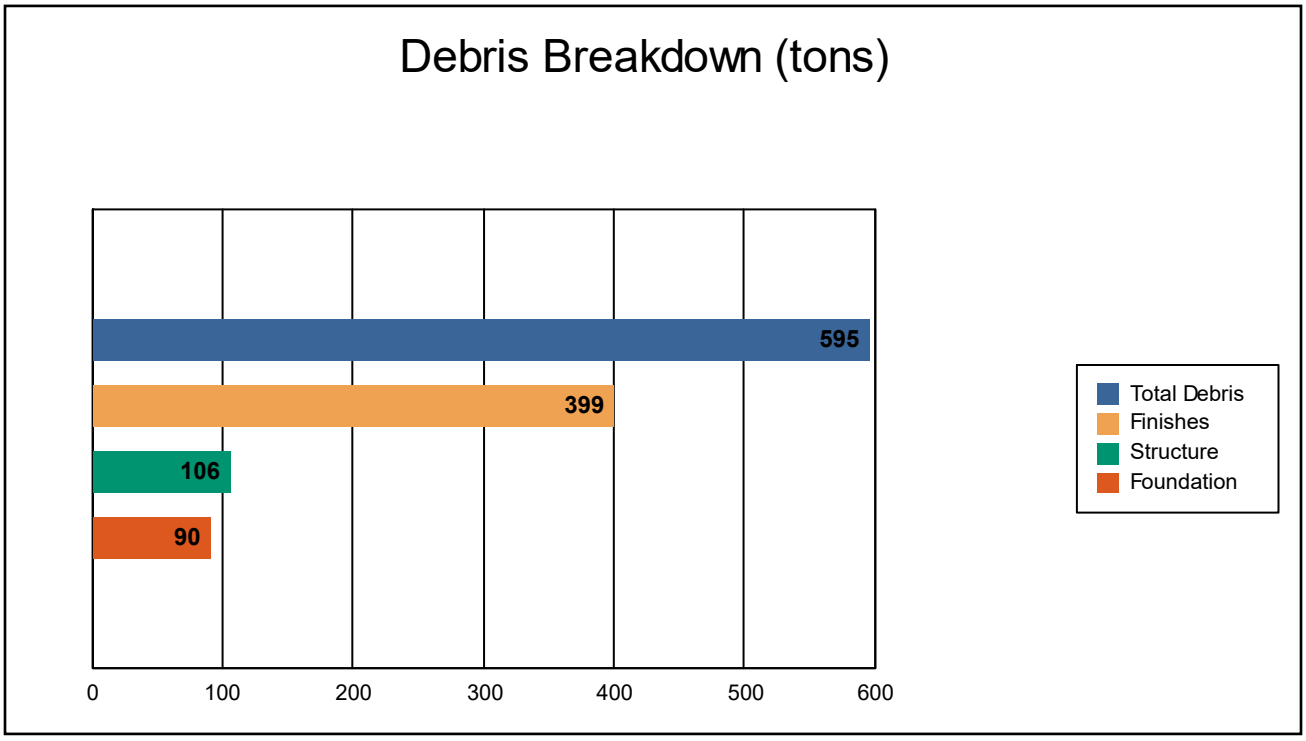
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

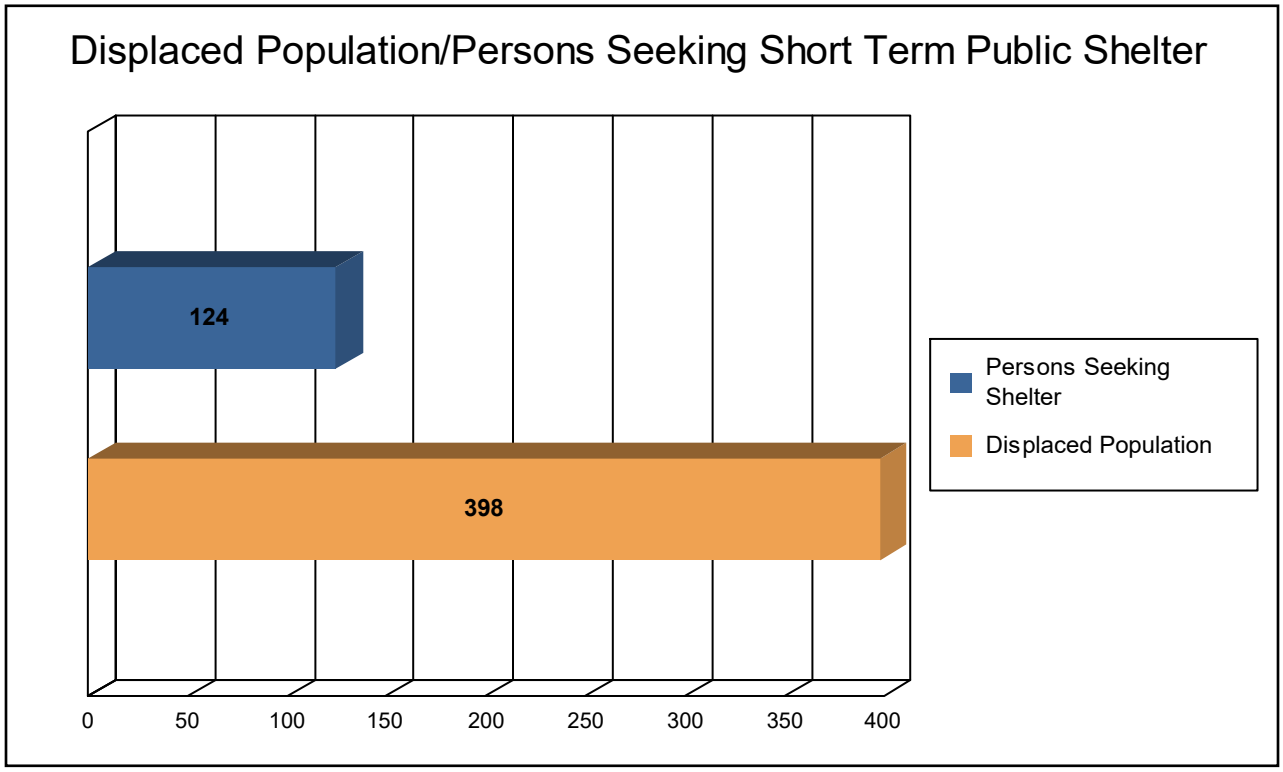


The model estimates that a total of 595 tons of debris will be generated. Of the total amount, Finishes comprises 67% of the total, Structure comprises 18% of the total, and Foundation comprises 15%. If the debris tonnage is converted into an estimated number of truckloads, it will require 24 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 133 households (or 398 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 124 people (out of a total population of 42,127) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 51.41 million dollars, which represents 2.60 % of the total replacement value of the scenario buildings.

Building-Related Losses

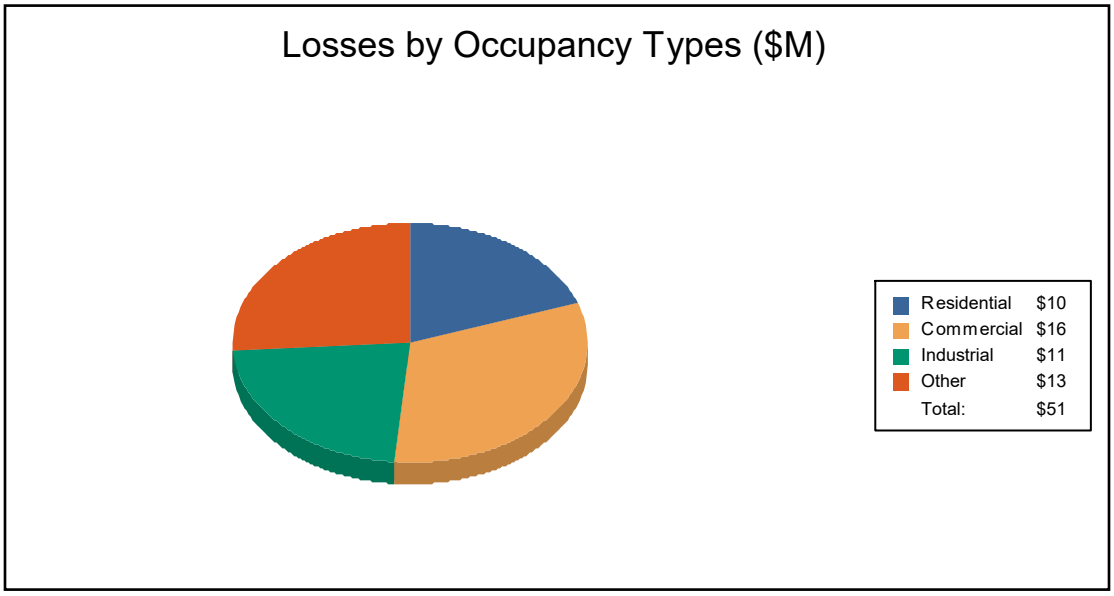
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 28.79 million dollars. 44% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.67% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.29	1.59	2.70	0.42	10.01
	Content	2.69	5.30	7.09	2.43	17.51
	Inventory	0.00	0.36	0.90	0.01	1.27
	Subtotal	**7.98**	**7.25**	**10.69**	**2.86**	**28.79**
Business Interruption						
	Income	0.03	3.82	0.14	0.65	4.64
	Relocation	1.21	0.75	0.34	0.53	2.83
	Rental Income	0.83	0.53	0.06	0.13	1.55
	Wage	0.07	3.99	0.25	9.31	13.61
	Subtotal	**2.13**	**9.08**	**0.79**	**10.62**	**22.62**
ALL	**Total**	**10.11**	**16.33**	**11.49**	**13.48**	**51.41**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	42,127	4,401,072	3,471,376	7,872,448
Total	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**
Total Study Region	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**

Hazus: Flood Global Risk Report

Region Name: Enfield_FL

Flood Scenario: Enfield_Flood

Print Date: Monday, April 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 557 census blocks. The region contains over 17 thousand households and has a total population of 42,127 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 14,458 buildings in the region with a total building replacement value (excluding contents) of 7,872 million dollars. Approximately 89.78% of the buildings (and 55.90% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of 7,872 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,401,072	55.9%
Commercial	1,824,880	23.2%
Industrial	730,429	9.3%
Agricultural	11,901	0.2%
Religion	91,459	1.2%
Government	412,151	5.2%
Education	400,556	5.1%
Total	**7,872,448**	**100%**

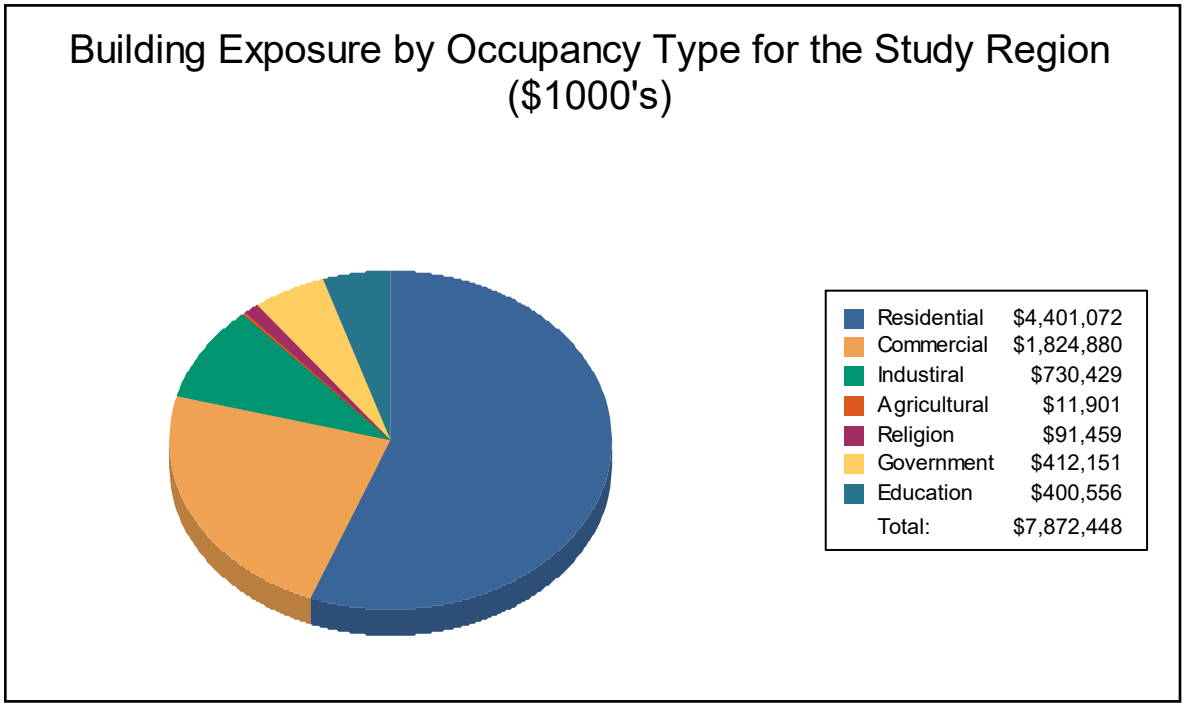
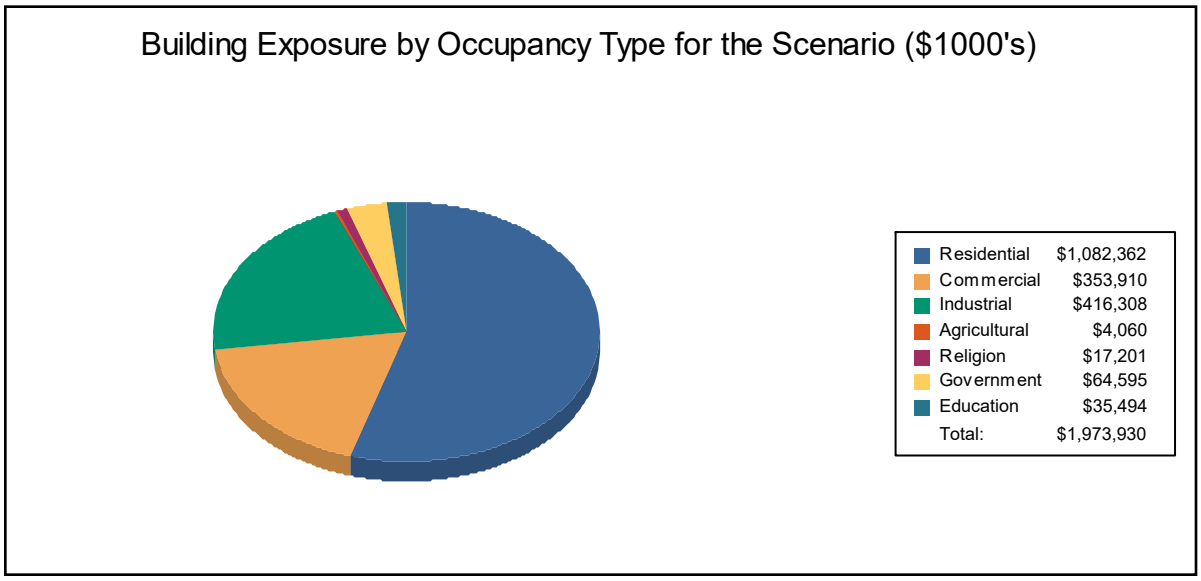


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,082,362	54.8%
Commercial	353,910	17.9%
Industrial	416,308	21.1%
Agricultural	4,060	0.2%
Religion	17,201	0.9%
Government	64,595	3.3%
Education	35,494	1.8%
Total	**1,973,930**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 14 schools, 6 fire stations, 1 police station and 1 emergency operation center.

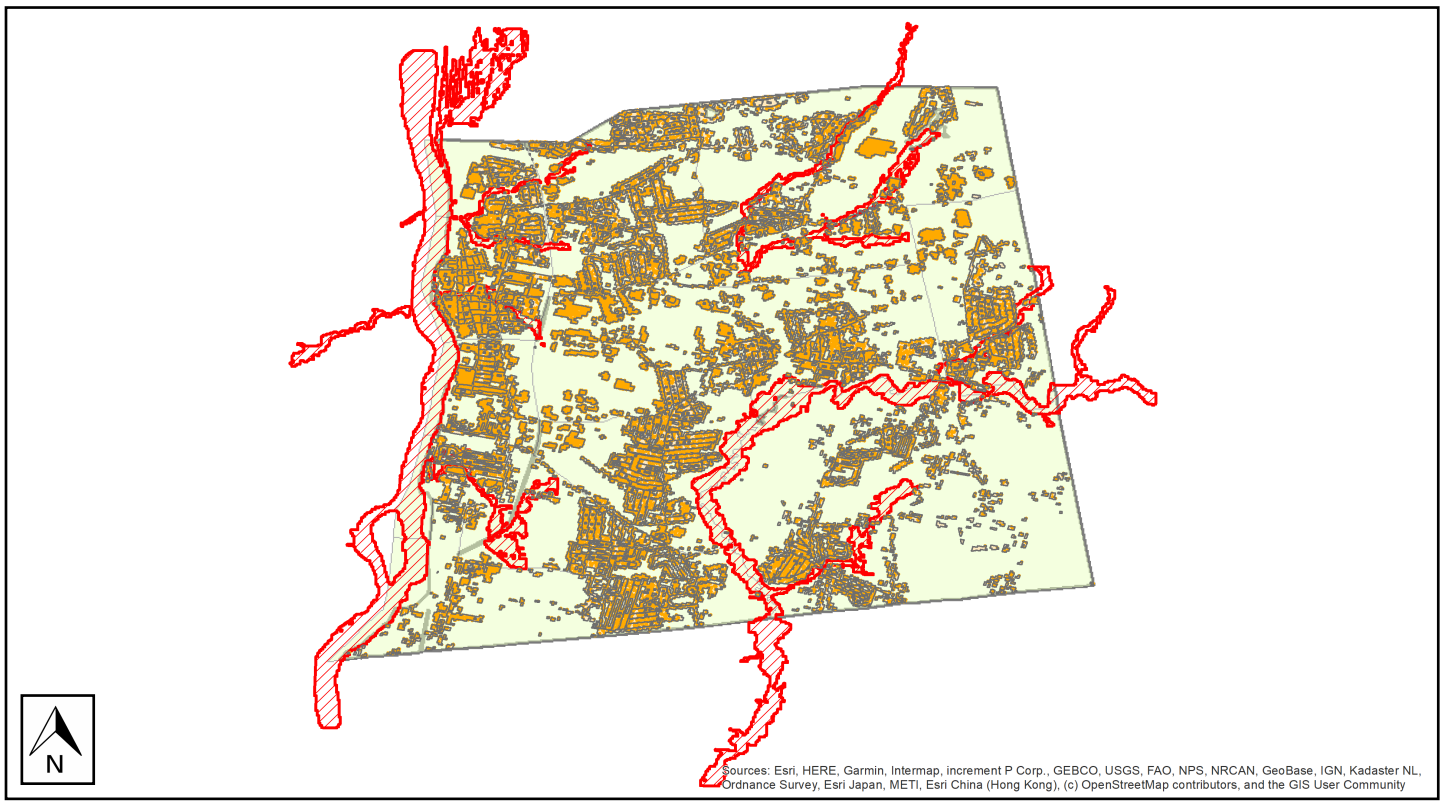
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Enfield_FL
Scenario Name:	Enfield_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 38 buildings will be at least moderately damaged. This is over 95% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

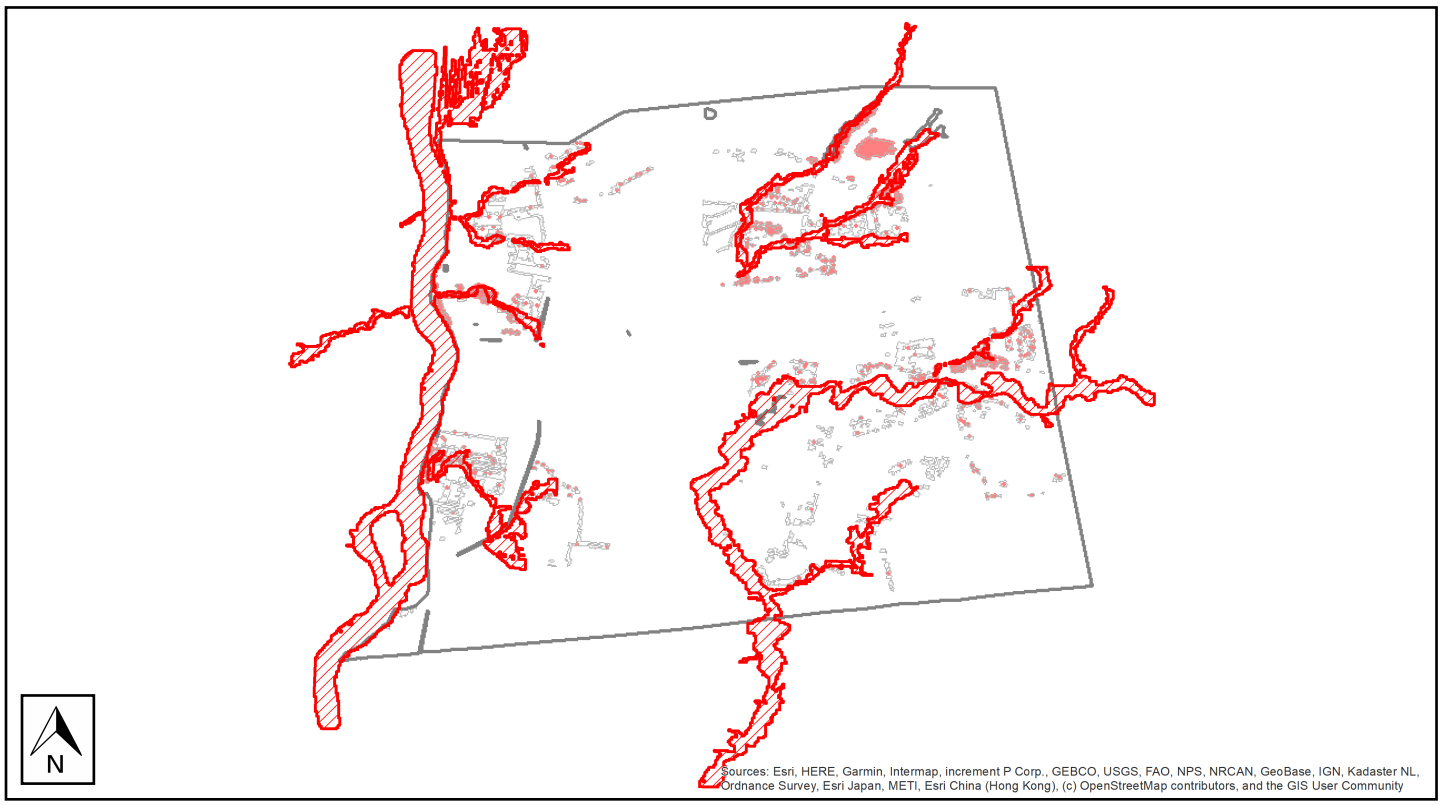


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	1	100	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	23	38	27	44	10	16	0	0	1	2	0	0
Total	**24**		**27**		**10**		**0**		**1**		**0**	

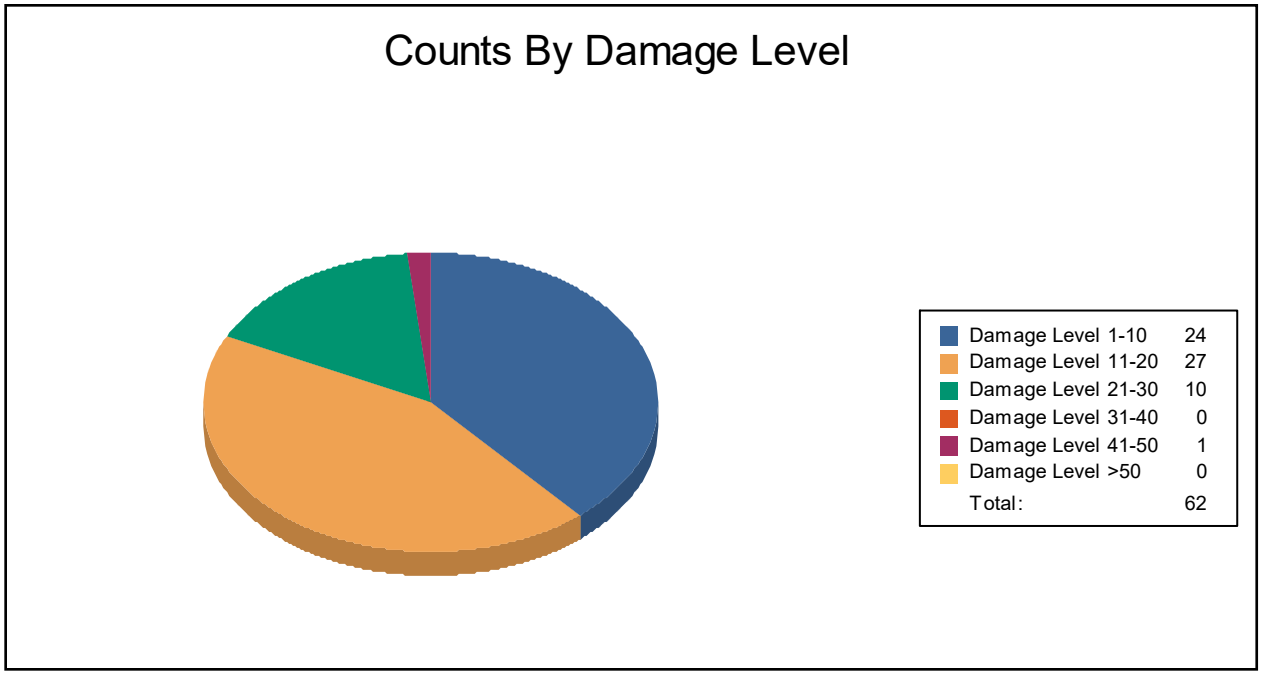


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	50	1	50	0	0	0	0	0	0	0	0
Steel	1	100	0	0	0	0	0	0	0	0	0	0
Wood	22	37	26	44	10	17	0	0	1	2	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	14	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

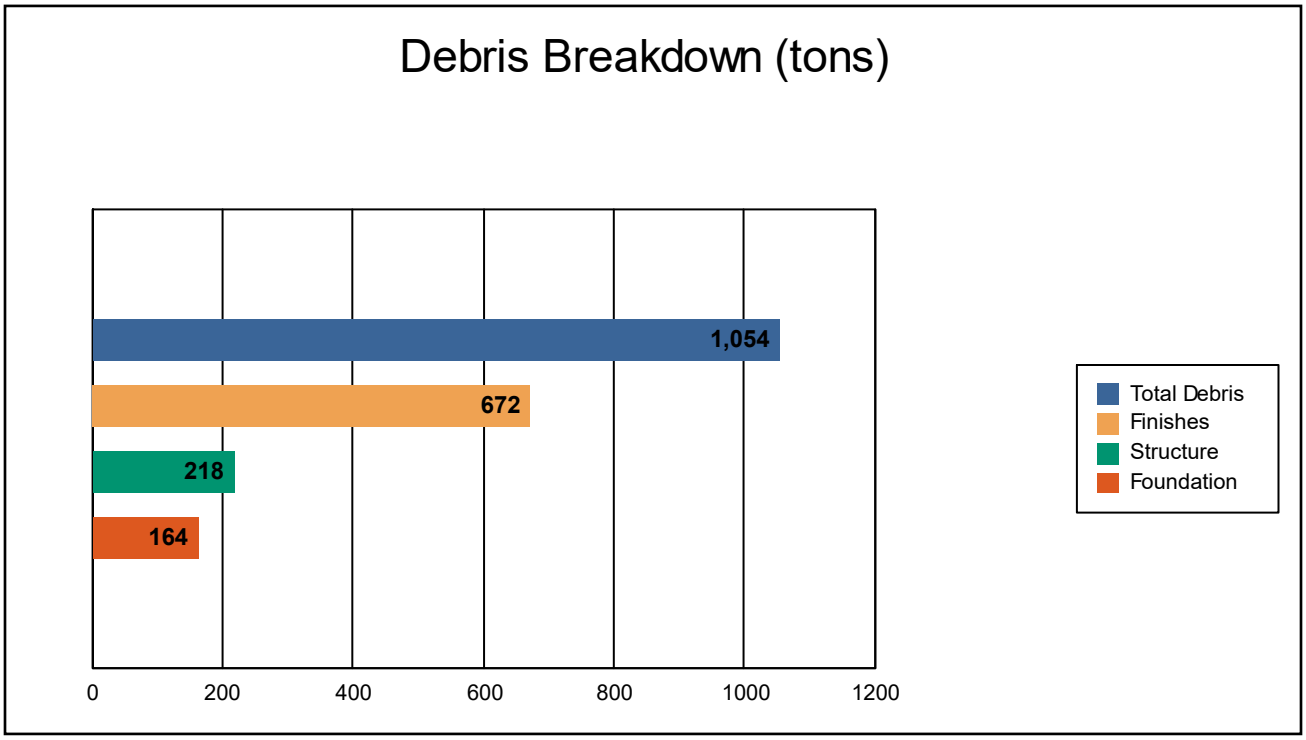
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

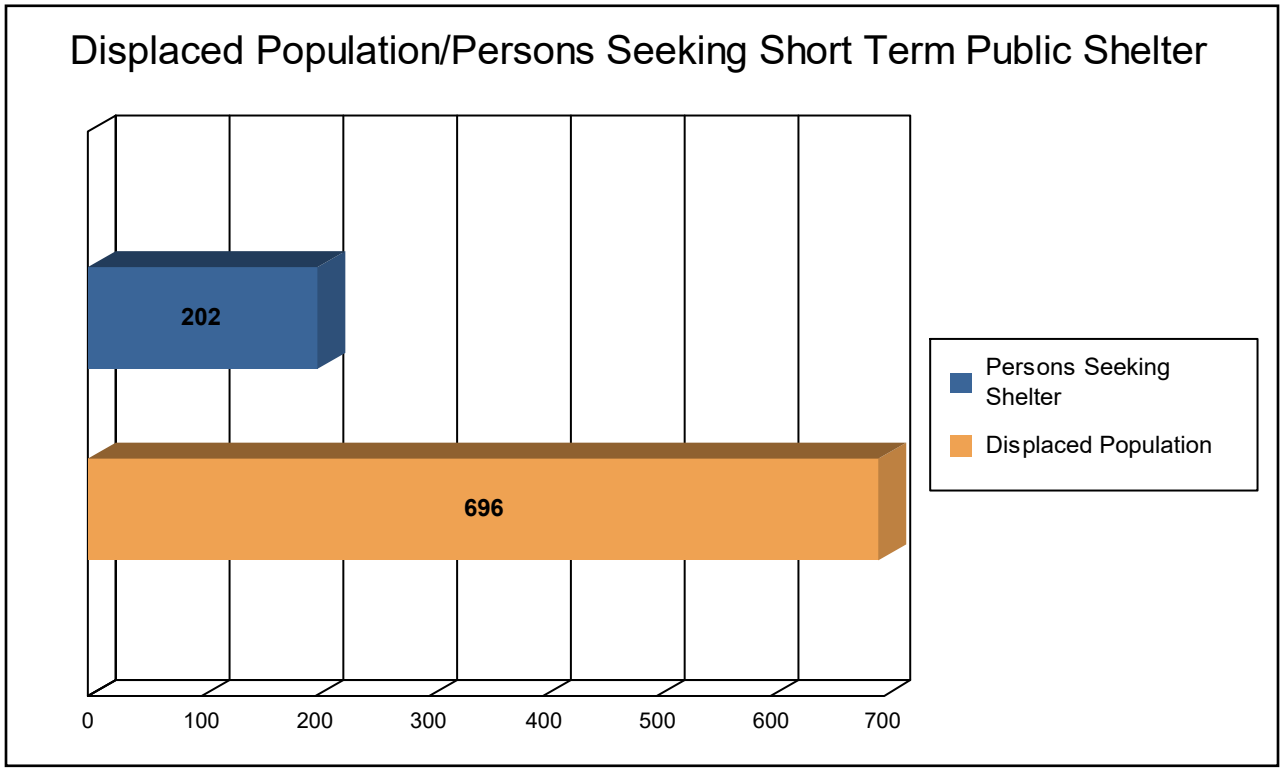


The model estimates that a total of 1,054 tons of debris will be generated. Of the total amount, Finishes comprises 64% of the total, Structure comprises 21% of the total, and Foundation comprises 16%. If the debris tonnage is converted into an estimated number of truckloads, it will require 43 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 232 households (or 696 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 202 people (out of a total population of 42,127) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 93.88 million dollars, which represents 4.76 % of the total replacement value of the scenario buildings.

Building-Related Losses

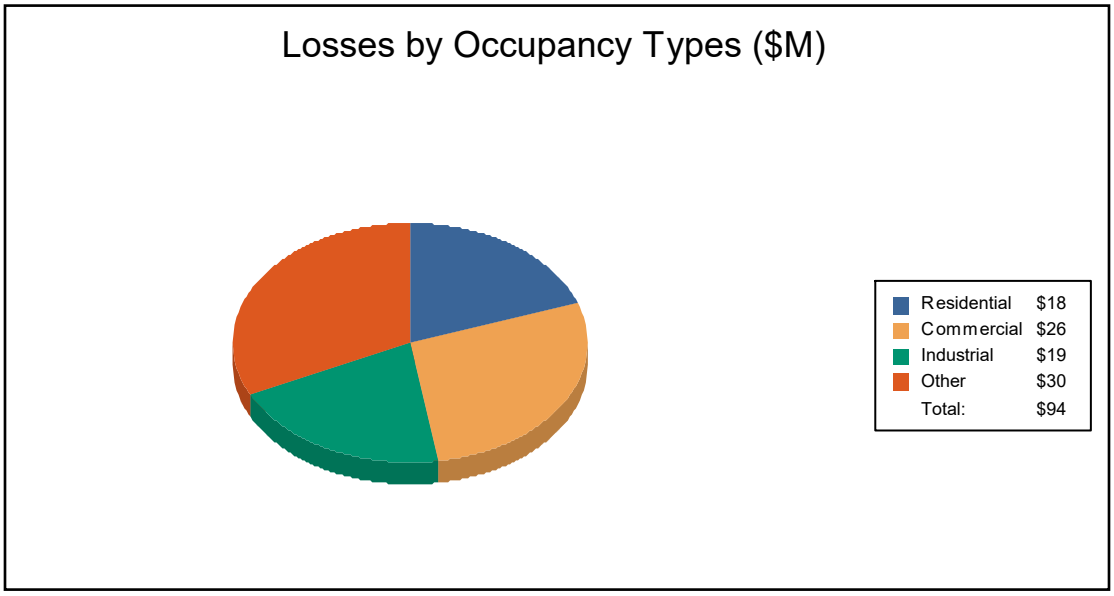
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 48.91 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.67% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.75	2.58	4.40	0.68	17.41
	Content	4.77	8.55	12.10	3.86	29.27
	Inventory	0.00	0.70	1.47	0.06	2.23
	Subtotal	**14.52**	**11.83**	**17.96**	**4.60**	**48.91**
Business Interruption						
	Income	0.06	5.77	0.20	1.20	7.23
	Relocation	2.39	1.18	0.44	1.01	5.02
	Rental Income	1.36	0.82	0.08	0.22	2.48
	Wage	0.14	6.55	0.34	23.22	30.24
	Subtotal	**3.95**	**14.32**	**1.06**	**25.65**	**44.97**
ALL	**Total**	**18.47**	**26.15**	**19.02**	**30.25**	**93.88**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	42,127	4,401,072	3,471,376	7,872,448
Total	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**
Total Study Region	**42,127**	**4,401,072**	**3,471,376**	**7,872,448**

Hazus: Flood Global Risk Report

Region Name: Farmington_FL

Flood Scenario: Farmington_Flood

Print Date: Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 271 census blocks. The region contains over 11 thousand households and has a total population of 26,712 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,374 buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87.44% of the buildings (and 60.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,374 buildings in the region which have an aggregate total replacement value of 7,066 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,256,309	60.2%
Commercial	1,638,784	23.2%
Industrial	433,771	6.1%
Agricultural	30,955	0.4%
Religion	131,034	1.9%
Government	58,595	0.8%
Education	516,480	7.3%
Total	**7,065,928**	**100%**

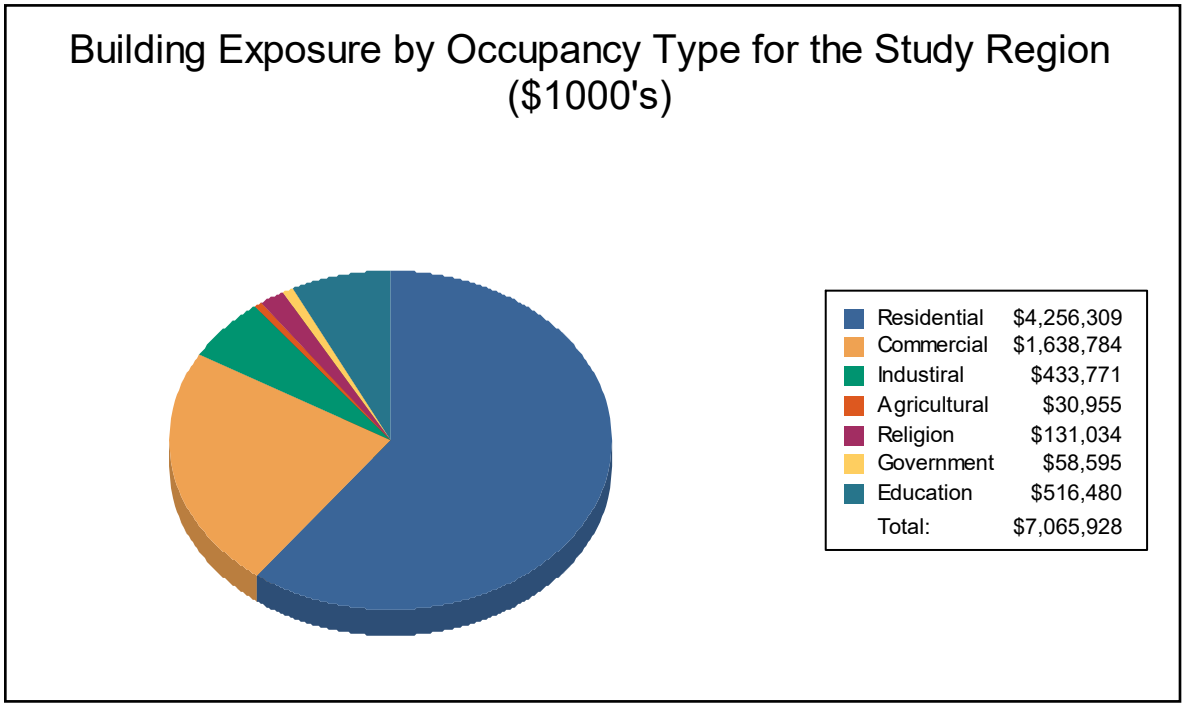
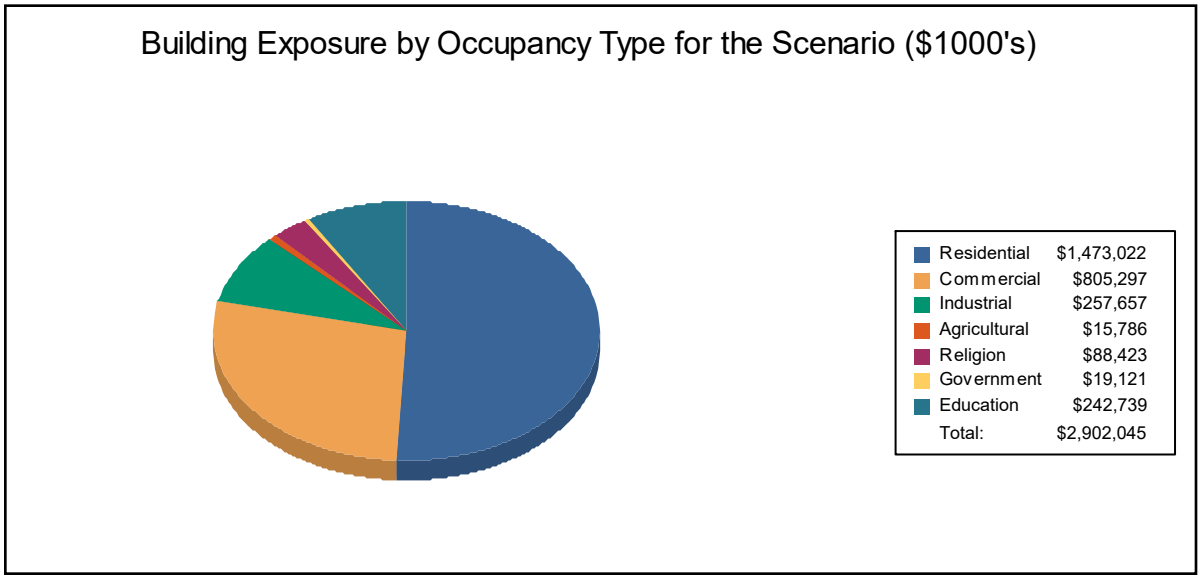


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,473,022	50.8%
Commercial	805,297	27.7%
Industrial	257,657	8.9%
Agricultural	15,786	0.5%
Religion	88,423	3.0%
Government	19,121	0.7%
Education	242,739	8.4%
Total	**2,902,045**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds.
There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

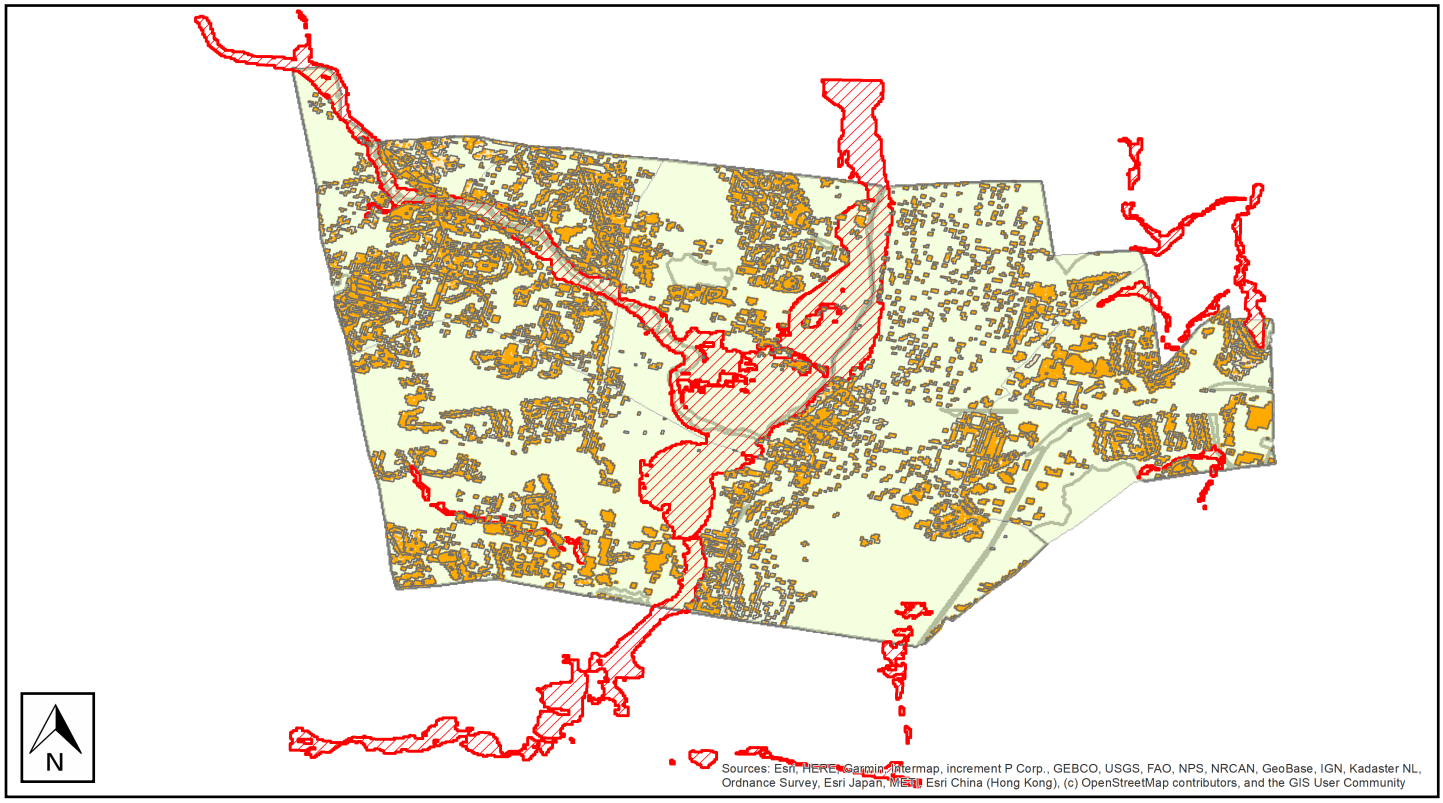
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Farmington_FL
Scenario Name:	Farmington_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 45 buildings will be at least moderately damaged. This is over 92% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

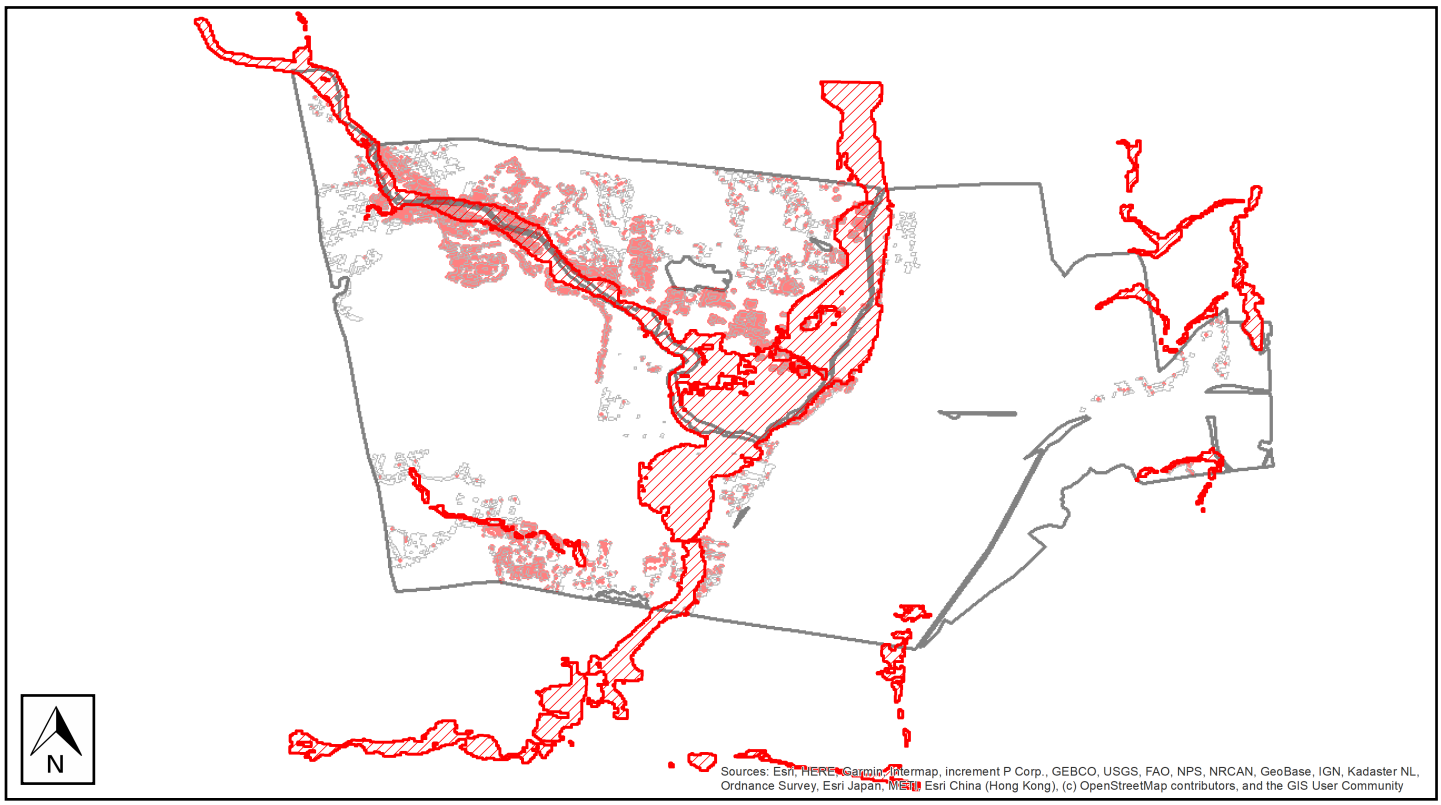


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	8	15	24	45	17	32	2	4	2	4	0	0
Total	**8**		**24**		**17**		**2**		**2**		**0**	

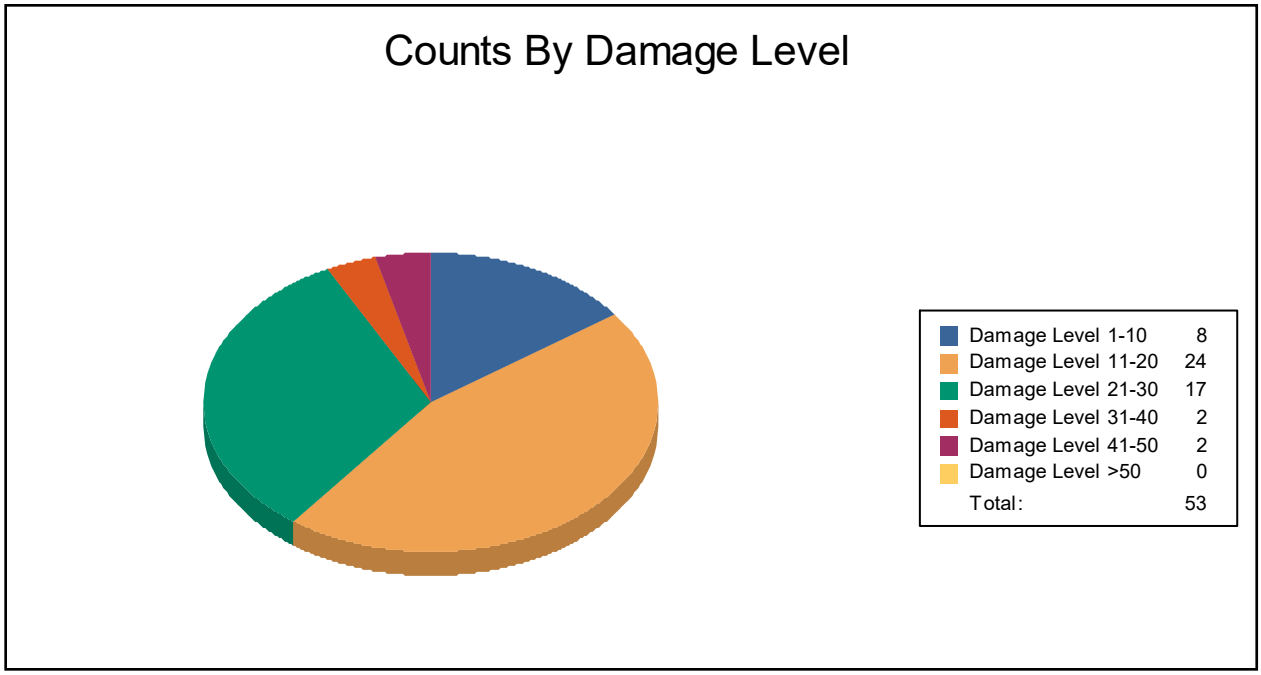


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	17	3	50	2	33	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	7	16	20	44	14	31	2	4	2	4	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 137 hospital beds available for use. On the day of the scenario flood event, the model estimates that 137 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

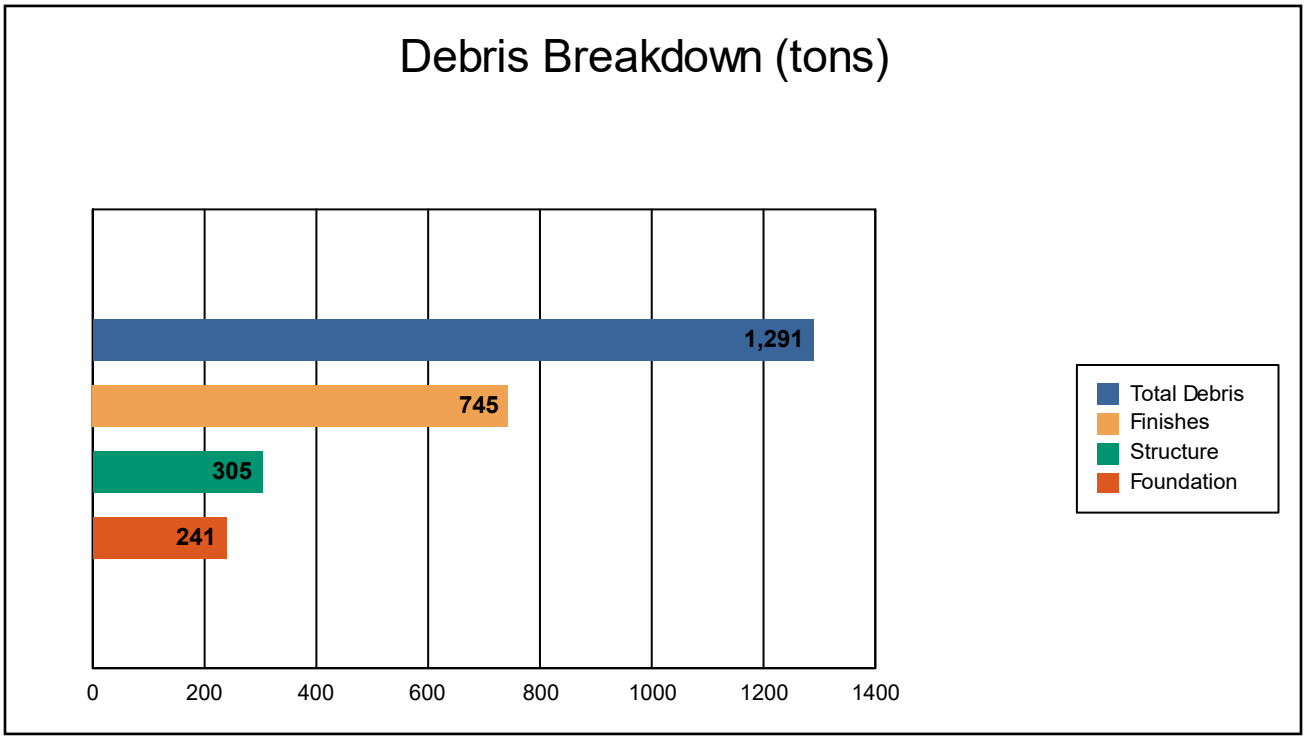
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

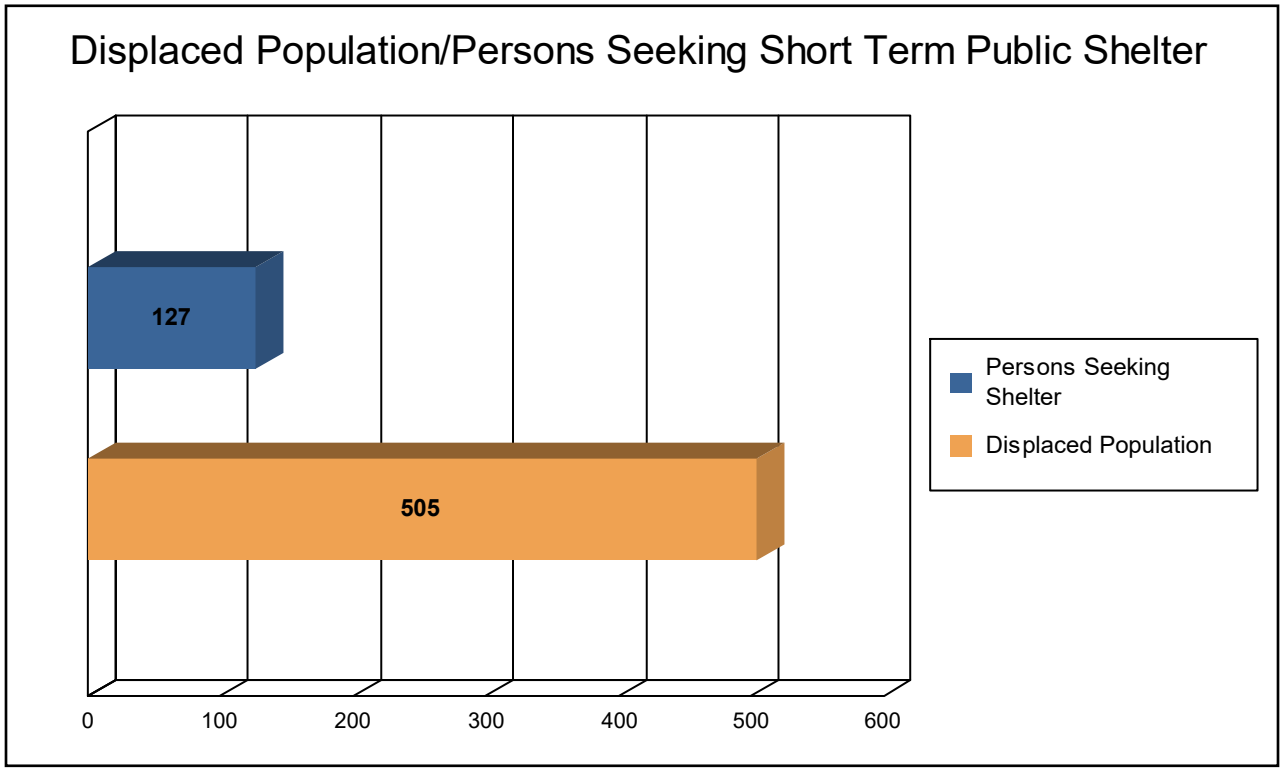


The model estimates that a total of 1,291 tons of debris will be generated. Of the total amount, Finishes comprises 58% of the total, Structure comprises 24% of the total, and Foundation comprises 19%. If the debris tonnage is converted into an estimated number of truckloads, it will require 52 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 168 households (or 505 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 127 people (out of a total population of 26,712) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 130.08 million dollars, which represents 4.48 % of the total replacement value of the scenario buildings.

Building-Related Losses

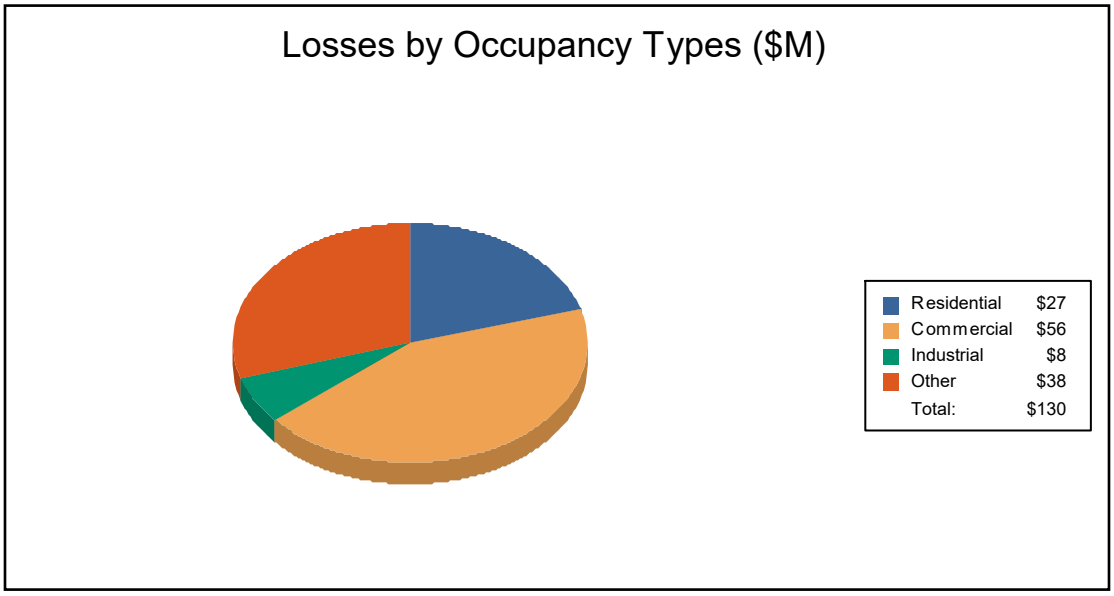
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 69.81 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 20.55% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	14.33	6.66	2.92	2.35	26.25
	Content	6.92	18.20	4.49	9.14	38.75
	Inventory	0.00	2.86	0.64	1.31	4.80
	Subtotal	**21.25**	**27.72**	**8.05**	**12.80**	**69.81**
Business Interruption						
	Income	0.01	11.41	0.11	2.58	14.10
	Relocation	3.40	2.62	0.09	1.76	7.86
	Rental Income	2.07	1.97	0.00	0.44	4.48
	Wage	0.02	12.69	0.20	20.92	33.83
	Subtotal	**5.49**	**28.68**	**0.40**	**25.69**	**60.27**
ALL	**Total**	**26.74**	**56.40**	**8.45**	**38.49**	**130.08**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,309	2,809,619	7,065,928
Total	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**
Total Study Region	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**

Hazus: Flood Global Risk Report

Region Name: Farmington_FL

Flood Scenario: Farmington_Flood

Print Date: Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 271 census blocks. The region contains over 11 thousand households and has a total population of 26,712 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,374 buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87.44% of the buildings (and 60.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,374 buildings in the region which have an aggregate total replacement value of 7,066 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,256,309	60.2%
Commercial	1,638,784	23.2%
Industrial	433,771	6.1%
Agricultural	30,955	0.4%
Religion	131,034	1.9%
Government	58,595	0.8%
Education	516,480	7.3%
Total	**7,065,928**	**100%**

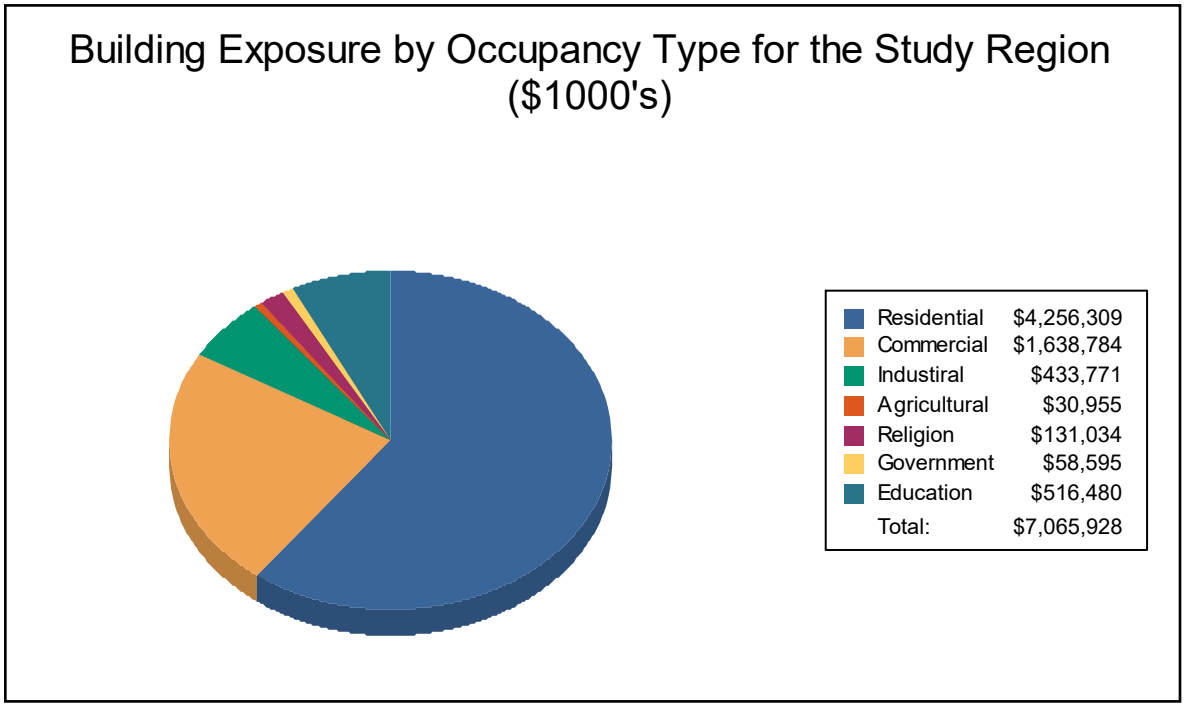
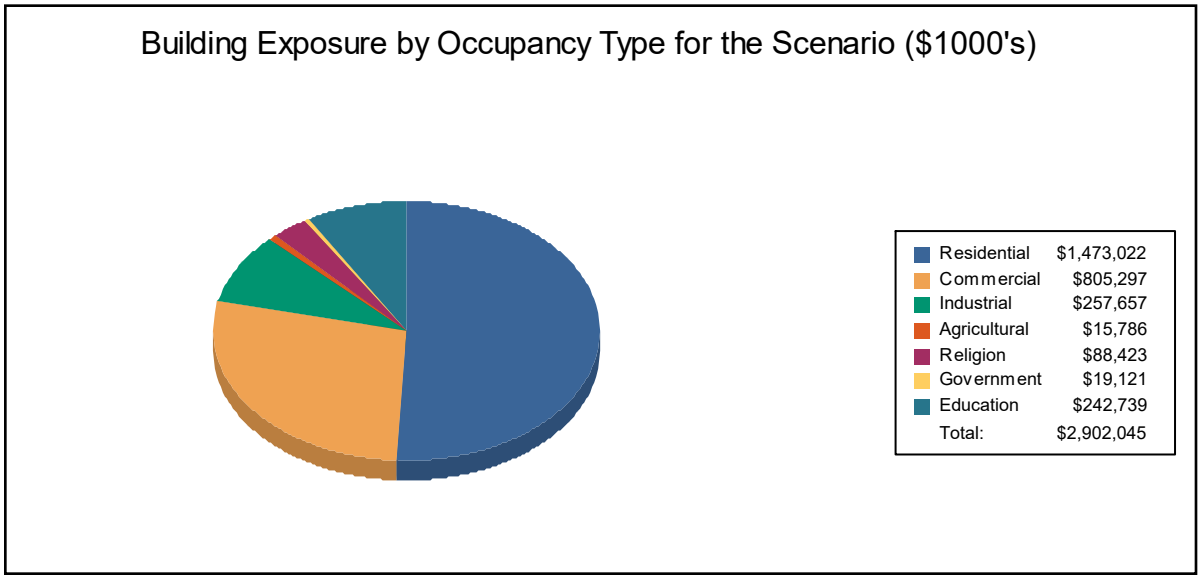


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,473,022	50.8%
Commercial	805,297	27.7%
Industrial	257,657	8.9%
Agricultural	15,786	0.5%
Religion	88,423	3.0%
Government	19,121	0.7%
Education	242,739	8.4%
Total	**2,902,045**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds.
There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

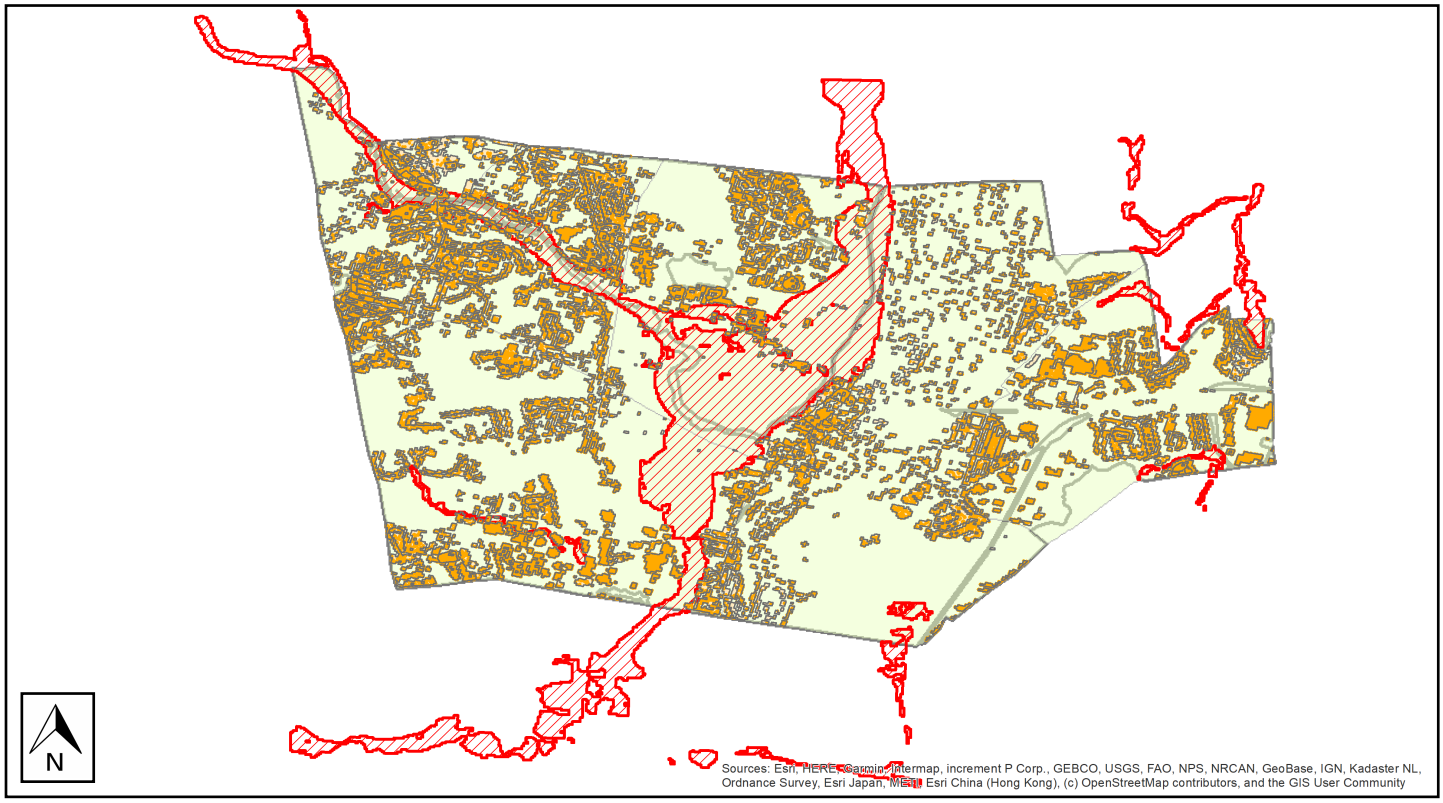
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Farmington_FL
Scenario Name:	Farmington_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 65 buildings will be at least moderately damaged. This is over 60% of the total number of buildings in the scenario. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

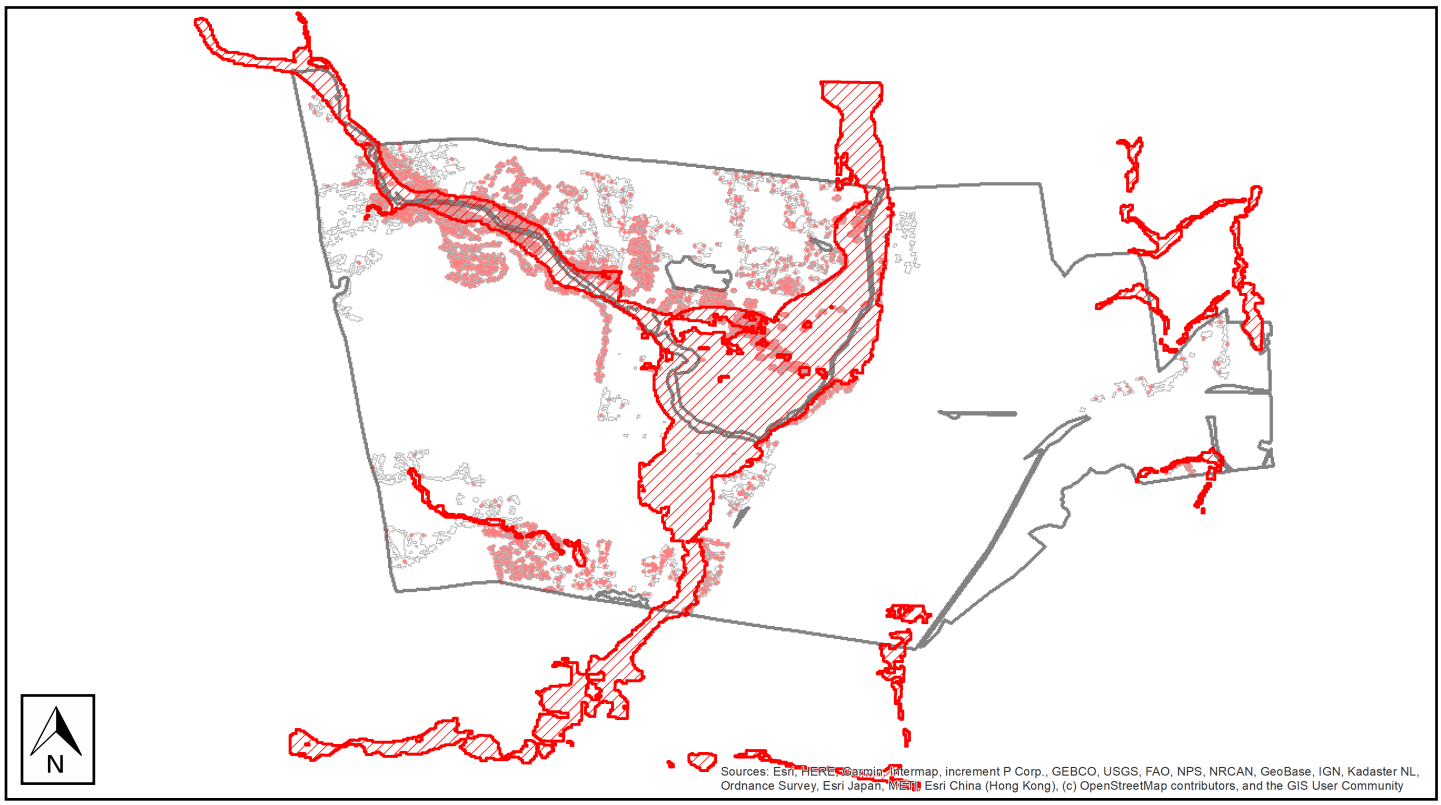


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	16	20	10	12	24	30	16	20	13	16	2	2
Total	**16**		**10**		**24**		**16**		**13**		**2**	

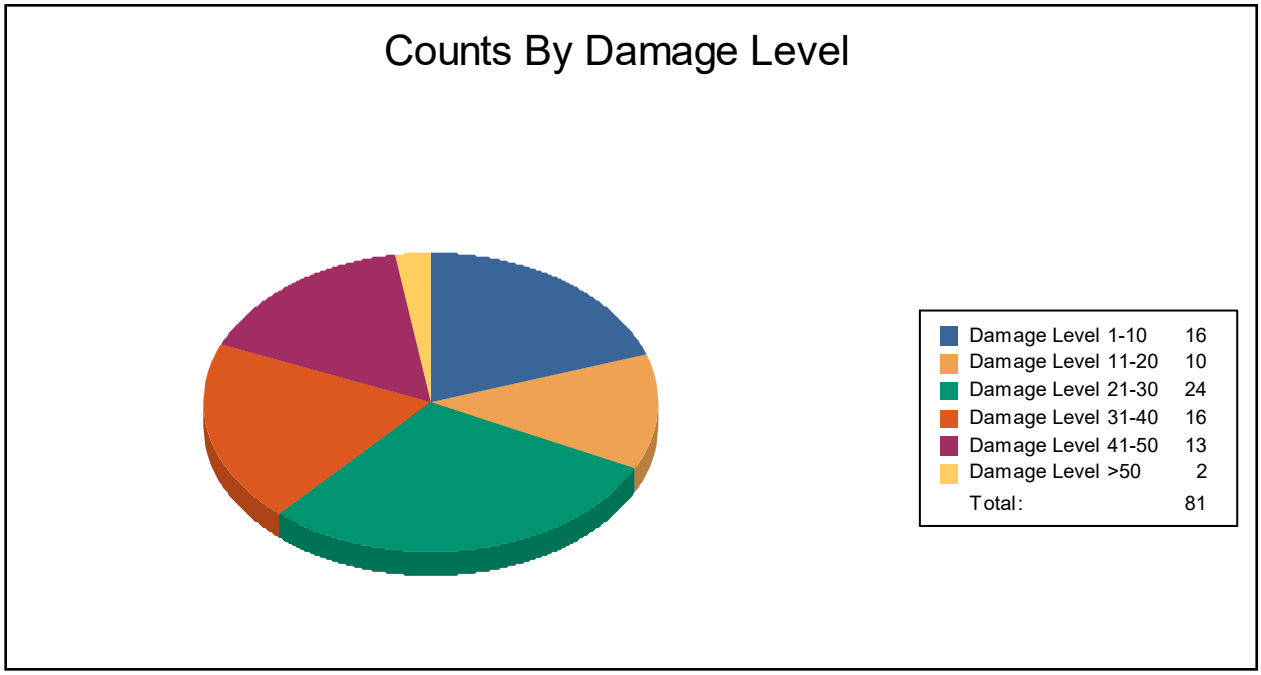


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	3	30	0	0	3	30	2	20	2	20	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	13	19	10	14	20	29	14	20	11	16	2	3

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 137 hospital beds available for use. On the day of the scenario flood event, the model estimates that 137 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

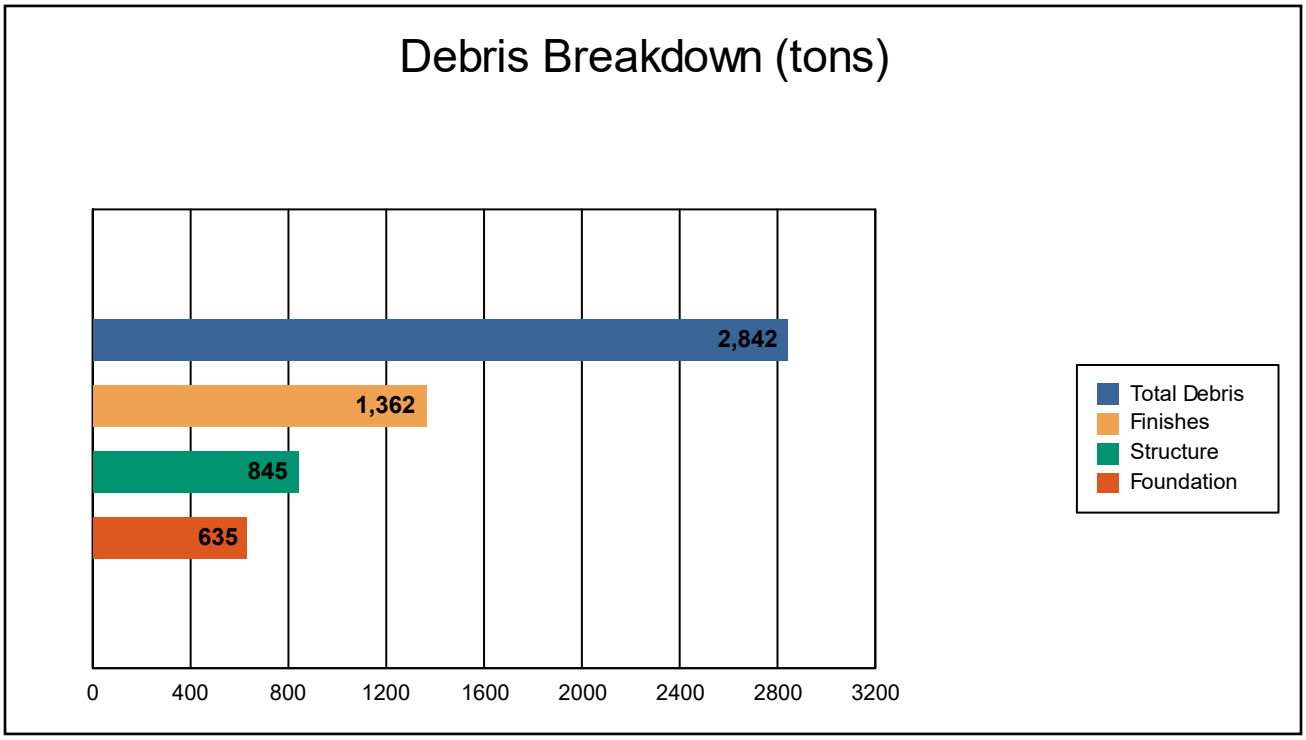
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

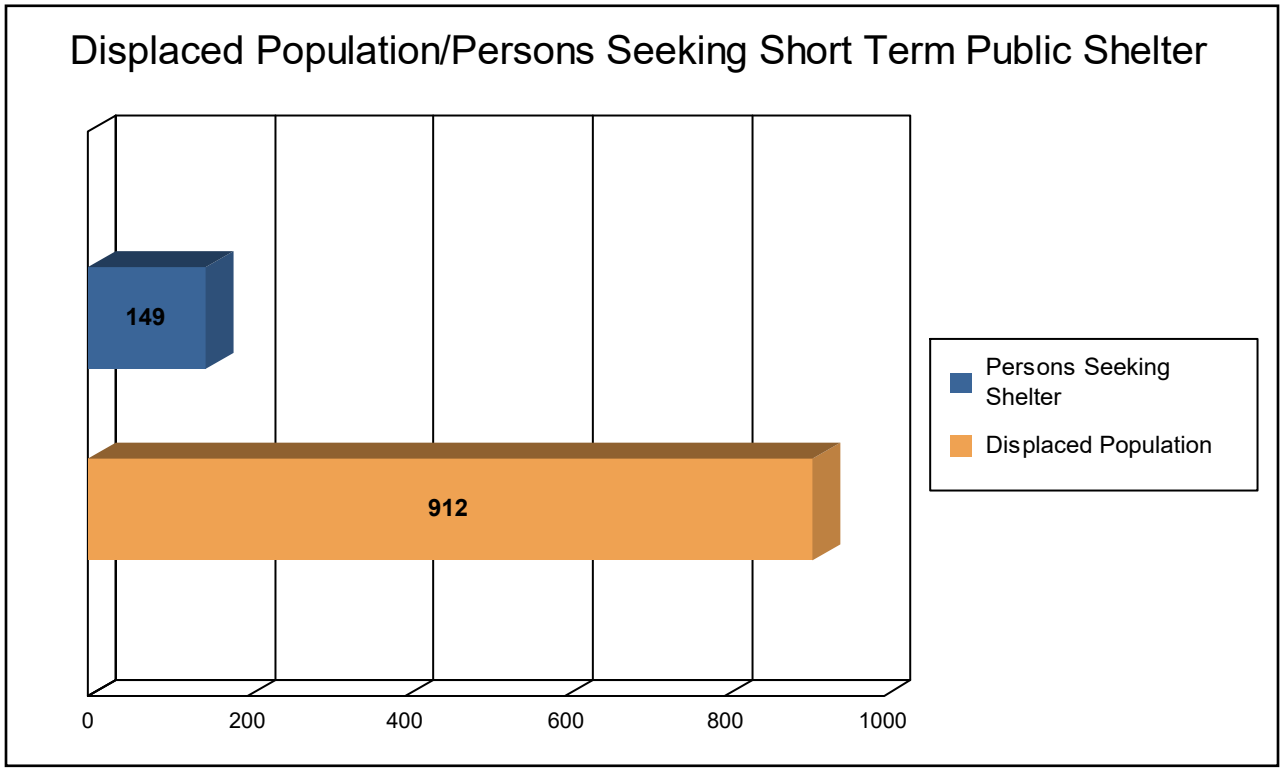


The model estimates that a total of 2,842 tons of debris will be generated. Of the total amount, Finishes comprises 48% of the total, Structure comprises 30% of the total, and Foundation comprises 22%. If the debris tonnage is converted into an estimated number of truckloads, it will require 114 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 304 households (or 912 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 149 people (out of a total population of 26,712) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 248.75 million dollars, which represents 8.57 % of the total replacement value of the scenario buildings.

Building-Related Losses

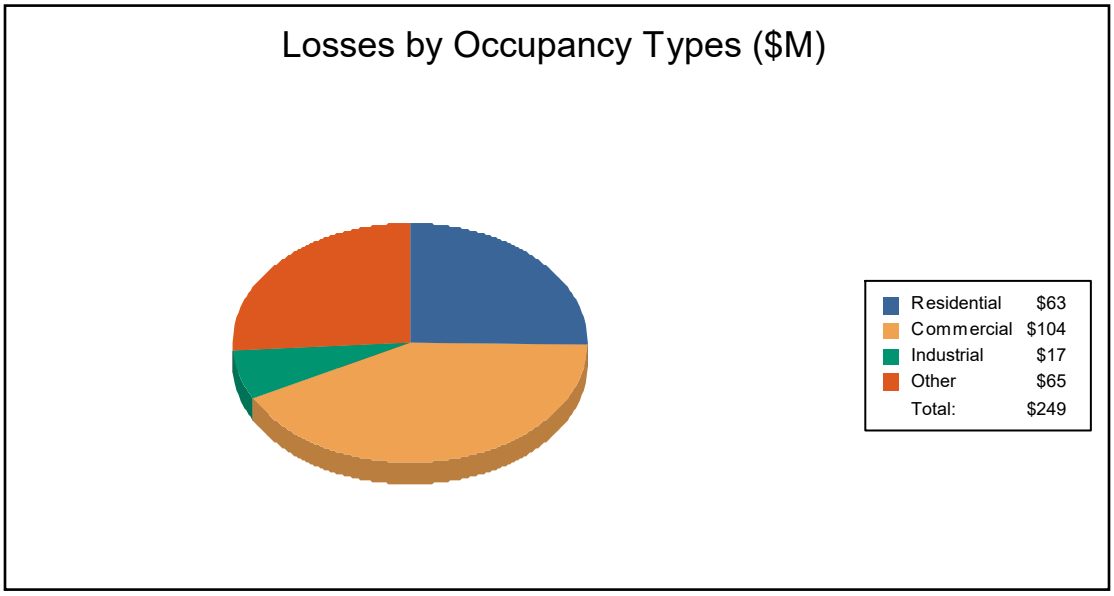
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 130.93 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 25.24% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	29.12	12.09	5.33	4.13	50.67
	Content	15.89	31.84	9.03	15.52	72.29
	Inventory	0.00	4.76	1.34	1.88	7.97
	Subtotal	**45.01**	**48.69**	**15.70**	**21.53**	**130.93**
Business Interruption						
	Income	2.03	21.64	0.22	4.35	28.23
	Relocation	6.17	4.96	0.20	2.98	14.31
	Rental Income	4.80	3.68	0.02	0.64	9.14
	Wage	4.78	25.27	0.38	35.72	66.14
	Subtotal	**17.78**	**55.54**	**0.82**	**43.68**	**117.83**
ALL	**Total**	**62.79**	**104.23**	**16.52**	**65.21**	**248.75**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,309	2,809,619	7,065,928
Total	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**
Total Study Region	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**

Hazus: Flood Global Risk Report

Region Name:	Farmington_FL
Flood Scenario:	Farmington_Flood
Print Date:	Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 271 census blocks. The region contains over 11 thousand households and has a total population of 26,712 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,374 buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87.44% of the buildings (and 60.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,374 buildings in the region which have an aggregate total replacement value of 7,066 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,256,309	60.2%
Commercial	1,638,784	23.2%
Industrial	433,771	6.1%
Agricultural	30,955	0.4%
Religion	131,034	1.9%
Government	58,595	0.8%
Education	516,480	7.3%
Total	**7,065,928**	**100%**

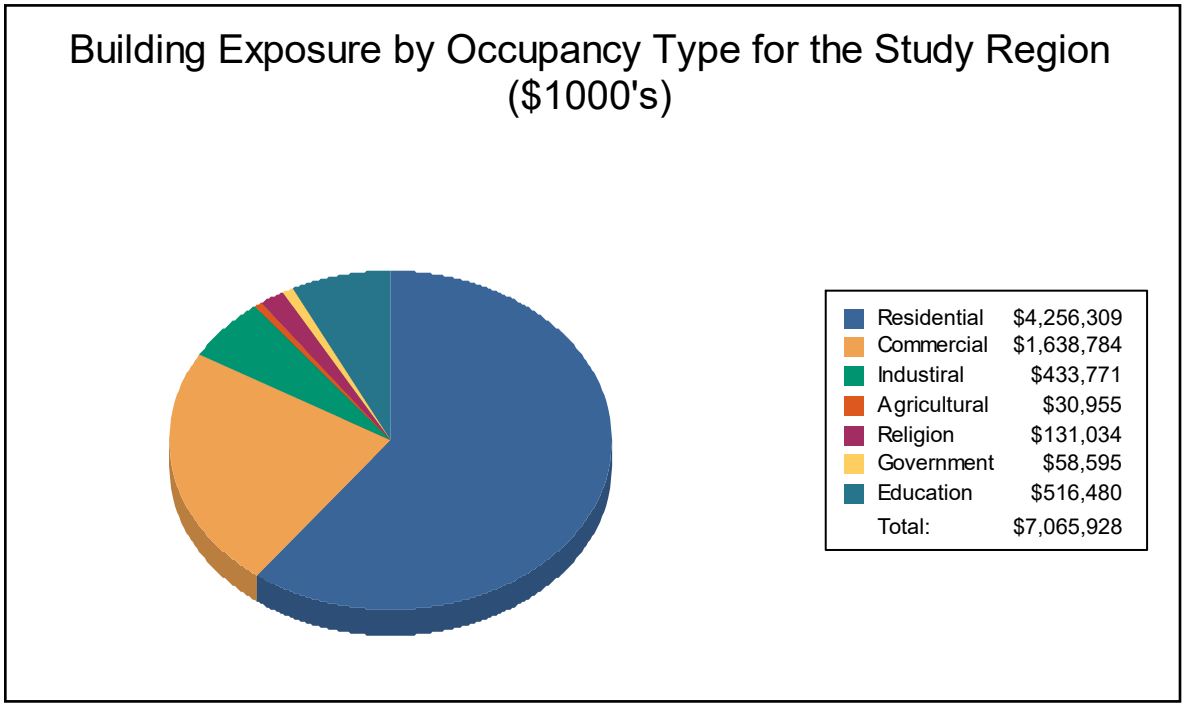
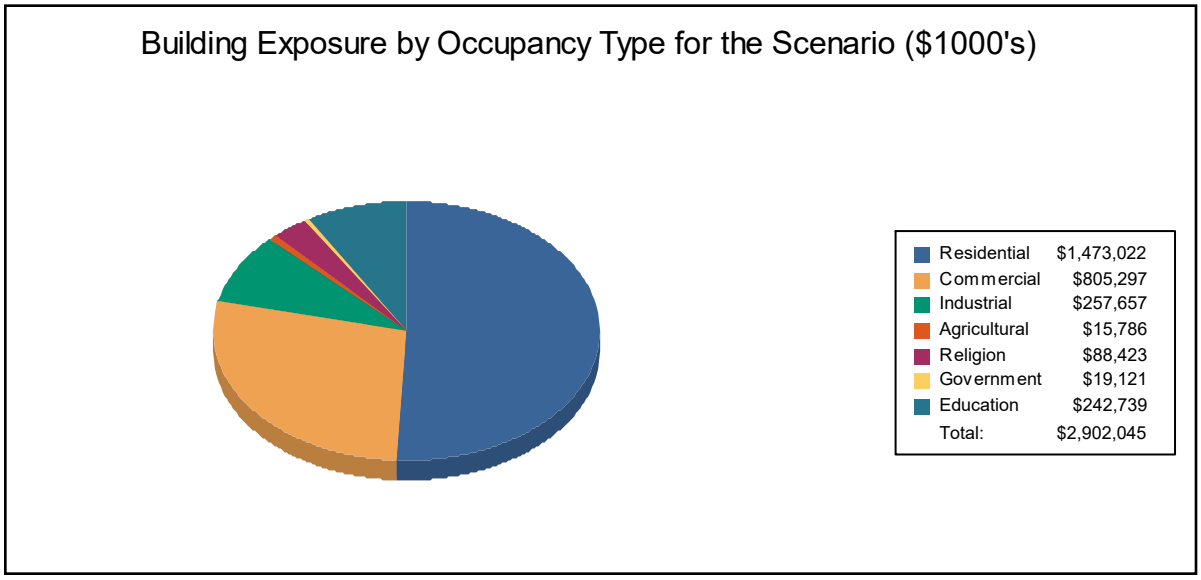


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,473,022	50.8%
Commercial	805,297	27.7%
Industrial	257,657	8.9%
Agricultural	15,786	0.5%
Religion	88,423	3.0%
Government	19,121	0.7%
Education	242,739	8.4%
Total	**2,902,045**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds.
There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

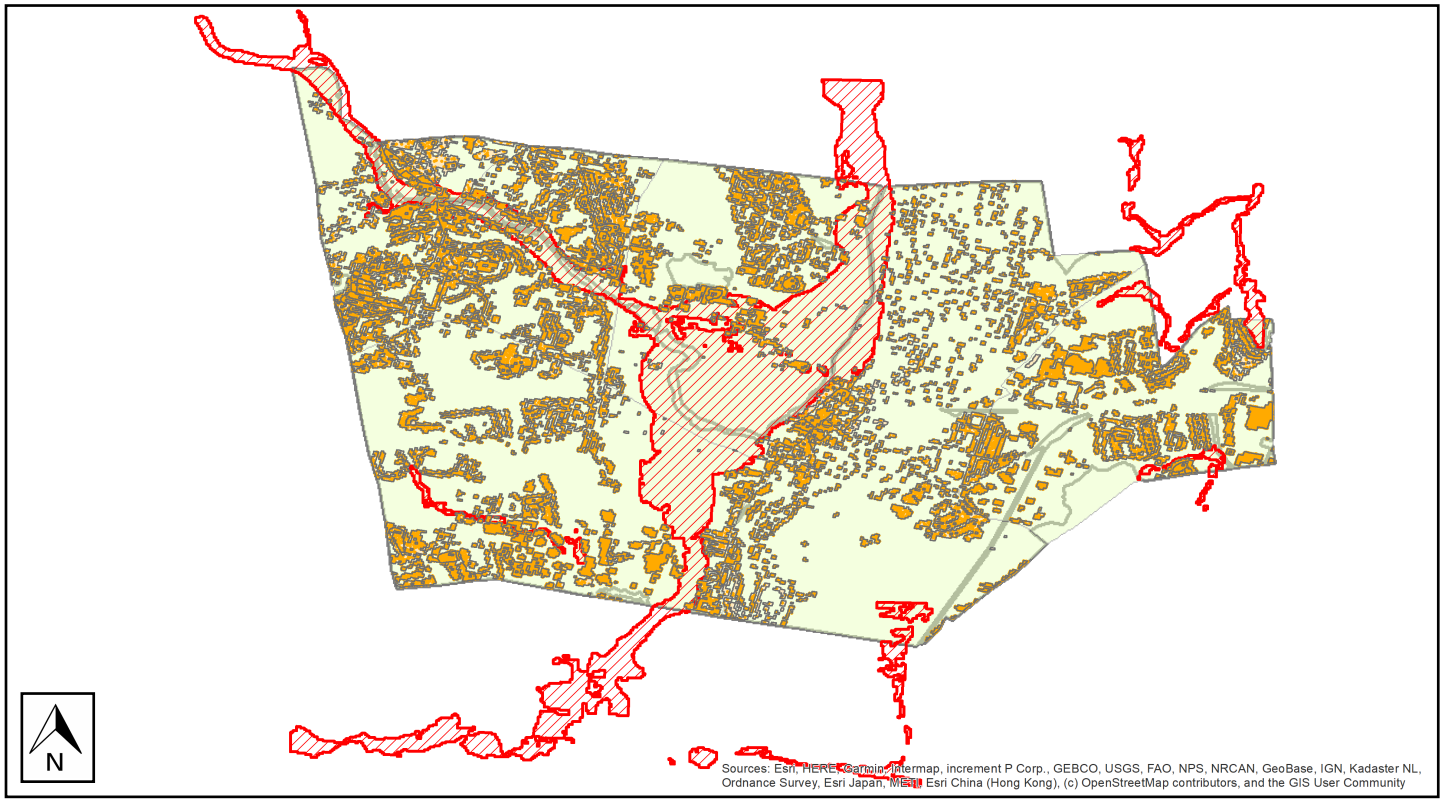
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Farmington_FL
Scenario Name:	Farmington_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 102 buildings will be at least moderately damaged. This is over 48% of the total number of buildings in the scenario. There are an estimated 19 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

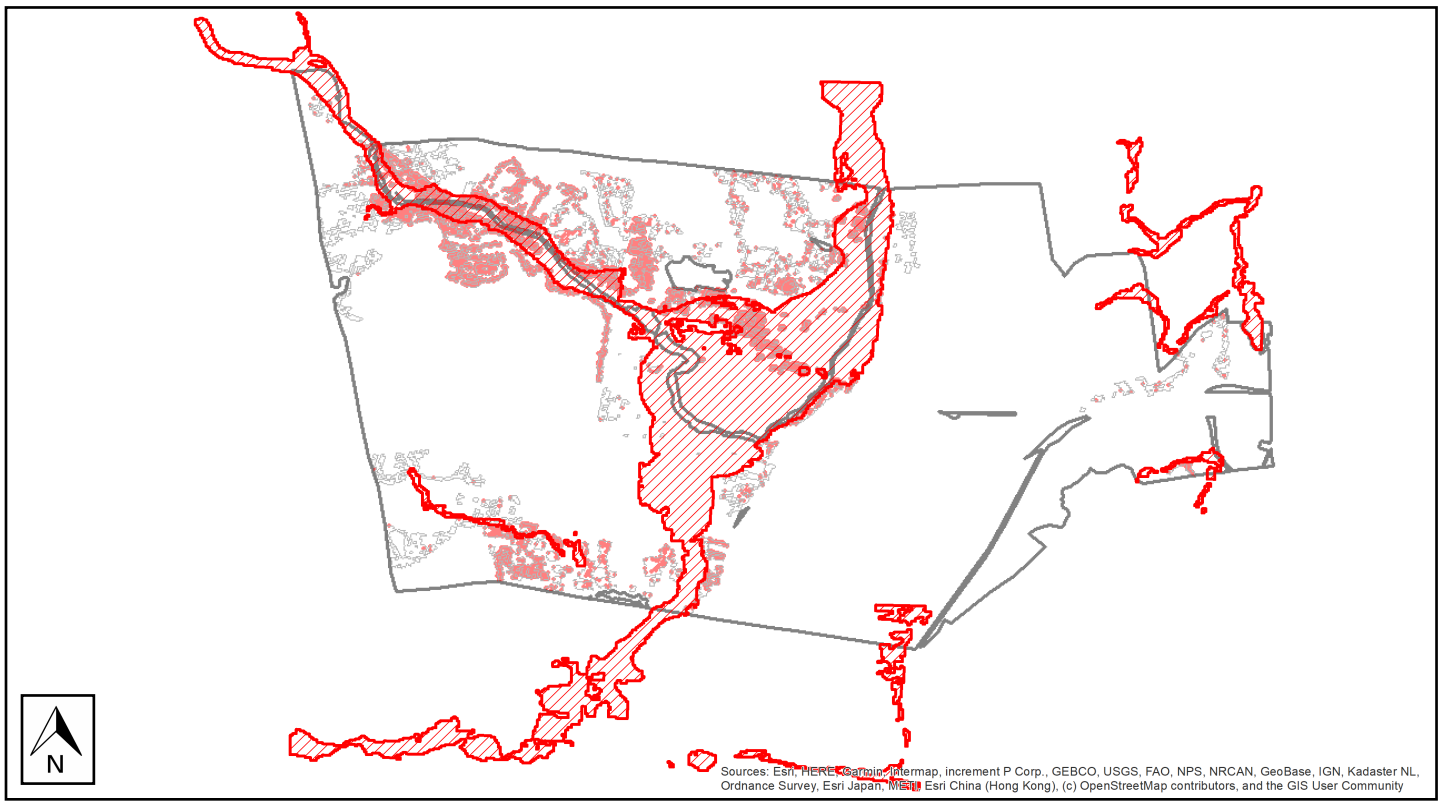


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	2	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	17	15	24	21	15	13	18	15	24	21	19	16
Total	**17**		**26**		**15**		**18**		**24**		**19**	

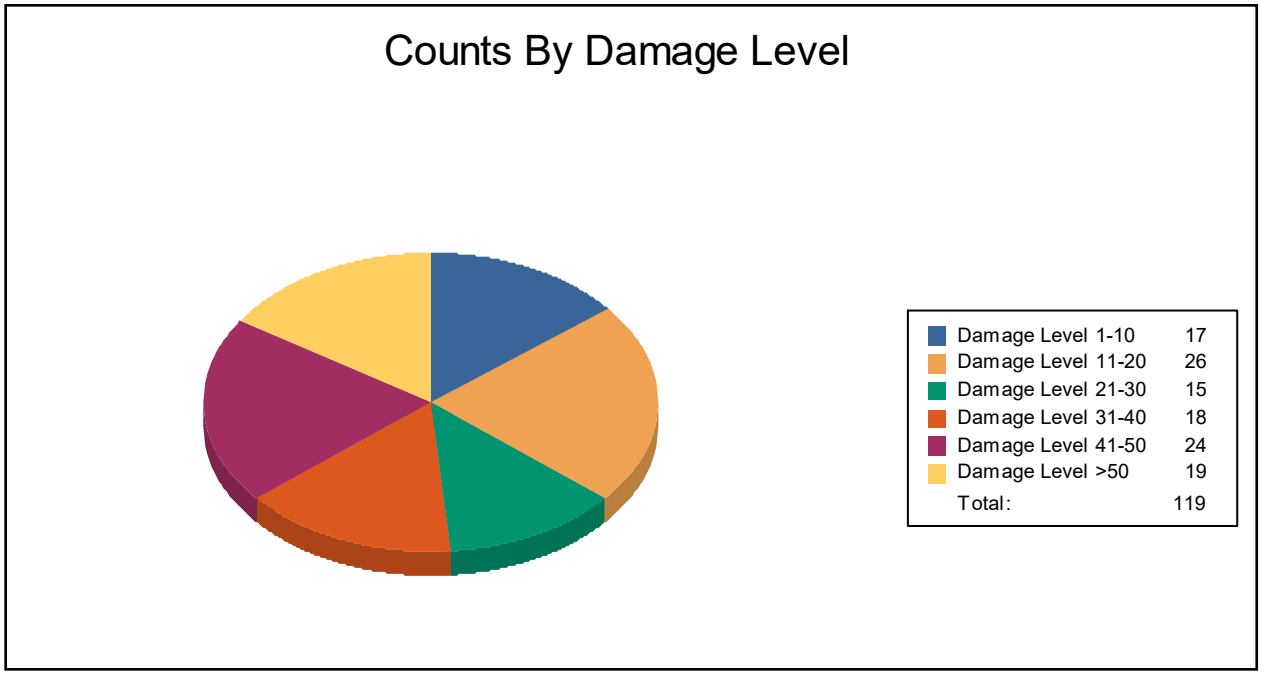


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	8	3	25	1	8	2	17	3	25	2	17
Steel	0	0	1	100	0	0	0	0	0	0	0	0
Wood	16	15	22	21	14	13	15	14	20	19	17	16

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 137 hospital beds available for use. On the day of the scenario flood event, the model estimates that 137 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

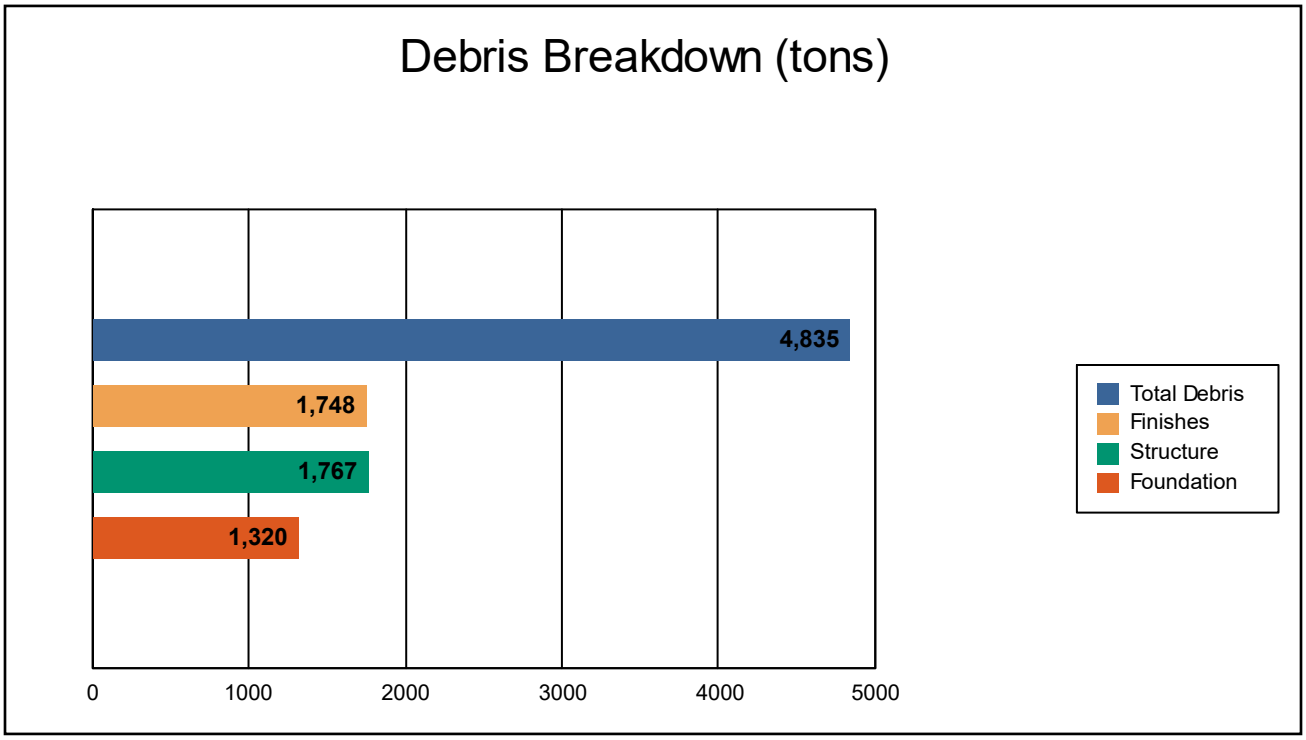
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

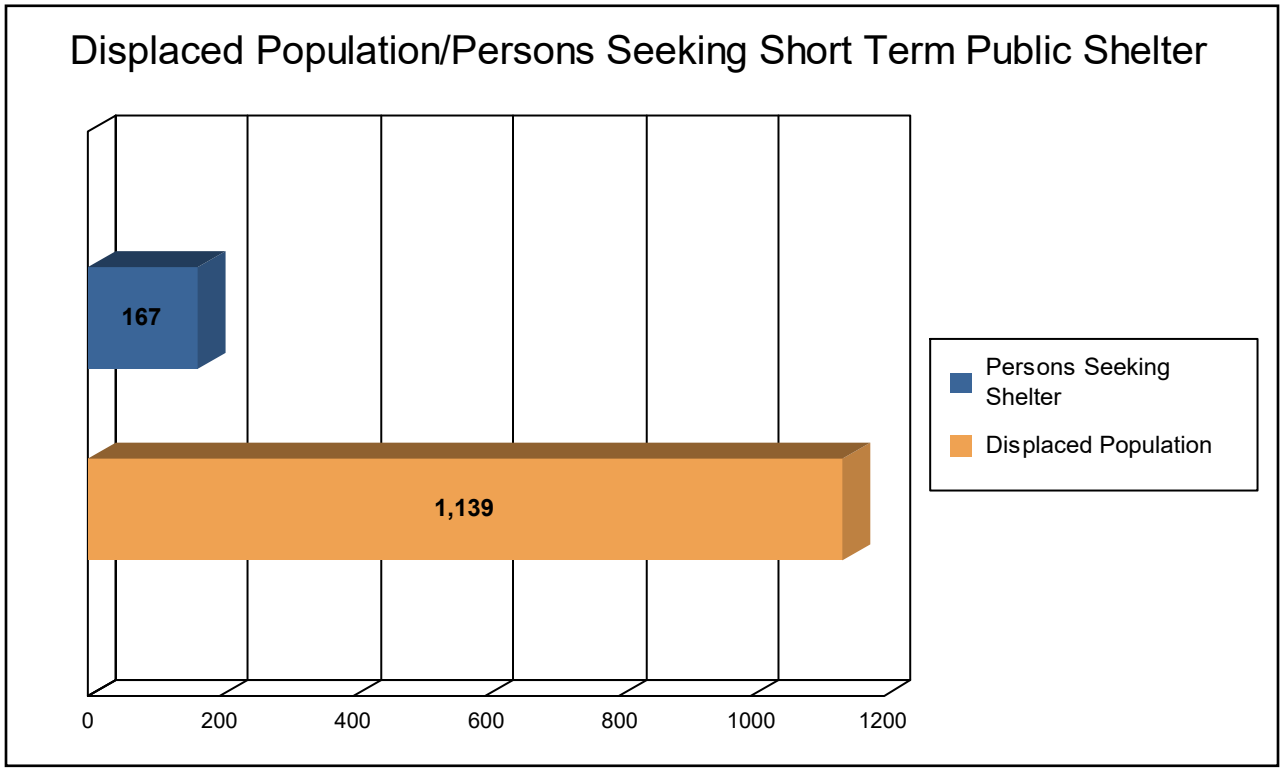


The model estimates that a total of 4,835 tons of debris will be generated. Of the total amount, Finishes comprises 36% of the total, Structure comprises 37% of the total, and Foundation comprises 27%. If the debris tonnage is converted into an estimated number of truckloads, it will require 194 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 380 households (or 1,139 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 167 people (out of a total population of 26,712) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 350.01 million dollars, which represents 12.06 % of the total replacement value of the scenario buildings.

Building-Related Losses

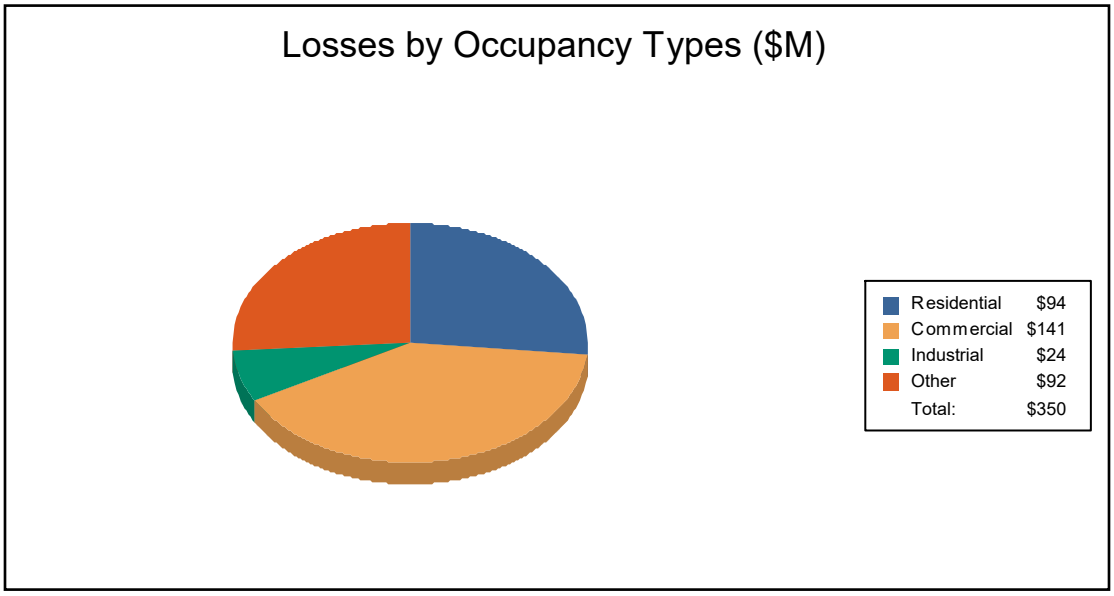
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 190.37 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 26.76% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	44.08	17.03	7.62	5.94	74.66
	Content	25.07	44.80	13.40	21.59	104.86
	Inventory	0.00	6.34	2.03	2.49	10.86
	Subtotal	**69.14**	**68.17**	**23.05**	**30.01**	**190.37**
Business Interruption						
	Income	2.84	27.85	0.29	5.70	36.69
	Relocation	8.54	6.57	0.28	3.88	19.27
	Rental Income	6.47	4.82	0.03	0.77	12.09
	Wage	6.68	33.09	0.52	51.29	91.58
	Subtotal	**24.54**	**72.33**	**1.13**	**61.64**	**159.64**
ALL	**Total**	**93.68**	**140.50**	**24.18**	**91.65**	**350.01**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,309	2,809,619	7,065,928
Total	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**
Total Study Region	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**

Hazus: Flood Global Risk Report

Region Name:	Farmington_FL
Flood Scenario:	Farmington_Flood
Print Date:	Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 271 census blocks. The region contains over 11 thousand households and has a total population of 26,712 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,374 buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87.44% of the buildings (and 60.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,374 buildings in the region which have an aggregate total replacement value of 7,066 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,256,309	60.2%
Commercial	1,638,784	23.2%
Industrial	433,771	6.1%
Agricultural	30,955	0.4%
Religion	131,034	1.9%
Government	58,595	0.8%
Education	516,480	7.3%
Total	**7,065,928**	**100%**

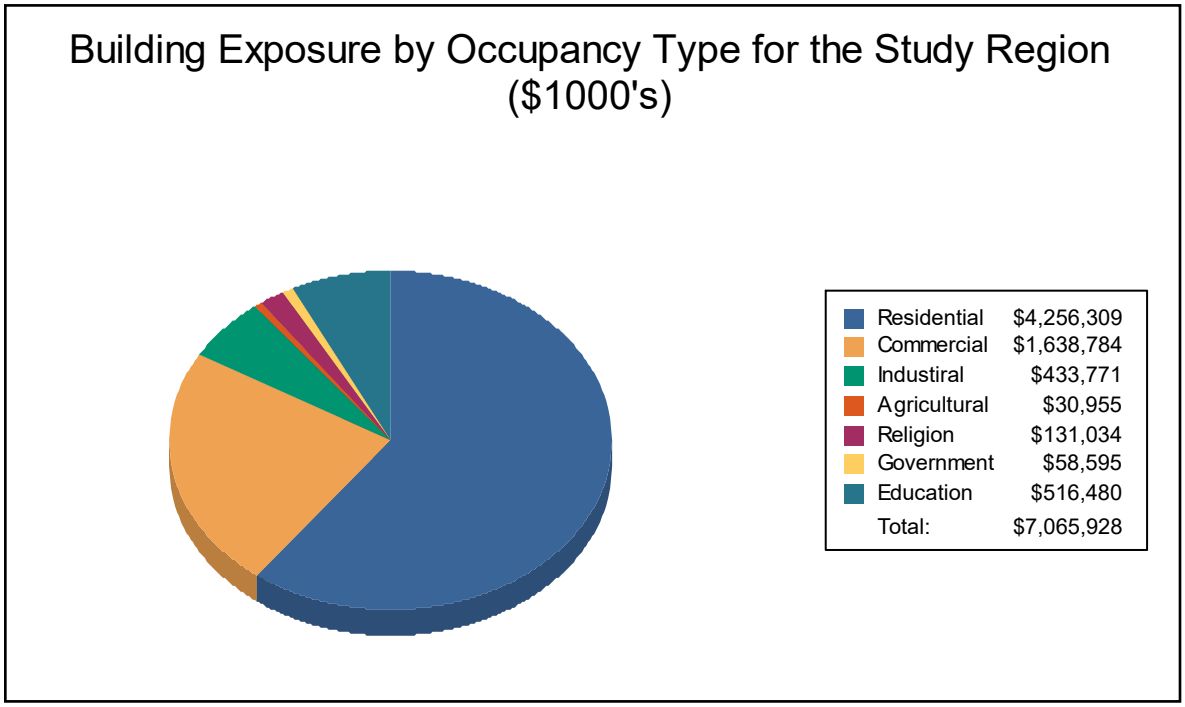
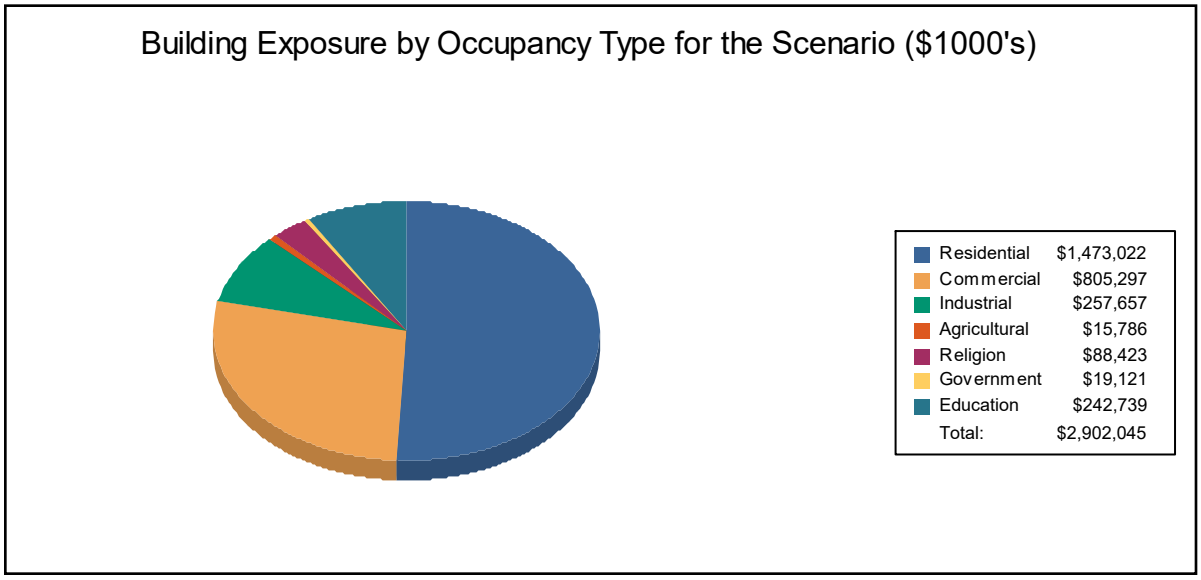


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,473,022	50.8%
Commercial	805,297	27.7%
Industrial	257,657	8.9%
Agricultural	15,786	0.5%
Religion	88,423	3.0%
Government	19,121	0.7%
Education	242,739	8.4%
Total	**2,902,045**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds.
There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

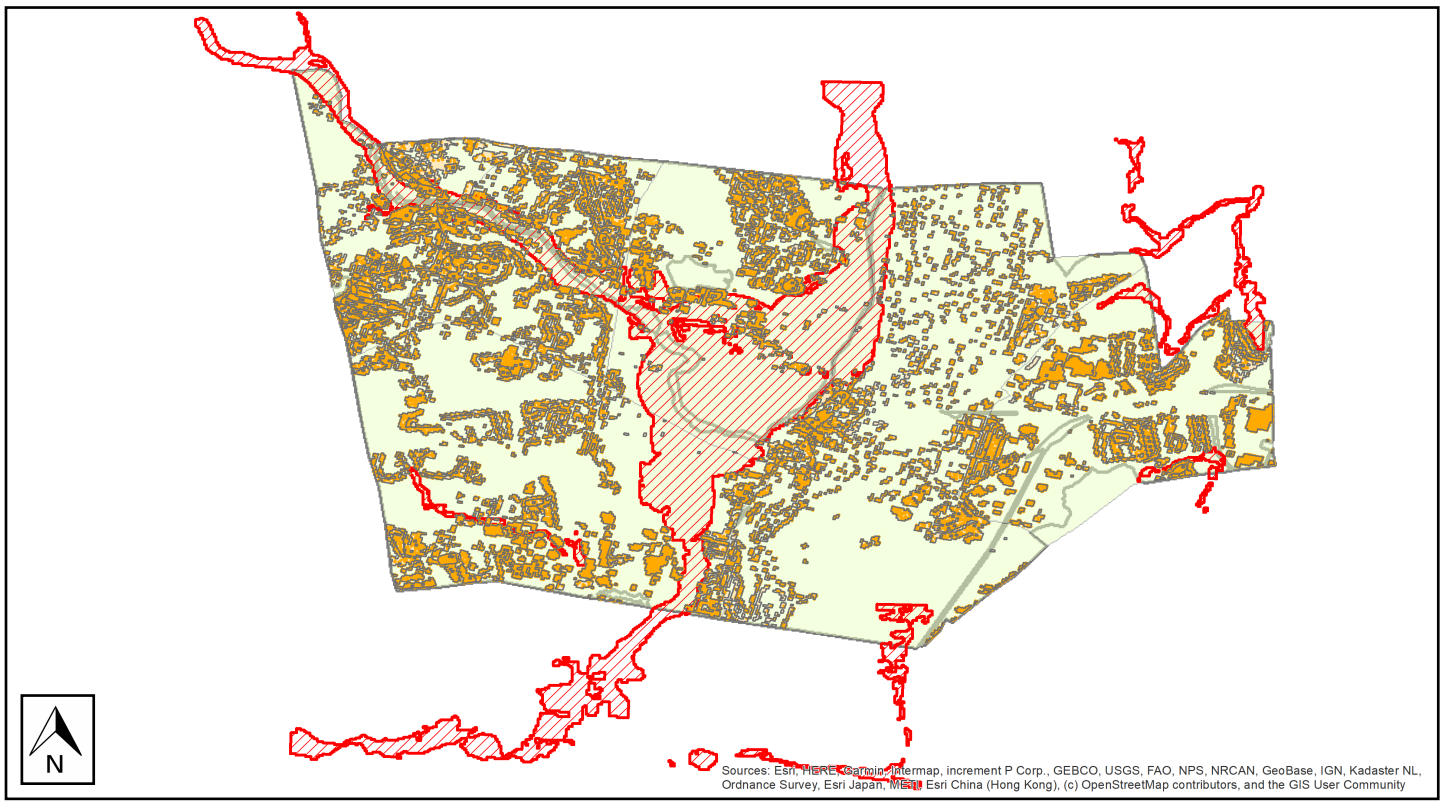
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Farmington_FL
Scenario Name:	Farmington_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 117 buildings will be at least moderately damaged. This is over 47% of the total number of buildings in the scenario. There are an estimated 34 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

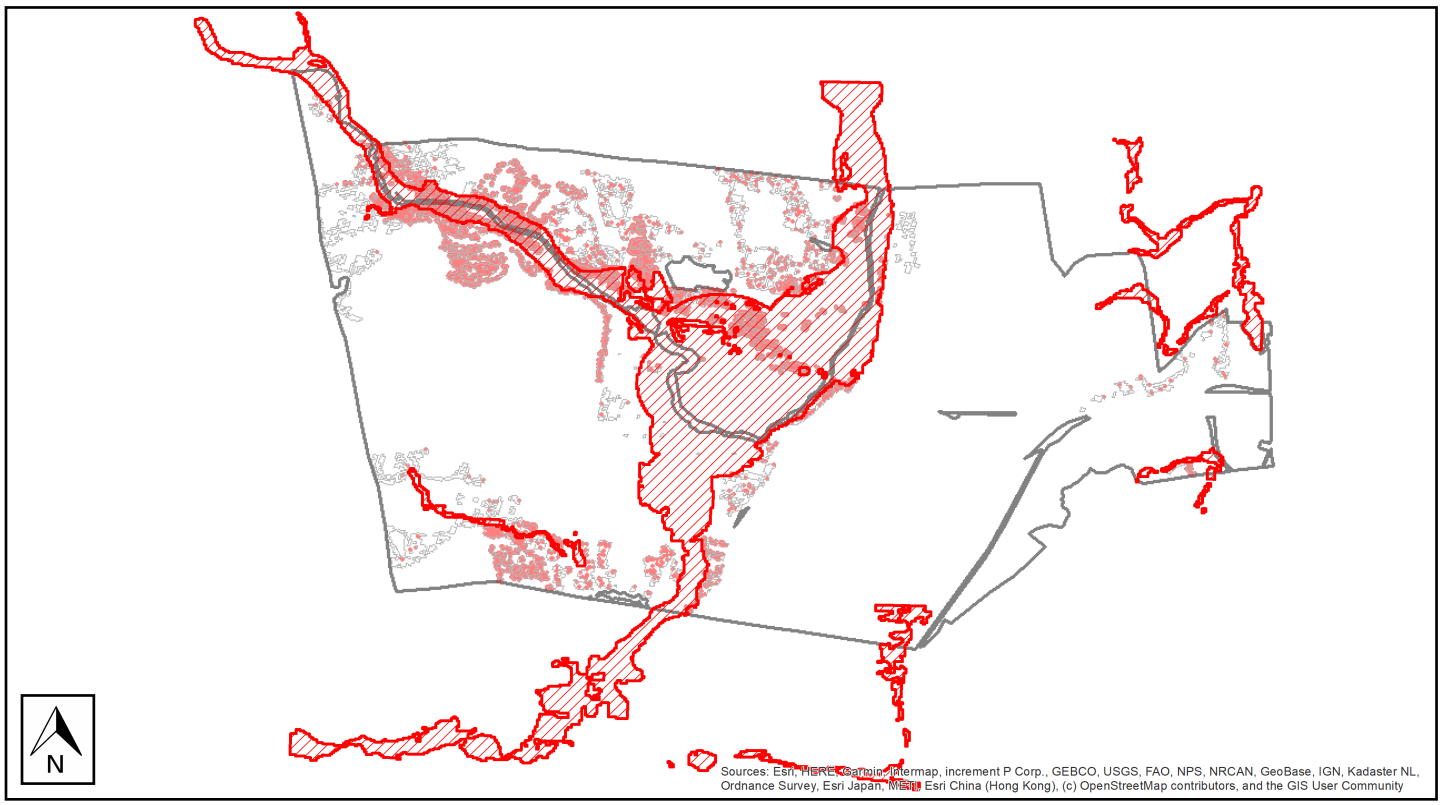


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	2	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	16	12	29	22	18	14	11	8	23	18	34	26
Total	**16**		**31**		**18**		**11**		**23**		**34**	

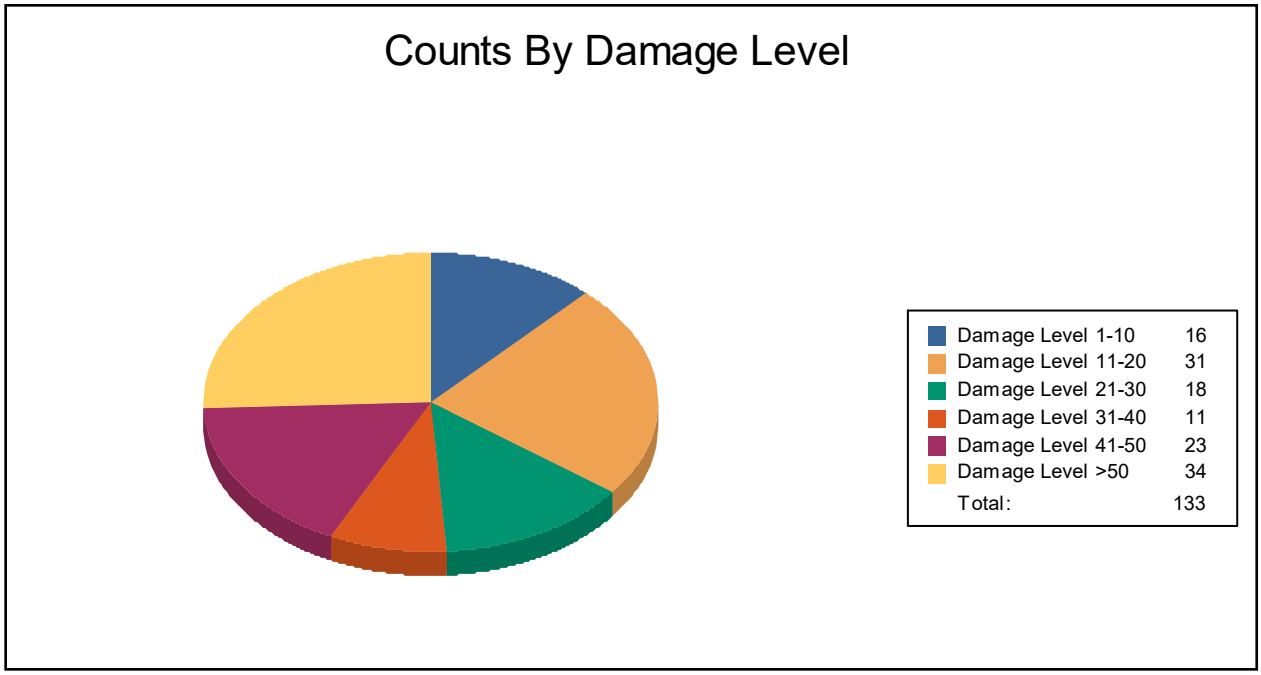


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	1	10	2	20	0	0	4	40	3	30
Steel	0	0	1	100	0	0	0	0	0	0	0	0
Wood	15	13	28	24	16	13	11	9	19	16	30	25

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 137 hospital beds available for use. On the day of the scenario flood event, the model estimates that 137 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

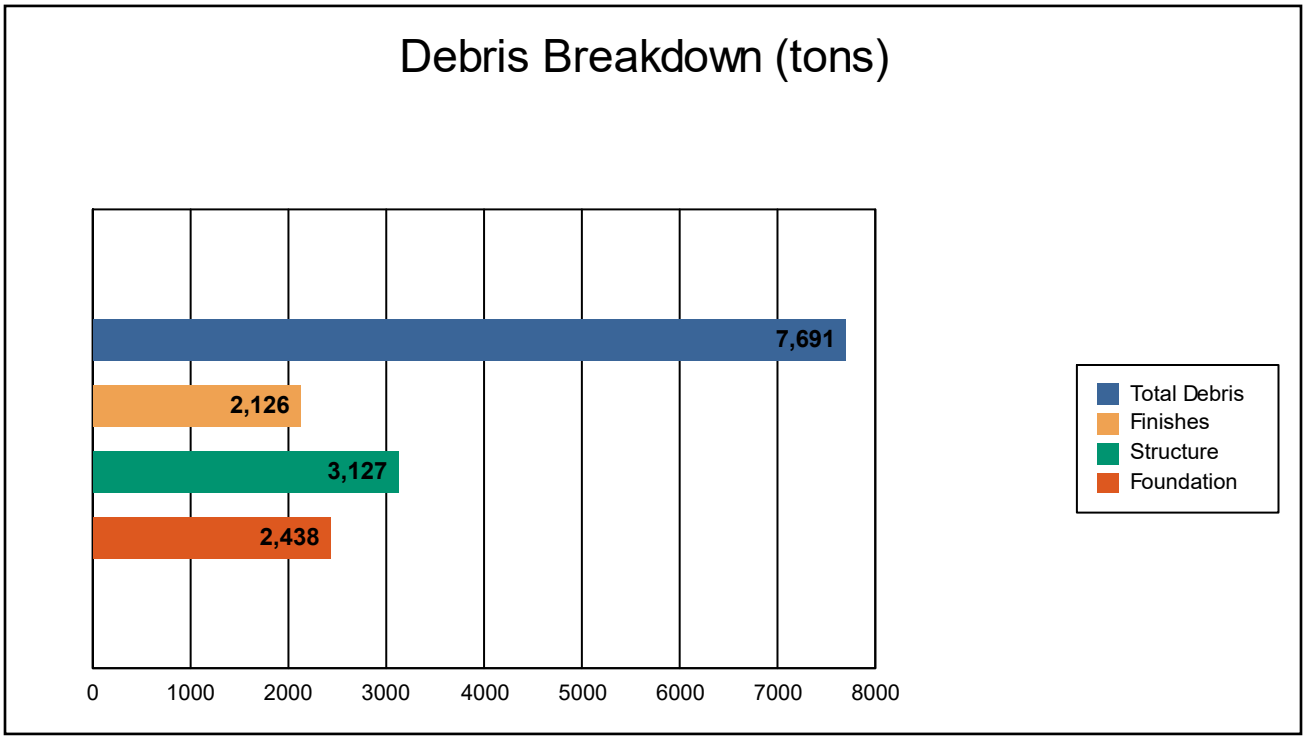
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

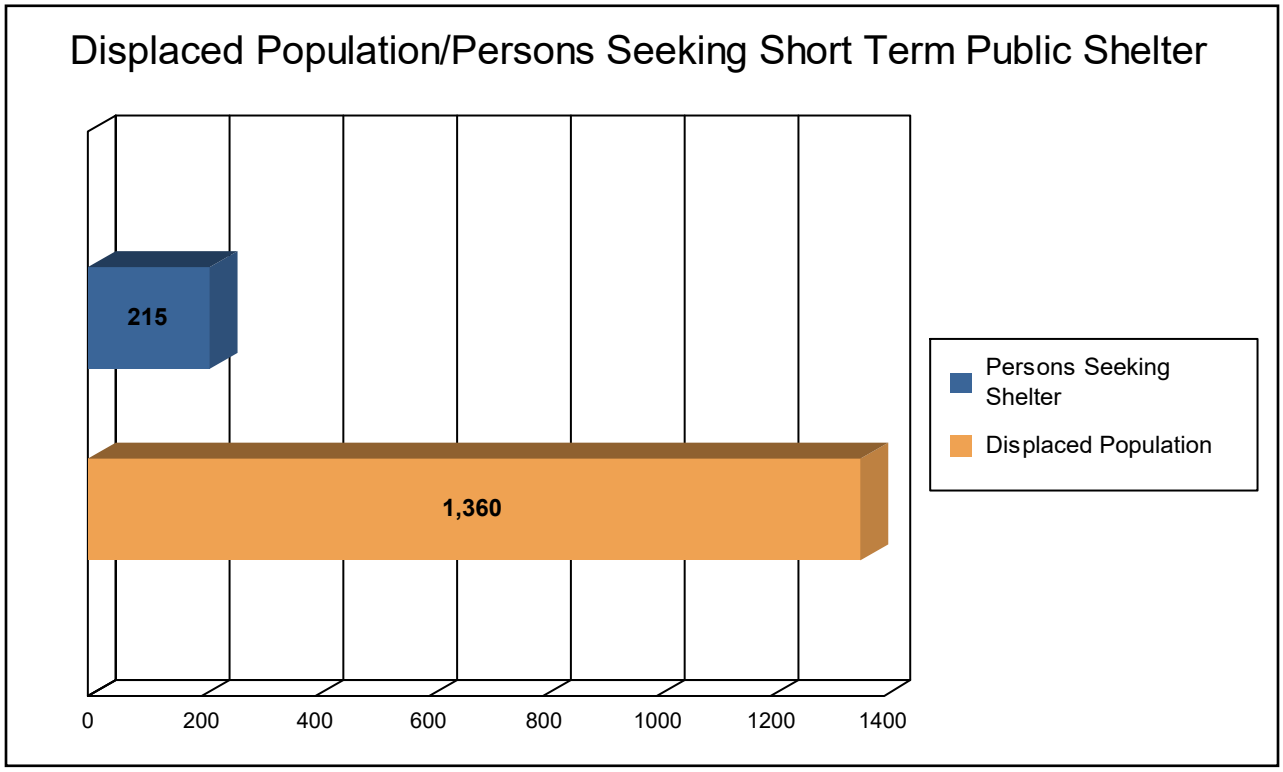


The model estimates that a total of 7,691 tons of debris will be generated. Of the total amount, Finishes comprises 28% of the total, Structure comprises 41% of the total, and Foundation comprises 32%. If the debris tonnage is converted into an estimated number of truckloads, it will require 308 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 453 households (or 1,360 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 215 people (out of a total population of 26,712) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 455.77 million dollars, which represents 15.70 % of the total replacement value of the scenario buildings.

Building-Related Losses

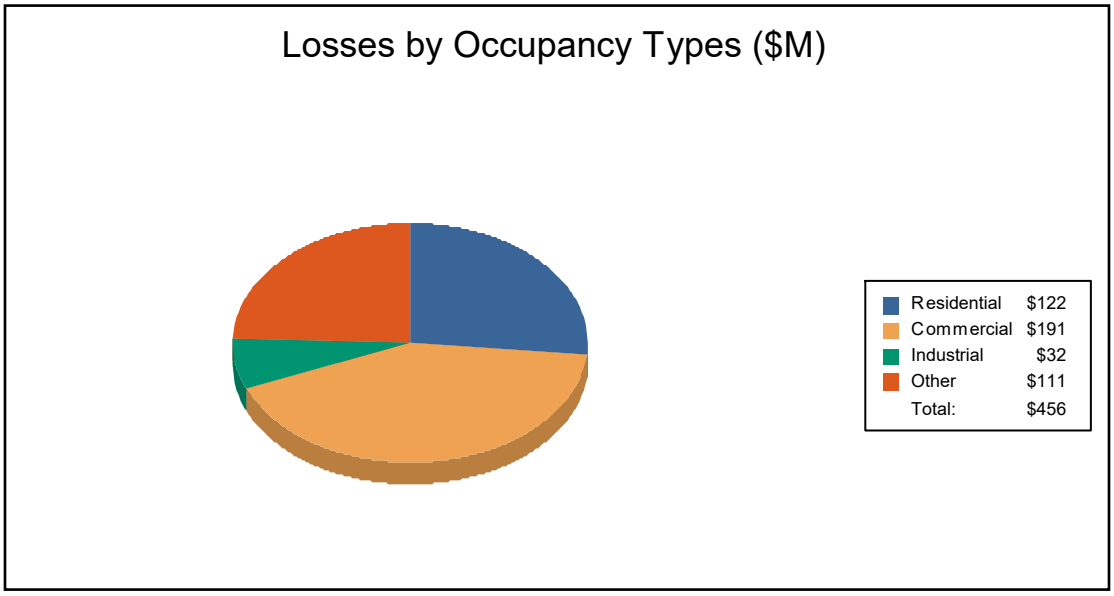
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 257.30 million dollars. 44% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 26.68% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	58.98	24.12	9.88	8.20	101.18
	Content	33.65	61.99	18.11	28.44	142.19
	Inventory	0.00	7.96	2.73	3.23	13.92
	Subtotal	**92.63**	**94.07**	**30.72**	**39.87**	**257.30**
Business Interruption						
	Income	3.22	38.25	0.34	6.99	48.79
	Relocation	10.48	8.42	0.32	4.65	23.87
	Rental Income	7.72	6.24	0.04	0.87	14.88
	Wage	7.56	43.84	0.60	58.93	110.94
	Subtotal	**28.98**	**96.75**	**1.30**	**71.44**	**198.47**
ALL	**Total**	**121.61**	**190.82**	**32.03**	**111.31**	**455.77**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,309	2,809,619	7,065,928
Total	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**
Total Study Region	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**

Hazus: Flood Global Risk Report

Region Name: Farmington_FL

Flood Scenario: Farmington_Flood

Print Date: Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 271 census blocks. The region contains over 11 thousand households and has a total population of 26,712 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,374 buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87.44% of the buildings (and 60.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,374 buildings in the region which have an aggregate total replacement value of 7,066 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,256,309	60.2%
Commercial	1,638,784	23.2%
Industrial	433,771	6.1%
Agricultural	30,955	0.4%
Religion	131,034	1.9%
Government	58,595	0.8%
Education	516,480	7.3%
Total	**7,065,928**	**100%**

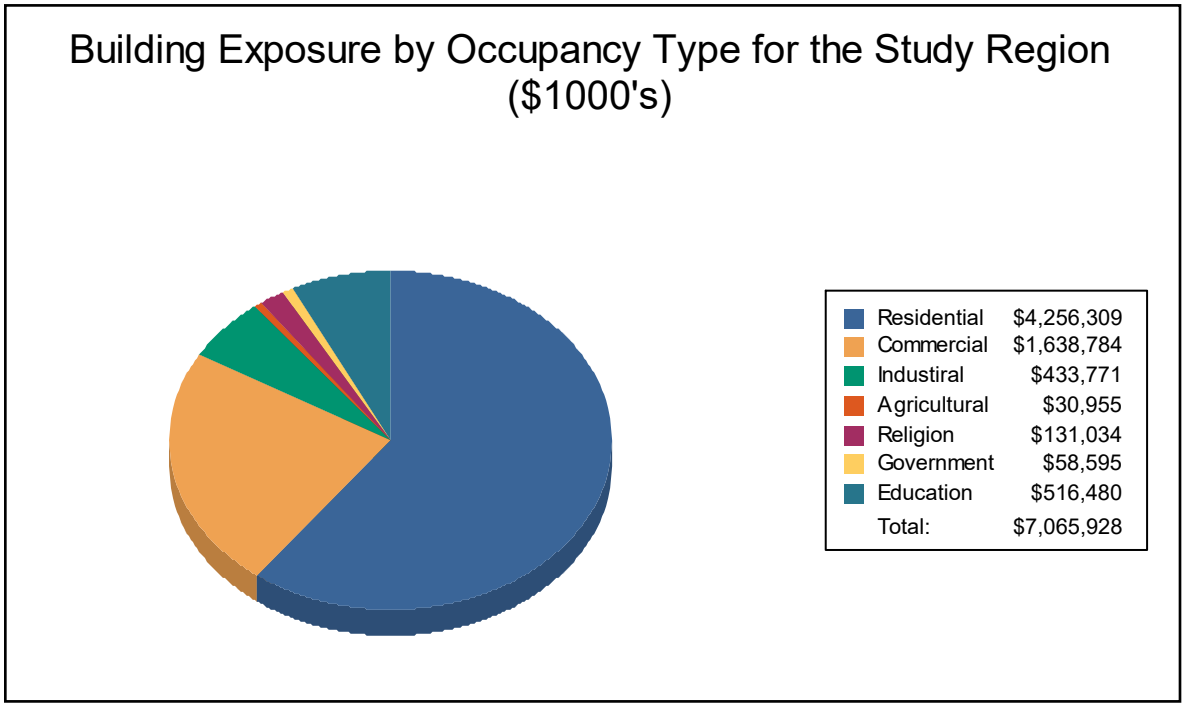
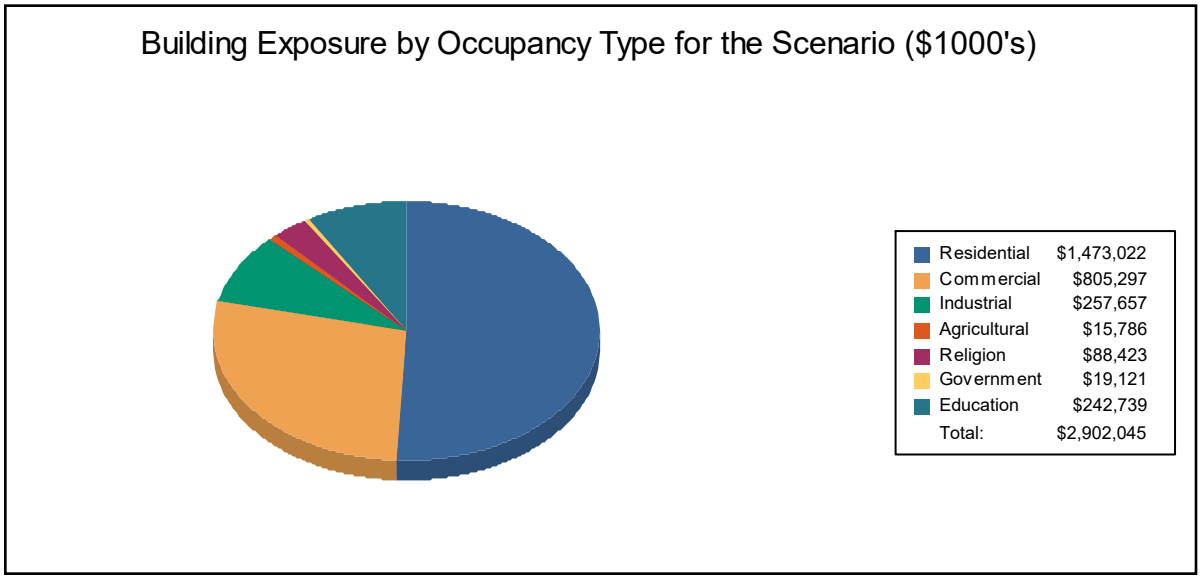


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,473,022	50.8%
Commercial	805,297	27.7%
Industrial	257,657	8.9%
Agricultural	15,786	0.5%
Religion	88,423	3.0%
Government	19,121	0.7%
Education	242,739	8.4%
Total	**2,902,045**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds.
There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

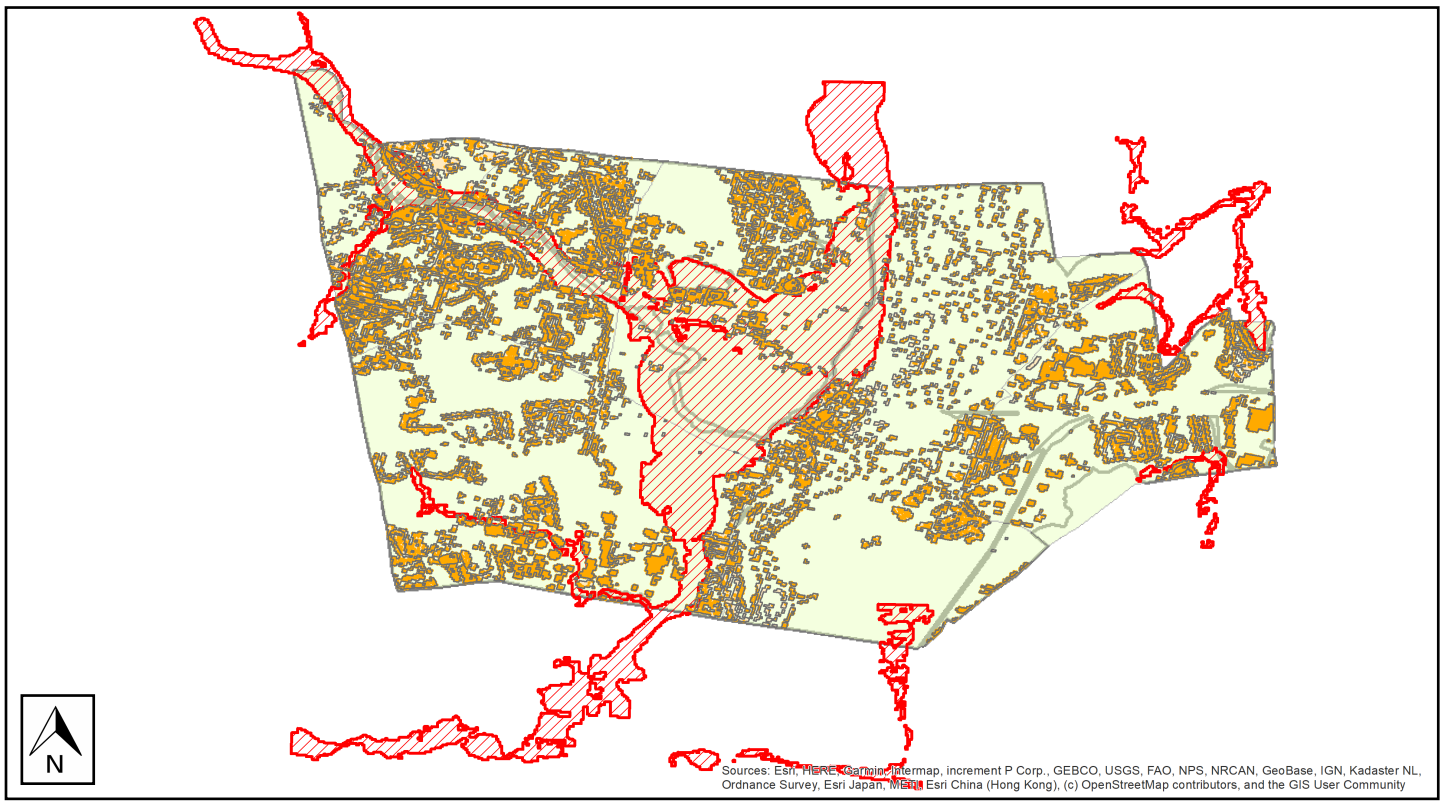
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Farmington_FL
Scenario Name:	Farmington_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 206 buildings will be at least moderately damaged. This is over 53% of the total number of buildings in the scenario. There are an estimated 75 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

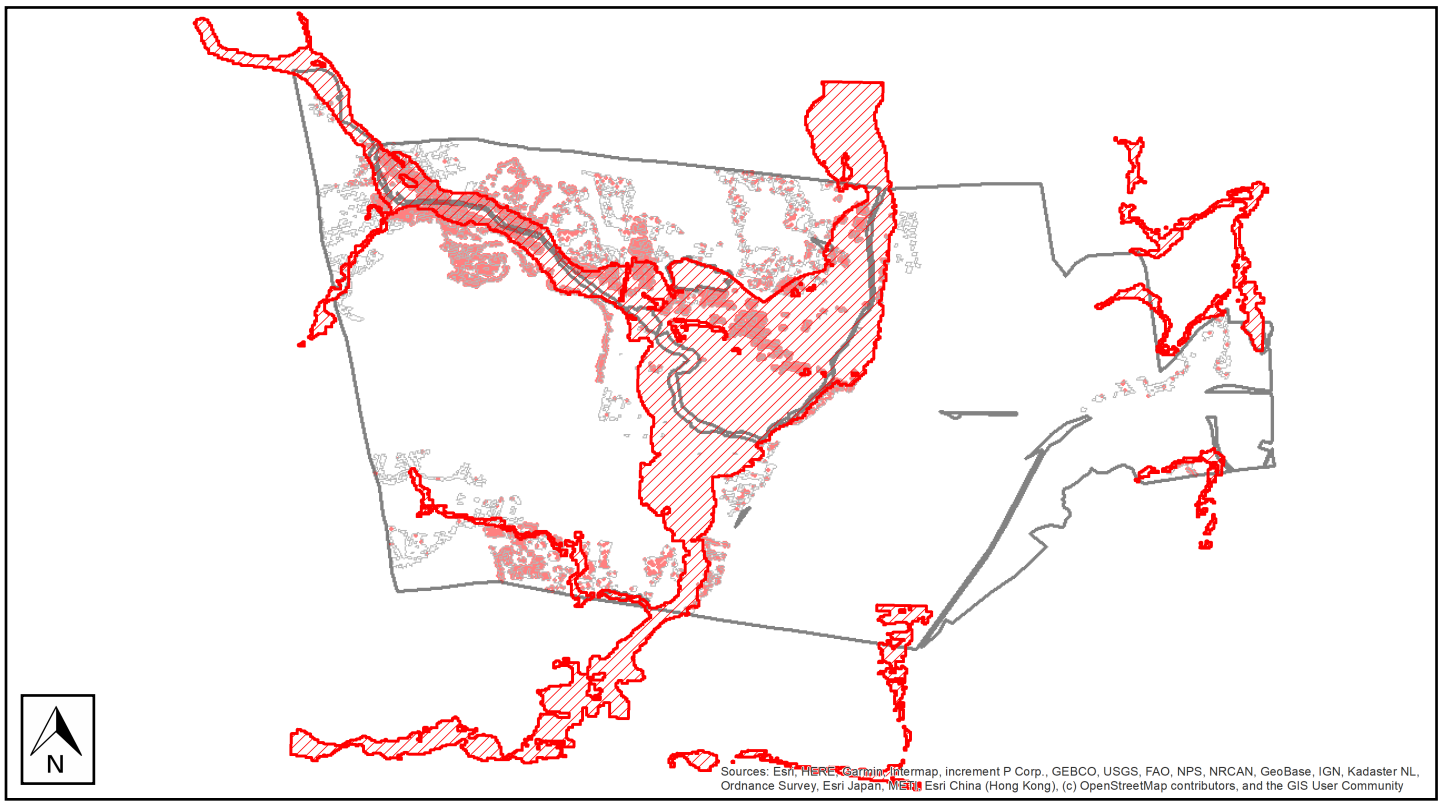


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	13	6	75	1	13	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	31	13	59	26	32	14	16	7	17	7	75	33
Total	**32**		**65**		**33**		**16**		**17**		**75**	

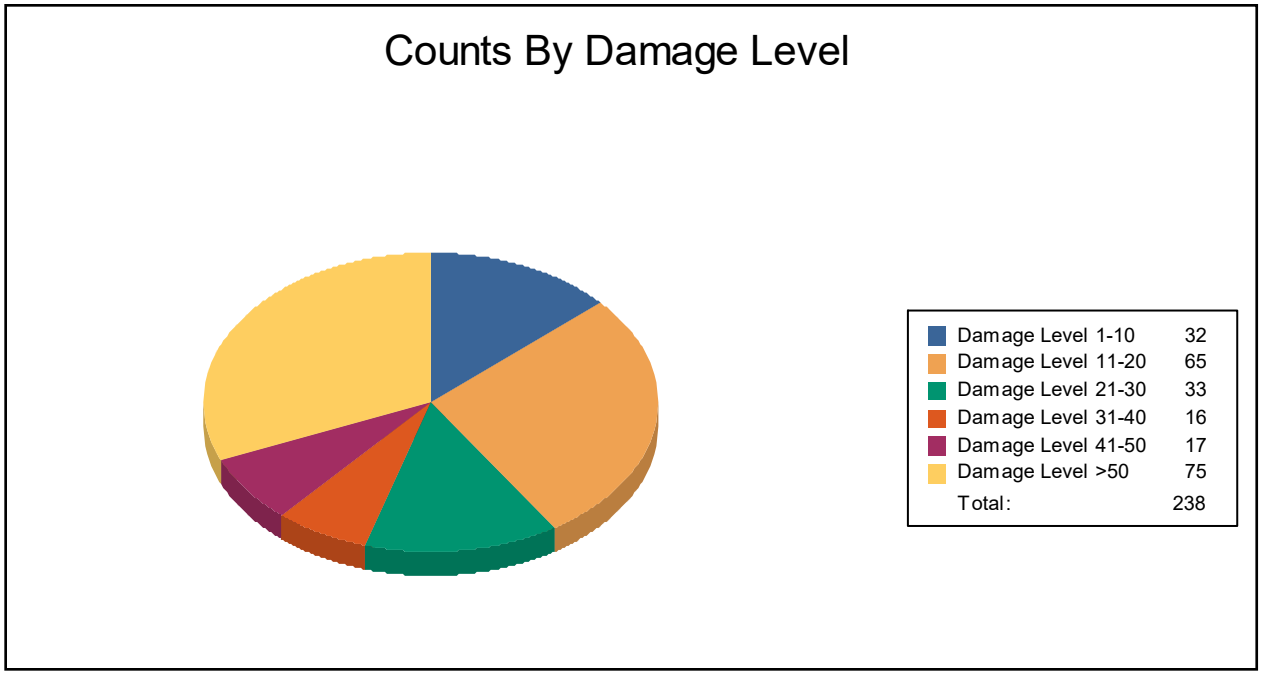


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	3	15	4	20	1	5	1	5	2	10	9	45
Steel	1	17	4	67	1	17	0	0	0	0	0	0
Wood	28	13	57	27	31	15	15	7	15	7	64	30

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 137 hospital beds available for use. On the day of the scenario flood event, the model estimates that 137 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

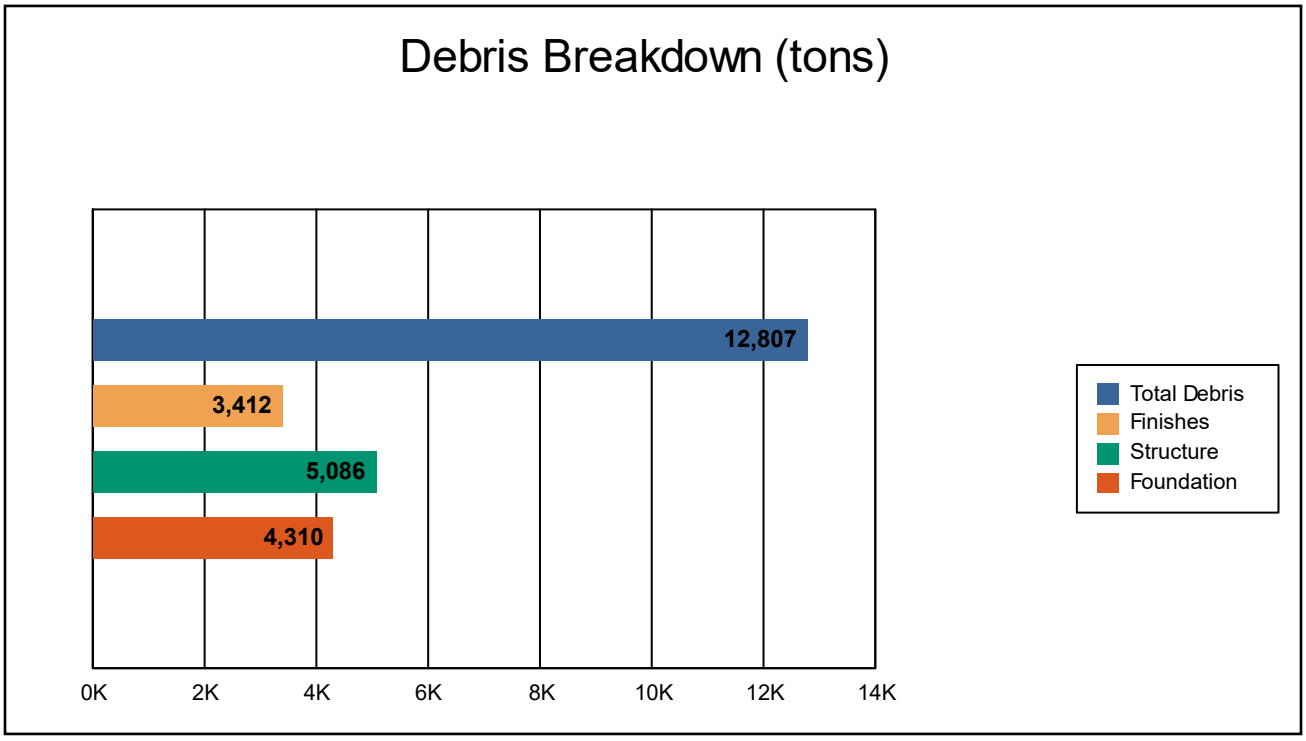
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

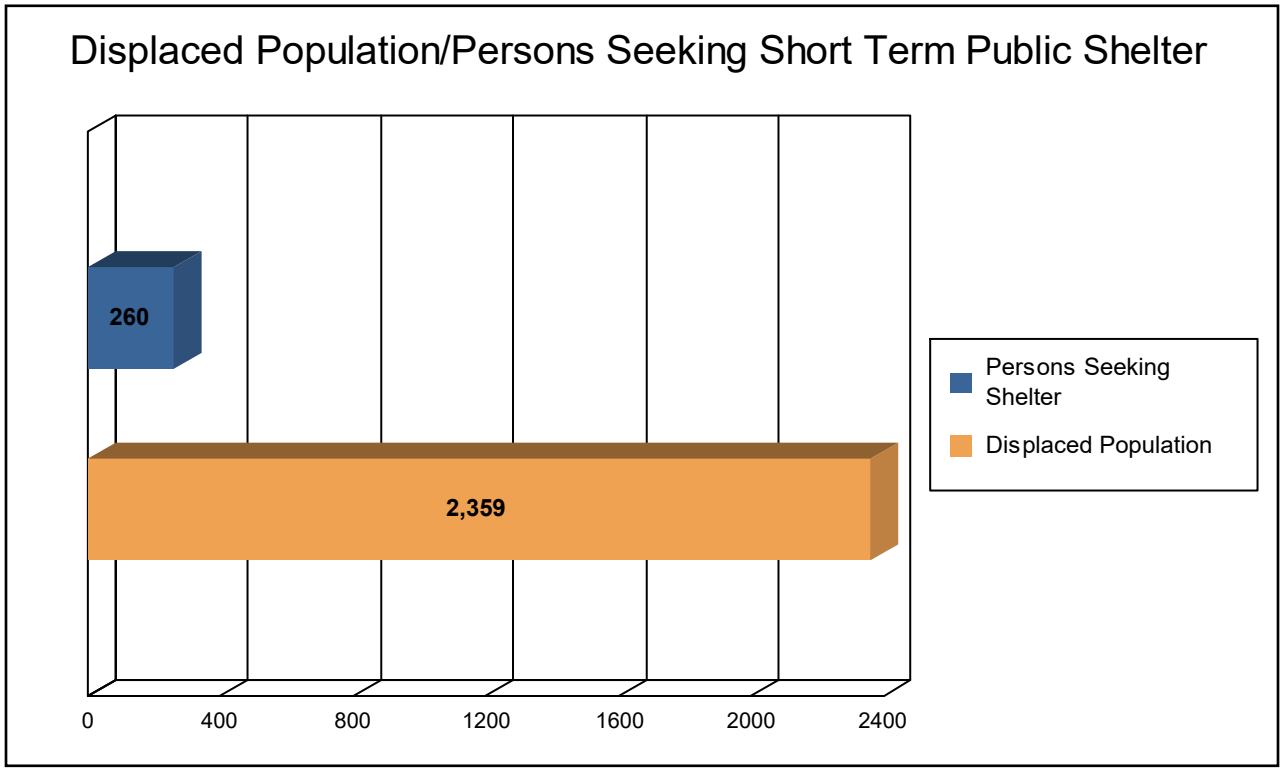


The model estimates that a total of 12,807 tons of debris will be generated. Of the total amount, Finishes comprises 27% of the total, Structure comprises 40% of the total, and Foundation comprises 34%. If the debris tonnage is converted into an estimated number of truckloads, it will require 513 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 786 households (or 2,359 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 260 people (out of a total population of 26,712) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 694.80 million dollars, which represents 23.94 % of the total replacement value of the scenario buildings.

Building-Related Losses

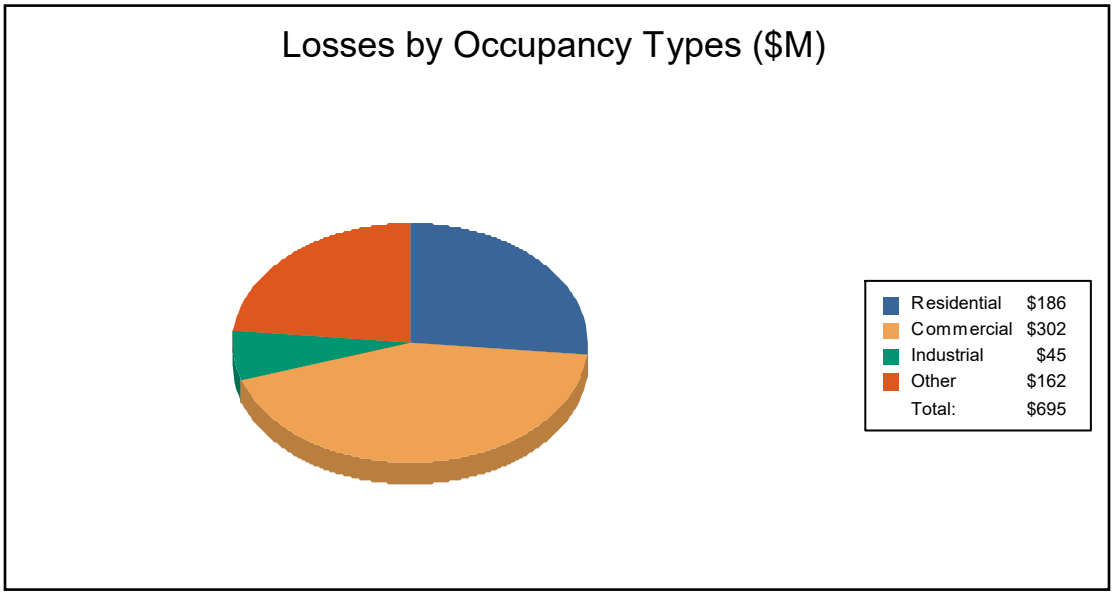
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 394.49 million dollars. 43% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 26.71% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	93.81	37.95	13.80	12.97	158.54
	Content	51.53	97.03	26.07	41.59	216.22
	Inventory	0.00	11.14	3.88	4.71	19.73
	Subtotal	**145.34**	**146.13**	**43.75**	**59.27**	**394.49**
Business Interruption						
	Income	3.73	61.58	0.44	12.30	78.04
	Relocation	16.15	13.14	0.39	7.51	37.19
	Rental Income	11.63	9.70	0.06	1.14	22.52
	Wage	8.76	71.08	0.77	81.94	162.56
	Subtotal	**40.27**	**155.50**	**1.66**	**102.89**	**300.31**
ALL	**Total**	**185.61**	**301.62**	**45.41**	**162.16**	**694.80**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,309	2,809,619	7,065,928
Total	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**
Total Study Region	**26,712**	**4,256,309**	**2,809,619**	**7,065,928**

Hazus: Flood Global Risk Report

Region Name:	Glastonbury_FL
Flood Scenario:	Glastonbury_Flood
Print Date:	Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 341 census blocks. The region contains over 14 thousand households and has a total population of 35,150 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 12,355 buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 85.98% of the buildings (and 71.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of 7,592 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,462,241	72.0%
Commercial	1,350,933	17.8%
Industrial	302,178	4.0%
Agricultural	15,669	0.2%
Religion	36,234	0.5%
Government	218,103	2.9%
Education	206,231	2.7%
Total	**7,591,589**	**100%**

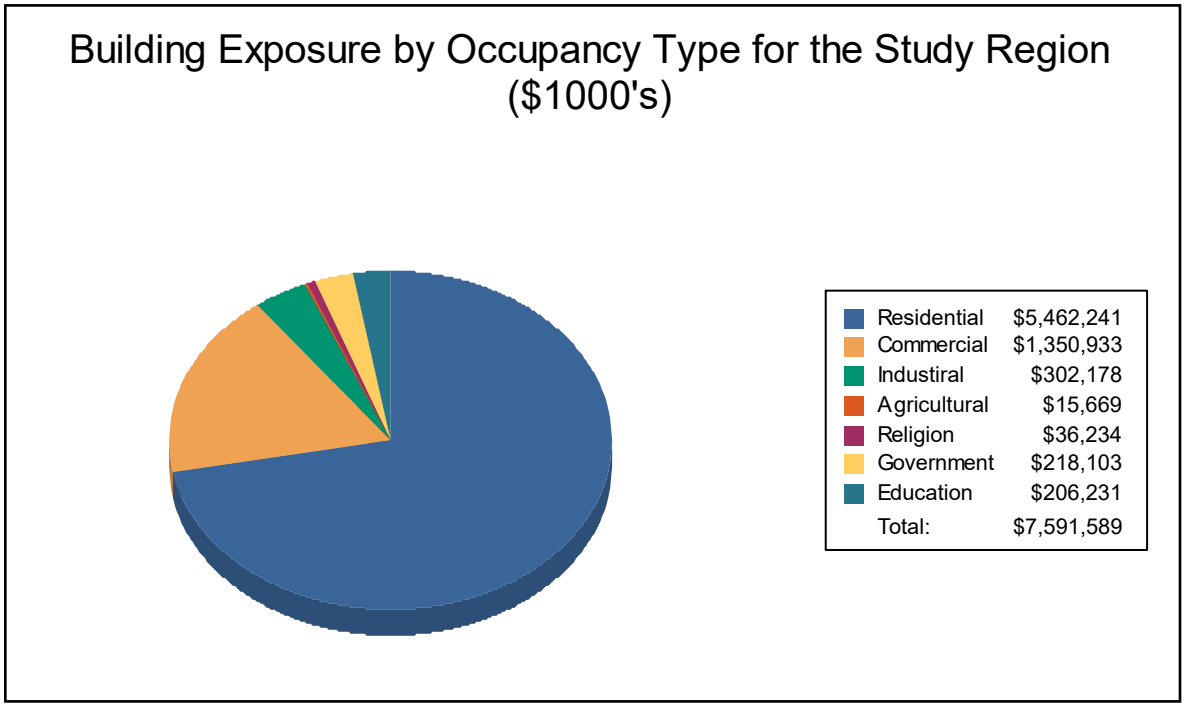
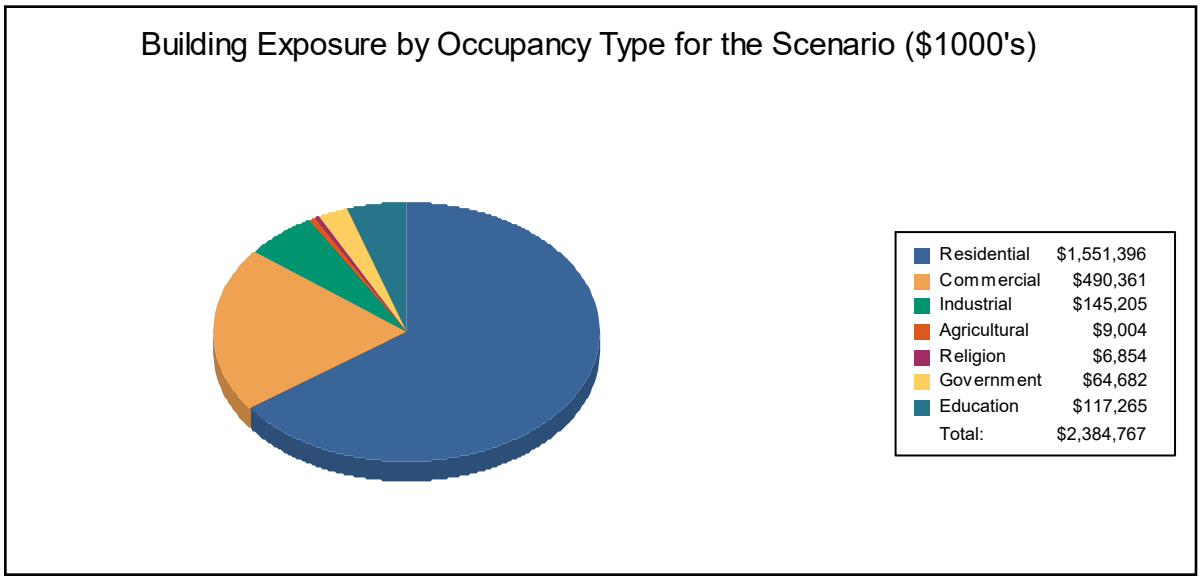


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,551,396	65.1%
Commercial	490,361	20.6%
Industrial	145,205	6.1%
Agricultural	9,004	0.4%
Religion	6,854	0.3%
Government	64,682	2.7%
Education	117,265	4.9%
Total	**2,384,767**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 9 schools, 4 fire stations, 1 police station and 1 emergency operation center.

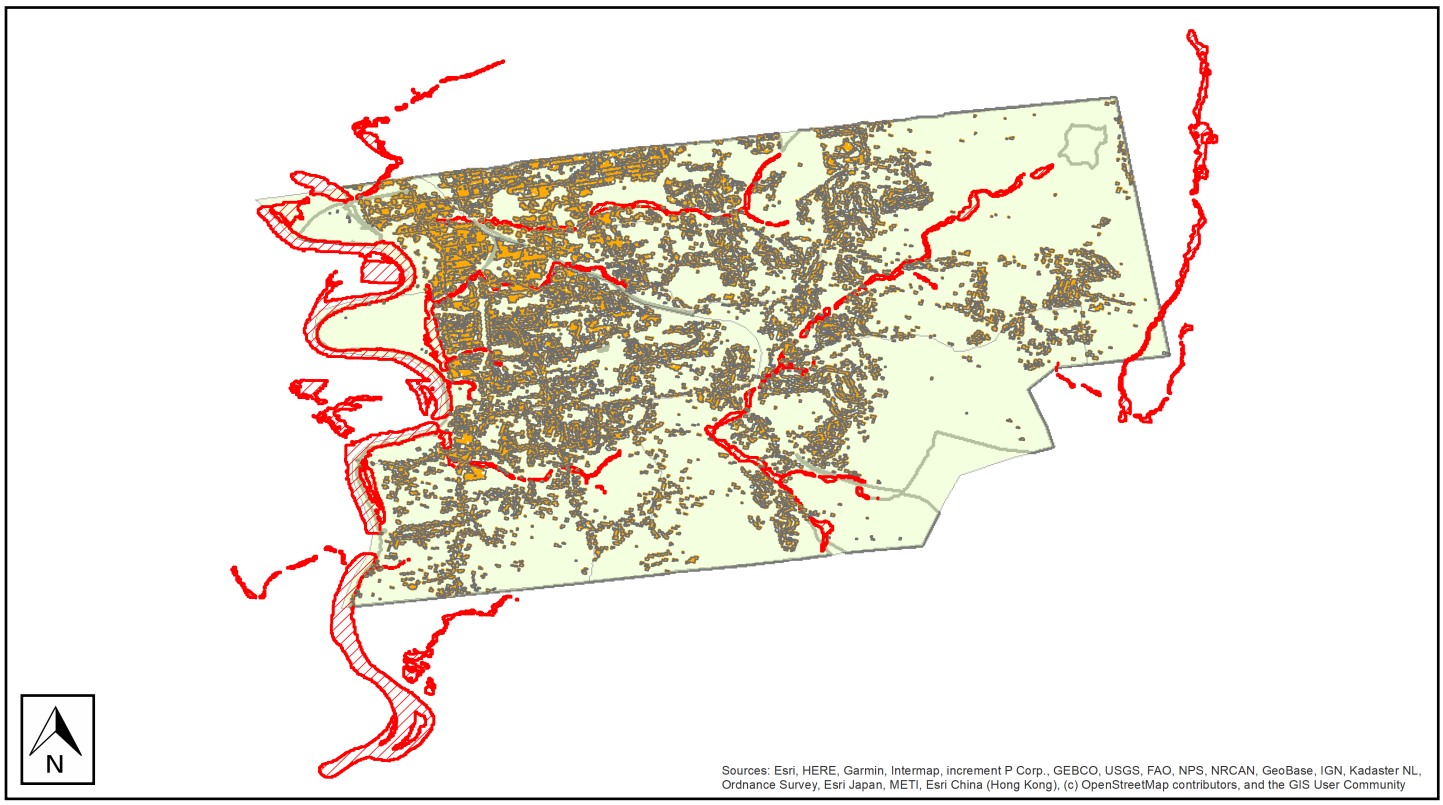
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Glastonbury_FL
Scenario Name:	Glastonbury_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 8 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

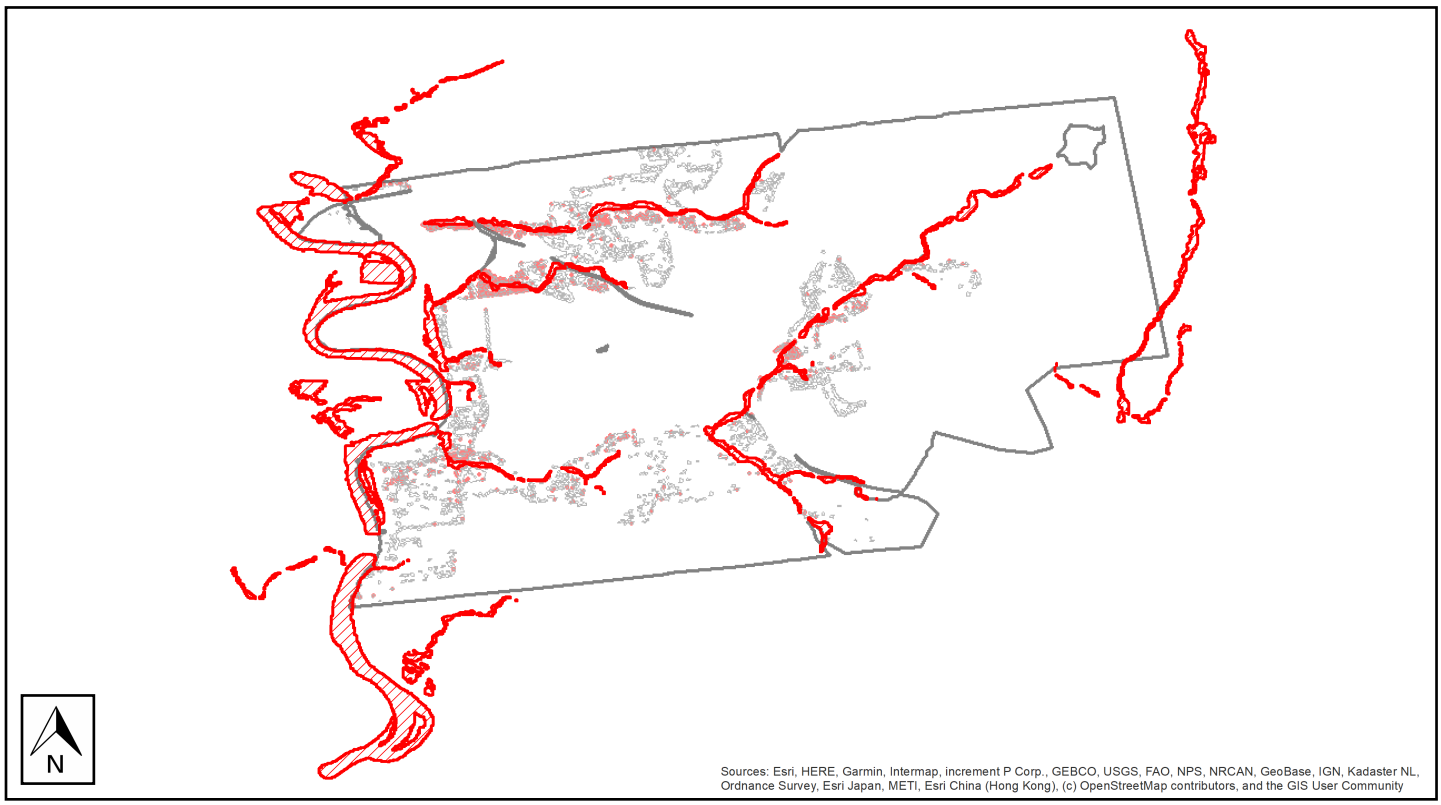


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	30	4	40	3	30	0	0	0	0	0	0
Total	**3**		**5**		**3**		**0**		**0**		**0**	

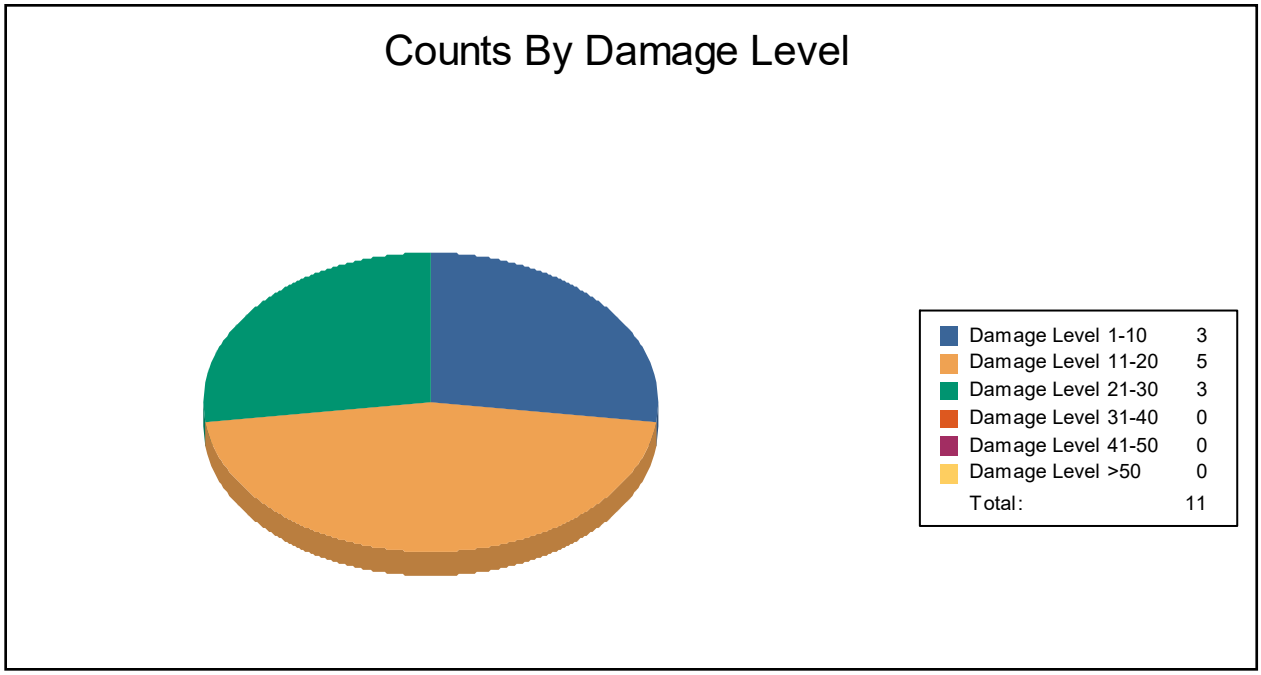


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	30	4	40	3	30	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	9	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

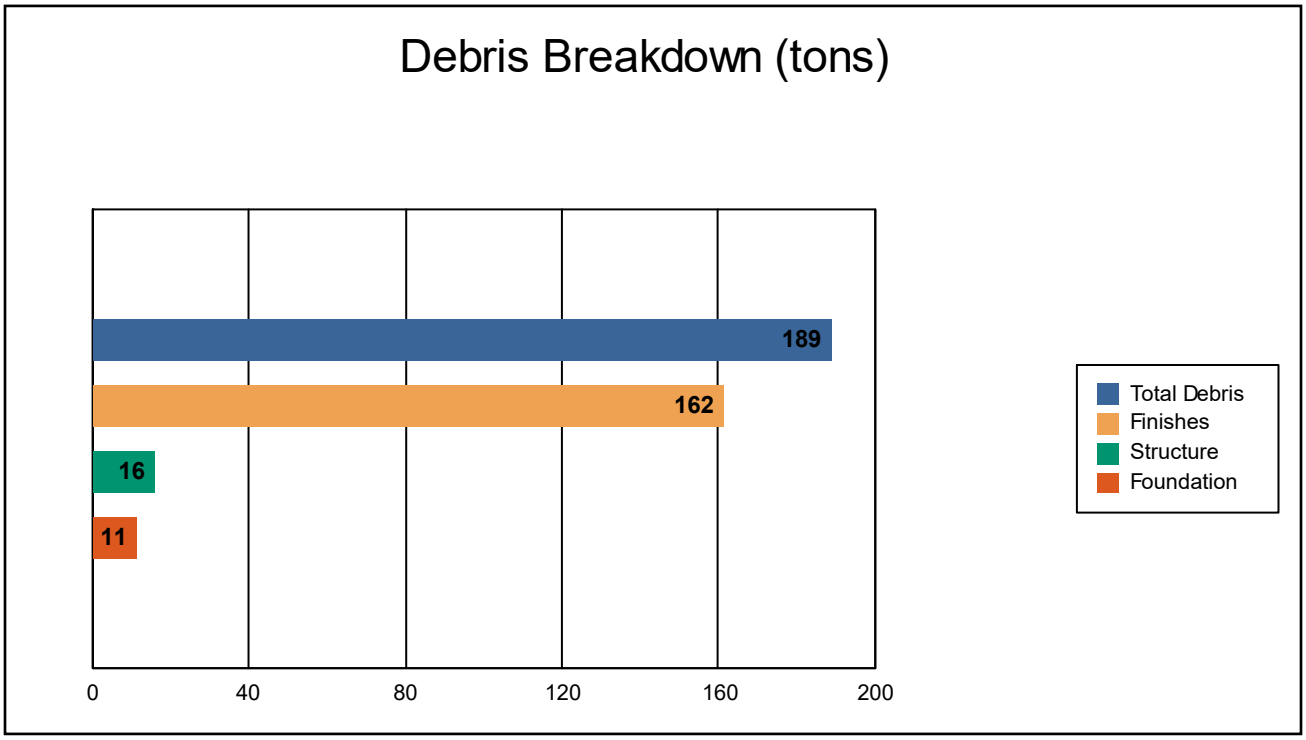
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

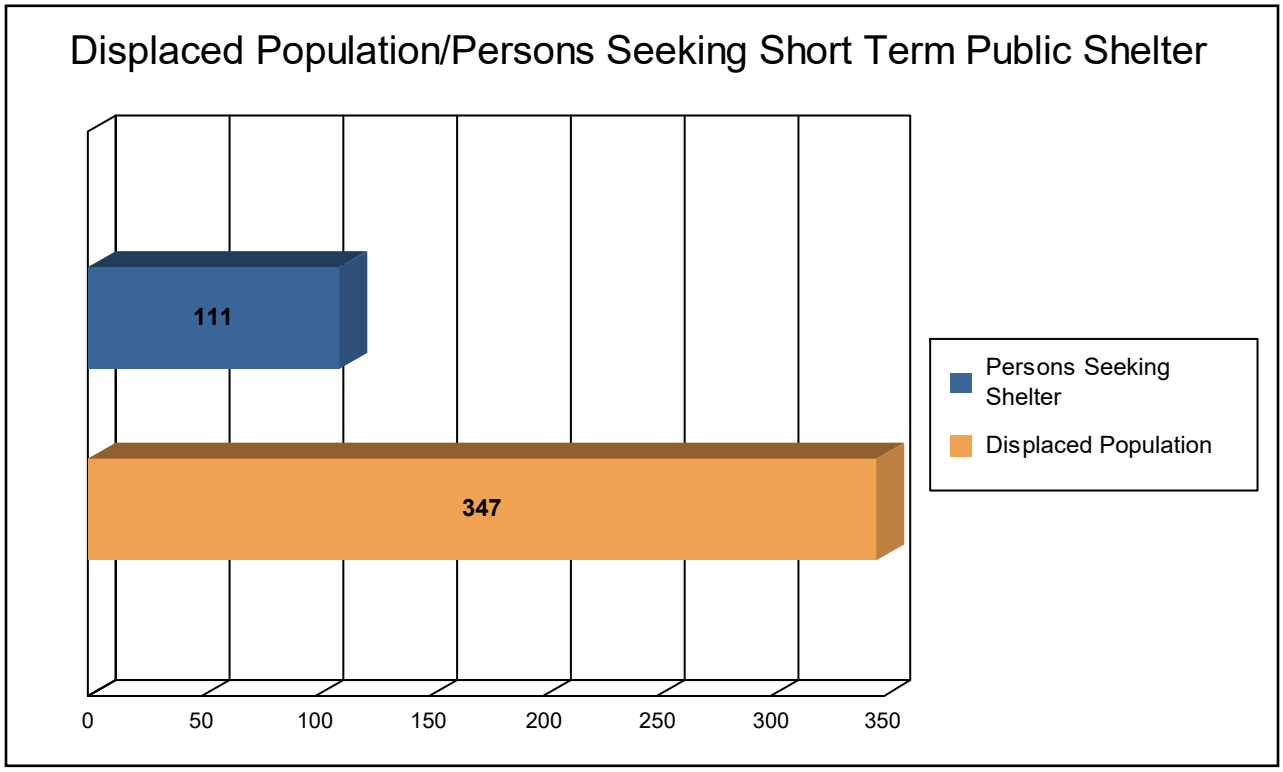


The model estimates that a total of 189 tons of debris will be generated. Of the total amount, Finishes comprises 86% of the total, Structure comprises 9% of the total, and Foundation comprises 6%. If the debris tonnage is converted into an estimated number of truckloads, it will require 8 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 116 households (or 347 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 111 people (out of a total population of 35,150) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 43.37 million dollars, which represents 1.82 % of the total replacement value of the scenario buildings.

Building-Related Losses

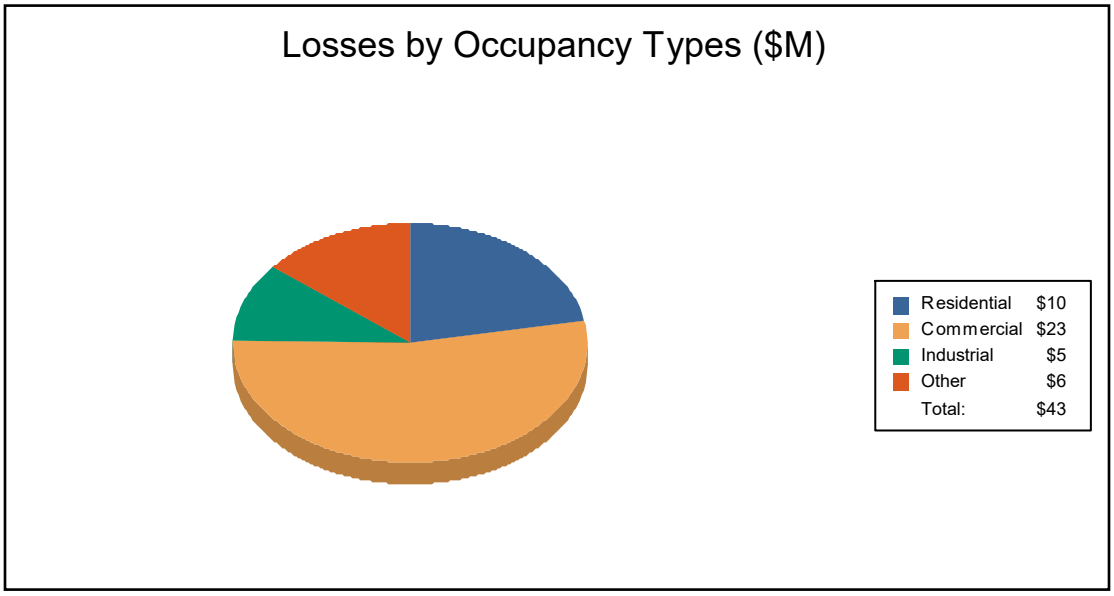
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 22.70 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.01% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.90	2.26	1.27	0.15	8.59
	Content	2.39	6.97	2.59	1.06	13.01
	Inventory	0.00	0.70	0.35	0.05	1.10
	Subtotal	**7.29**	**9.93**	**4.21**	**1.27**	**22.70**
Business Interruption						
	Income	0.03	5.04	0.08	0.50	5.66
	Relocation	1.41	1.32	0.10	0.24	3.07
	Rental Income	0.73	0.90	0.02	0.04	1.68
	Wage	0.08	5.95	0.15	4.09	10.27
	Subtotal	**2.26**	**13.21**	**0.34**	**4.87**	**20.67**
ALL	**Total**	**9.55**	**23.14**	**4.55**	**6.14**	**43.37**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	35,150	5,462,241	2,129,348	7,591,589
Total	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**
Total Study Region	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**

Hazus: Flood Global Risk Report

Region Name:	Glastonbury_FL
Flood Scenario:	Glastonbury_Flood
Print Date:	Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 341 census blocks. The region contains over 14 thousand households and has a total population of 35,150 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 12,355 buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 85.98% of the buildings (and 71.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of 7,592 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,462,241	72.0%
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Agricultural	15,669	0.2%
Religion	36,234	0.5%
Government	218,103	2.9%
Education	206,231	2.7%
Total	**7,591,589**	**100%**

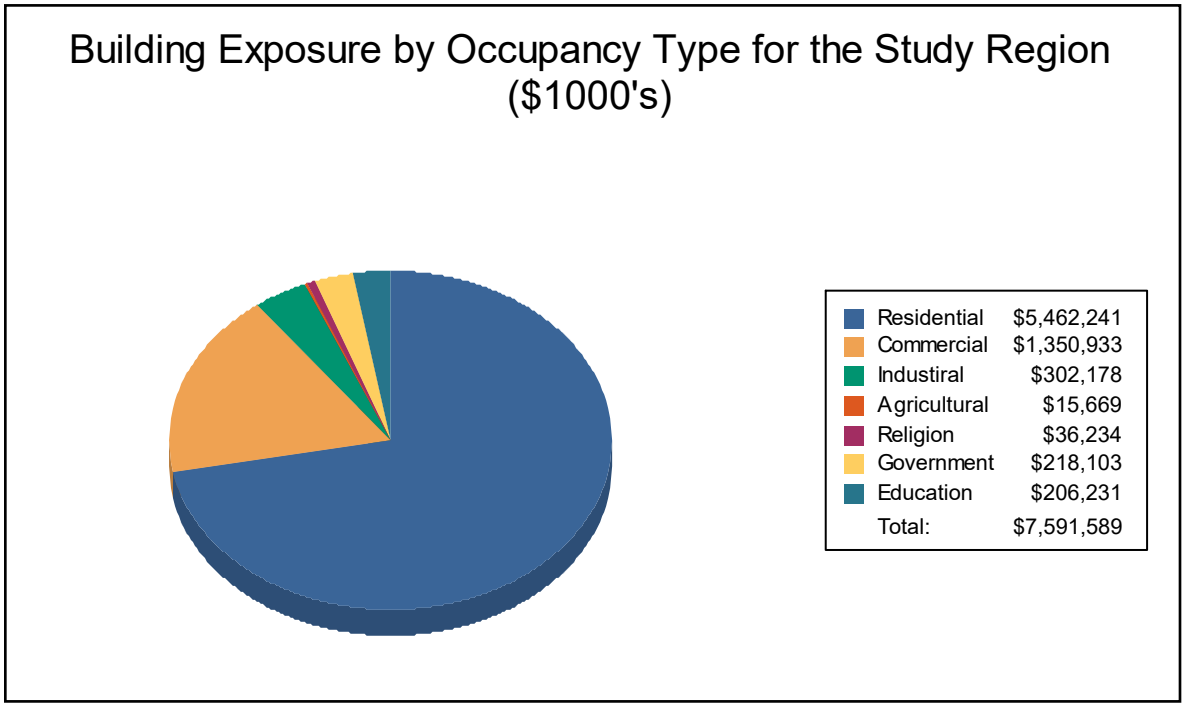
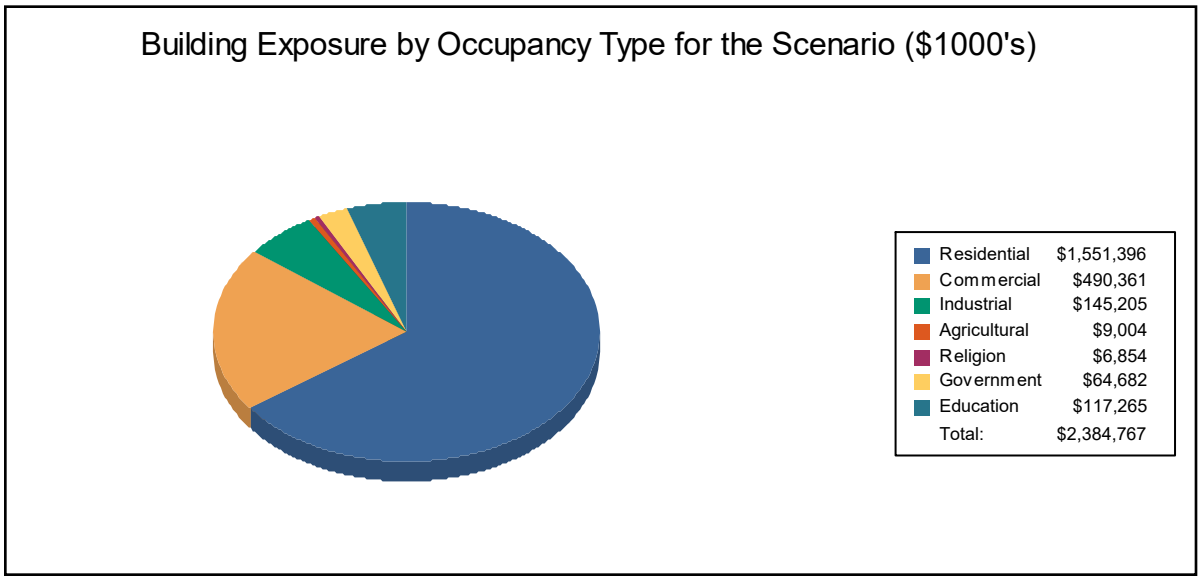


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,551,396	65.1%
Commercial	490,361	20.6%
Industrial	145,205	6.1%
Agricultural	9,004	0.4%
Religion	6,854	0.3%
Government	64,682	2.7%
Education	117,265	4.9%
Total	**2,384,767**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 9 schools, 4 fire stations, 1 police station and 1 emergency operation center.

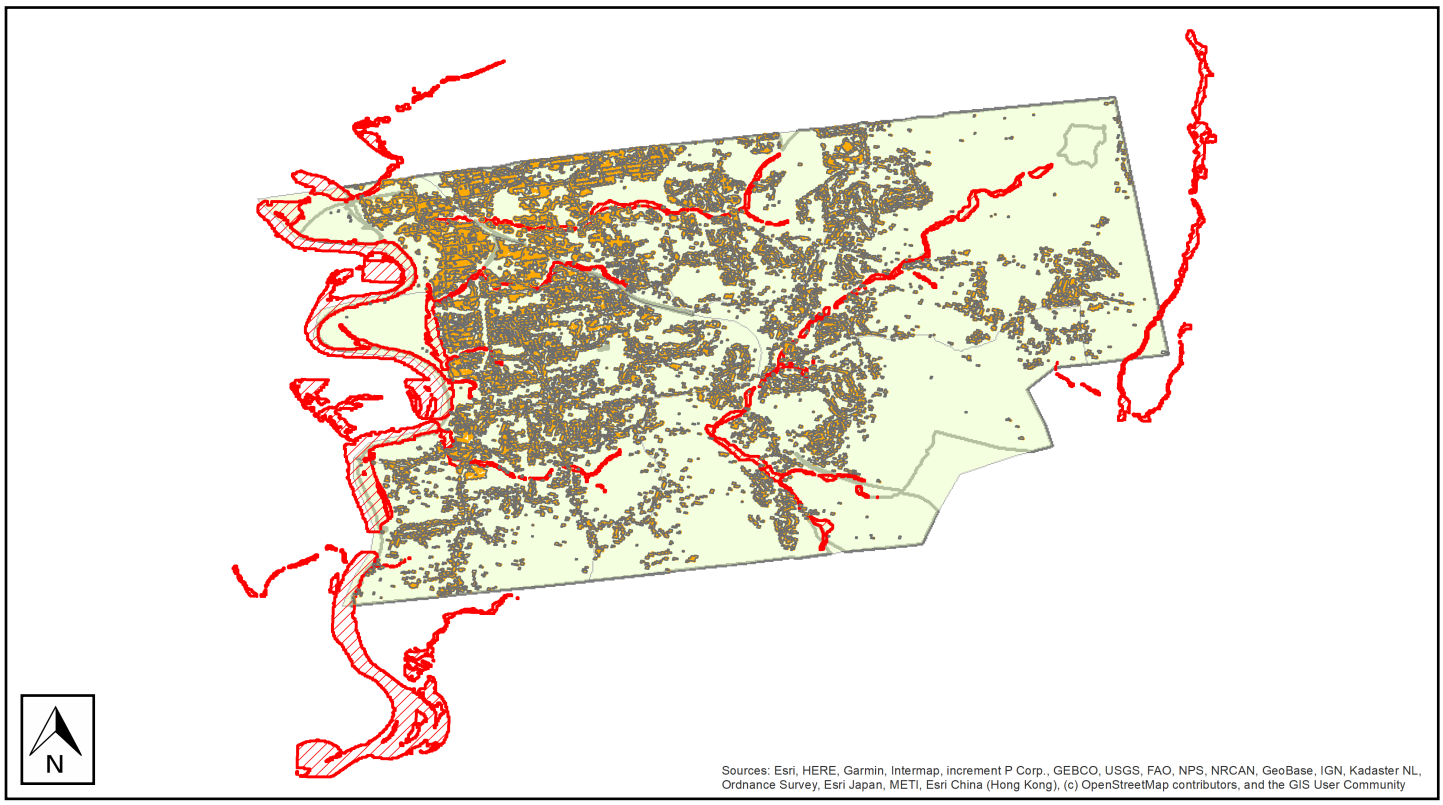
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Glastonbury_FL
Scenario Name:	Glastonbury_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 7 buildings will be at least moderately damaged. This is over 89% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

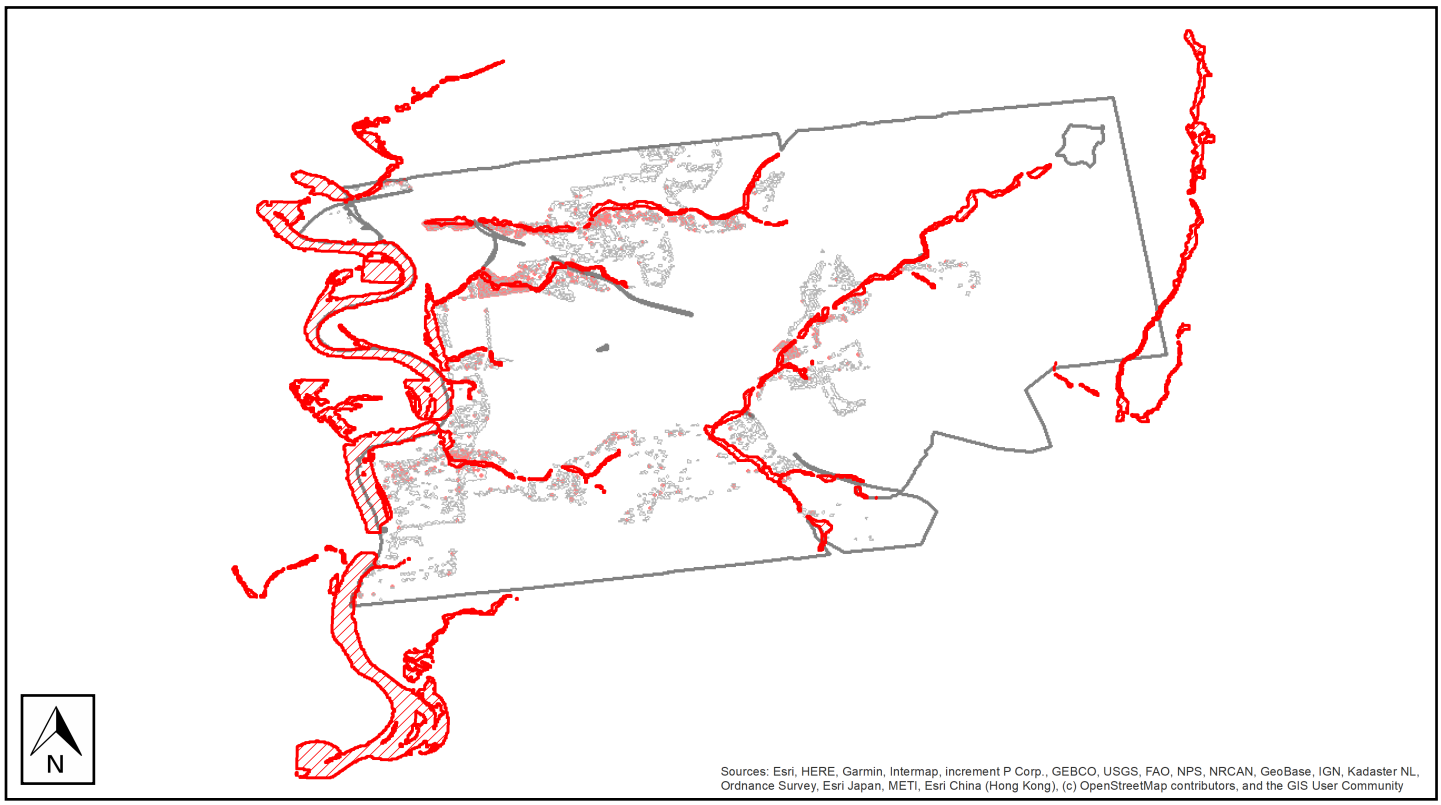


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	25	4	50	1	13	1	13	0	0	0	0
Total	**2**		**5**		**1**		**1**		**0**		**0**	

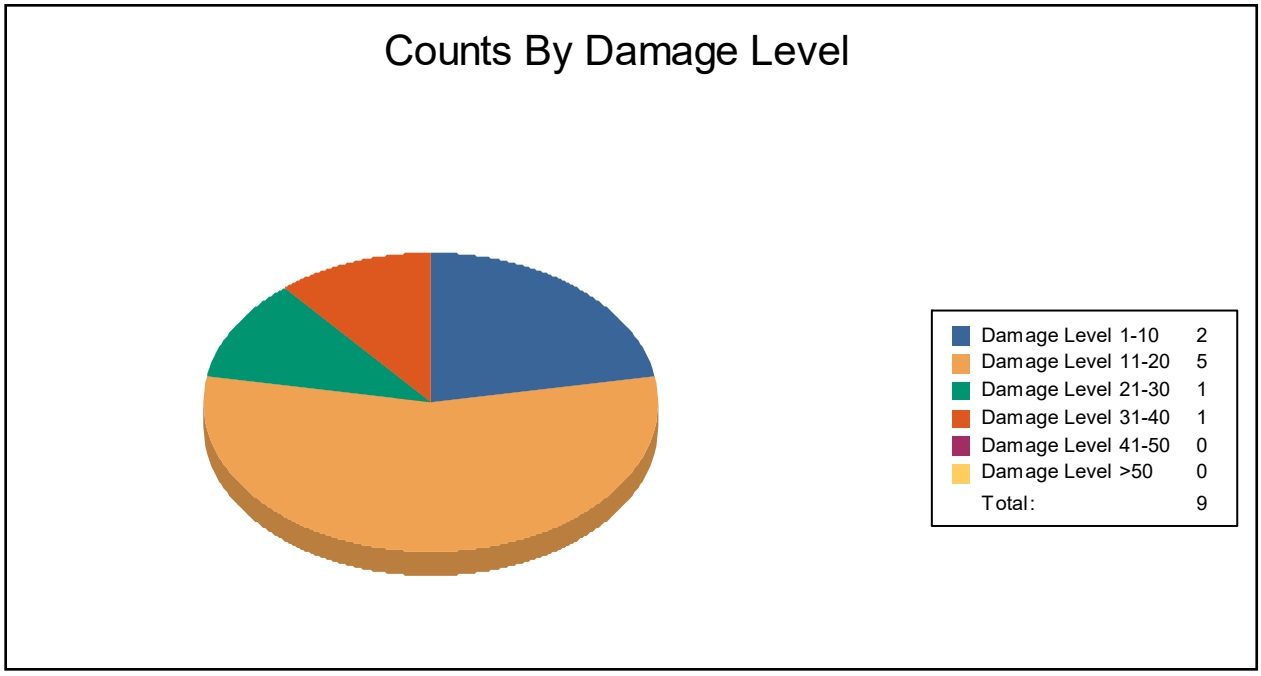


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	25	4	50	1	13	1	13	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	9	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

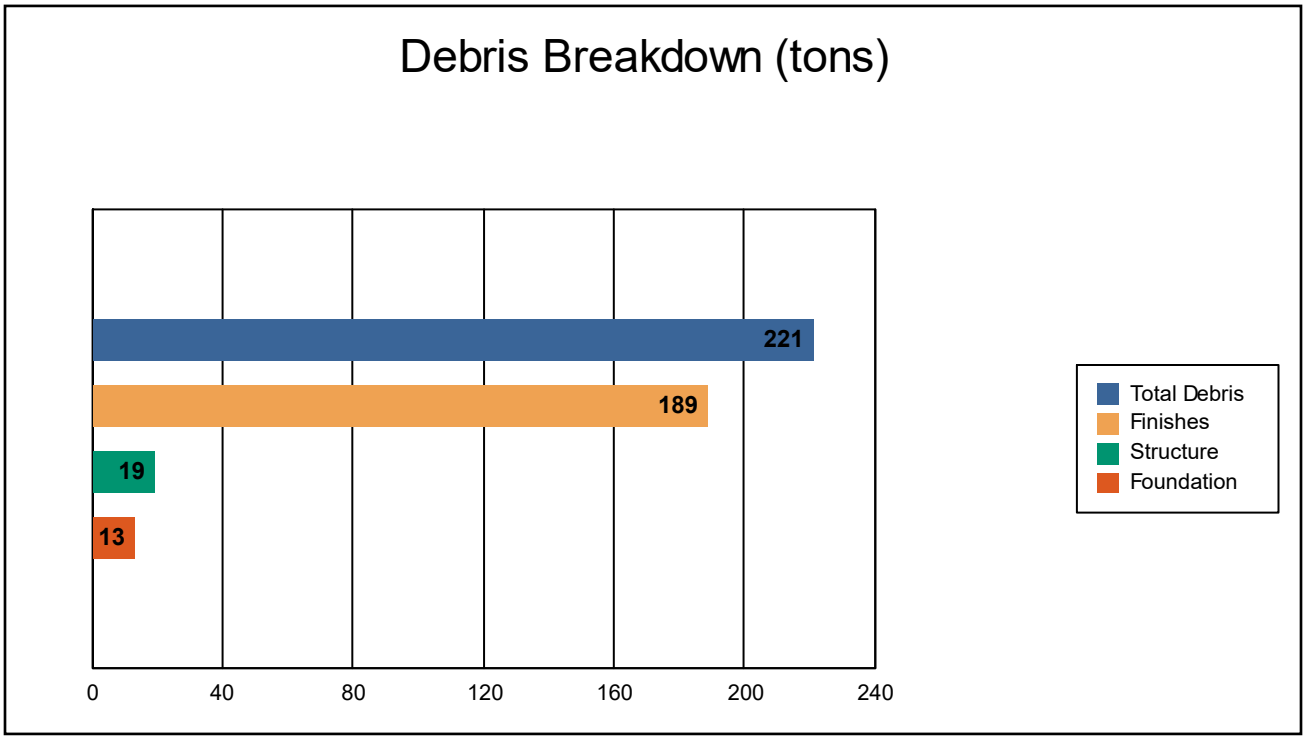
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

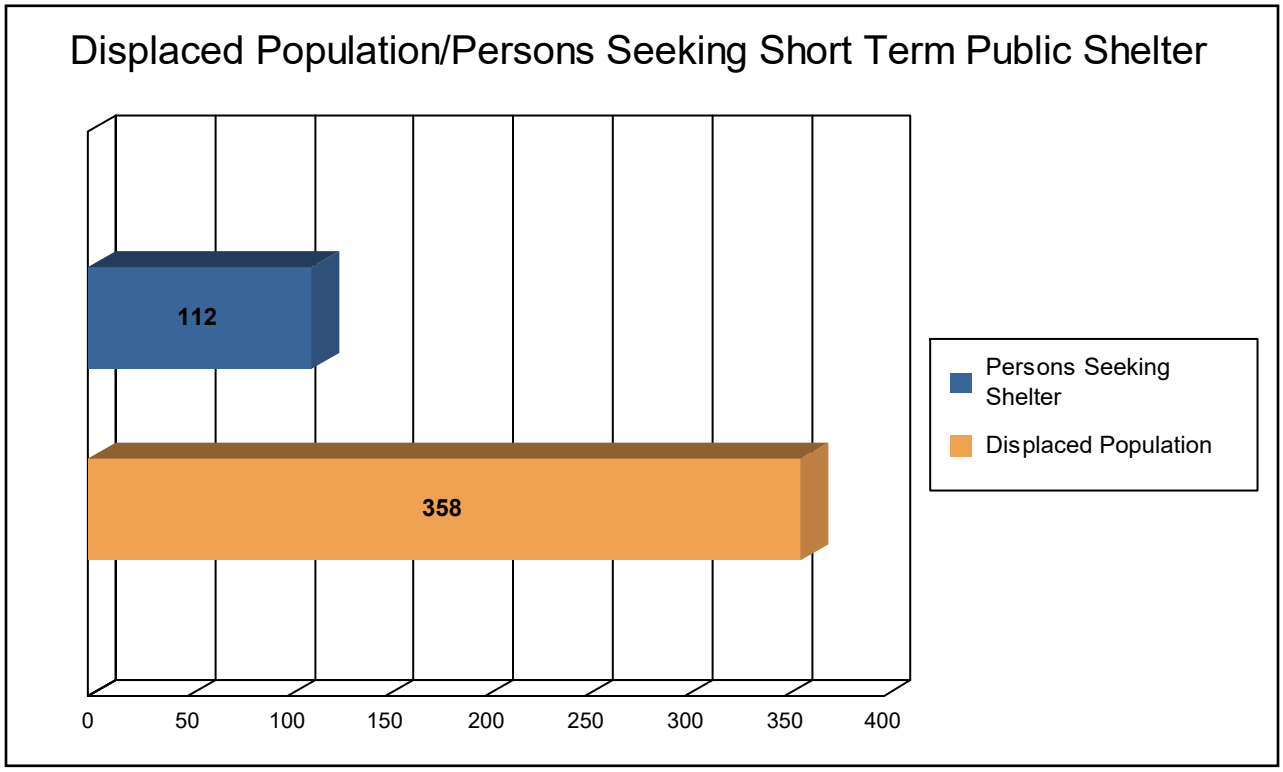


The model estimates that a total of 221 tons of debris will be generated. Of the total amount, Finishes comprises 85% of the total, Structure comprises 9% of the total, and Foundation comprises 6%. If the debris tonnage is converted into an estimated number of truckloads, it will require 9 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 119 households (or 358 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 112 people (out of a total population of 35,150) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 47.58 million dollars, which represents 1.99 % of the total replacement value of the scenario buildings.

Building-Related Losses

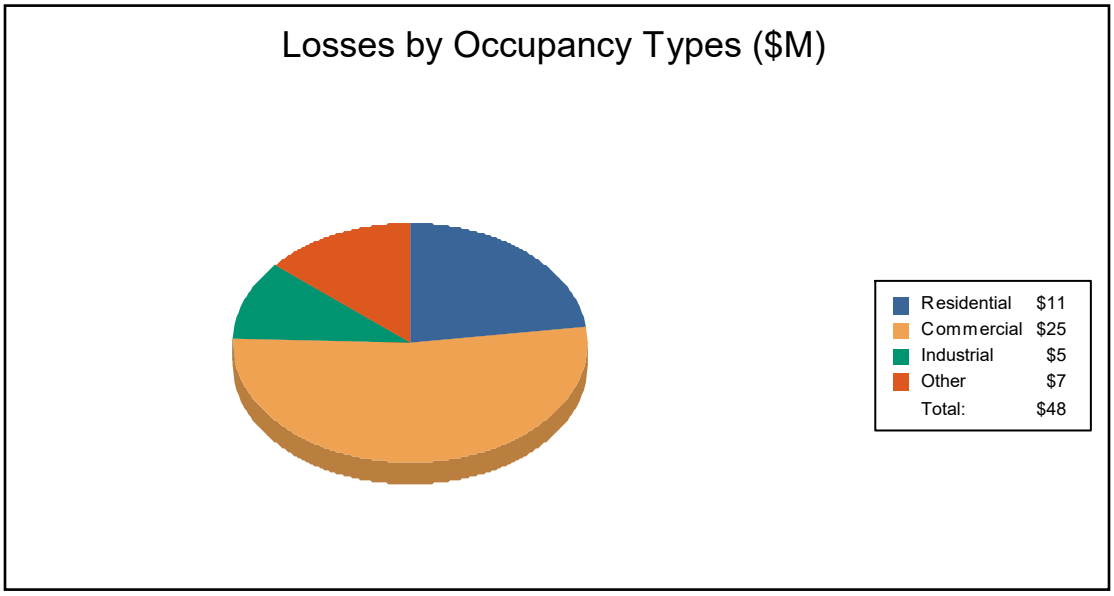
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 25.57 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.88% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.66	2.49	1.40	0.19	9.74
	Content	2.78	7.66	2.90	1.24	14.59
	Inventory	0.00	0.80	0.39	0.06	1.24
	Subtotal	**8.44**	**10.95**	**4.69**	**1.48**	**25.57**
Business Interruption						
	Income	0.03	5.38	0.08	0.53	6.03
	Relocation	1.54	1.40	0.10	0.26	3.31
	Rental Income	0.78	0.96	0.02	0.04	1.80
	Wage	0.08	6.40	0.15	4.23	10.87
	Subtotal	**2.44**	**14.14**	**0.36**	**5.07**	**22.01**
ALL	**Total**	**10.88**	**25.10**	**5.05**	**6.55**	**47.58**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	35,150	5,462,241	2,129,348	7,591,589
Total	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**
Total Study Region	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**

Hazus: Flood Global Risk Report

Region Name:	Glastonbury_FL
Flood Scenario:	Glastonbury_Flood
Print Date:	Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 341 census blocks. The region contains over 14 thousand households and has a total population of 35,150 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 12,355 buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 85.98% of the buildings (and 71.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of 7,592 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,462,241	72.0%
Commercial	1,350,933	17.8%
Industrial	302,178	4.0%
Agricultural	15,669	0.2%
Religion	36,234	0.5%
Government	218,103	2.9%
Education	206,231	2.7%
Total	**7,591,589**	**100%**

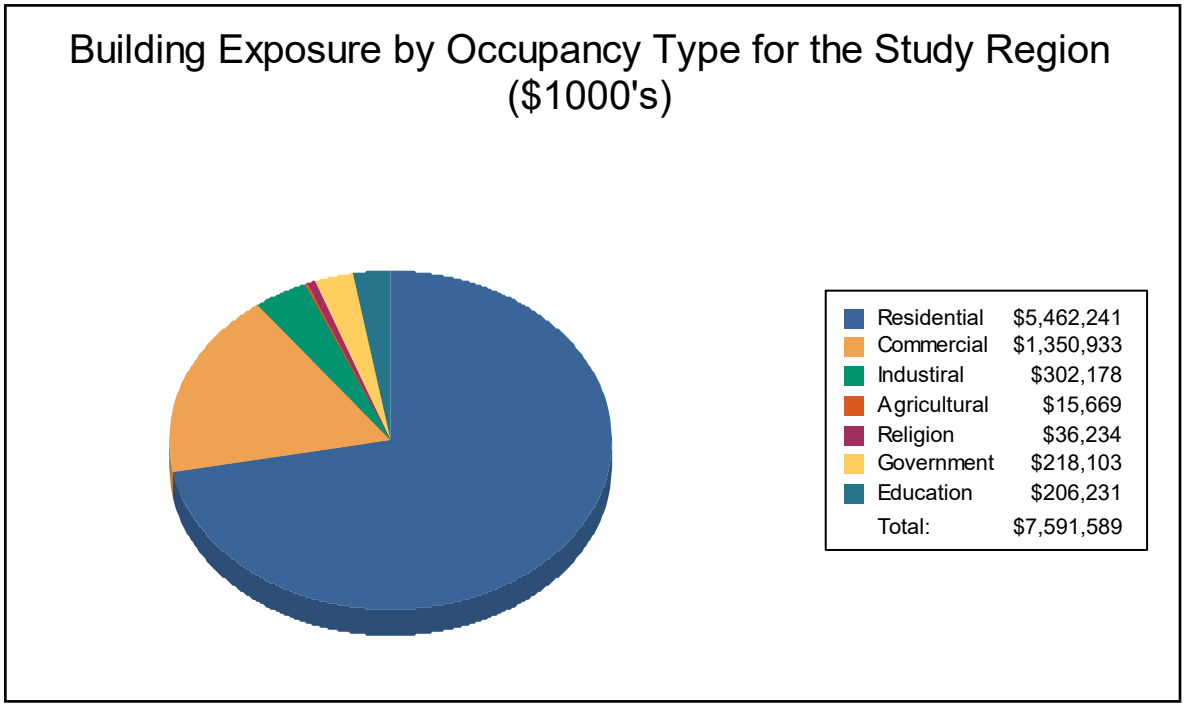
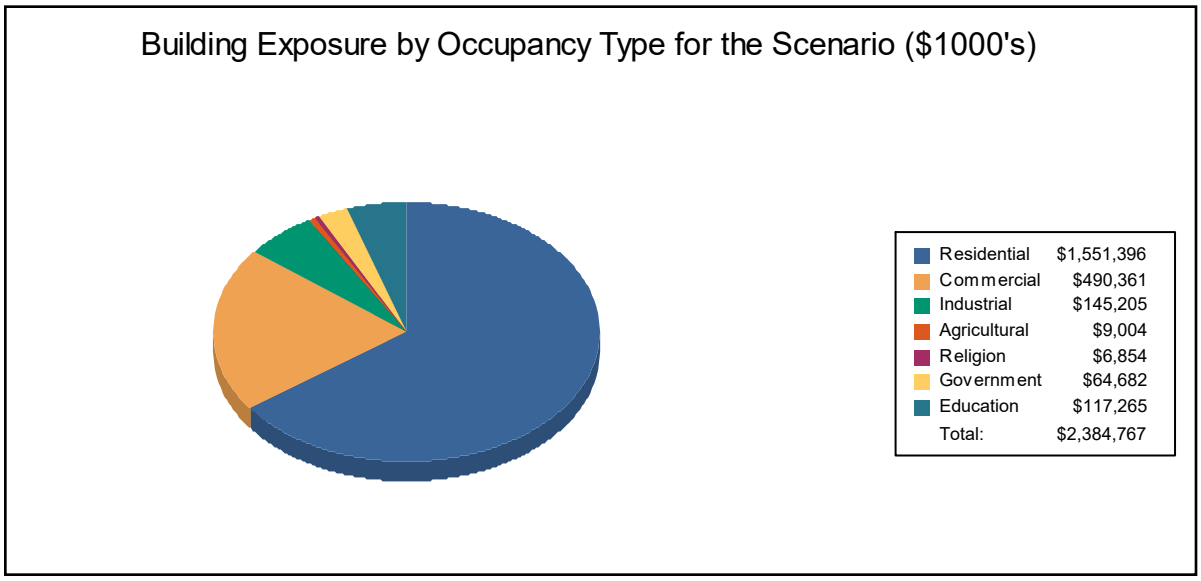


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,551,396	65.1%
Commercial	490,361	20.6%
Industrial	145,205	6.1%
Agricultural	9,004	0.4%
Religion	6,854	0.3%
Government	64,682	2.7%
Education	117,265	4.9%
Total	**2,384,767**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 9 schools, 4 fire stations, 1 police station and 1 emergency operation center.

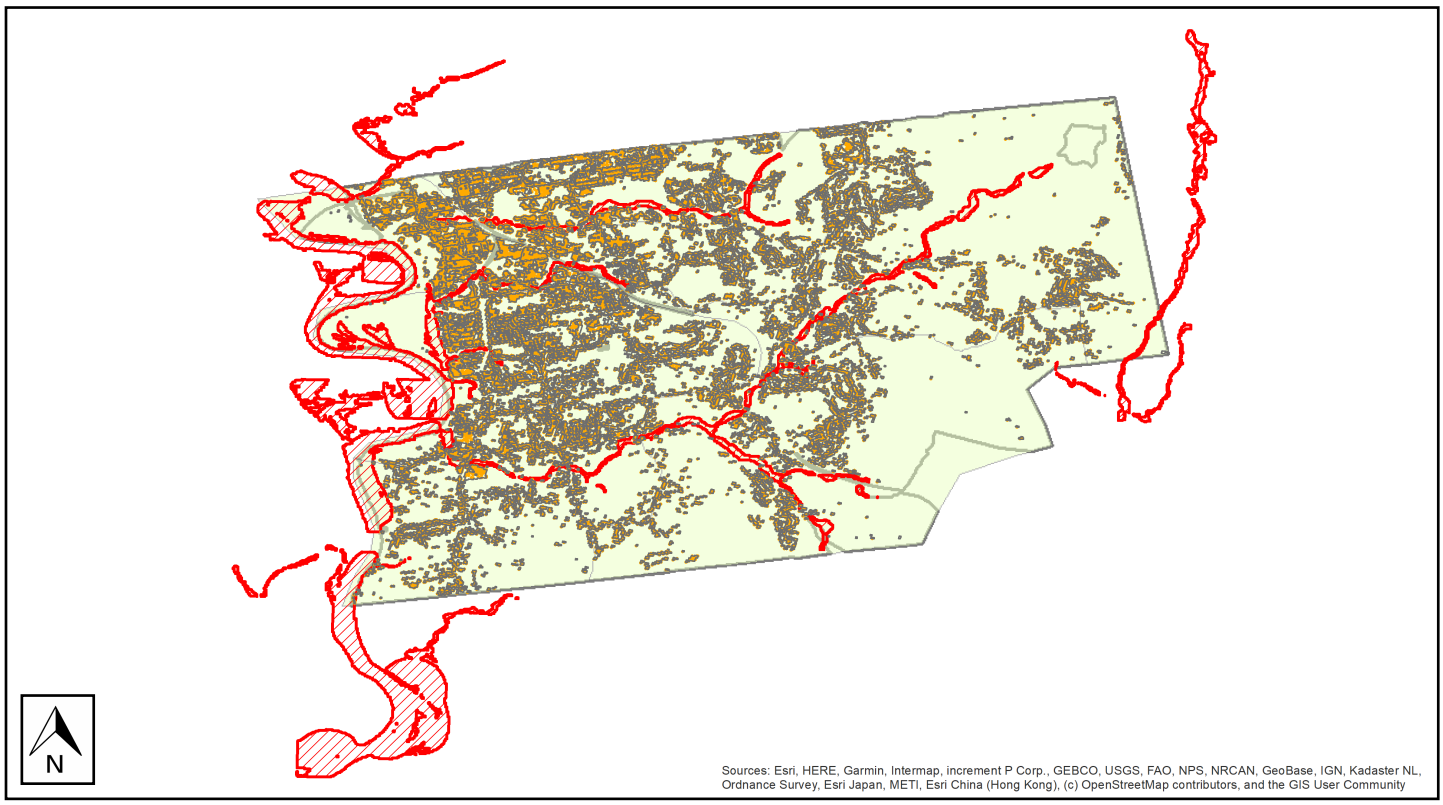
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Glastonbury_FL
Scenario Name:	Glastonbury_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 83% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

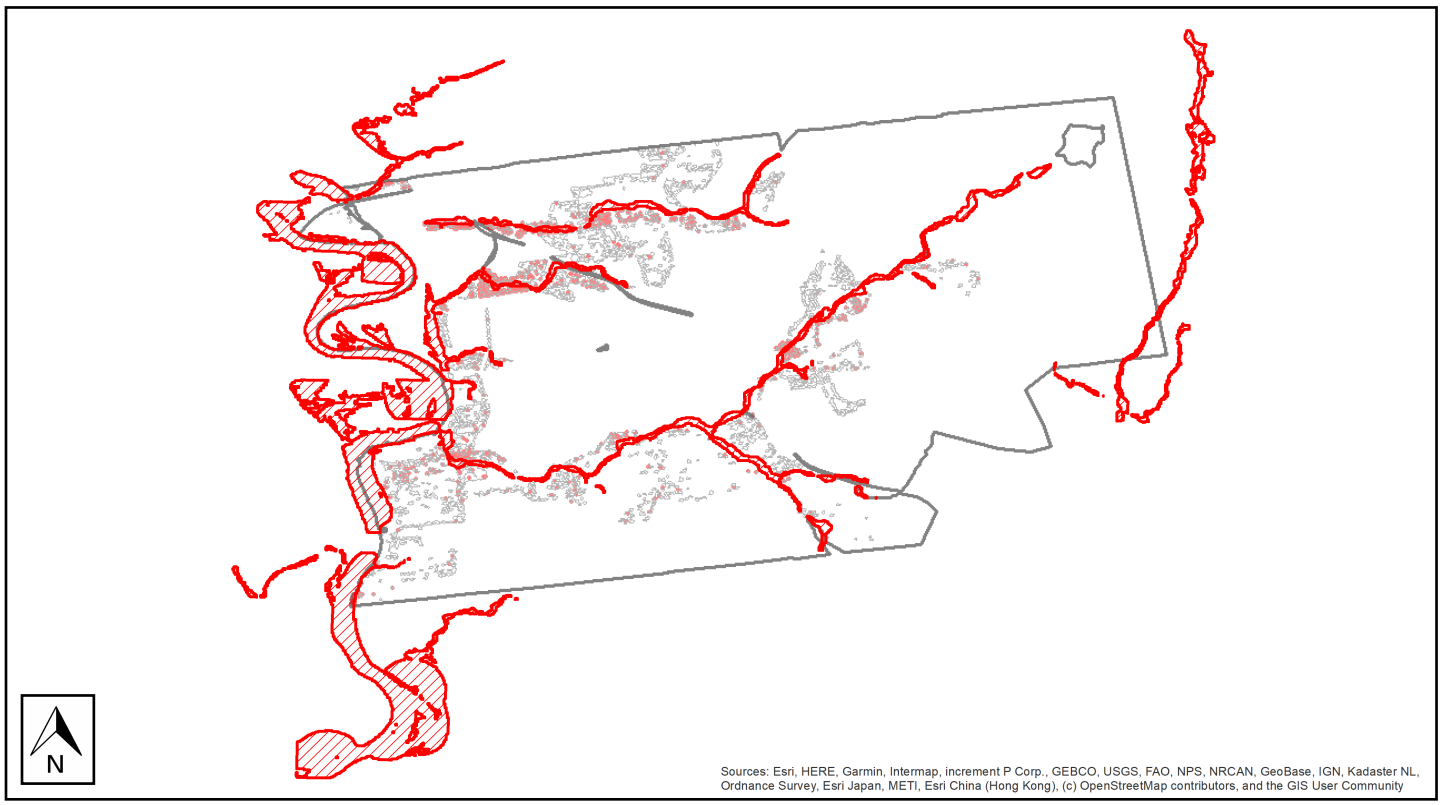


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	9	7	64	1	9	1	9	1	9	0	0
Total	**1**		**8**		**1**		**1**		**1**		**0**	

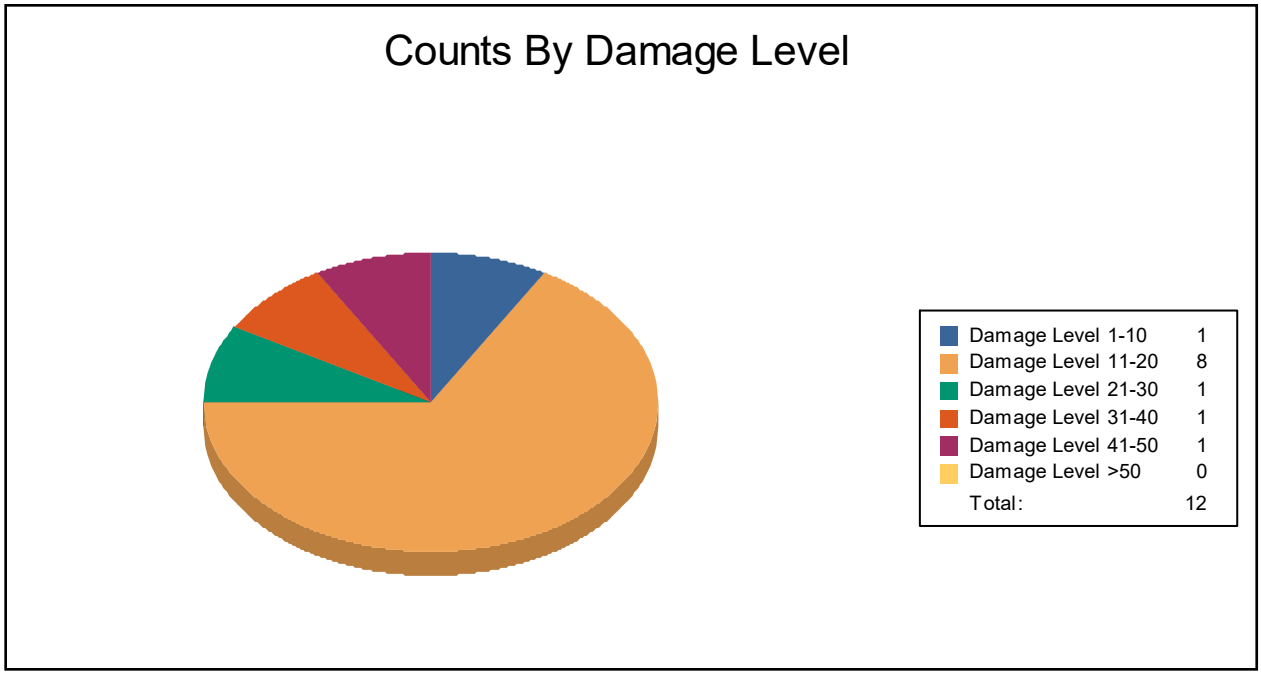


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	9	7	64	1	9	1	9	1	9	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	9	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

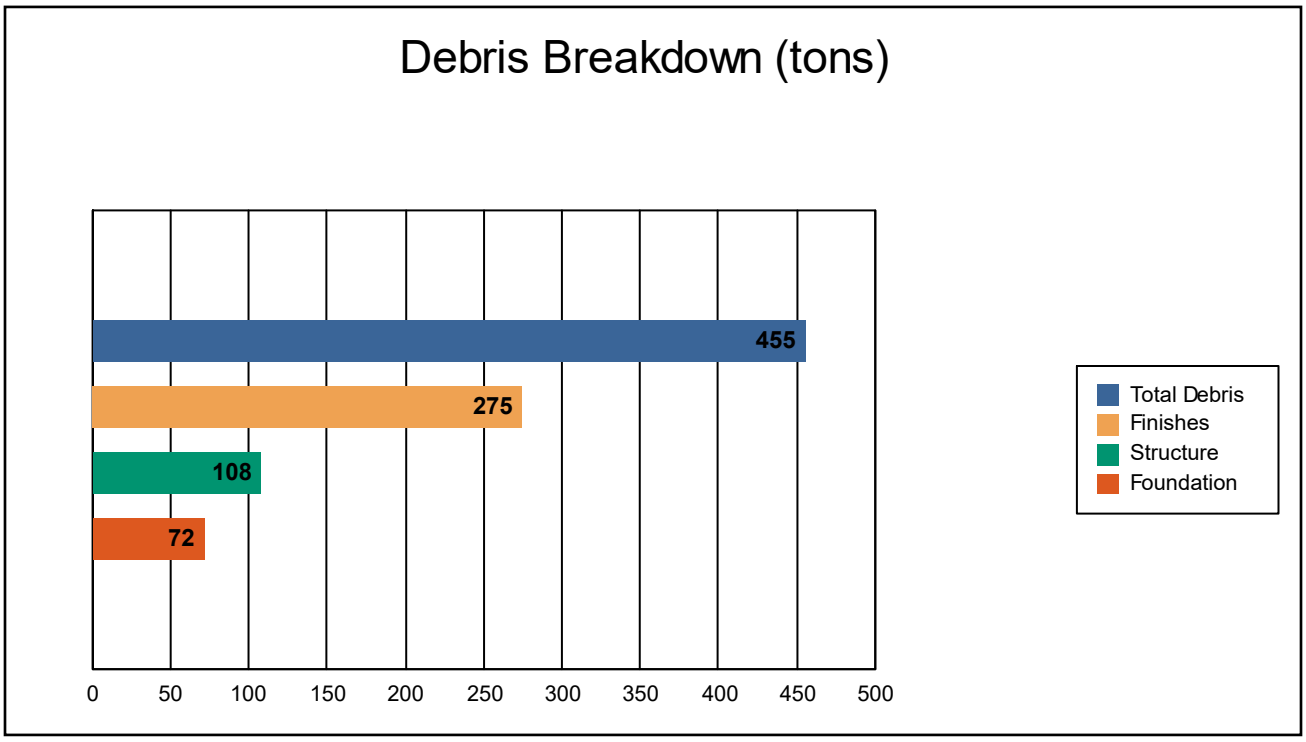
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

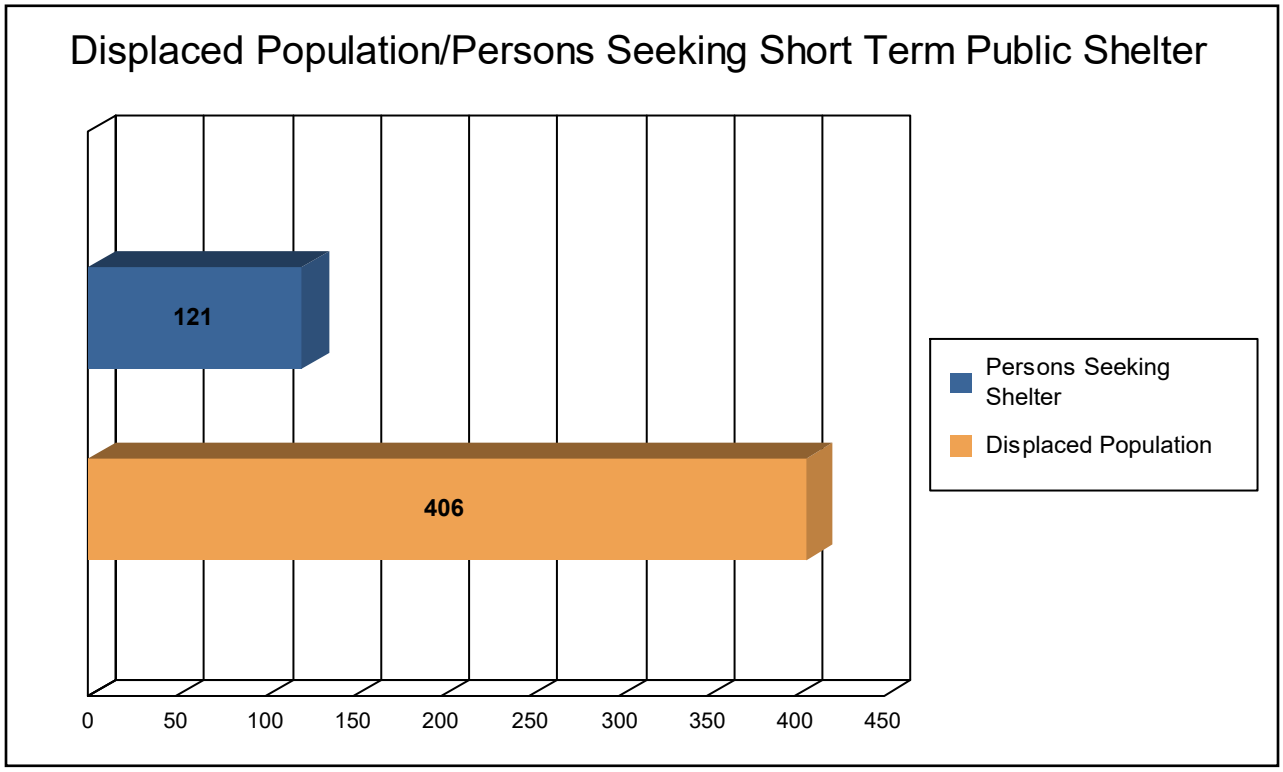


The model estimates that a total of 455 tons of debris will be generated. Of the total amount, Finishes comprises 60% of the total, Structure comprises 24% of the total, and Foundation comprises 16%. If the debris tonnage is converted into an estimated number of truckloads, it will require 19 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 135 households (or 406 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 121 people (out of a total population of 35,150) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 59.81 million dollars, which represents 2.51 % of the total replacement value of the scenario buildings.

Building-Related Losses

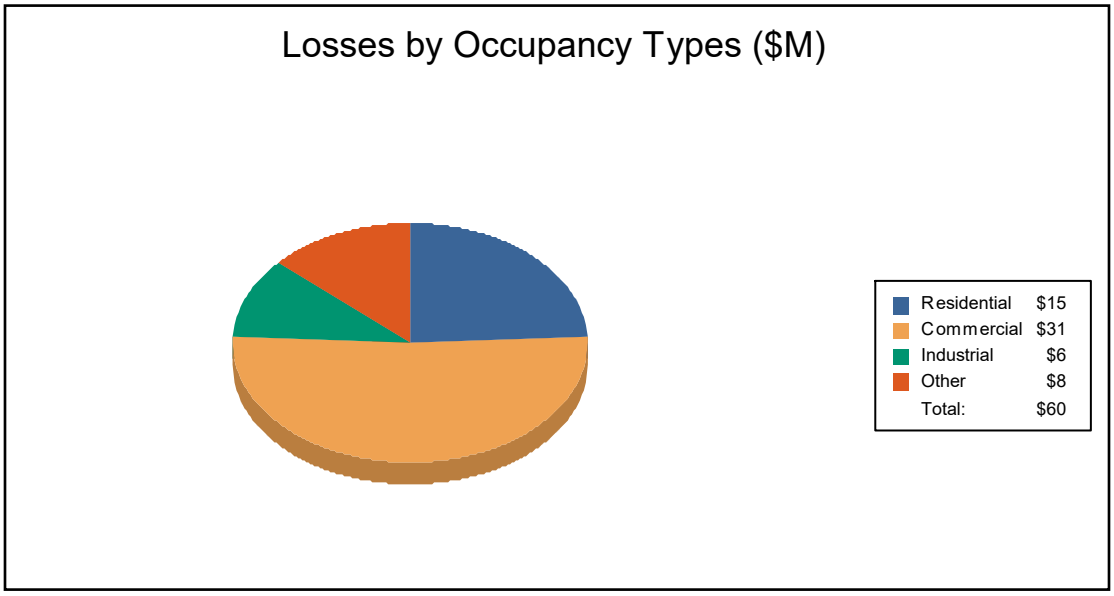
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 33.62 million dollars. 44% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 24.27% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.75	3.25	1.77	0.26	13.03
	Content	3.82	9.69	3.81	1.63	18.95
	Inventory	0.00	1.07	0.50	0.08	1.64
	Subtotal	**11.58**	**14.01**	**6.07**	**1.97**	**33.62**
Business Interruption						
	Income	0.04	6.53	0.09	0.66	7.33
	Relocation	1.87	1.64	0.11	0.31	3.93
	Rental Income	0.93	1.12	0.02	0.05	2.12
	Wage	0.10	7.58	0.17	4.96	12.82
	Subtotal	**2.94**	**16.87**	**0.40**	**5.98**	**26.19**
ALL	**Total**	**14.52**	**30.88**	**6.47**	**7.95**	**59.81**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	35,150	5,462,241	2,129,348	7,591,589
Total	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**
Total Study Region	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**

Hazus: Flood Global Risk Report

Region Name:	Glastonbury_FL
Flood Scenario:	Glastonbury_Flood
Print Date:	Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 341 census blocks. The region contains over 14 thousand households and has a total population of 35,150 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 12,355 buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 85.98% of the buildings (and 71.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of 7,592 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
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Religion	36,234	0.5%
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Education	206,231	2.7%
Total	**7,591,589**	**100%**

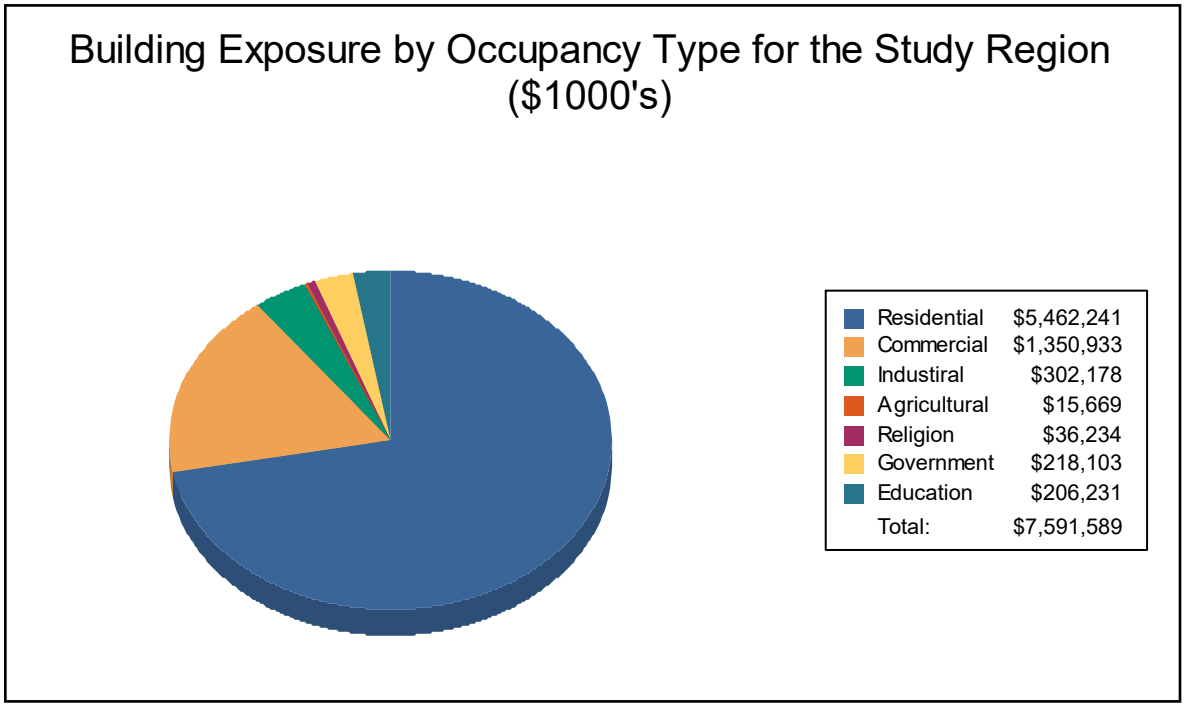
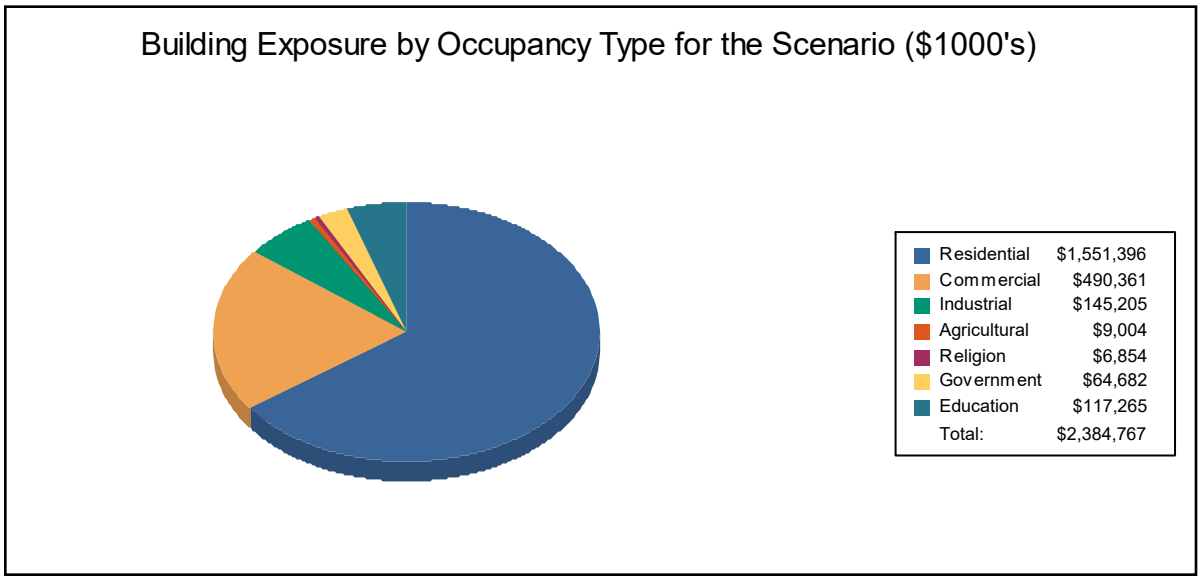


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,551,396	65.1%
Commercial	490,361	20.6%
Industrial	145,205	6.1%
Agricultural	9,004	0.4%
Religion	6,854	0.3%
Government	64,682	2.7%
Education	117,265	4.9%
Total	**2,384,767**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 9 schools, 4 fire stations, 1 police station and 1 emergency operation center.

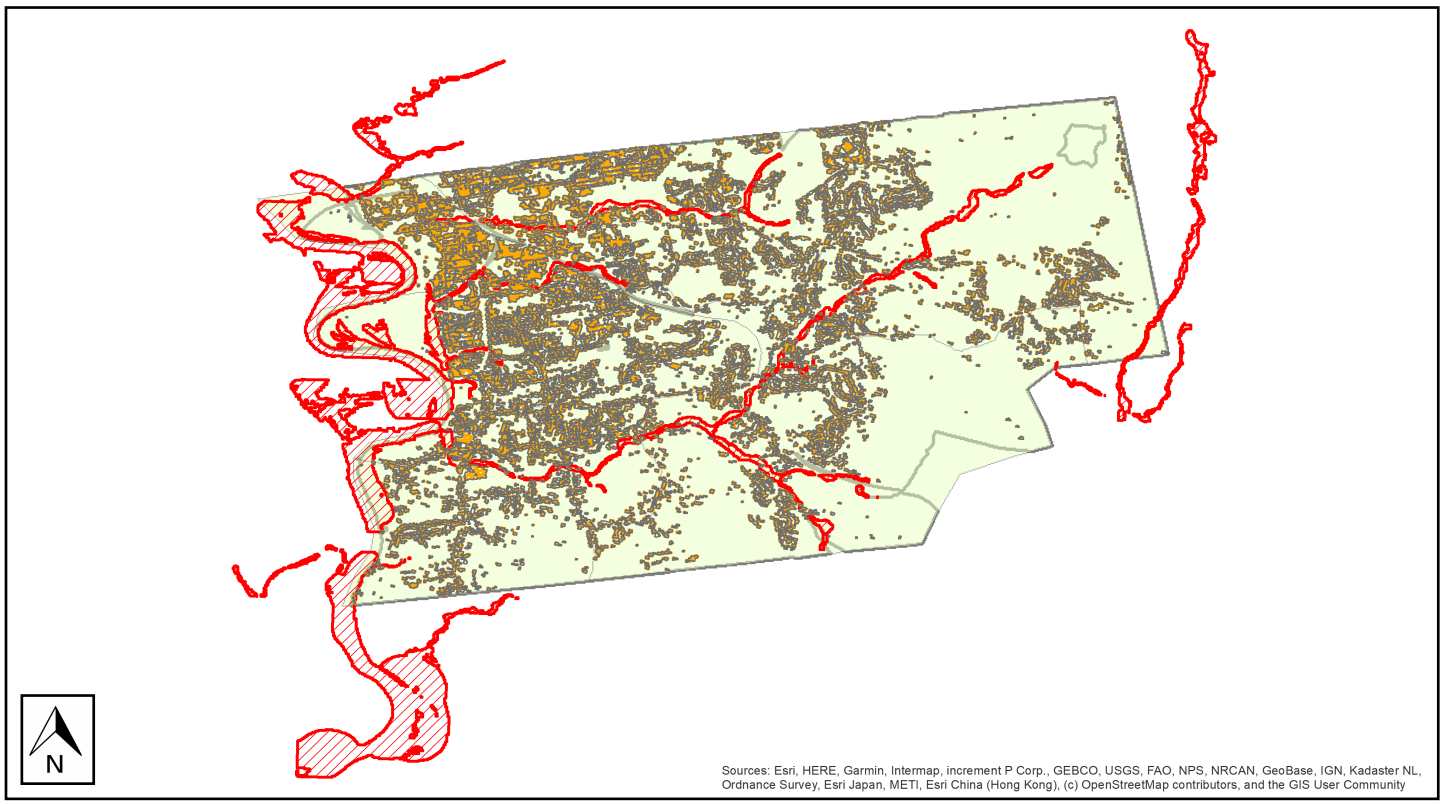
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Glastonbury_FL
Scenario Name:	Glastonbury_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 13 buildings will be at least moderately damaged. This is over 79% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

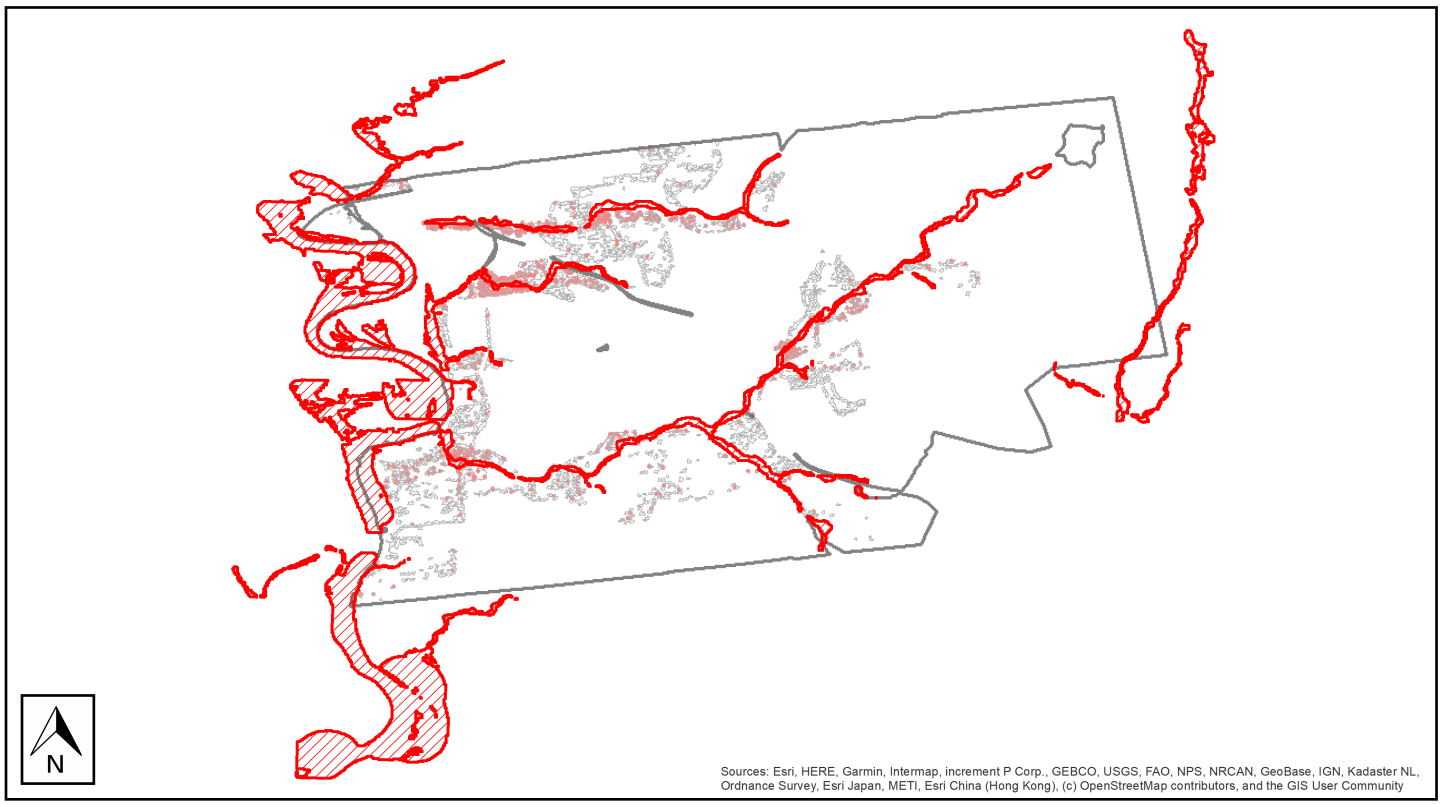


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	8	9	69	0	0	1	8	1	8	1	8
Total	**1**		**10**		**0**		**1**		**1**		**1**	

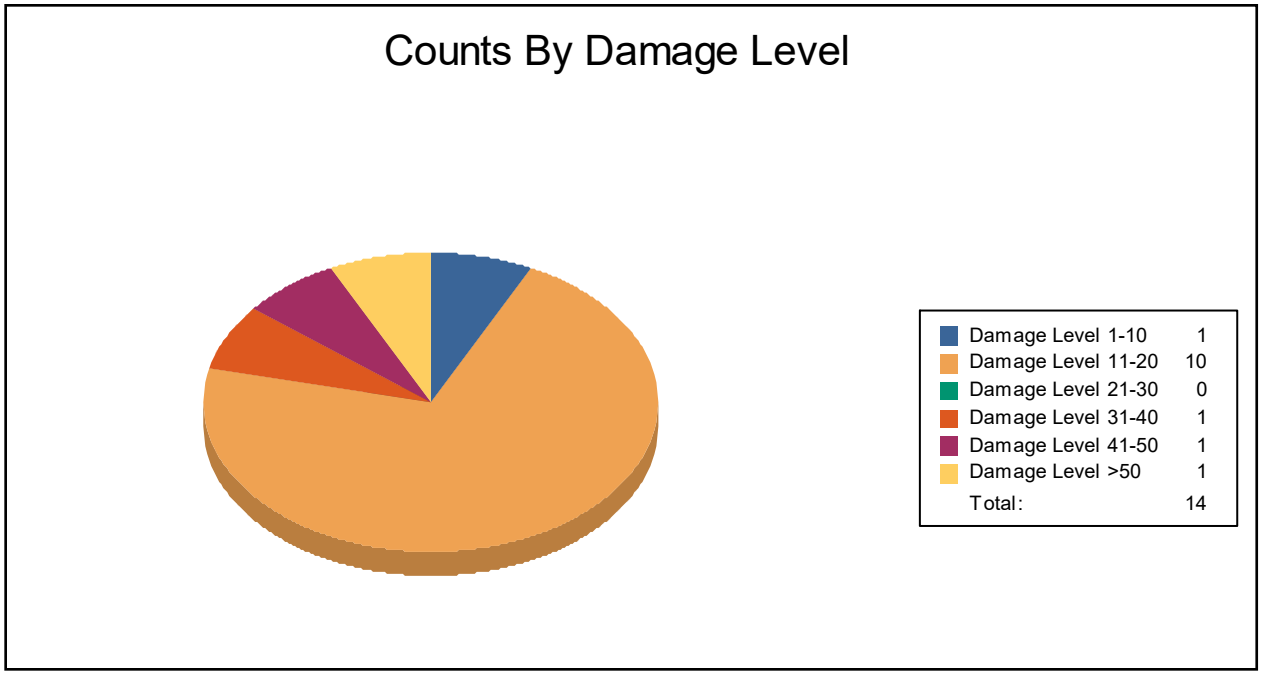


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	8	9	69	0	0	1	8	1	8	1	8

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	9	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

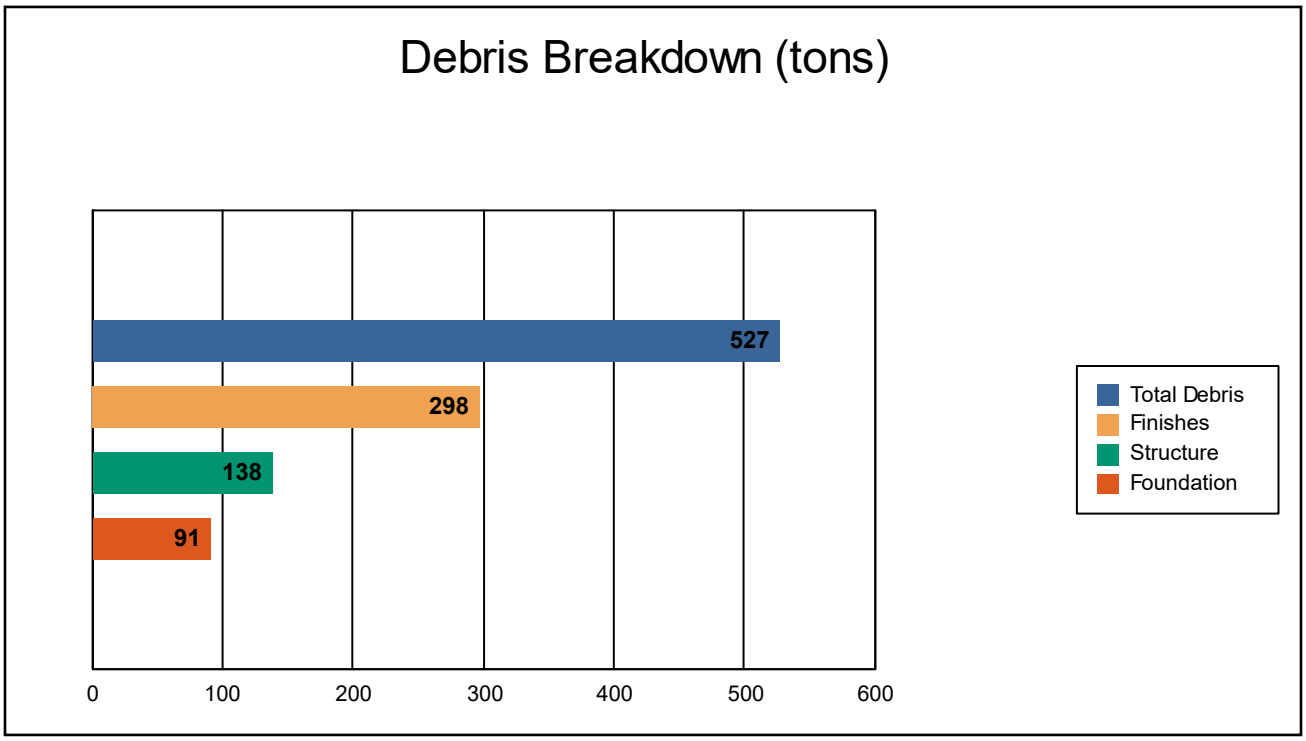
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

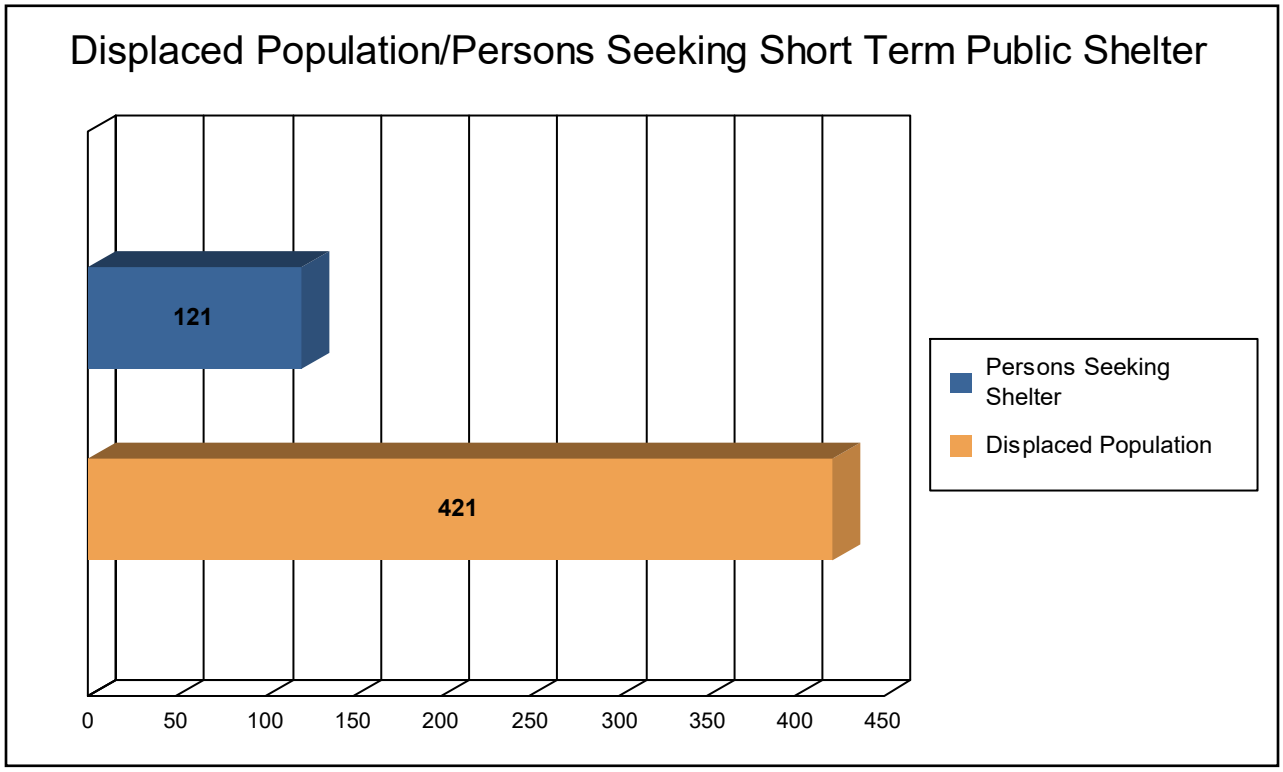


The model estimates that a total of 527 tons of debris will be generated. Of the total amount, Finishes comprises 56% of the total, Structure comprises 26% of the total, and Foundation comprises 17%. If the debris tonnage is converted into an estimated number of truckloads, it will require 22 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 140 households (or 421 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 121 people (out of a total population of 35,150) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 64.28 million dollars, which represents 2.70 % of the total replacement value of the scenario buildings.

Building-Related Losses

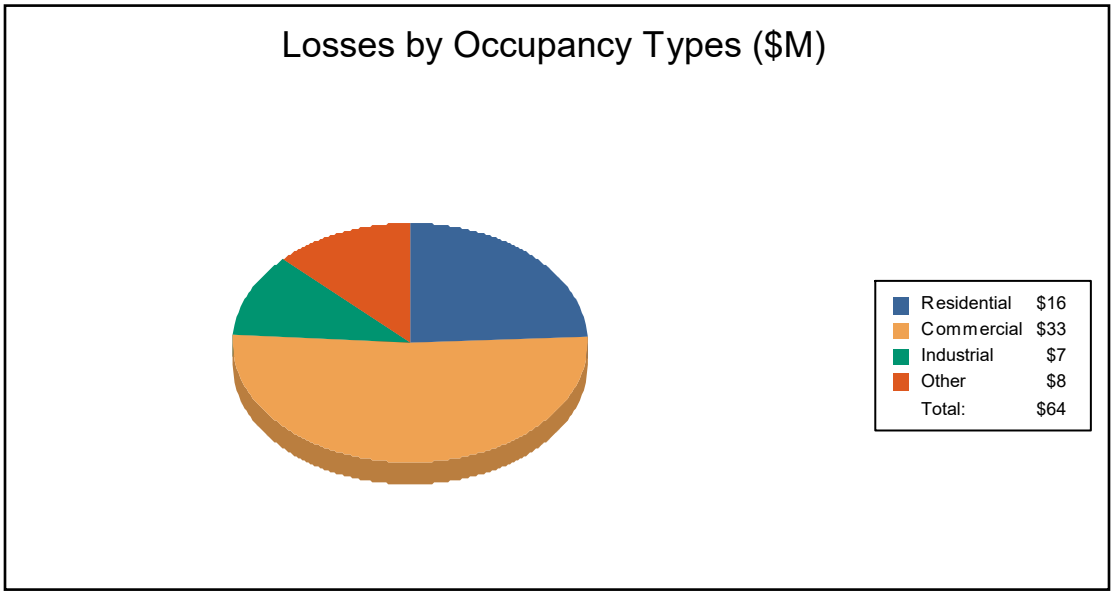
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 36.51 million dollars. 43% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 24.25% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	8.37	3.58	1.92	0.29	14.16
	Content	4.12	10.49	4.20	1.77	20.57
	Inventory	0.00	1.15	0.55	0.08	1.78
	Subtotal	**12.49**	**15.22**	**6.67**	**2.13**	**36.51**
Business Interruption						
	Income	0.04	7.10	0.10	0.67	7.91
	Relocation	1.97	1.79	0.12	0.34	4.22
	Rental Income	0.98	1.23	0.02	0.06	2.28
	Wage	0.11	8.01	0.18	5.07	13.36
	Subtotal	**3.10**	**18.13**	**0.42**	**6.12**	**27.77**
ALL	**Total**	**15.59**	**33.35**	**7.09**	**8.26**	**64.28**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	35,150	5,462,241	2,129,348	7,591,589
Total	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**
Total Study Region	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**

Hazus: Flood Global Risk Report

Region Name:	Glastonbury_FL
Flood Scenario:	Glastonbury_Flood
Print Date:	Tuesday, April 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 341 census blocks. The region contains over 14 thousand households and has a total population of 35,150 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 12,355 buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 85.98% of the buildings (and 71.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of 7,592 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,462,241	72.0%
Commercial	1,350,933	17.8%
Industrial	302,178	4.0%
Agricultural	15,669	0.2%
Religion	36,234	0.5%
Government	218,103	2.9%
Education	206,231	2.7%
Total	**7,591,589**	**100%**

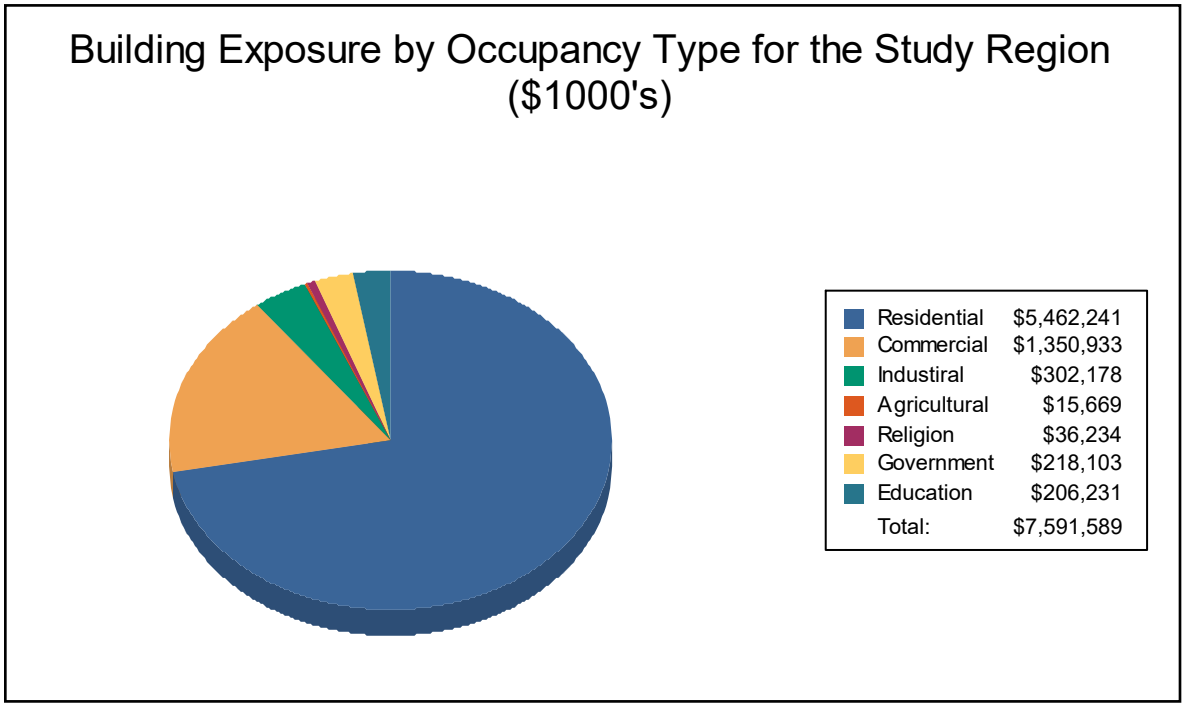
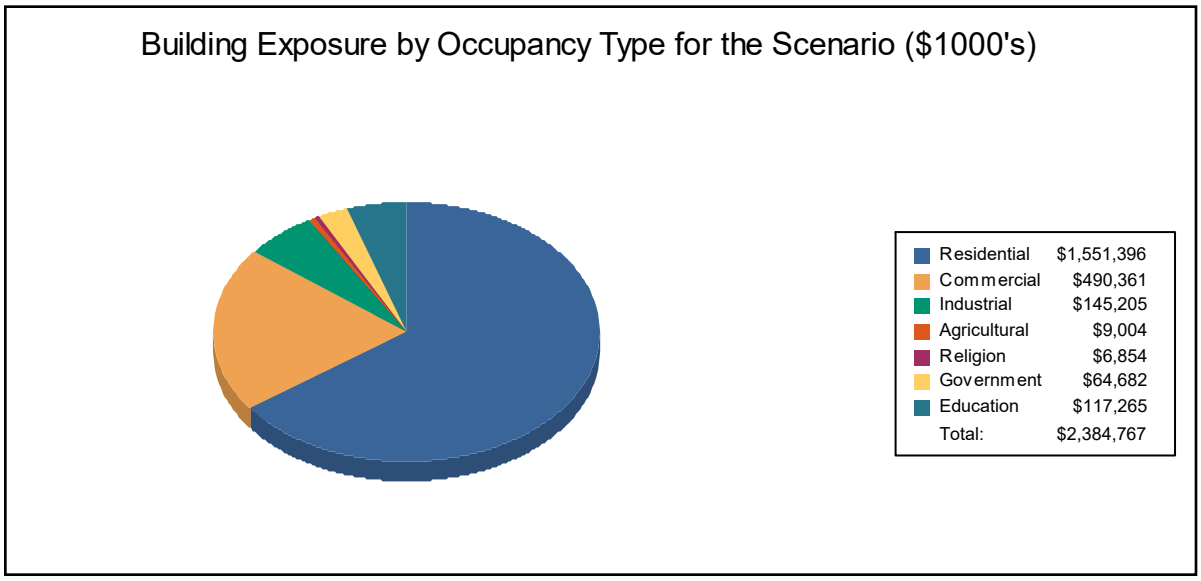


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,551,396	65.1%
Commercial	490,361	20.6%
Industrial	145,205	6.1%
Agricultural	9,004	0.4%
Religion	6,854	0.3%
Government	64,682	2.7%
Education	117,265	4.9%
Total	**2,384,767**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 9 schools, 4 fire stations, 1 police station and 1 emergency operation center.

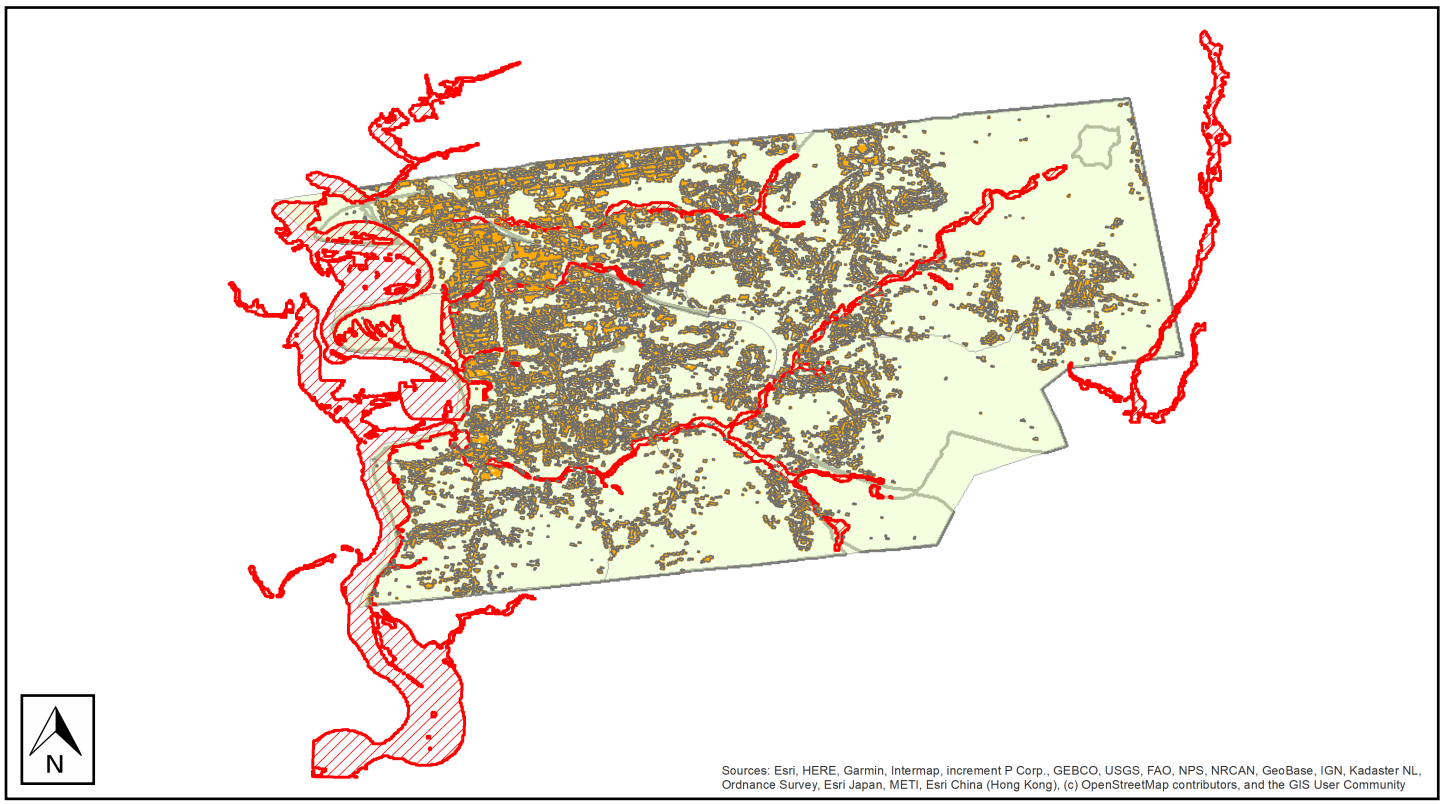
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Glastonbury_FL
Scenario Name:	Glastonbury_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 19 buildings will be at least moderately damaged. This is over 75% of the total number of buildings in the scenario. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

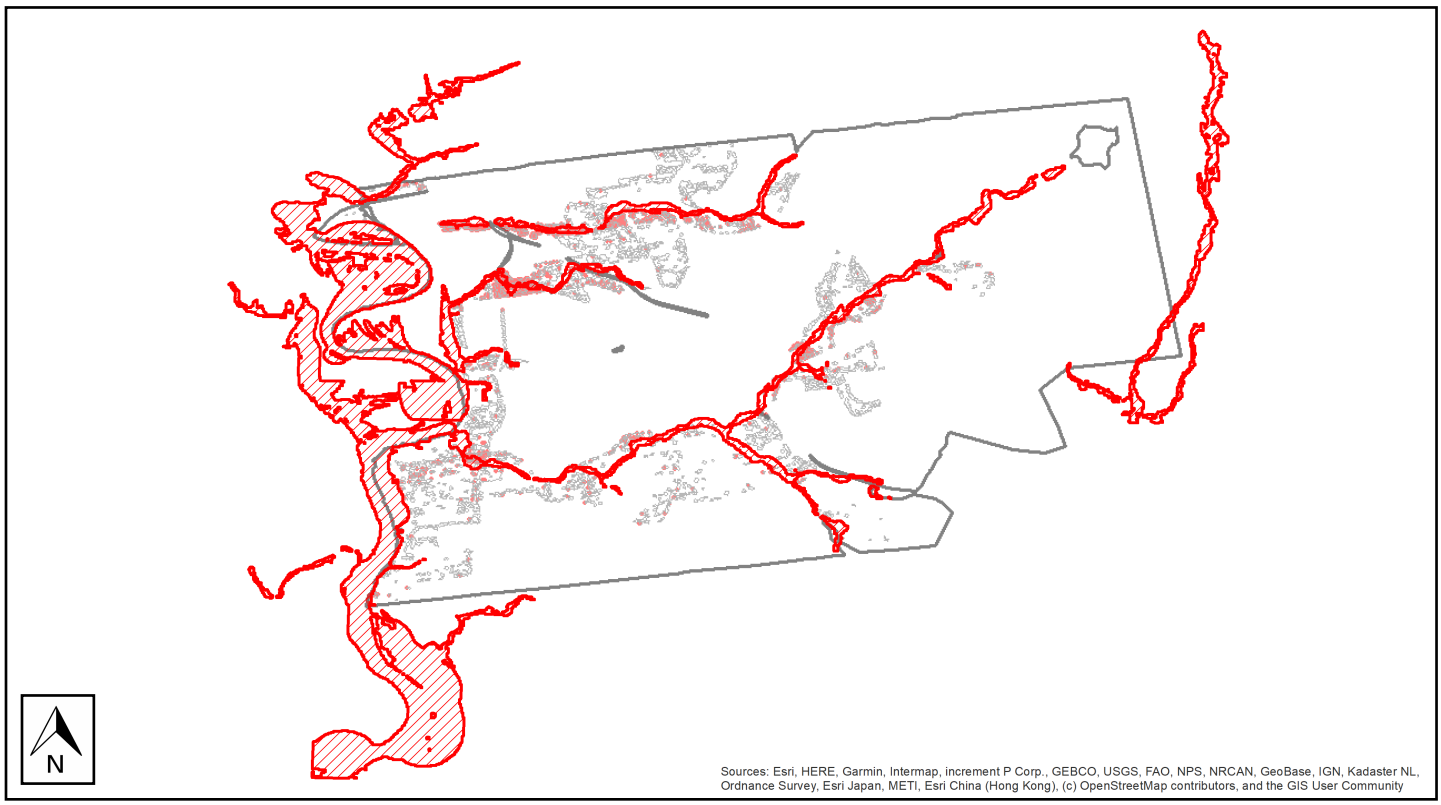


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	5	10	53	3	16	0	0	1	5	4	21
Total	**1**		**11**		**3**		**0**		**1**		**4**	

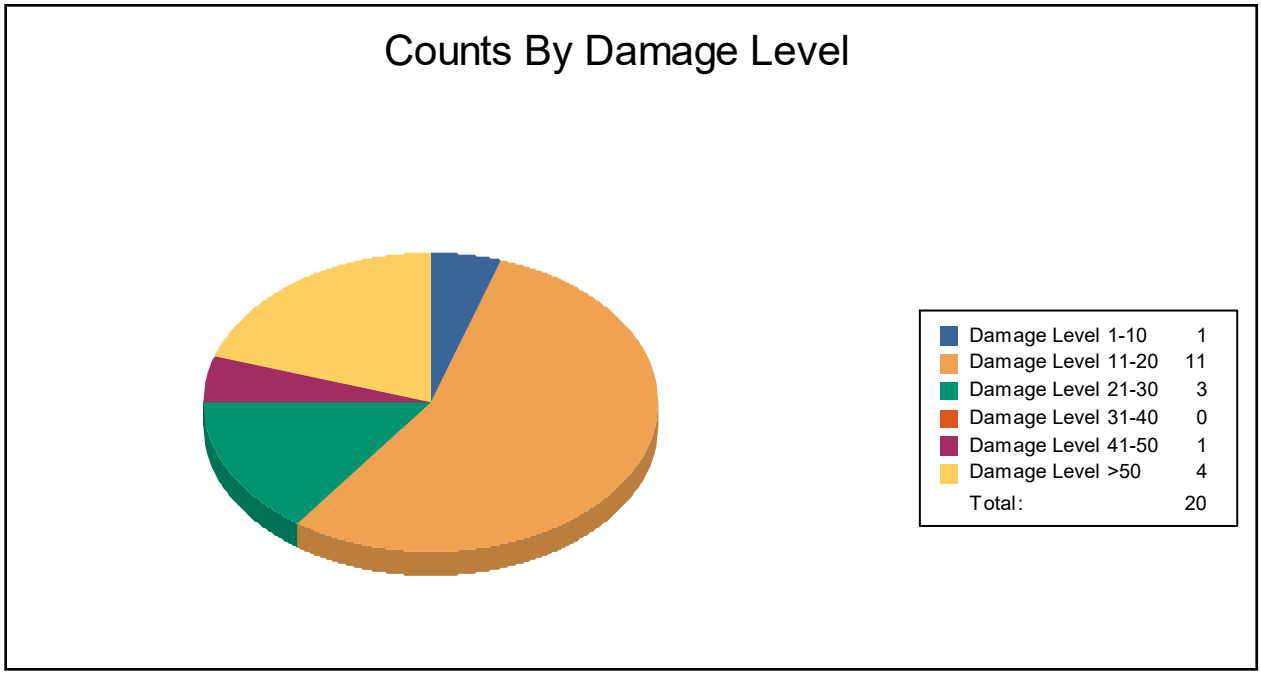


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	5	10	53	3	16	0	0	1	5	4	21

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	9	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

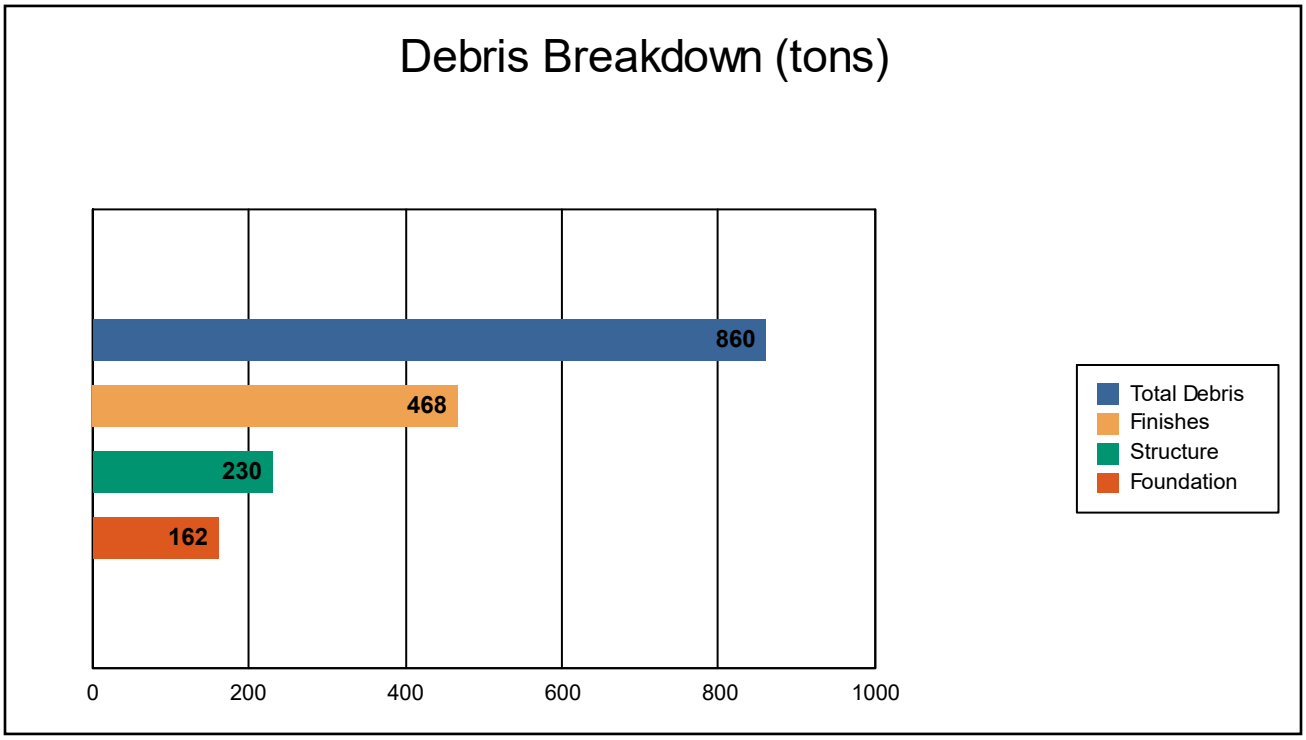
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

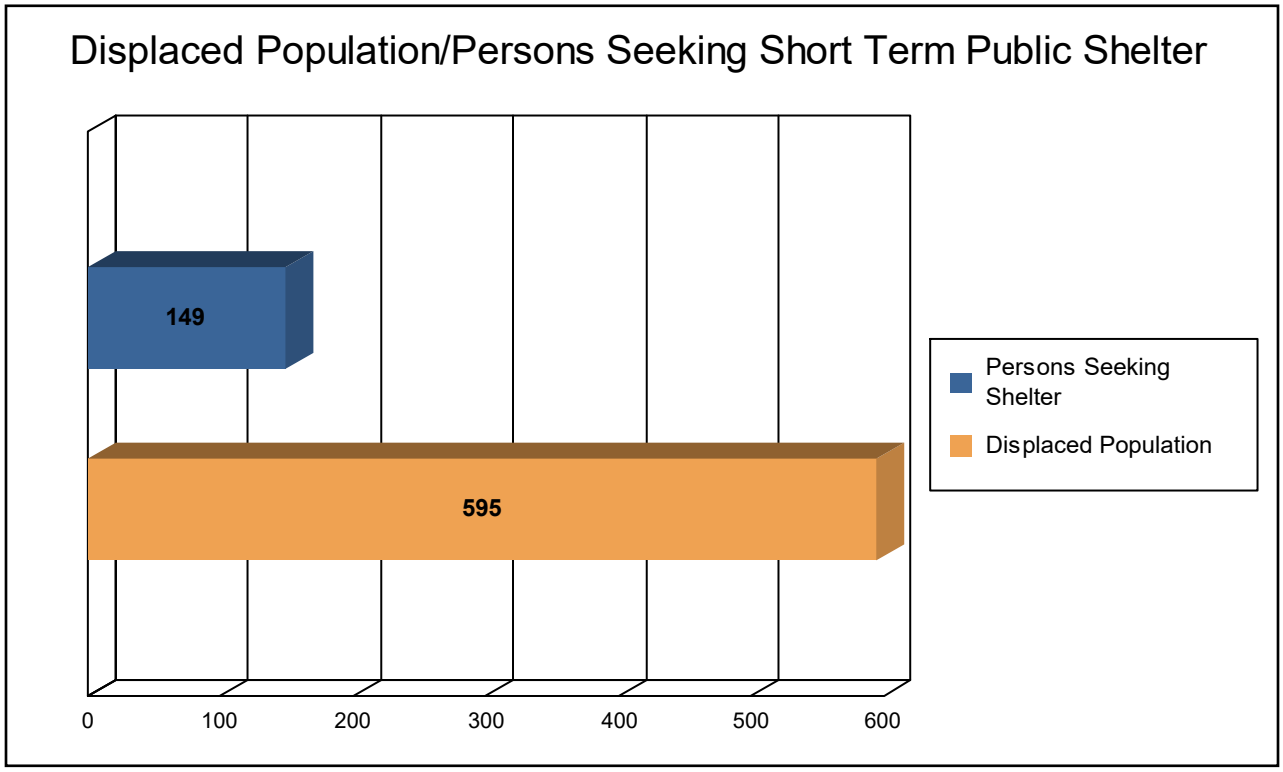


The model estimates that a total of 860 tons of debris will be generated. Of the total amount, Finishes comprises 54% of the total, Structure comprises 27% of the total, and Foundation comprises 19%. If the debris tonnage is converted into an estimated number of truckloads, it will require 35 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 198 households (or 595 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 149 people (out of a total population of 35,150) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 100.28 million dollars, which represents 4.20 % of the total replacement value of the scenario buildings.

Building-Related Losses

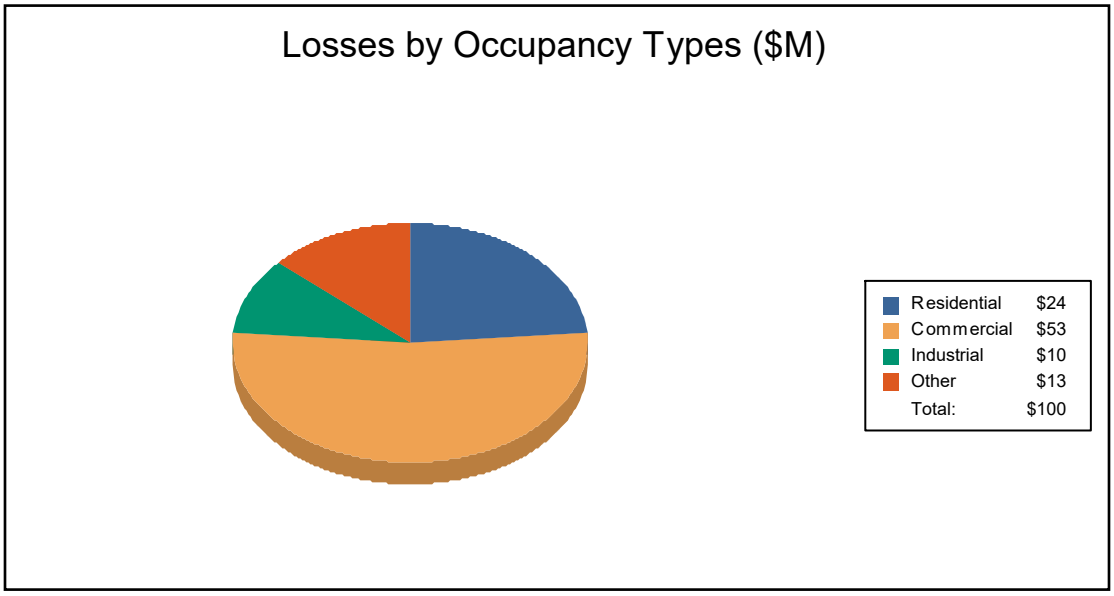
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 56.82 million dollars. 43% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 23.61% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	12.94	5.86	2.81	0.49	22.09
	Content	6.37	16.39	6.29	2.87	31.91
	Inventory	0.00	1.88	0.81	0.13	2.82
	Subtotal	**19.30**	**24.12**	**9.91**	**3.48**	**56.82**
Business Interruption						
	Income	0.06	11.45	0.13	1.05	12.69
	Relocation	2.79	2.93	0.16	0.54	6.42
	Rental Income	1.37	2.04	0.03	0.10	3.54
	Wage	0.15	12.36	0.23	8.07	20.81
	Subtotal	**4.37**	**28.78**	**0.56**	**9.75**	**43.46**
ALL	**Total**	**23.67**	**52.90**	**10.47**	**13.24**	**100.28**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	35,150	5,462,241	2,129,348	7,591,589
Total	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**
Total Study Region	**35,150**	**5,462,241**	**2,129,348**	**7,591,589**

Hazus: Flood Global Risk Report

Region Name: Granby_FL

Flood Scenario: Granby_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 163 census blocks. The region contains over 4 thousand households and has a total population of 10,903 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,329 buildings in the region with a total building replacement value (excluding contents) of 2,350 million dollars. Approximately 89.86% of the buildings (and 77.57% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,329 buildings in the region which have an aggregate total replacement value of 2,350 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,823,164	77.6%
Commercial	257,538	11.0%
Industrial	66,817	2.8%
Agricultural	6,790	0.3%
Religion	19,057	0.8%
Government	72,919	3.1%
Education	104,099	4.4%
Total	**2,350,384**	**100%**

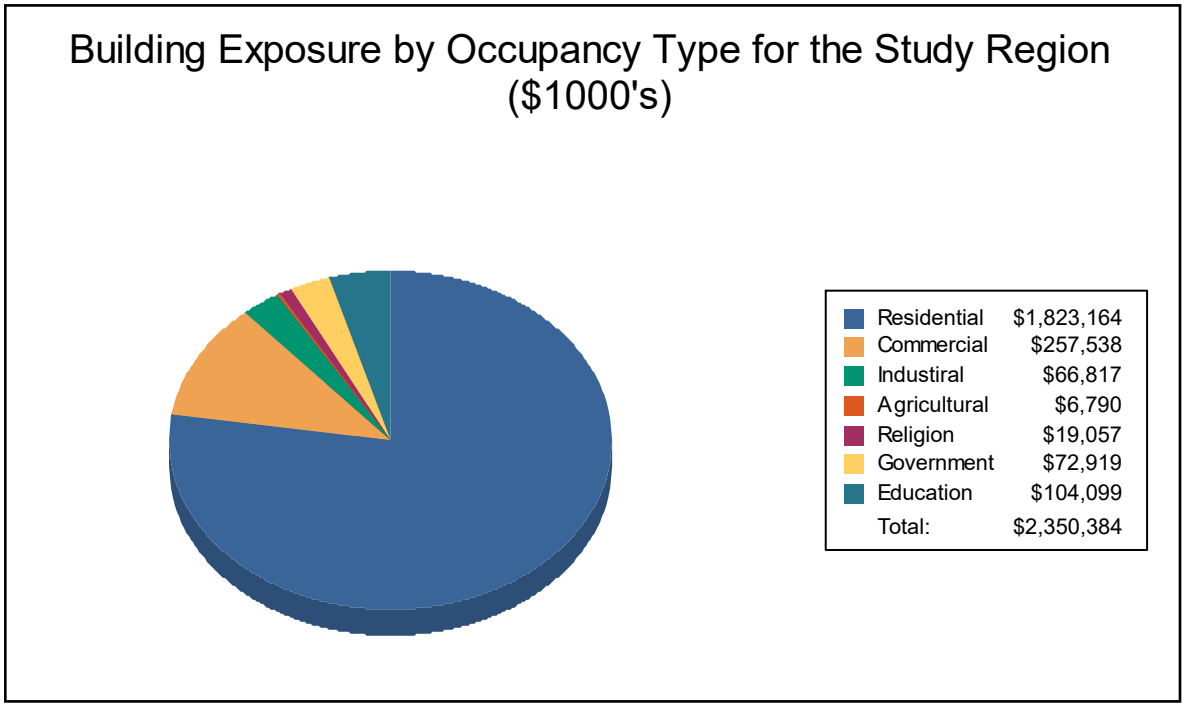
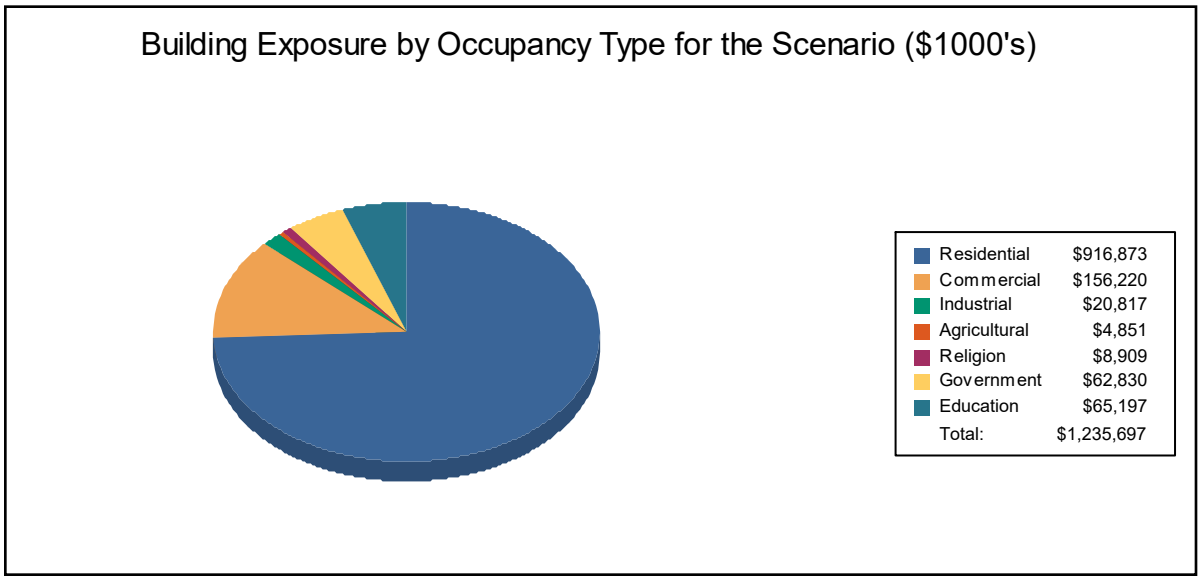


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	916,873	74.2%
Commercial	156,220	12.6%
Industrial	20,817	1.7%
Agricultural	4,851	0.4%
Religion	8,909	0.7%
Government	62,830	5.1%
Education	65,197	5.3%
Total	**1,235,697**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

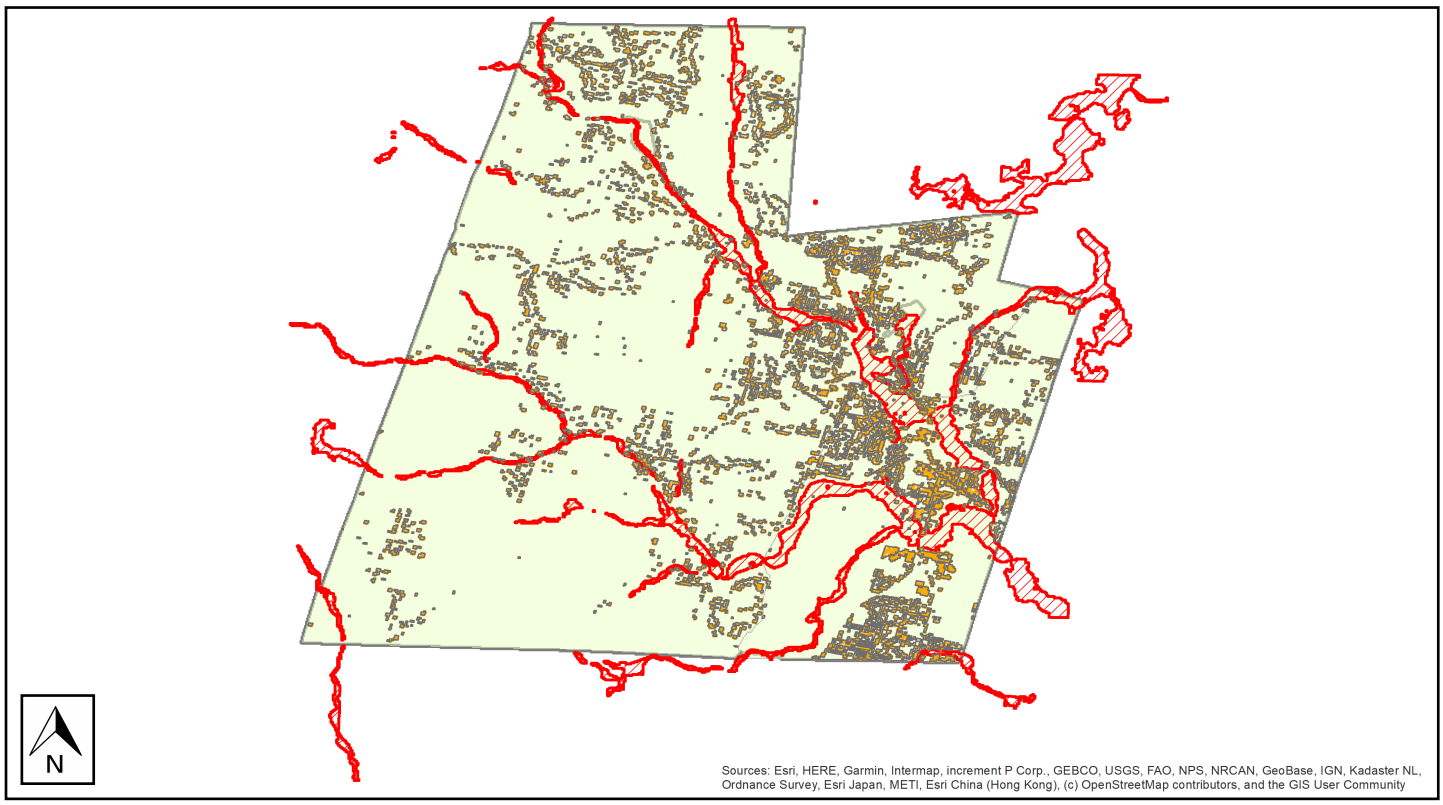
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Granby_FL
Scenario Name:	Granby_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

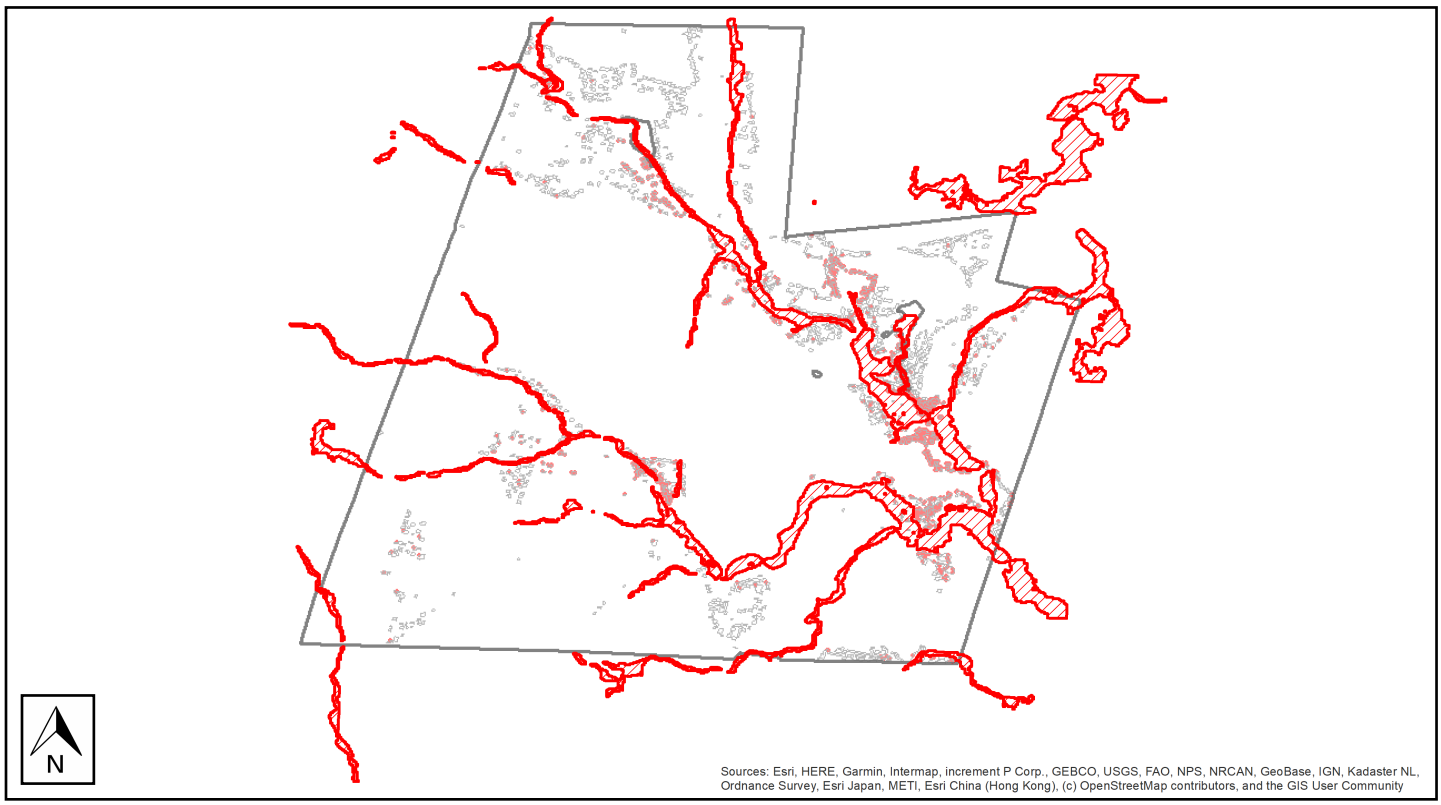


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	100	0	0	0	0	0	0	0	0	0	0
Total	**2**		**0**		**0**		**0**		**0**		**0**	

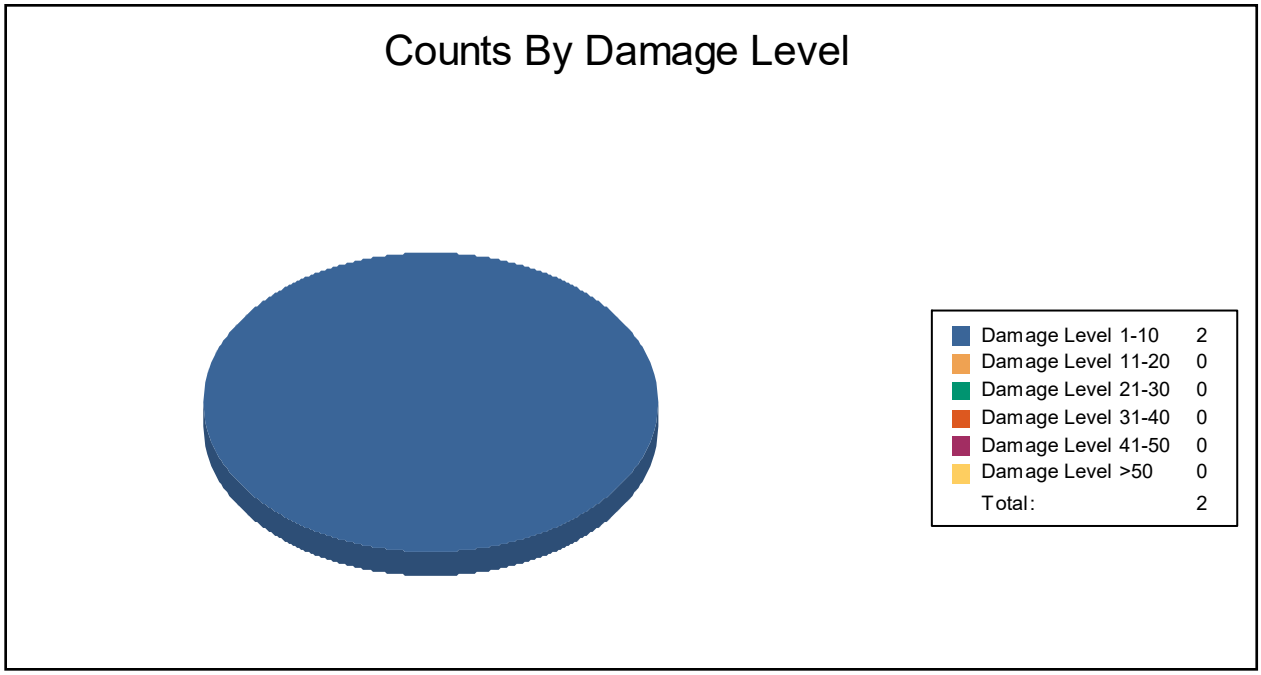


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

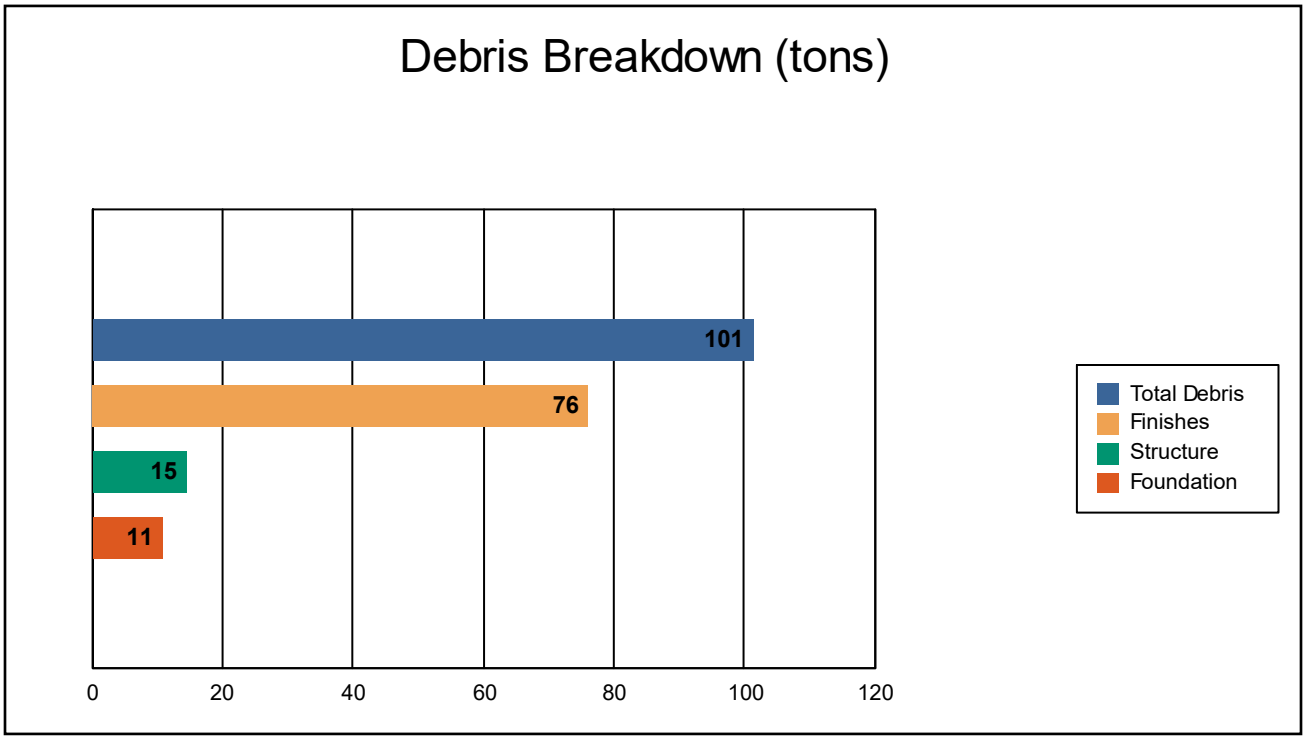
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

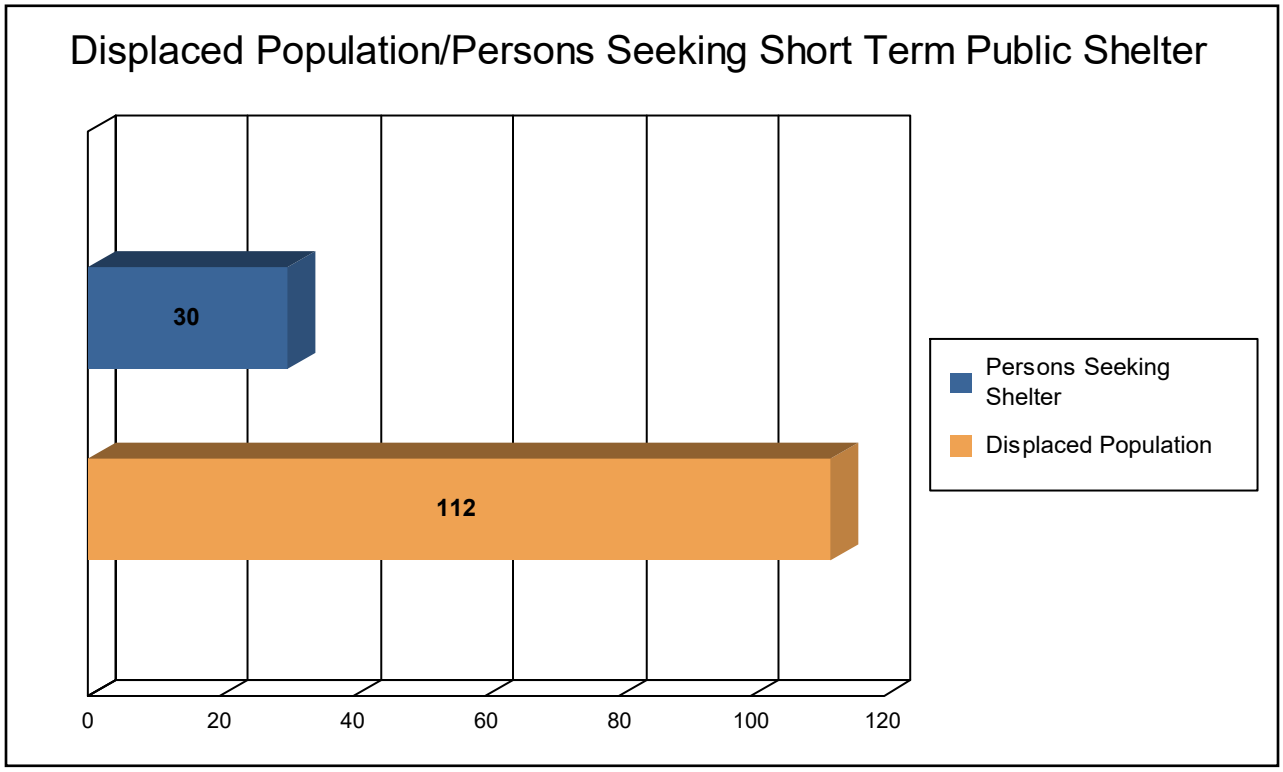


The model estimates that a total of 101 tons of debris will be generated. Of the total amount, Finishes comprises 75% of the total, Structure comprises 14% of the total, and Foundation comprises 11%. If the debris tonnage is converted into an estimated number of truckloads, it will require 5 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 37 households (or 112 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 30 people (out of a total population of 10,903) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 23.02 million dollars, which represents 1.86 % of the total replacement value of the scenario buildings.

Building-Related Losses

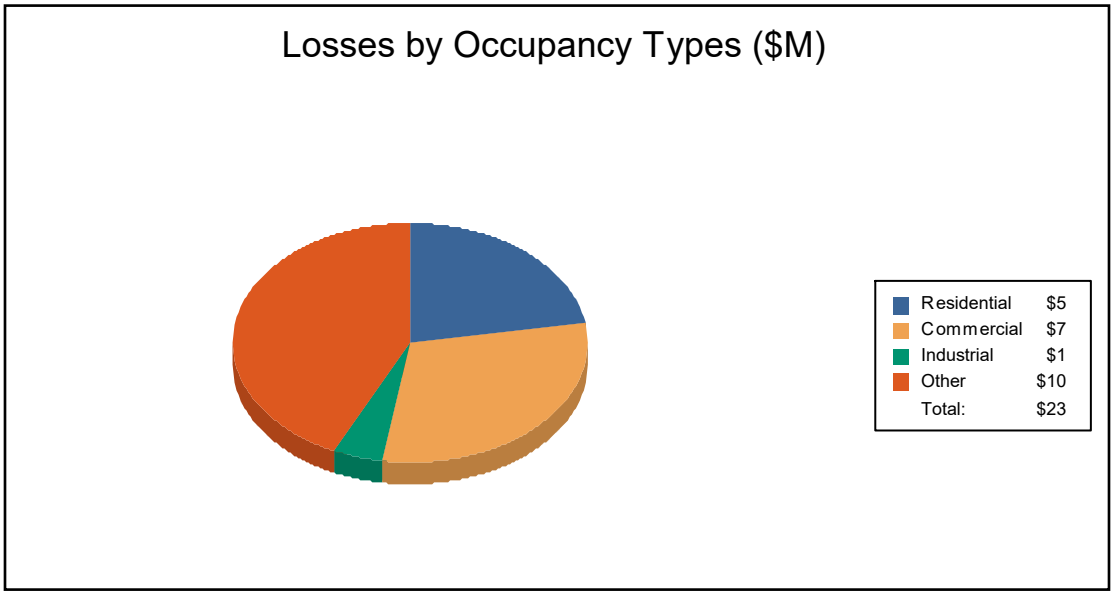
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 10.48 million dollars. 54% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.17% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.52	0.53	0.20	0.45	3.70
	Content	1.10	2.05	0.59	2.71	6.46
	Inventory	0.00	0.17	0.13	0.02	0.32
	Subtotal	**3.62**	**2.76**	**0.92**	**3.18**	**10.48**
Business Interruption						
	Income	0.13	1.62	0.02	0.83	2.59
	Relocation	0.65	0.24	0.02	0.55	1.46
	Rental Income	0.41	0.15	0.00	0.09	0.65
	Wage	0.30	2.22	0.03	5.29	7.84
	Subtotal	**1.48**	**4.24**	**0.07**	**6.76**	**12.54**
ALL	**Total**	**5.10**	**6.99**	**0.99**	**9.93**	**23.02**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,164	527,220	2,350,384
Total	**10,903**	**1,823,164**	**527,220**	**2,350,384**
Total Study Region	**10,903**	**1,823,164**	**527,220**	**2,350,384**

Hazus: Flood Global Risk Report

Region Name: Granby_FL

Flood Scenario: Granby_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 163 census blocks. The region contains over 4 thousand households and has a total population of 10,903 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,329 buildings in the region with a total building replacement value (excluding contents) of 2,350 million dollars. Approximately 89.86% of the buildings (and 77.57% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,329 buildings in the region which have an aggregate total replacement value of 2,350 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,823,164	77.6%
Commercial	257,538	11.0%
Industrial	66,817	2.8%
Agricultural	6,790	0.3%
Religion	19,057	0.8%
Government	72,919	3.1%
Education	104,099	4.4%
Total	**2,350,384**	**100%**

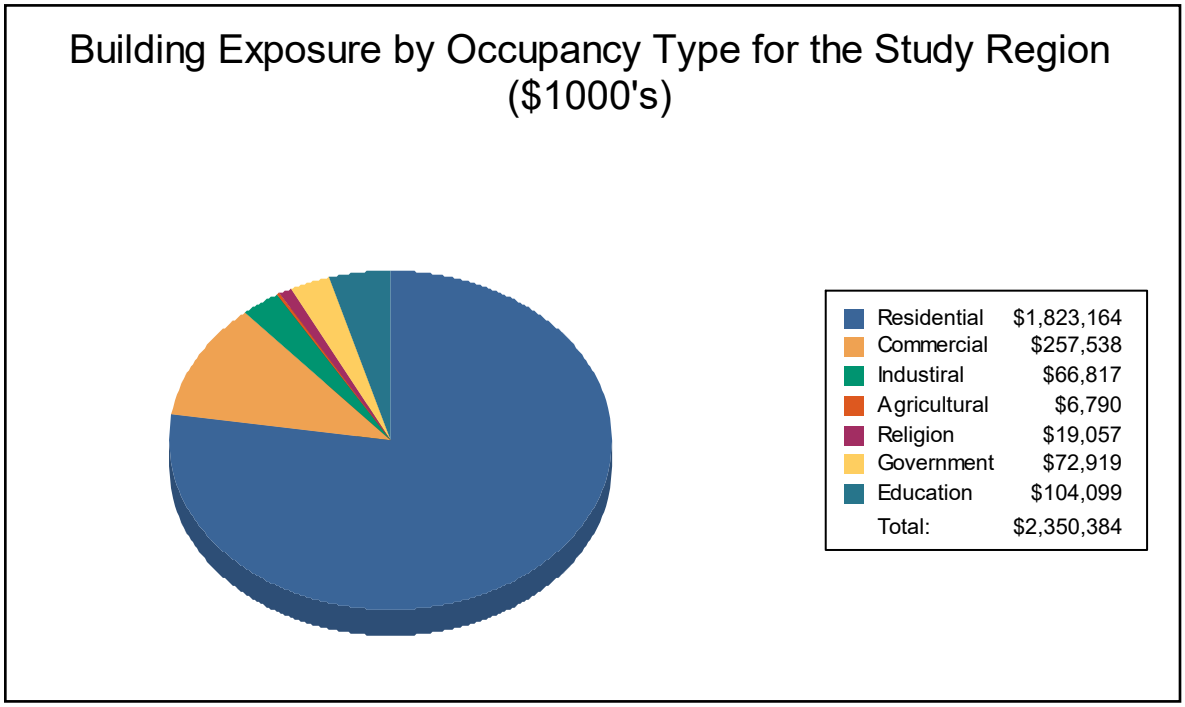
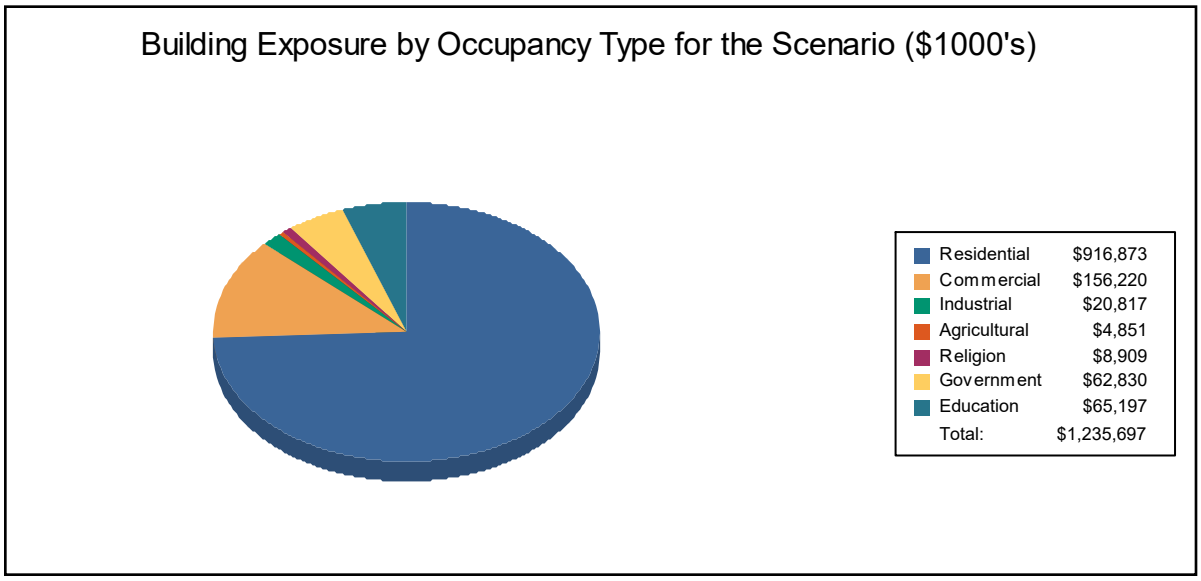


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	916,873	74.2%
Commercial	156,220	12.6%
Industrial	20,817	1.7%
Agricultural	4,851	0.4%
Religion	8,909	0.7%
Government	62,830	5.1%
Education	65,197	5.3%
Total	**1,235,697**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

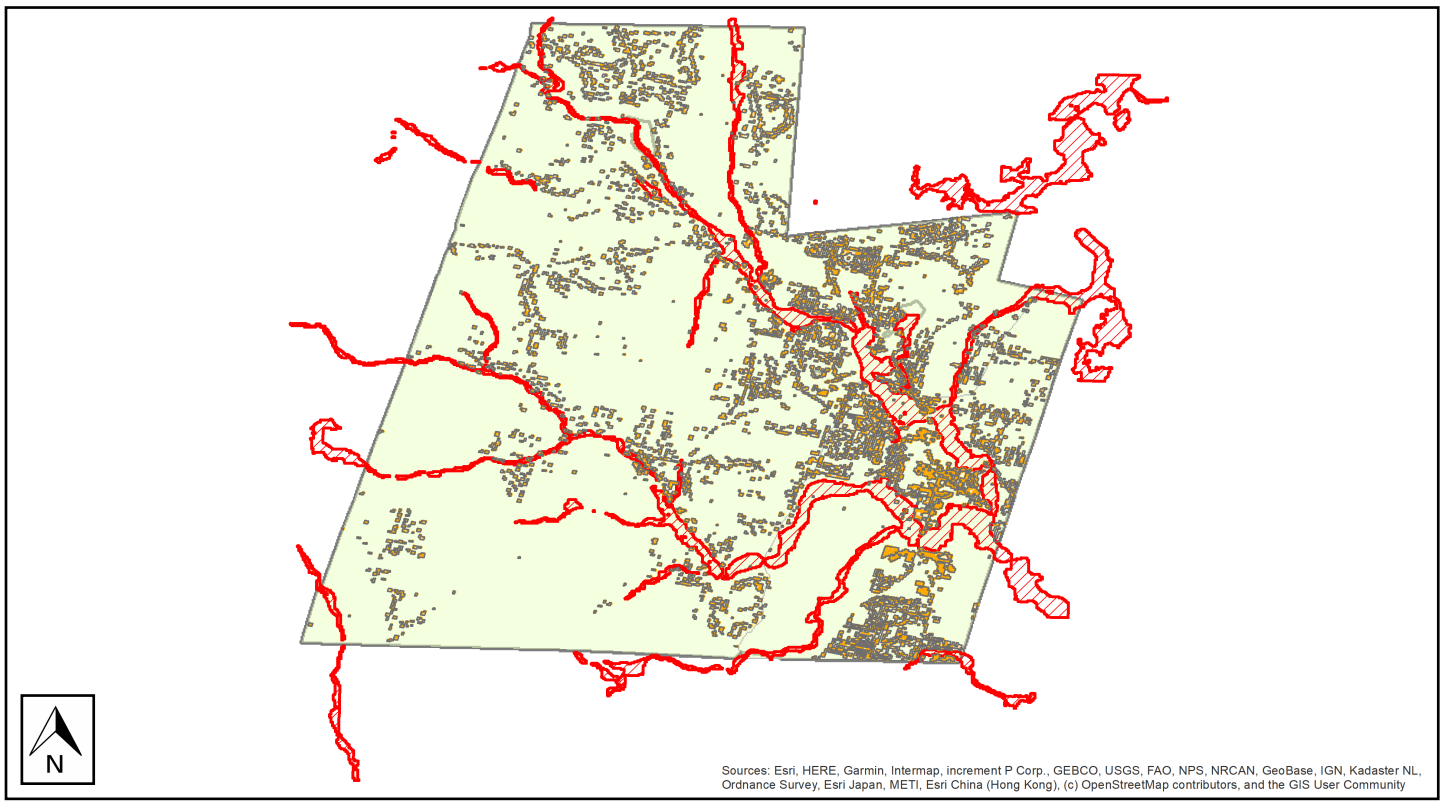
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Granby_FL
Scenario Name:	Granby_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

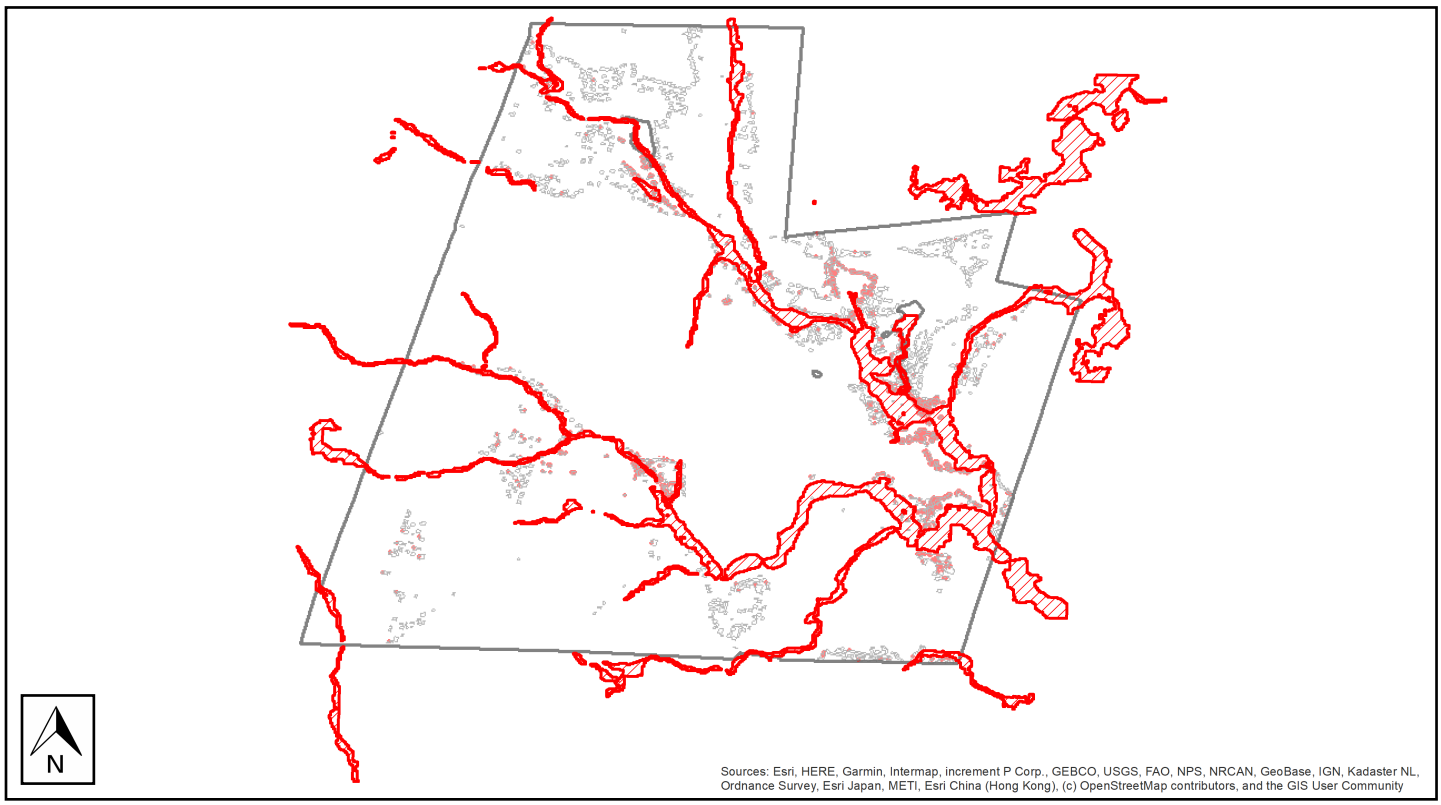


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	33	2	67	0	0	0	0	0	0	0	0
Total	**1**		**2**		**0**		**0**		**0**		**0**	

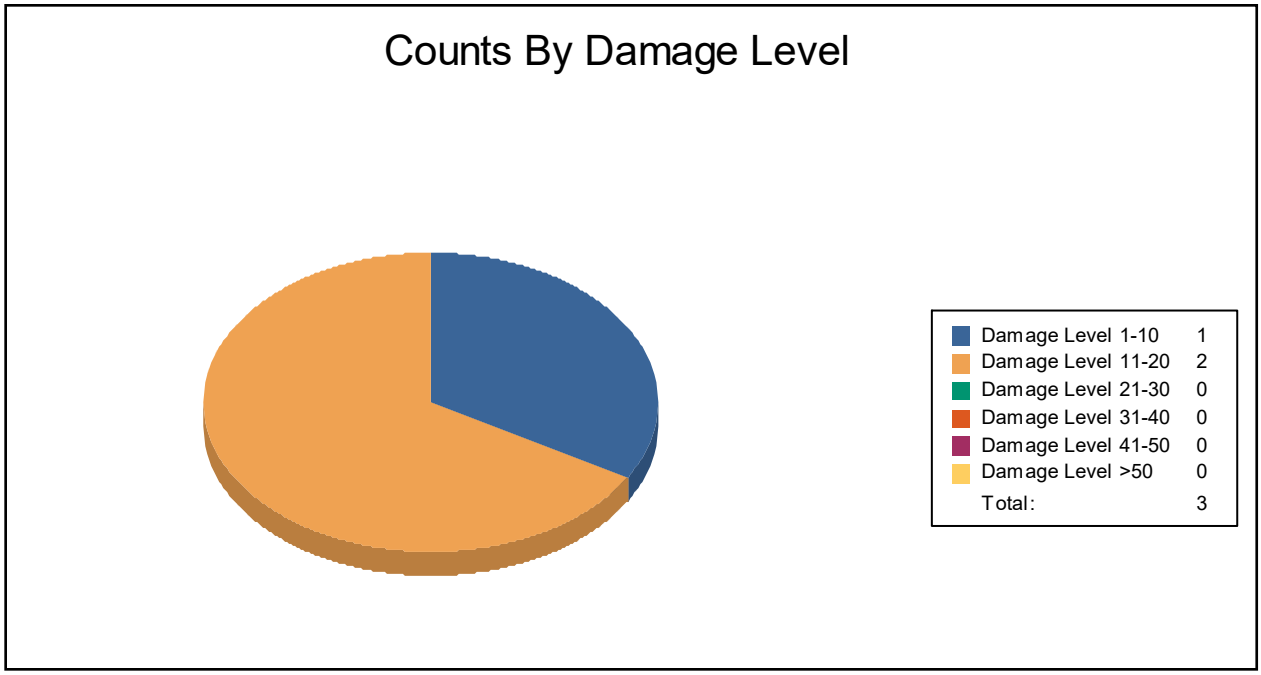


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	33	2	67	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

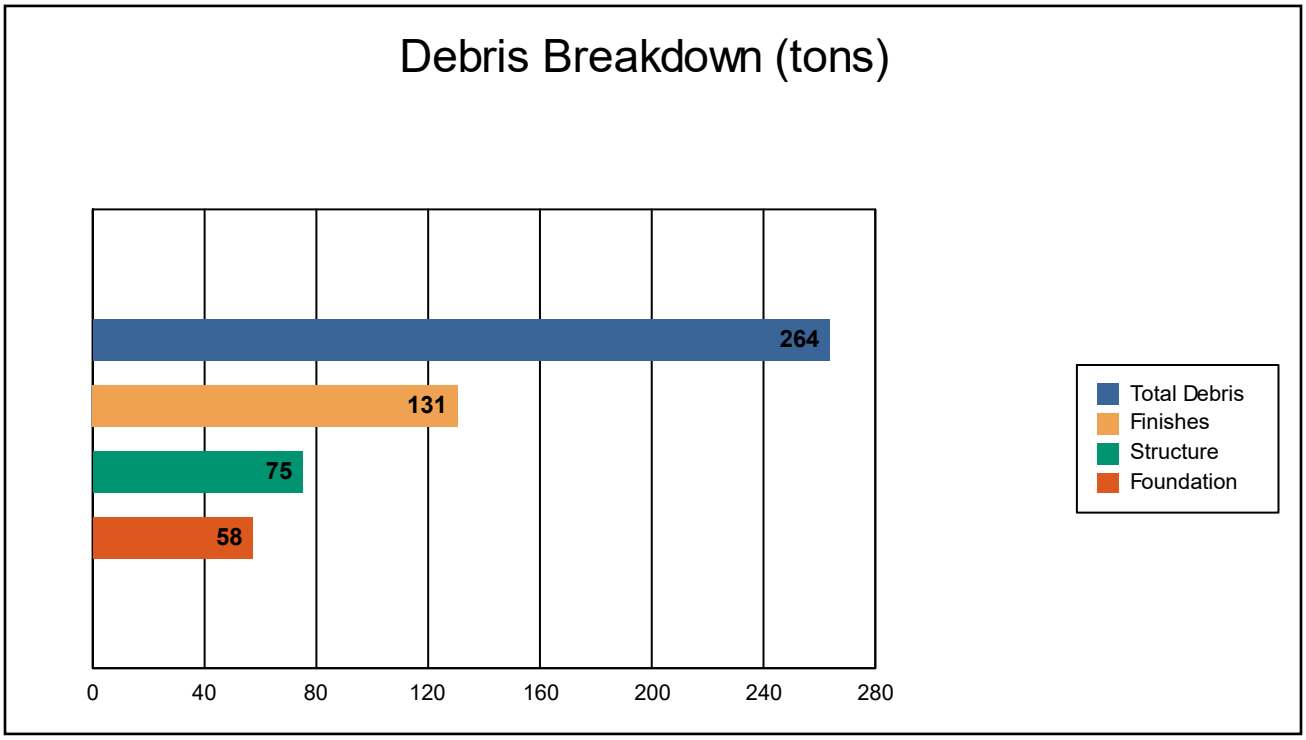
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

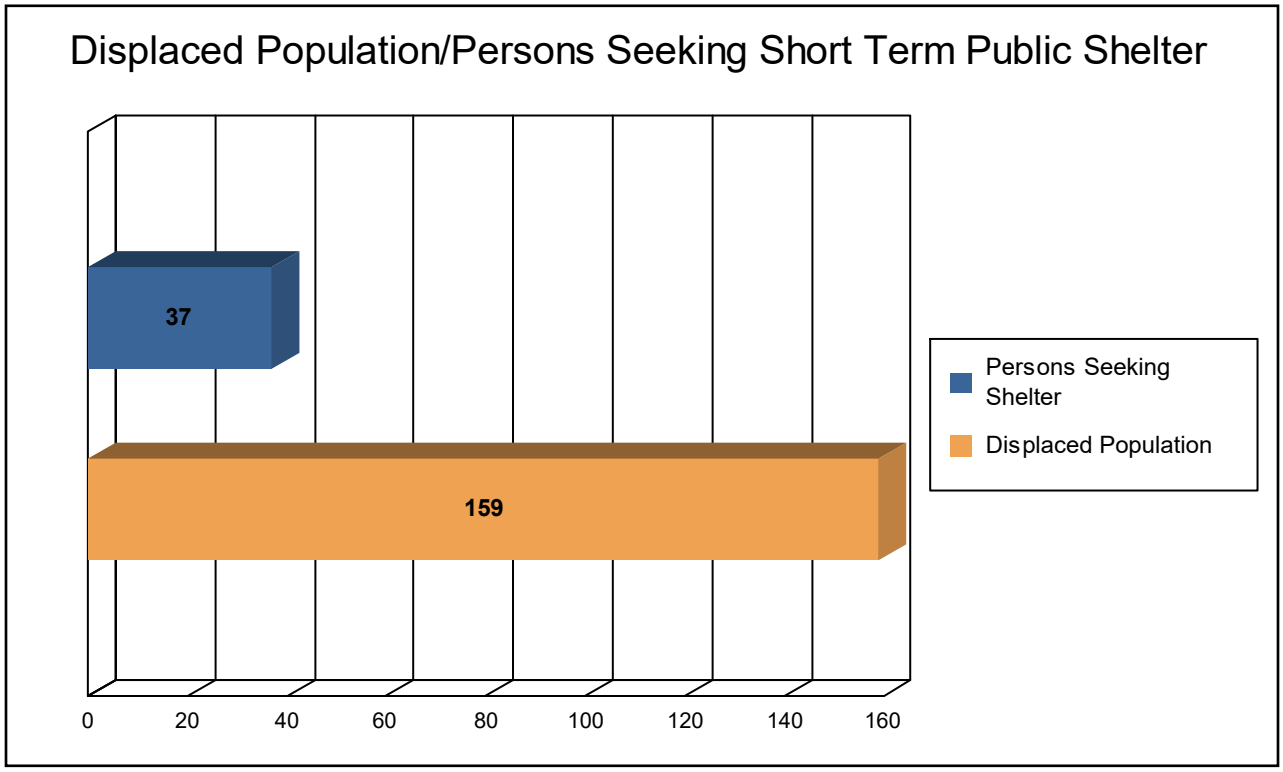


The model estimates that a total of 264 tons of debris will be generated. Of the total amount, Finishes comprises 50% of the total, Structure comprises 29% of the total, and Foundation comprises 22%. If the debris tonnage is converted into an estimated number of truckloads, it will require 11 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 53 households (or 159 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 37 people (out of a total population of 10,903) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 36.90 million dollars, which represents 2.99 % of the total replacement value of the scenario buildings.

Building-Related Losses

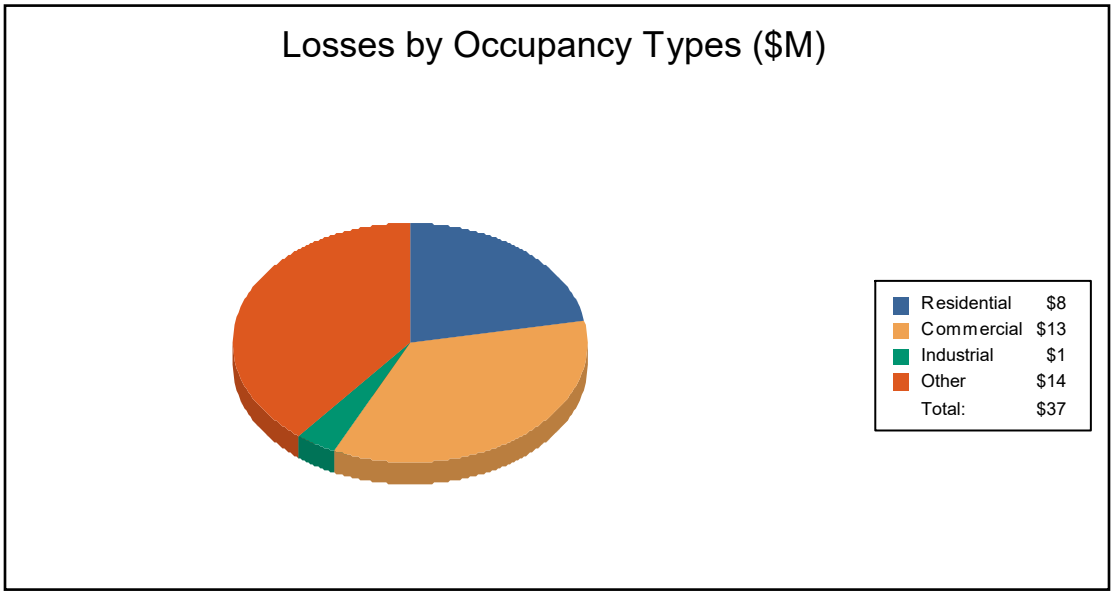
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 17.33 million dollars. 53% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 21.84% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.82	1.08	0.32	0.60	5.81
	Content	1.82	4.20	0.85	3.99	10.86
	Inventory	0.00	0.46	0.18	0.02	0.66
	Subtotal	**5.64**	**5.73**	**1.35**	**4.61**	**17.33**
Business Interruption						
	Income	0.28	2.49	0.03	1.15	3.96
	Relocation	0.90	0.51	0.03	0.75	2.19
	Rental Income	0.57	0.32	0.01	0.14	1.03
	Wage	0.67	3.88	0.05	7.80	12.40
	Subtotal	**2.42**	**7.21**	**0.10**	**9.84**	**19.57**
ALL	**Total**	**8.06**	**12.93**	**1.46**	**14.45**	**36.90**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,164	527,220	2,350,384
Total	**10,903**	**1,823,164**	**527,220**	**2,350,384**
Total Study Region	**10,903**	**1,823,164**	**527,220**	**2,350,384**

Hazus: Flood Global Risk Report

Region Name: Granby_FL

Flood Scenario: Granby_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 163 census blocks. The region contains over 4 thousand households and has a total population of 10,903 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,329 buildings in the region with a total building replacement value (excluding contents) of 2,350 million dollars. Approximately 89.86% of the buildings (and 77.57% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,329 buildings in the region which have an aggregate total replacement value of 2,350 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,823,164	77.6%
Commercial	257,538	11.0%
Industrial	66,817	2.8%
Agricultural	6,790	0.3%
Religion	19,057	0.8%
Government	72,919	3.1%
Education	104,099	4.4%
Total	**2,350,384**	**100%**

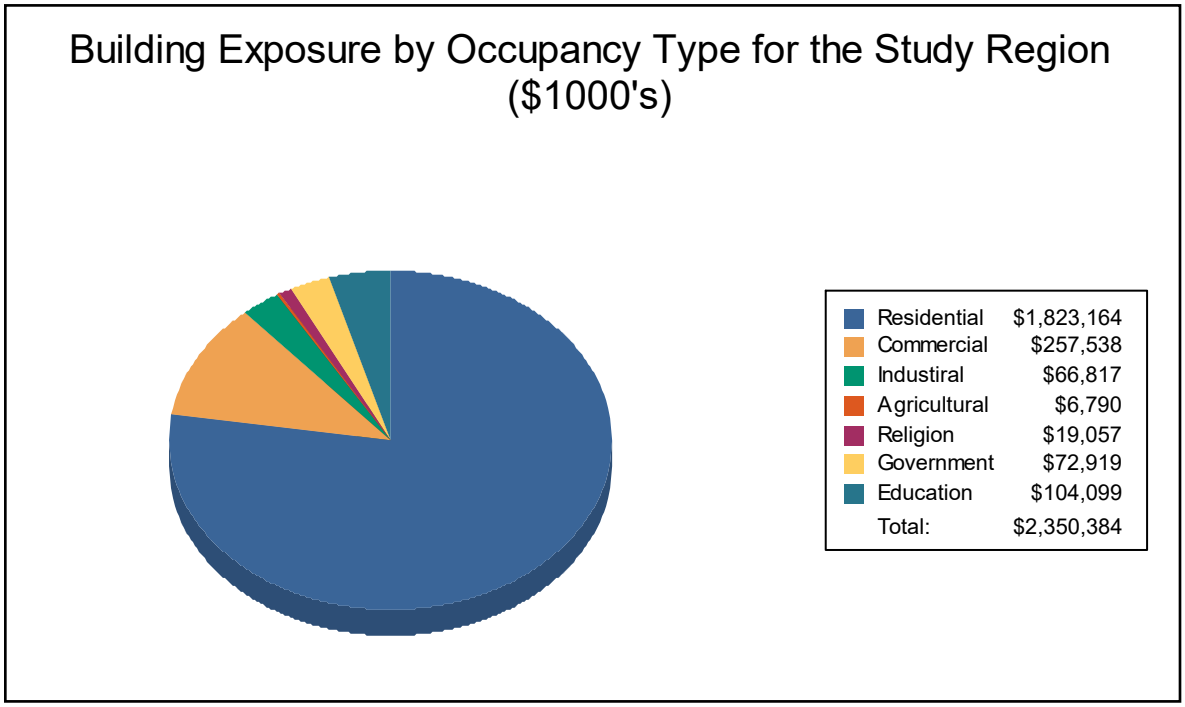
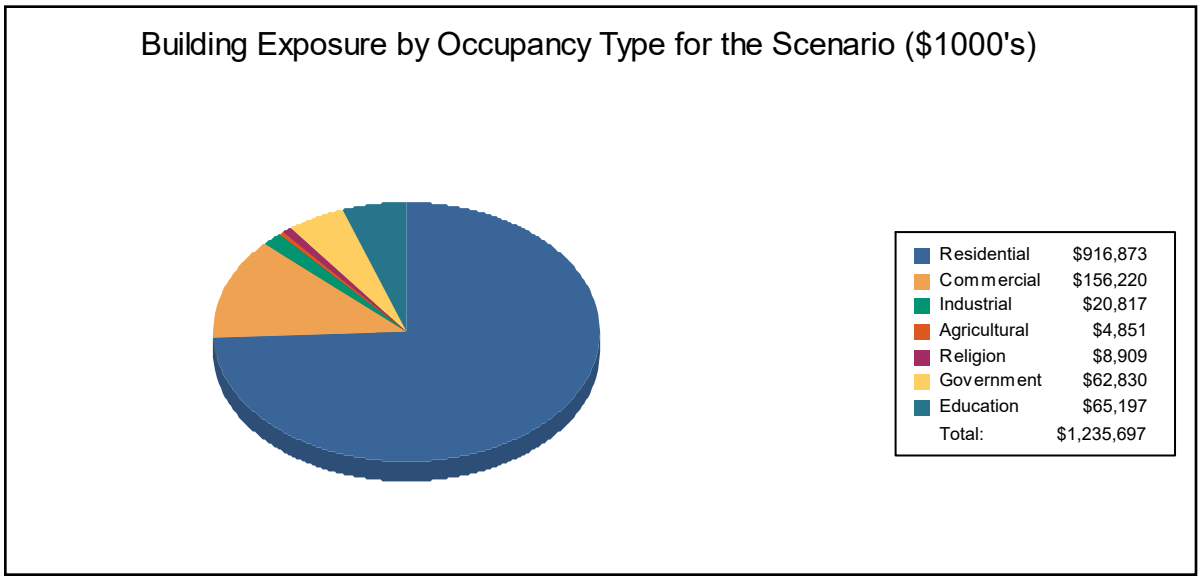


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	916,873	74.2%
Commercial	156,220	12.6%
Industrial	20,817	1.7%
Agricultural	4,851	0.4%
Religion	8,909	0.7%
Government	62,830	5.1%
Education	65,197	5.3%
Total	**1,235,697**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

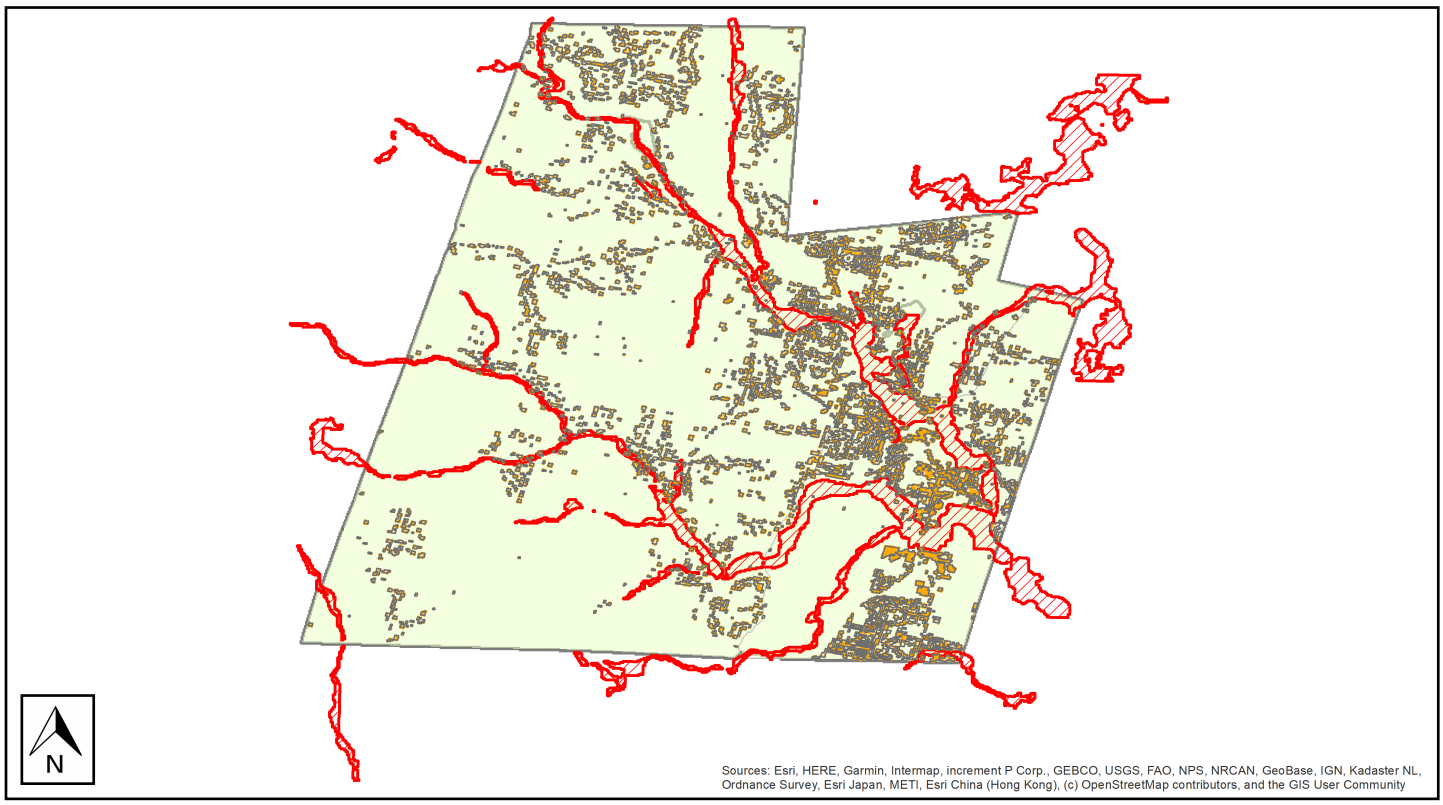
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Granby_FL
Scenario Name:	Granby_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

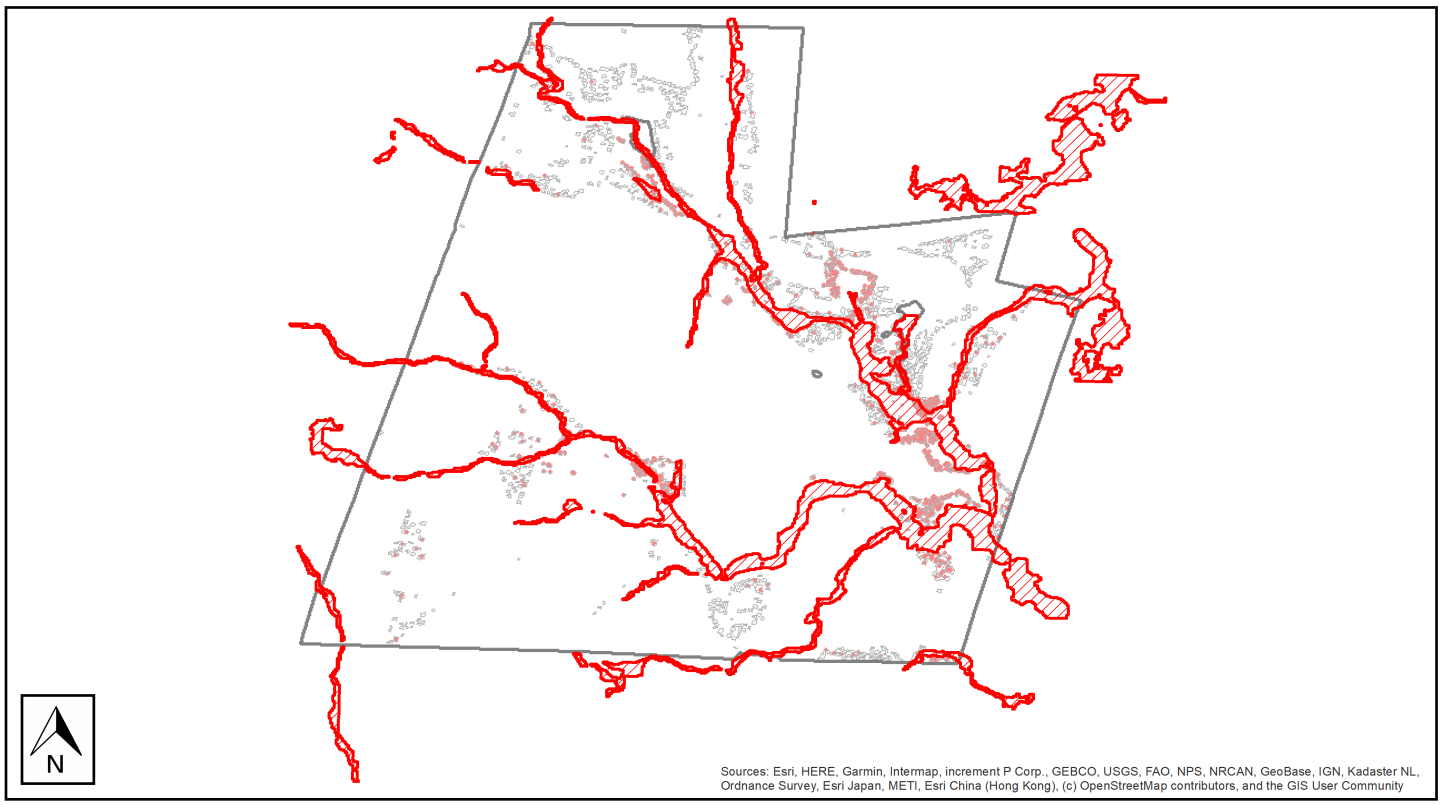


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	33	2	67	0	0	0	0	0	0	0	0
Total	**1**		**2**		**0**		**0**		**0**		**0**	

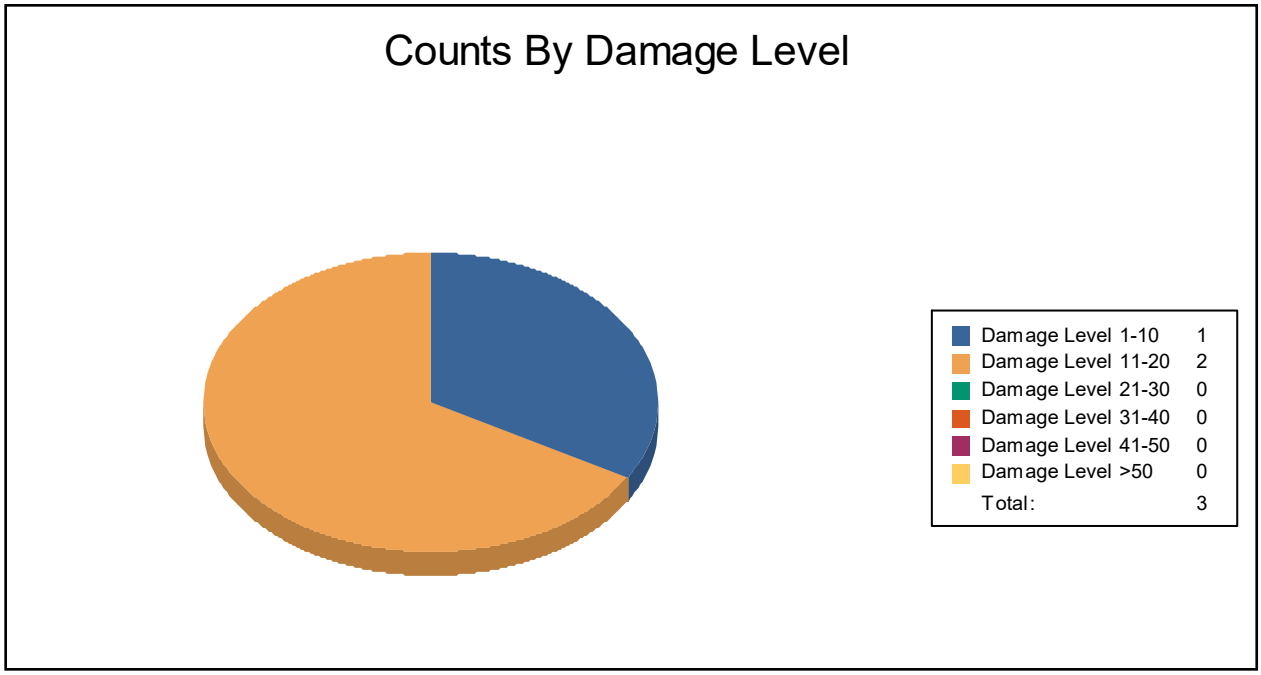


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	33	2	67	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

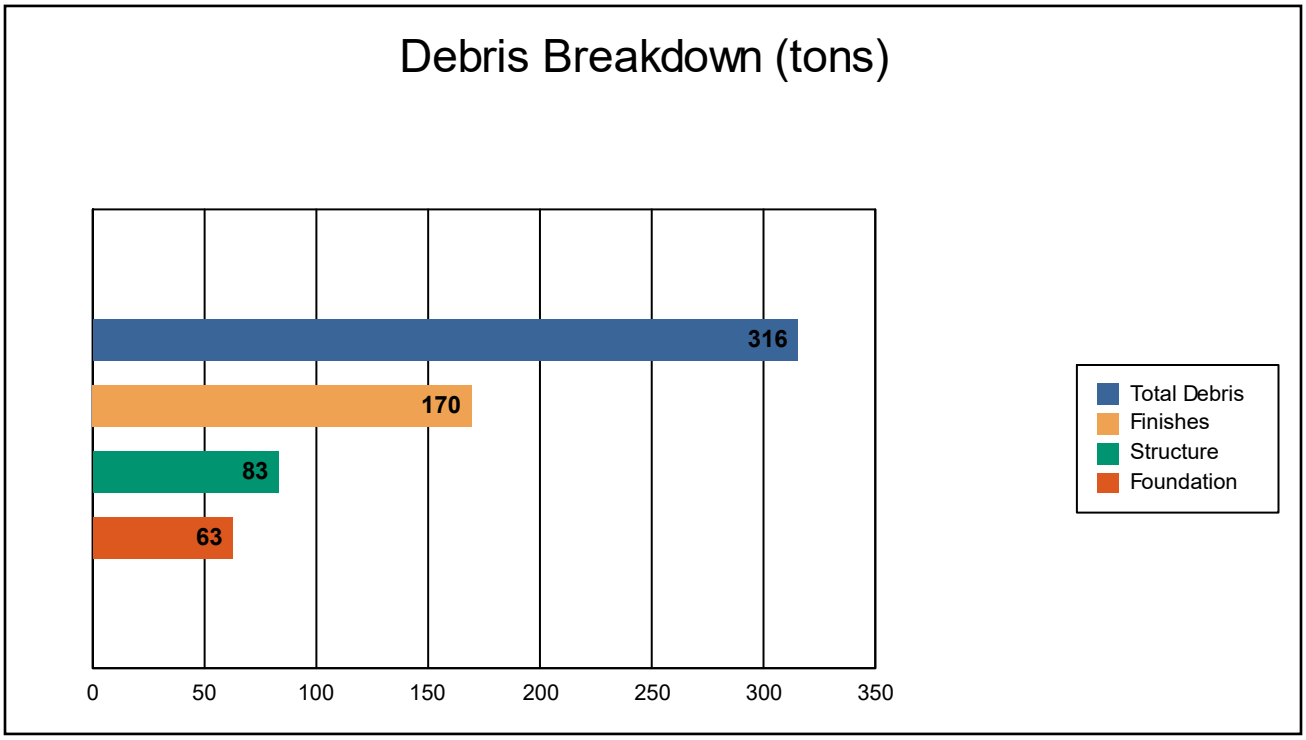
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

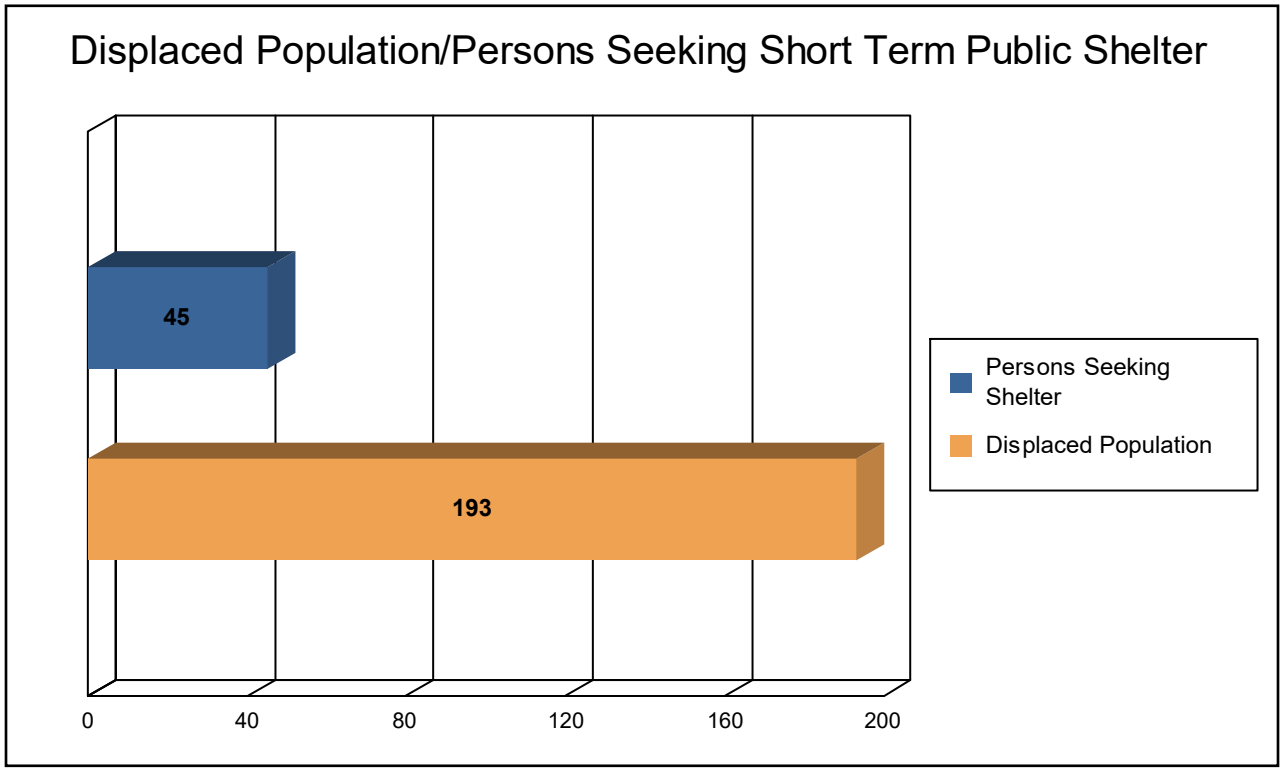


The model estimates that a total of 316 tons of debris will be generated. Of the total amount, Finishes comprises 54% of the total, Structure comprises 26% of the total, and Foundation comprises 20%. If the debris tonnage is converted into an estimated number of truckloads, it will require 13 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 64 households (or 193 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 45 people (out of a total population of 10,903) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 47.27 million dollars, which represents 3.83 % of the total replacement value of the scenario buildings.

Building-Related Losses

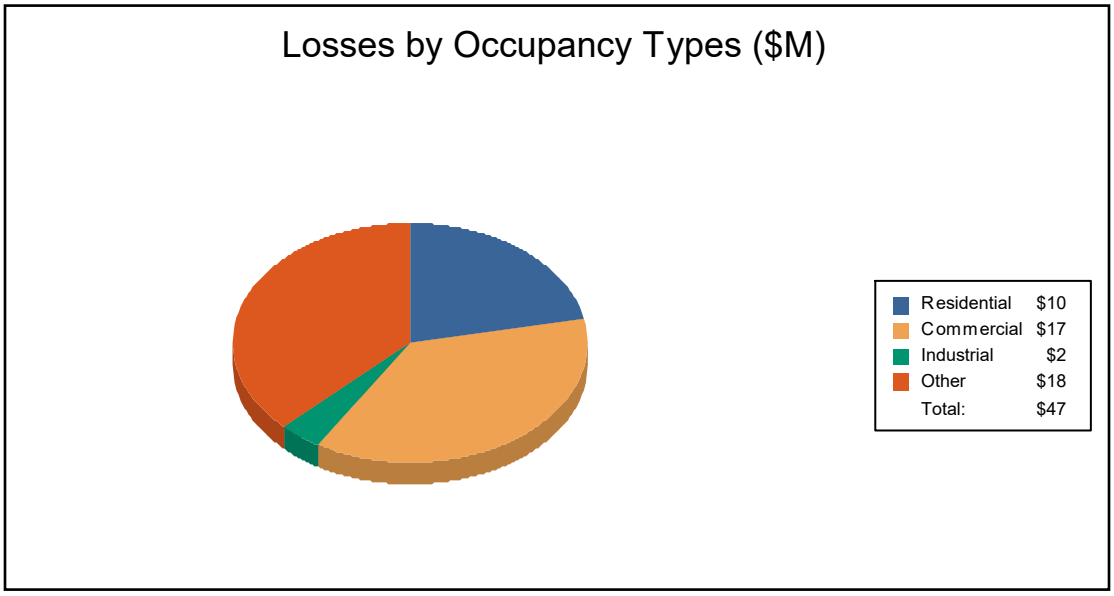
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 20.91 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 21.73% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.75	1.33	0.39	0.69	7.15
	Content	2.30	5.04	1.05	4.54	12.94
	Inventory	0.00	0.56	0.23	0.03	0.82
	Subtotal	**7.05**	**6.93**	**1.67**	**5.26**	**20.91**
Business Interruption						
	Income	0.43	3.56	0.04	1.31	5.33
	Relocation	1.09	0.79	0.05	0.89	2.82
	Rental Income	0.70	0.49	0.01	0.19	1.39
	Wage	1.00	5.64	0.07	10.12	16.83
	Subtotal	**3.22**	**10.47**	**0.17**	**12.51**	**26.36**
ALL	**Total**	**10.27**	**17.40**	**1.84**	**17.76**	**47.27**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,164	527,220	2,350,384
Total	**10,903**	**1,823,164**	**527,220**	**2,350,384**
Total Study Region	**10,903**	**1,823,164**	**527,220**	**2,350,384**

Hazus: Flood Global Risk Report

Region Name: Granby_FL

Flood Scenario: Granby_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 163 census blocks. The region contains over 4 thousand households and has a total population of 10,903 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,329 buildings in the region with a total building replacement value (excluding contents) of 2,350 million dollars. Approximately 89.86% of the buildings (and 77.57% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,329 buildings in the region which have an aggregate total replacement value of 2,350 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,823,164	77.6%
Commercial	257,538	11.0%
Industrial	66,817	2.8%
Agricultural	6,790	0.3%
Religion	19,057	0.8%
Government	72,919	3.1%
Education	104,099	4.4%
Total	**2,350,384**	**100%**

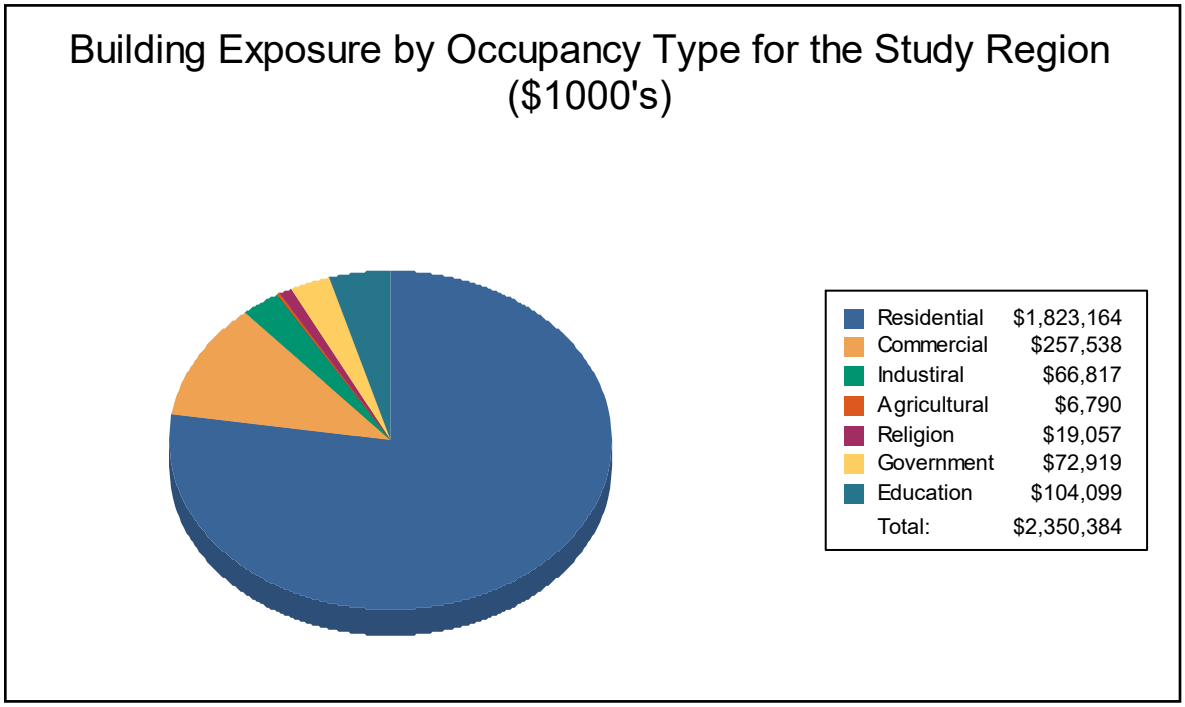
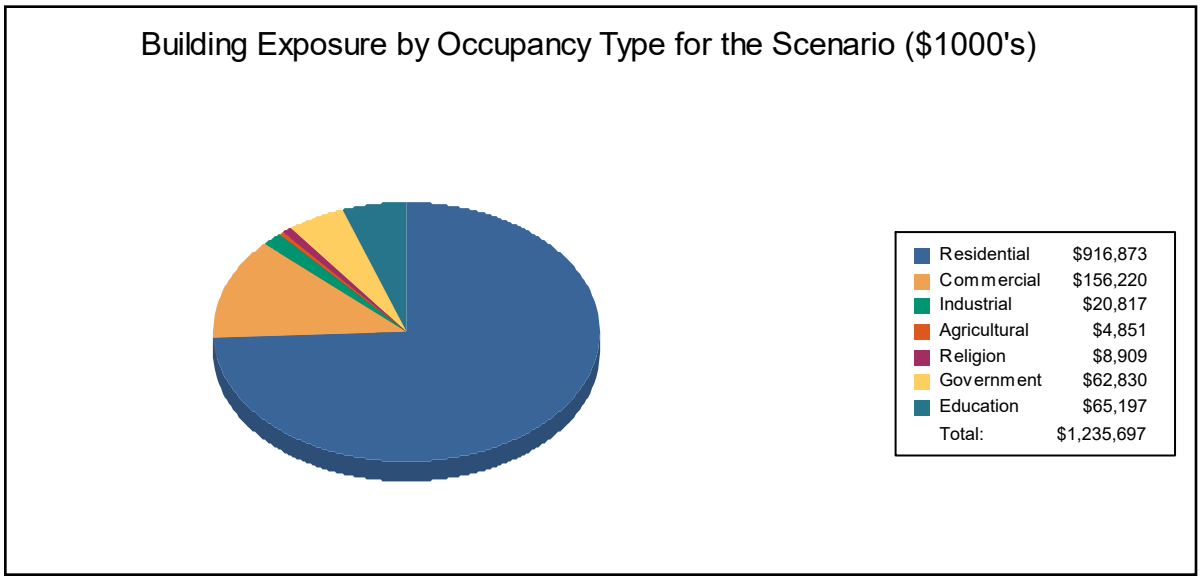


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	916,873	74.2%
Commercial	156,220	12.6%
Industrial	20,817	1.7%
Agricultural	4,851	0.4%
Religion	8,909	0.7%
Government	62,830	5.1%
Education	65,197	5.3%
Total	**1,235,697**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

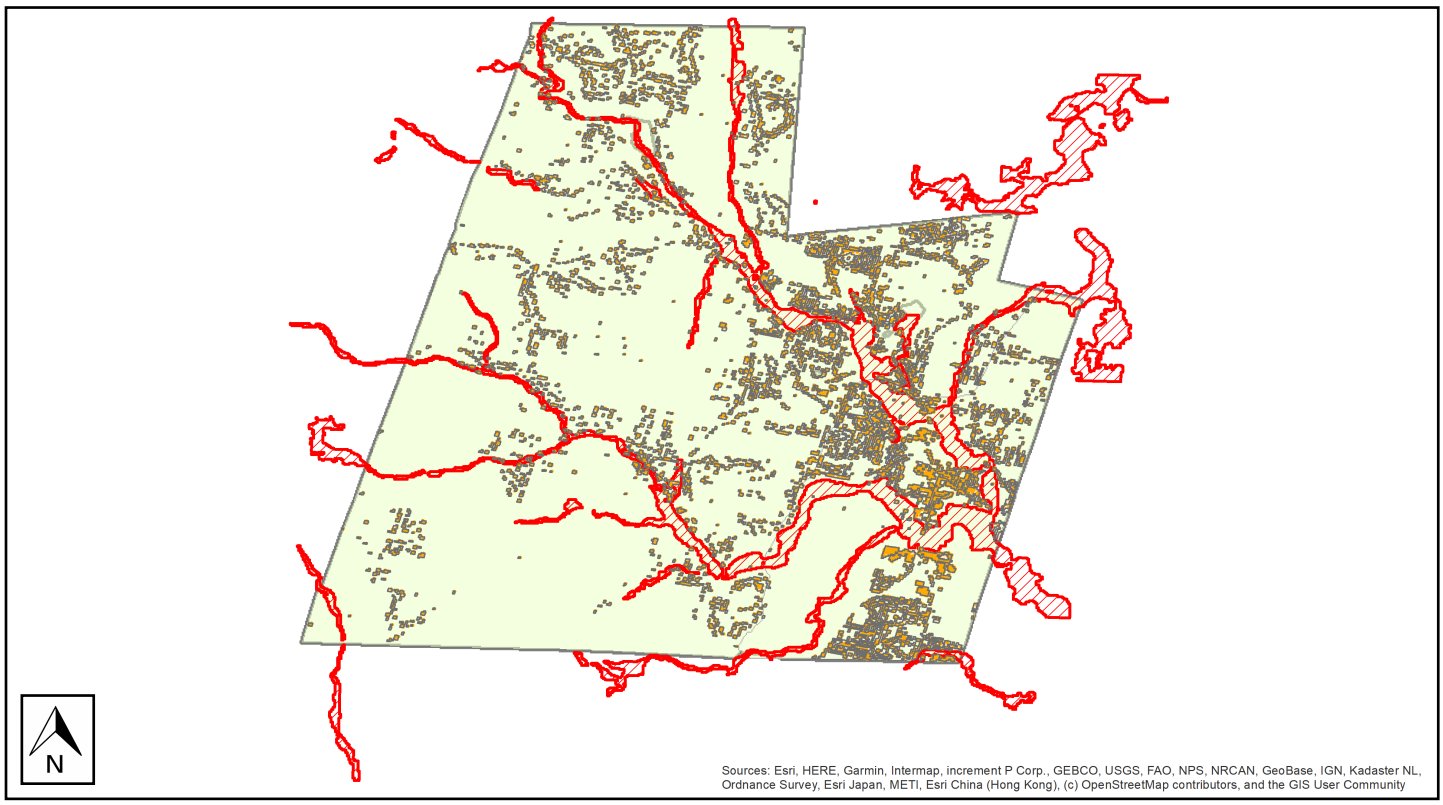
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Granby_FL
Scenario Name:	Granby_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 5 buildings will be at least moderately damaged. This is over 90% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

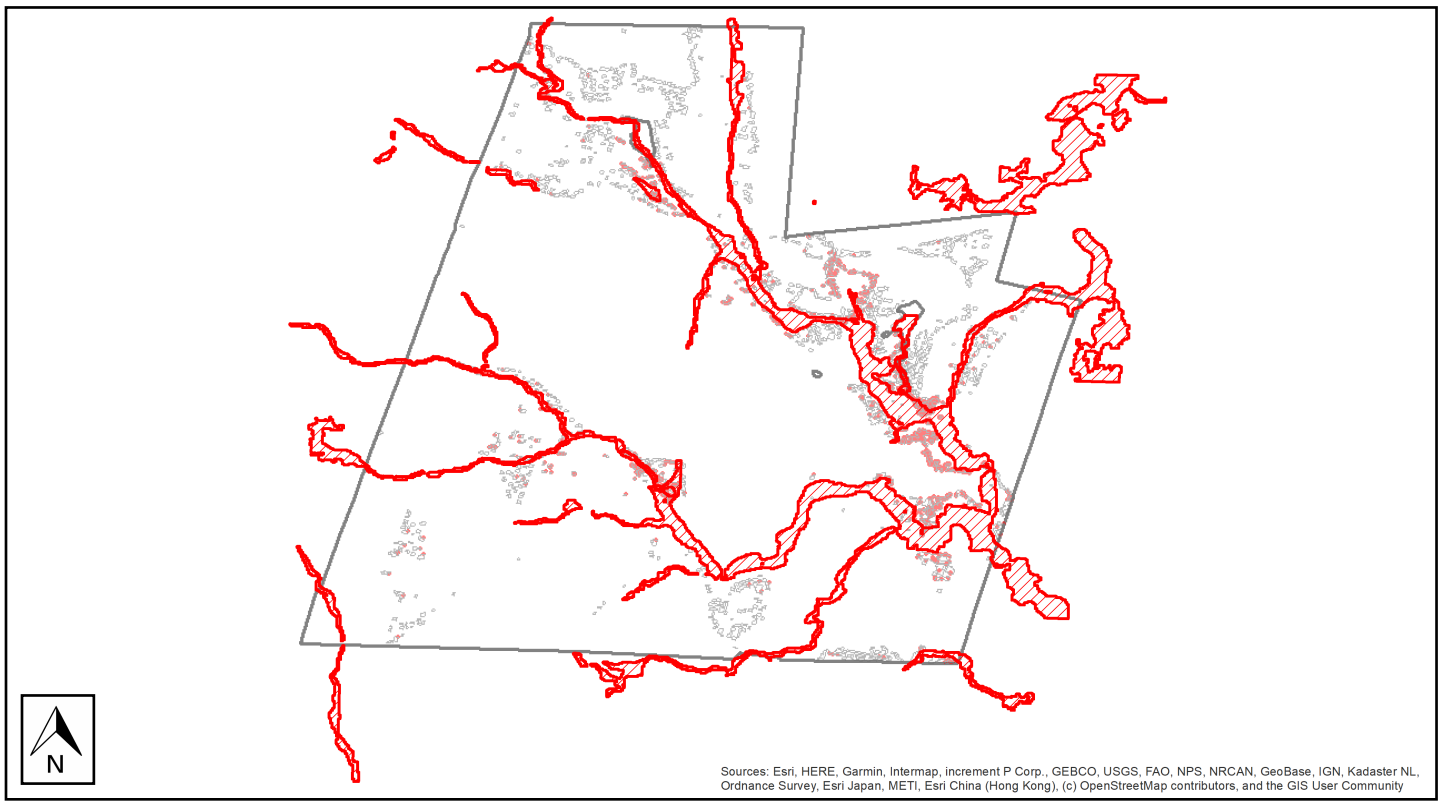


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	1	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	38	5	63	0	0	0	0	0	0	0	0
Total	**4**		**5**		**0**		**0**		**0**		**0**	

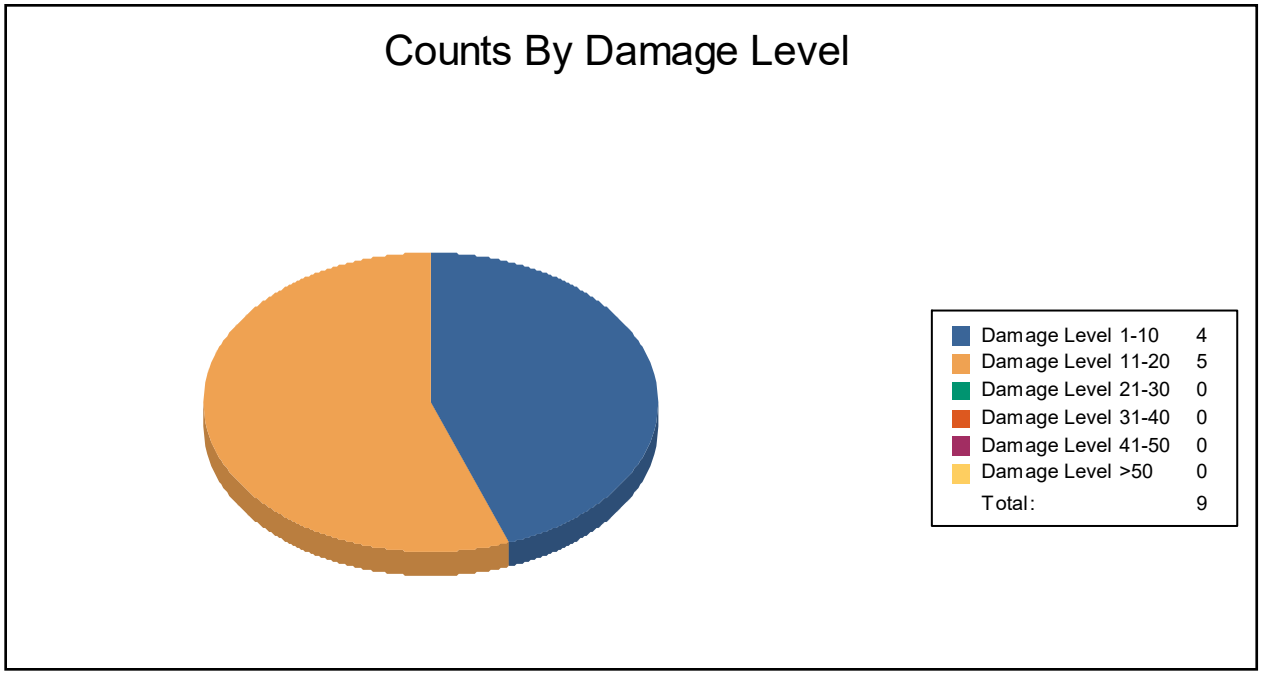


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	1	100	0	0	0	0	0	0	0	0	0	0
Wood	3	38	5	63	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

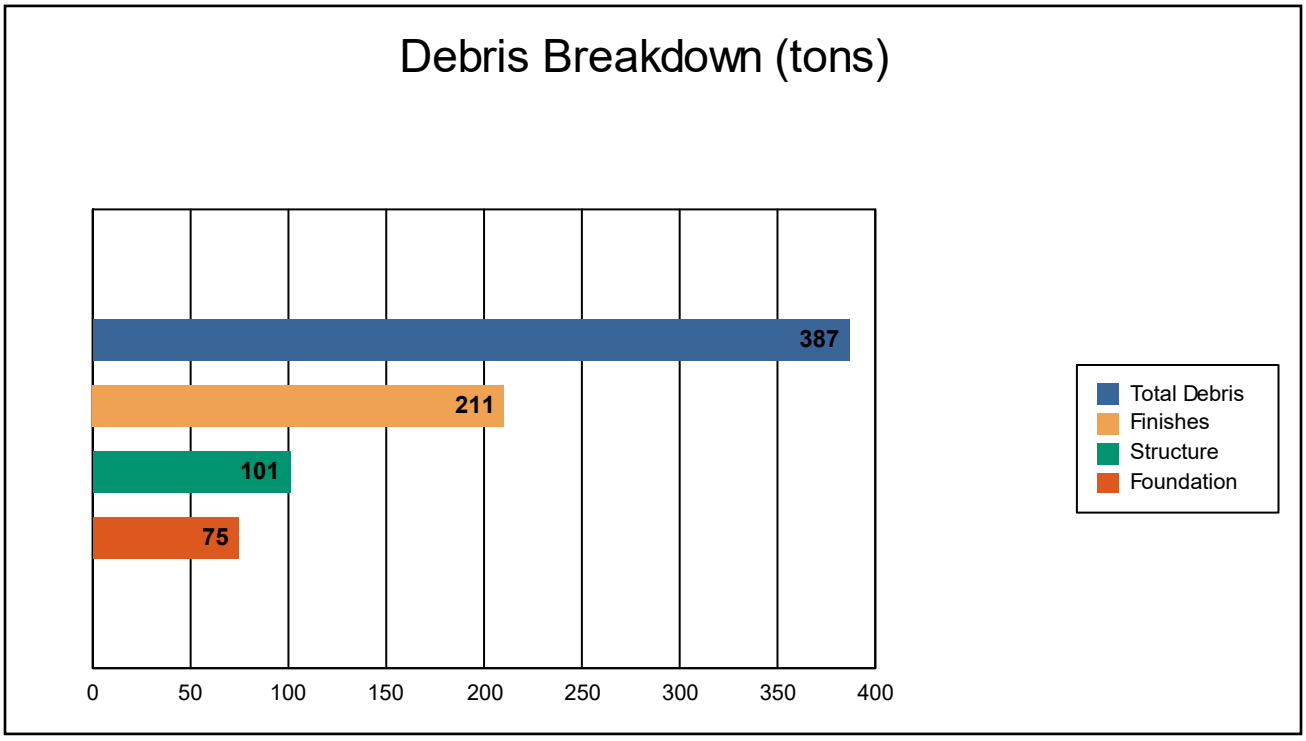
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

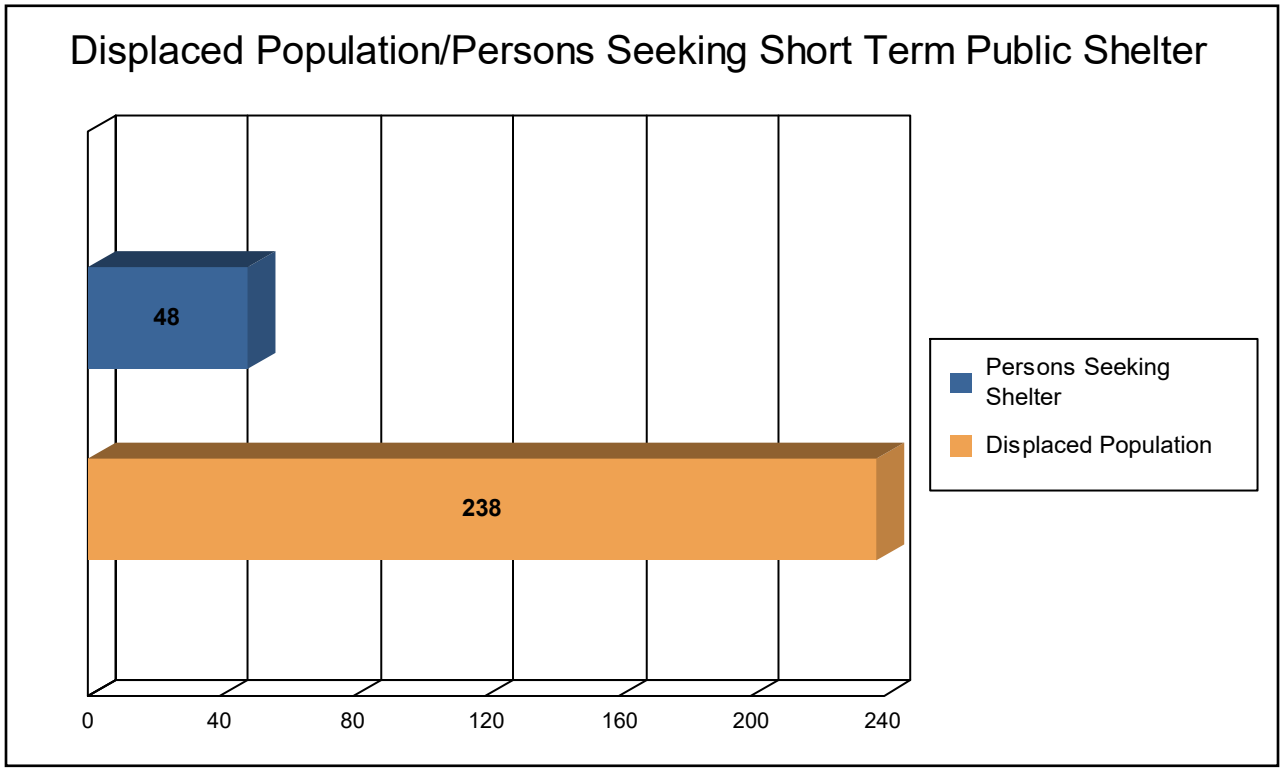


The model estimates that a total of 387 tons of debris will be generated. Of the total amount, Finishes comprises 54% of the total, Structure comprises 26% of the total, and Foundation comprises 19%. If the debris tonnage is converted into an estimated number of truckloads, it will require 16 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 79 households (or 238 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 48 people (out of a total population of 10,903) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 60.11 million dollars, which represents 4.86 % of the total replacement value of the scenario buildings.

Building-Related Losses

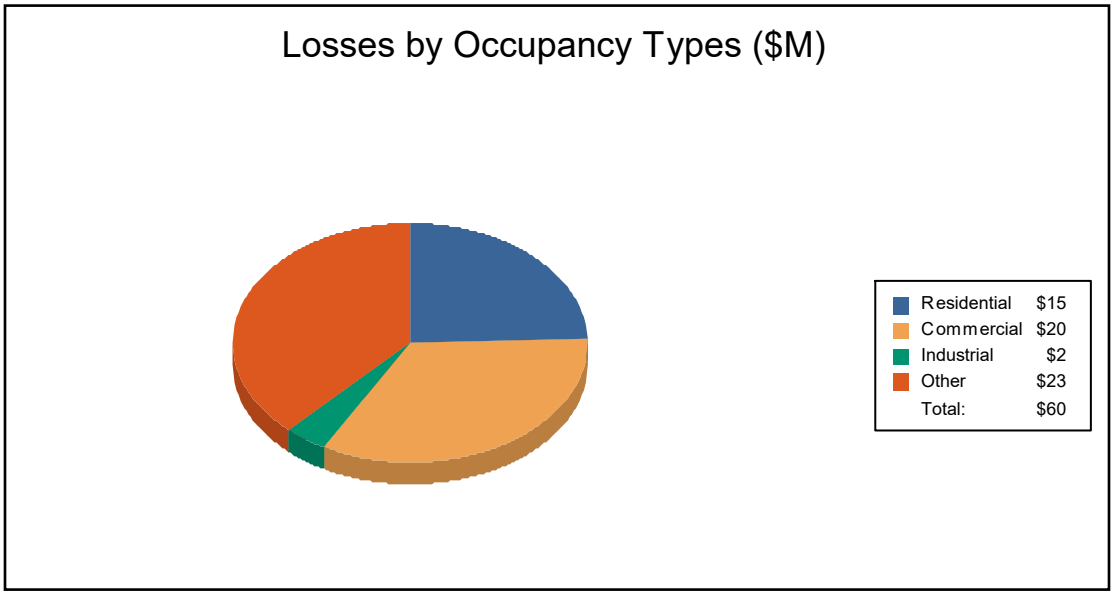
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 26.14 million dollars. 57% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 24.33% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.87	1.66	0.53	0.83	8.89
	Content	3.23	6.25	1.36	5.39	16.22
	Inventory	0.00	0.71	0.29	0.03	1.02
	Subtotal	**9.09**	**8.62**	**2.17**	**6.25**	**26.14**
Business Interruption						
	Income	0.96	3.95	0.05	1.57	6.53
	Relocation	1.32	0.87	0.05	1.16	3.40
	Rental Income	0.99	0.54	0.01	0.27	1.81
	Wage	2.26	6.26	0.09	13.63	22.24
	Subtotal	**5.53**	**11.61**	**0.20**	**16.63**	**33.97**
ALL	**Total**	**14.62**	**20.23**	**2.37**	**22.88**	**60.11**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,164	527,220	2,350,384
Total	**10,903**	**1,823,164**	**527,220**	**2,350,384**
Total Study Region	**10,903**	**1,823,164**	**527,220**	**2,350,384**

Hazus: Flood Global Risk Report

Region Name: Granby_FL

Flood Scenario: Granby_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 163 census blocks. The region contains over 4 thousand households and has a total population of 10,903 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,329 buildings in the region with a total building replacement value (excluding contents) of 2,350 million dollars. Approximately 89.86% of the buildings (and 77.57% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,329 buildings in the region which have an aggregate total replacement value of 2,350 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,823,164	77.6%
Commercial	257,538	11.0%
Industrial	66,817	2.8%
Agricultural	6,790	0.3%
Religion	19,057	0.8%
Government	72,919	3.1%
Education	104,099	4.4%
Total	**2,350,384**	**100%**

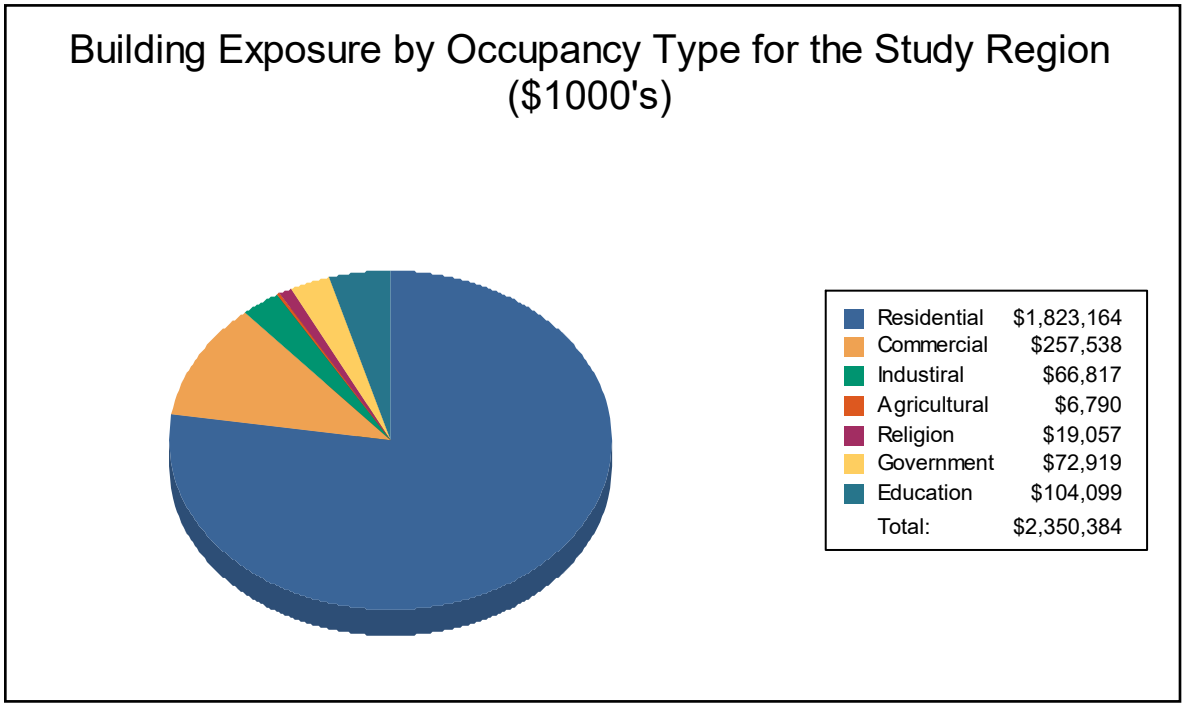
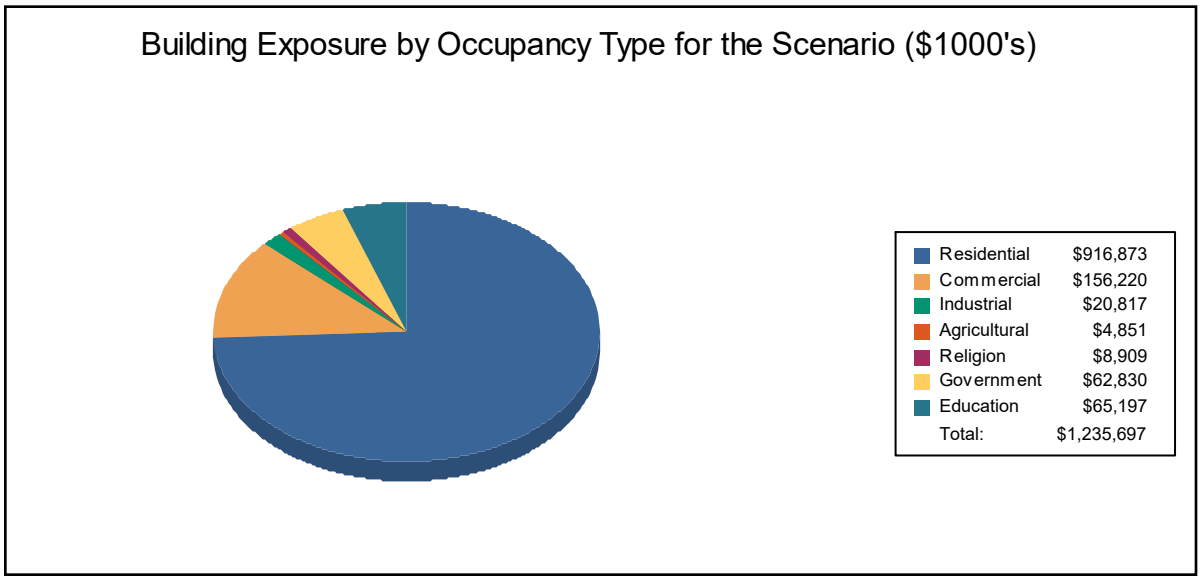


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	916,873	74.2%
Commercial	156,220	12.6%
Industrial	20,817	1.7%
Agricultural	4,851	0.4%
Religion	8,909	0.7%
Government	62,830	5.1%
Education	65,197	5.3%
Total	**1,235,697**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 3 fire stations, 1 police station and 1 emergency operation center.

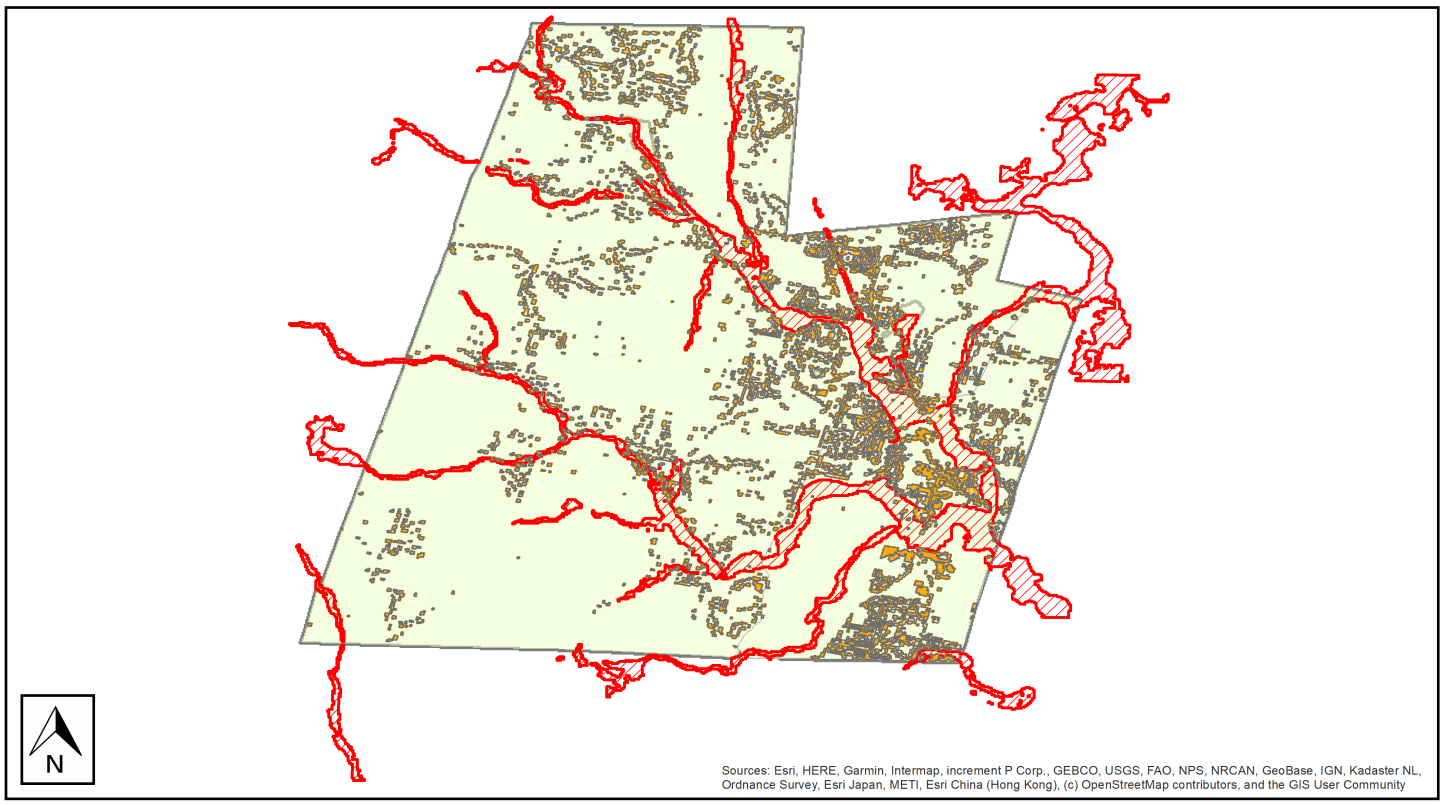
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Granby_FL
Scenario Name:	Granby_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 8 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

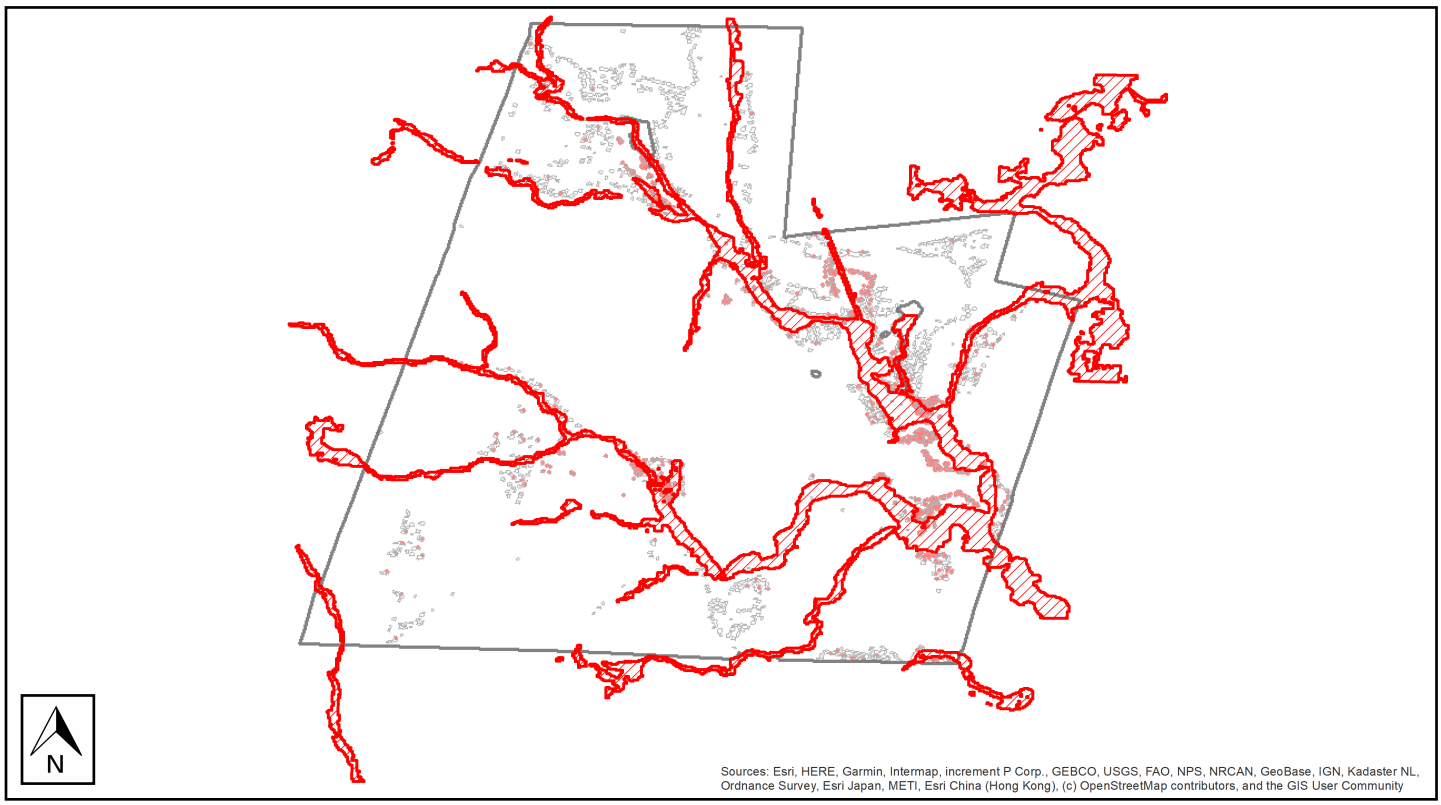


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	2	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	27	8	73	0	0	0	0	0	0	0	0
Total	**5**		**8**		**0**		**0**		**0**		**0**	

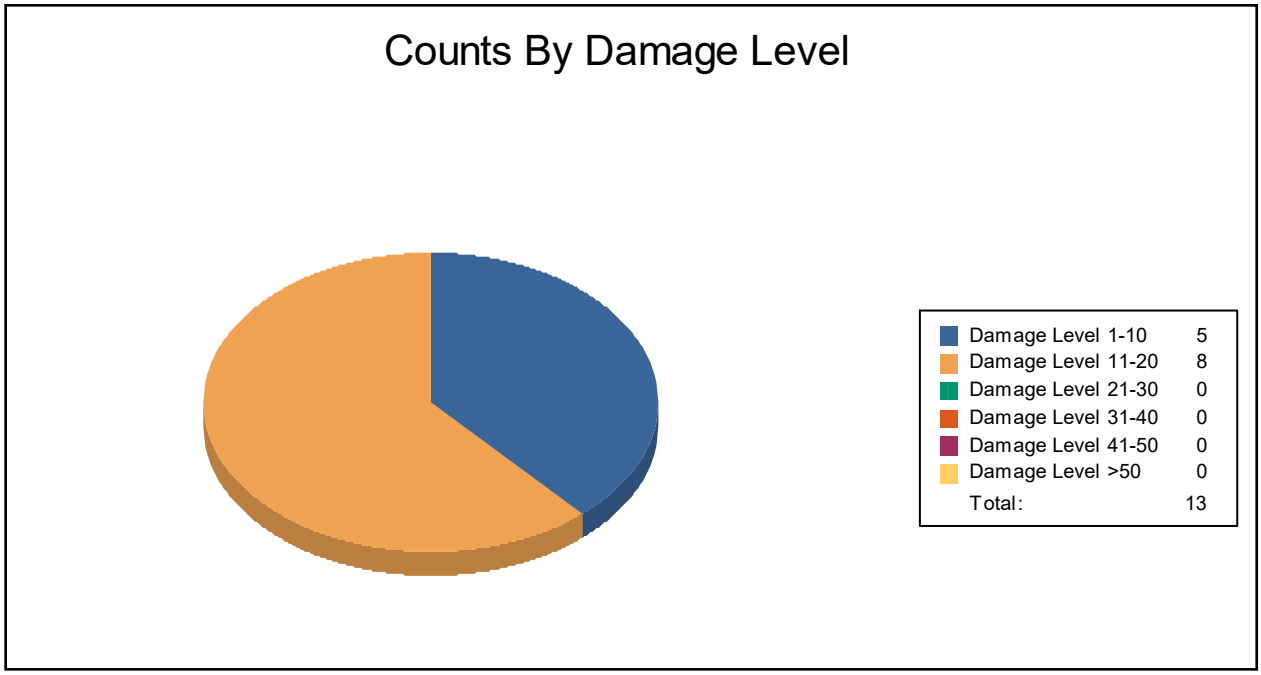


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	1	100	0	0	0	0	0	0	0	0	0	0
Wood	3	27	8	73	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

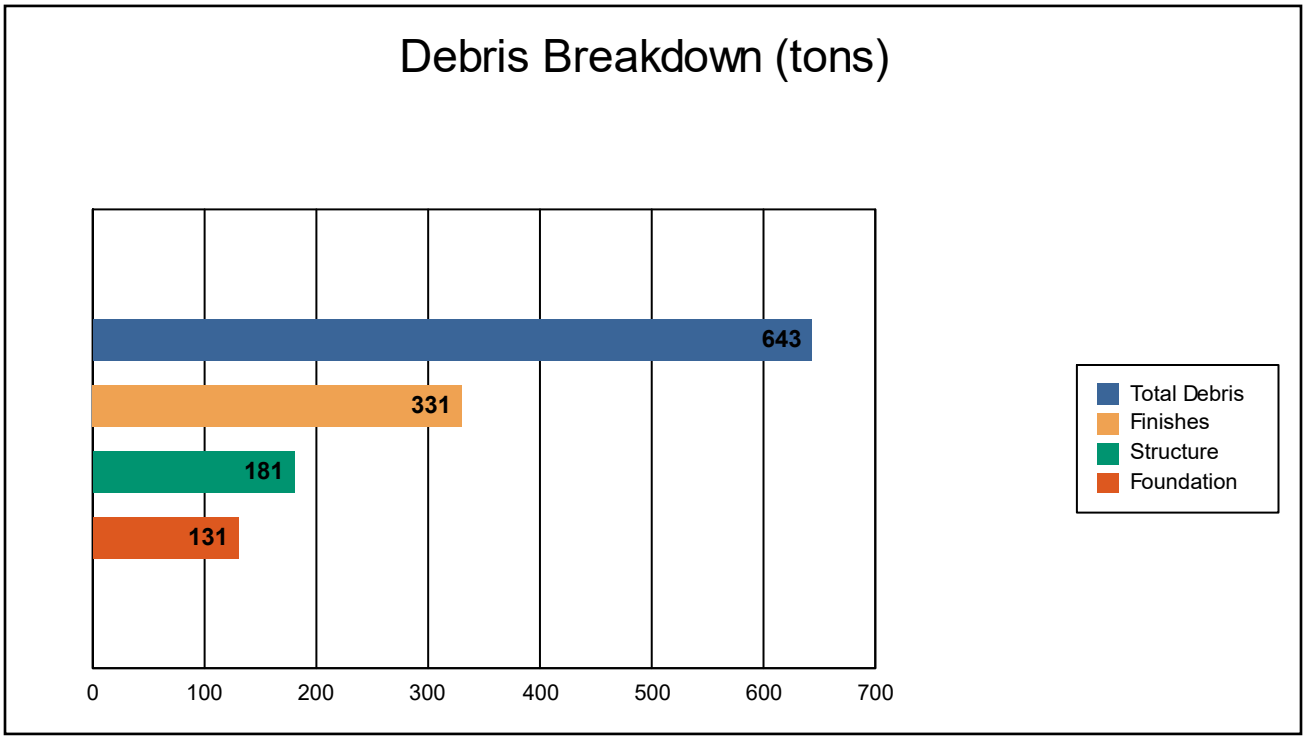
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

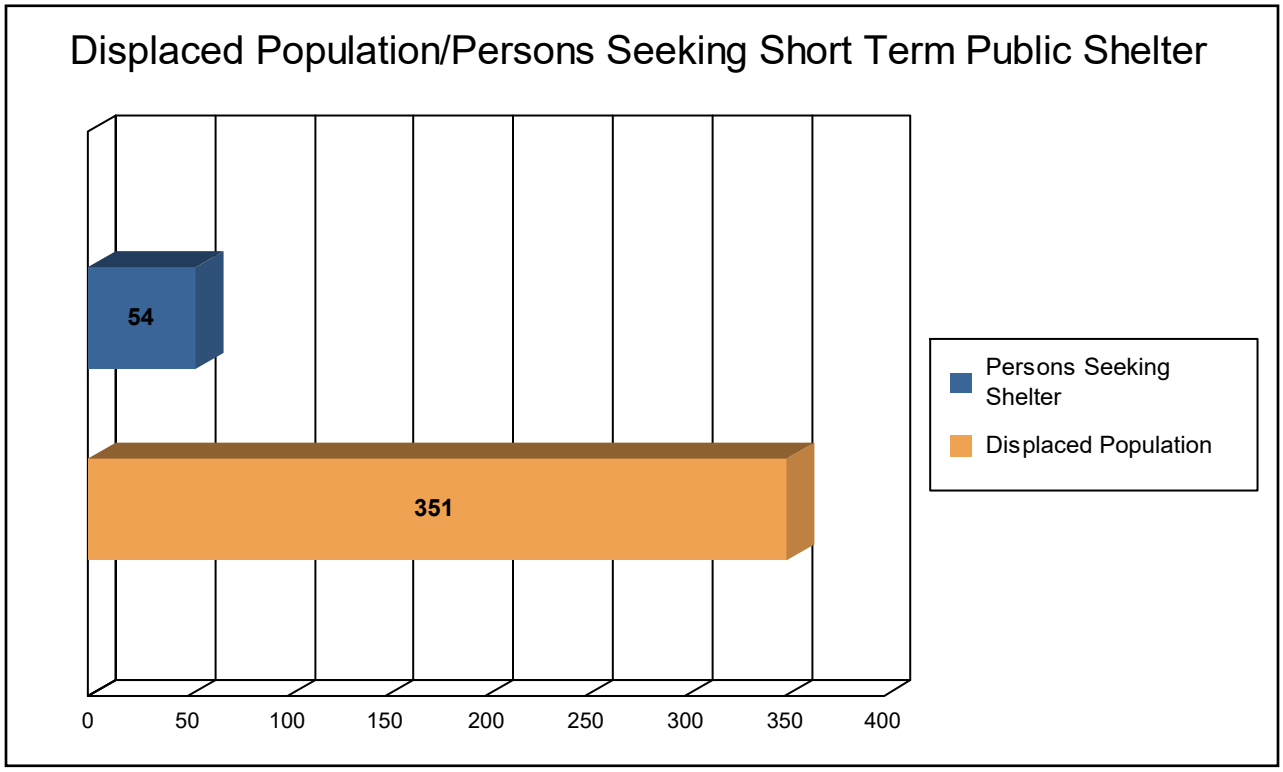


The model estimates that a total of 643 tons of debris will be generated. Of the total amount, Finishes comprises 51% of the total, Structure comprises 28% of the total, and Foundation comprises 20%. If the debris tonnage is converted into an estimated number of truckloads, it will require 26 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 117 households (or 351 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 54 people (out of a total population of 10,903) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 87.48 million dollars, which represents 7.08 % of the total replacement value of the scenario buildings.

Building-Related Losses

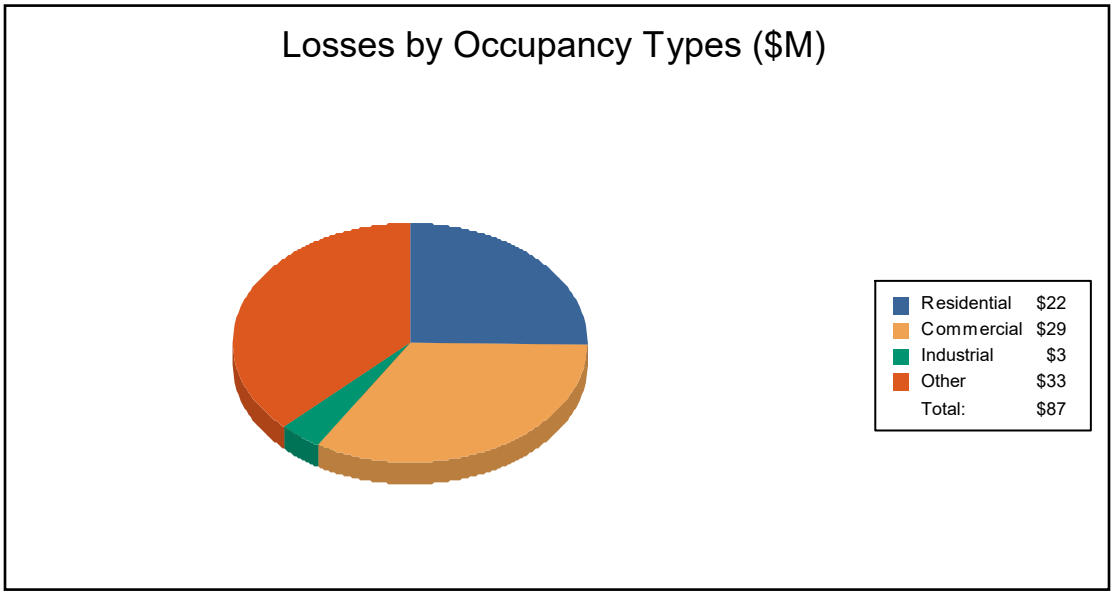
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 40.24 million dollars. 54% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 25.29% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.14	2.61	0.74	1.33	13.82
	Content	5.51	9.34	1.99	7.88	24.72
	Inventory	0.00	1.19	0.43	0.08	1.70
	Subtotal	**14.64**	**13.14**	**3.16**	**9.30**	**40.24**
Business Interruption						
	Income	1.23	5.48	0.06	2.12	8.88
	Relocation	2.00	1.32	0.06	1.61	4.99
	Rental Income	1.37	0.83	0.02	0.39	2.60
	Wage	2.89	8.42	0.10	19.37	30.78
	Subtotal	**7.48**	**16.04**	**0.24**	**23.48**	**47.24**
ALL	**Total**	**22.13**	**29.19**	**3.39**	**32.77**	**87.48**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,164	527,220	2,350,384
Total	**10,903**	**1,823,164**	**527,220**	**2,350,384**
Total Study Region	**10,903**	**1,823,164**	**527,220**	**2,350,384**

Hazus: Flood Global Risk Report

Region Name: Hartford_FL

Flood Scenario: Hartford_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 9 square miles and contains 927 census blocks. The region contains over 47 thousand households and has a total population of 121,029 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 20,715 buildings in the region with a total building replacement value (excluding contents) of 18,504 million dollars. Approximately 76.90% of the buildings (and 46.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 20,715 buildings in the region which have an aggregate total replacement value of 18,504 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	8,687,229	46.9%
Commercial	5,528,732	29.9%
Industrial	655,037	3.5%
Agricultural	13,591	0.1%
Religion	527,175	2.8%
Government	1,049,763	5.7%
Education	2,042,591	11.0%
Total	**18,504,118**	**100%**

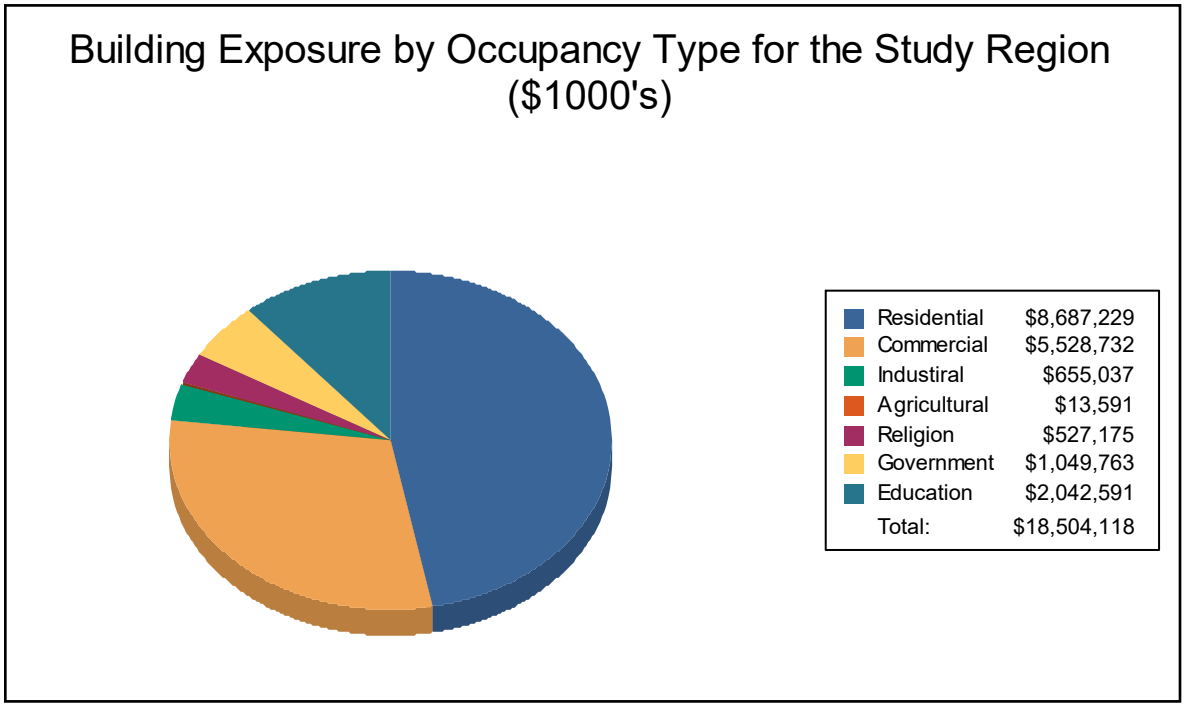
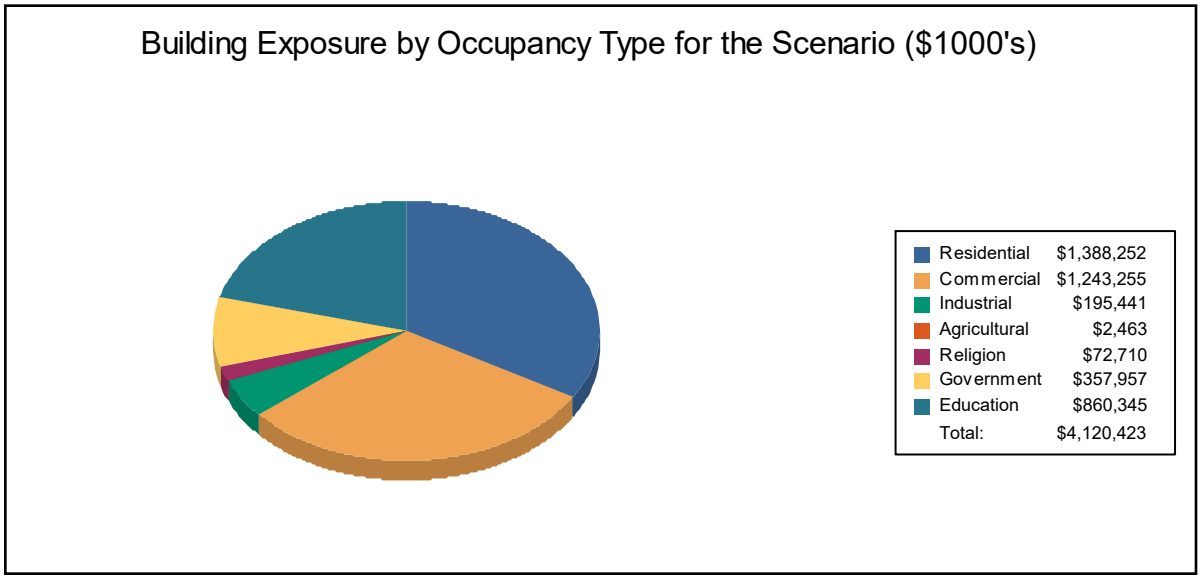


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,388,252	33.7%
Commercial	1,243,255	30.2%
Industrial	195,441	4.7%
Agricultural	2,463	0.1%
Religion	72,710	1.8%
Government	357,957	8.7%
Education	860,345	20.9%
Total	**4,120,423**	**100%**



Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds.
There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation centers.

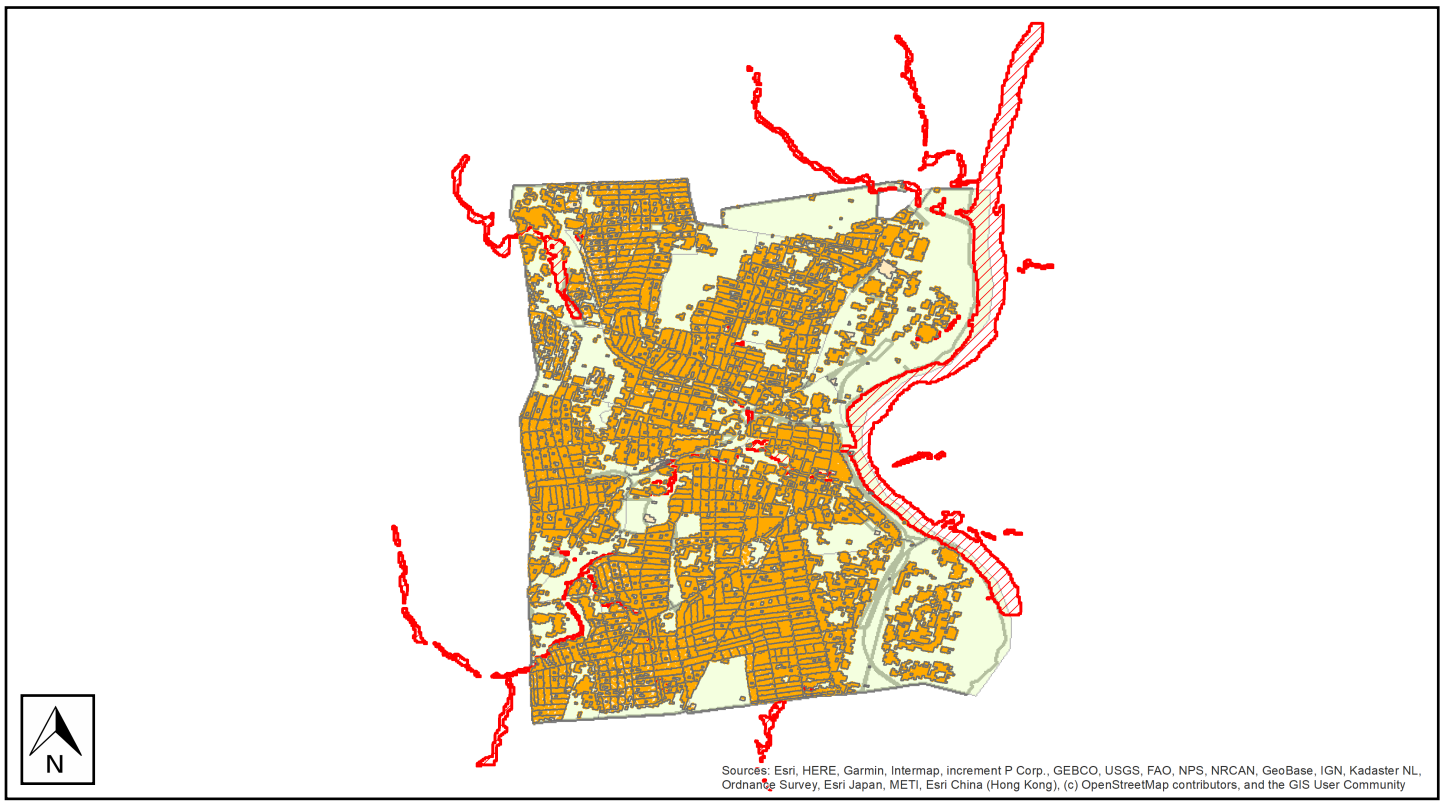
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hartford_FL
Scenario Name:	Hartford_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 63% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

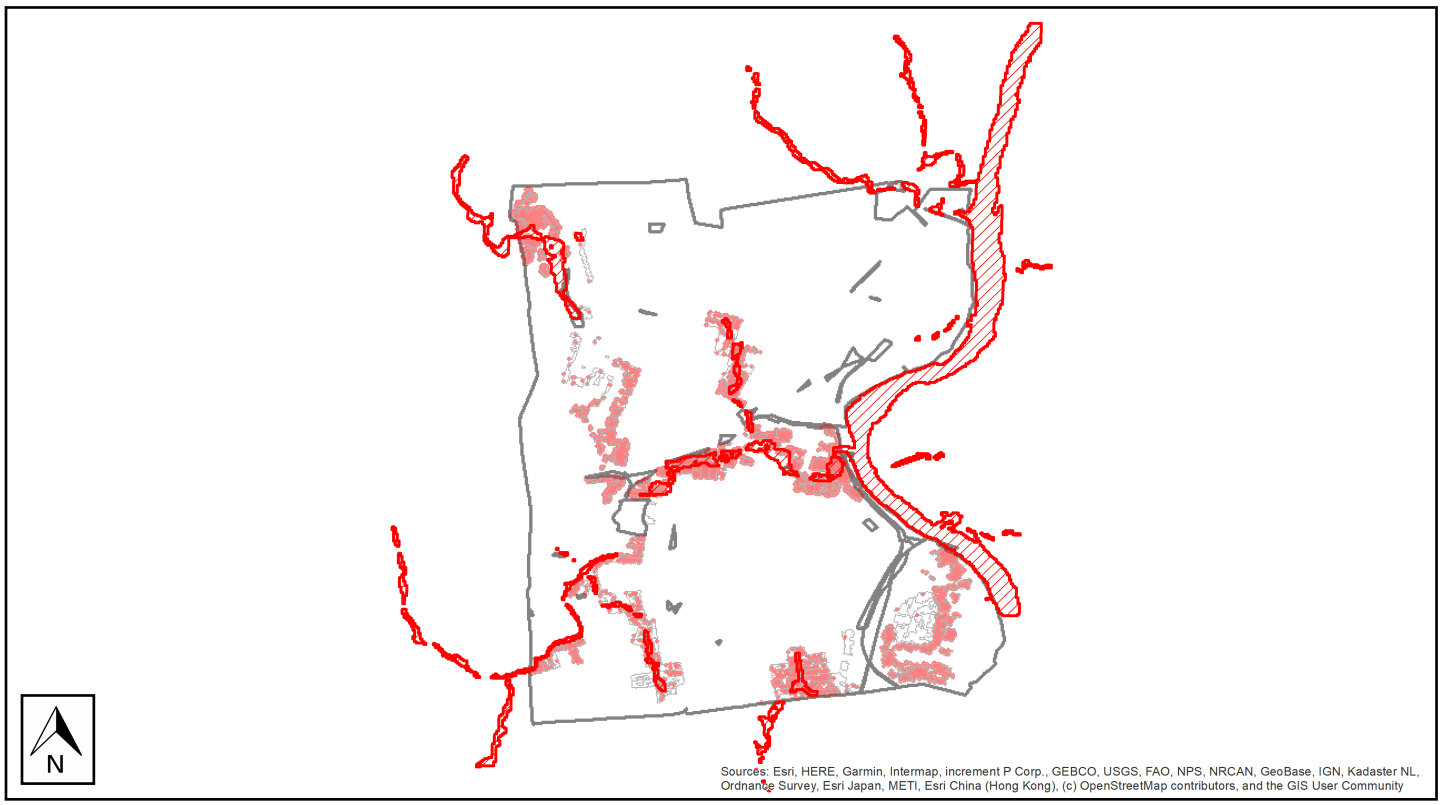


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	3	75	1	25	0	0	0	0	0	0	0	0
Industrial	0	0	1	100	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	33	80	8	20	0	0	0	0	0	0	0	0
Total	**36**		**11**		**0**		**0**		**0**		**0**	

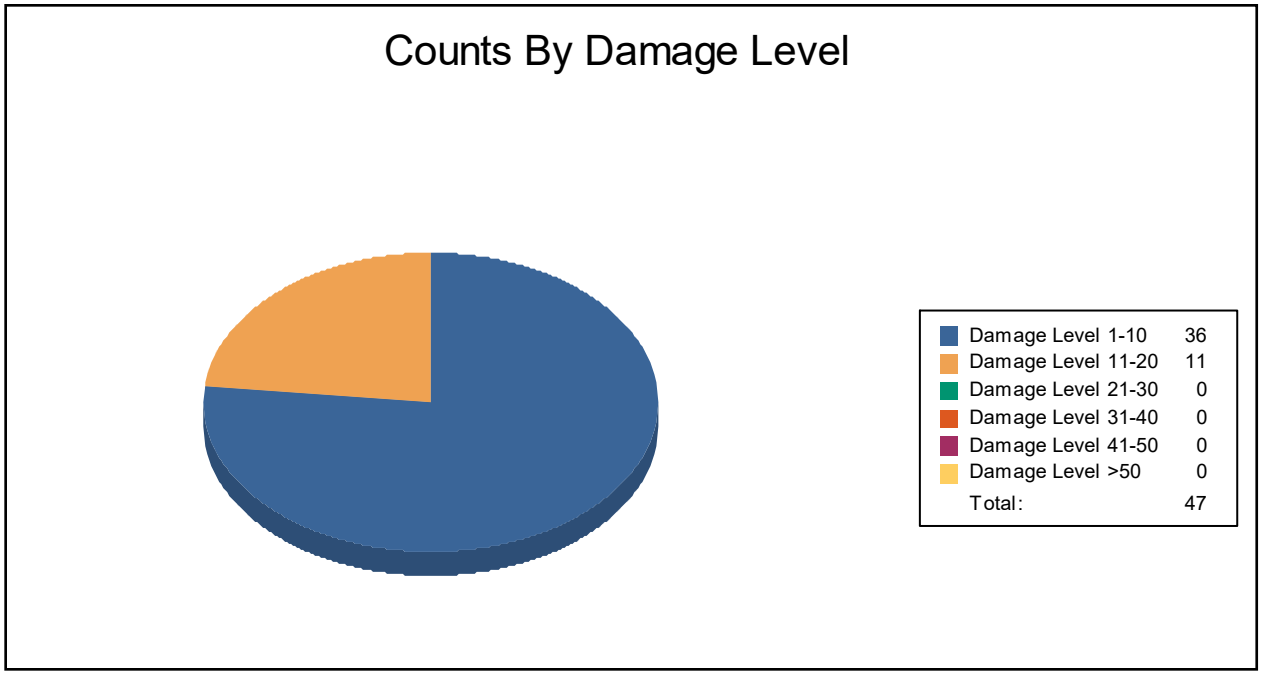


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	2	50	2	50	0	0	0	0	0	0	0	0
Wood	32	80	8	20	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 1,731 hospital beds available for use. On the day of the scenario flood event, the model estimates that 1,731 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	2	0	0	0
Fire Stations	12	0	0	0
Hospitals	5	0	0	0
Police Stations	7	0	0	0
Schools	62	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

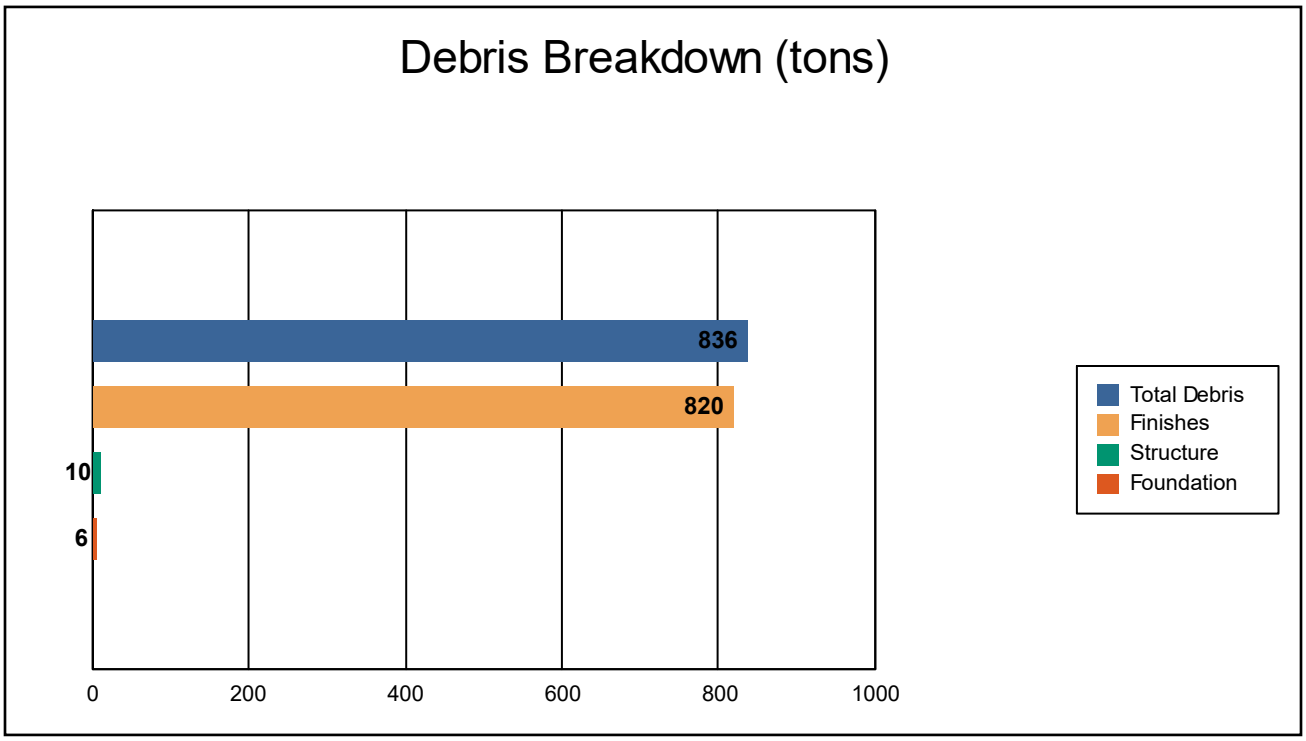
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

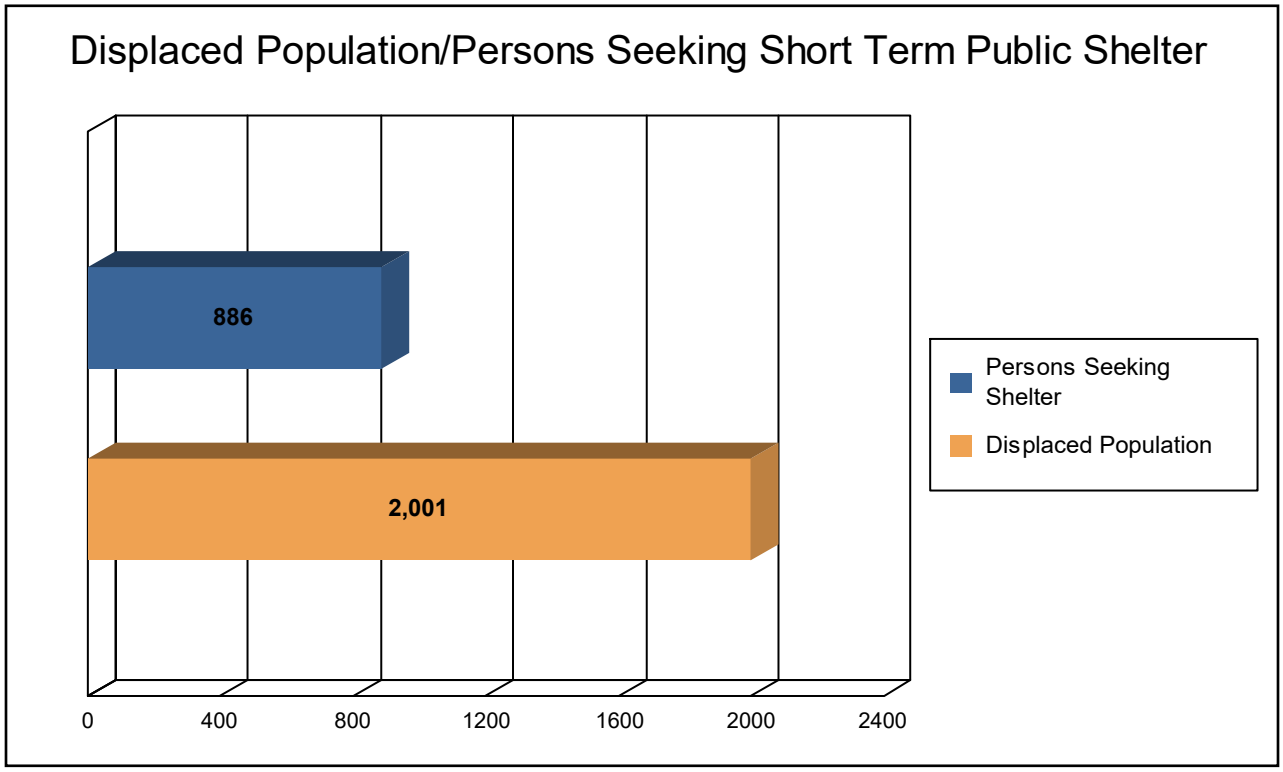


The model estimates that a total of 836 tons of debris will be generated. Of the total amount, Finishes comprises 98% of the total, Structure comprises 1% of the total, and Foundation comprises 1%. If the debris tonnage is converted into an estimated number of truckloads, it will require 34 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 667 households (or 2,001 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 886 people (out of a total population of 121,029) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 431.02 million dollars, which represents 10.46 % of the total replacement value of the scenario buildings.

Building-Related Losses

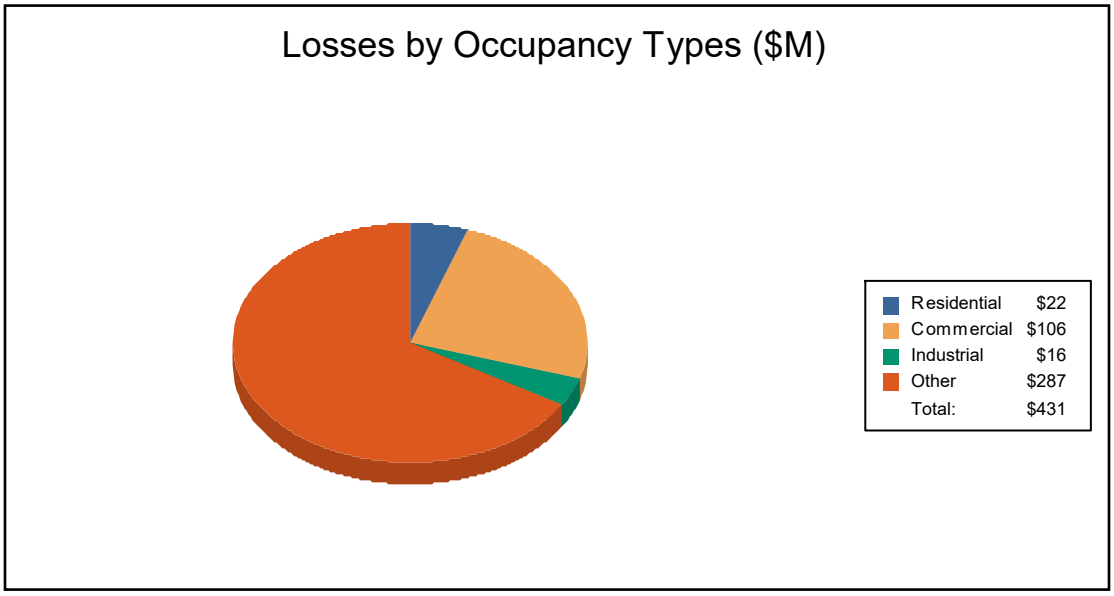
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 126.59 million dollars. 71% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 5.16% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.15	8.83	3.38	7.94	27.29
	Content	5.97	28.44	8.99	50.65	94.05
	Inventory	0.00	3.73	1.50	0.02	5.25
	Subtotal	**13.12**	**41.01**	**13.87**	**58.60**	**126.59**
Business Interruption						
	Income	0.42	27.15	0.49	12.67	40.73
	Relocation	3.54	7.23	0.40	12.90	24.06
	Rental Income	4.17	5.17	0.20	4.39	13.93
	Wage	1.01	25.66	0.85	198.20	225.71
	Subtotal	**9.14**	**65.20**	**1.94**	**228.14**	**304.43**
ALL	**Total**	**22.26**	**106.20**	**15.81**	**286.75**	**431.02**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	121,029	8,687,229	9,816,889	18,504,118
Total	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**
Total Study Region	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**

Hazus: Flood Global Risk Report

Region Name: Hartford_FL

Flood Scenario: Hartford_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 9 square miles and contains 927 census blocks. The region contains over 47 thousand households and has a total population of 121,029 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 20,715 buildings in the region with a total building replacement value (excluding contents) of 18,504 million dollars. Approximately 76.90% of the buildings (and 46.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 20,715 buildings in the region which have an aggregate total replacement value of 18,504 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	8,687,229	46.9%
Commercial	5,528,732	29.9%
Industrial	655,037	3.5%
Agricultural	13,591	0.1%
Religion	527,175	2.8%
Government	1,049,763	5.7%
Education	2,042,591	11.0%
Total	**18,504,118**	**100%**

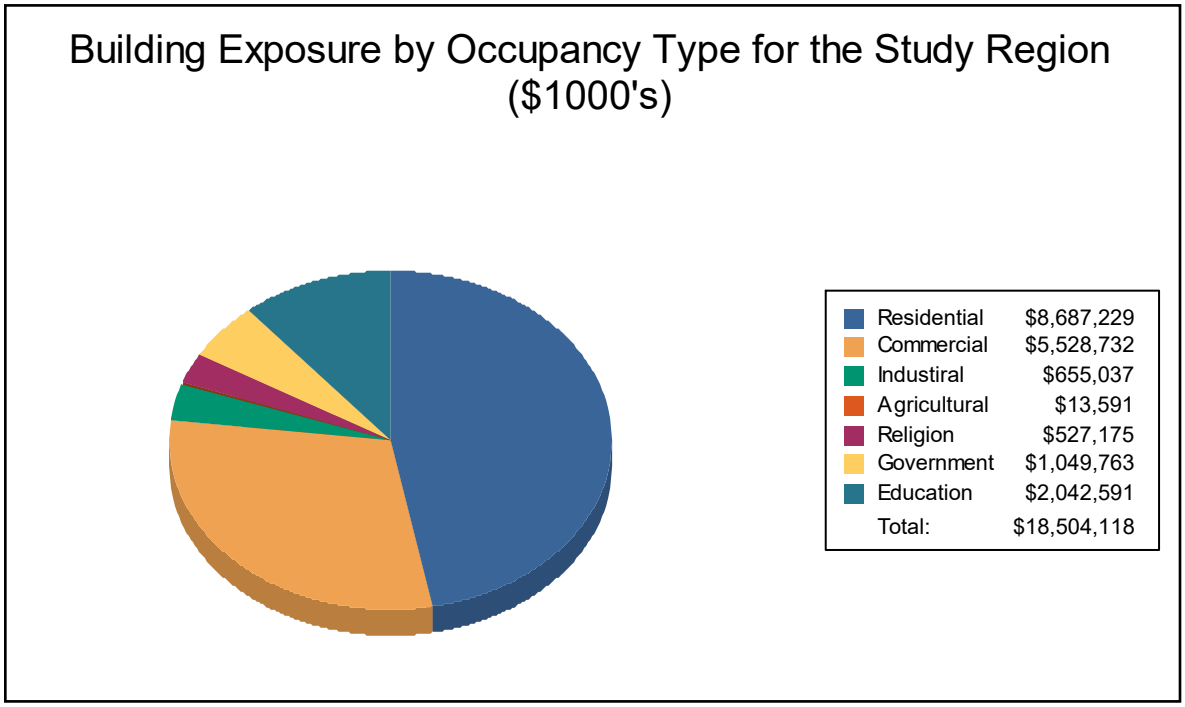
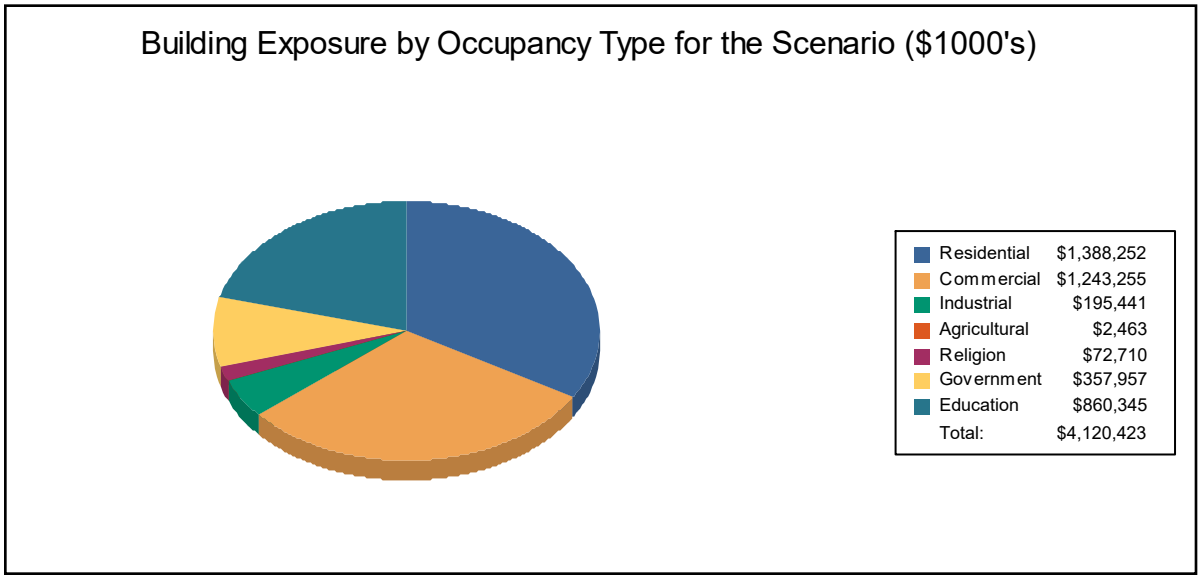


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,388,252	33.7%
Commercial	1,243,255	30.2%
Industrial	195,441	4.7%
Agricultural	2,463	0.1%
Religion	72,710	1.8%
Government	357,957	8.7%
Education	860,345	20.9%
Total	**4,120,423**	**100%**



Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds.
There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation centers.

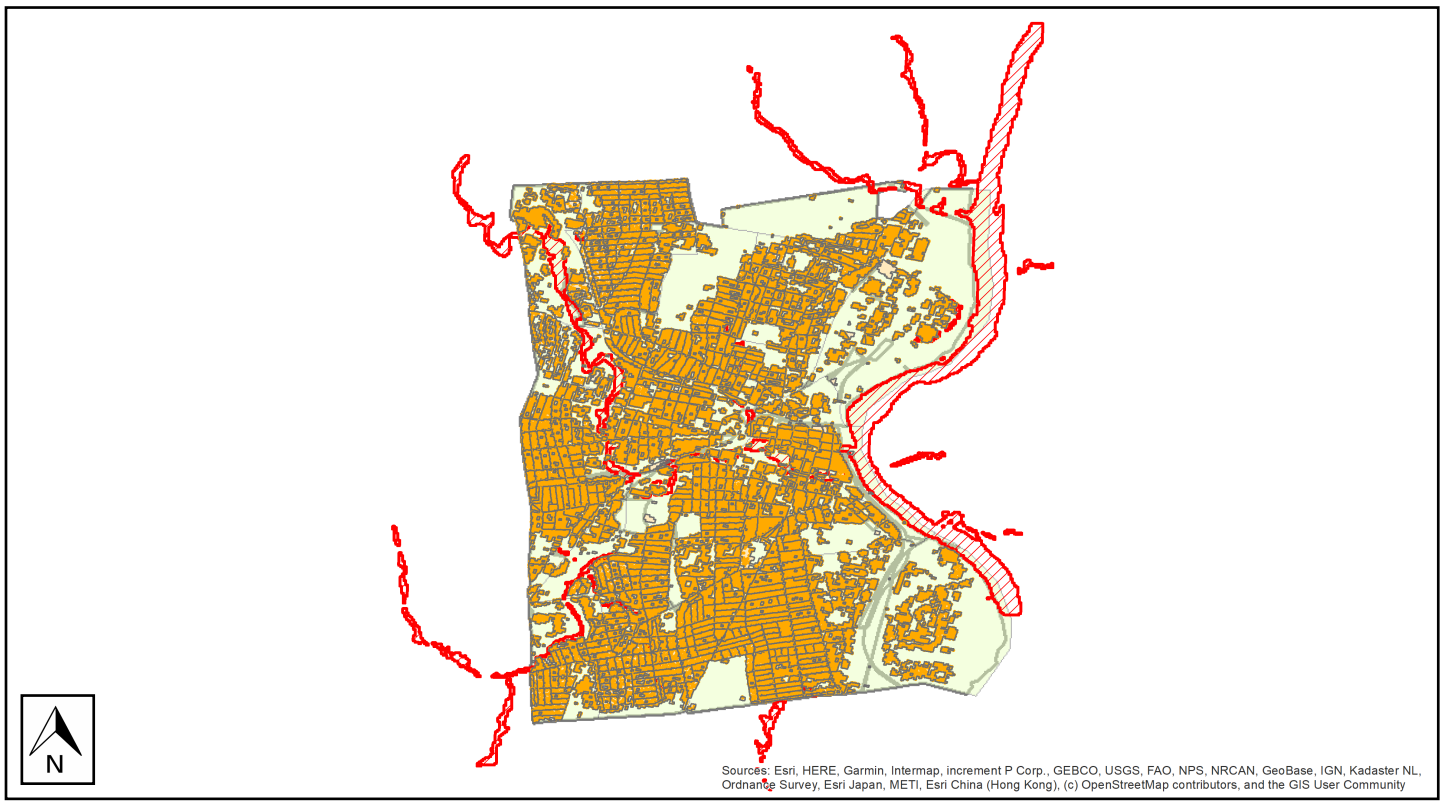
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hartford_FL
Scenario Name:	Hartford_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 20 buildings will be at least moderately damaged. This is over 69% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

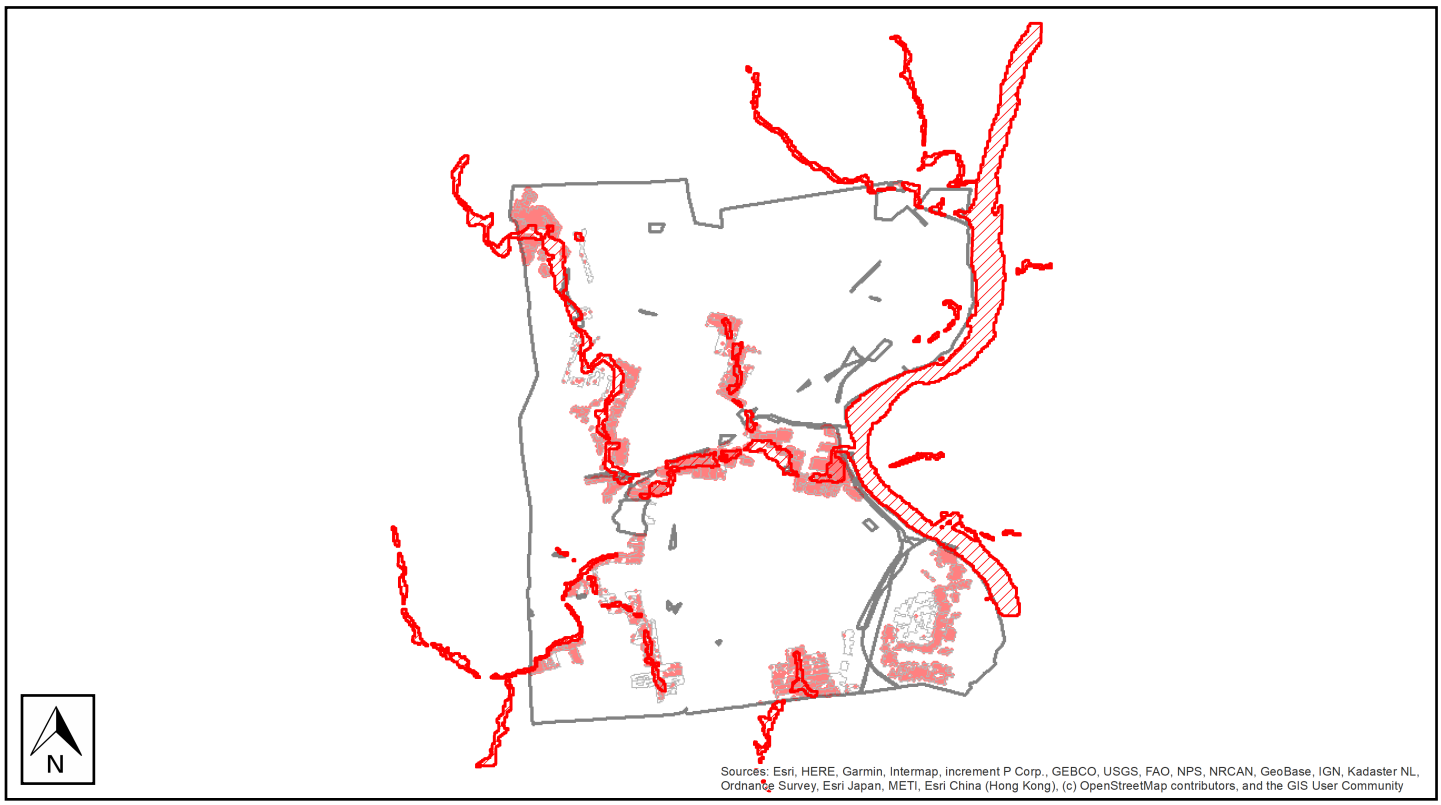


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	20	3	60	1	20	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	3	50	3	50	0	0	0	0	0	0	0	0
Industrial	0	0	1	100	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	36	75	12	25	0	0	0	0	0	0	0	0
Total	**40**		**19**		**1**		**0**		**0**		**0**	

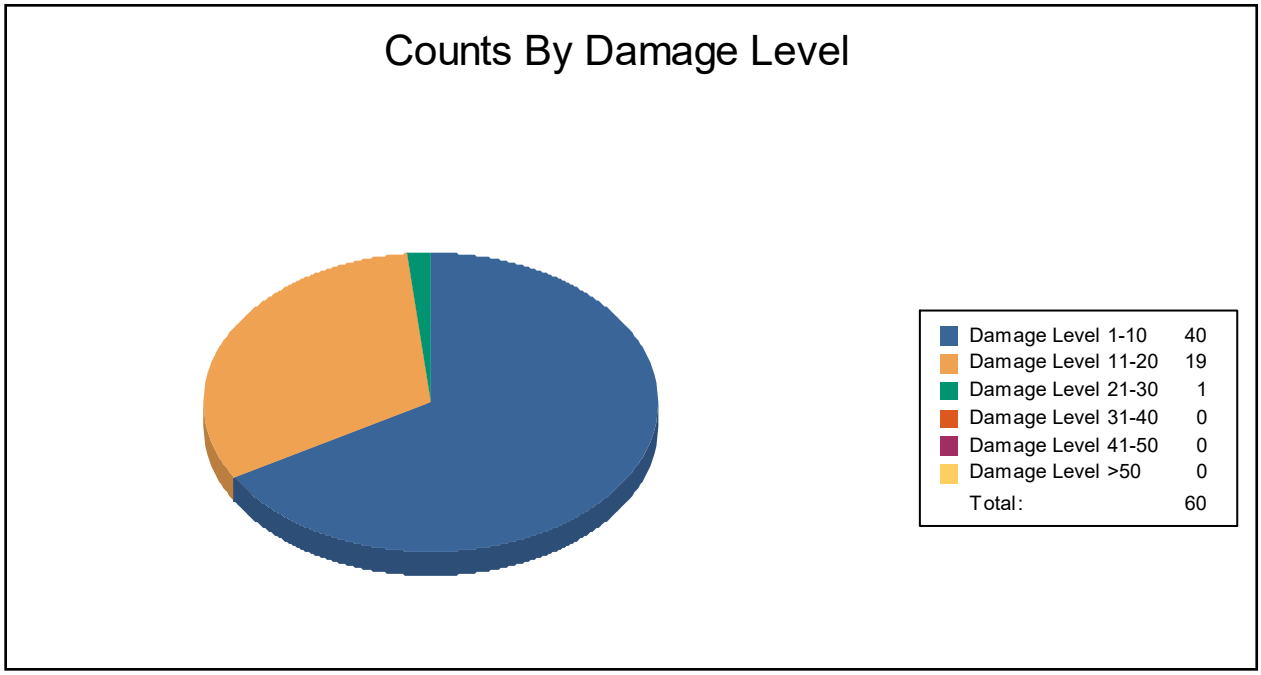


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	2	33	4	67	0	0	0	0	0	0	0	0
Wood	35	74	12	26	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 1,731 hospital beds available for use. On the day of the scenario flood event, the model estimates that 1,731 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	2	0	0	0
Fire Stations	12	0	0	0
Hospitals	5	0	0	0
Police Stations	7	0	0	0
Schools	62	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

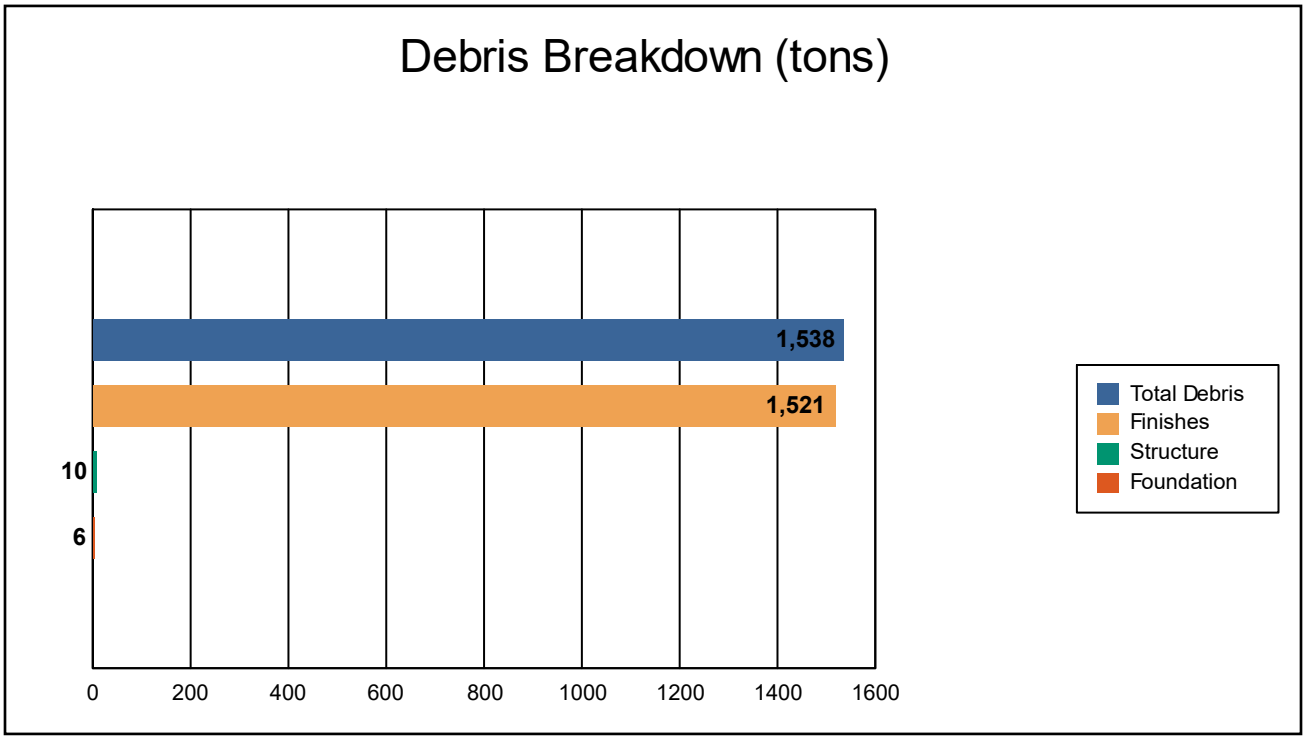
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

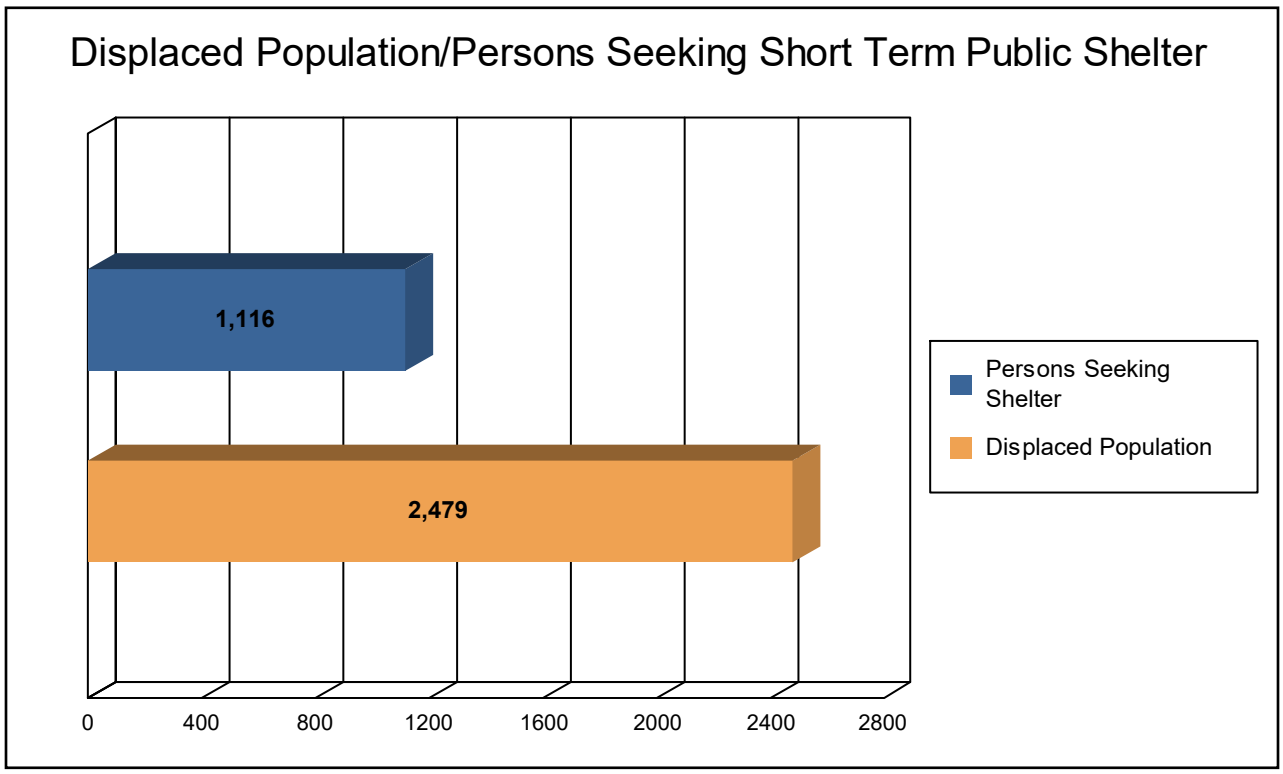


The model estimates that a total of 1,538 tons of debris will be generated. Of the total amount, Finishes comprises 99% of the total, Structure comprises 1% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 62 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 826 households (or 2,479 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,116 people (out of a total population of 121,029) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 588.44 million dollars, which represents 14.28 % of the total replacement value of the scenario buildings.

Building-Related Losses

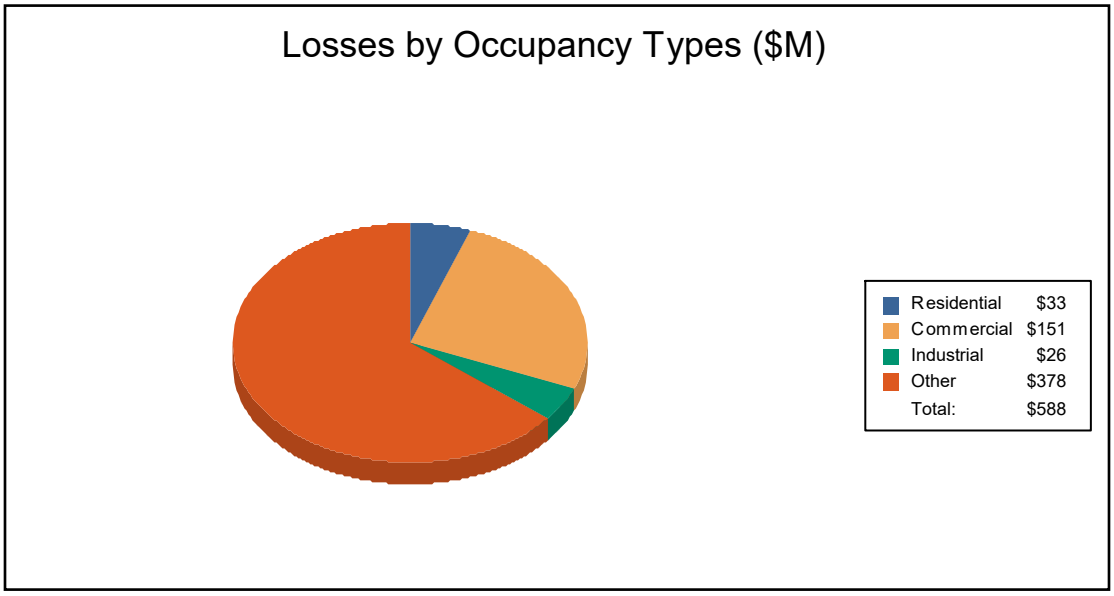
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 197.72 million dollars. 66% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 5.62% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	11.83	14.44	5.54	11.79	43.60
	Content	9.57	45.94	15.18	75.06	145.76
	Inventory	0.00	5.88	2.44	0.04	8.36
	Subtotal	**21.40**	**66.26**	**23.16**	**86.89**	**197.72**
Business Interruption						
	Income	0.55	34.93	0.72	21.33	57.54
	Relocation	4.34	9.27	0.58	17.21	31.40
	Rental Income	5.47	6.64	0.31	5.35	17.77
	Wage	1.31	34.16	1.24	247.31	284.02
	Subtotal	**11.68**	**85.00**	**2.85**	**291.19**	**390.72**
ALL	**Total**	**33.08**	**151.26**	**26.01**	**378.08**	**588.44**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	121,029	8,687,229	9,816,889	18,504,118
Total	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**
Total Study Region	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**

Hazus: Flood Global Risk Report

Region Name: Hartford_FL

Flood Scenario: Hartford_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 9 square miles and contains 927 census blocks. The region contains over 47 thousand households and has a total population of 121,029 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 20,715 buildings in the region with a total building replacement value (excluding contents) of 18,504 million dollars. Approximately 76.90% of the buildings (and 46.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 20,715 buildings in the region which have an aggregate total replacement value of 18,504 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	8,687,229	46.9%
Commercial	5,528,732	29.9%
Industrial	655,037	3.5%
Agricultural	13,591	0.1%
Religion	527,175	2.8%
Government	1,049,763	5.7%
Education	2,042,591	11.0%
Total	**18,504,118**	**100%**

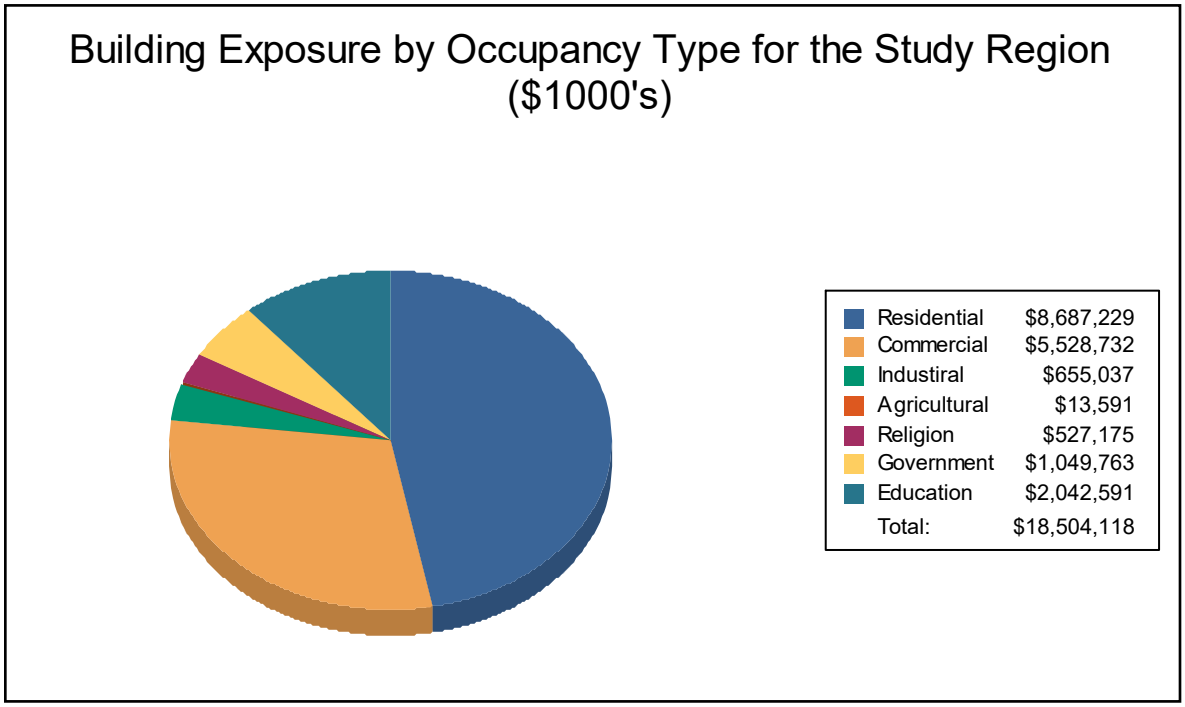
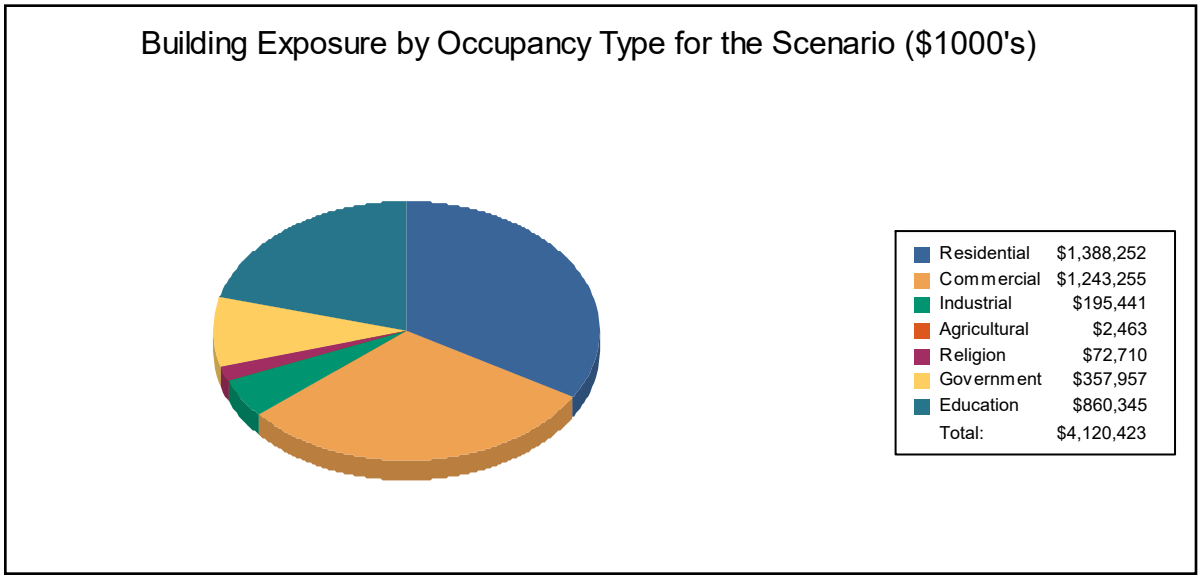


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,388,252	33.7%
Commercial	1,243,255	30.2%
Industrial	195,441	4.7%
Agricultural	2,463	0.1%
Religion	72,710	1.8%
Government	357,957	8.7%
Education	860,345	20.9%
Total	**4,120,423**	**100%**



Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds.
There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation centers.

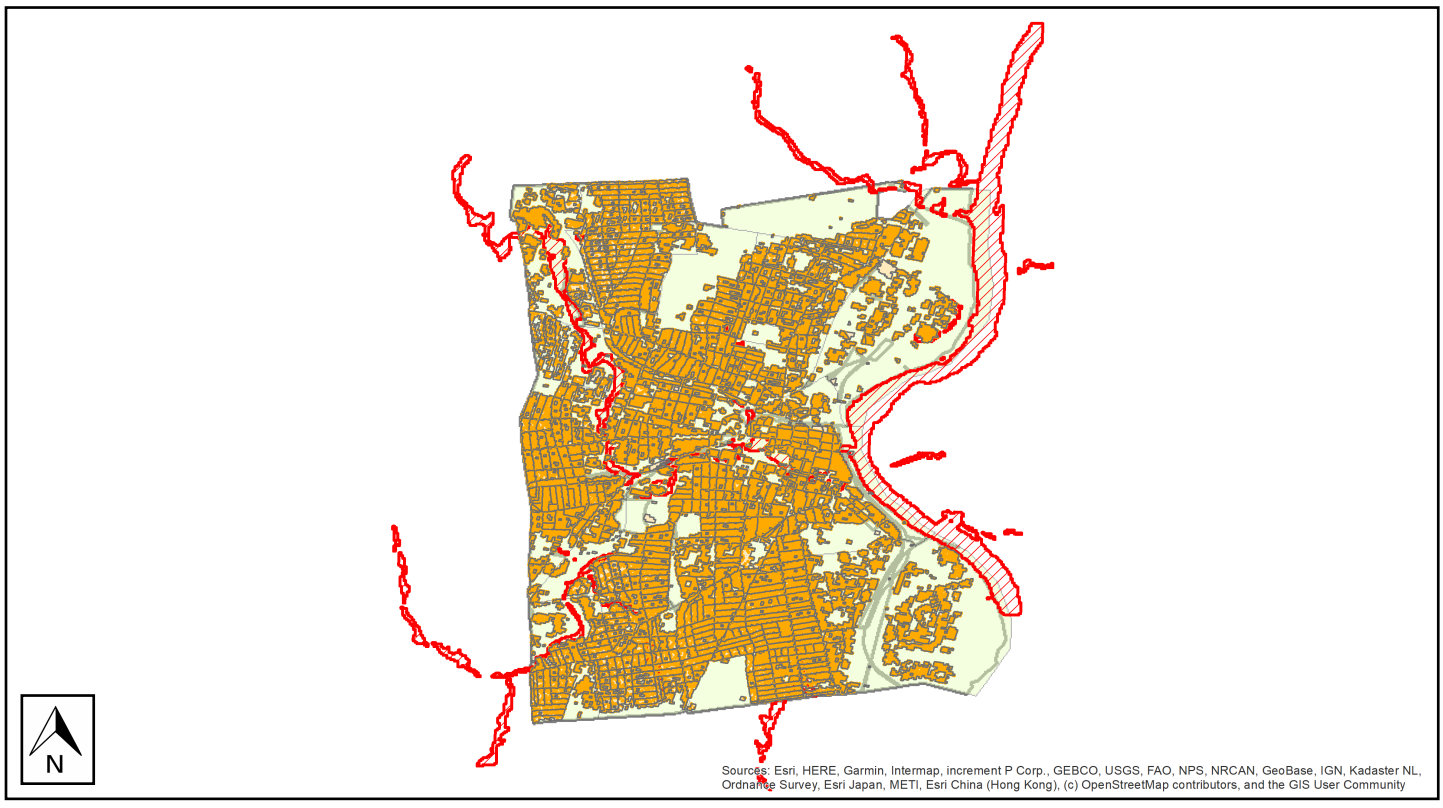
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hartford_FL
Scenario Name:	Hartford_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 35 buildings will be at least moderately damaged. This is over 68% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

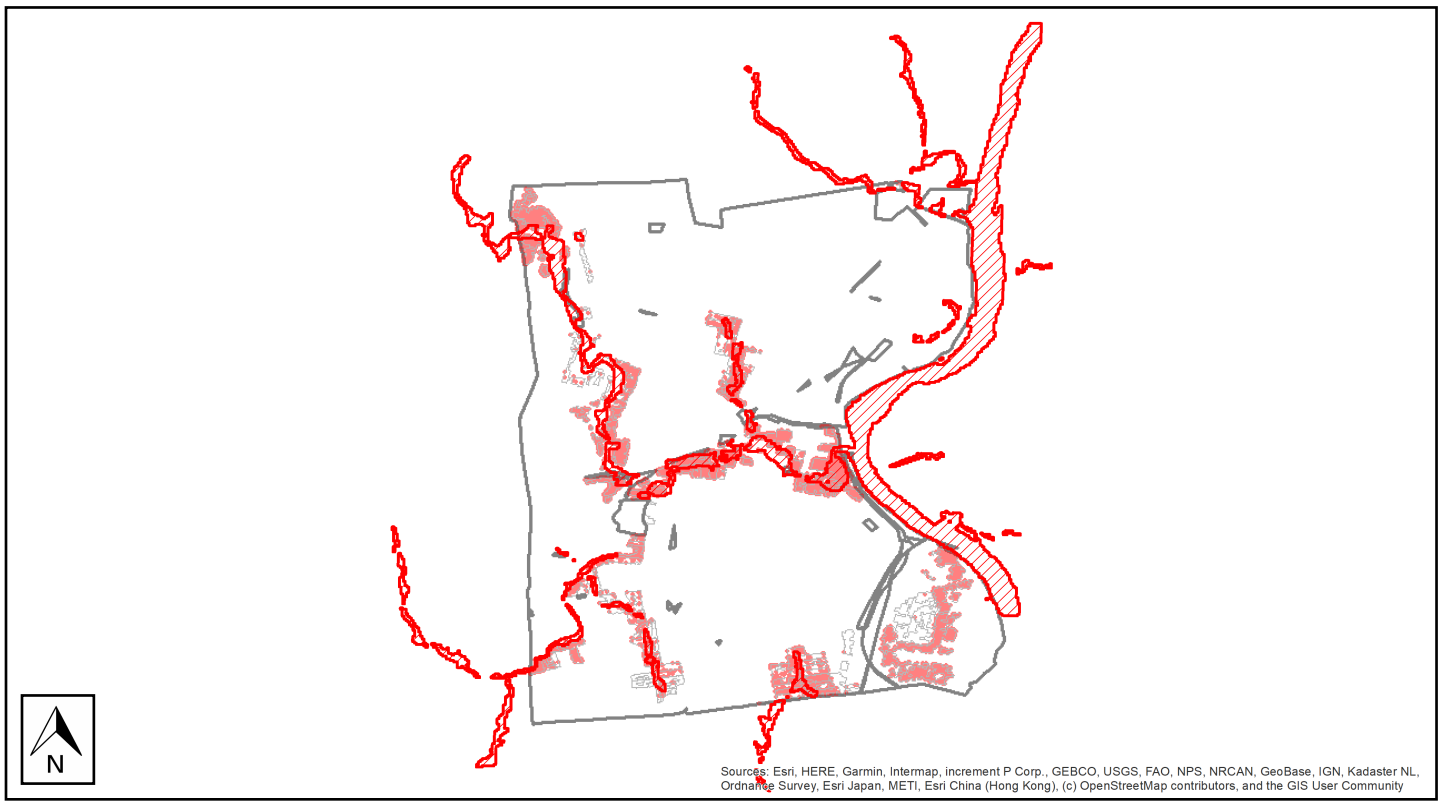


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	9	2	18	4	36	1	9	3	27	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	6	100	0	0	0	0	0	0	0	0
Industrial	0	0	1	50	1	50	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	43	73	15	25	1	2	0	0	0	0	0	0
Total	**44**		**25**		**6**		**1**		**3**		**0**	

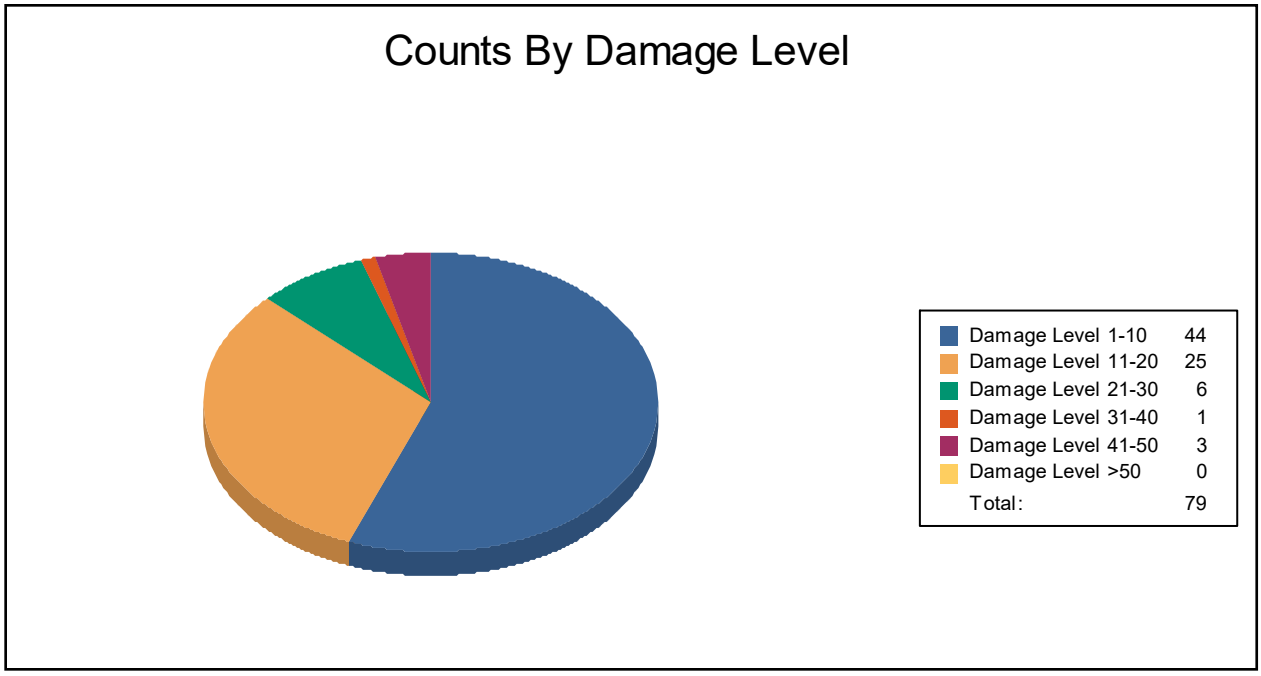


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	20	2	40	1	20	0	0	1	20	0	0
Steel	0	0	6	60	3	30	0	0	1	10	0	0
Wood	42	71	15	25	1	2	0	0	1	2	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 1,731 hospital beds available for use. On the day of the scenario flood event, the model estimates that 1,731 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	2	0	0	0
Fire Stations	12	0	0	0
Hospitals	5	0	0	0
Police Stations	7	0	0	0
Schools	62	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

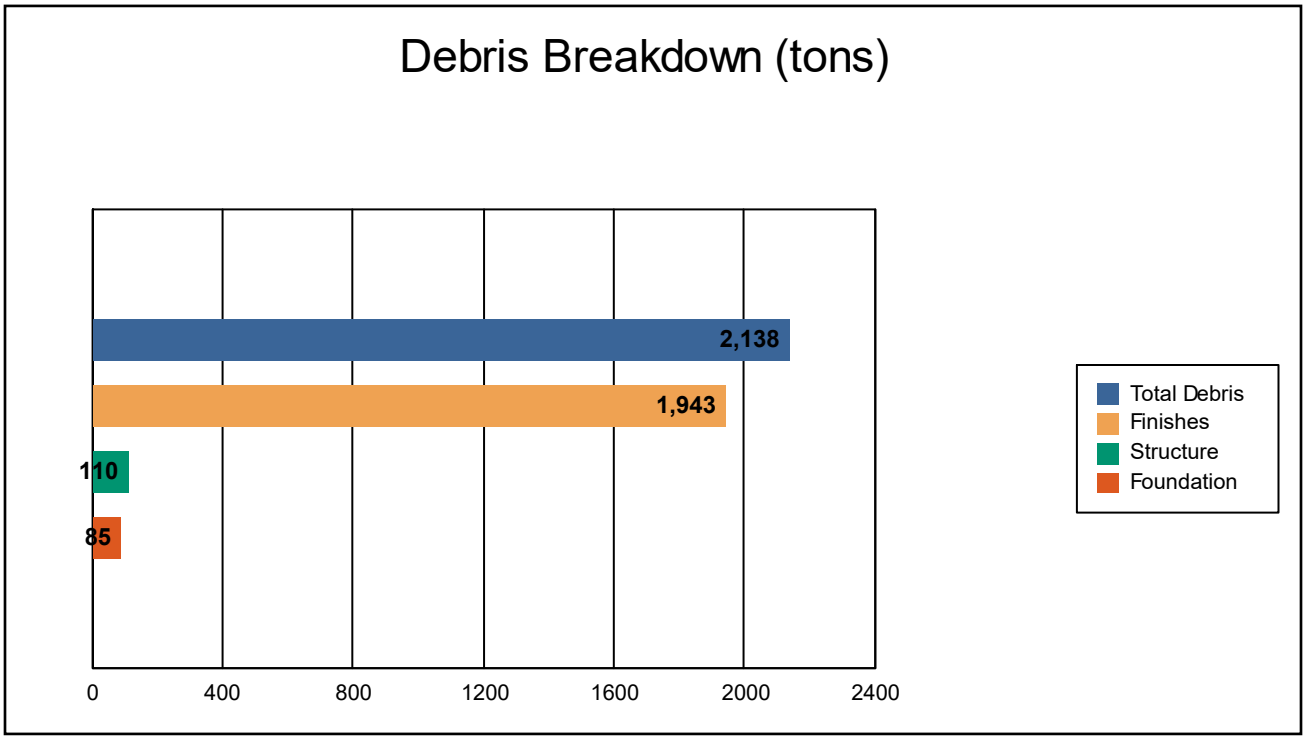
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

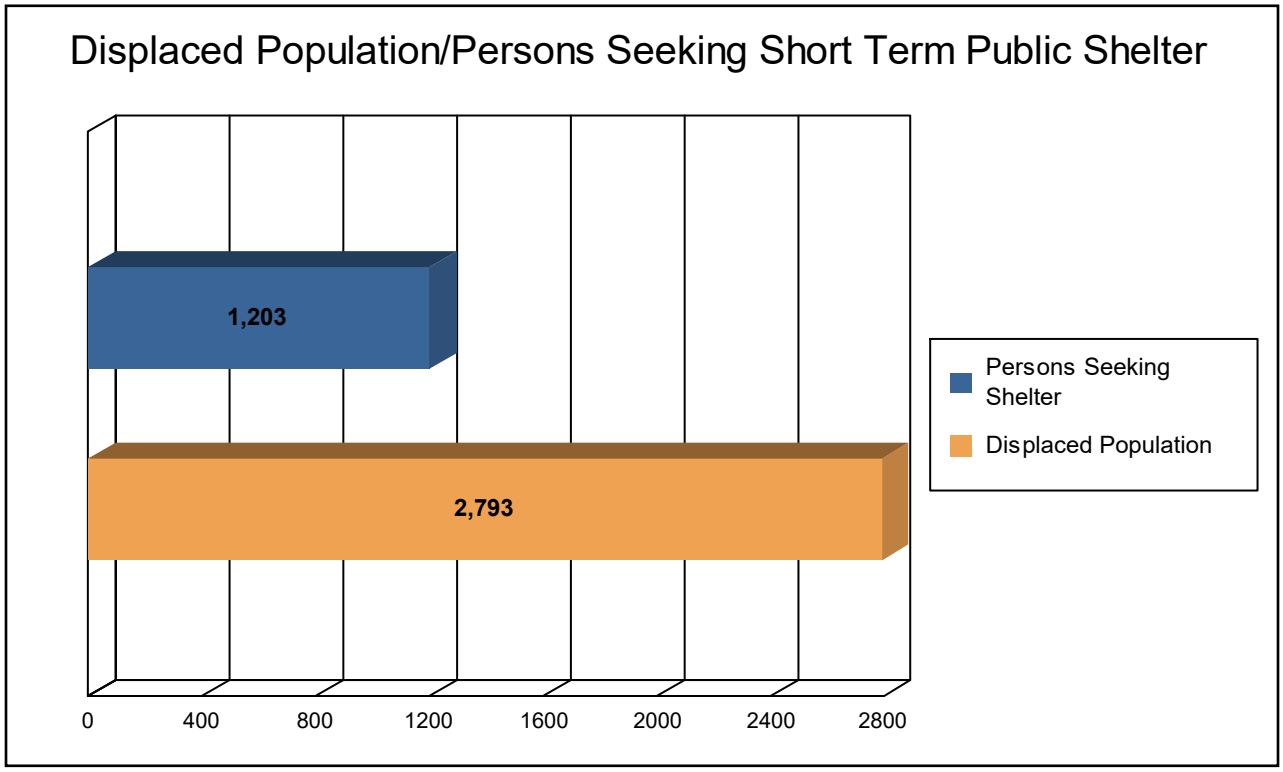


The model estimates that a total of 2,138 tons of debris will be generated. Of the total amount, Finishes comprises 91% of the total, Structure comprises 5% of the total, and Foundation comprises 4%. If the debris tonnage is converted into an estimated number of truckloads, it will require 86 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 931 households (or 2,793 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,203 people (out of a total population of 121,029) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 743.78 million dollars, which represents 18.05 % of the total replacement value of the scenario buildings.

Building-Related Losses

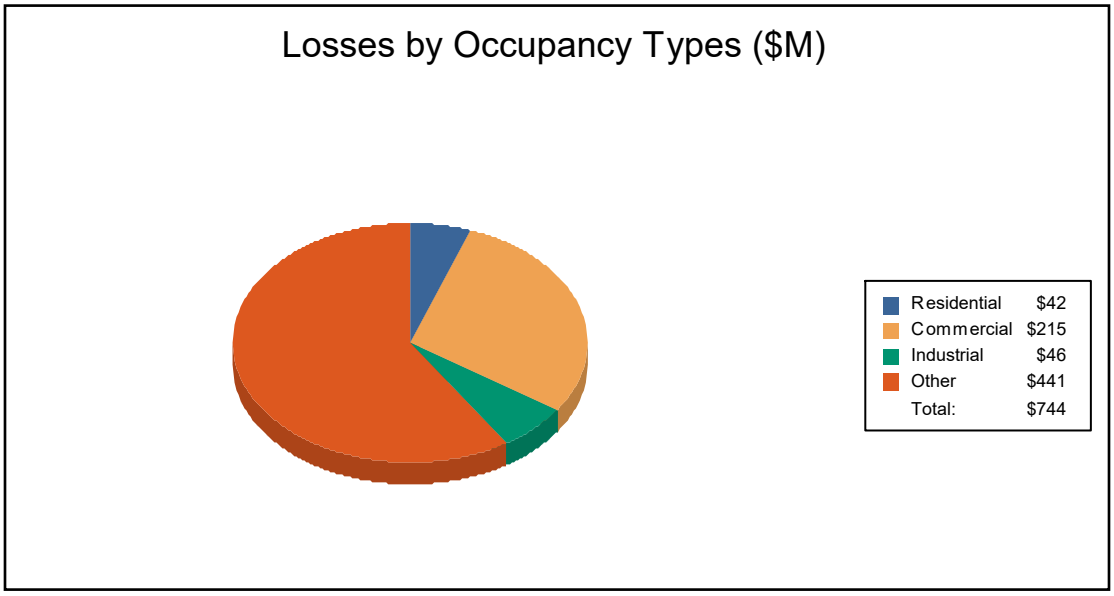
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 275.61 million dollars. 63% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 5.62% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	15.56	22.54	10.07	14.92	63.09
	Content	12.08	67.11	28.01	92.80	199.99
	Inventory	0.00	8.13	4.35	0.06	12.53
	Subtotal	**27.64**	**97.77**	**42.43**	**107.78**	**275.61**
Business Interruption						
	Income	0.70	48.43	1.02	24.85	75.00
	Relocation	5.10	12.67	0.81	19.85	38.42
	Rental Income	6.66	9.18	0.43	6.07	22.34
	Wage	1.67	46.84	1.72	282.17	332.40
	Subtotal	**14.13**	**117.12**	**3.98**	**332.94**	**468.16**
ALL	**Total**	**41.77**	**214.89**	**46.40**	**440.72**	**743.78**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	121,029	8,687,229	9,816,889	18,504,118
Total	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**
Total Study Region	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**

Hazus: Flood Global Risk Report

Region Name: Hartford_FL

Flood Scenario: Hartford_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 9 square miles and contains 927 census blocks. The region contains over 47 thousand households and has a total population of 121,029 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 20,715 buildings in the region with a total building replacement value (excluding contents) of 18,504 million dollars. Approximately 76.90% of the buildings (and 46.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 20,715 buildings in the region which have an aggregate total replacement value of 18,504 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	8,687,229	46.9%
Commercial	5,528,732	29.9%
Industrial	655,037	3.5%
Agricultural	13,591	0.1%
Religion	527,175	2.8%
Government	1,049,763	5.7%
Education	2,042,591	11.0%
Total	**18,504,118**	**100%**

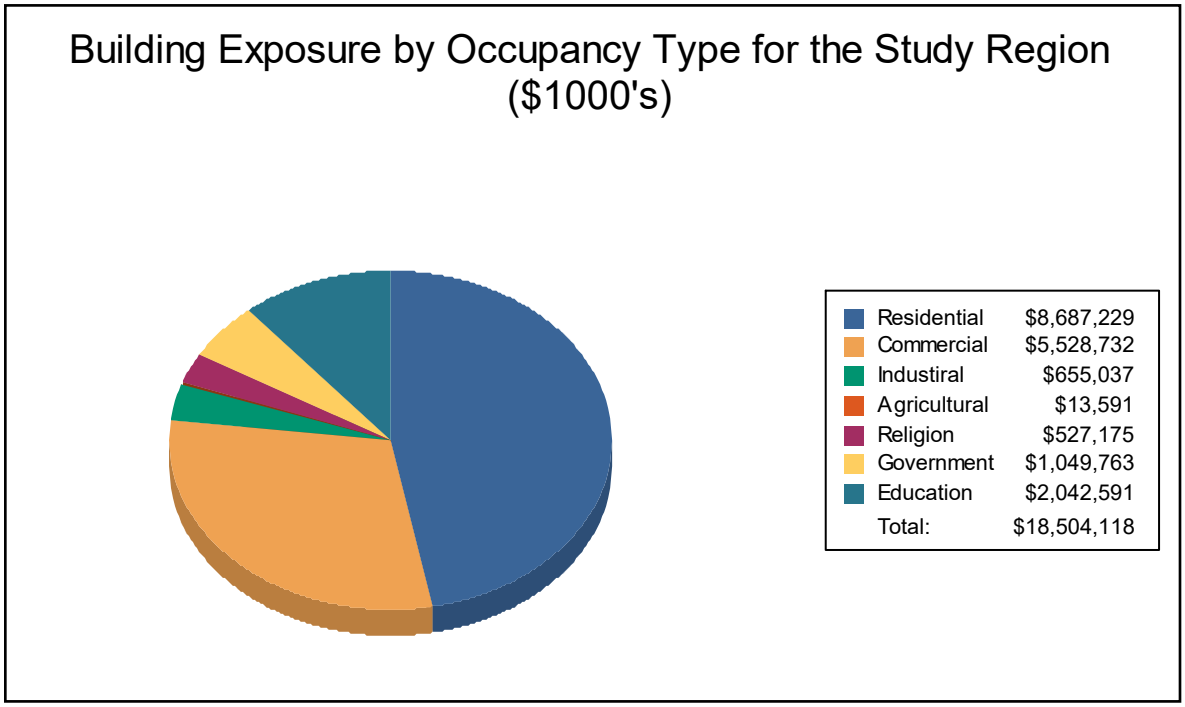
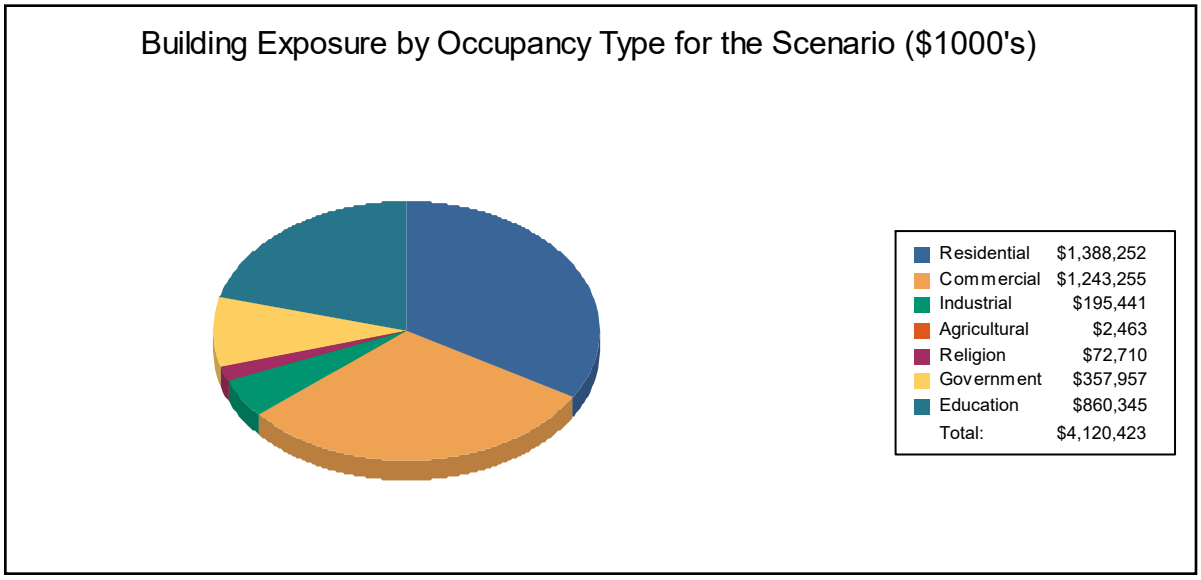


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,388,252	33.7%
Commercial	1,243,255	30.2%
Industrial	195,441	4.7%
Agricultural	2,463	0.1%
Religion	72,710	1.8%
Government	357,957	8.7%
Education	860,345	20.9%
Total	**4,120,423**	**100%**



Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds.
There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation centers.

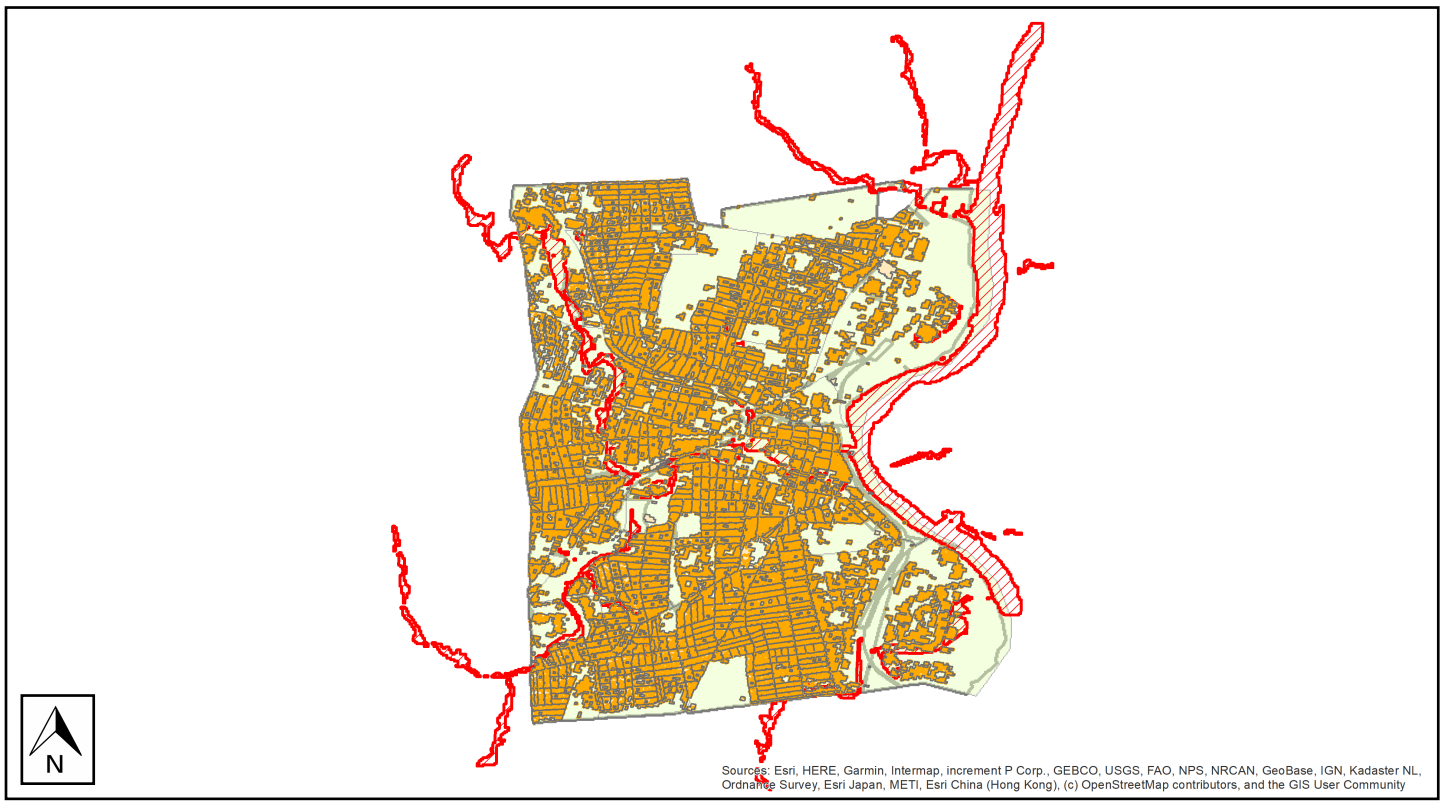
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hartford_FL
Scenario Name:	Hartford_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 36 buildings will be at least moderately damaged. This is over 69% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

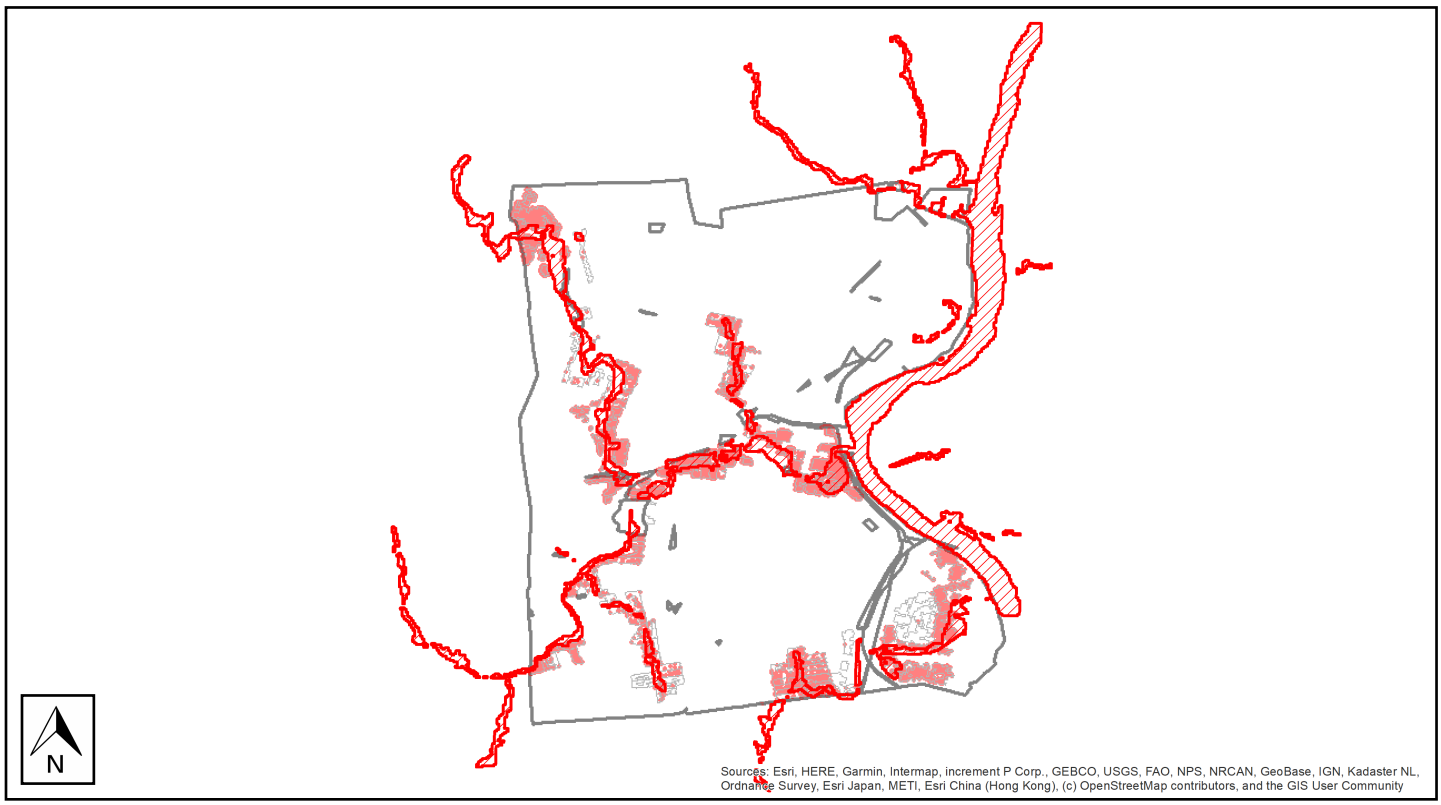


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	3	25	2	17	2	17	2	17	3	25	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	6	100	0	0	0	0	0	0	0	0
Industrial	0	0	1	33	2	67	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	53	76	16	23	1	1	0	0	0	0	0	0
Total	**56**		**26**		**5**		**2**		**3**		**0**	

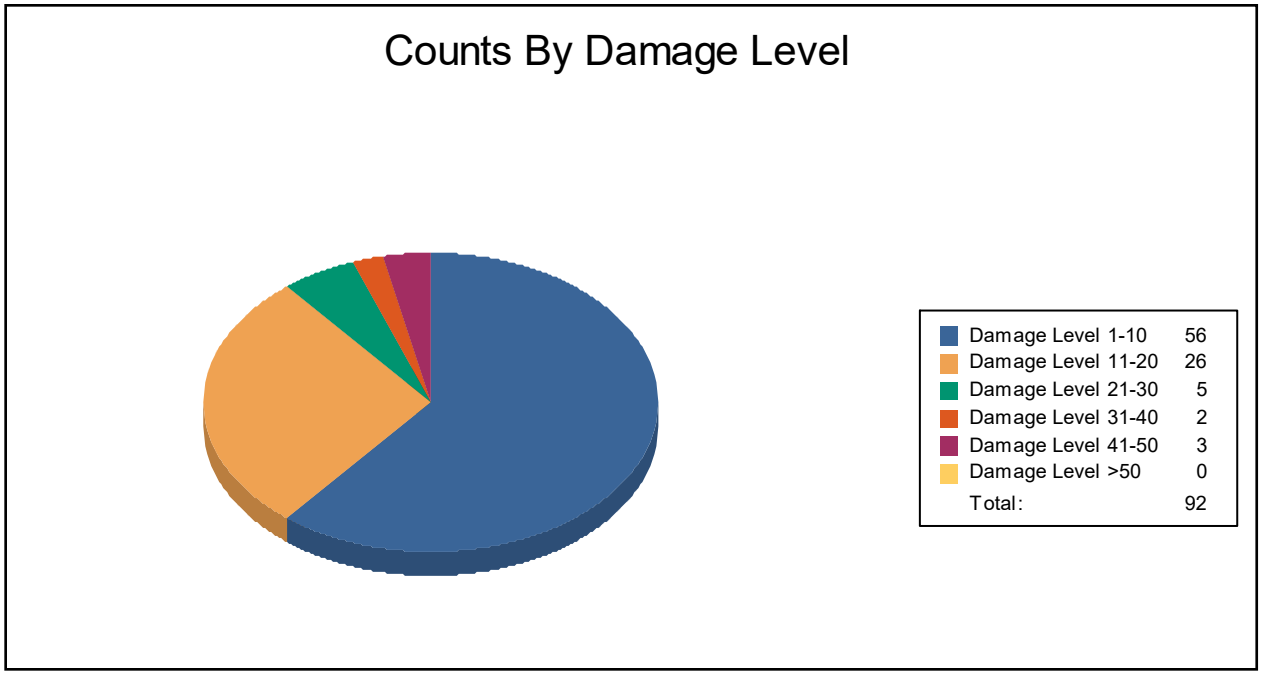


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	2	33	2	33	0	0	1	17	1	17	0	0
Steel	1	9	6	55	2	18	1	9	1	9	0	0
Wood	50	74	16	24	1	1	0	0	1	1	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 1,731 hospital beds available for use. On the day of the scenario flood event, the model estimates that 1,731 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	2	0	0	0
Fire Stations	12	0	0	0
Hospitals	5	0	0	0
Police Stations	7	0	0	0
Schools	62	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

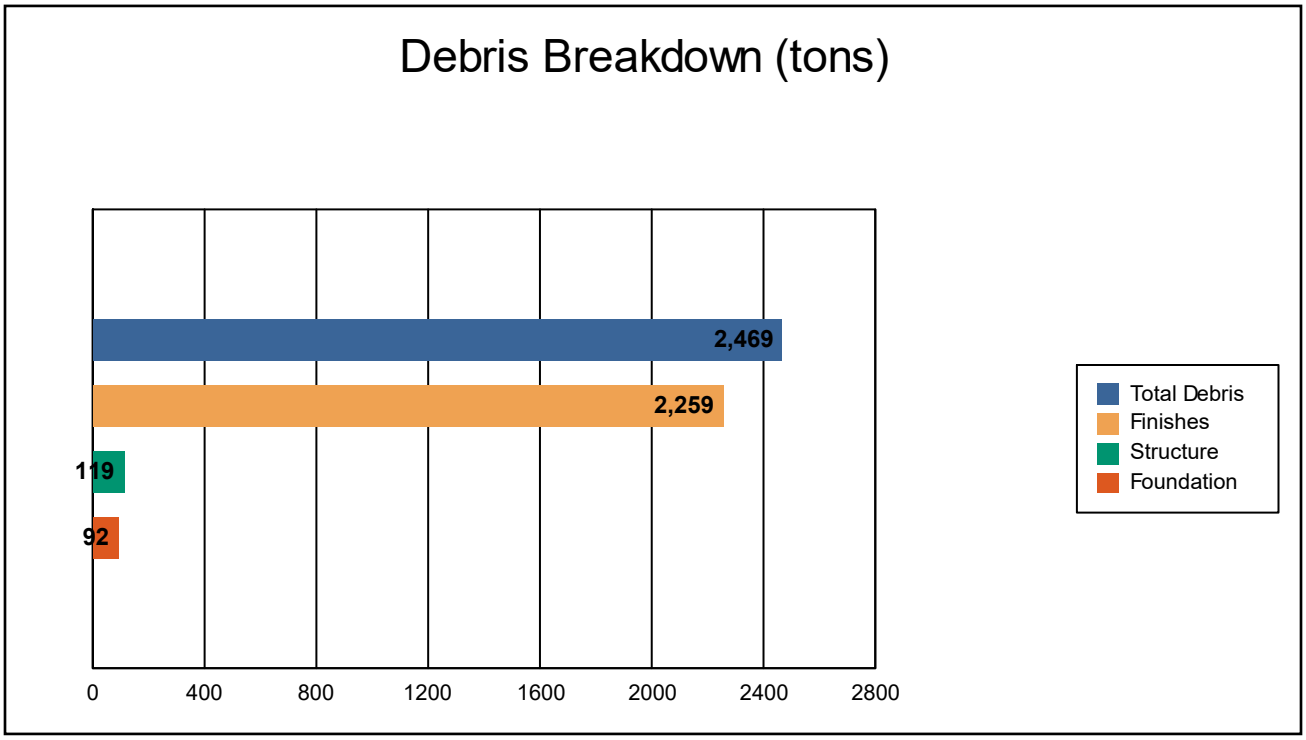
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

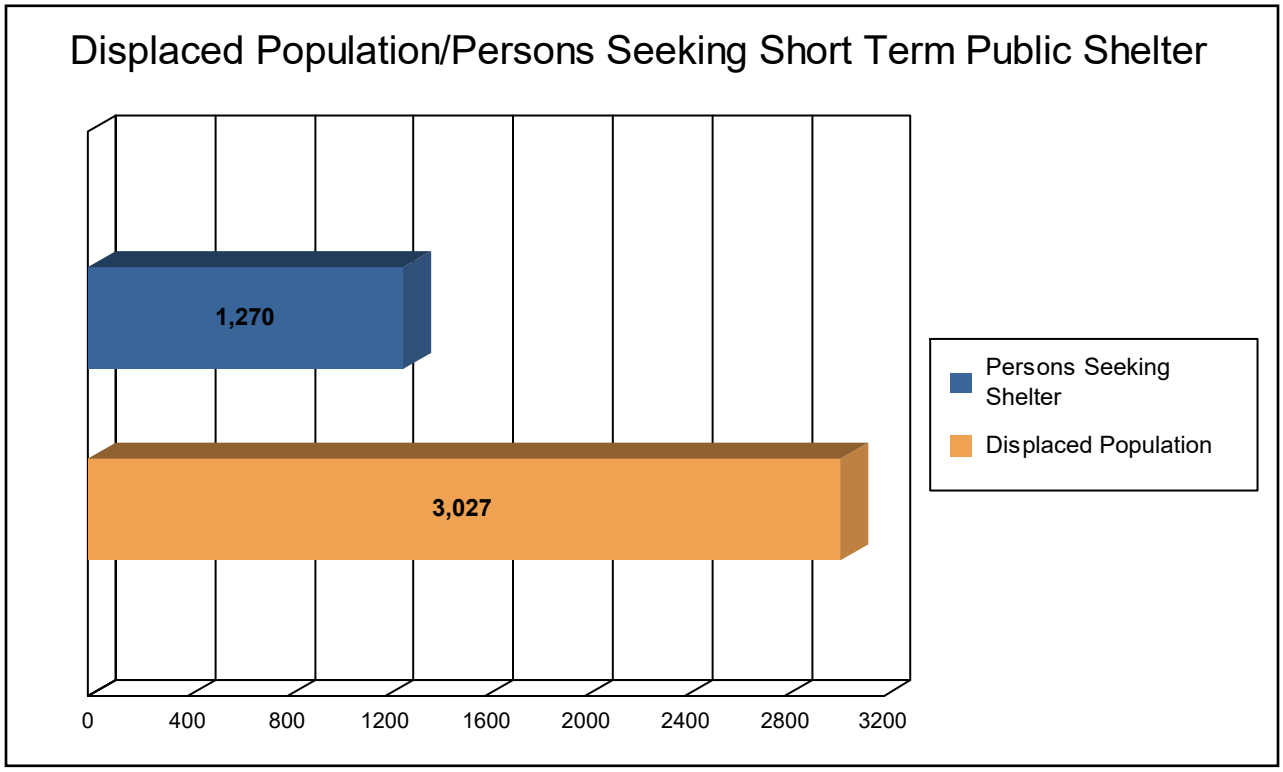


The model estimates that a total of 2,469 tons of debris will be generated. Of the total amount, Finishes comprises 91% of the total, Structure comprises 5% of the total, and Foundation comprises 4%. If the debris tonnage is converted into an estimated number of truckloads, it will require 99 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,009 households (or 3,027 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,270 people (out of a total population of 121,029) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 860.98 million dollars, which represents 20.90 % of the total replacement value of the scenario buildings.

Building-Related Losses

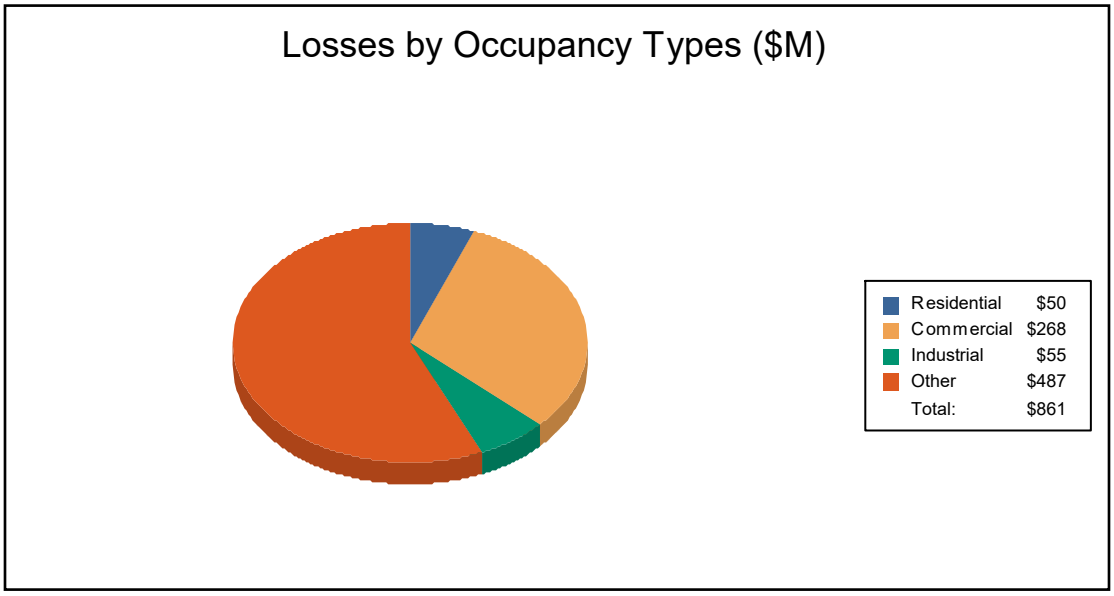
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 329.51 million dollars. 62% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 5.85% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	19.11	28.35	12.16	17.42	77.04
	Content	14.87	82.36	33.12	107.10	237.46
	Inventory	0.00	9.85	5.09	0.09	15.02
	Subtotal	**33.98**	**120.56**	**50.37**	**124.61**	**329.51**
Business Interruption						
	Income	0.92	61.58	1.14	28.06	91.70
	Relocation	5.64	15.94	0.94	21.85	44.37
	Rental Income	7.67	11.58	0.47	6.58	26.30
	Wage	2.18	58.60	1.94	306.38	369.09
	Subtotal	**16.41**	**147.70**	**4.49**	**362.87**	**531.47**
ALL	**Total**	**50.39**	**268.26**	**54.86**	**487.48**	**860.98**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	121,029	8,687,229	9,816,889	18,504,118
Total	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**
Total Study Region	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**

Hazus: Flood Global Risk Report

Region Name: Hartford_FL

Flood Scenario: Hartford_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 9 square miles and contains 927 census blocks. The region contains over 47 thousand households and has a total population of 121,029 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 20,715 buildings in the region with a total building replacement value (excluding contents) of 18,504 million dollars. Approximately 76.90% of the buildings (and 46.95% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 20,715 buildings in the region which have an aggregate total replacement value of 18,504 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	8,687,229	46.9%
Commercial	5,528,732	29.9%
Industrial	655,037	3.5%
Agricultural	13,591	0.1%
Religion	527,175	2.8%
Government	1,049,763	5.7%
Education	2,042,591	11.0%
Total	**18,504,118**	**100%**

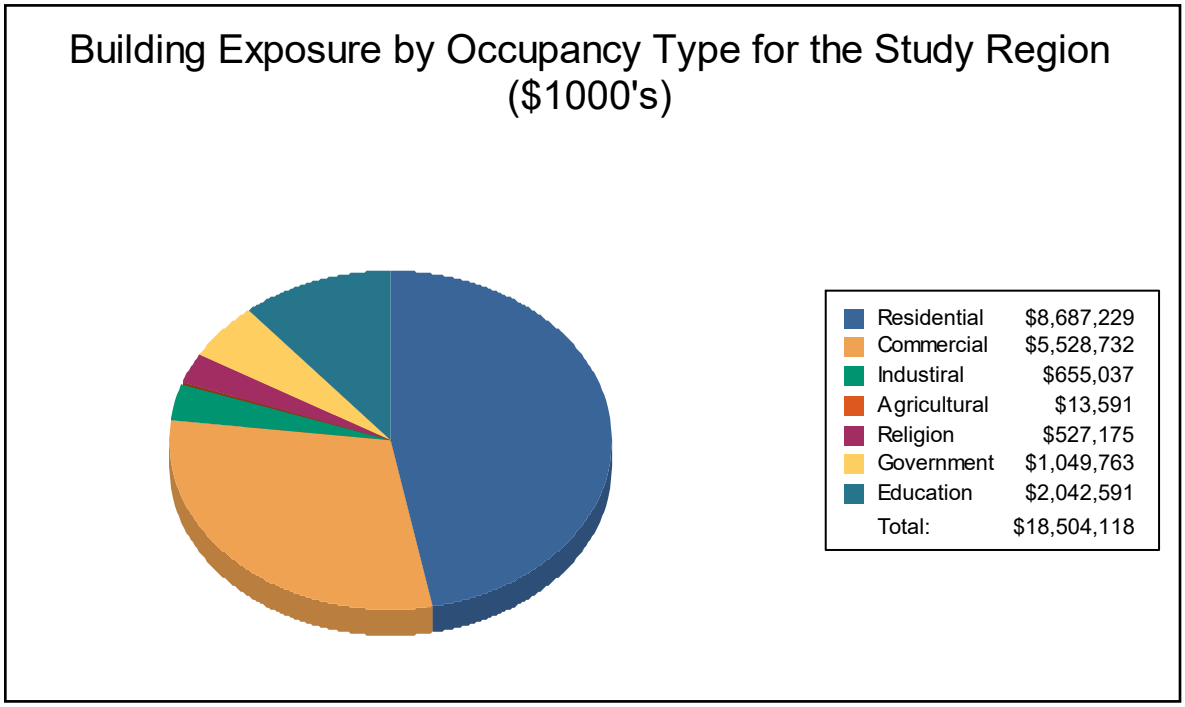
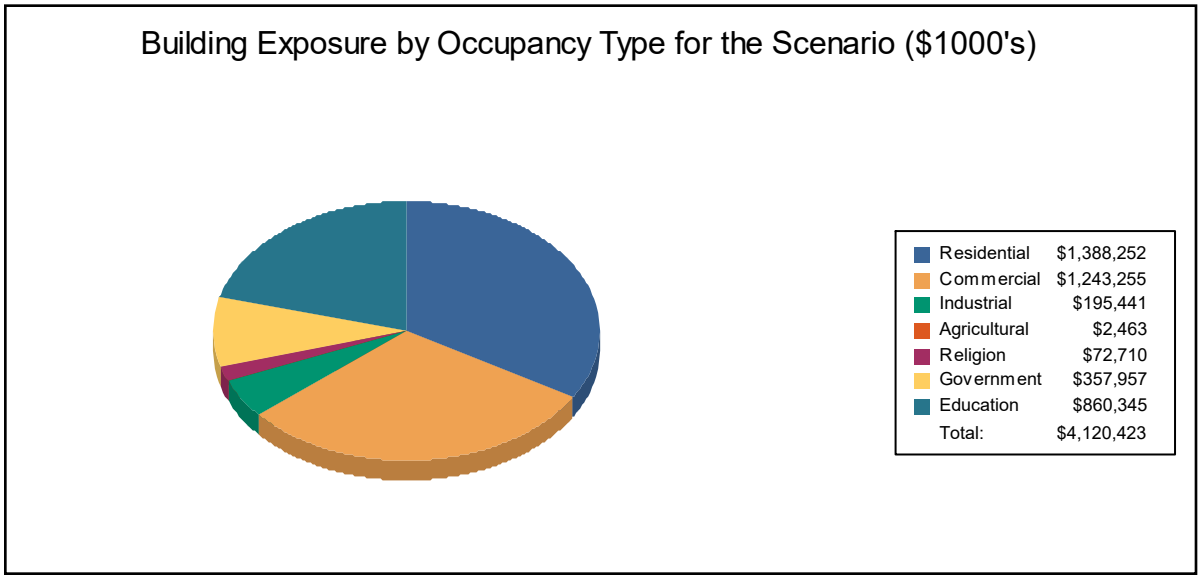


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,388,252	33.7%
Commercial	1,243,255	30.2%
Industrial	195,441	4.7%
Agricultural	2,463	0.1%
Religion	72,710	1.8%
Government	357,957	8.7%
Education	860,345	20.9%
Total	**4,120,423**	**100%**



Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds.
There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation centers.

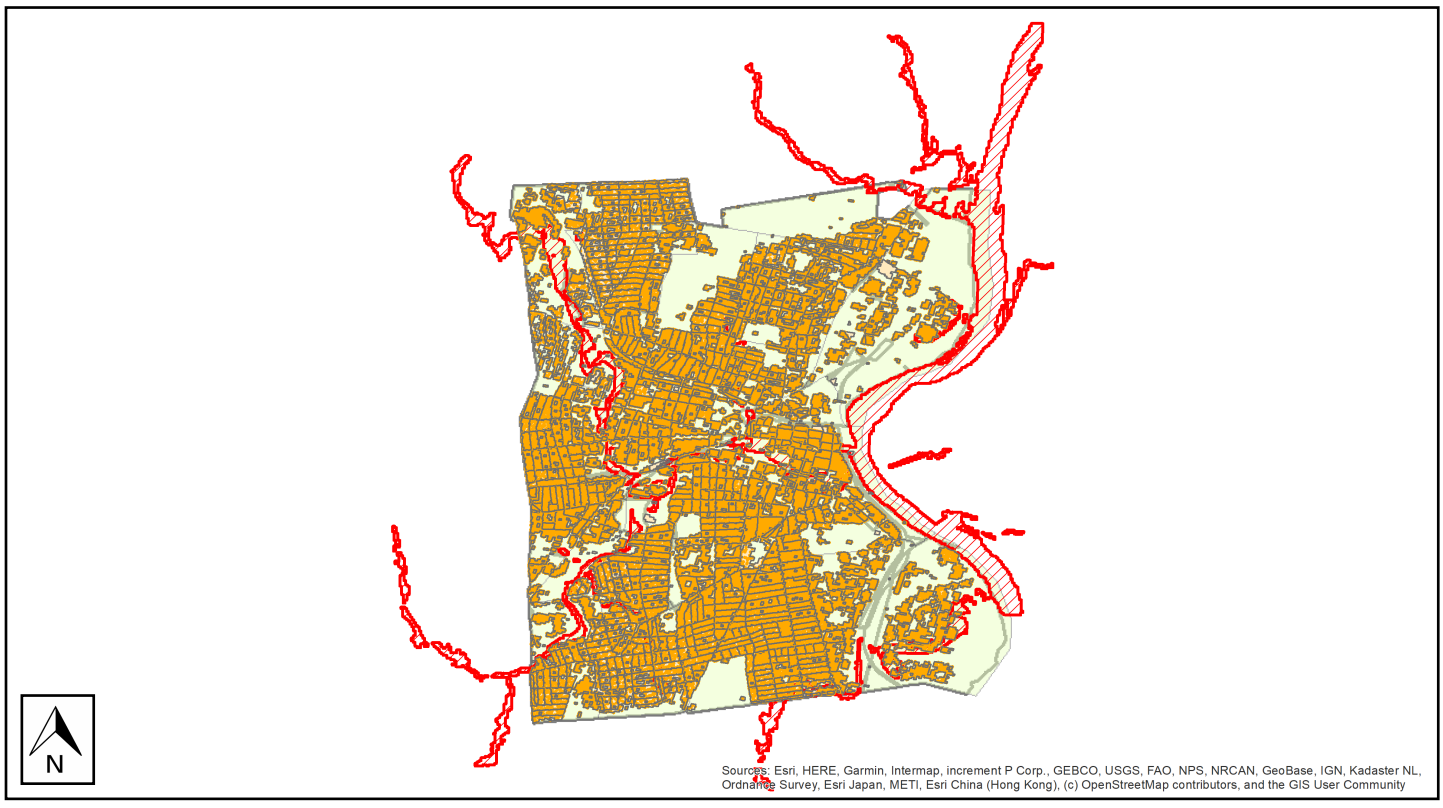
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hartford_FL
Scenario Name:	Hartford_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 58 buildings will be at least moderately damaged. This is over 66% of the total number of buildings in the scenario. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

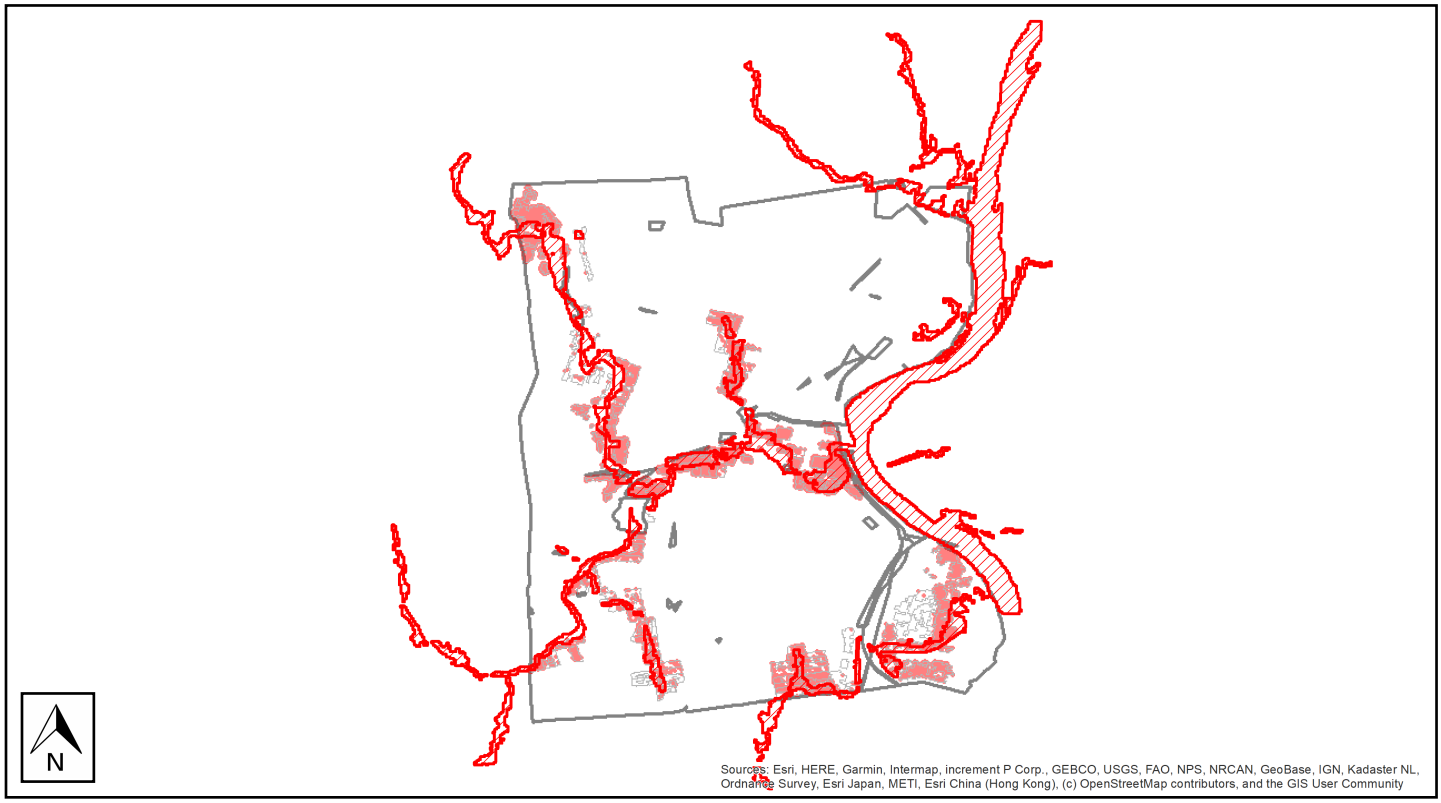


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	5	28	3	17	1	6	6	33	0	0	3	17
Education	1	100	0	0	0	0	0	0	0	0	0	0
Government	1	11	8	89	0	0	0	0	0	0	0	0
Industrial	0	0	1	33	2	67	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	85	72	25	21	3	3	2	2	1	1	2	2
Total	**92**		**38**		**6**		**8**		**1**		**5**	

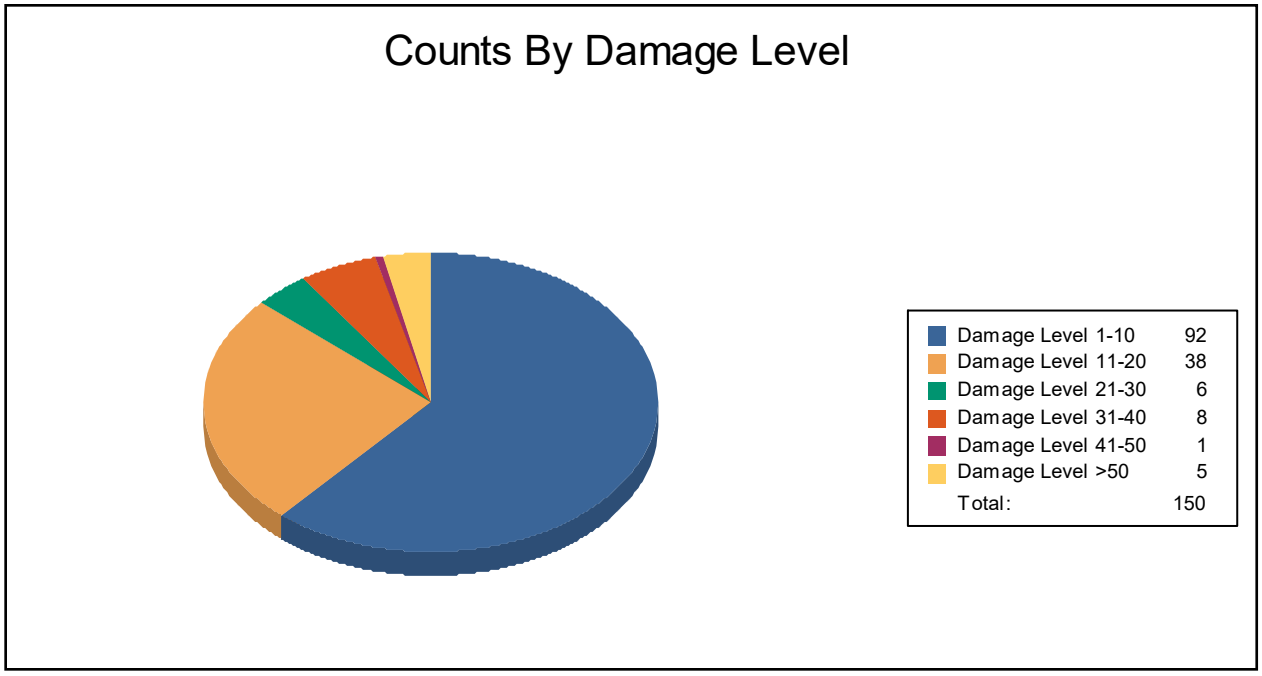


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	8	62	3	23	0	0	1	8	0	0	1	8
Steel	3	20	7	47	2	13	2	13	0	0	1	7
Wood	78	71	23	21	3	3	2	2	1	1	3	3

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 1,731 hospital beds available for use. On the day of the scenario flood event, the model estimates that 1,731 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	2	0	0	0
Fire Stations	12	0	0	0
Hospitals	5	0	0	0
Police Stations	7	0	0	0
Schools	62	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

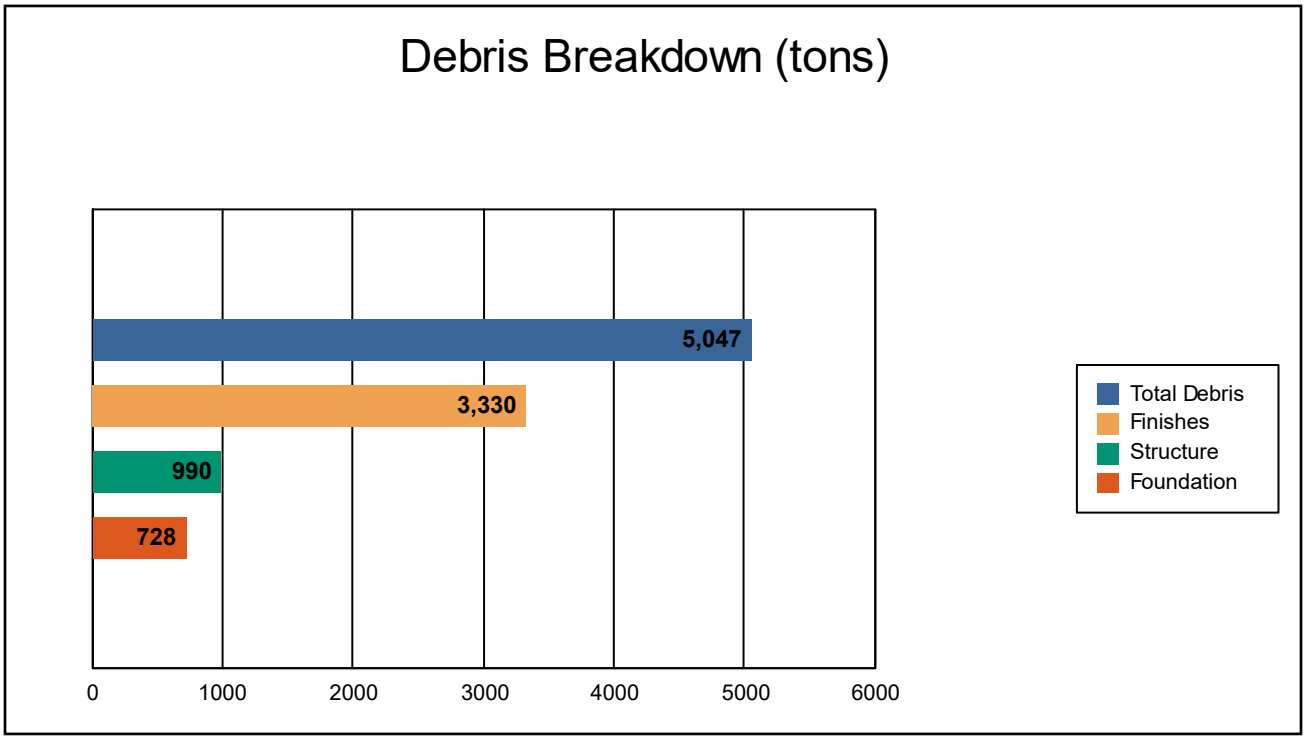
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

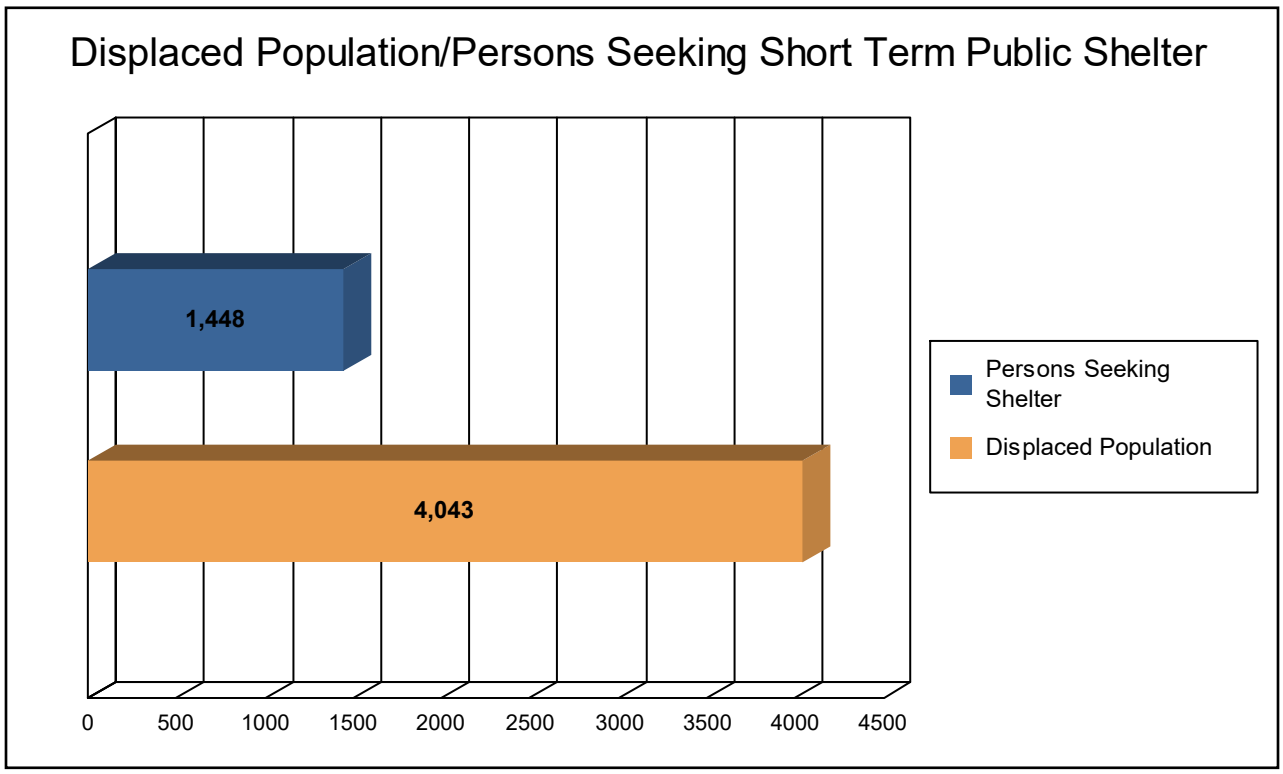


The model estimates that a total of 5,047 tons of debris will be generated. Of the total amount, Finishes comprises 66% of the total, Structure comprises 20% of the total, and Foundation comprises 14%. If the debris tonnage is converted into an estimated number of truckloads, it will require 202 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,348 households (or 4,043 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,448 people (out of a total population of 121,029) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 1,138.91 million dollars, which represents 27.64 % of the total replacement value of the scenario buildings.

Building-Related Losses

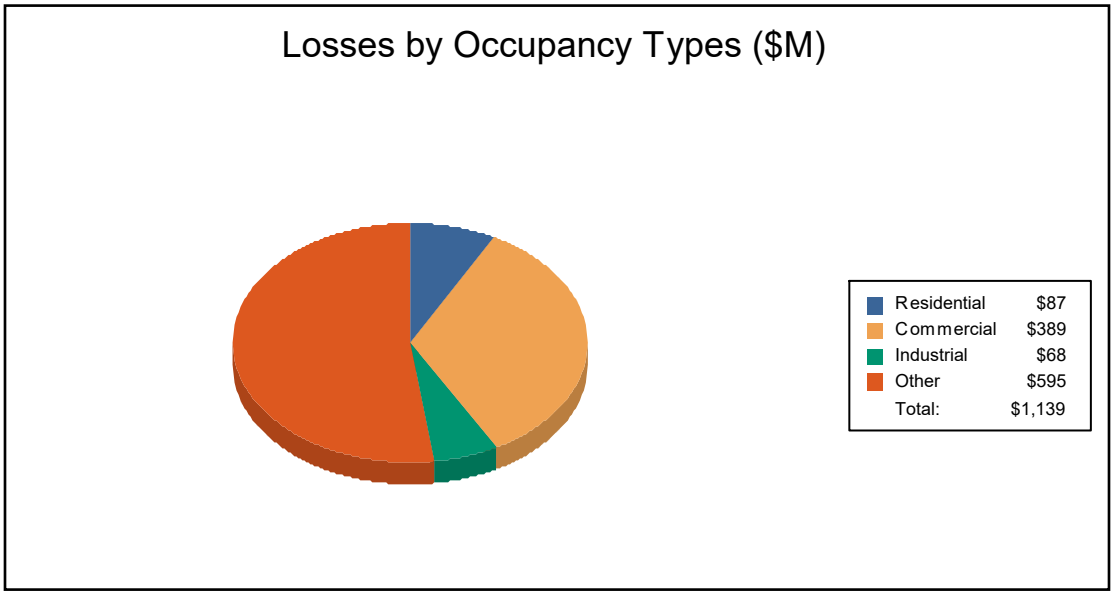
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 457.79 million dollars. 60% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 7.66% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	33.42	43.70	15.46	21.71	114.28
	Content	25.59	121.64	41.08	133.20	321.50
	Inventory	0.00	15.69	6.15	0.16	22.01
	Subtotal	**59.00**	**181.03**	**62.69**	**155.07**	**457.79**
Business Interruption						
	Income	2.04	86.93	1.34	44.03	134.33
	Relocation	8.83	22.51	1.09	28.36	60.79
	Rental Income	12.52	16.31	0.55	7.51	36.88
	Wage	4.82	82.45	2.25	359.58	449.11
	Subtotal	**28.22**	**208.19**	**5.24**	**439.48**	**681.12**
ALL	**Total**	**87.22**	**389.22**	**67.92**	**594.55**	**1,138.91**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	121,029	8,687,229	9,816,889	18,504,118
Total	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**
Total Study Region	**121,029**	**8,687,229**	**9,816,889**	**18,504,118**

Hazus: Flood Global Risk Report

Region Name: Hebron_FL

Flood Scenario: Hebron_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 137 census blocks. The region contains over 3 thousand households and has a total population of 9,098 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,618 buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 90.57% of the buildings (and 76.66% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,618 buildings in the region which have an aggregate total replacement value of 1,896 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,453,518	76.7%
Commercial	177,352	9.4%
Industrial	28,615	1.5%
Agricultural	3,416	0.2%
Religion	13,771	0.7%
Government	74,889	3.9%
Education	144,412	7.6%
Total	**1,895,973**	**100%**

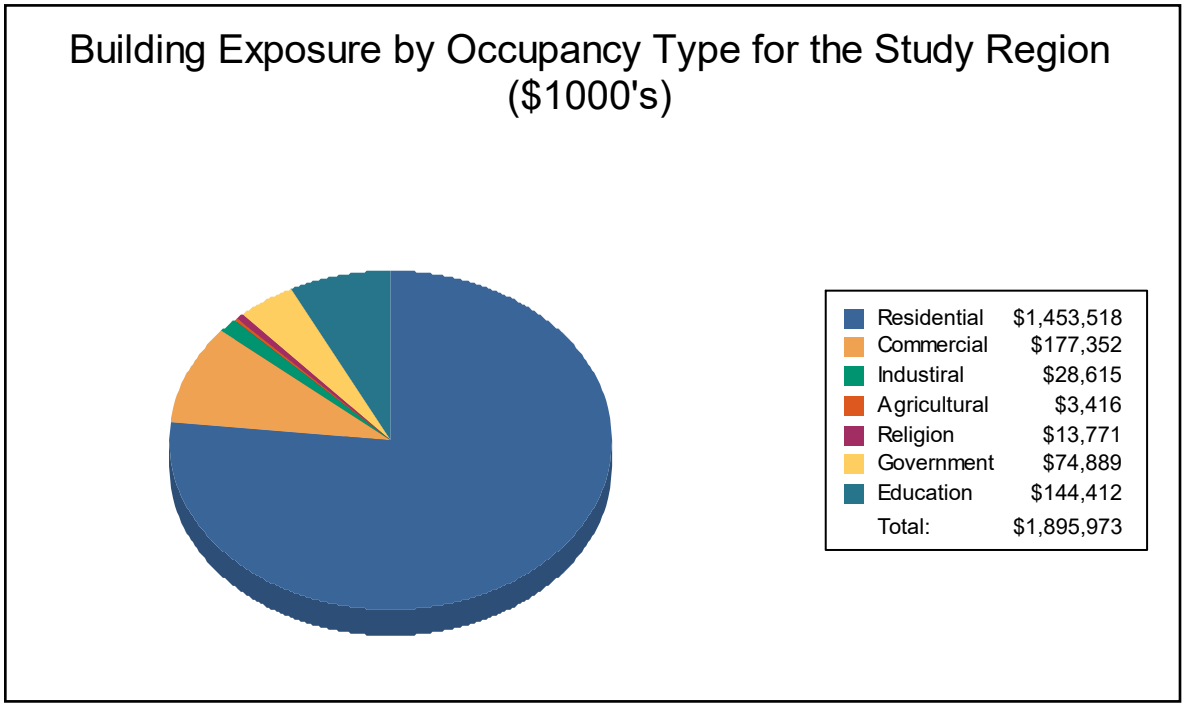
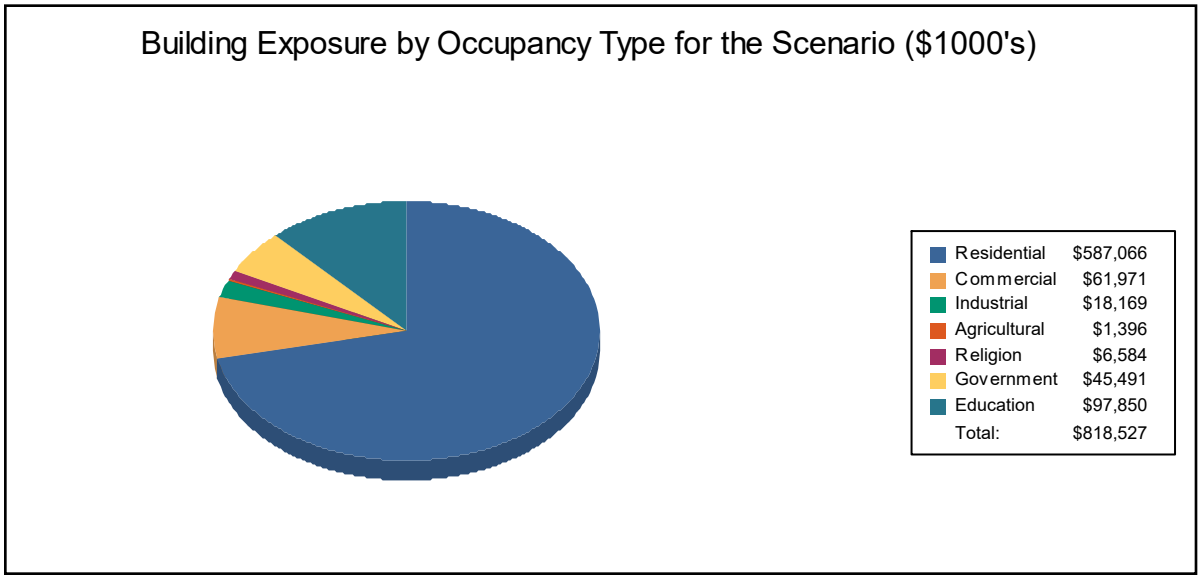


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	587,066	71.7%
Commercial	61,971	7.6%
Industrial	18,169	2.2%
Agricultural	1,396	0.2%
Religion	6,584	0.8%
Government	45,491	5.6%
Education	97,850	12.0%
Total	**818,527**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 2 fire stations, 1 police station and 1 emergency operation center.

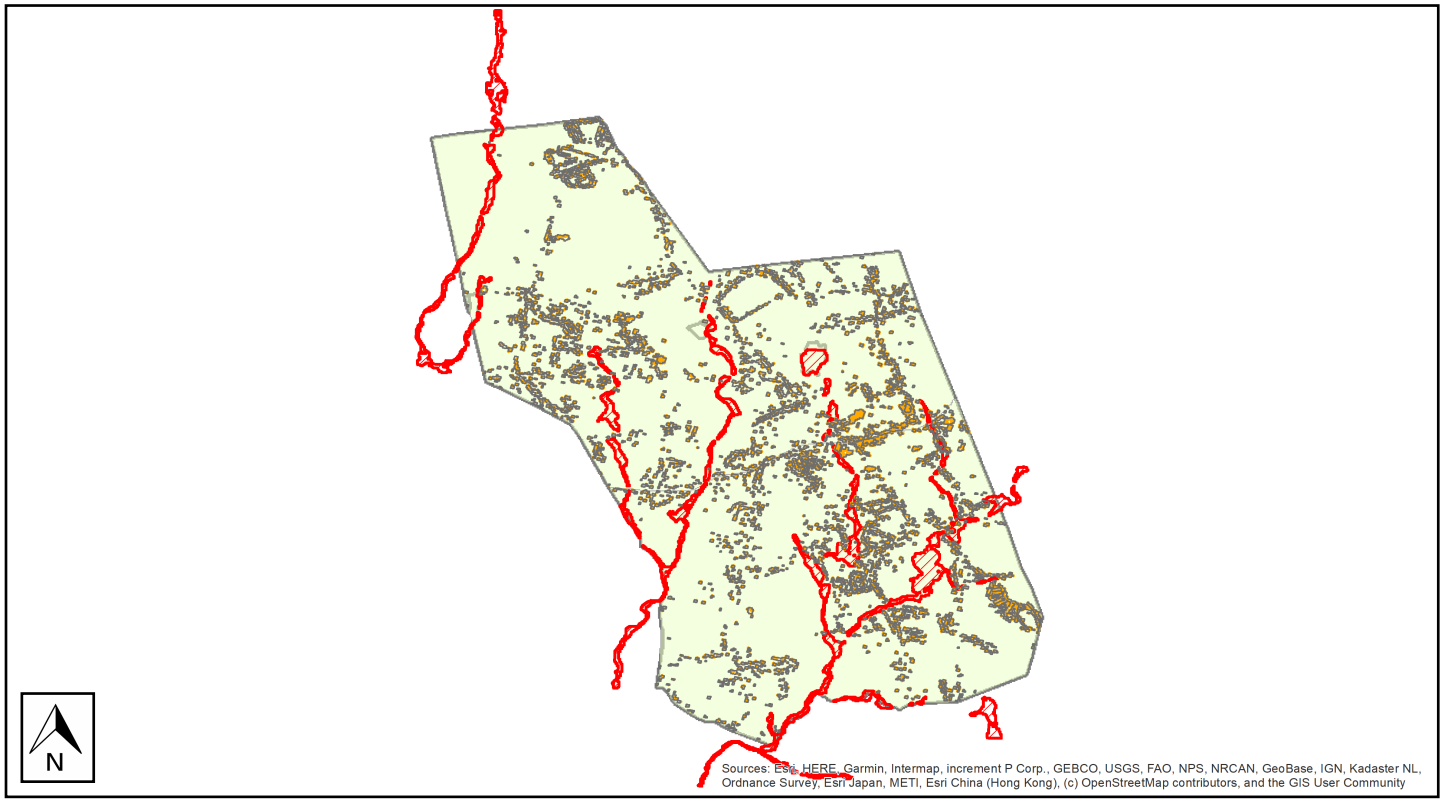
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hebron_FL
Scenario Name:	Hebron_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

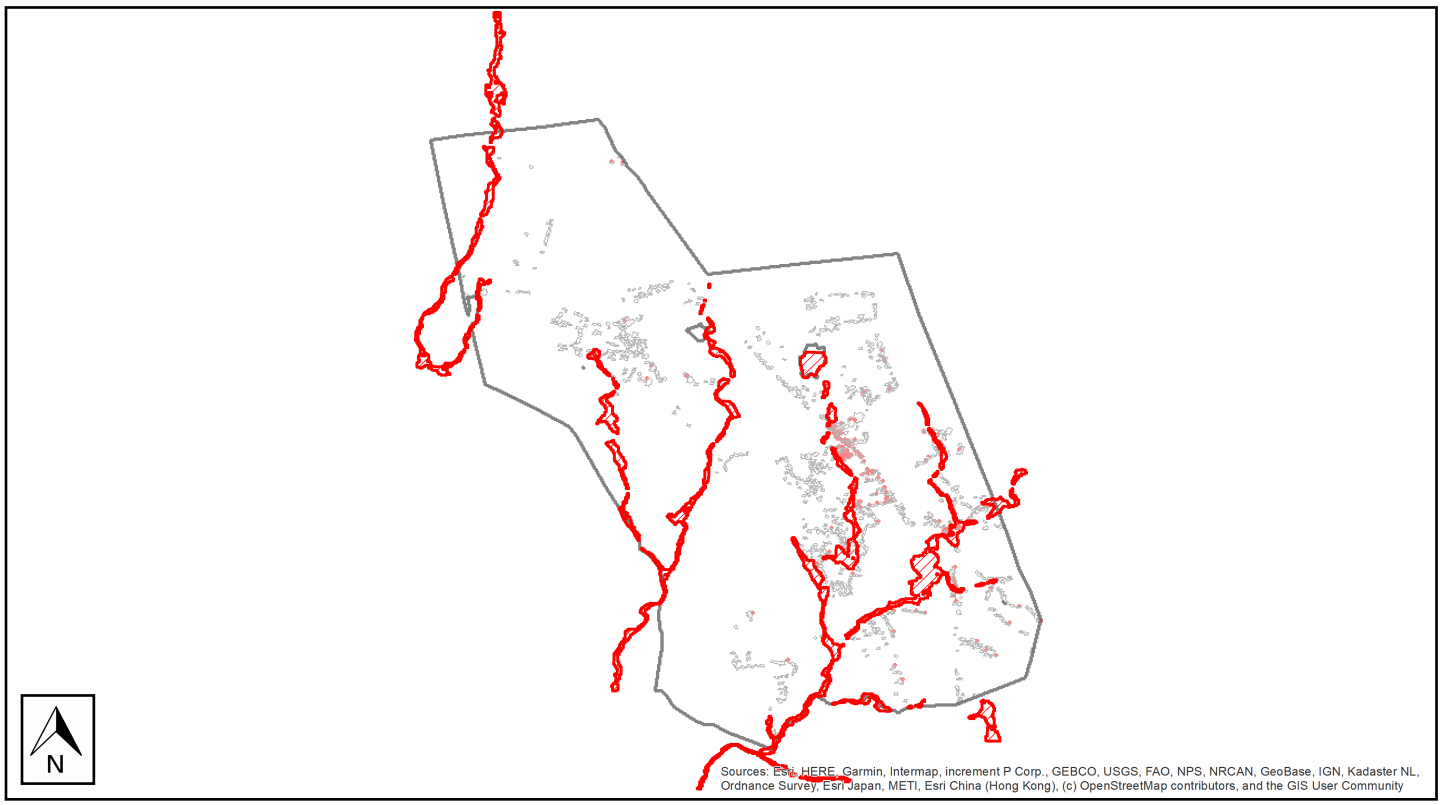


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

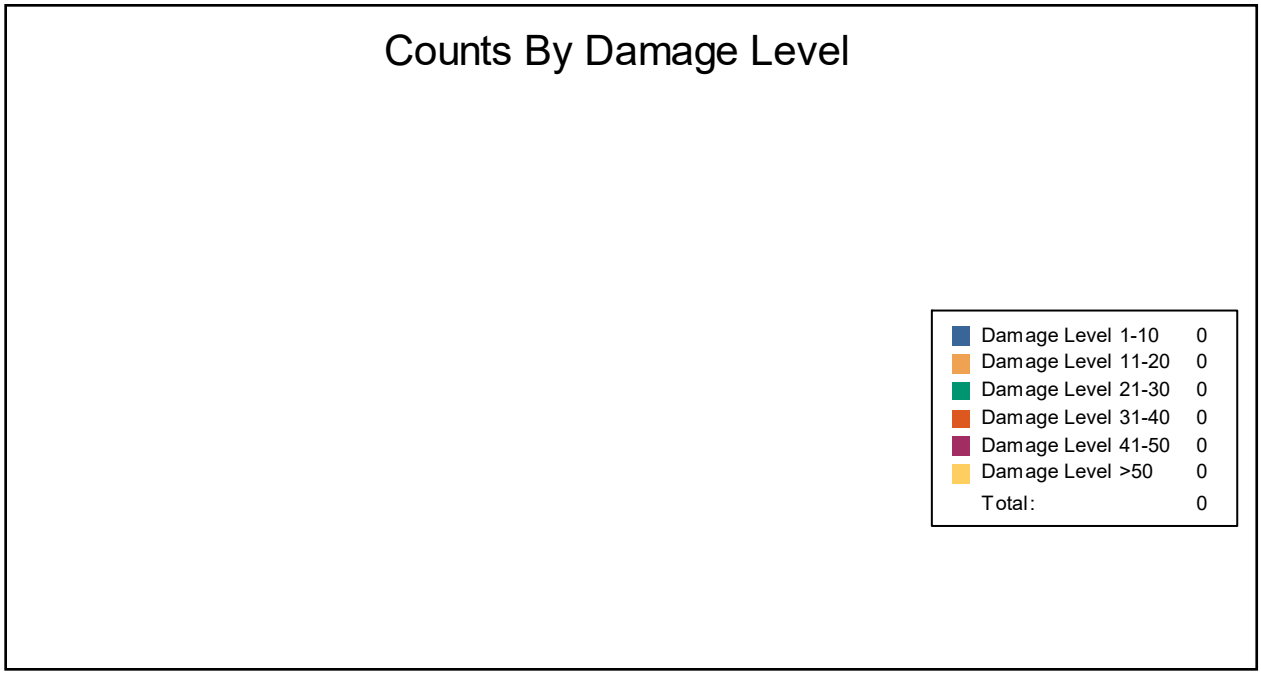


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

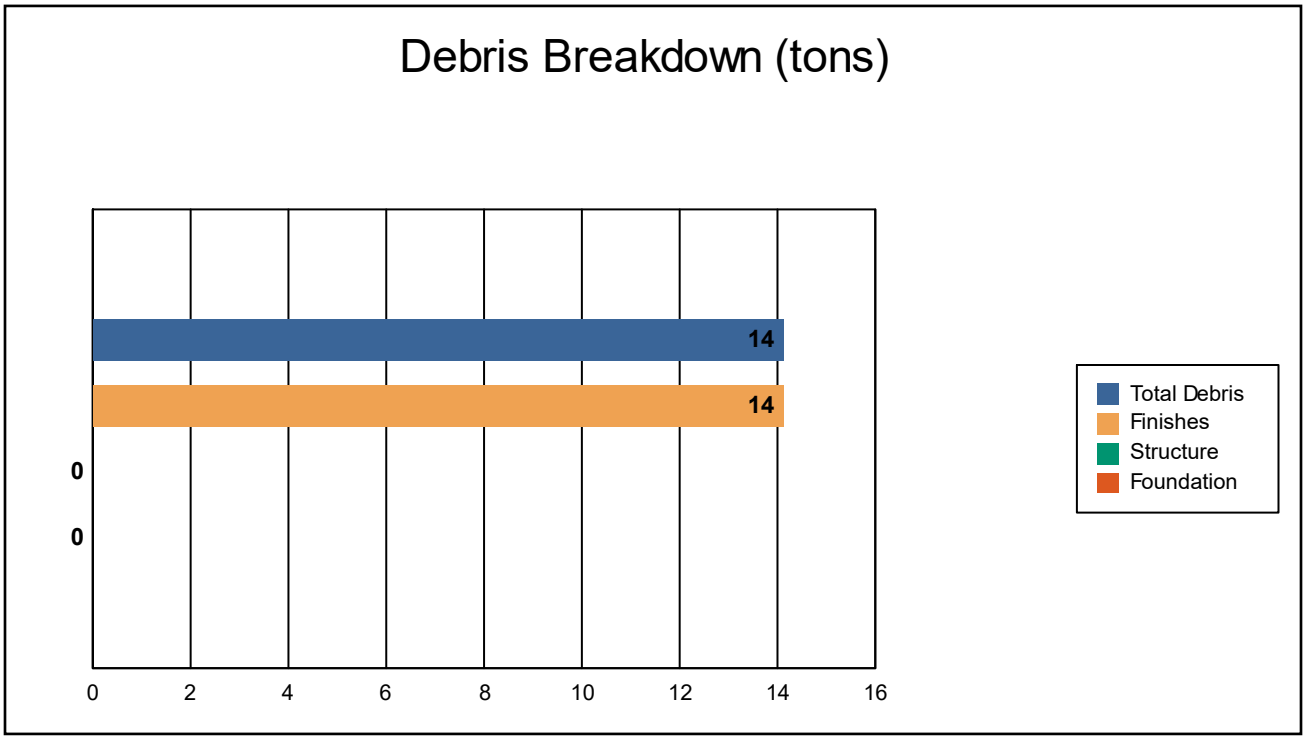
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

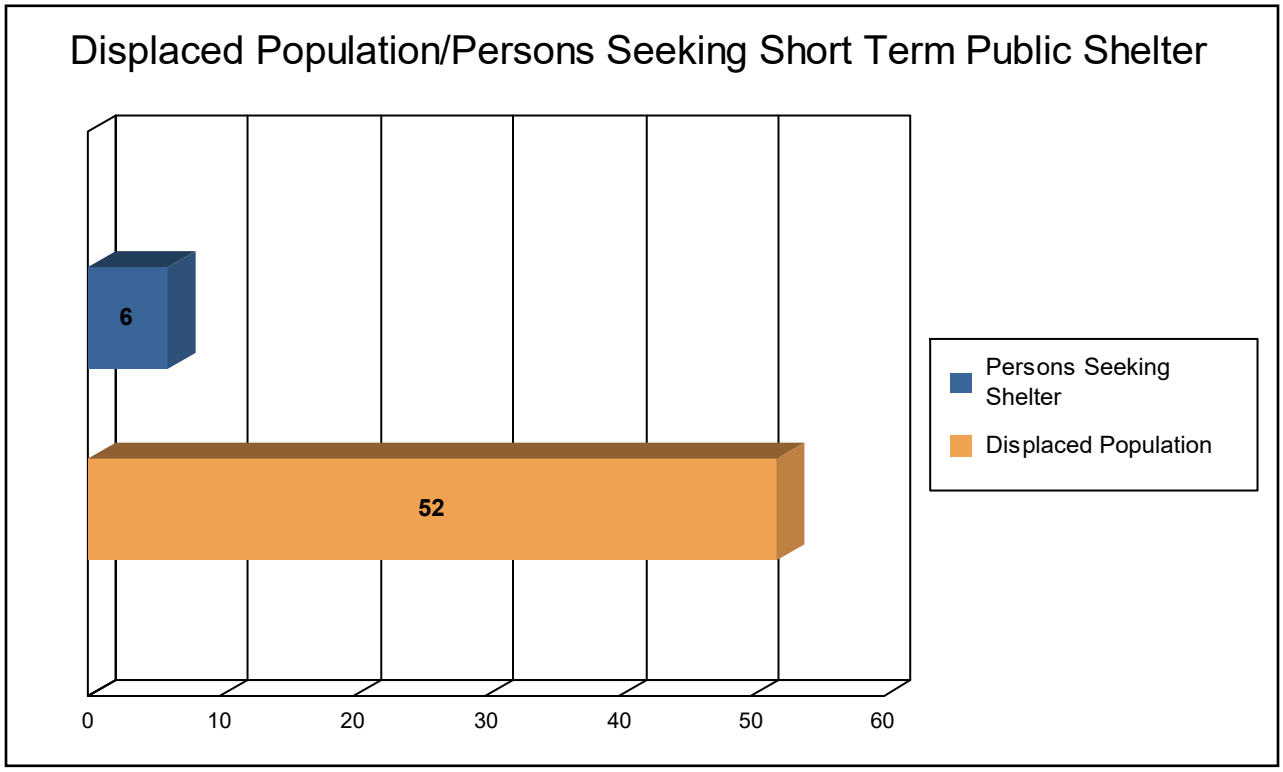


The model estimates that a total of 14 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 17 households (or 52 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 6 people (out of a total population of 9,098) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 10.34 million dollars, which represents 1.26 % of the total replacement value of the scenario buildings.

Building-Related Losses

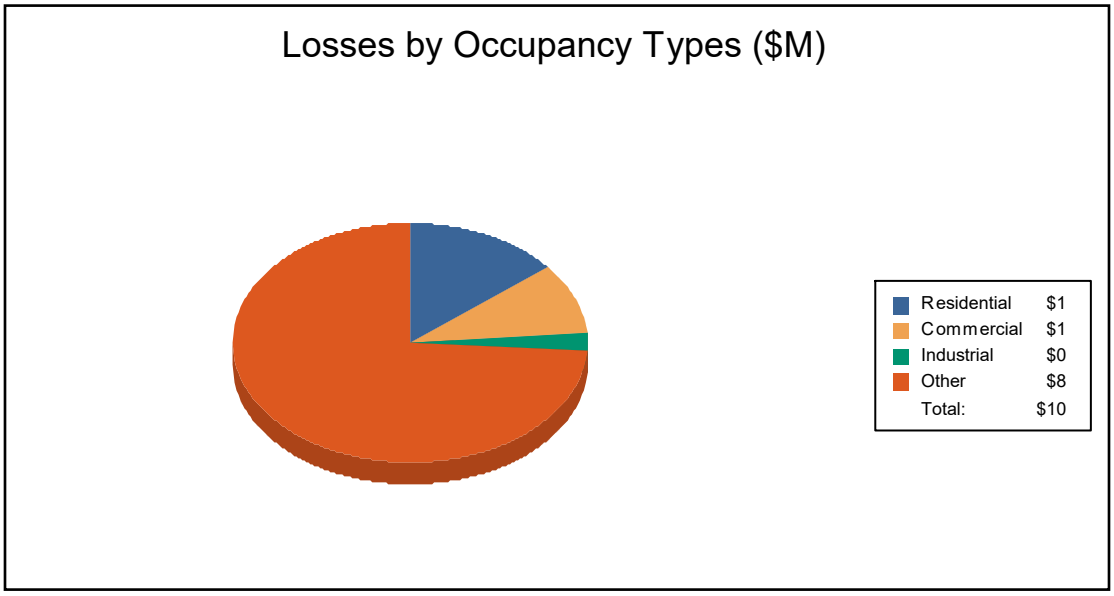
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 2.83 million dollars. 73% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 14.08% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.77	0.08	0.07	0.14	1.06
	Content	0.34	0.36	0.13	0.92	1.75
	Inventory	0.00	0.01	0.01	0.00	0.02
	Subtotal	**1.11**	**0.44**	**0.22**	**1.07**	**2.83**
Business Interruption						
	Income	0.00	0.19	0.01	0.24	0.44
	Relocation	0.25	0.01	0.02	0.30	0.57
	Rental Income	0.10	0.01	0.00	0.11	0.22
	Wage	0.00	0.34	0.01	5.93	6.28
	Subtotal	**0.35**	**0.55**	**0.03**	**6.57**	**7.51**
ALL	**Total**	**1.46**	**0.99**	**0.25**	**7.64**	**10.34**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,518	442,455	1,895,973
Total	**9,098**	**1,453,518**	**442,455**	**1,895,973**
Total Study Region	**9,098**	**1,453,518**	**442,455**	**1,895,973**

Hazus: Flood Global Risk Report

Region Name: Hebron_FL

Flood Scenario: Hebron_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 137 census blocks. The region contains over 3 thousand households and has a total population of 9,098 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,618 buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 90.57% of the buildings (and 76.66% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,618 buildings in the region which have an aggregate total replacement value of 1,896 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,453,518	76.7%
Commercial	177,352	9.4%
Industrial	28,615	1.5%
Agricultural	3,416	0.2%
Religion	13,771	0.7%
Government	74,889	3.9%
Education	144,412	7.6%
Total	**1,895,973**	**100%**

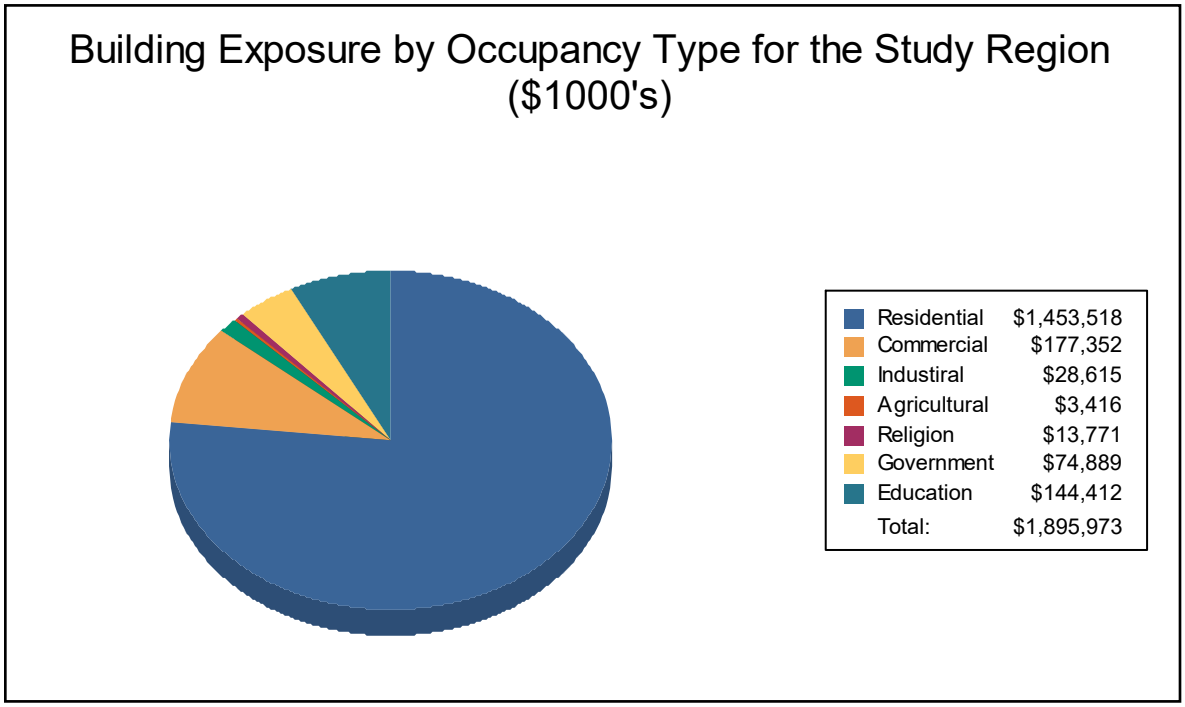
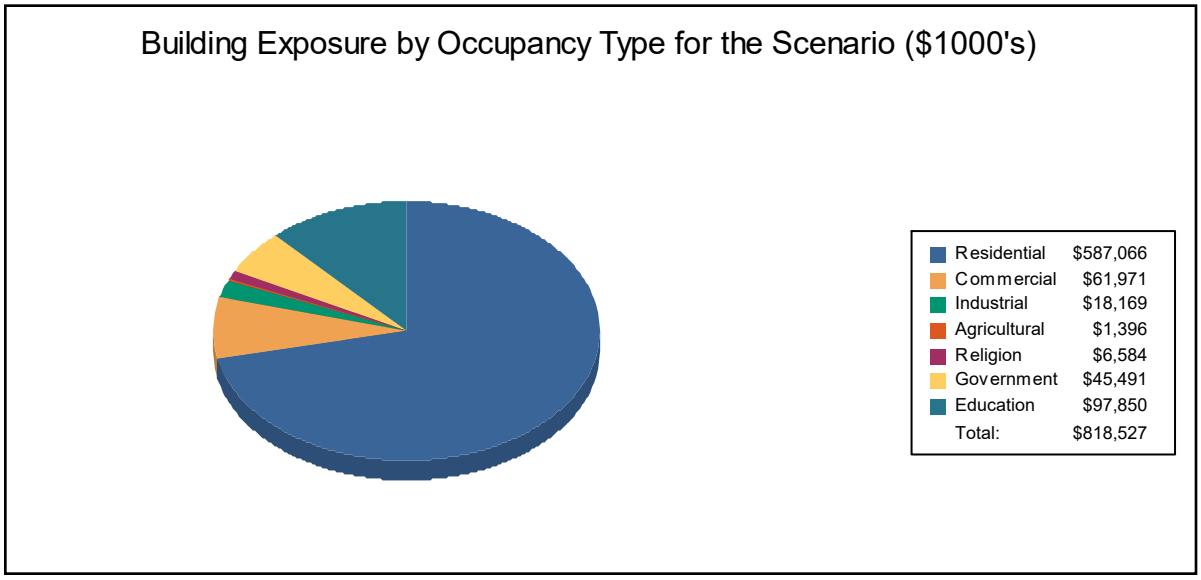


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	587,066	71.7%
Commercial	61,971	7.6%
Industrial	18,169	2.2%
Agricultural	1,396	0.2%
Religion	6,584	0.8%
Government	45,491	5.6%
Education	97,850	12.0%
Total	**818,527**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 2 fire stations, 1 police station and 1 emergency operation center.

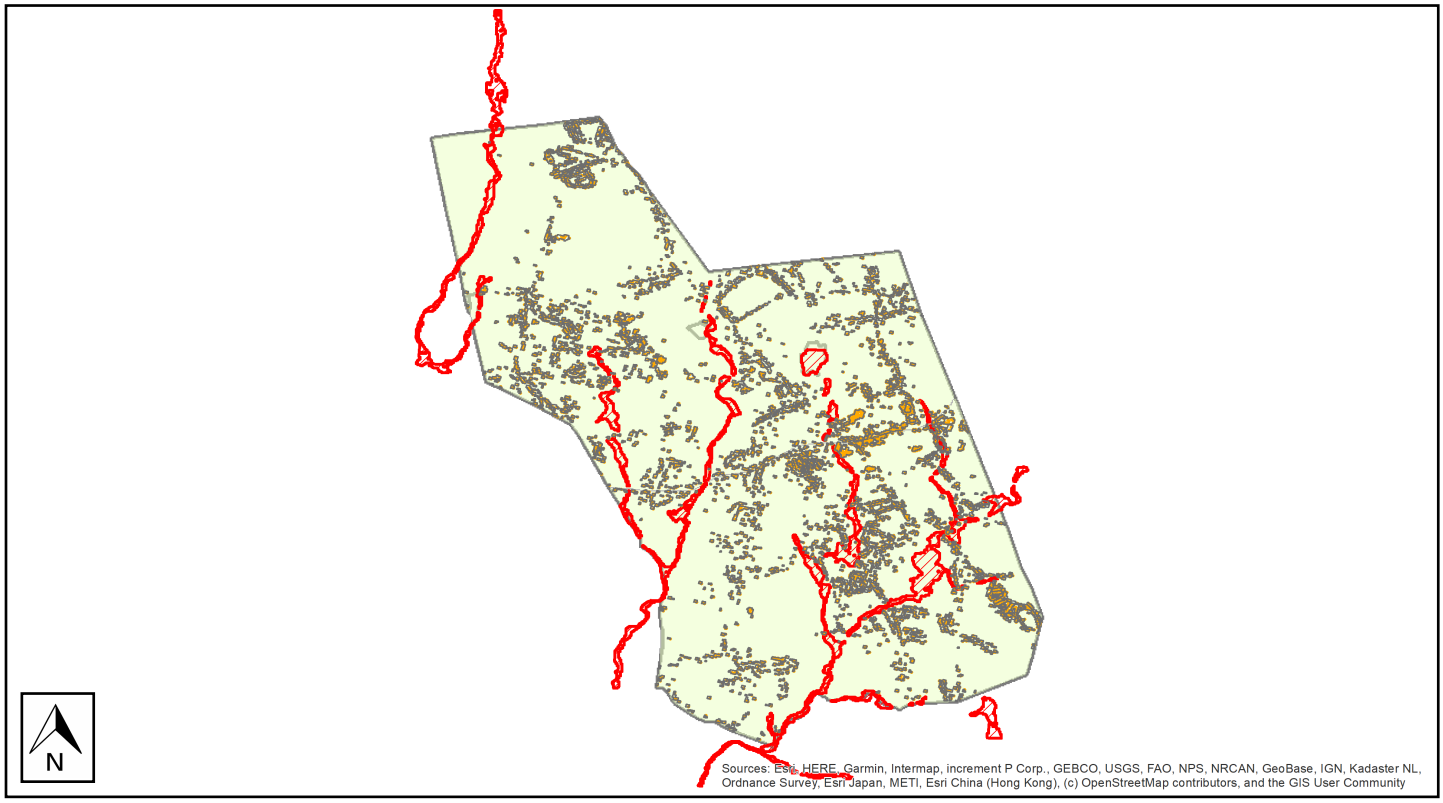
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hebron_FL
Scenario Name:	Hebron_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

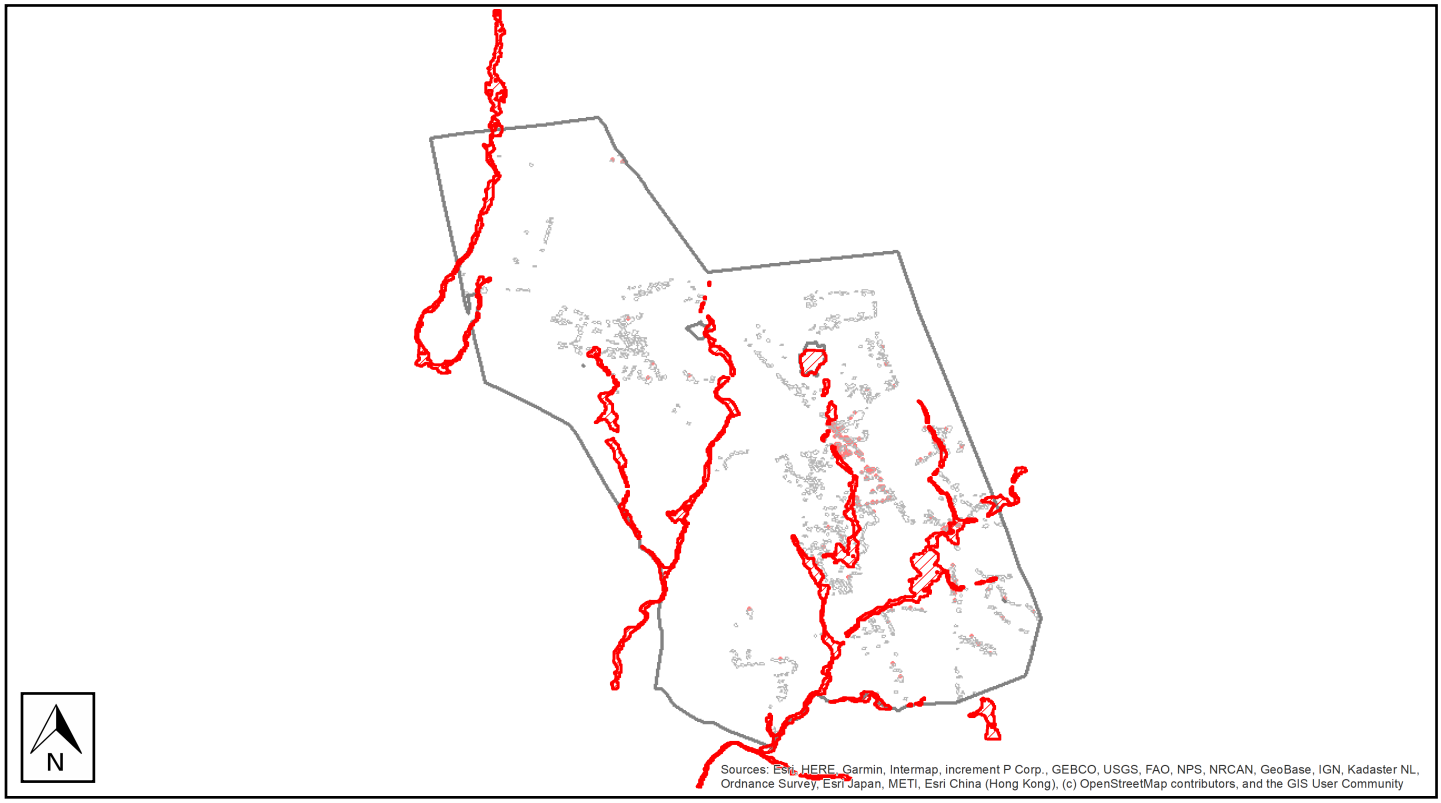


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

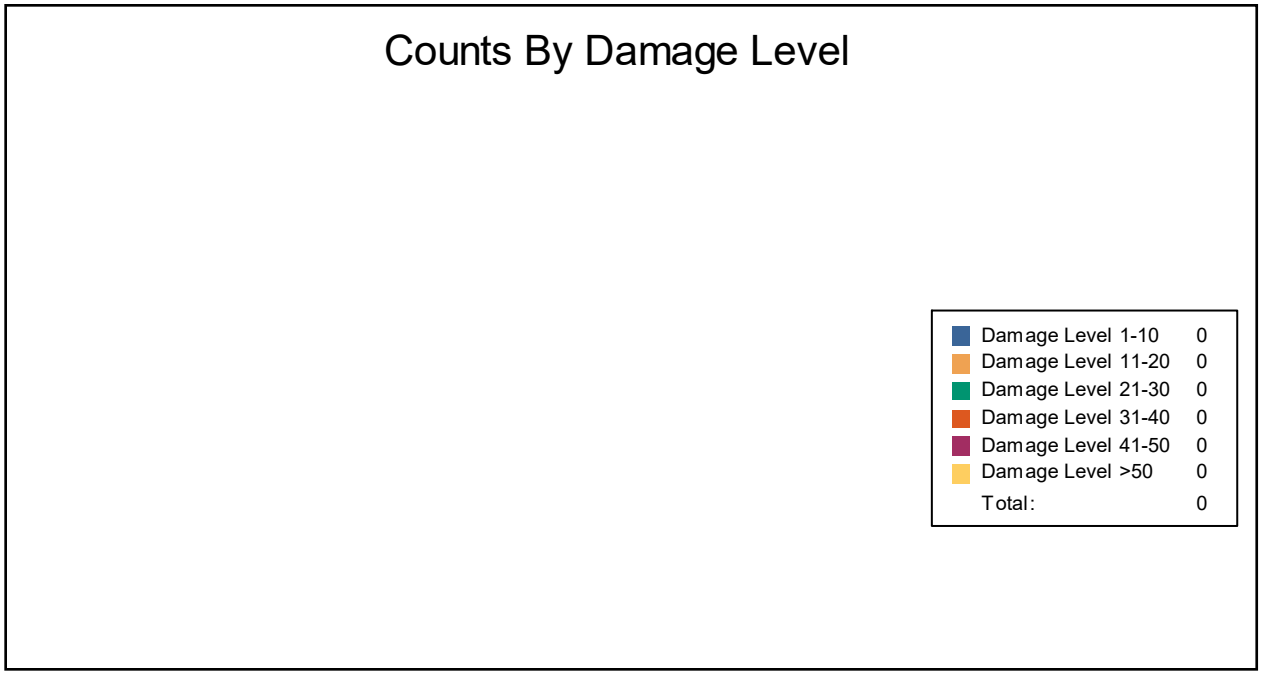


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

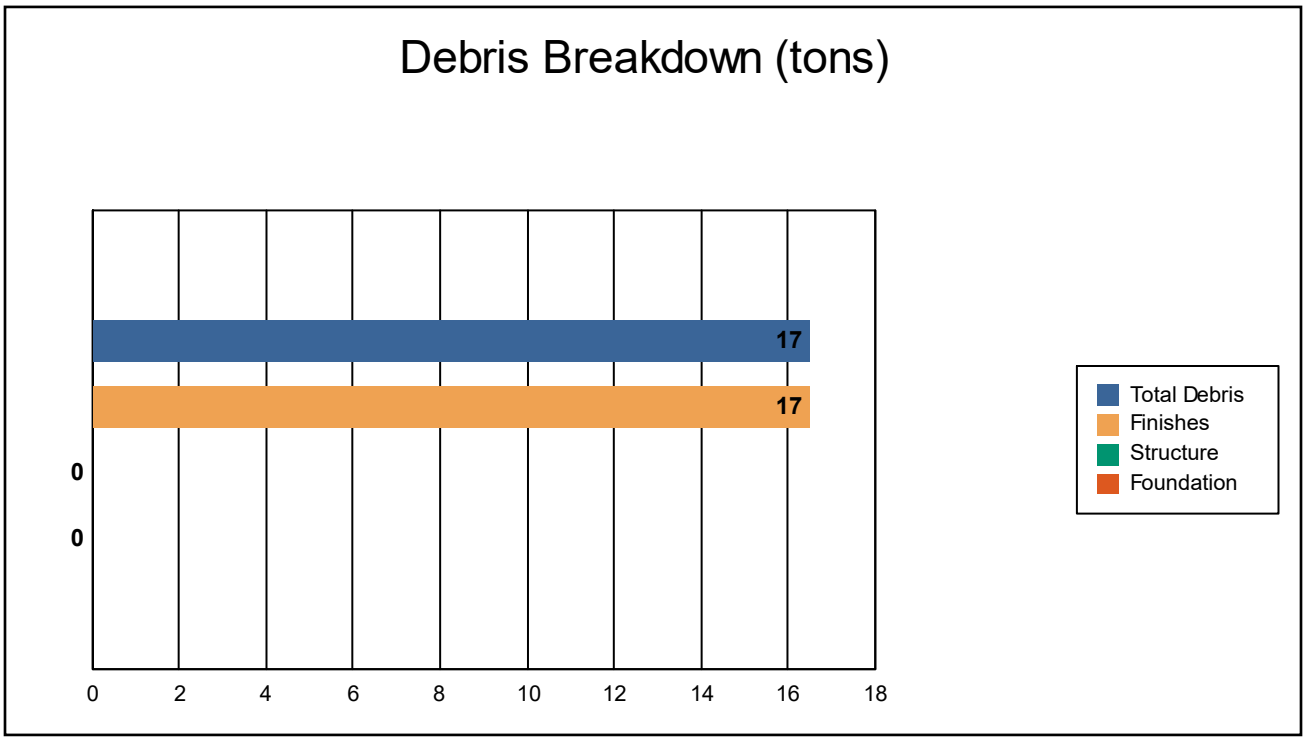
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

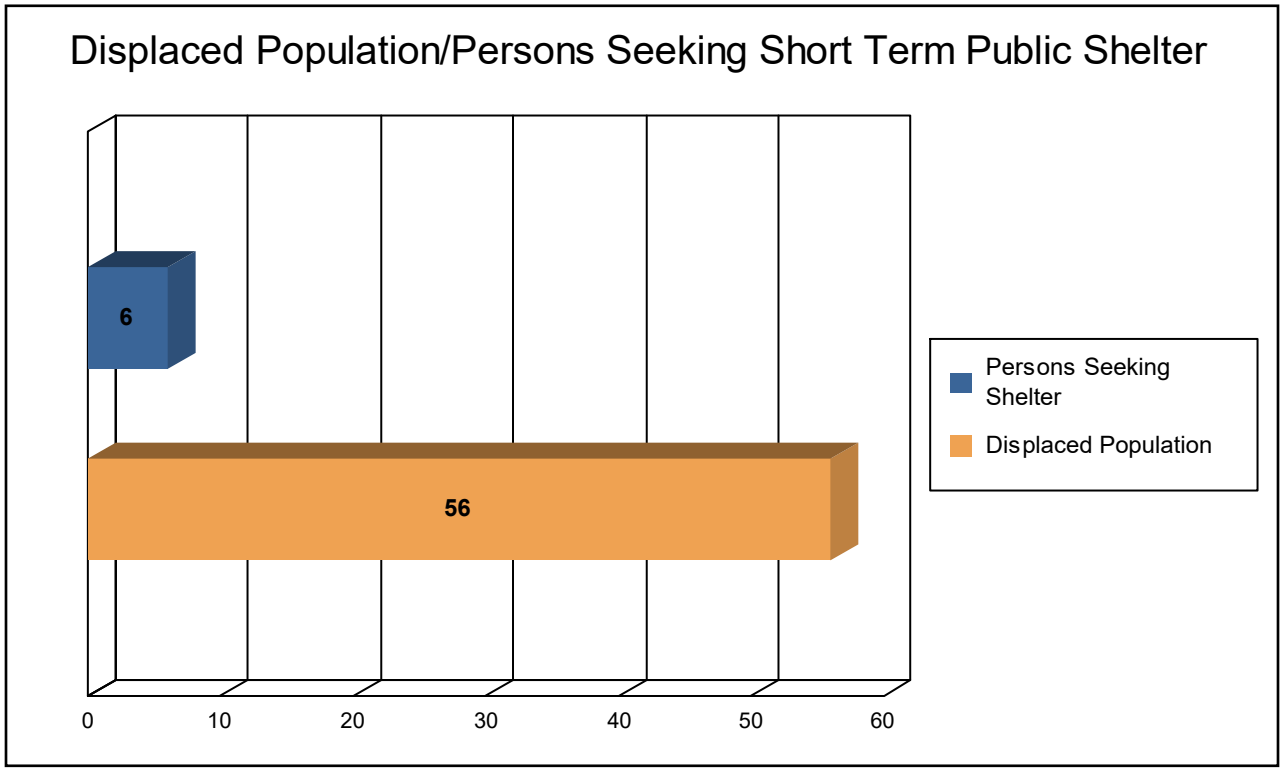


The model estimates that a total of 17 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 19 households (or 56 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 6 people (out of a total population of 9,098) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 11.65 million dollars, which represents 1.42 % of the total replacement value of the scenario buildings.

Building-Related Losses

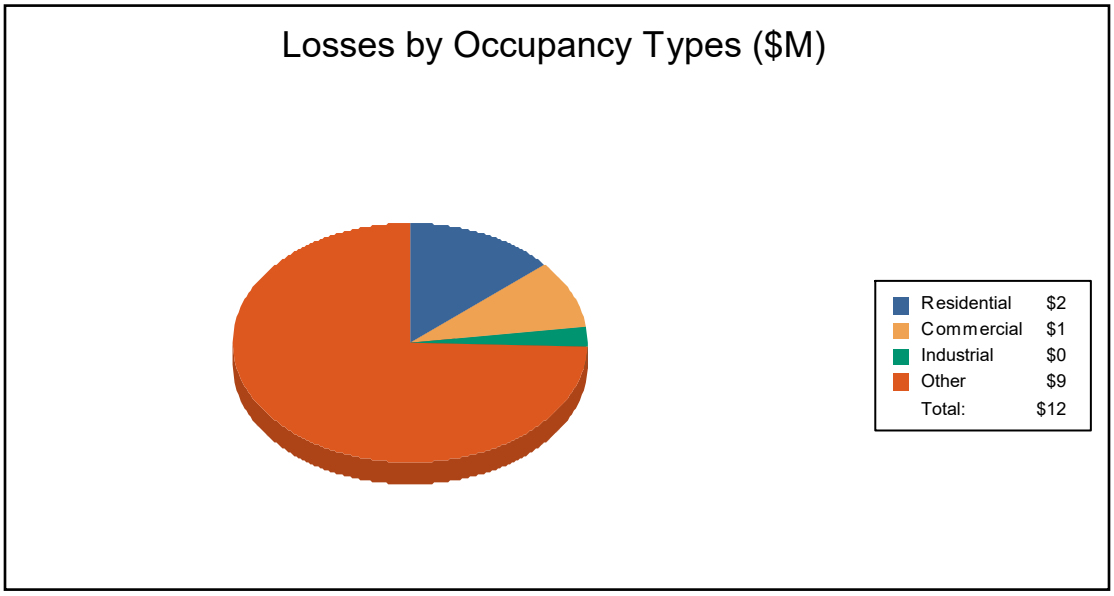
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 3.17 million dollars. 73% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.73% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.86	0.08	0.09	0.16	1.18
	Content	0.37	0.38	0.16	1.04	1.96
	Inventory	0.00	0.01	0.02	0.00	0.03
	Subtotal	**1.23**	**0.47**	**0.26**	**1.21**	**3.17**
Business Interruption						
	Income	0.00	0.21	0.01	0.26	0.48
	Relocation	0.27	0.01	0.02	0.32	0.62
	Rental Income	0.10	0.00	0.00	0.12	0.23
	Wage	0.00	0.37	0.01	6.78	7.16
	Subtotal	**0.37**	**0.59**	**0.04**	**7.48**	**8.48**
ALL	**Total**	**1.60**	**1.06**	**0.31**	**8.68**	**11.65**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,518	442,455	1,895,973
Total	**9,098**	**1,453,518**	**442,455**	**1,895,973**
Total Study Region	**9,098**	**1,453,518**	**442,455**	**1,895,973**

Hazus: Flood Global Risk Report

Region Name: Hebron_FL

Flood Scenario: Hebron_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 137 census blocks. The region contains over 3 thousand households and has a total population of 9,098 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,618 buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 90.57% of the buildings (and 76.66% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,618 buildings in the region which have an aggregate total replacement value of 1,896 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,453,518	76.7%
Commercial	177,352	9.4%
Industrial	28,615	1.5%
Agricultural	3,416	0.2%
Religion	13,771	0.7%
Government	74,889	3.9%
Education	144,412	7.6%
Total	**1,895,973**	**100%**

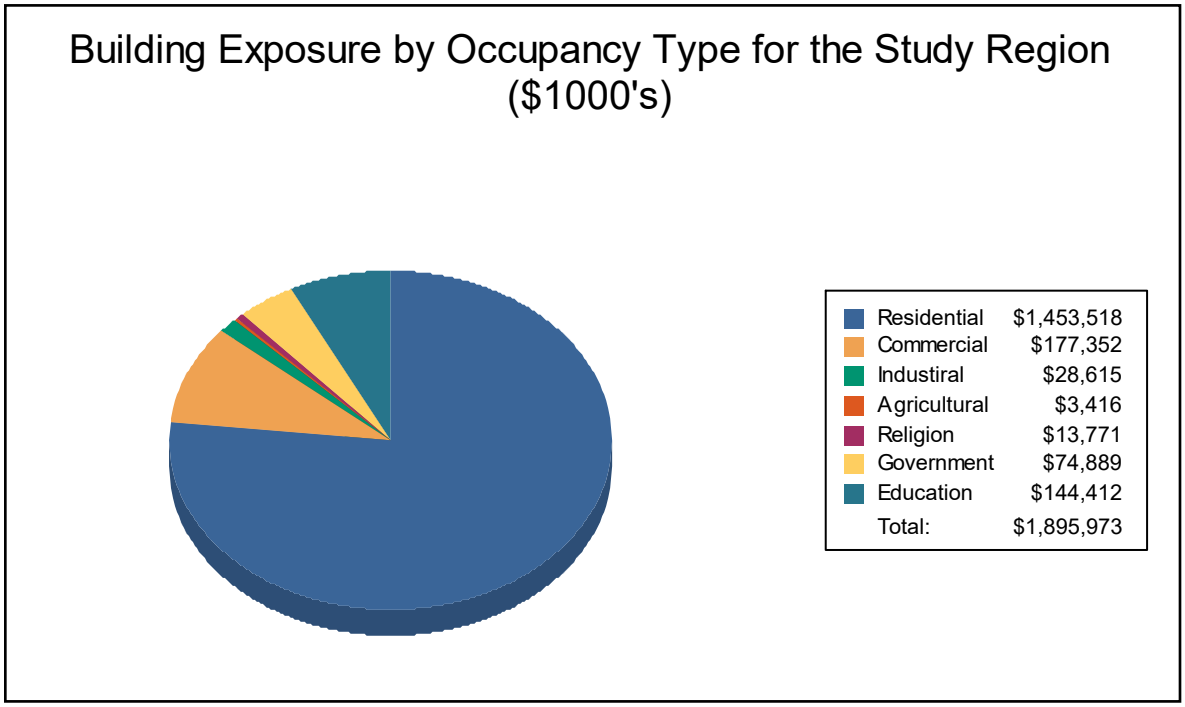
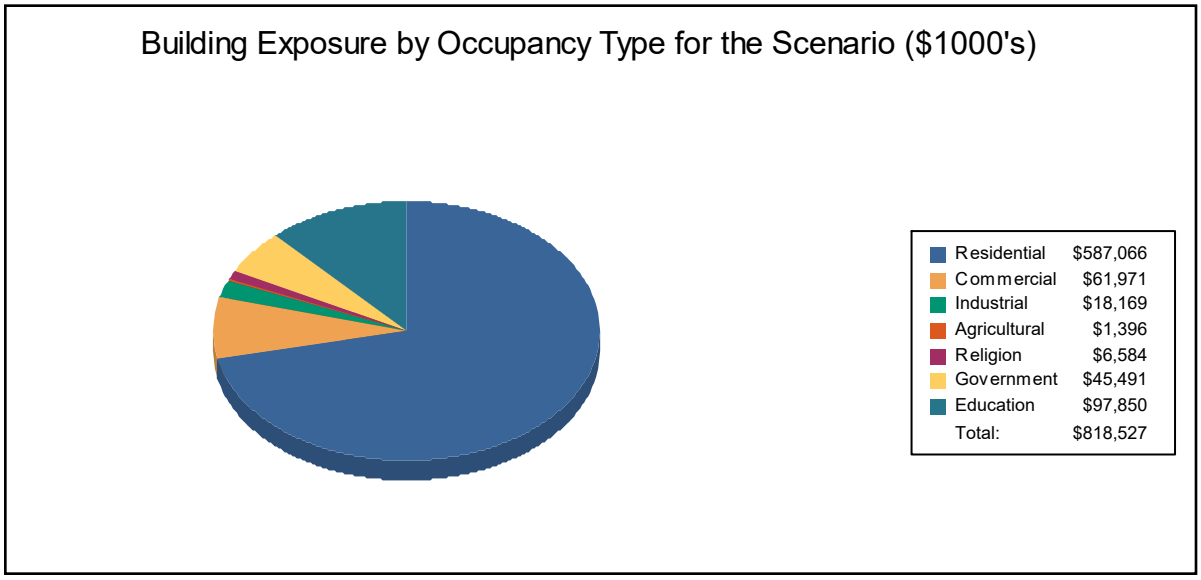


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	587,066	71.7%
Commercial	61,971	7.6%
Industrial	18,169	2.2%
Agricultural	1,396	0.2%
Religion	6,584	0.8%
Government	45,491	5.6%
Education	97,850	12.0%
Total	**818,527**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 2 fire stations, 1 police station and 1 emergency operation center.

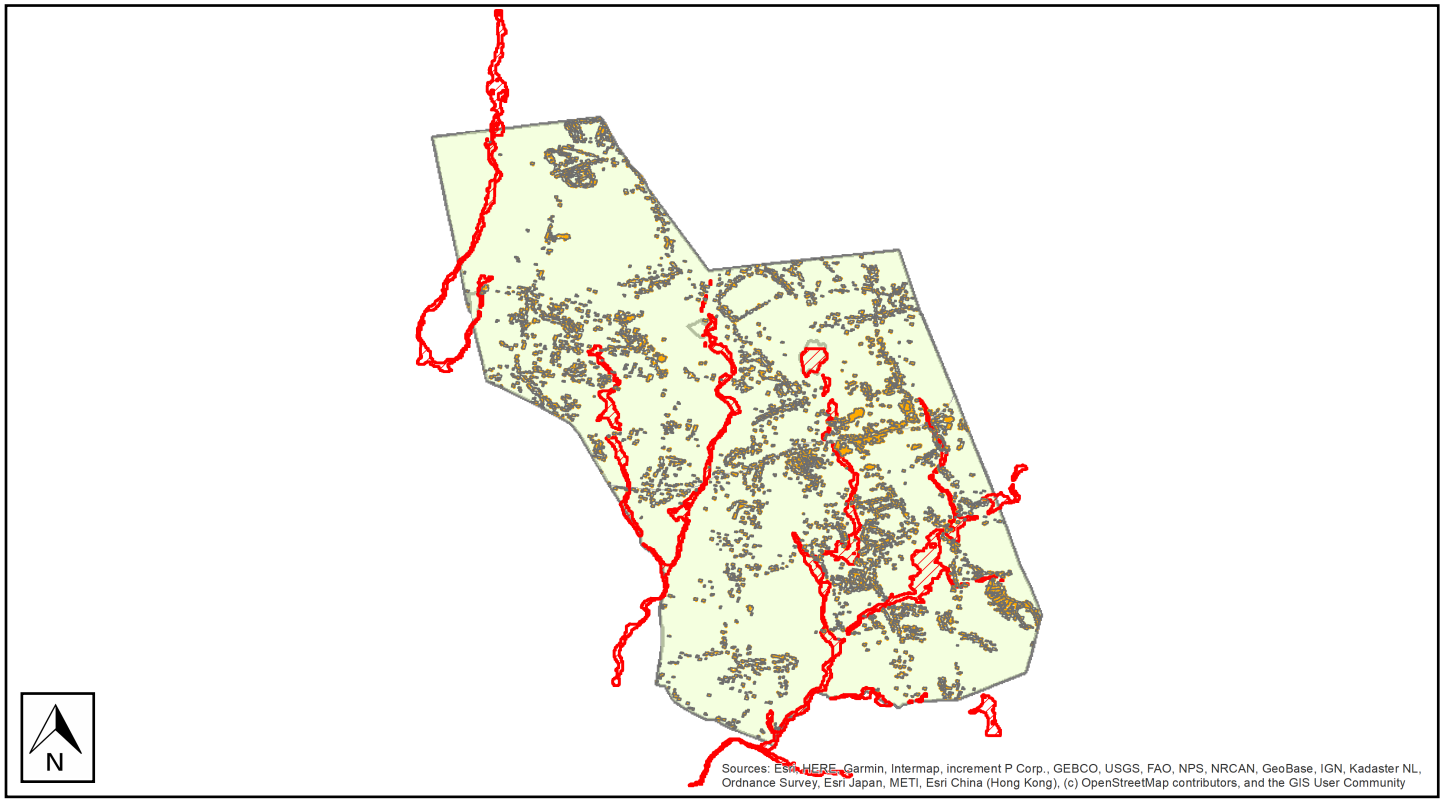
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hebron_FL
Scenario Name:	Hebron_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

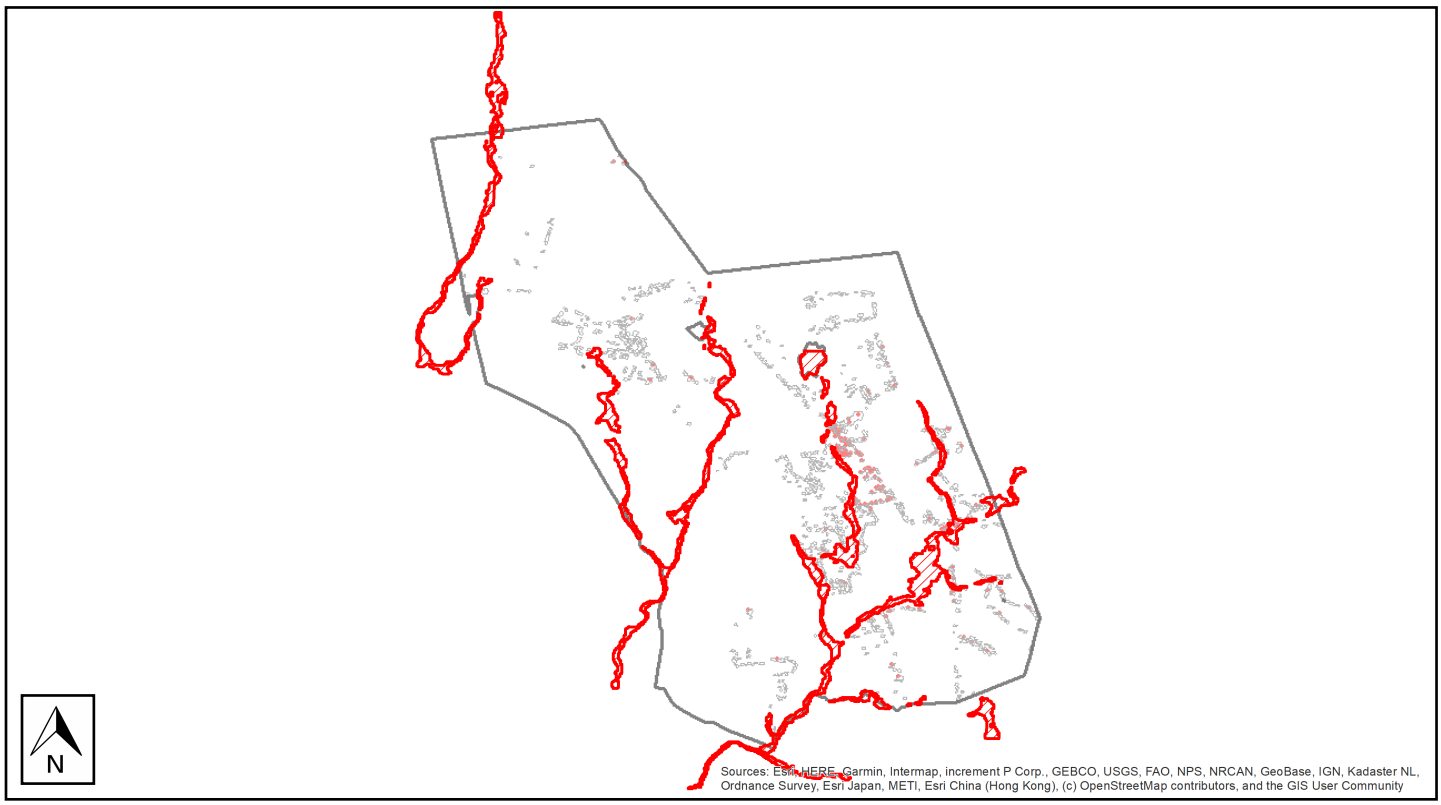


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	100	0	0	0	0	0	0	0	0	0	0
Total	**1**		**0**		**0**		**0**		**0**		**0**	

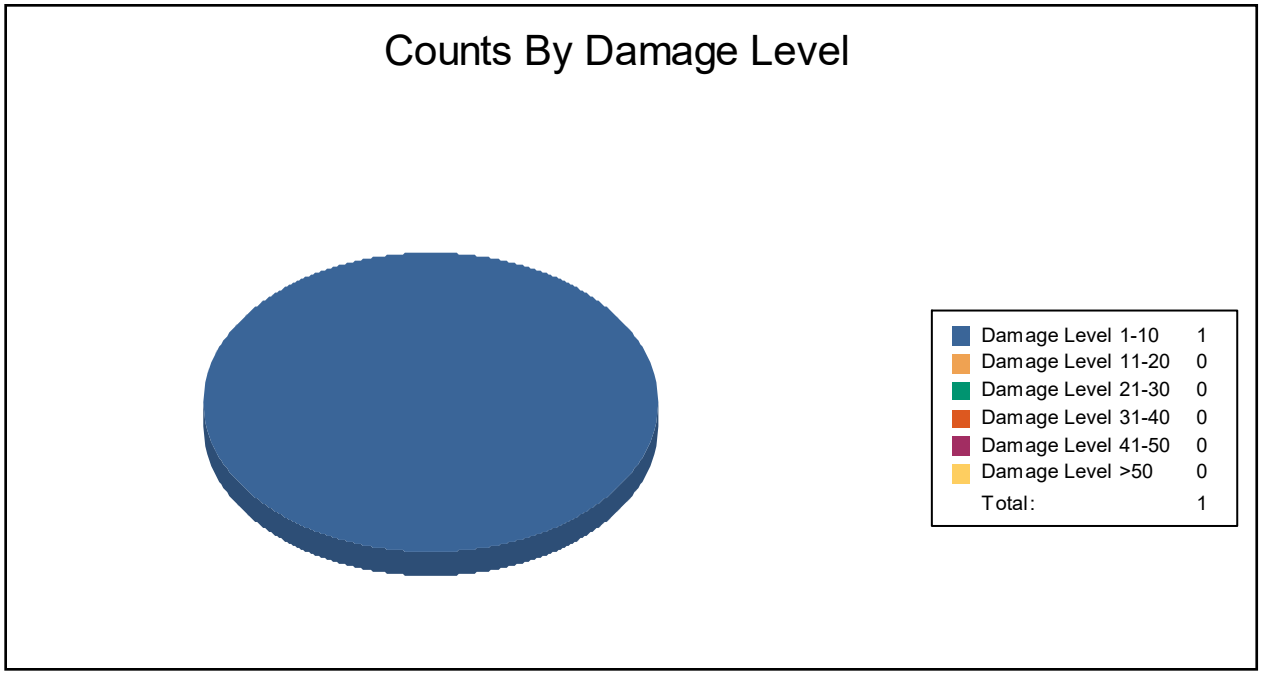


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

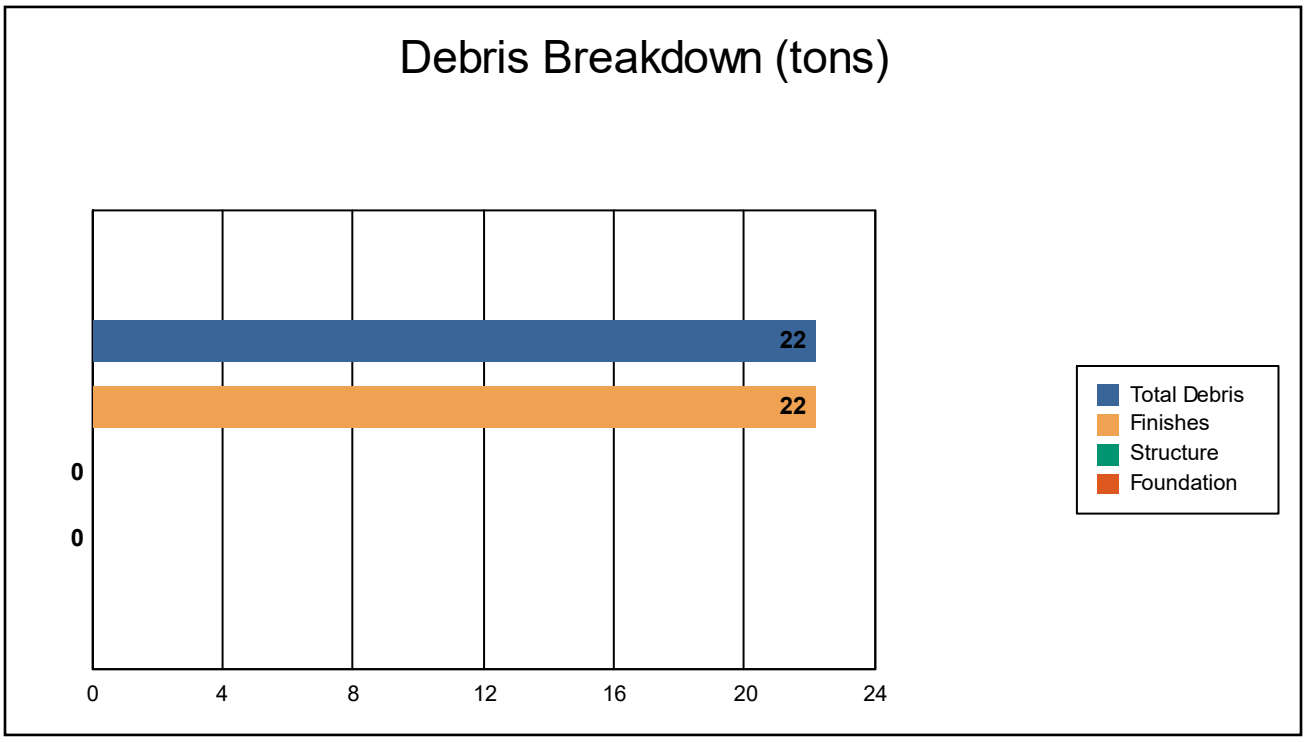
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

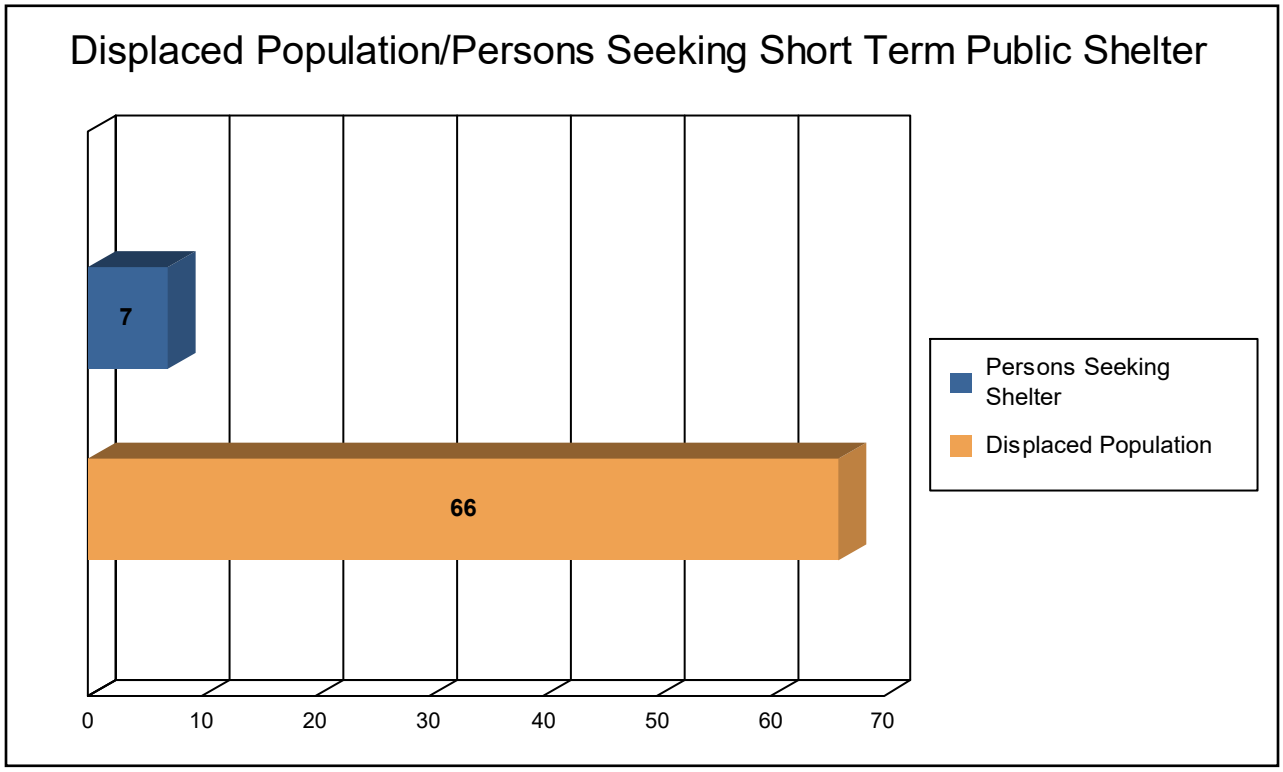


The model estimates that a total of 22 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 22 households (or 66 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 7 people (out of a total population of 9,098) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 14.28 million dollars, which represents 1.74 % of the total replacement value of the scenario buildings.

Building-Related Losses

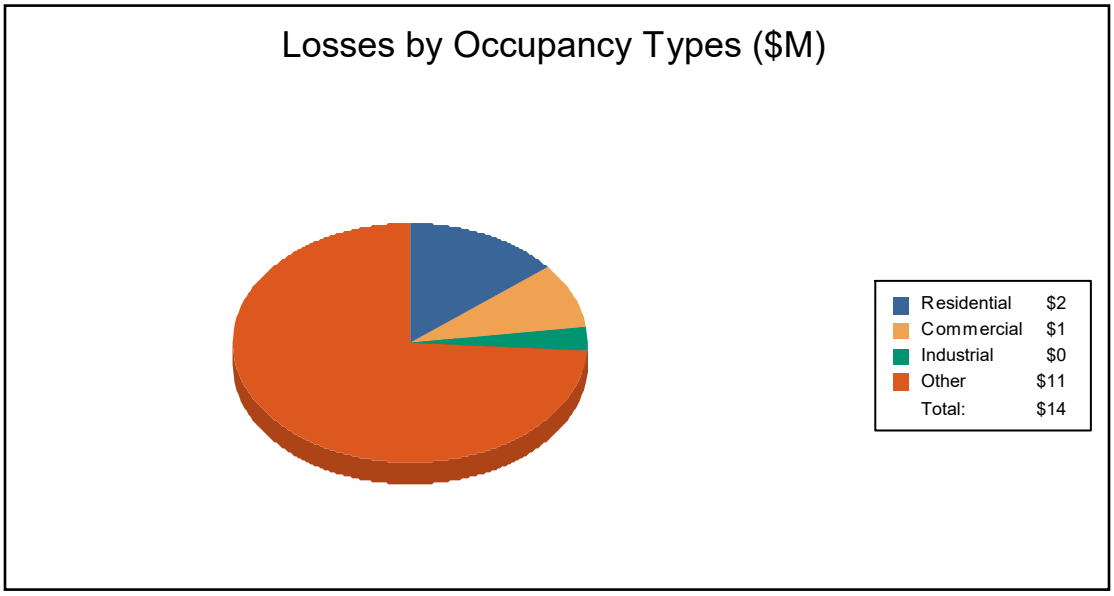
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 4.17 million dollars. 71% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 14.24% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.09	0.10	0.12	0.22	1.52
	Content	0.48	0.45	0.25	1.42	2.60
	Inventory	0.00	0.01	0.03	0.00	0.04
	Subtotal	**1.57**	**0.56**	**0.40**	**1.64**	**4.17**
Business Interruption						
	Income	0.00	0.25	0.01	0.32	0.58
	Relocation	0.34	0.01	0.02	0.37	0.74
	Rental Income	0.13	0.01	0.00	0.14	0.27
	Wage	0.00	0.41	0.01	8.09	8.51
	Subtotal	**0.47**	**0.68**	**0.05**	**8.92**	**10.11**
ALL	**Total**	**2.03**	**1.24**	**0.45**	**10.56**	**14.28**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,518	442,455	1,895,973
Total	**9,098**	**1,453,518**	**442,455**	**1,895,973**
Total Study Region	**9,098**	**1,453,518**	**442,455**	**1,895,973**

Hazus: Flood Global Risk Report

Region Name: Hebron_FL

Flood Scenario: Hebron_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 137 census blocks. The region contains over 3 thousand households and has a total population of 9,098 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,618 buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 90.57% of the buildings (and 76.66% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,618 buildings in the region which have an aggregate total replacement value of 1,896 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,453,518	76.7%
Commercial	177,352	9.4%
Industrial	28,615	1.5%
Agricultural	3,416	0.2%
Religion	13,771	0.7%
Government	74,889	3.9%
Education	144,412	7.6%
Total	**1,895,973**	**100%**

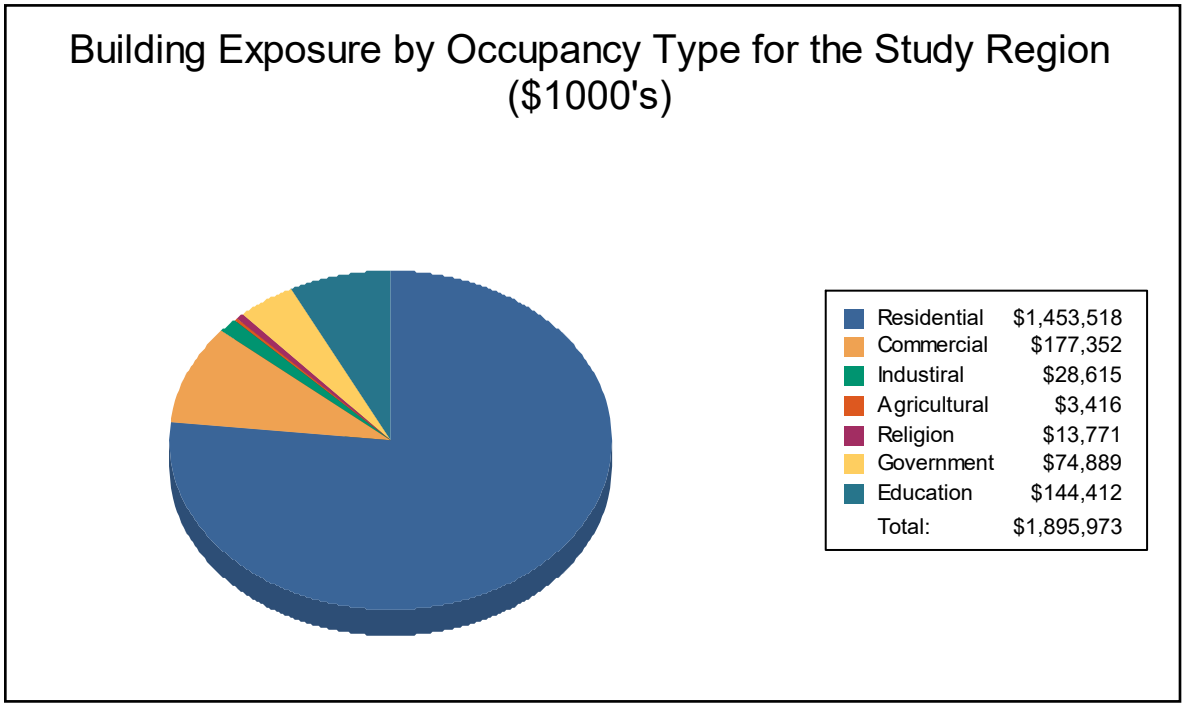
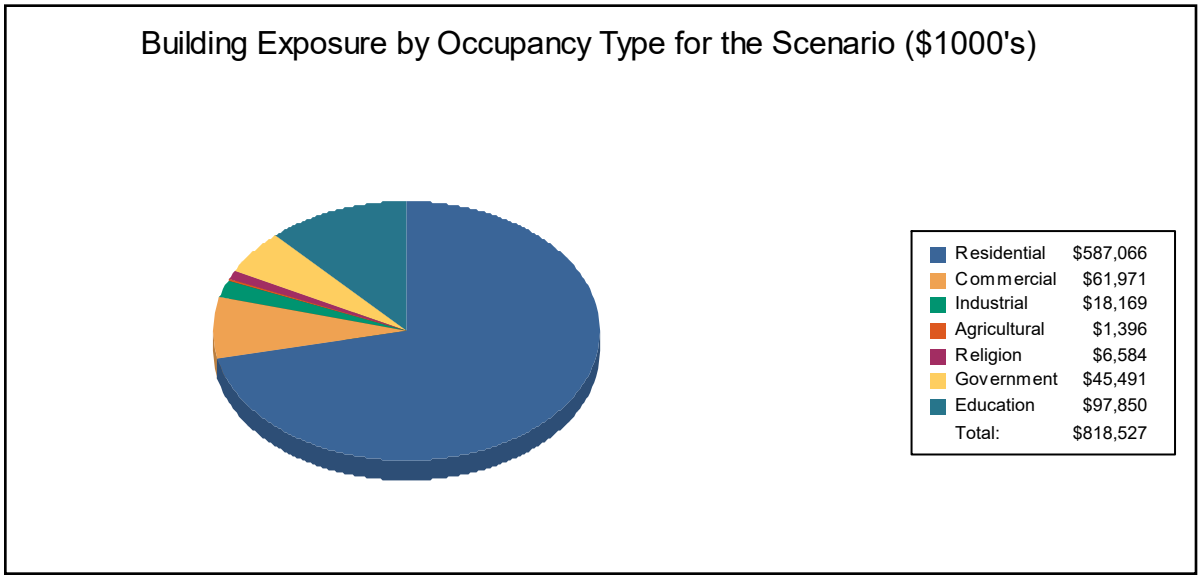


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	587,066	71.7%
Commercial	61,971	7.6%
Industrial	18,169	2.2%
Agricultural	1,396	0.2%
Religion	6,584	0.8%
Government	45,491	5.6%
Education	97,850	12.0%
Total	**818,527**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 2 fire stations, 1 police station and 1 emergency operation center.

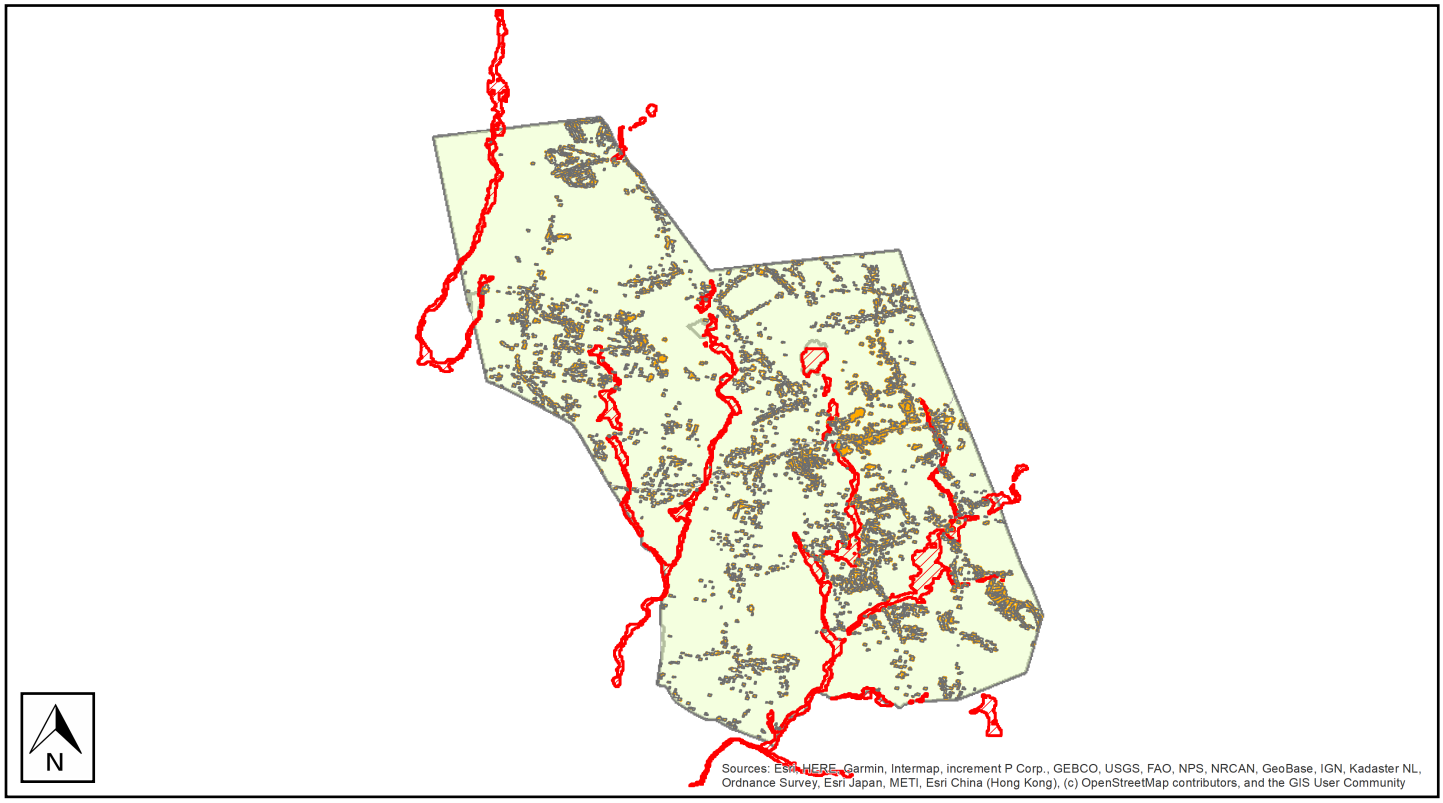
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hebron_FL
Scenario Name:	Hebron_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

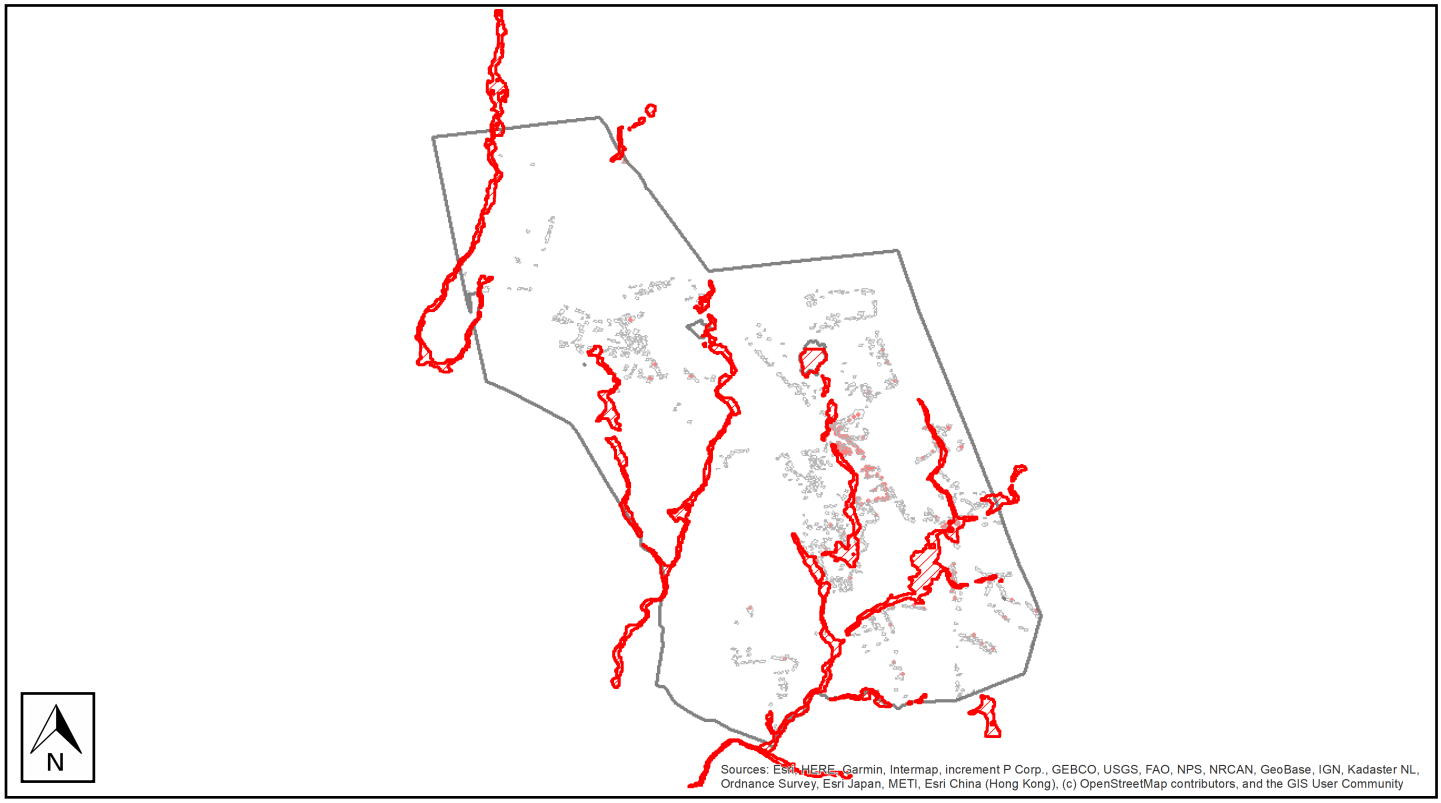


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	1	100	0	0	0	0	0	0	0	0	0	0
Total	**1**		**0**		**0**		**0**		**0**		**0**	

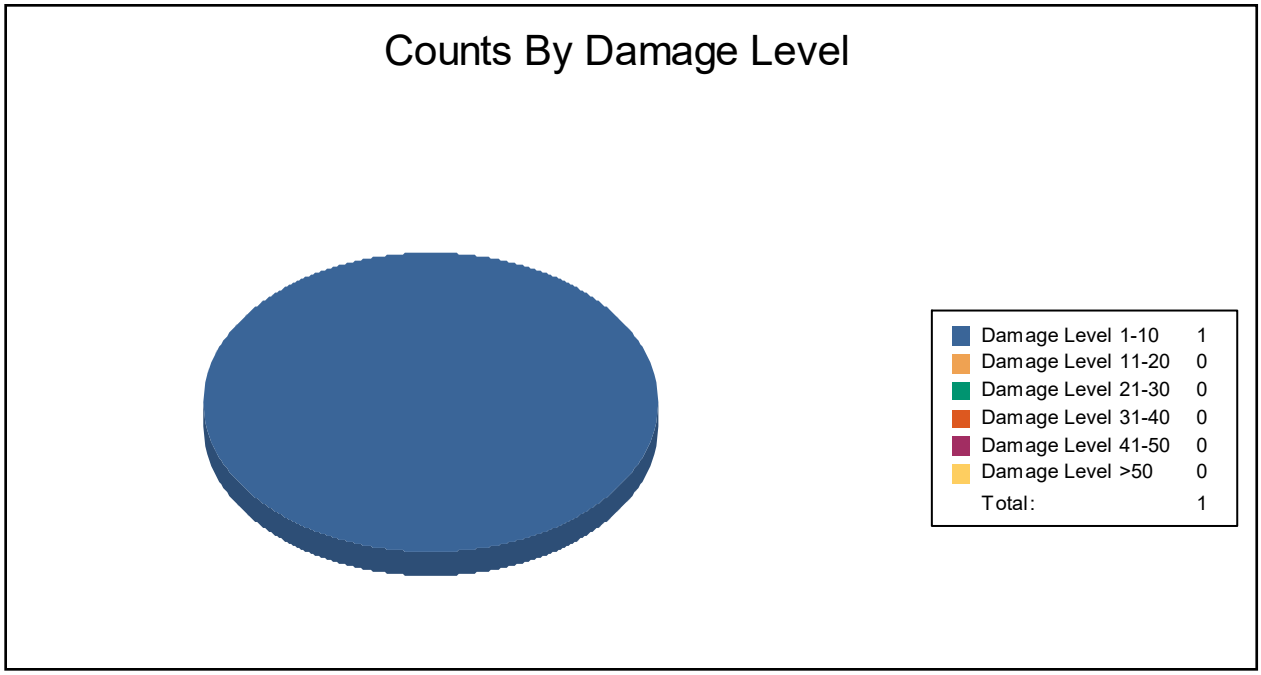


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	1	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

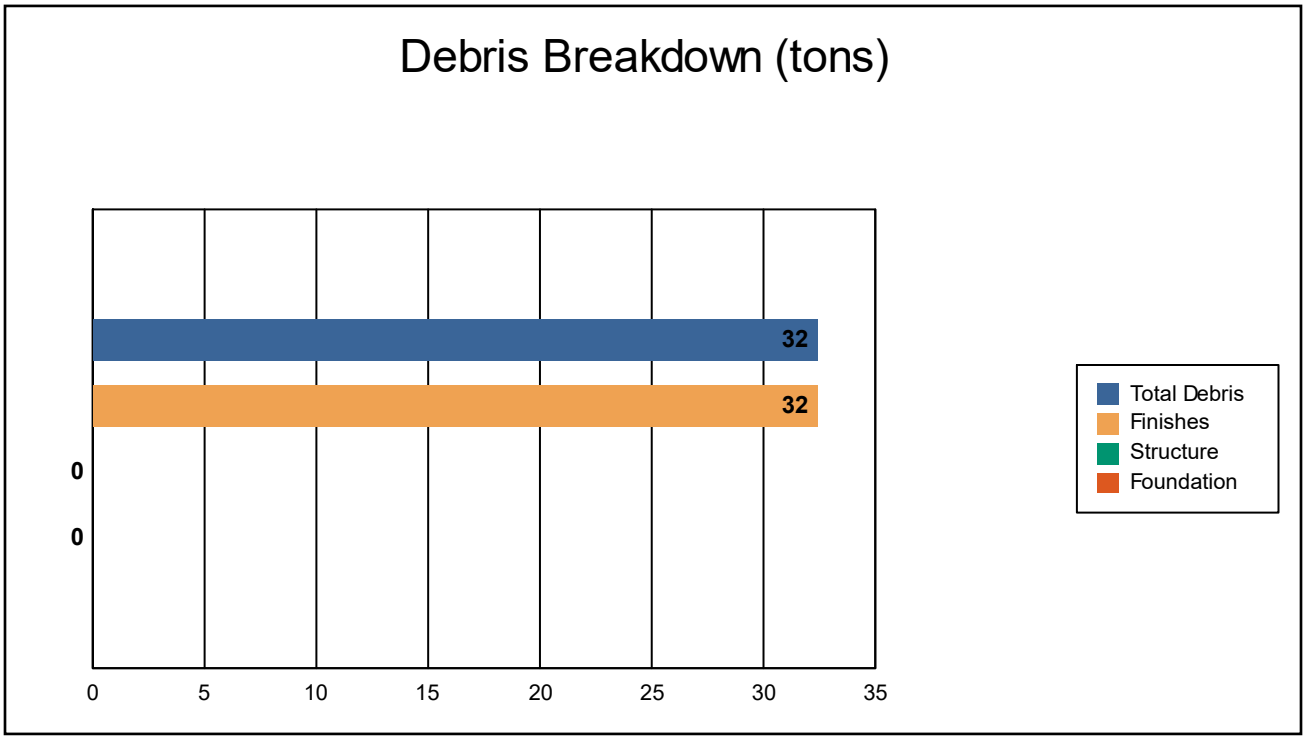
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

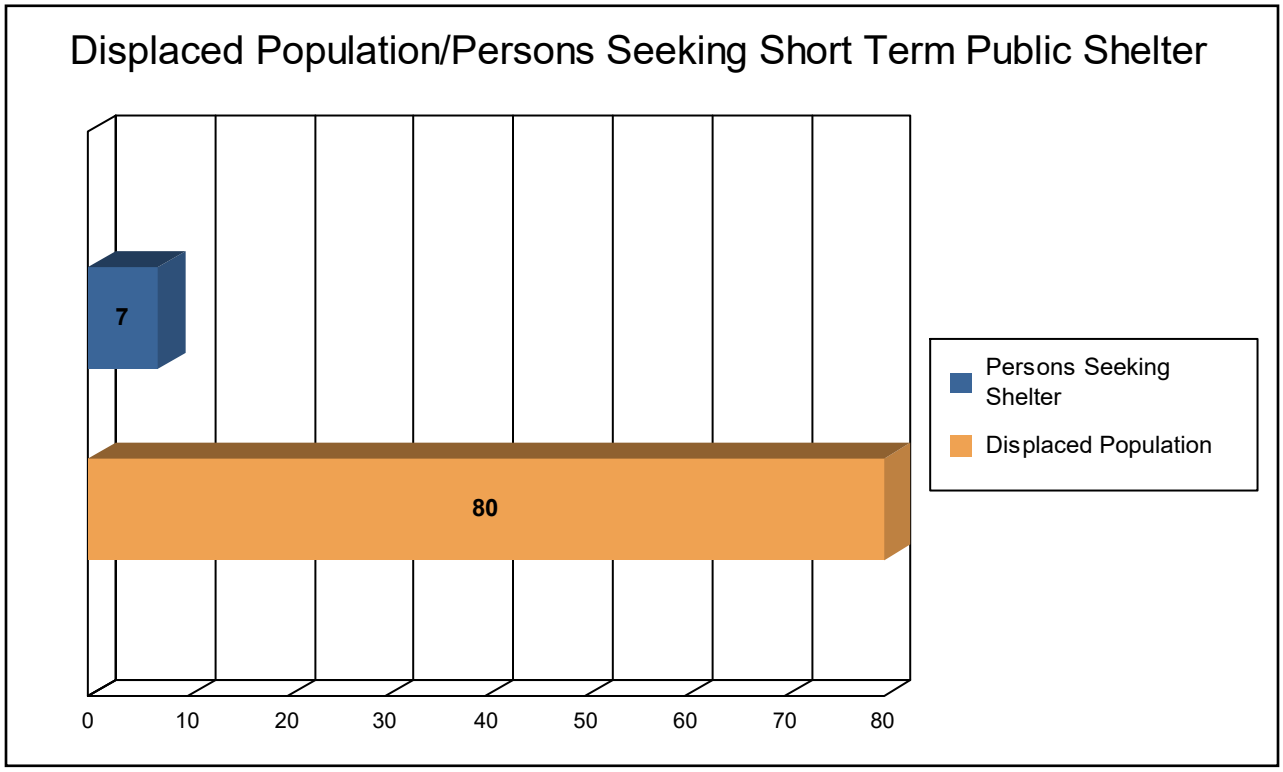


The model estimates that a total of 32 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 27 households (or 80 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 7 people (out of a total population of 9,098) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 15.09 million dollars, which represents 1.84 % of the total replacement value of the scenario buildings.

Building-Related Losses

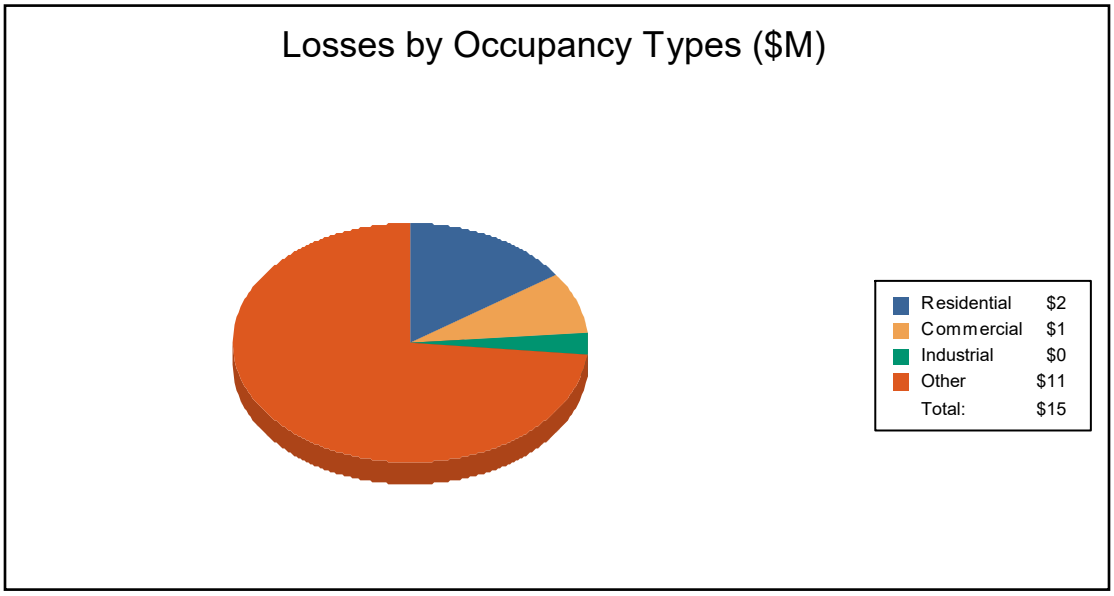
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 4.42 million dollars. 71% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 15.27% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.24	0.10	0.13	0.22	1.68
	Content	0.54	0.46	0.25	1.45	2.69
	Inventory	0.00	0.01	0.03	0.00	0.04
	Subtotal	**1.78**	**0.57**	**0.40**	**1.66**	**4.42**
Business Interruption						
	Income	0.00	0.26	0.01	0.34	0.61
	Relocation	0.39	0.01	0.03	0.40	0.82
	Rental Income	0.14	0.01	0.00	0.14	0.30
	Wage	0.00	0.42	0.02	8.51	8.95
	Subtotal	**0.53**	**0.70**	**0.06**	**9.39**	**10.68**
ALL	**Total**	**2.30**	**1.27**	**0.46**	**11.06**	**15.09**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,518	442,455	1,895,973
Total	**9,098**	**1,453,518**	**442,455**	**1,895,973**
Total Study Region	**9,098**	**1,453,518**	**442,455**	**1,895,973**

Hazus: Flood Global Risk Report

Region Name: Hebron_FL

Flood Scenario: Hebron_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 137 census blocks. The region contains over 3 thousand households and has a total population of 9,098 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,618 buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 90.57% of the buildings (and 76.66% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,618 buildings in the region which have an aggregate total replacement value of 1,896 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,453,518	76.7%
Commercial	177,352	9.4%
Industrial	28,615	1.5%
Agricultural	3,416	0.2%
Religion	13,771	0.7%
Government	74,889	3.9%
Education	144,412	7.6%
Total	**1,895,973**	**100%**

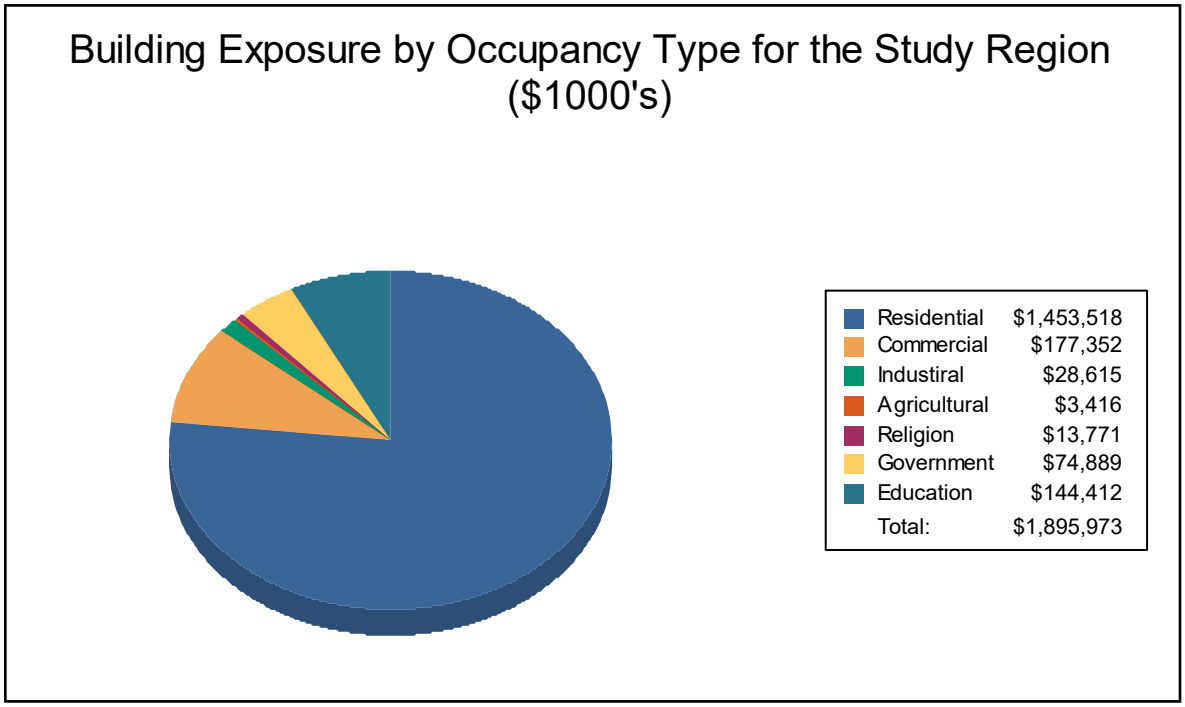
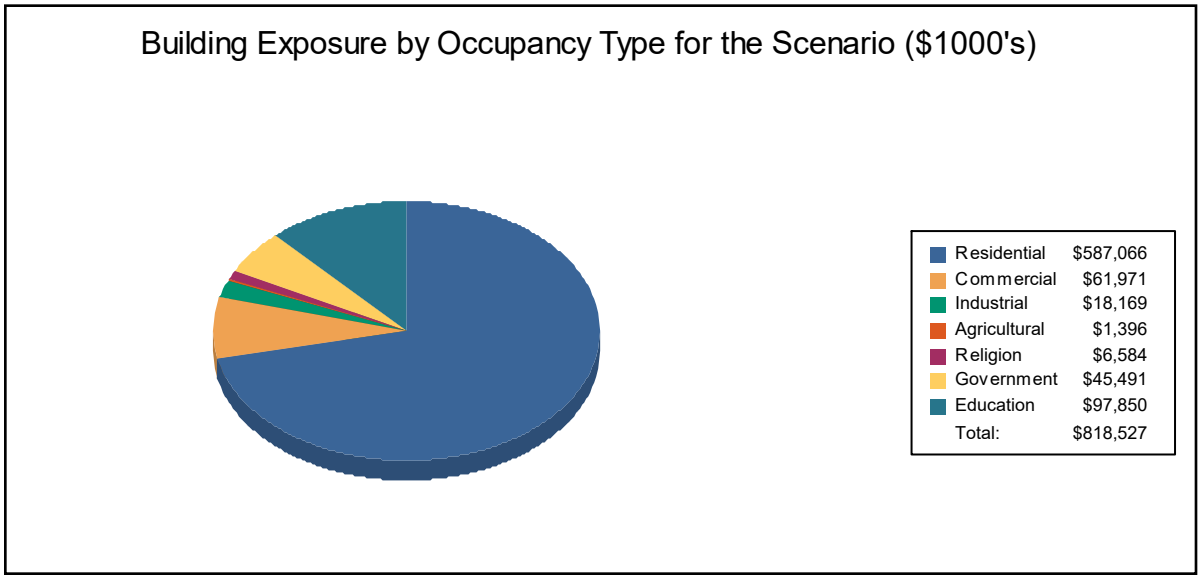


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	587,066	71.7%
Commercial	61,971	7.6%
Industrial	18,169	2.2%
Agricultural	1,396	0.2%
Religion	6,584	0.8%
Government	45,491	5.6%
Education	97,850	12.0%
Total	**818,527**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 2 fire stations, 1 police station and 1 emergency operation center.

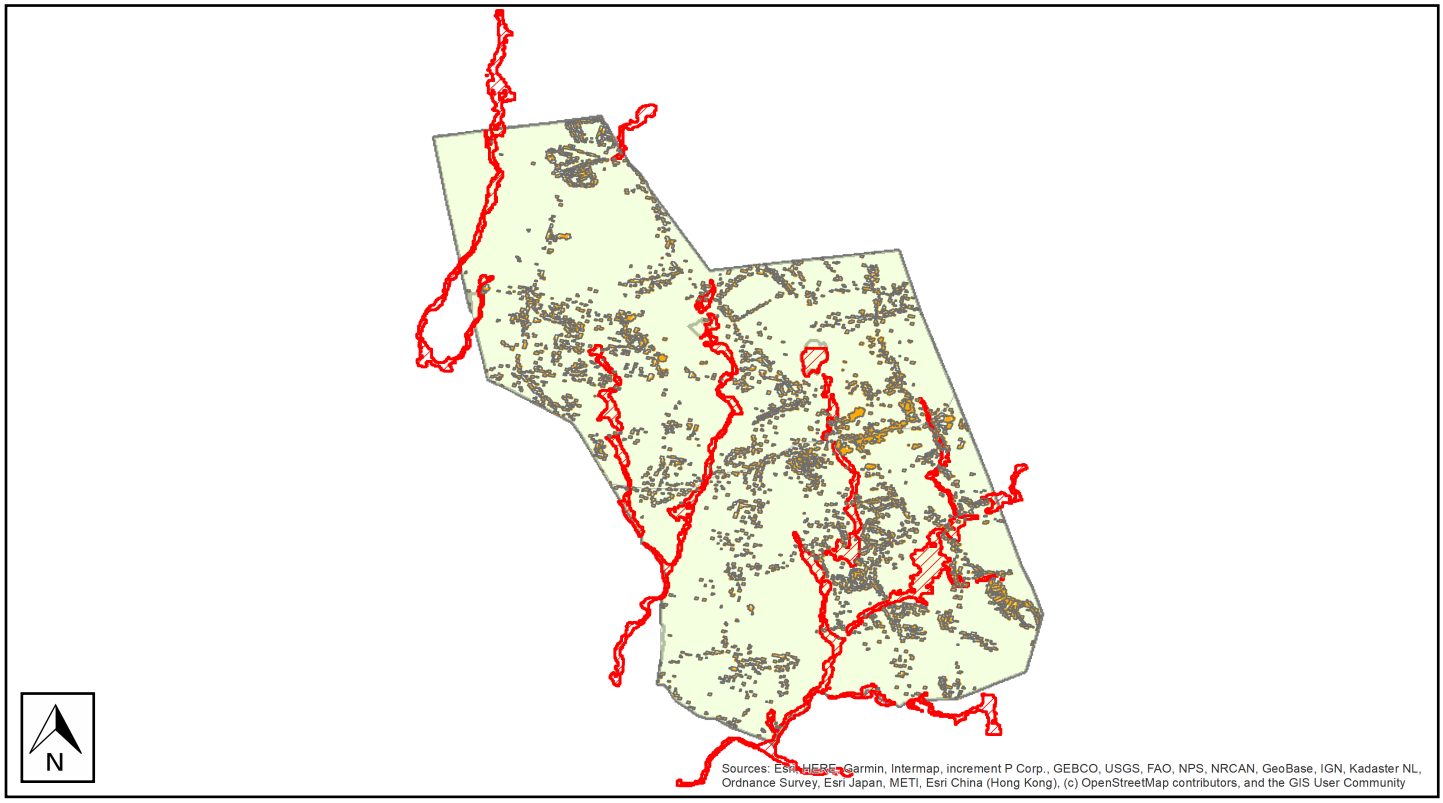
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Hebron_FL
Scenario Name:	Hebron_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

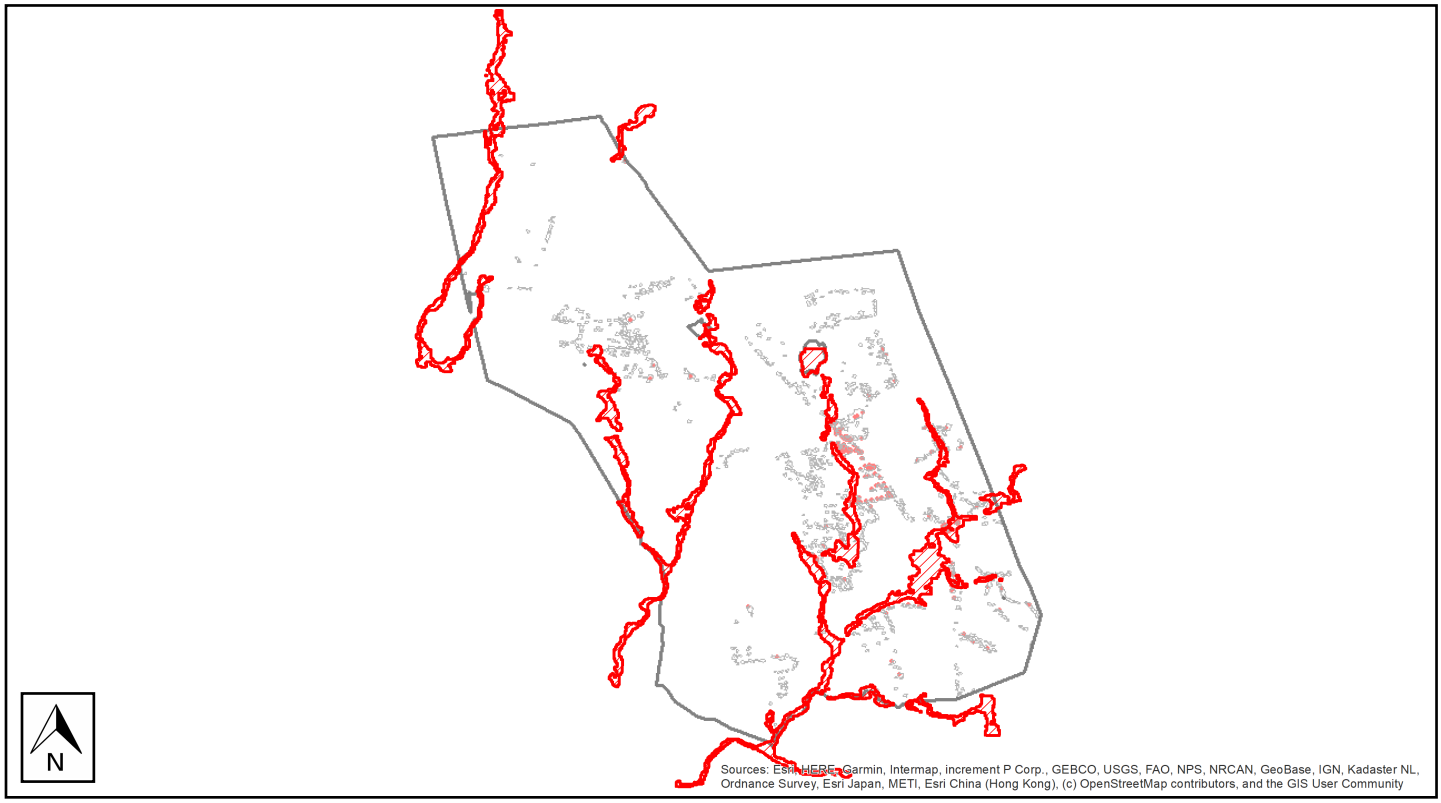


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	1	100	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

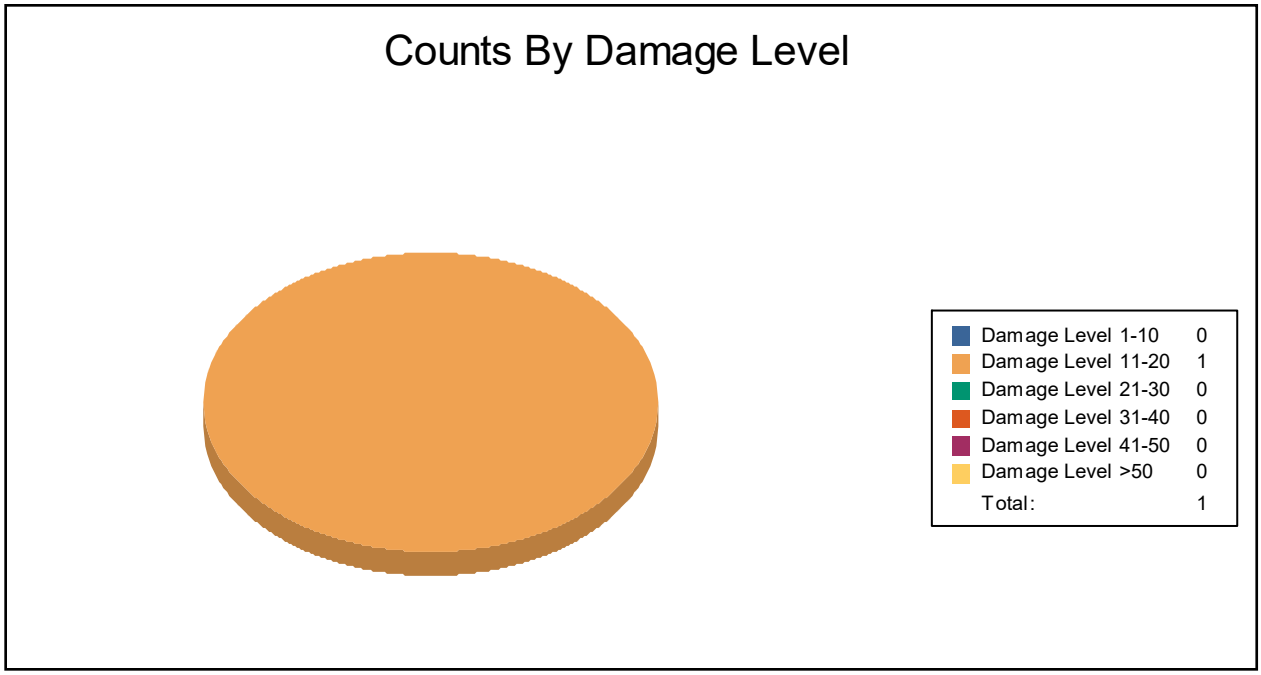


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	1	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

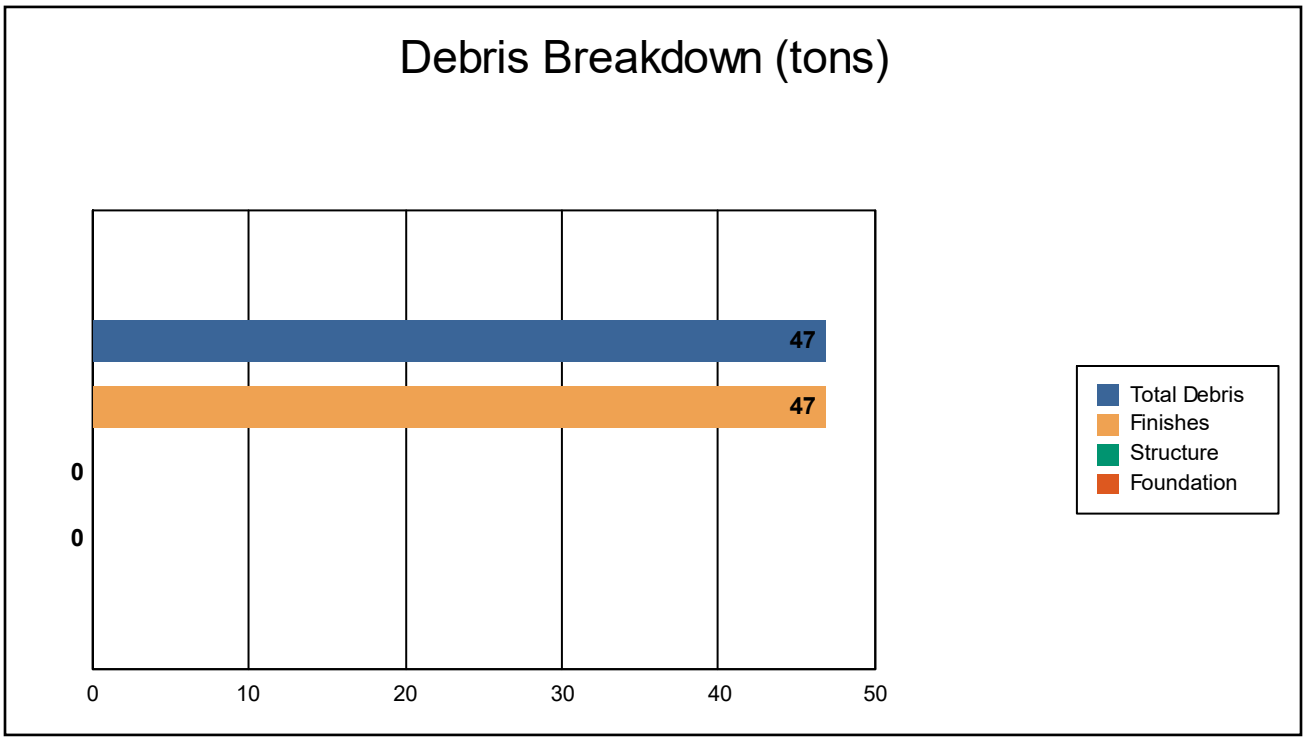
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

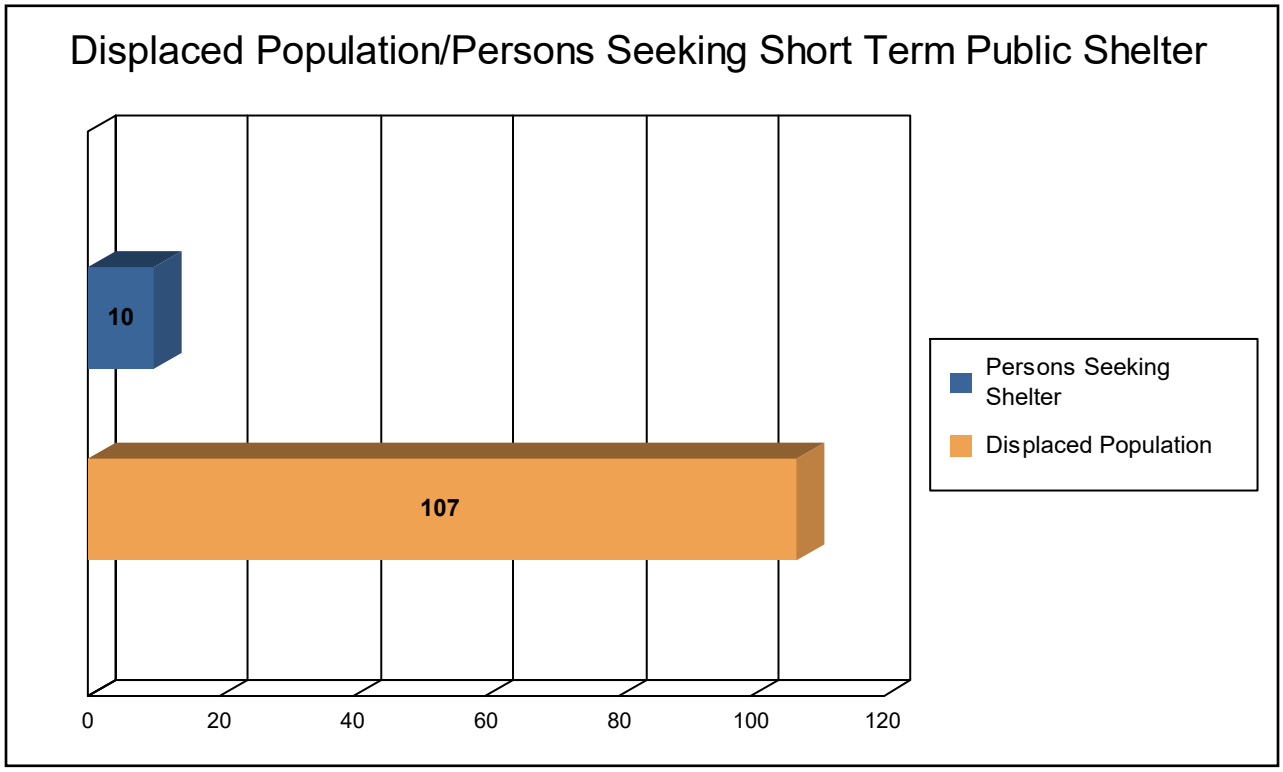


The model estimates that a total of 47 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 36 households (or 107 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 10 people (out of a total population of 9,098) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 19.77 million dollars, which represents 2.42 % of the total replacement value of the scenario buildings.

Building-Related Losses

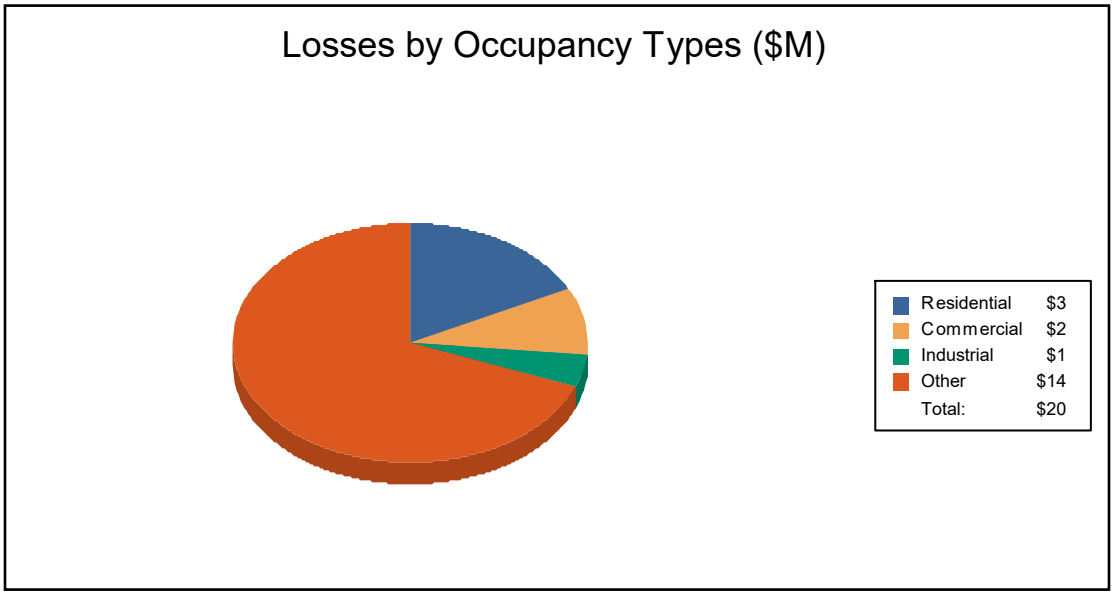
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 6.89 million dollars. 65% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 17.56% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.92	0.14	0.23	0.33	2.63
	Content	0.85	0.62	0.53	2.17	4.17
	Inventory	0.00	0.03	0.06	0.00	0.09
	Subtotal	**2.78**	**0.79**	**0.83**	**2.50**	**6.89**
Business Interruption						
	Income	0.00	0.37	0.01	0.40	0.78
	Relocation	0.51	0.02	0.03	0.48	1.04
	Rental Income	0.19	0.01	0.01	0.18	0.38
	Wage	0.00	0.60	0.02	10.08	10.69
	Subtotal	**0.70**	**0.99**	**0.07**	**11.13**	**12.89**
ALL	**Total**	**3.47**	**1.78**	**0.89**	**13.63**	**19.77**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,518	442,455	1,895,973
Total	**9,098**	**1,453,518**	**442,455**	**1,895,973**
Total Study Region	**9,098**	**1,453,518**	**442,455**	**1,895,973**

Hazus: Flood Global Risk Report

Region Name: Manchester_FL

Flood Scenario: Manchester_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

RiskMAP
Increasing Resilience Together

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 765 census blocks. The region contains over 25 thousand households and has a total population of 59,713 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 17,326 buildings in the region with a total building replacement value (excluding contents) of 11,095 million dollars. Approximately 87.11% of the buildings (and 53.60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of 11,095 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,946,455	53.6%
Commercial	2,982,511	26.9%
Industrial	725,919	6.5%
Agricultural	8,754	0.1%
Religion	369,857	3.3%
Government	273,672	2.5%
Education	787,443	7.1%
Total	**11,094,611**	**100%**

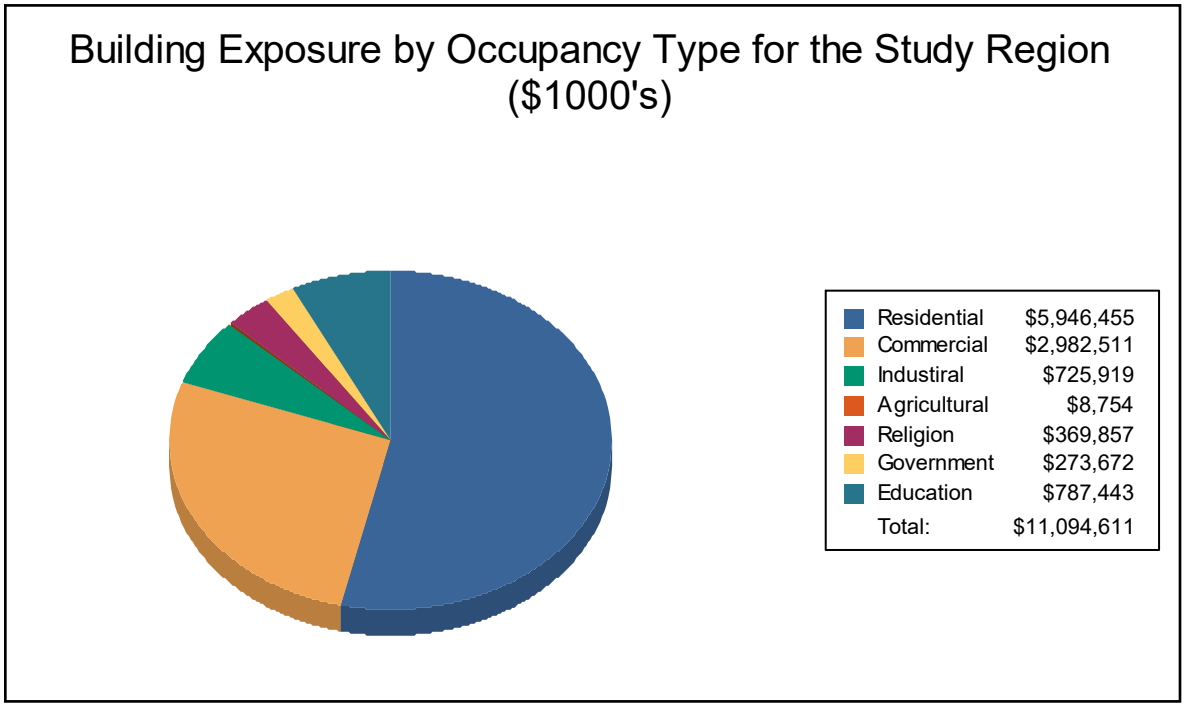
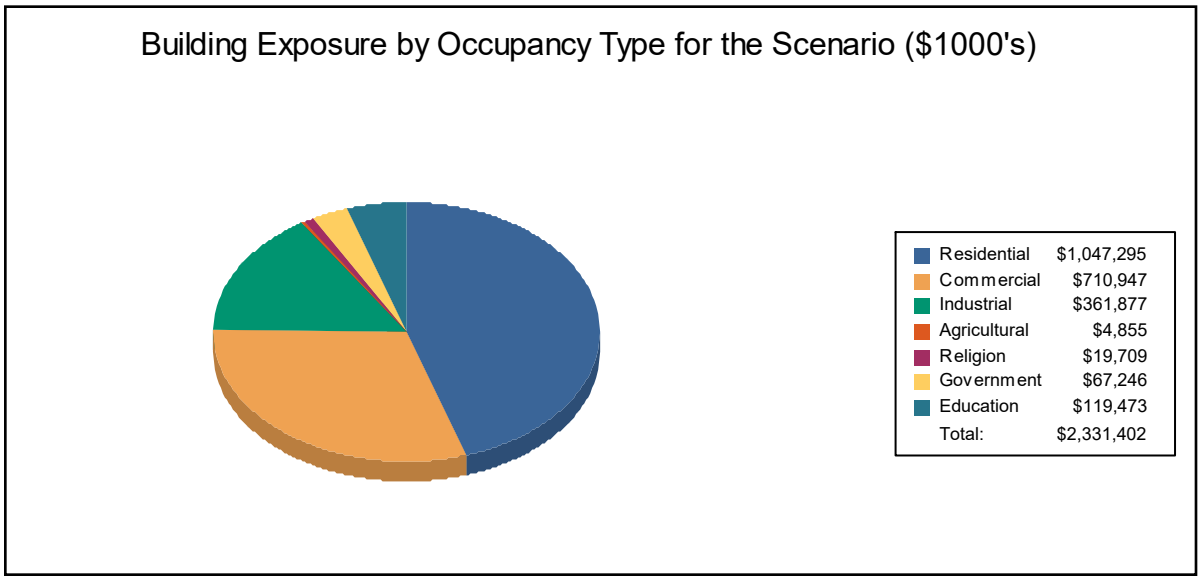


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,047,295	44.9%
Commercial	710,947	30.5%
Industrial	361,877	15.5%
Agricultural	4,855	0.2%
Religion	19,709	0.8%
Government	67,246	2.9%
Education	119,473	5.1%
Total	**2,331,402**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds.
There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation center.

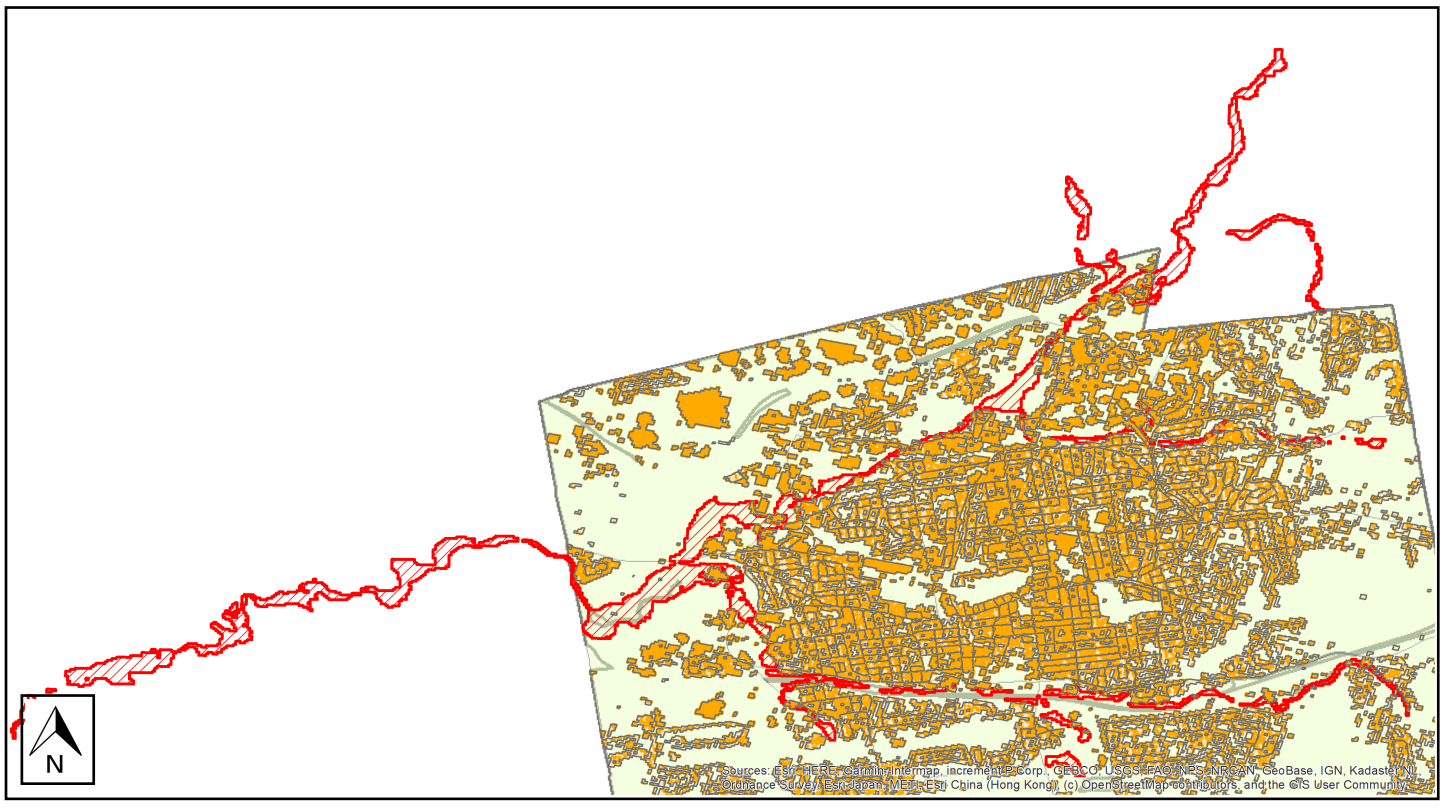
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Manchester_FL
Scenario Name:	Manchester_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 7 buildings will be at least moderately damaged. This is over 92% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

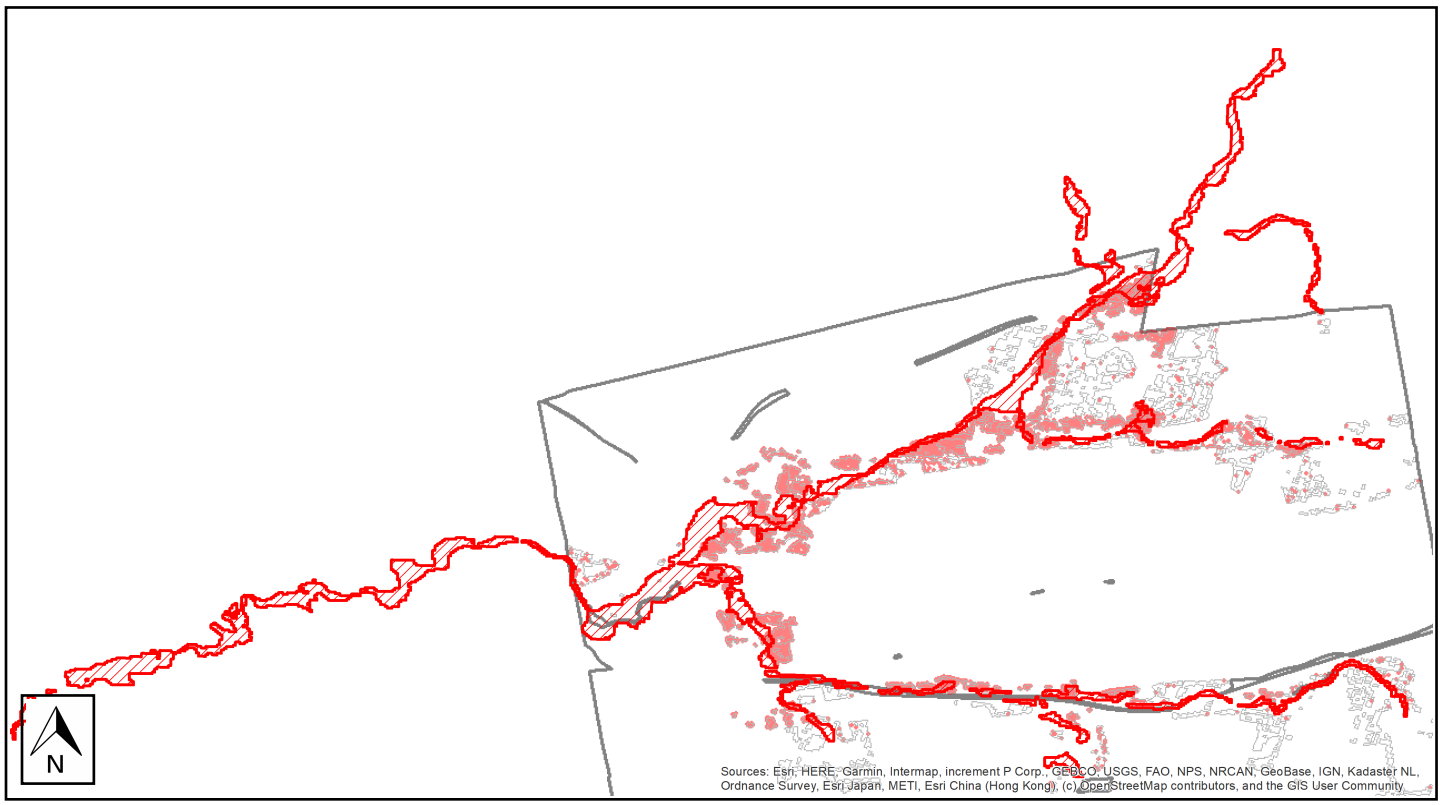


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	2	33	3	50	1	17	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	50	3	50	0	0	0	0	0	0	0	0
Total	**5**		**6**		**1**		**0**		**0**		**0**	

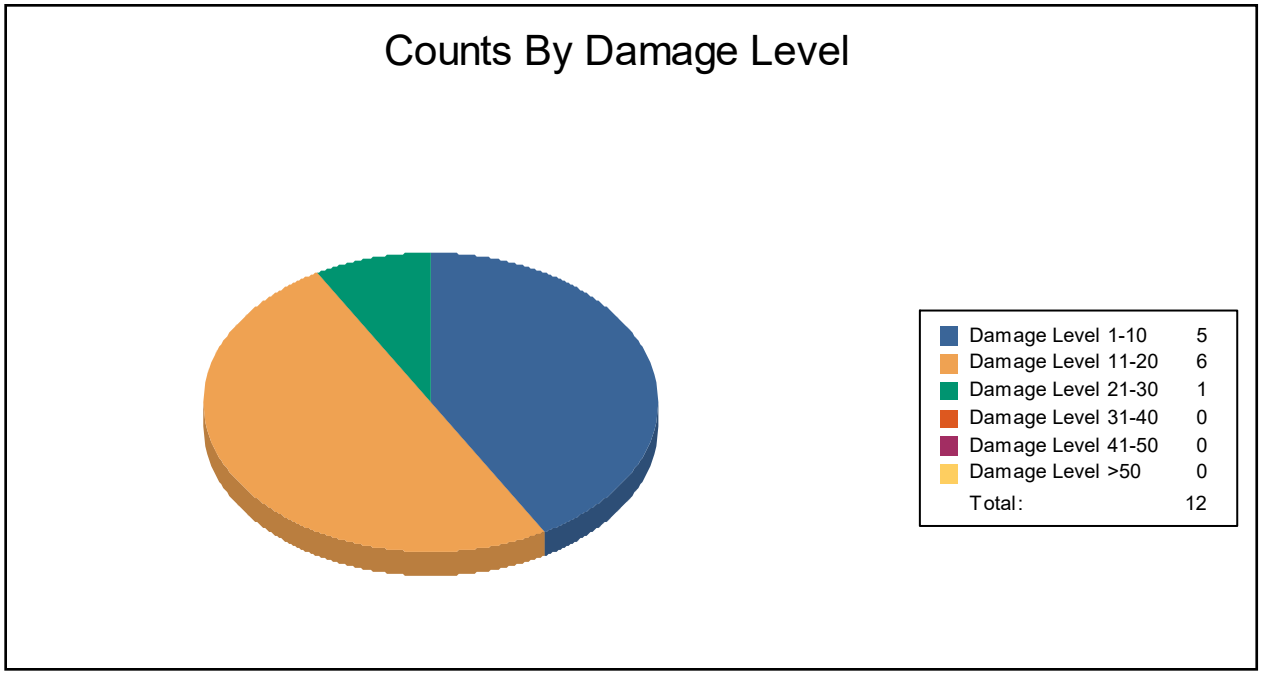


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	1	100	0	0	0	0	0	0	0	0
Steel	1	33	1	33	1	33	0	0	0	0	0	0
Wood	3	50	3	50	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 249 hospital beds available for use. On the day of the scenario flood event, the model estimates that 249 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	7	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

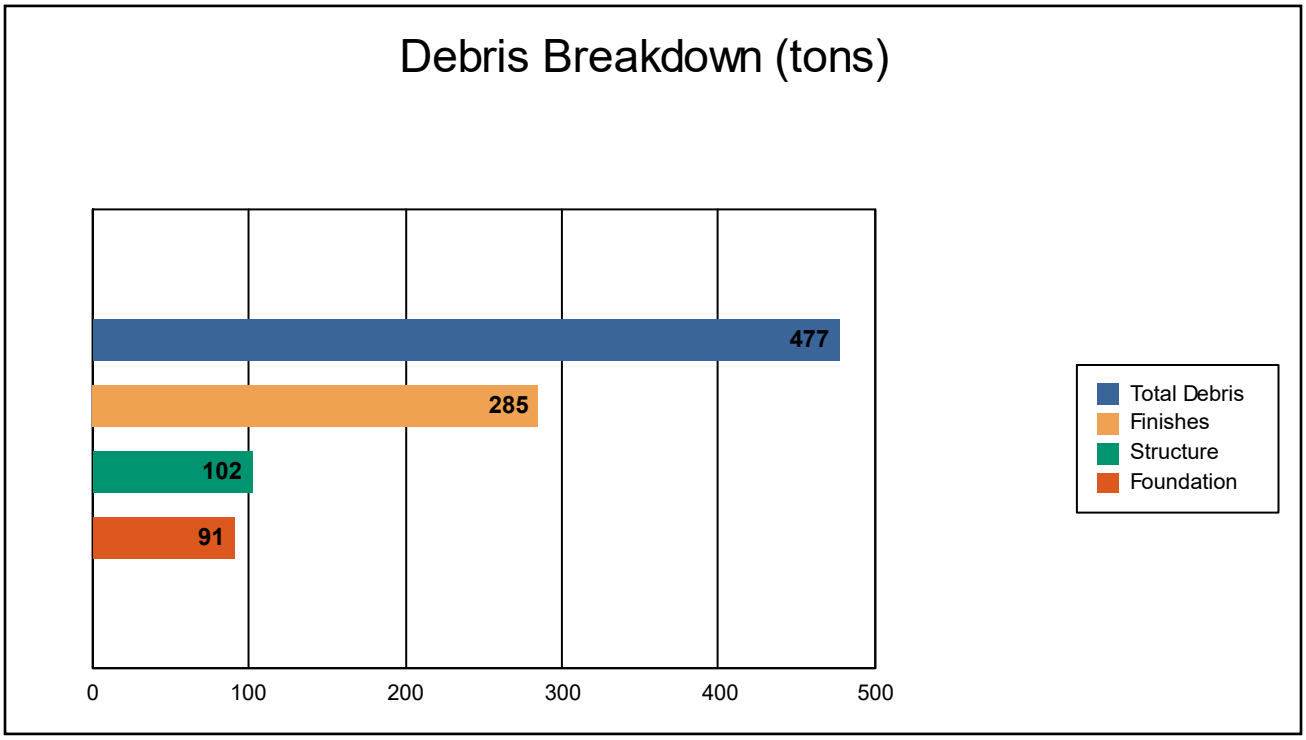
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

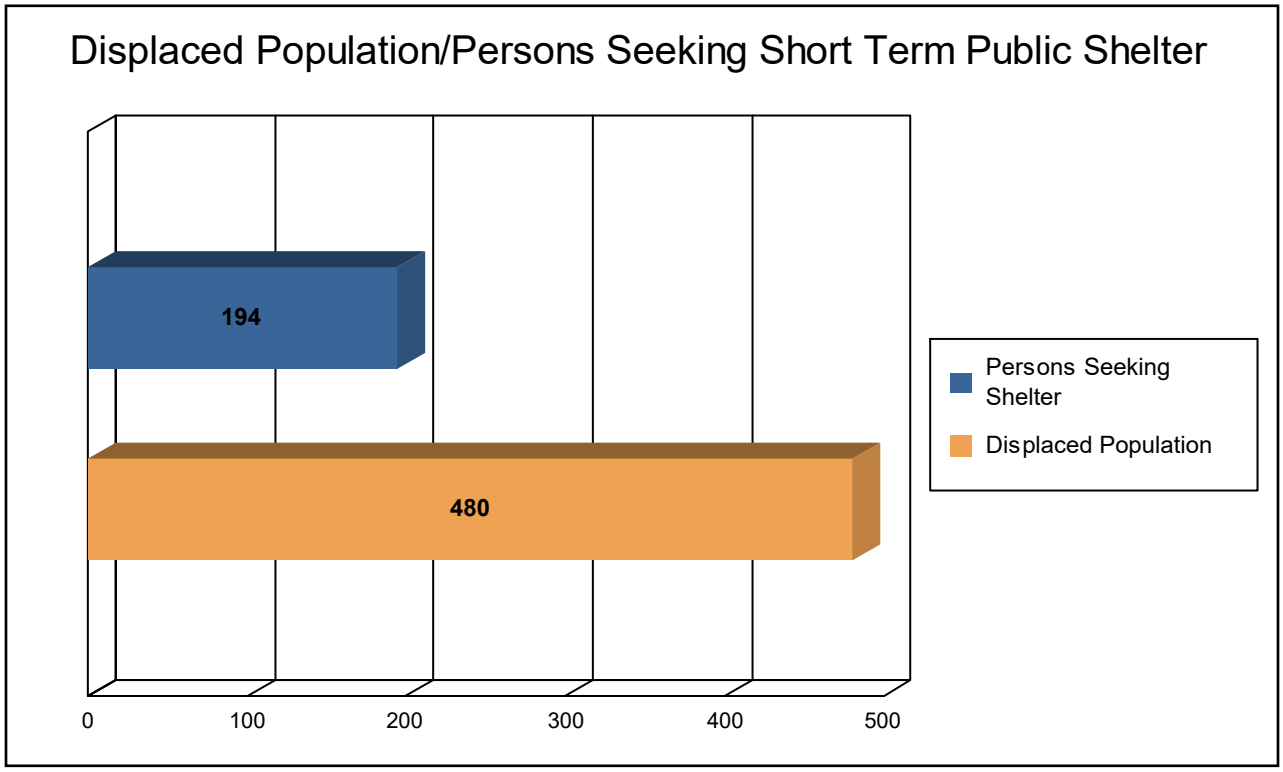


The model estimates that a total of 477 tons of debris will be generated. Of the total amount, Finishes comprises 60% of the total, Structure comprises 21% of the total, and Foundation comprises 19%. If the debris tonnage is converted into an estimated number of truckloads, it will require 20 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 160 households (or 480 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 194 people (out of a total population of 59,713) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 140.08 million dollars, which represents 6.01 % of the total replacement value of the scenario buildings.

Building-Related Losses

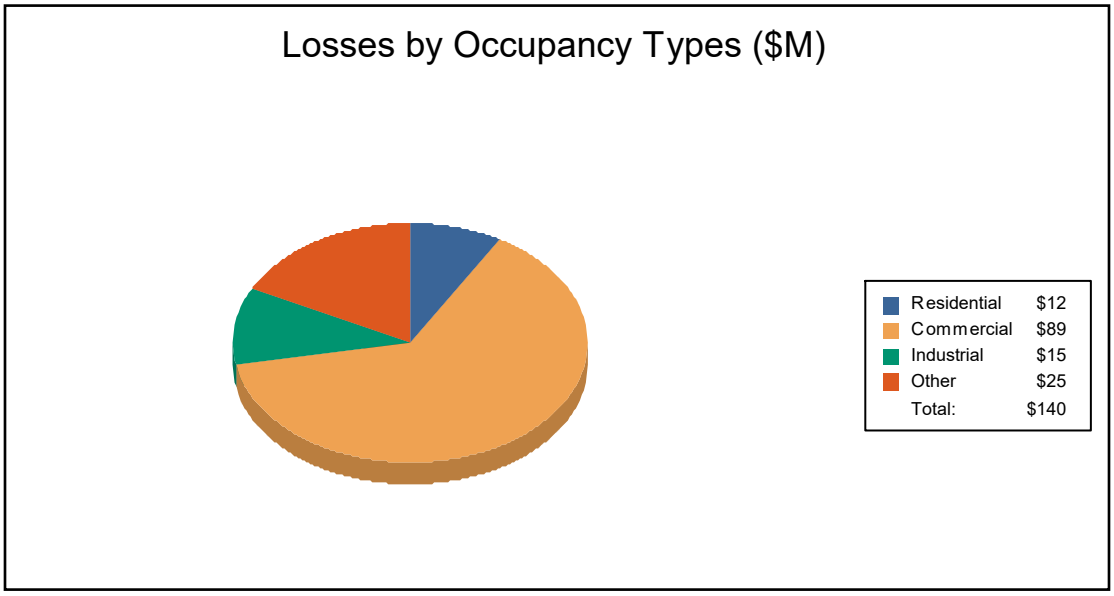
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 70.65 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.35% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.98	8.71	3.72	0.82	18.24
	Content	3.03	27.75	8.81	4.06	43.65
	Inventory	0.00	7.09	1.17	0.50	8.76
	Subtotal	**8.02**	**43.55**	**13.70**	**5.38**	**70.65**
Business Interruption						
	Income	0.41	17.19	0.25	2.02	19.87
	Relocation	1.19	5.09	0.28	1.33	7.89
	Rental Income	1.12	3.76	0.06	0.25	5.20
	Wage	0.96	19.58	0.37	15.56	36.47
	Subtotal	**3.68**	**45.62**	**0.96**	**19.17**	**69.43**
ALL	**Total**	**11.69**	**89.17**	**14.67**	**24.55**	**140.08**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,946,455	5,148,156	11,094,611
Total	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**
Total Study Region	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**

Hazus: Flood Global Risk Report

Region Name: Manchester_FL

Flood Scenario: Manchester_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 765 census blocks. The region contains over 25 thousand households and has a total population of 59,713 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 17,326 buildings in the region with a total building replacement value (excluding contents) of 11,095 million dollars. Approximately 87.11% of the buildings (and 53.60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of 11,095 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,946,455	53.6%
Commercial	2,982,511	26.9%
Industrial	725,919	6.5%
Agricultural	8,754	0.1%
Religion	369,857	3.3%
Government	273,672	2.5%
Education	787,443	7.1%
Total	**11,094,611**	**100%**

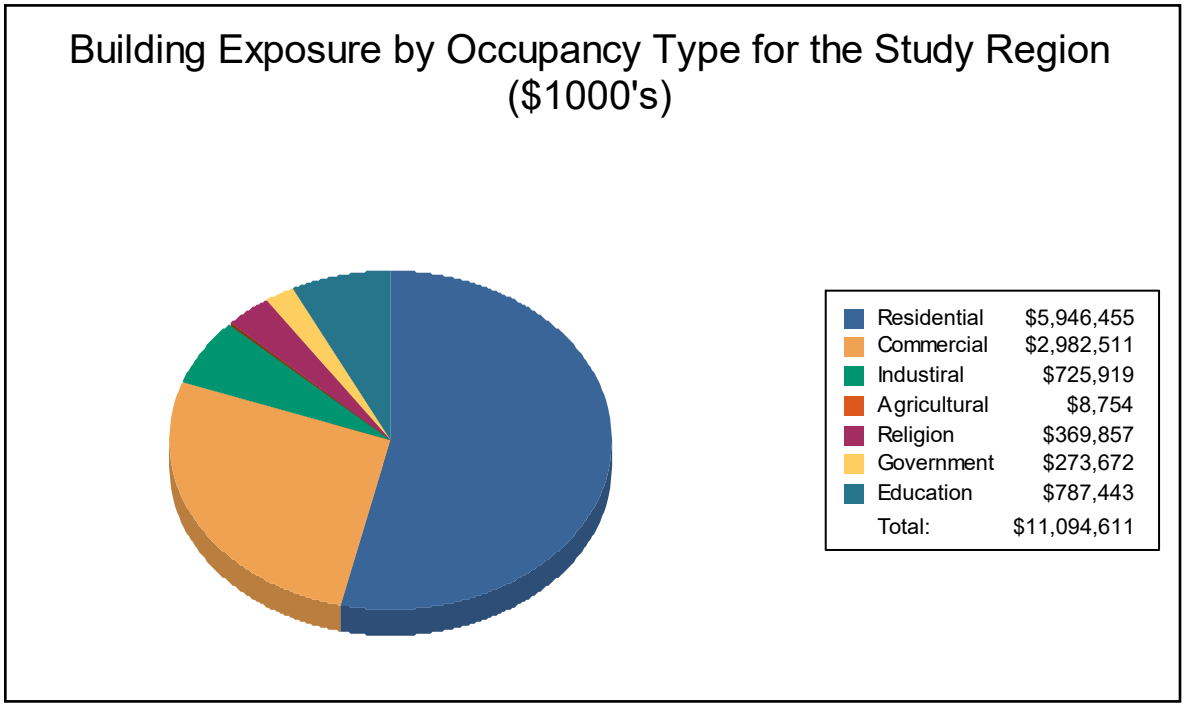
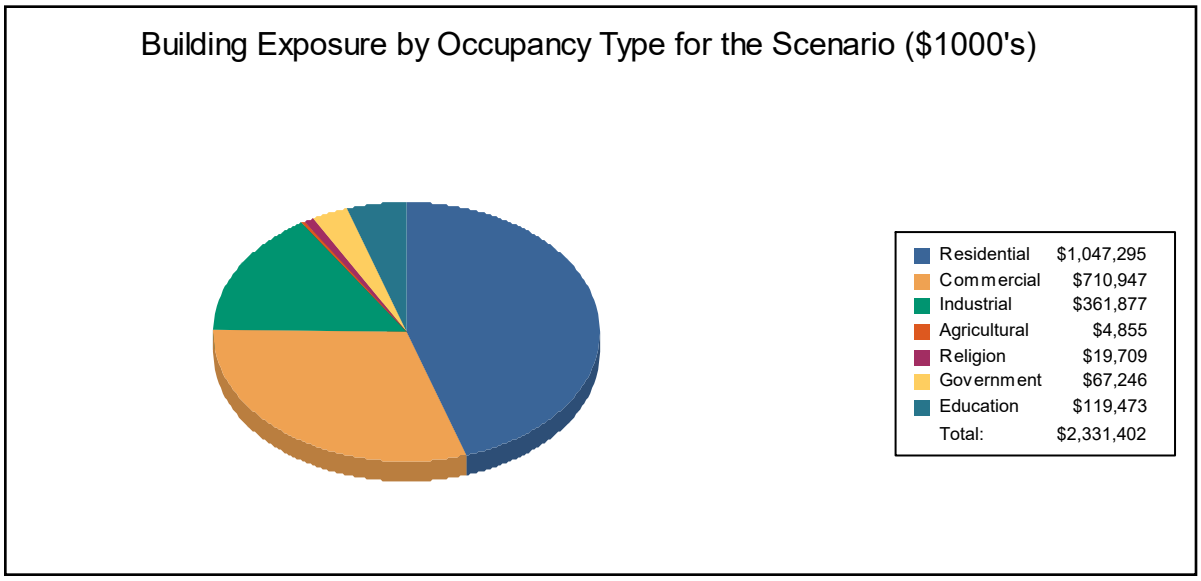


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,047,295	44.9%
Commercial	710,947	30.5%
Industrial	361,877	15.5%
Agricultural	4,855	0.2%
Religion	19,709	0.8%
Government	67,246	2.9%
Education	119,473	5.1%
Total	**2,331,402**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds.
There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation center.

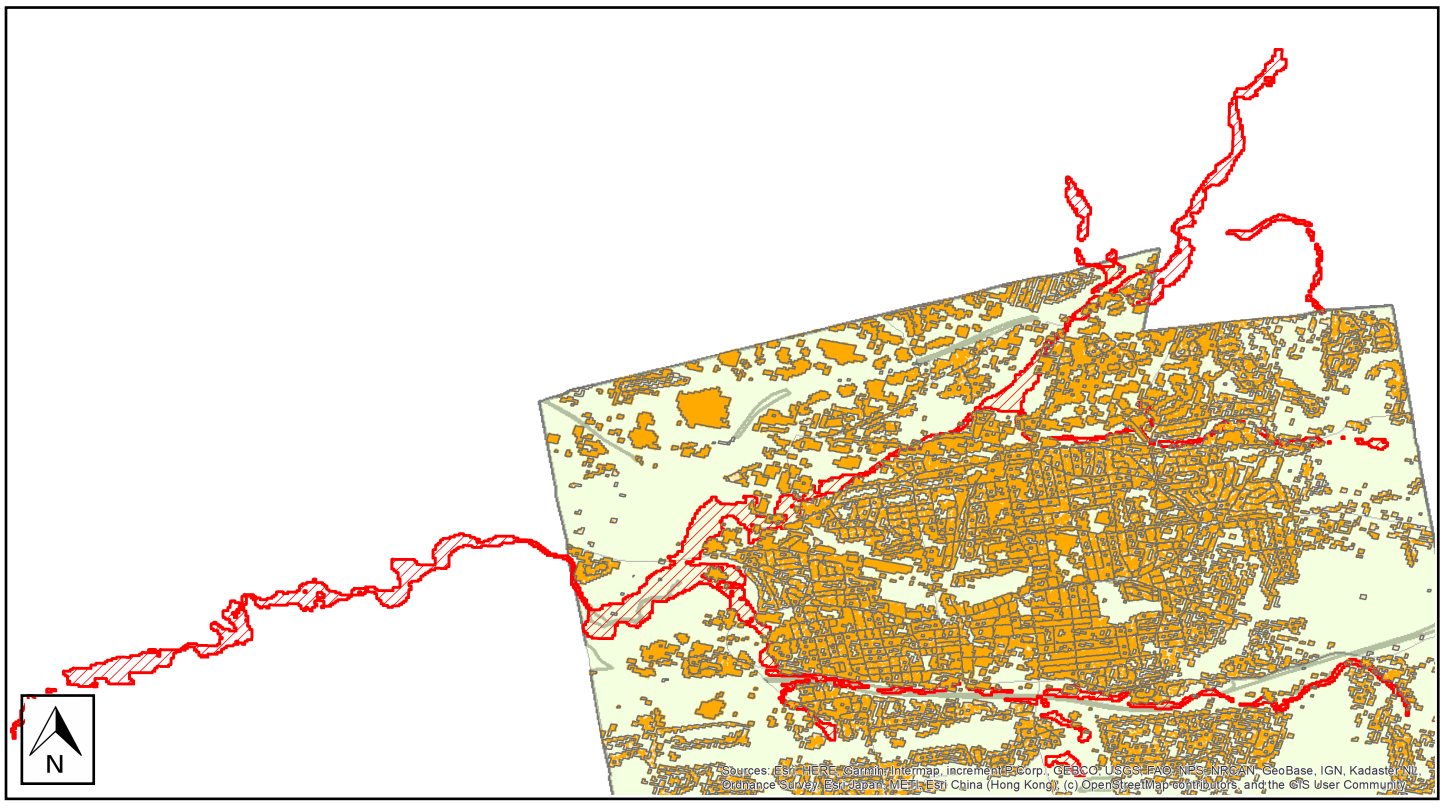
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Manchester_FL
Scenario Name:	Manchester_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 10 buildings will be at least moderately damaged. This is over 89% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

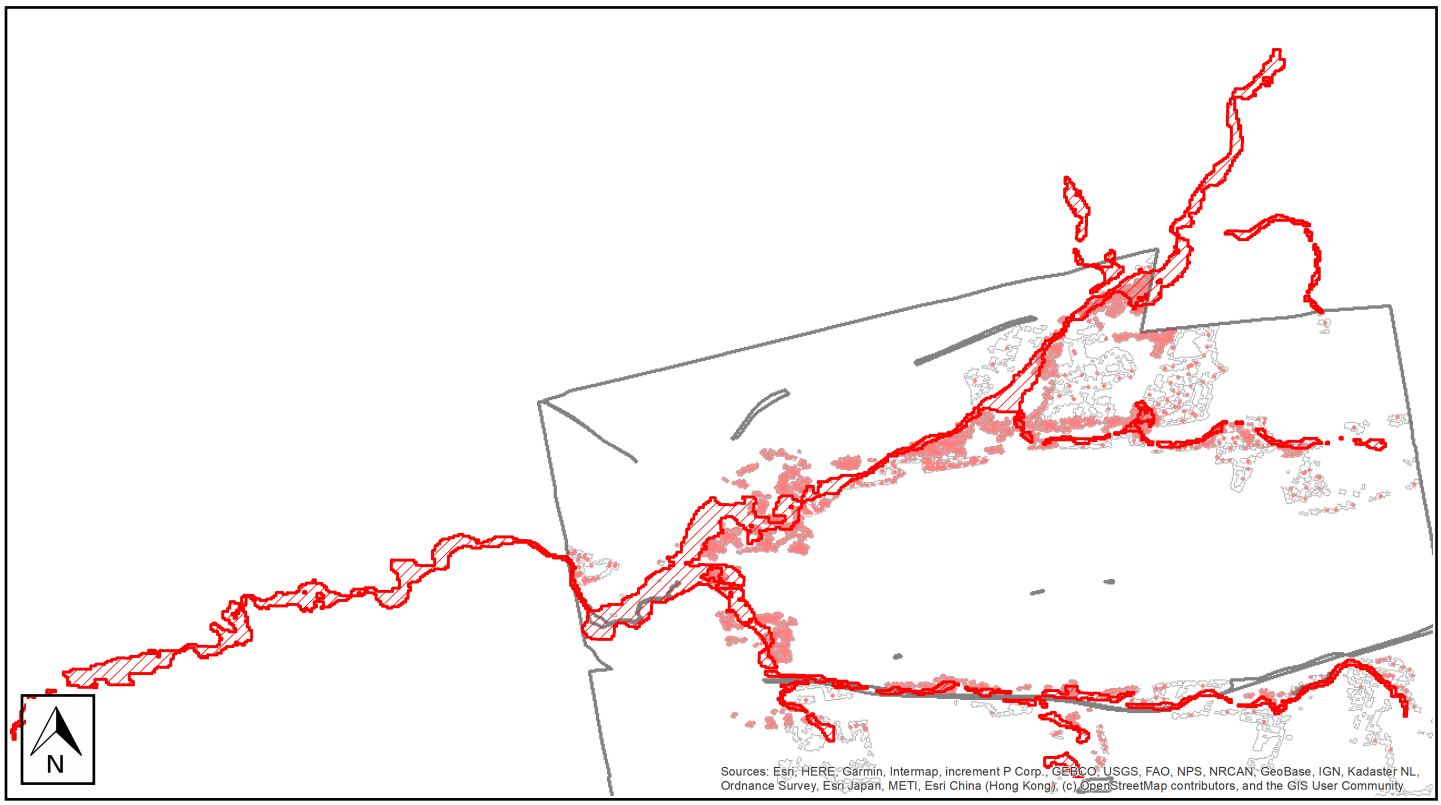


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	3	33	5	56	0	0	1	11	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	4	50	4	50	0	0	0	0	0	0	0	0
Total	**7**		**9**		**0**		**1**		**0**		**0**	

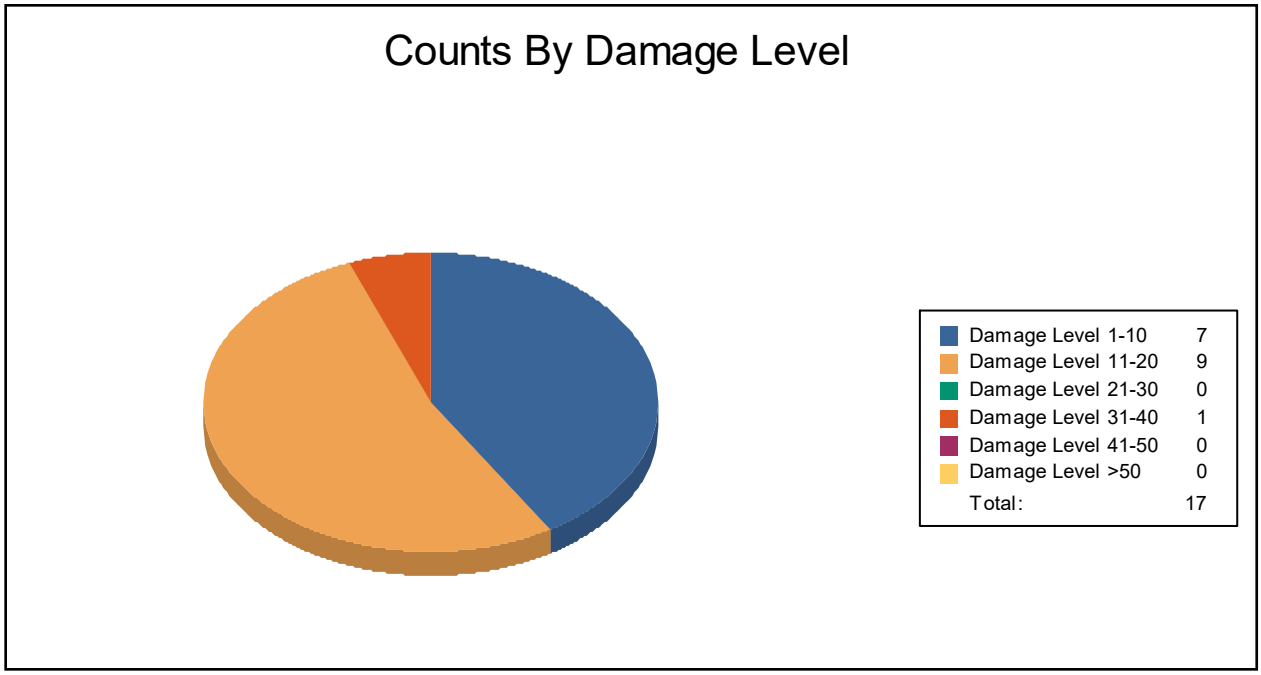


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	1	100	0	0	0	0	0	0	0	0
Steel	1	20	3	60	0	0	1	20	0	0	0	0
Wood	4	44	5	56	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 249 hospital beds available for use. On the day of the scenario flood event, the model estimates that 249 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	7	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

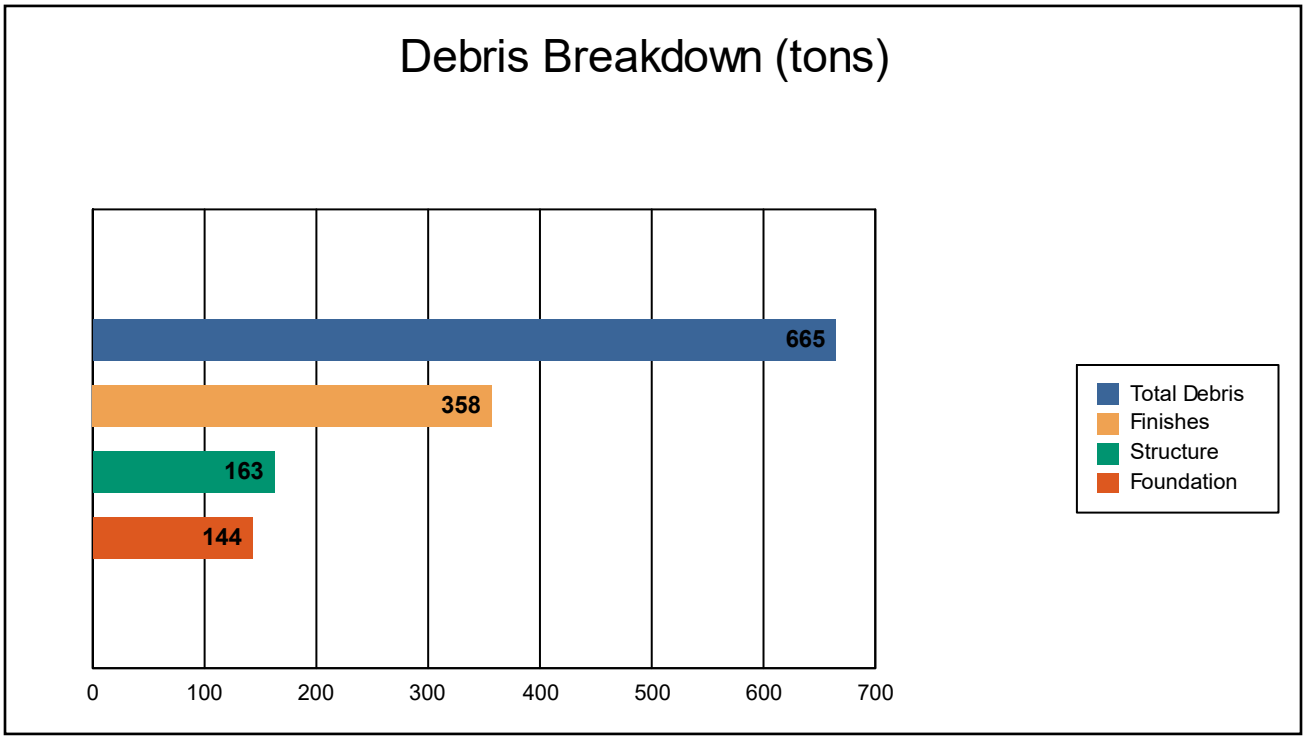
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

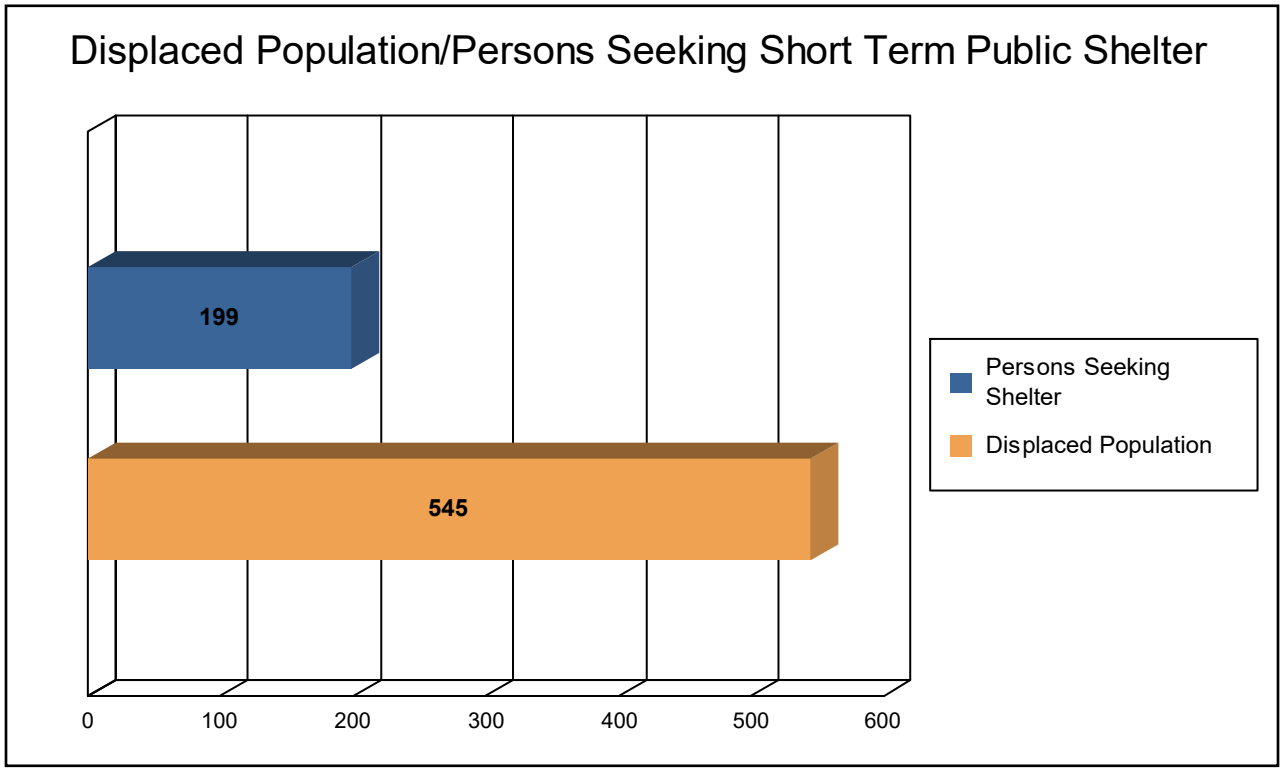


The model estimates that a total of 665 tons of debris will be generated. Of the total amount, Finishes comprises 54% of the total, Structure comprises 25% of the total, and Foundation comprises 22%. If the debris tonnage is converted into an estimated number of truckloads, it will require 27 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 182 households (or 545 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 199 people (out of a total population of 59,713) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 174.21 million dollars, which represents 7.47 % of the total replacement value of the scenario buildings.

Building-Related Losses

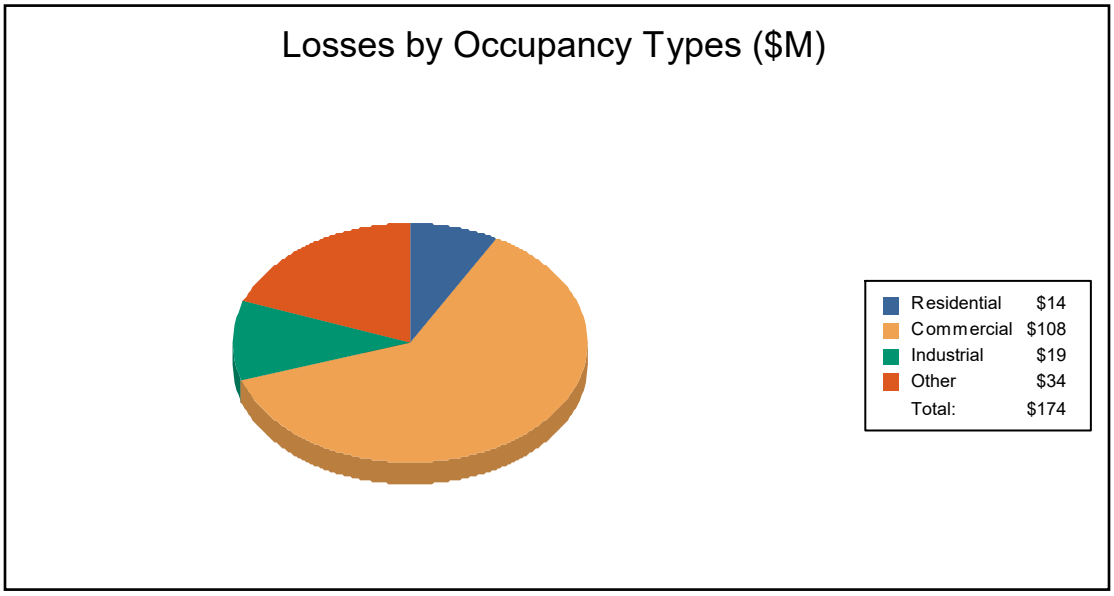
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 89.19 million dollars. 49% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.14% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6.17	10.90	4.68	1.25	23.01
	Content	3.80	33.81	11.38	6.42	55.41
	Inventory	0.00	8.67	1.50	0.60	10.78
	Subtotal	**9.97**	**53.39**	**17.56**	**8.27**	**89.19**
Business Interruption						
	Income	0.46	20.32	0.28	3.26	24.32
	Relocation	1.36	6.07	0.31	2.02	9.76
	Rental Income	1.29	4.49	0.06	0.31	6.15
	Wage	1.09	23.39	0.42	19.88	44.78
	Subtotal	**4.20**	**54.27**	**1.07**	**25.48**	**85.02**
ALL	**Total**	**14.17**	**107.66**	**18.63**	**33.75**	**174.21**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,946,455	5,148,156	11,094,611
Total	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**
Total Study Region	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**

Hazus: Flood Global Risk Report

Region Name: Manchester_FL

Flood Scenario: Manchester_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 765 census blocks. The region contains over 25 thousand households and has a total population of 59,713 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 17,326 buildings in the region with a total building replacement value (excluding contents) of 11,095 million dollars. Approximately 87.11% of the buildings (and 53.60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of 11,095 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,946,455	53.6%
Commercial	2,982,511	26.9%
Industrial	725,919	6.5%
Agricultural	8,754	0.1%
Religion	369,857	3.3%
Government	273,672	2.5%
Education	787,443	7.1%
Total	**11,094,611**	**100%**

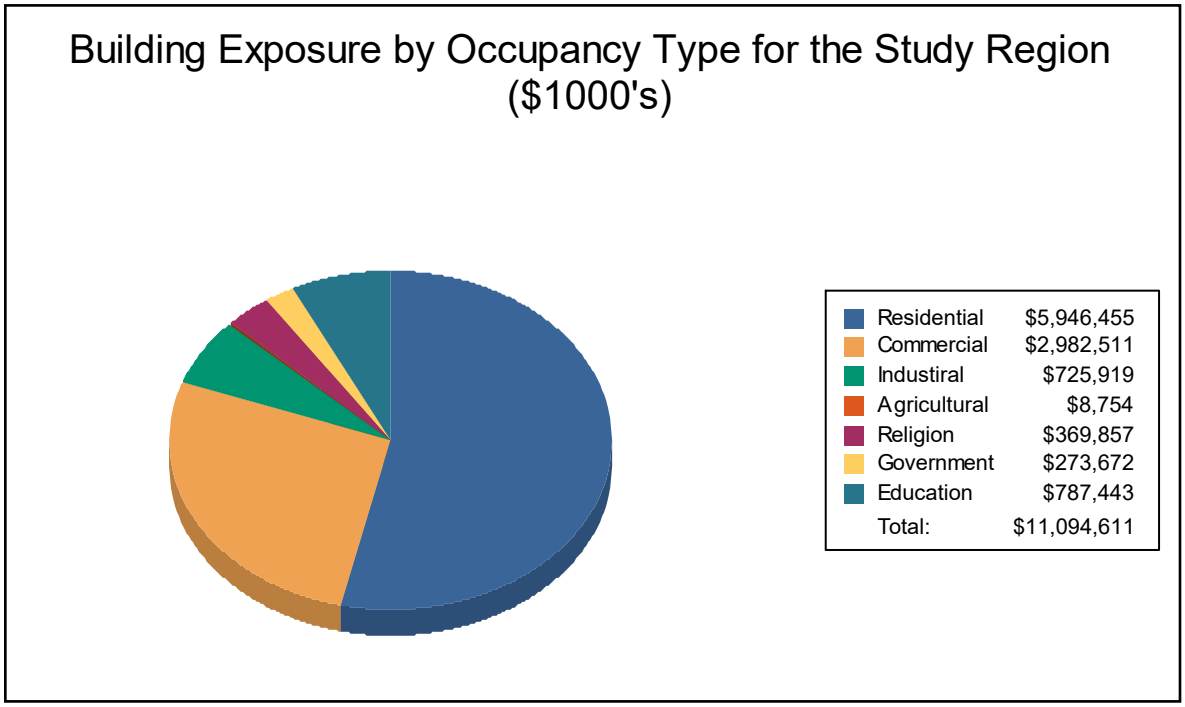
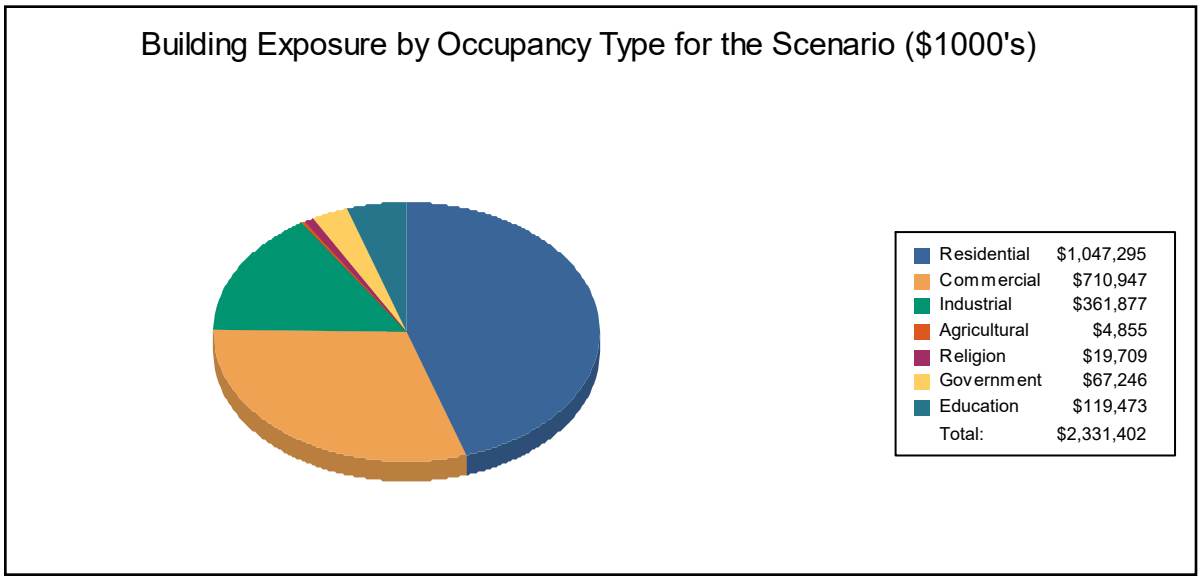


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,047,295	44.9%
Commercial	710,947	30.5%
Industrial	361,877	15.5%
Agricultural	4,855	0.2%
Religion	19,709	0.8%
Government	67,246	2.9%
Education	119,473	5.1%
Total	**2,331,402**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds.
There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation center.

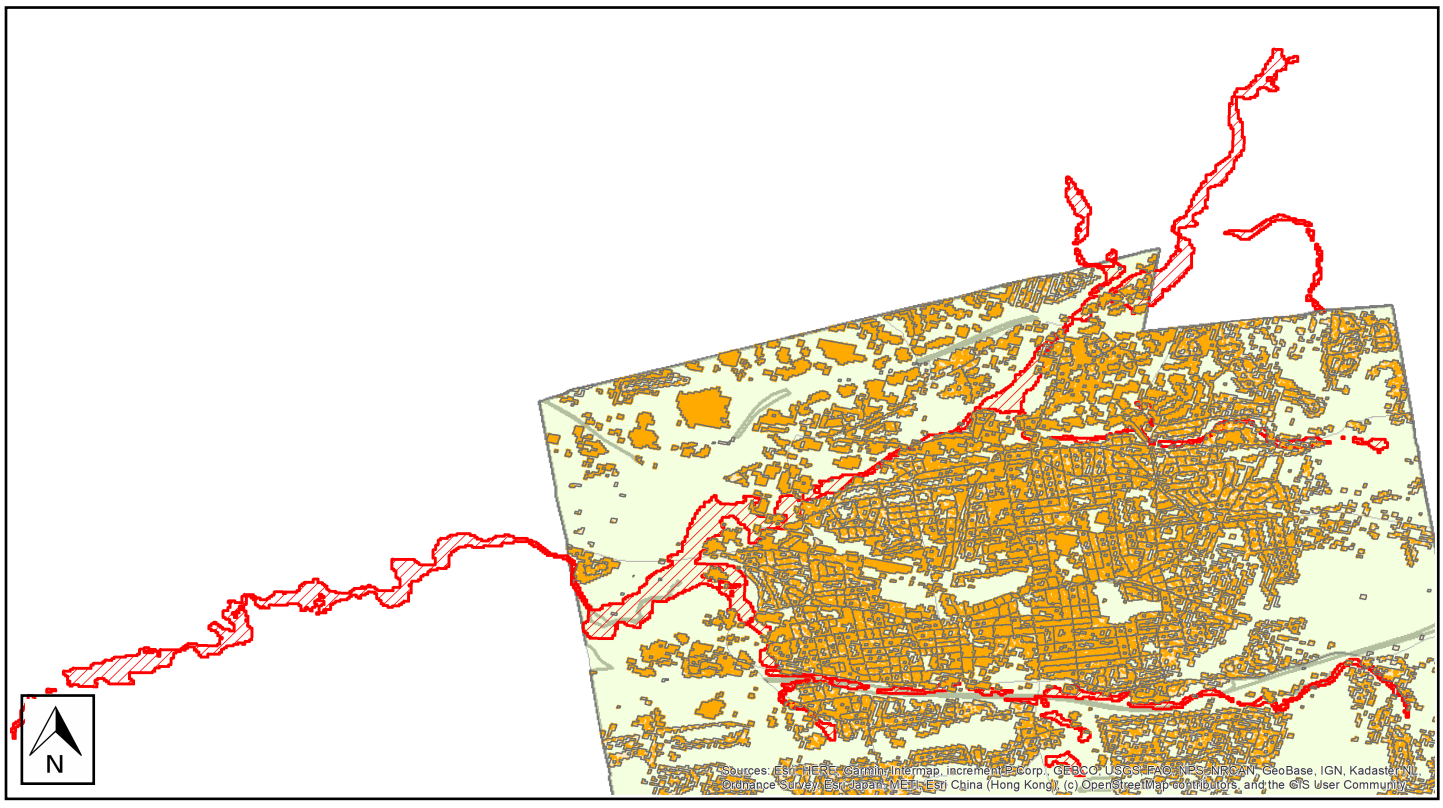
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Manchester_FL
Scenario Name:	Manchester_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 14 buildings will be at least moderately damaged. This is over 92% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

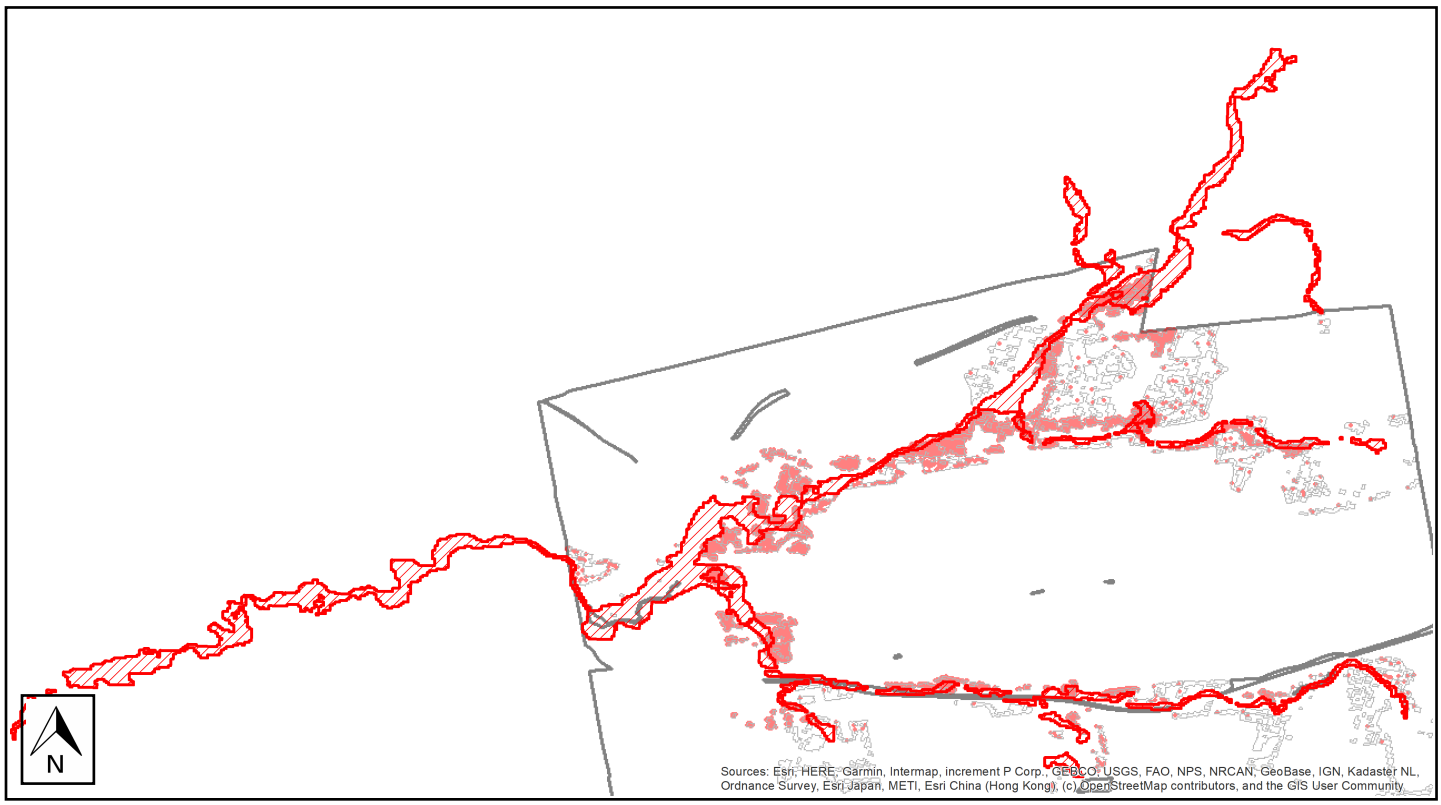


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	3	25	8	67	0	0	1	8	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	1	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	6	55	5	45	0	0	0	0	0	0	0	0
Total	**10**		**13**		**0**		**1**		**0**		**0**	

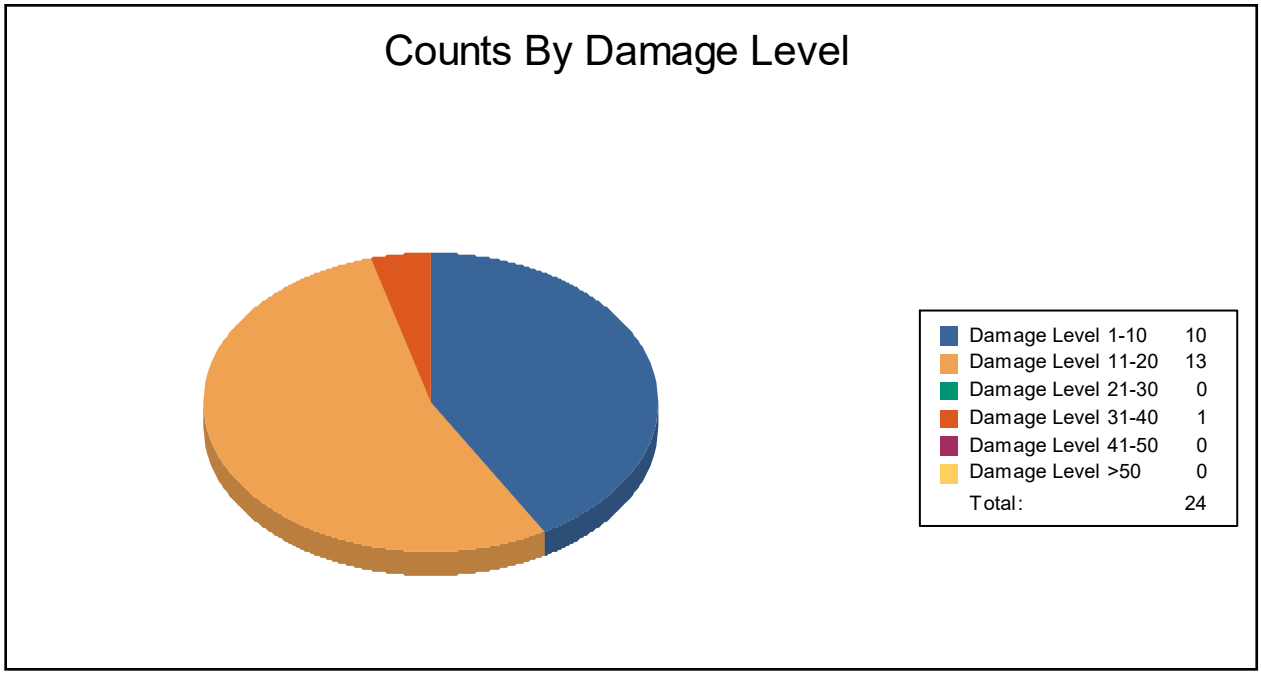


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	2	100	0	0	0	0	0	0	0	0
Steel	3	43	3	43	0	0	1	14	0	0	0	0
Wood	6	50	6	50	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 249 hospital beds available for use. On the day of the scenario flood event, the model estimates that 249 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	7	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

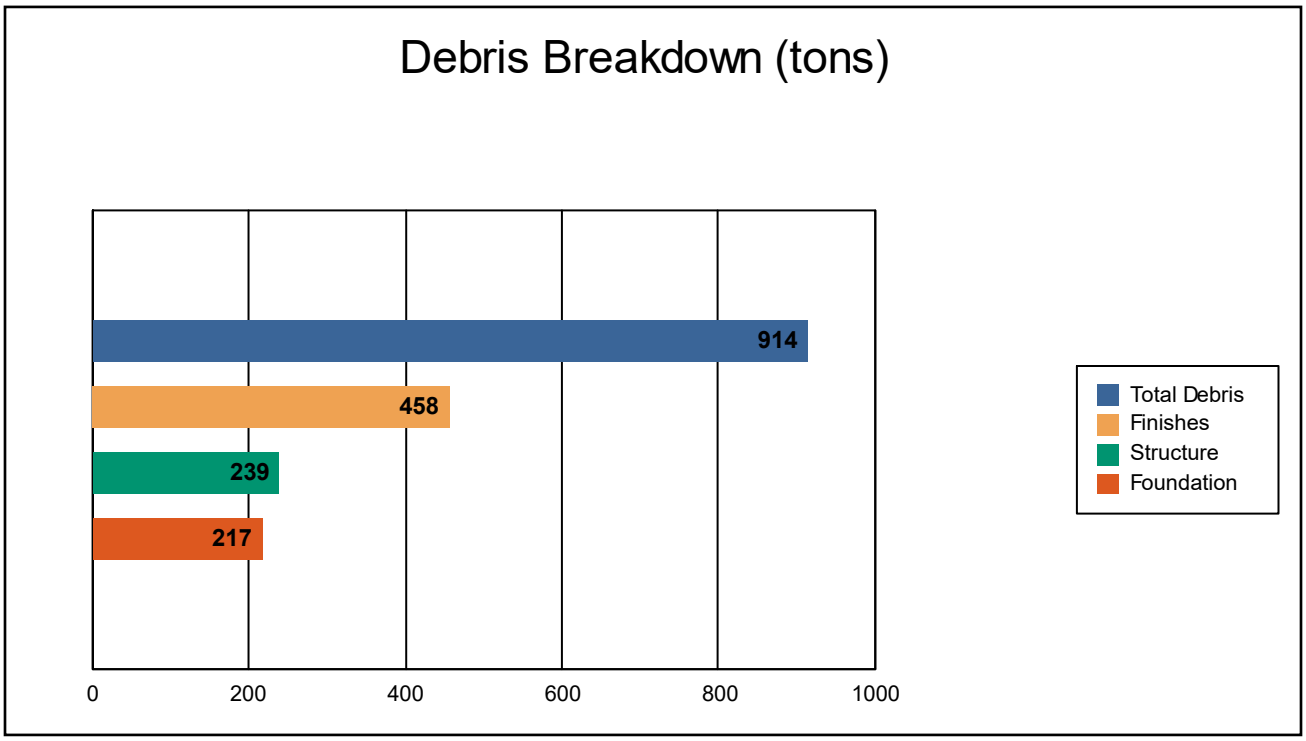
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

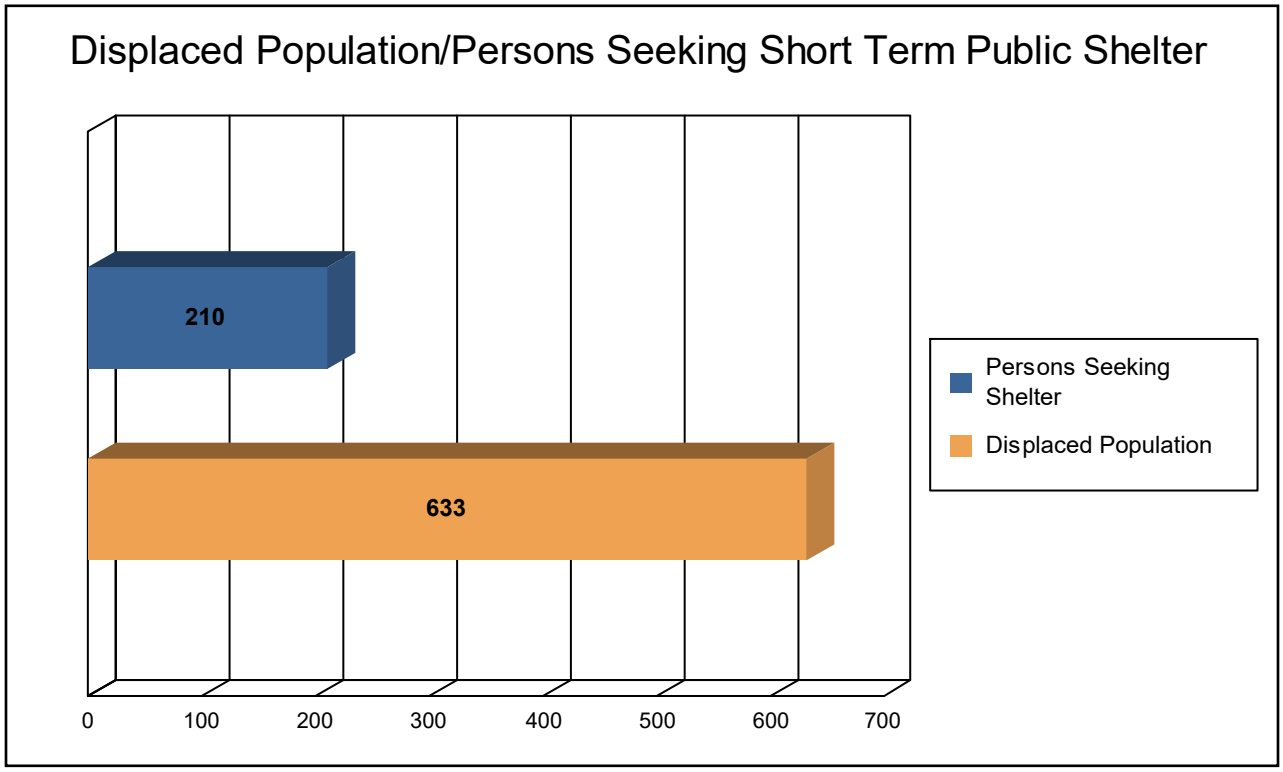


The model estimates that a total of 914 tons of debris will be generated. Of the total amount, Finishes comprises 50% of the total, Structure comprises 26% of the total, and Foundation comprises 24%. If the debris tonnage is converted into an estimated number of truckloads, it will require 37 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 211 households (or 633 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 210 people (out of a total population of 59,713) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 218.15 million dollars, which represents 9.36 % of the total replacement value of the scenario buildings.

Building-Related Losses

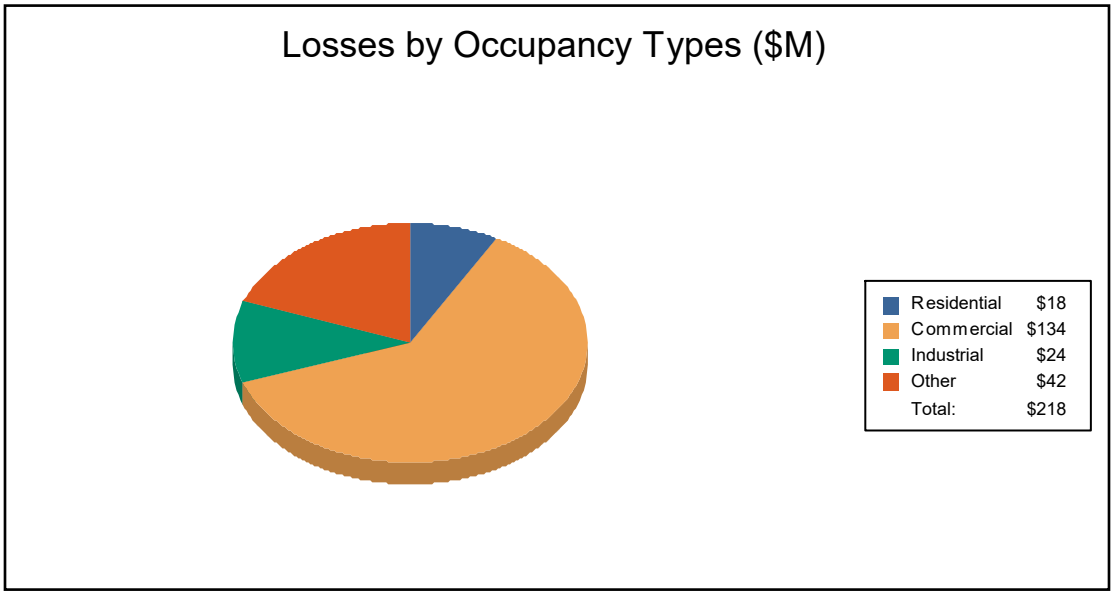
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 115.23 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.06% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.90	14.08	5.93	1.77	29.69
	Content	4.83	42.85	14.66	9.48	71.82
	Inventory	0.00	11.09	1.93	0.71	13.73
	Subtotal	**12.73**	**68.02**	**22.52**	**11.96**	**115.23**
Business Interruption						
	Income	0.53	24.62	0.36	4.03	29.54
	Relocation	1.60	7.58	0.40	2.47	12.04
	Rental Income	1.51	5.58	0.09	0.37	7.55
	Wage	1.23	28.68	0.54	23.35	53.80
	Subtotal	**4.86**	**66.46**	**1.38**	**30.21**	**102.92**
ALL	**Total**	**17.59**	**134.47**	**23.91**	**42.18**	**218.15**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,946,455	5,148,156	11,094,611
Total	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**
Total Study Region	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**

Hazus: Flood Global Risk Report

Region Name: Manchester_FL

Flood Scenario: Manchester_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 765 census blocks. The region contains over 25 thousand households and has a total population of 59,713 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 17,326 buildings in the region with a total building replacement value (excluding contents) of 11,095 million dollars. Approximately 87.11% of the buildings (and 53.60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of 11,095 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,946,455	53.6%
Commercial	2,982,511	26.9%
Industrial	725,919	6.5%
Agricultural	8,754	0.1%
Religion	369,857	3.3%
Government	273,672	2.5%
Education	787,443	7.1%
Total	**11,094,611**	**100%**

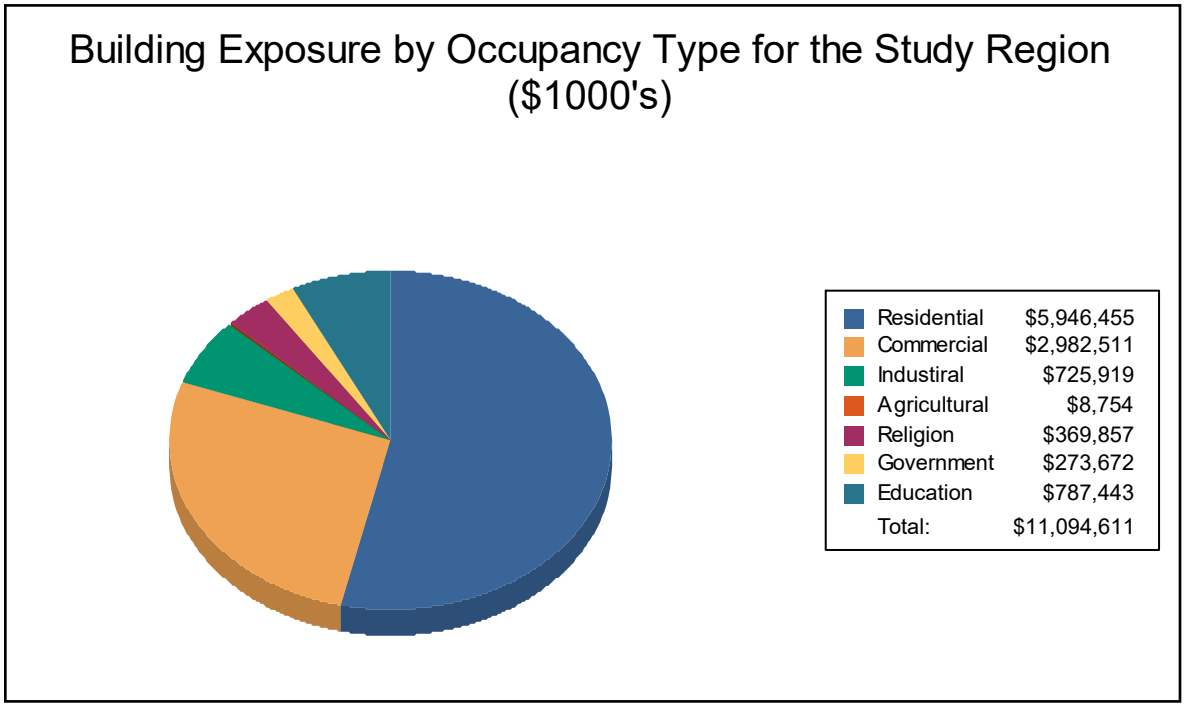
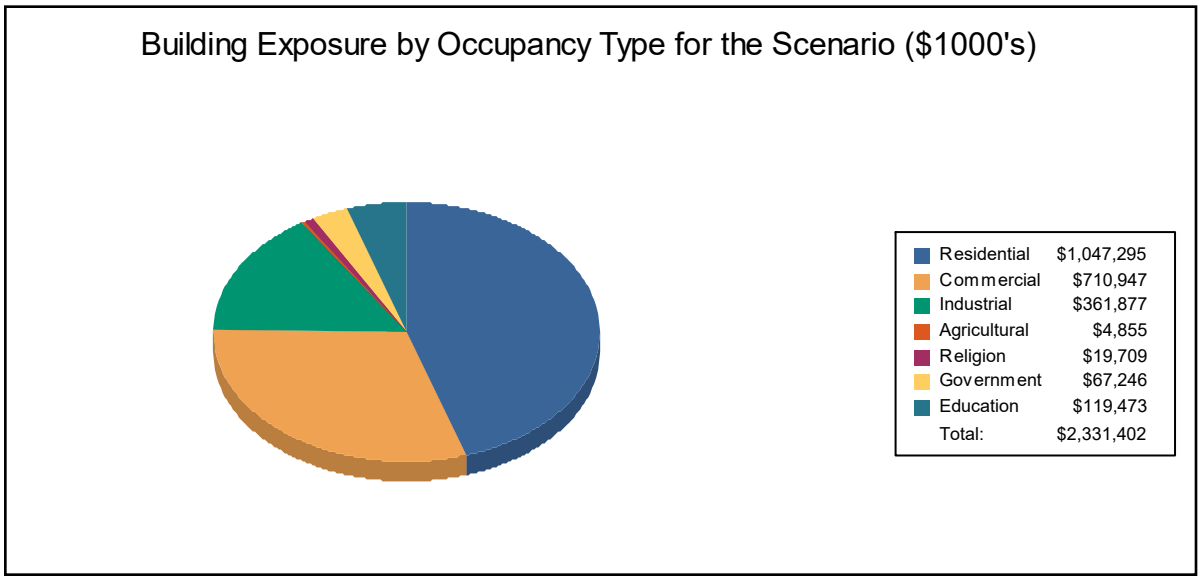


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,047,295	44.9%
Commercial	710,947	30.5%
Industrial	361,877	15.5%
Agricultural	4,855	0.2%
Religion	19,709	0.8%
Government	67,246	2.9%
Education	119,473	5.1%
Total	**2,331,402**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds.
There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation center.

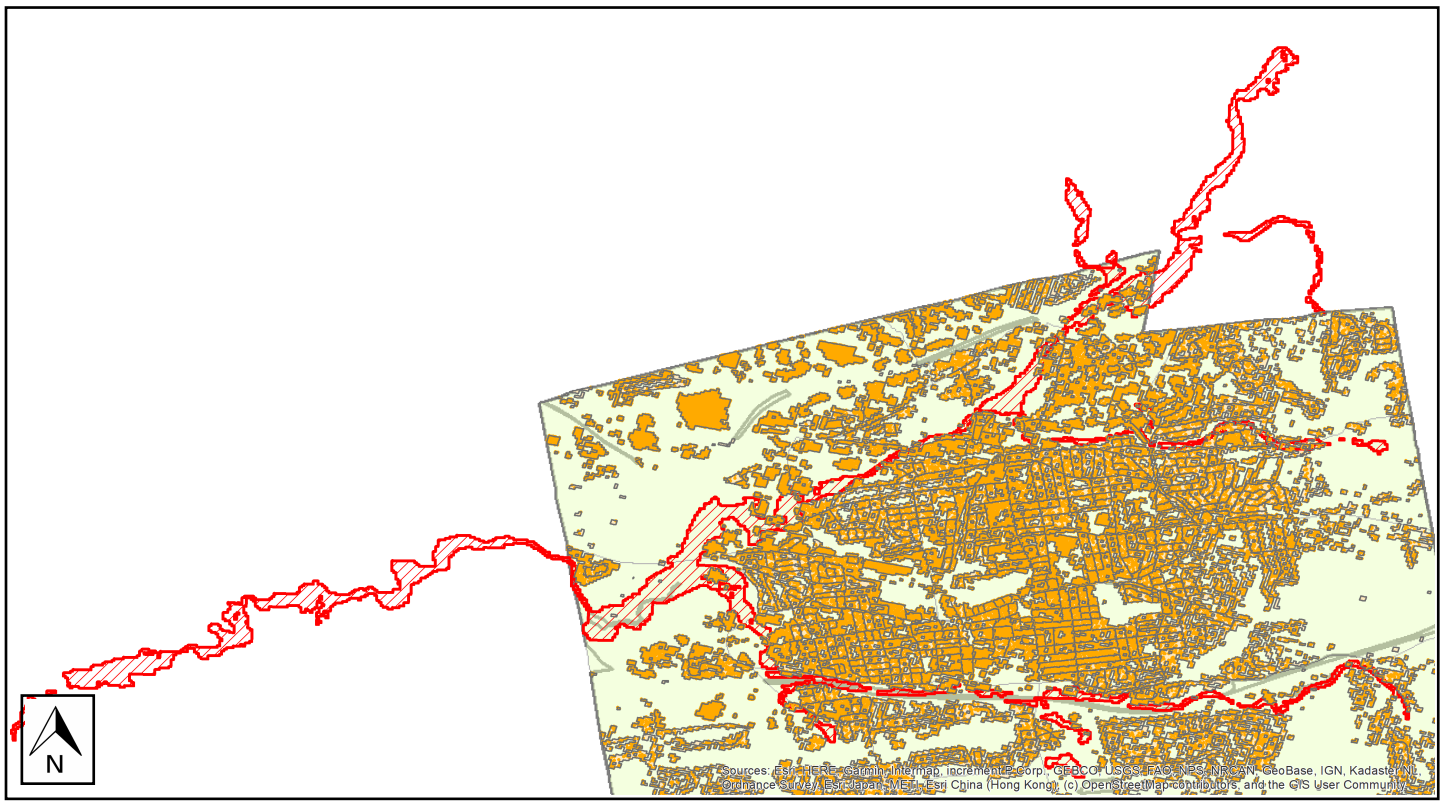
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Manchester_FL
Scenario Name:	Manchester_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 13 buildings will be at least moderately damaged. This is over 95% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

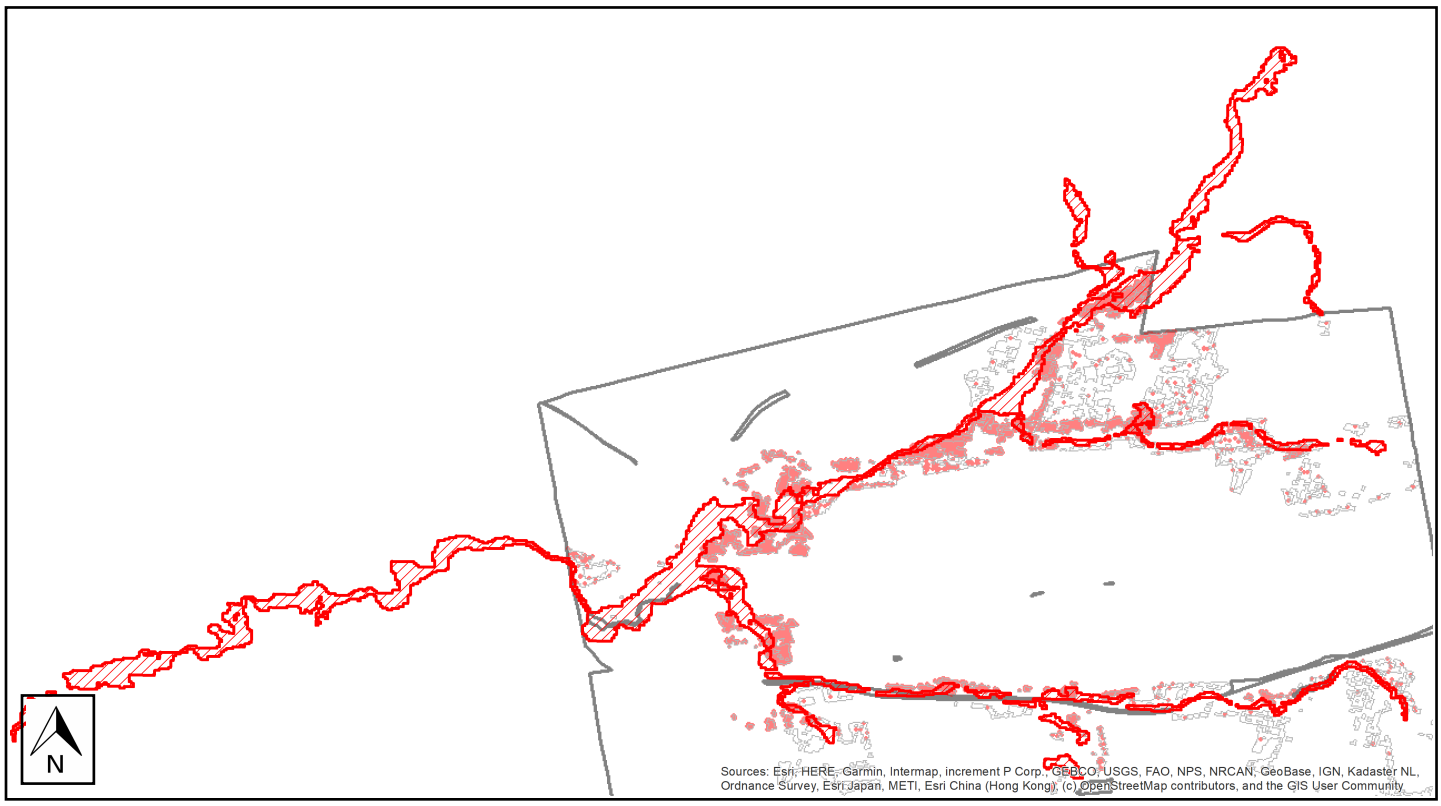


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	2	20	8	80	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	4	44	5	56	0	0	0	0	0	0	0	0
Total	**6**		**13**		**0**		**0**		**0**		**0**	

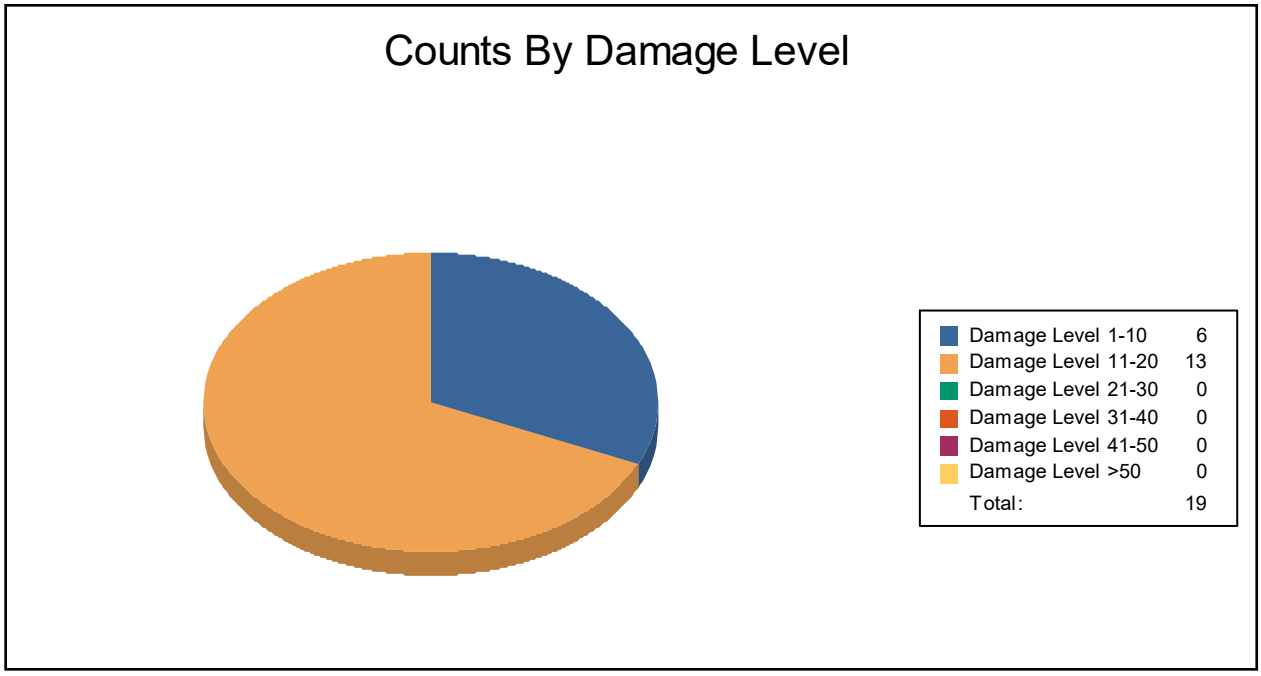


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	2	100	0	0	0	0	0	0	0	0
Steel	2	40	3	60	0	0	0	0	0	0	0	0
Wood	4	40	6	60	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 249 hospital beds available for use. On the day of the scenario flood event, the model estimates that 249 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	7	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

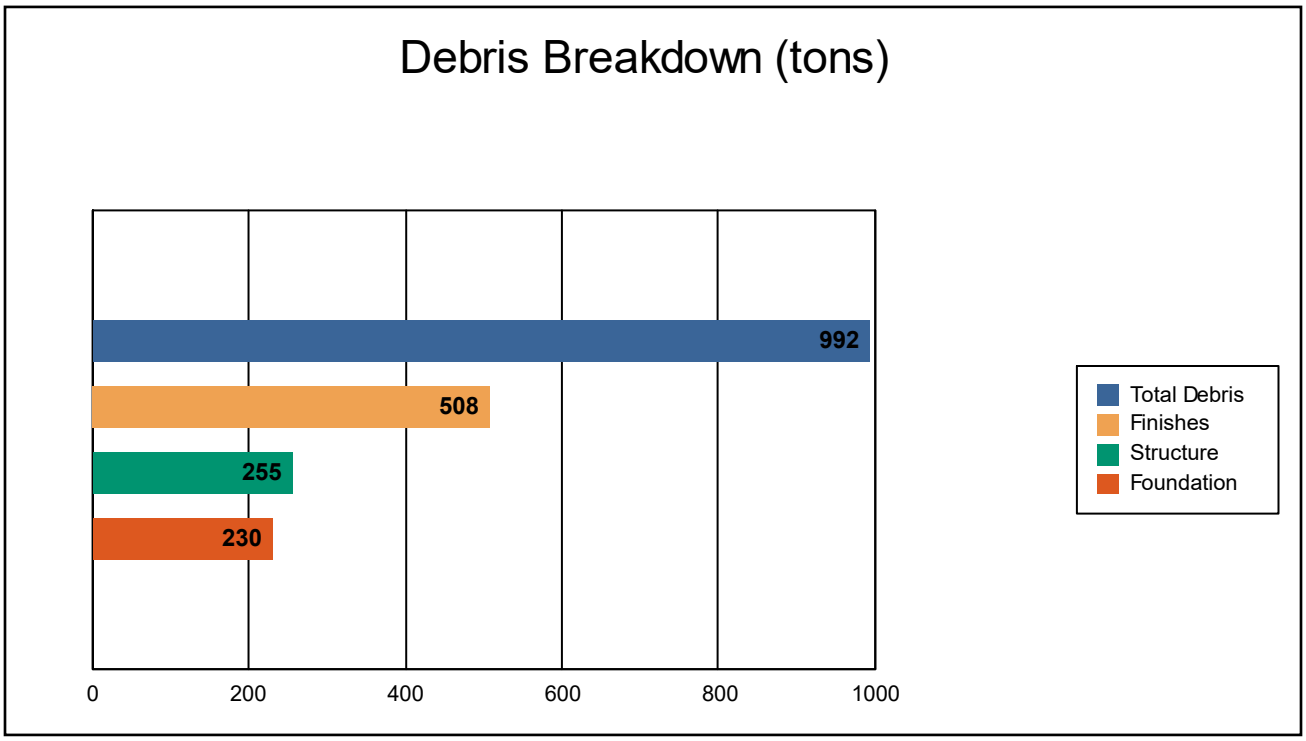
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

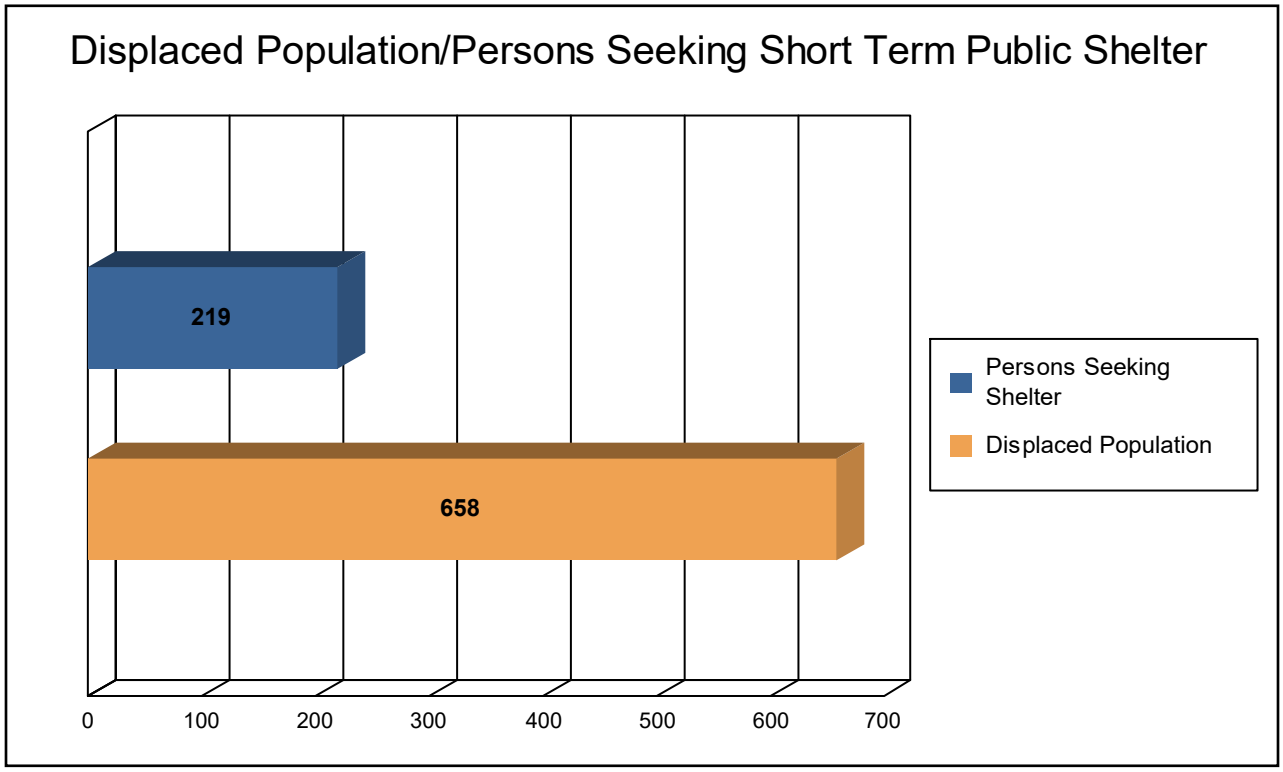


The model estimates that a total of 992 tons of debris will be generated. Of the total amount, Finishes comprises 51% of the total, Structure comprises 26% of the total, and Foundation comprises 23%. If the debris tonnage is converted into an estimated number of truckloads, it will require 40 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 219 households (or 658 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 219 people (out of a total population of 59,713) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 236.30 million dollars, which represents 10.14 % of the total replacement value of the scenario buildings.

Building-Related Losses

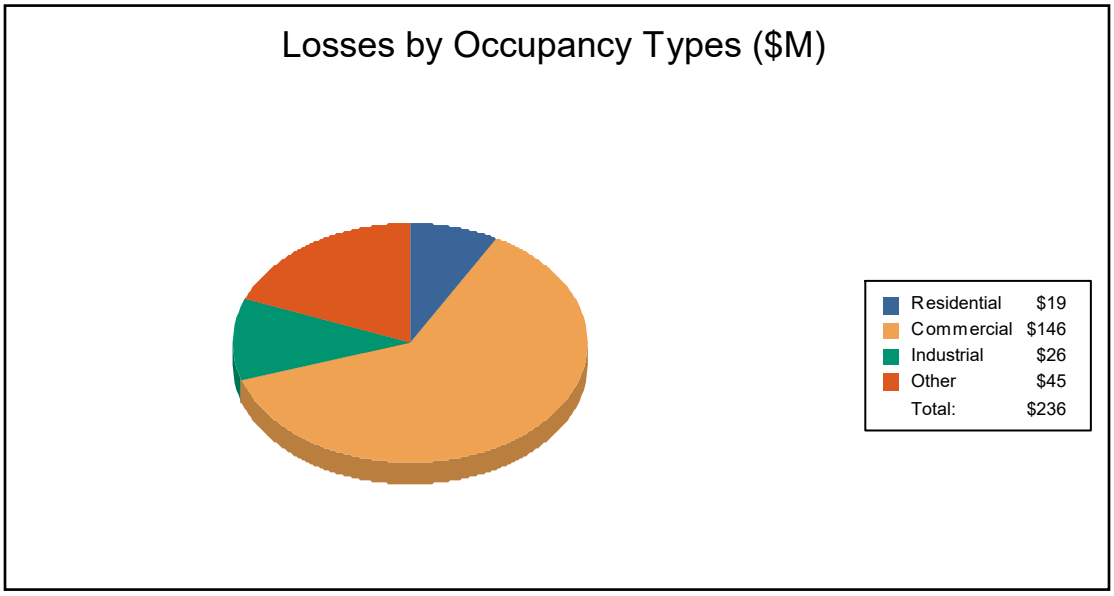
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 125.12 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.02% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	8.54	15.29	6.42	1.97	32.22
	Content	5.20	46.06	16.00	10.75	78.01
	Inventory	0.00	12.04	2.11	0.74	14.89
	Subtotal	**13.74**	**73.39**	**24.53**	**13.45**	**125.12**
Business Interruption						
	Income	0.57	26.82	0.38	4.28	32.05
	Relocation	1.69	8.50	0.44	2.58	13.21
	Rental Income	1.63	6.28	0.10	0.38	8.38
	Wage	1.34	31.14	0.57	24.49	57.54
	Subtotal	**5.22**	**72.74**	**1.49**	**31.73**	**111.18**
ALL	**Total**	**18.96**	**146.13**	**26.02**	**45.18**	**236.30**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,946,455	5,148,156	11,094,611
Total	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**
Total Study Region	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**

Hazus: Flood Global Risk Report

Region Name: Manchester_FL

Flood Scenario: Manchester_Flood

Print Date: Wednesday, April 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 10 square miles and contains 765 census blocks. The region contains over 25 thousand households and has a total population of 59,713 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 17,326 buildings in the region with a total building replacement value (excluding contents) of 11,095 million dollars. Approximately 87.11% of the buildings (and 53.60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of 11,095 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,946,455	53.6%
Commercial	2,982,511	26.9%
Industrial	725,919	6.5%
Agricultural	8,754	0.1%
Religion	369,857	3.3%
Government	273,672	2.5%
Education	787,443	7.1%
Total	**11,094,611**	**100%**

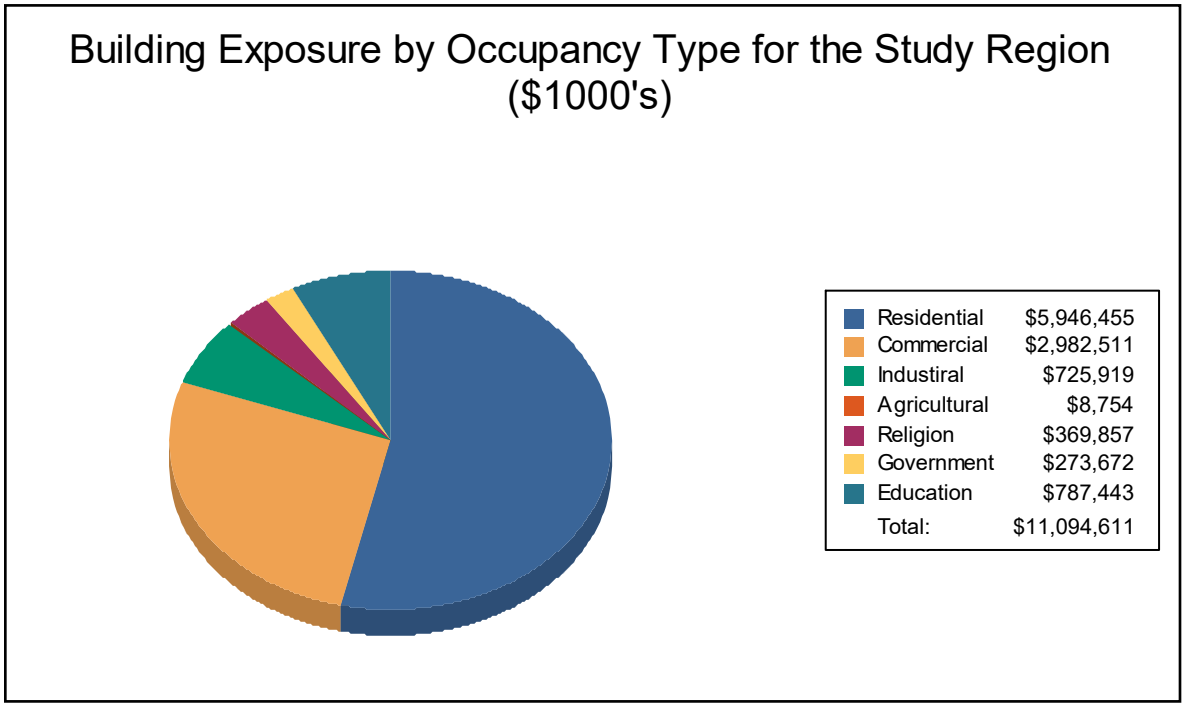
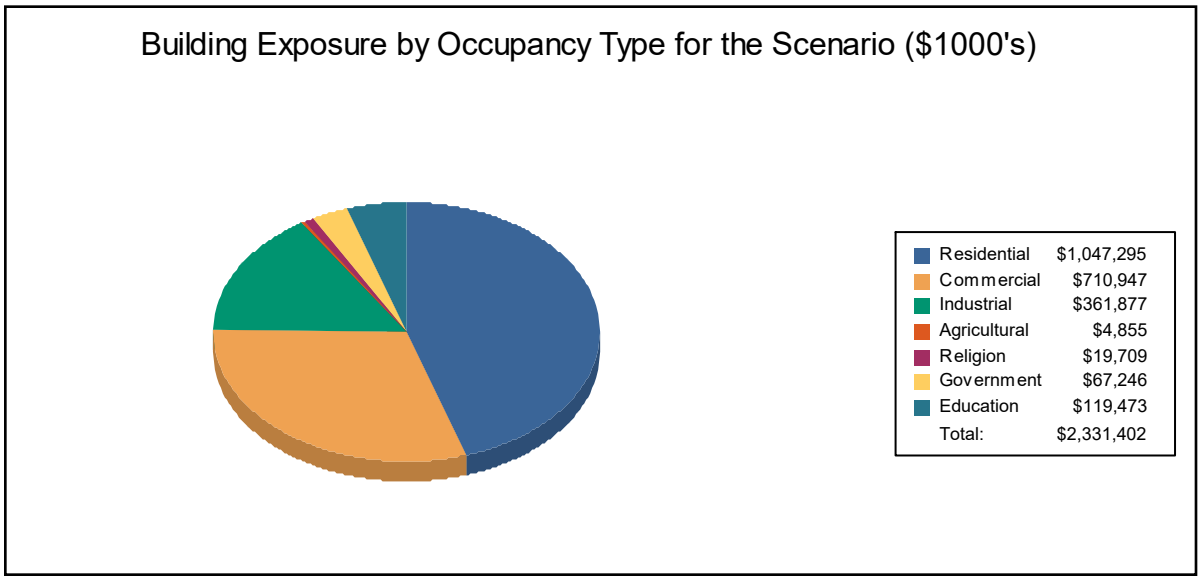


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,047,295	44.9%
Commercial	710,947	30.5%
Industrial	361,877	15.5%
Agricultural	4,855	0.2%
Religion	19,709	0.8%
Government	67,246	2.9%
Education	119,473	5.1%
Total	**2,331,402**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds.
There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation center.

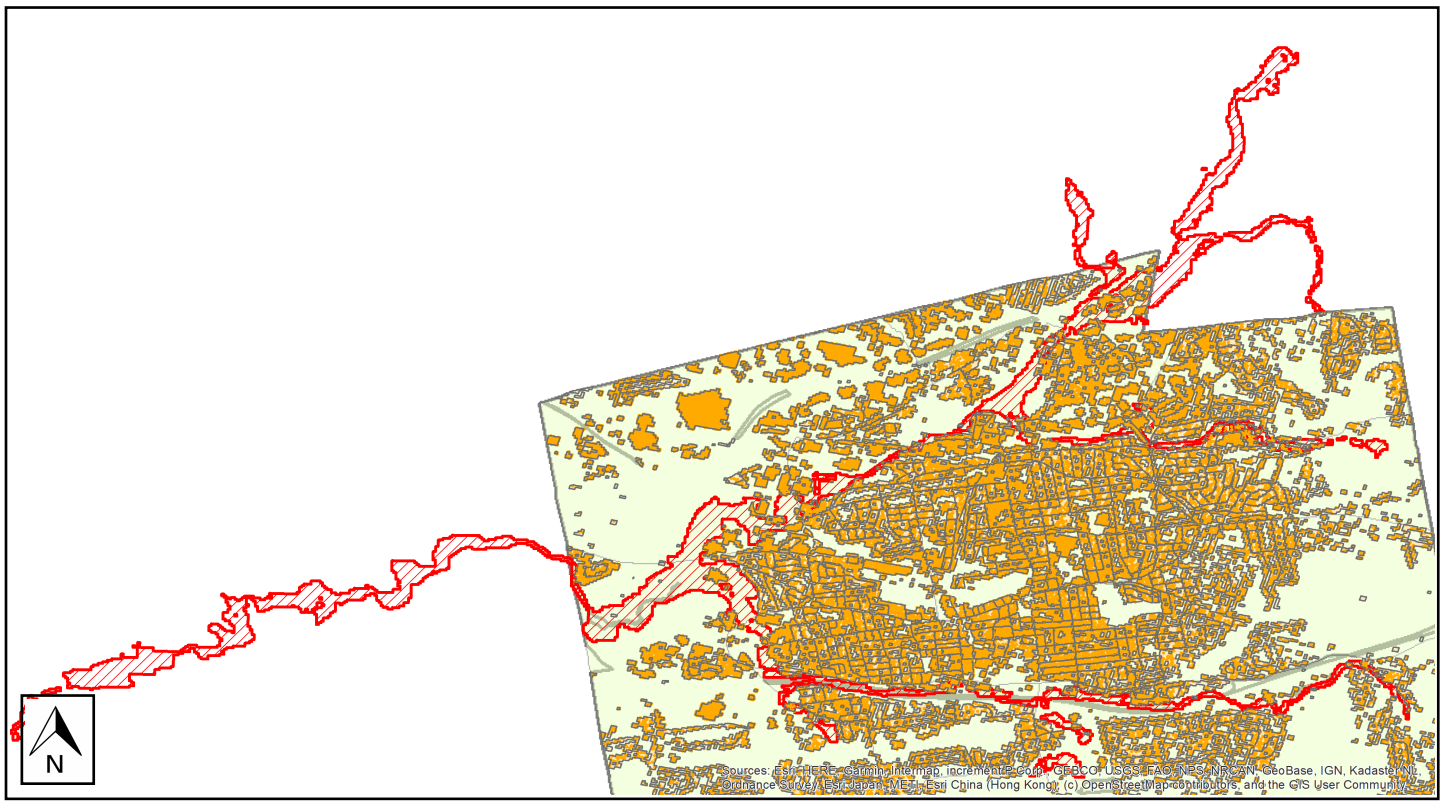
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Manchester_FL
Scenario Name:	Manchester_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 13 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

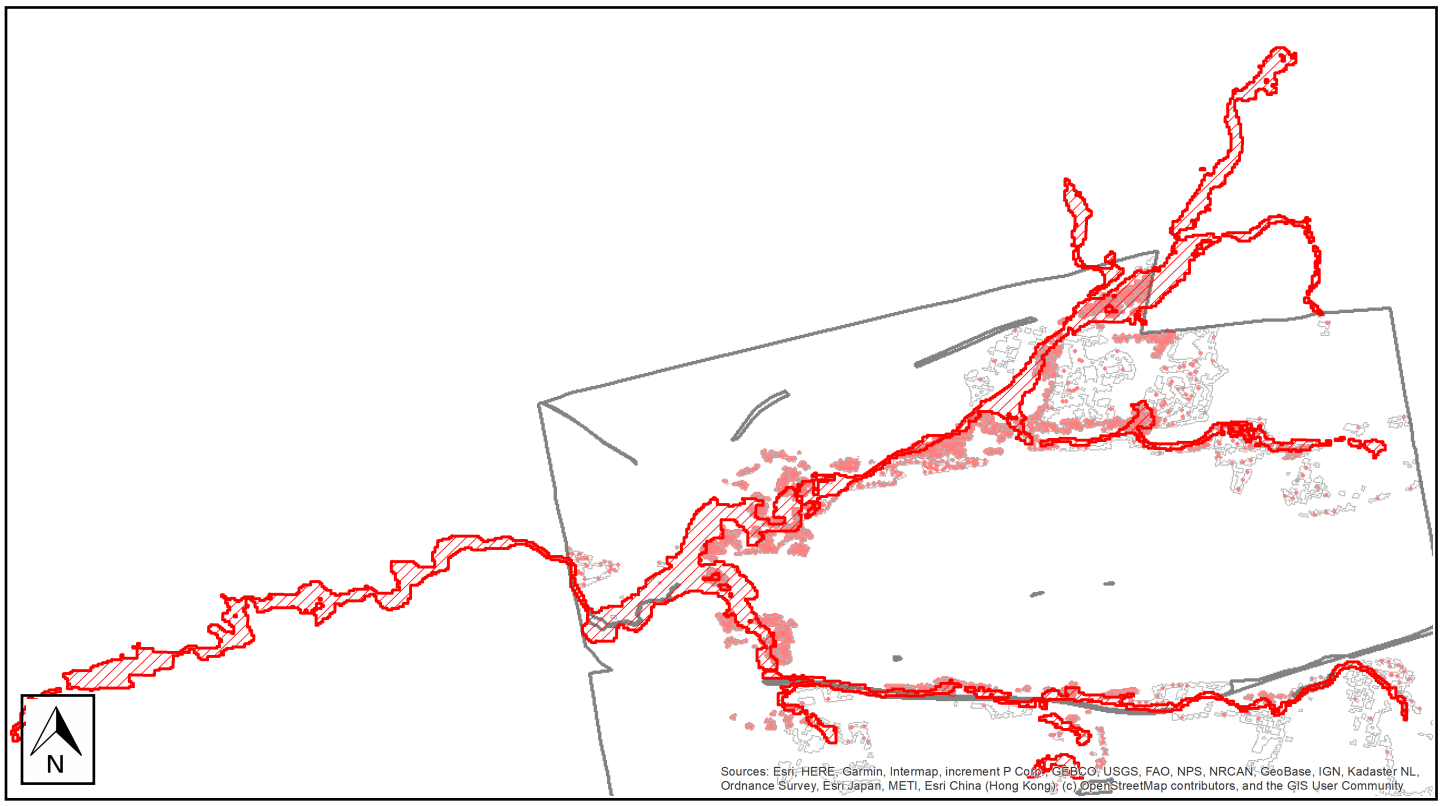


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	4	31	9	69	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	2	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	7	64	4	36	0	0	0	0	0	0	0	0
Total	**13**		**13**		**0**		**0**		**0**		**0**	

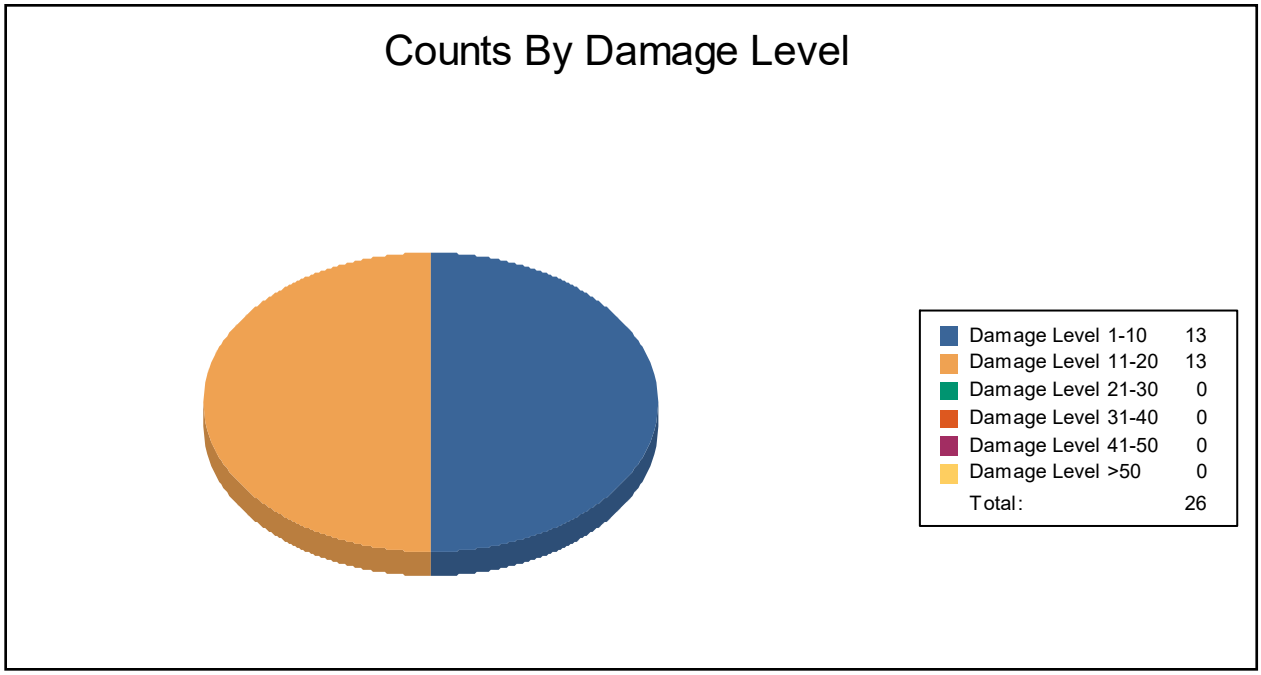


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	2	100	0	0	0	0	0	0	0	0
Steel	4	50	4	50	0	0	0	0	0	0	0	0
Wood	7	58	5	42	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 249 hospital beds available for use. On the day of the scenario flood event, the model estimates that 249 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	7	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

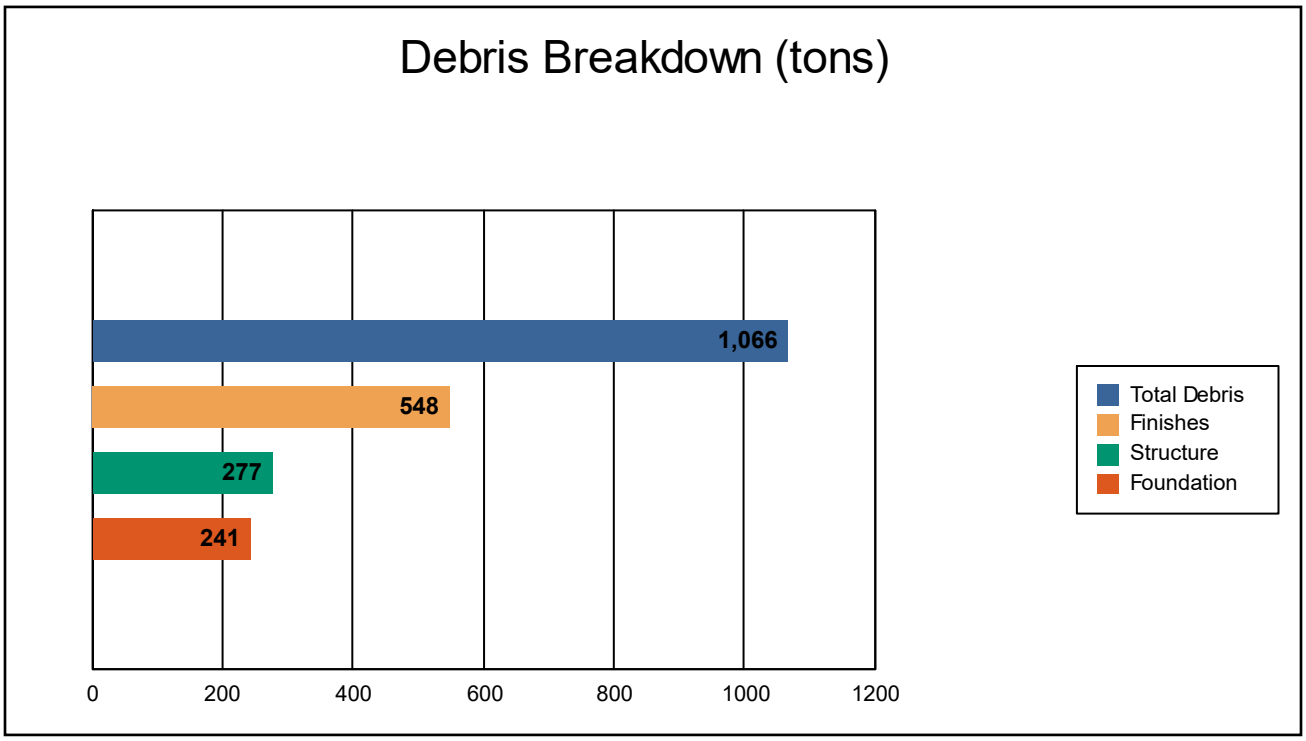
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

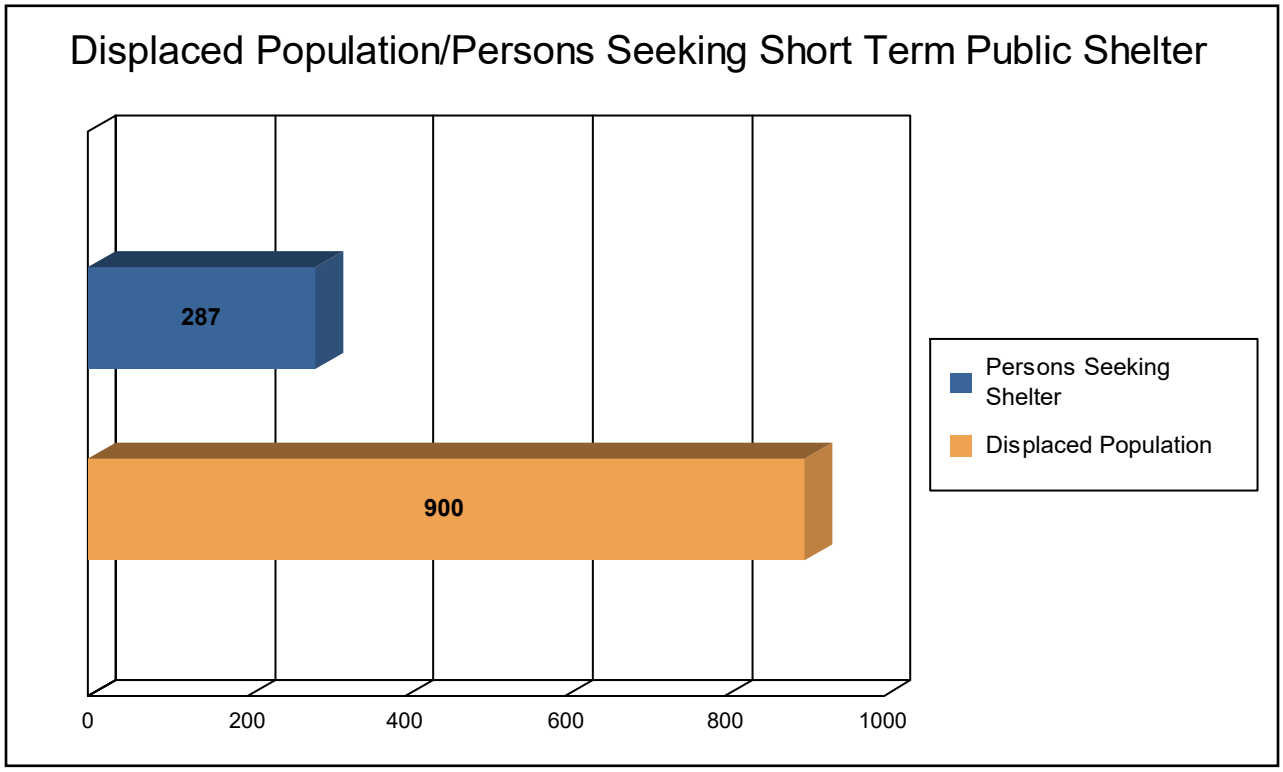


The model estimates that a total of 1,066 tons of debris will be generated. Of the total amount, Finishes comprises 51% of the total, Structure comprises 26% of the total, and Foundation comprises 23%. If the debris tonnage is converted into an estimated number of truckloads, it will require 43 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 300 households (or 900 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 287 people (out of a total population of 59,713) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 294.68 million dollars, which represents 12.64 % of the total replacement value of the scenario buildings.

Building-Related Losses

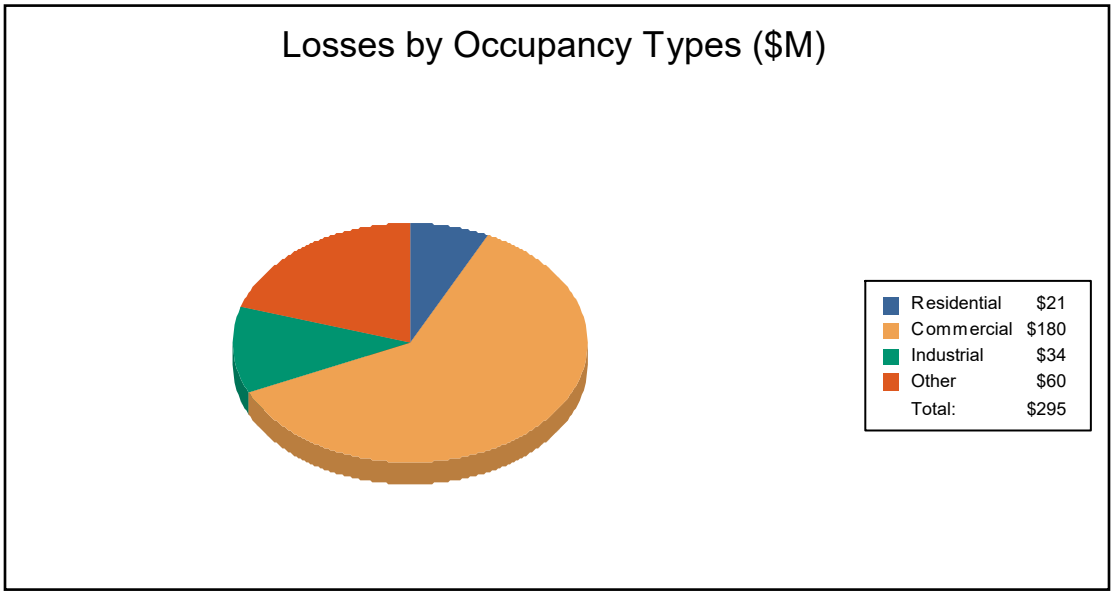
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 153.35 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 7.11% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	8.95	18.37	7.93	2.37	37.62
	Content	5.66	56.63	20.99	13.18	96.45
	Inventory	0.00	15.44	3.08	0.76	19.28
	Subtotal	**14.61**	**90.43**	**32.00**	**16.31**	**153.35**
Business Interruption						
	Income	0.71	32.79	0.55	4.25	38.30
	Relocation	1.86	10.55	0.62	2.89	15.93
	Rental Income	2.10	7.80	0.16	0.58	10.65
	Wage	1.67	38.22	0.84	35.73	76.46
	Subtotal	**6.35**	**89.36**	**2.17**	**43.45**	**141.33**
ALL	**Total**	**20.96**	**179.79**	**34.18**	**59.76**	**294.68**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,946,455	5,148,156	11,094,611
Total	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**
Total Study Region	**59,713**	**5,946,455**	**5,148,156**	**11,094,611**

Hazus: Flood Global Risk Report

Region Name: Mansfield_FL

Flood Scenario: Mansfield_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 291 census blocks. The region contains over 6 thousand households and has a total population of 25,892 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,908 buildings in the region with a total building replacement value (excluding contents) of 5,757 million dollars. Approximately 86.08% of the buildings (and 41.19% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,908 buildings in the region which have an aggregate total replacement value of 5,757 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,371,201	41.2%
Commercial	812,824	14.1%
Industrial	63,806	1.1%
Agricultural	13,697	0.2%
Religion	62,630	1.1%
Government	89,848	1.6%
Education	2,343,258	40.7%
Total	**5,757,264**	**100%**

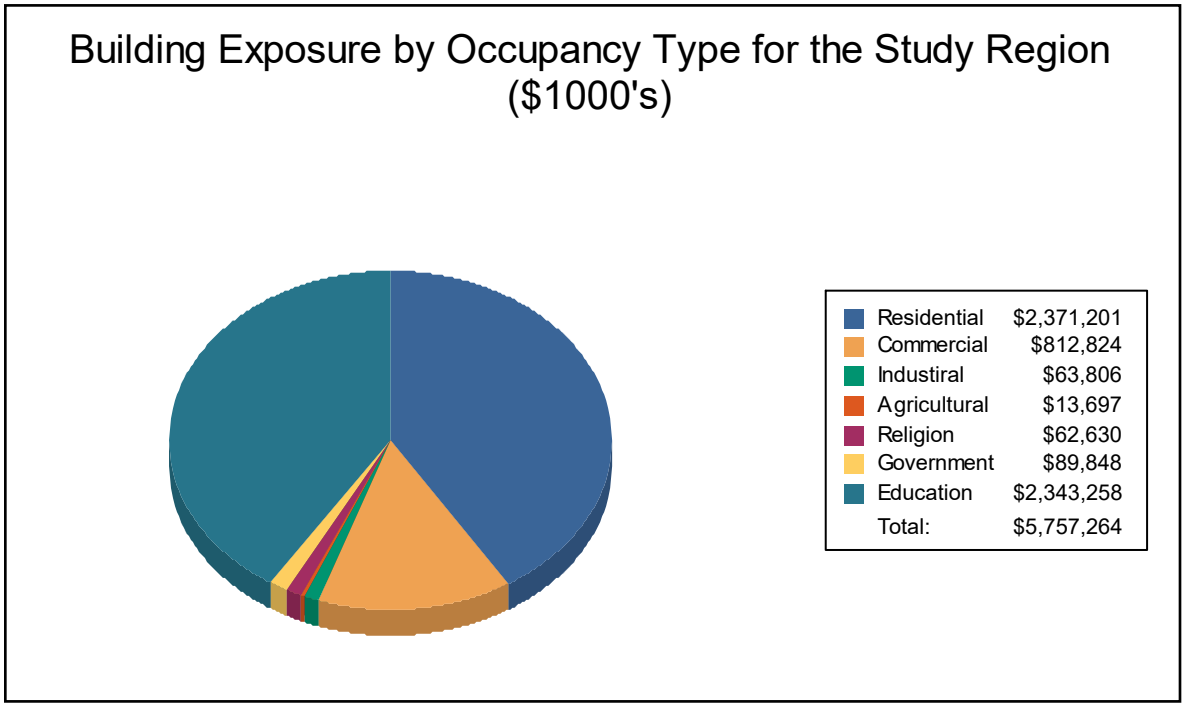
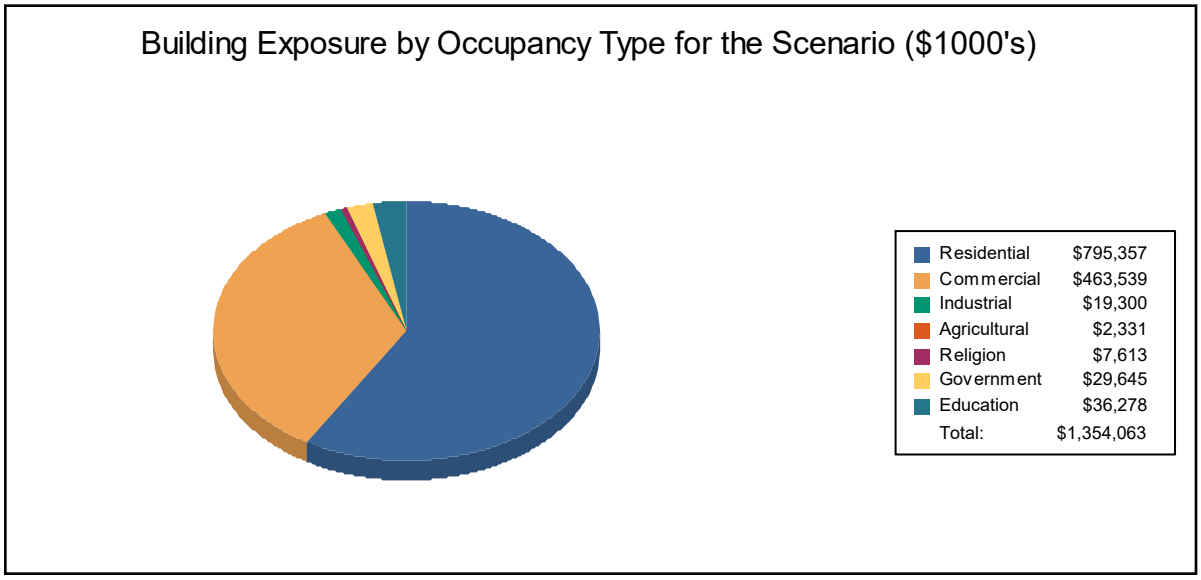


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	795,357	58.7%
Commercial	463,539	34.2%
Industrial	19,300	1.4%
Agricultural	2,331	0.2%
Religion	7,613	0.6%
Government	29,645	2.2%
Education	36,278	2.7%
Total	**1,354,063**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds.
There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

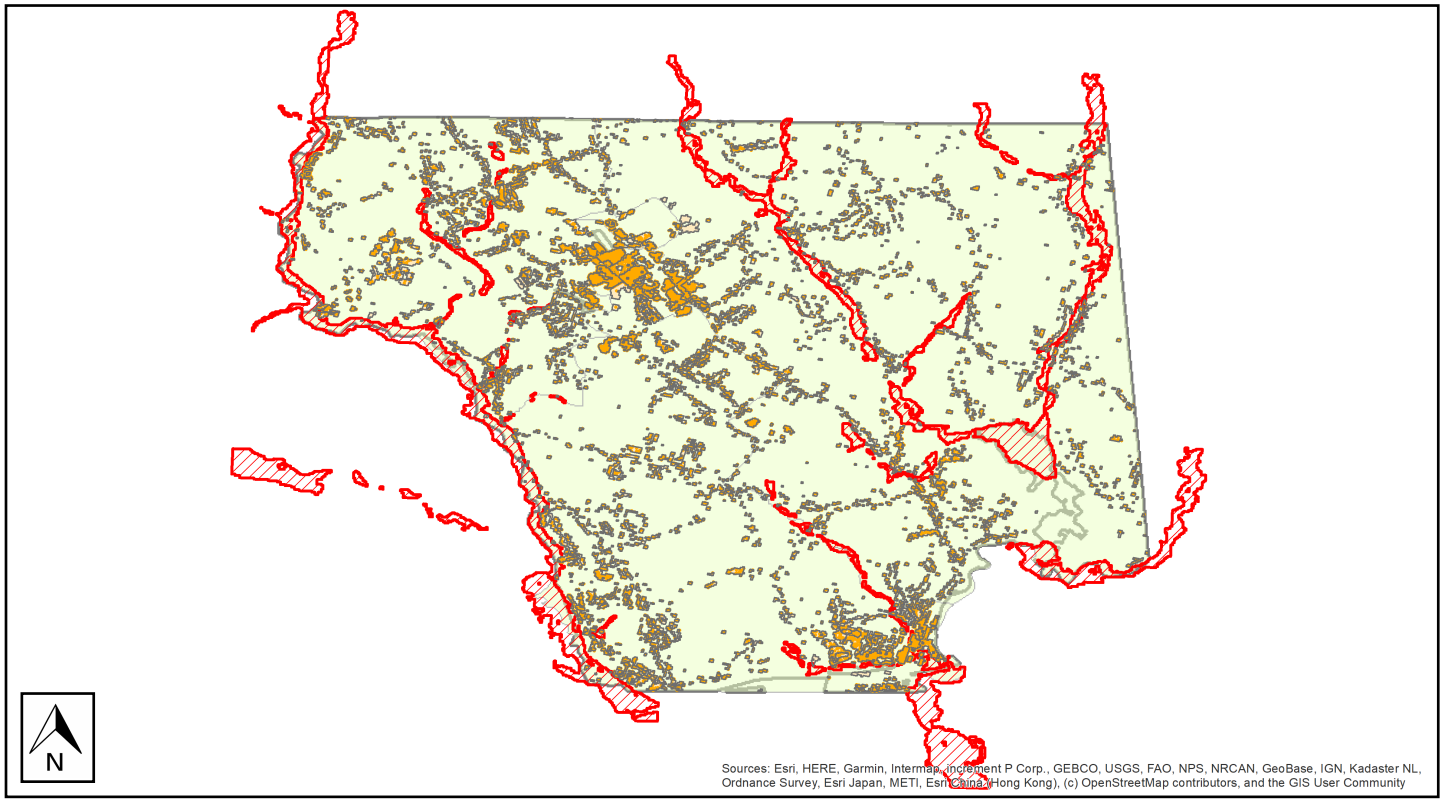
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Mansfield_FL
Scenario Name:	Mansfield_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

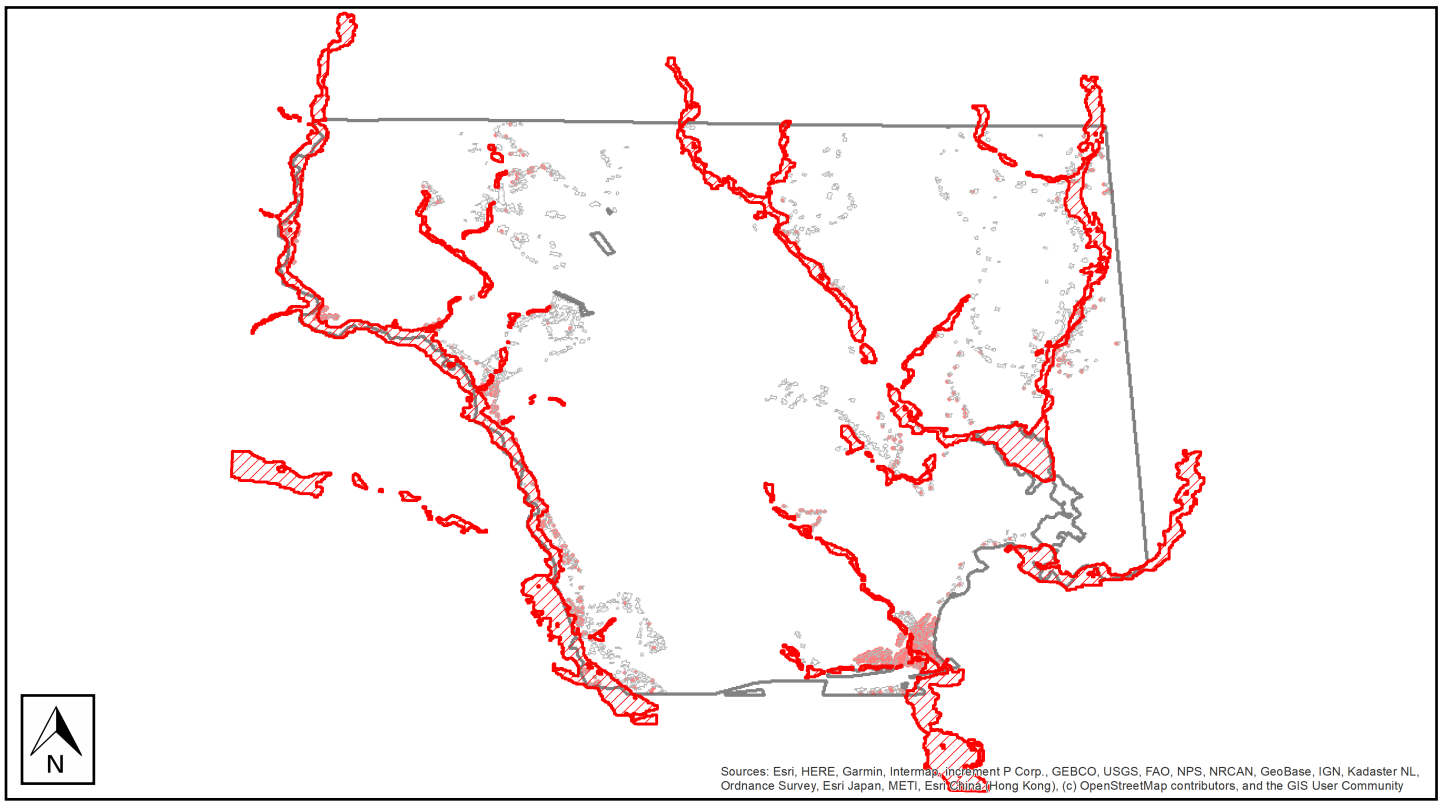


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	2	100	0	0	0	0	0	0	0	0
Total	**0**		**2**		**0**		**0**		**0**		**0**	

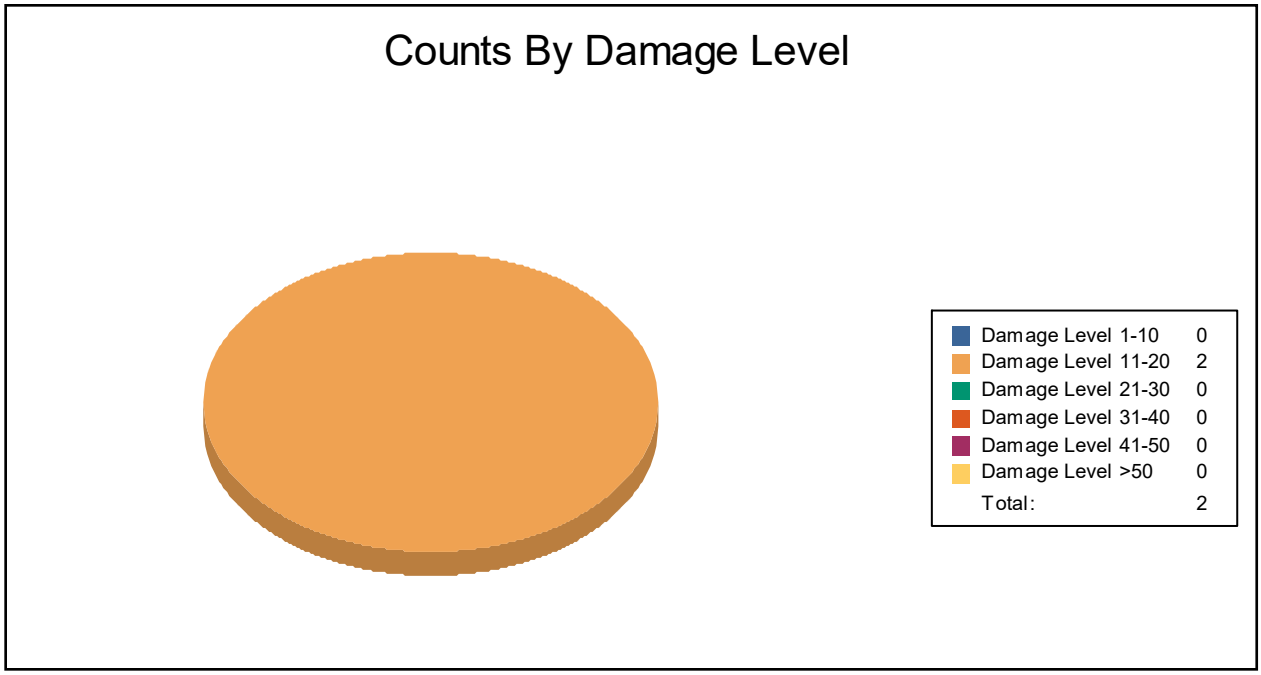


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	2	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 57 hospital beds available for use. On the day of the scenario flood event, the model estimates that 57 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

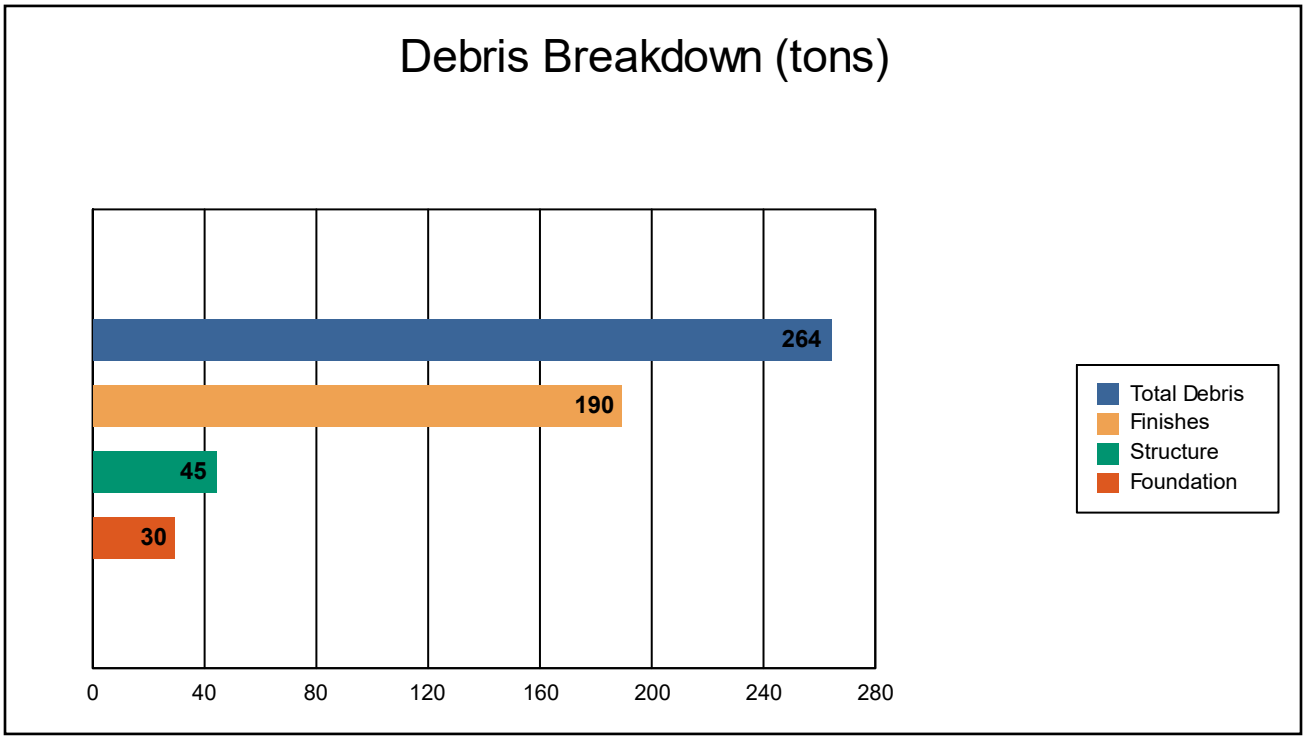
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

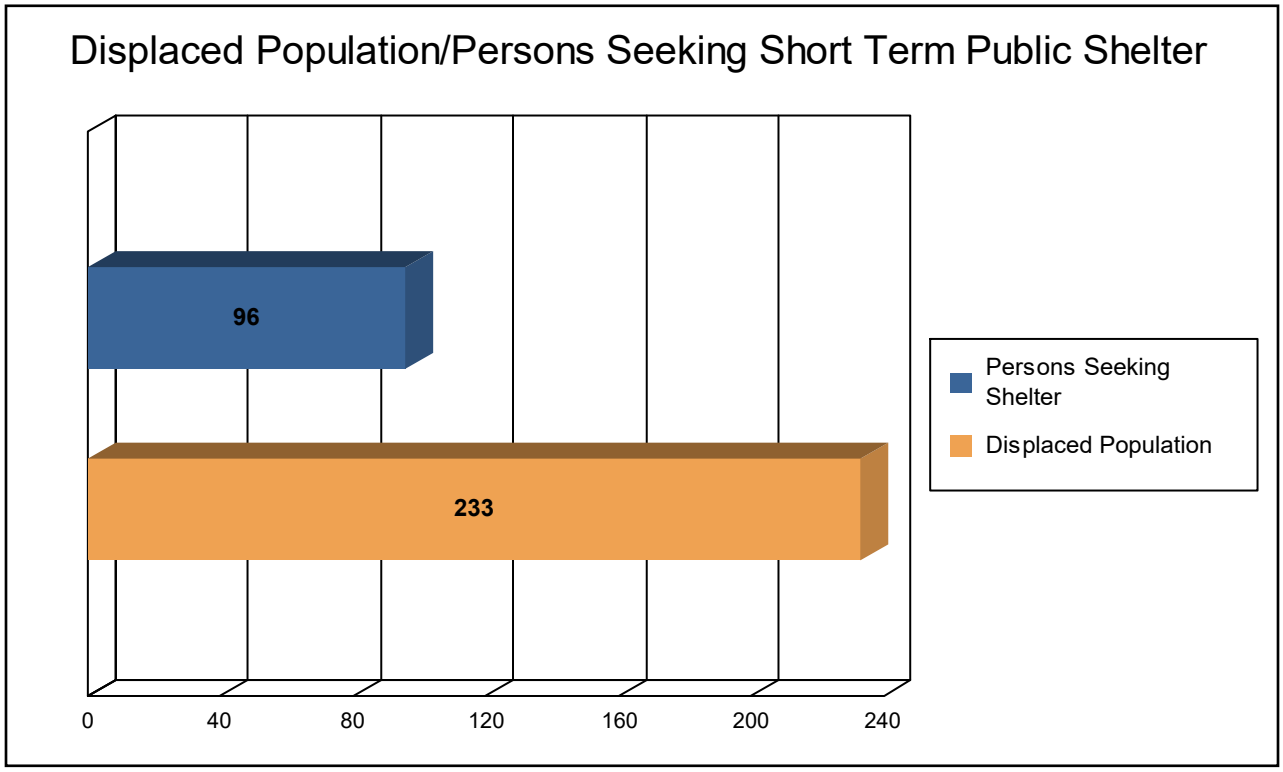


The model estimates that a total of 264 tons of debris will be generated. Of the total amount, Finishes comprises 72% of the total, Structure comprises 17% of the total, and Foundation comprises 11%. If the debris tonnage is converted into an estimated number of truckloads, it will require 11 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 78 households (or 233 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 96 people (out of a total population of 25,892) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 23.97 million dollars, which represents 1.77 % of the total replacement value of the scenario buildings.

Building-Related Losses

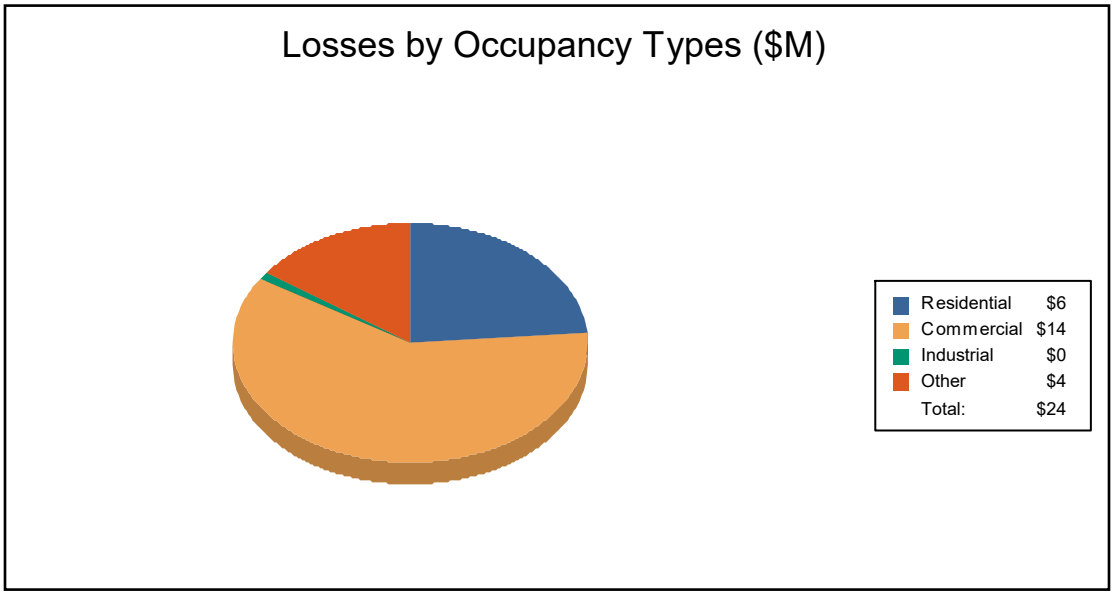
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 11.77 million dollars. 51% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 23.65% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.04	1.24	0.07	0.11	4.45
	Content	1.44	4.08	0.13	0.75	6.41
	Inventory	0.00	0.88	0.01	0.01	0.90
	Subtotal	**4.48**	**6.20**	**0.21**	**0.87**	**11.77**
Business Interruption						
	Income	0.00	2.54	0.00	0.24	2.78
	Relocation	0.82	0.95	0.00	0.13	1.90
	Rental Income	0.36	0.38	0.00	0.02	0.76
	Wage	0.00	4.40	0.00	2.37	6.77
	Subtotal	**1.19**	**8.27**	**0.01**	**2.75**	**12.21**
ALL	**Total**	**5.67**	**14.47**	**0.22**	**3.62**	**23.97**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,201	3,386,063	5,757,264
Total	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**
Total Study Region	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**

Hazus: Flood Global Risk Report

Region Name: Mansfield_FL

Flood Scenario: Mansfield_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 291 census blocks. The region contains over 6 thousand households and has a total population of 25,892 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,908 buildings in the region with a total building replacement value (excluding contents) of 5,757 million dollars. Approximately 86.08% of the buildings (and 41.19% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,908 buildings in the region which have an aggregate total replacement value of 5,757 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,371,201	41.2%
Commercial	812,824	14.1%
Industrial	63,806	1.1%
Agricultural	13,697	0.2%
Religion	62,630	1.1%
Government	89,848	1.6%
Education	2,343,258	40.7%
Total	**5,757,264**	**100%**

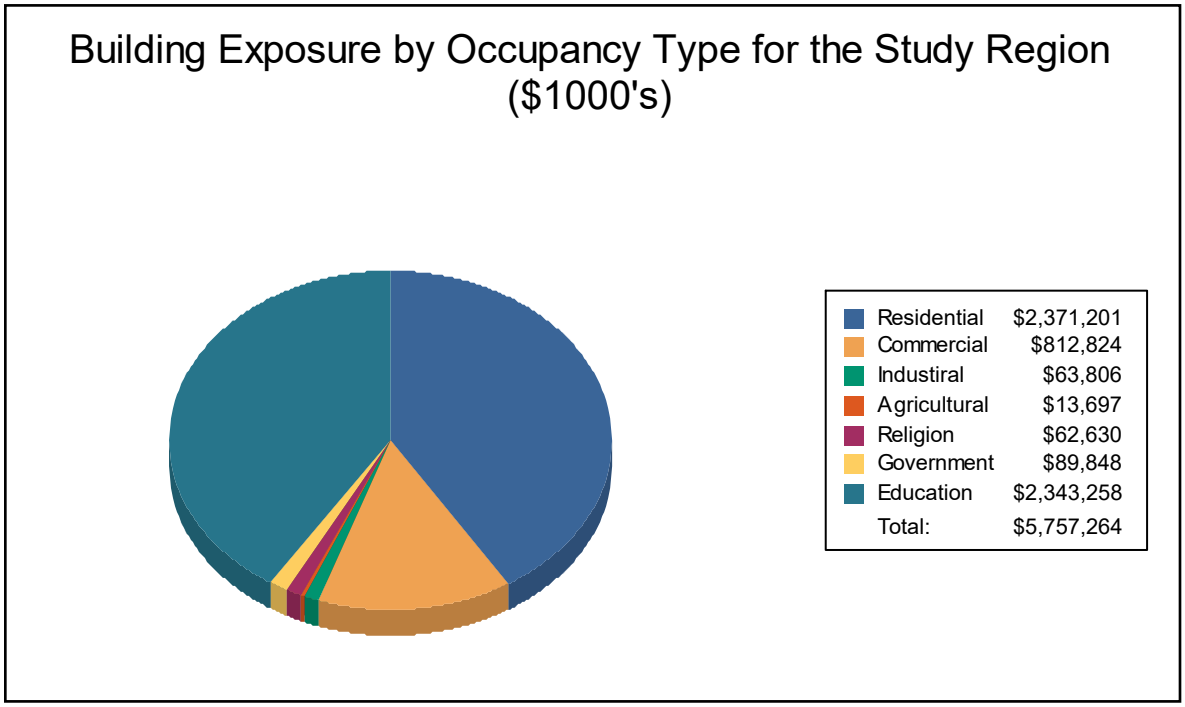
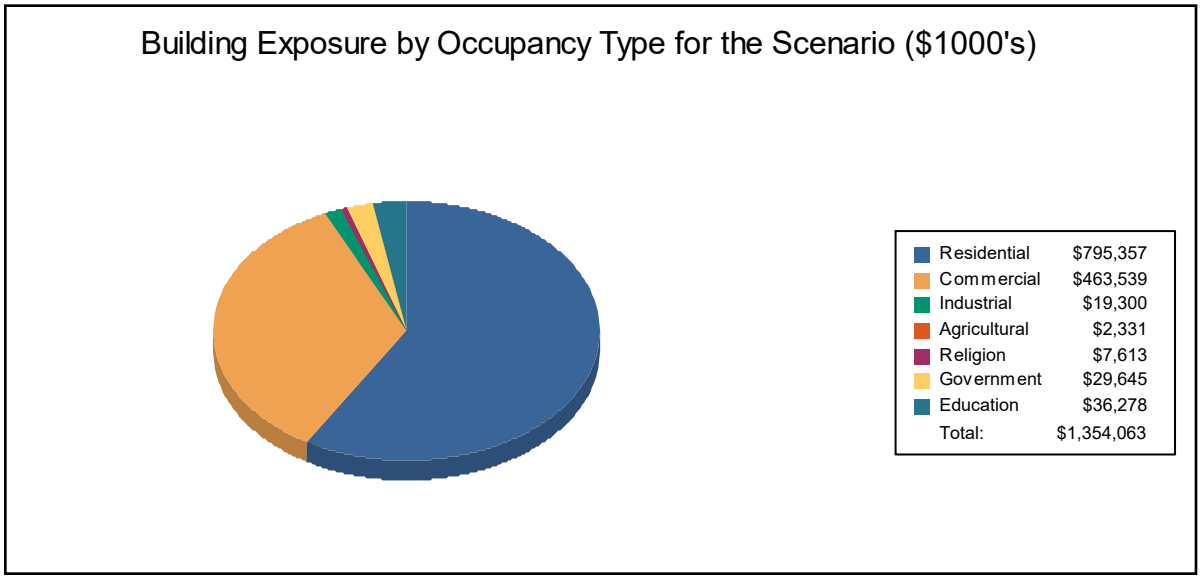


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	795,357	58.7%
Commercial	463,539	34.2%
Industrial	19,300	1.4%
Agricultural	2,331	0.2%
Religion	7,613	0.6%
Government	29,645	2.2%
Education	36,278	2.7%
Total	**1,354,063**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds.
There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

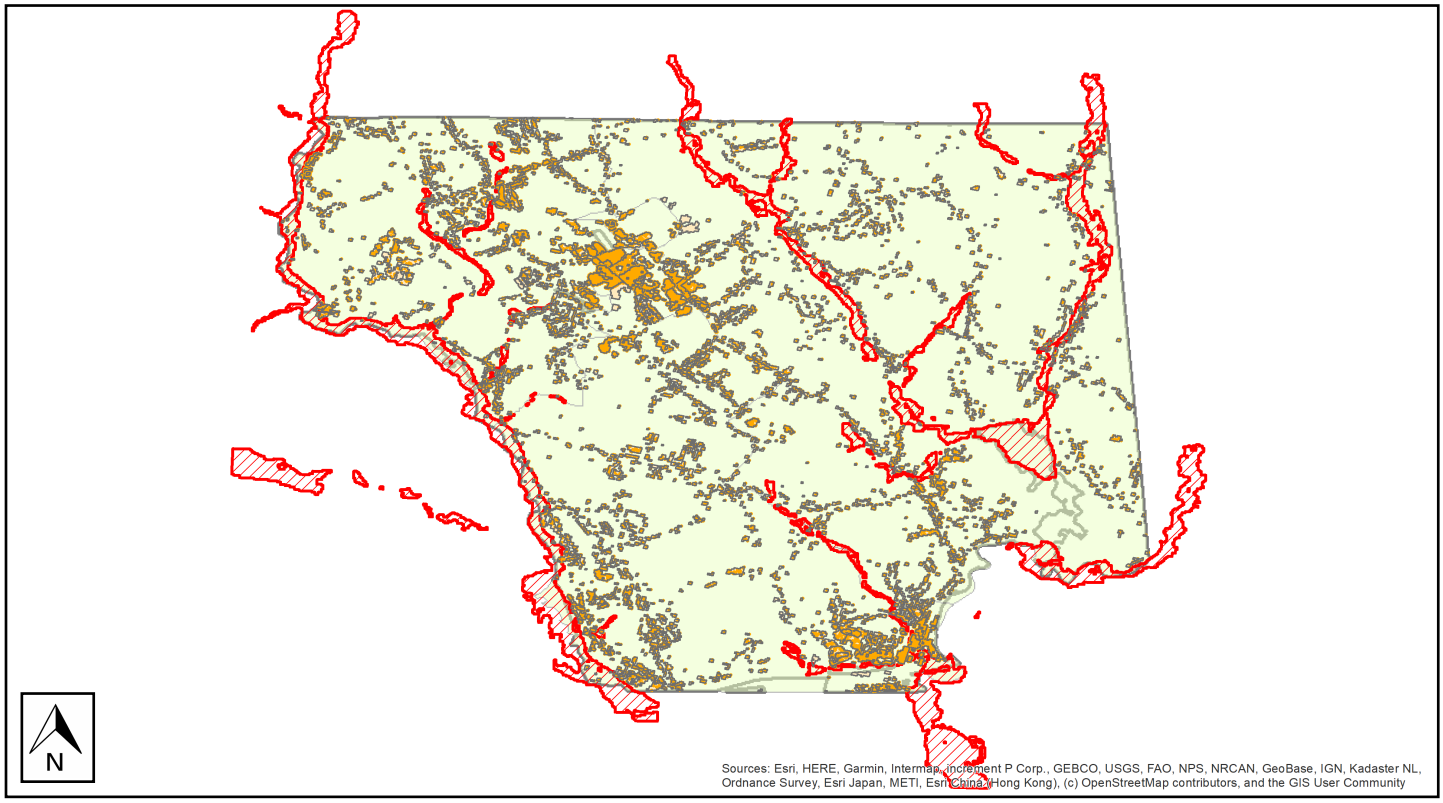
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Mansfield_FL
Scenario Name:	Mansfield_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

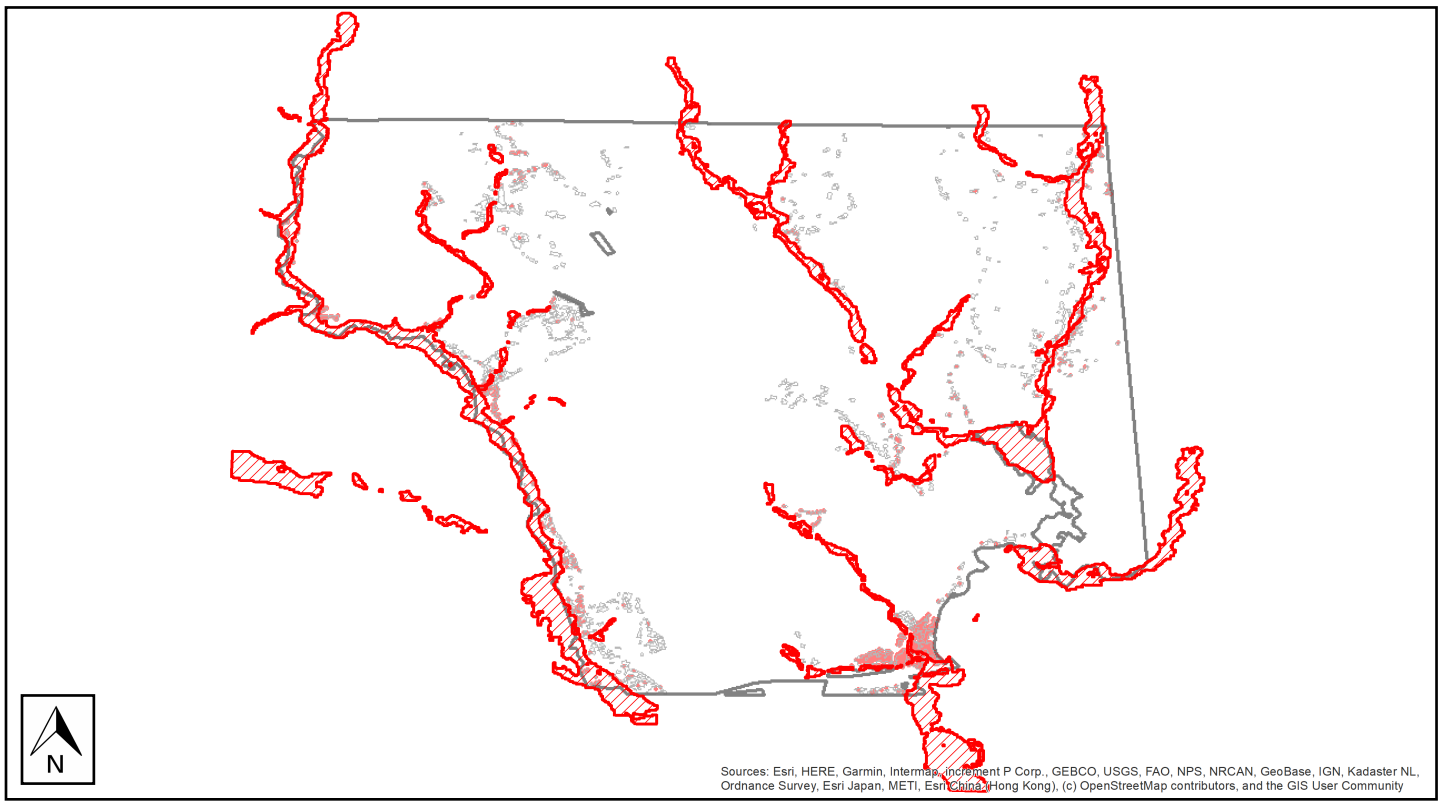


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	3	100	0	0	0	0	0	0	0	0
Total	**0**		**3**		**0**		**0**		**0**		**0**	

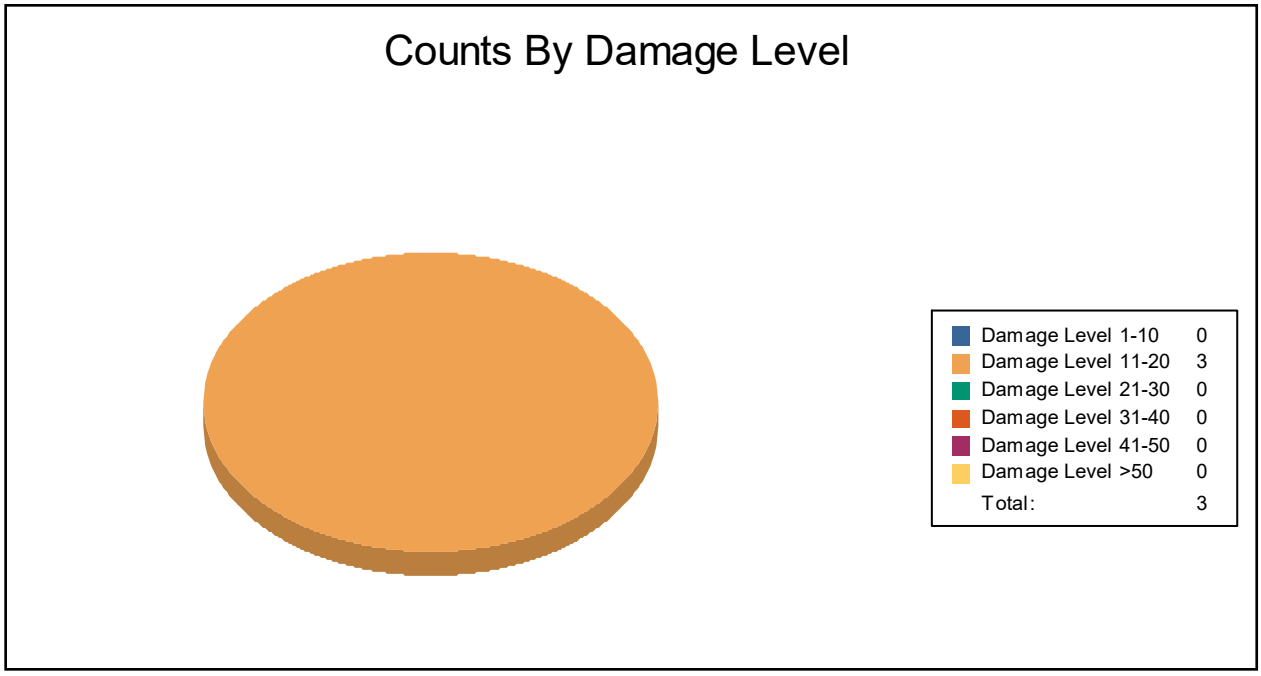


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	3	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 57 hospital beds available for use. On the day of the scenario flood event, the model estimates that 57 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

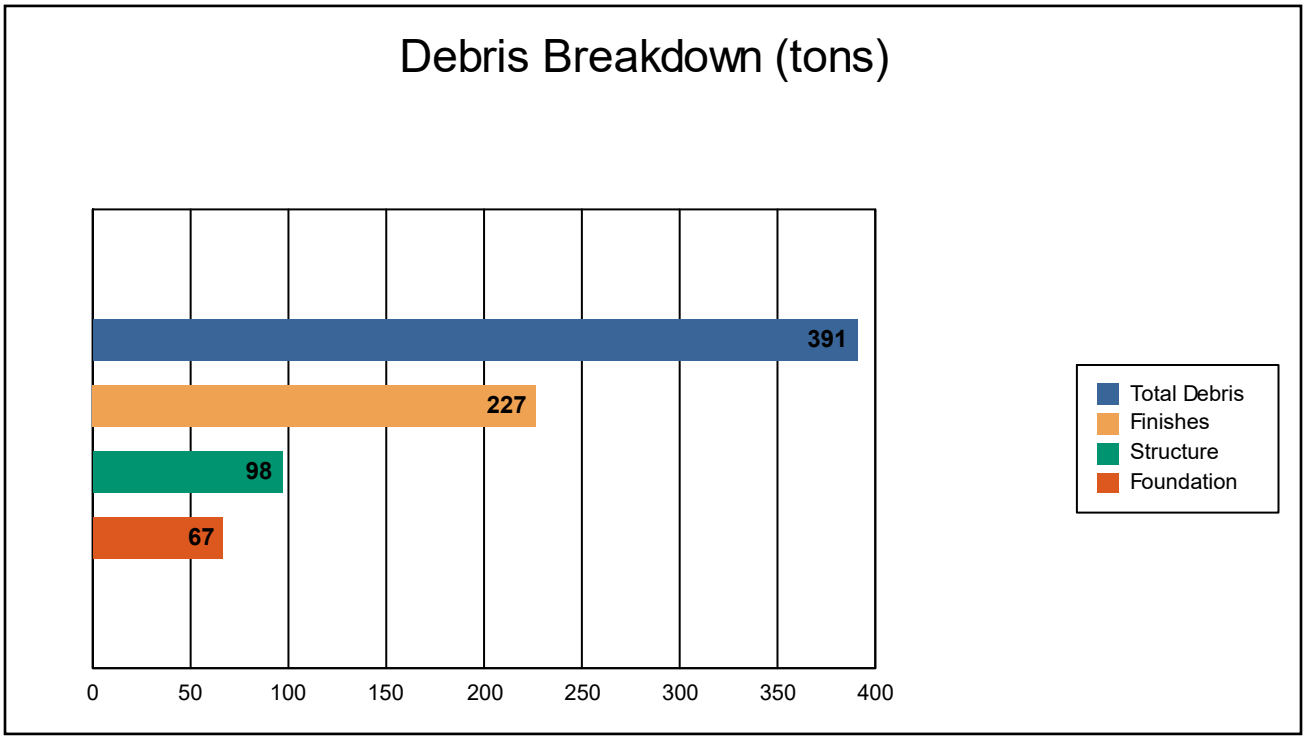
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

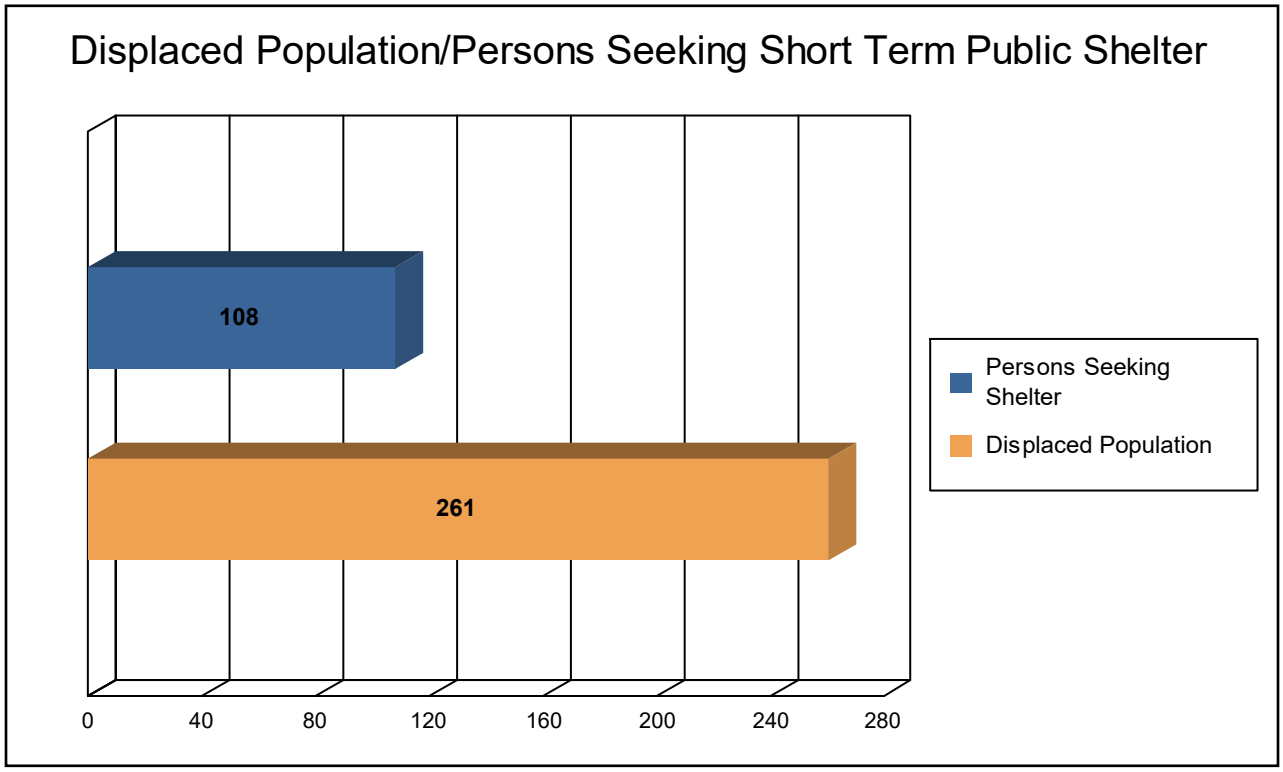


The model estimates that a total of 391 tons of debris will be generated. Of the total amount, Finishes comprises 58% of the total, Structure comprises 25% of the total, and Foundation comprises 17%. If the debris tonnage is converted into an estimated number of truckloads, it will require 16 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 87 households (or 261 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 108 people (out of a total population of 25,892) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 31.96 million dollars, which represents 2.36 % of the total replacement value of the scenario buildings.

Building-Related Losses

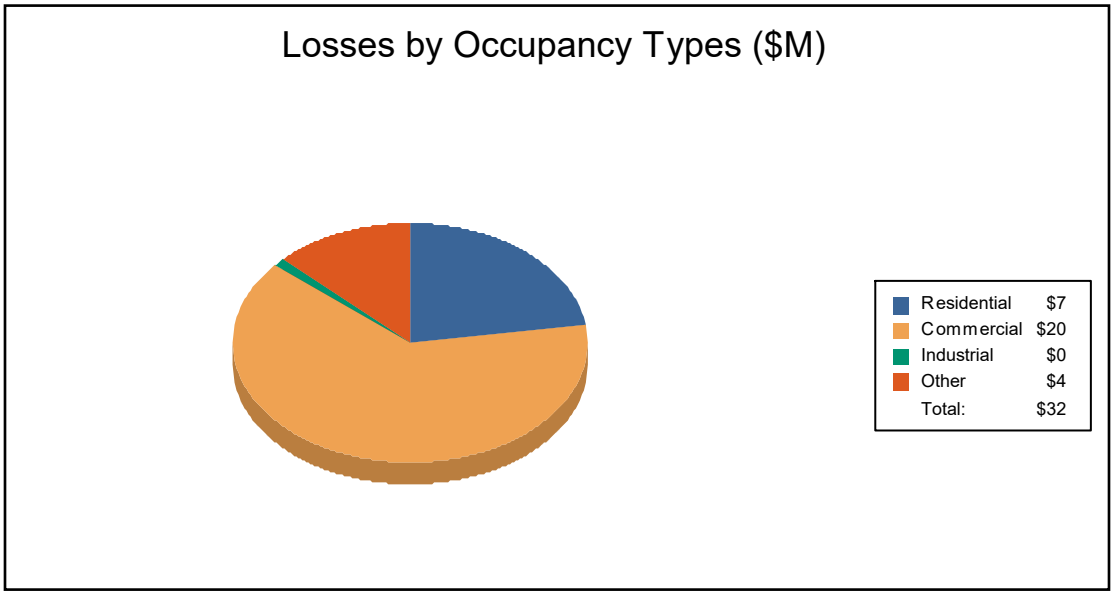
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 16.21 million dollars. 49% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.53% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.92	1.96	0.09	0.14	6.11
	Content	1.87	5.88	0.17	0.89	8.82
	Inventory	0.00	1.25	0.02	0.02	1.29
	Subtotal	**5.79**	**9.10**	**0.28**	**1.04**	**16.21**
Business Interruption						
	Income	0.00	3.45	0.00	0.31	3.76
	Relocation	0.98	1.34	0.00	0.15	2.47
	Rental Income	0.43	0.57	0.00	0.01	1.02
	Wage	0.00	5.89	0.00	2.60	8.50
	Subtotal	**1.42**	**11.26**	**0.01**	**3.07**	**15.75**
ALL	**Total**	**7.20**	**20.36**	**0.29**	**4.11**	**31.96**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,201	3,386,063	5,757,264
Total	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**
Total Study Region	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**

Hazus: Flood Global Risk Report

Region Name: Mansfield_FL

Flood Scenario: Mansfield_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 291 census blocks. The region contains over 6 thousand households and has a total population of 25,892 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,908 buildings in the region with a total building replacement value (excluding contents) of 5,757 million dollars. Approximately 86.08% of the buildings (and 41.19% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,908 buildings in the region which have an aggregate total replacement value of 5,757 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,371,201	41.2%
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Agricultural	13,697	0.2%
Religion	62,630	1.1%
Government	89,848	1.6%
Education	2,343,258	40.7%
Total	**5,757,264**	**100%**

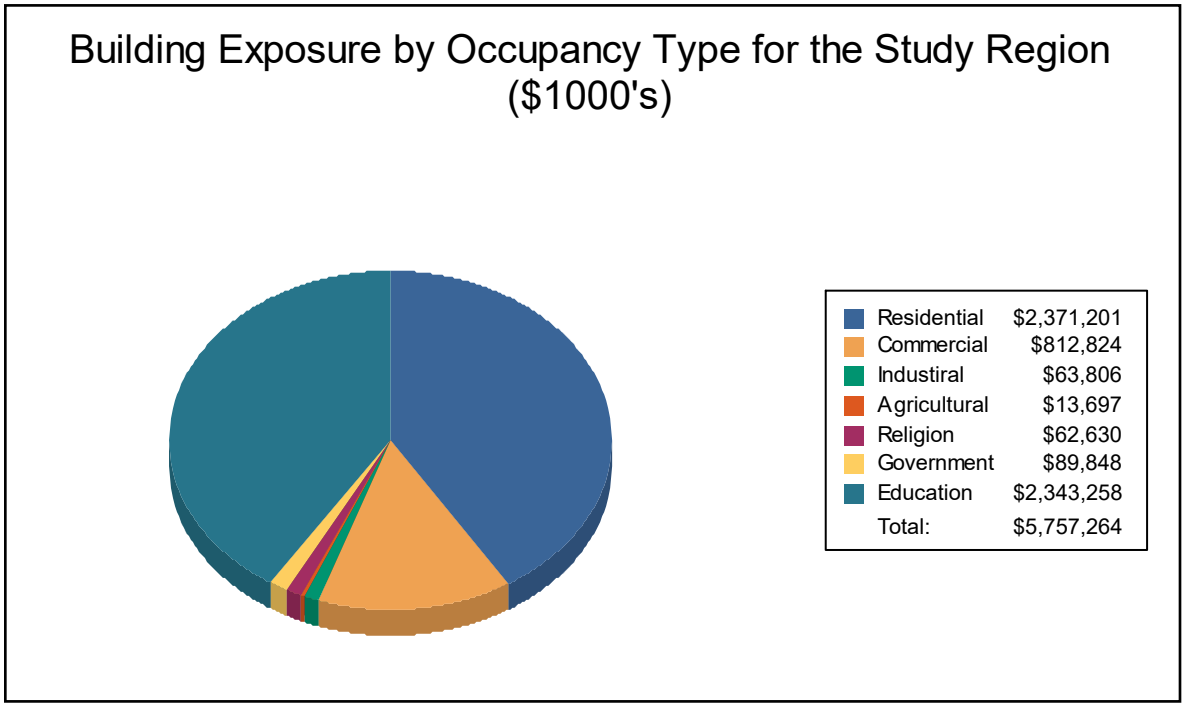
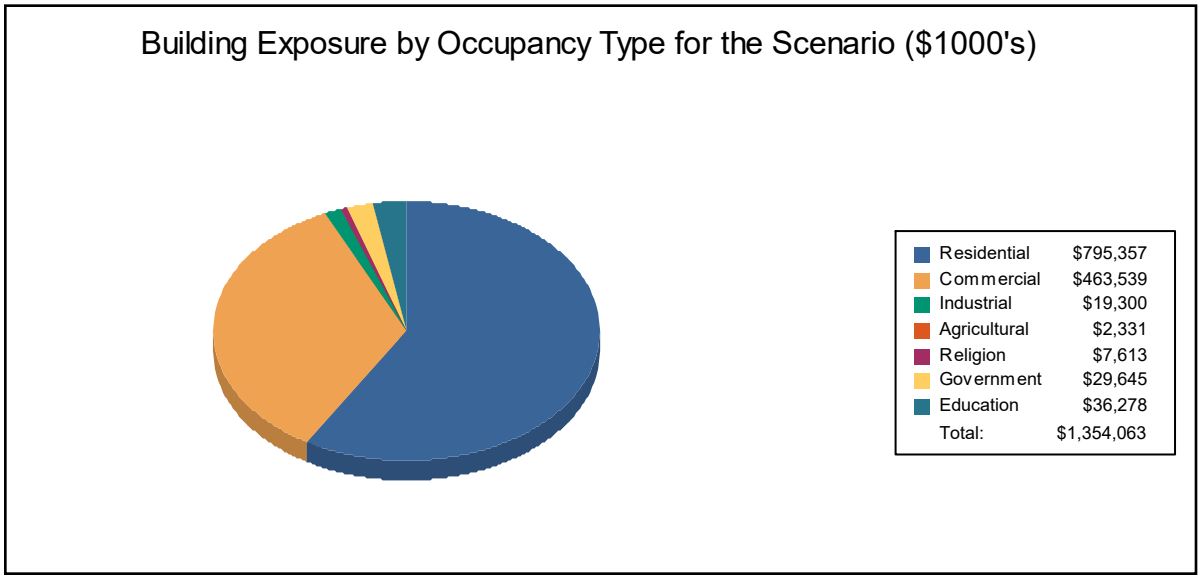


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	795,357	58.7%
Commercial	463,539	34.2%
Industrial	19,300	1.4%
Agricultural	2,331	0.2%
Religion	7,613	0.6%
Government	29,645	2.2%
Education	36,278	2.7%
Total	**1,354,063**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds.
There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

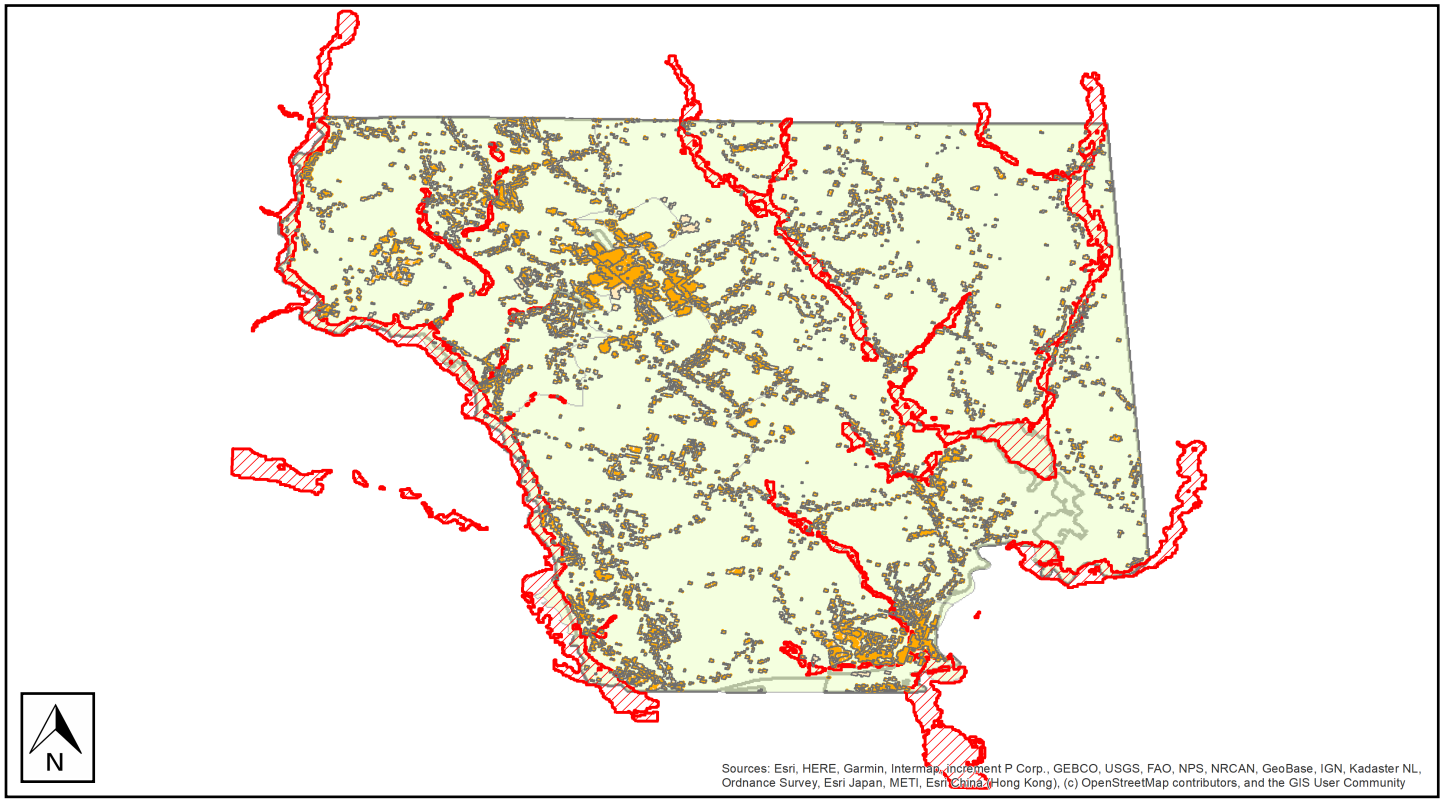
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Mansfield_FL
Scenario Name:	Mansfield_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

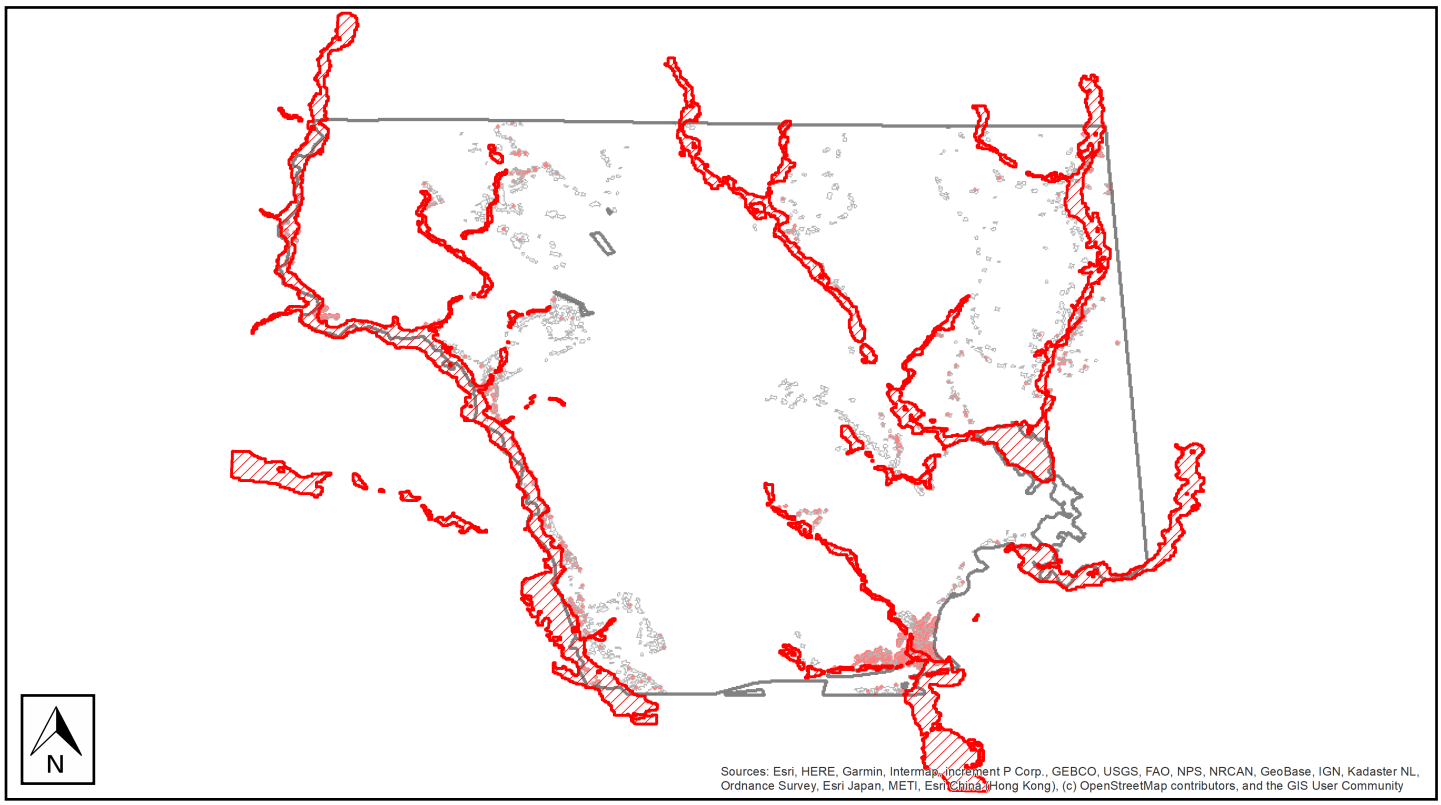


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	3	75	1	25	0	0	0	0	0	0
Total	**0**		**3**		**1**		**0**		**0**		**0**	

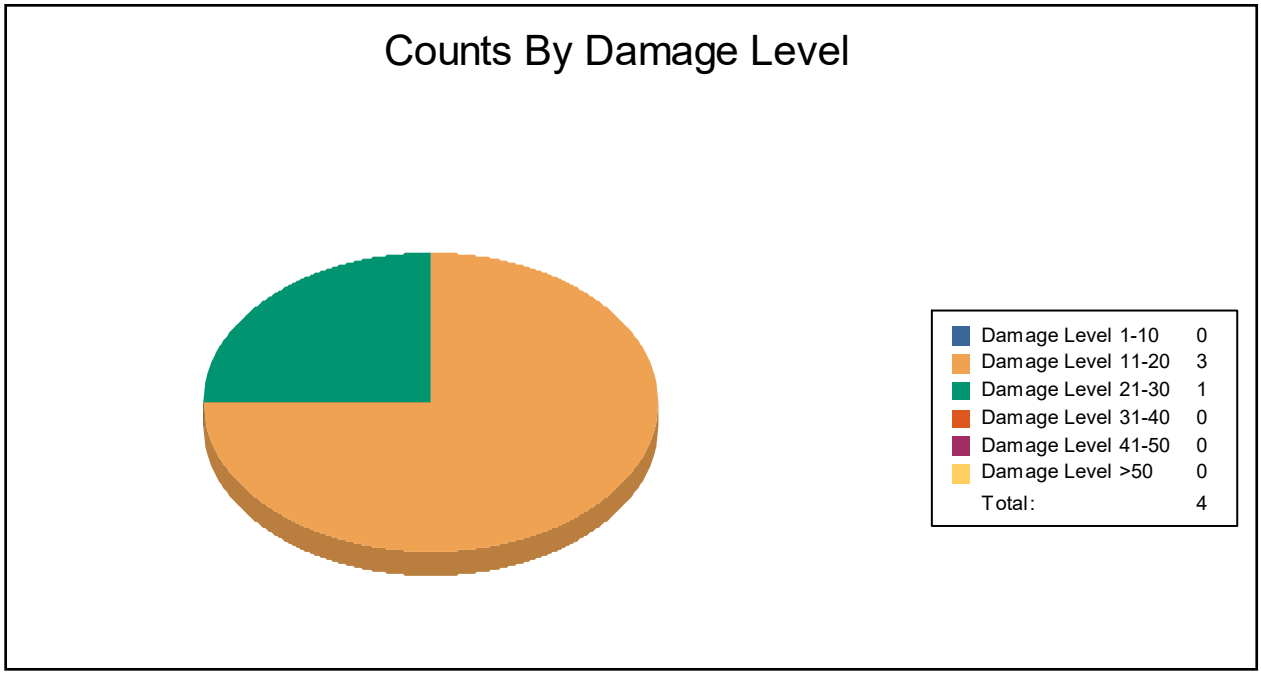


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	3	75	1	25	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 57 hospital beds available for use. On the day of the scenario flood event, the model estimates that 57 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

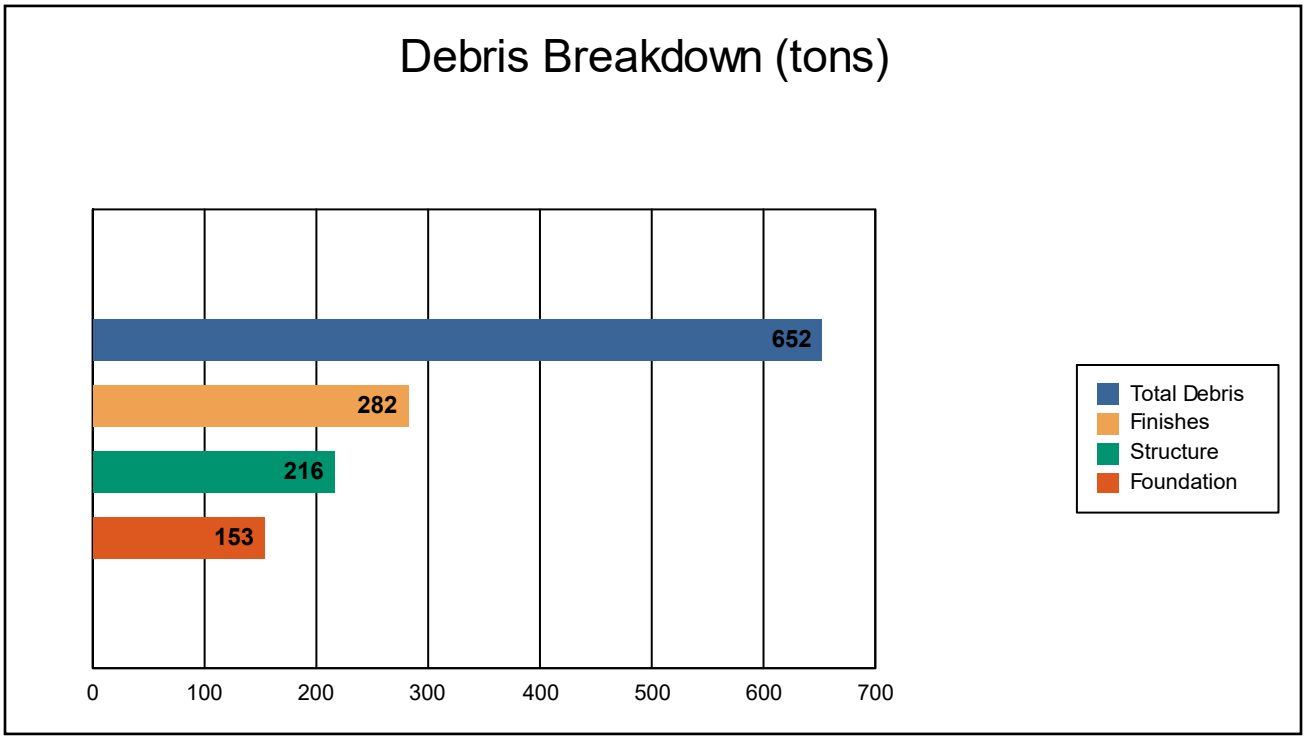
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

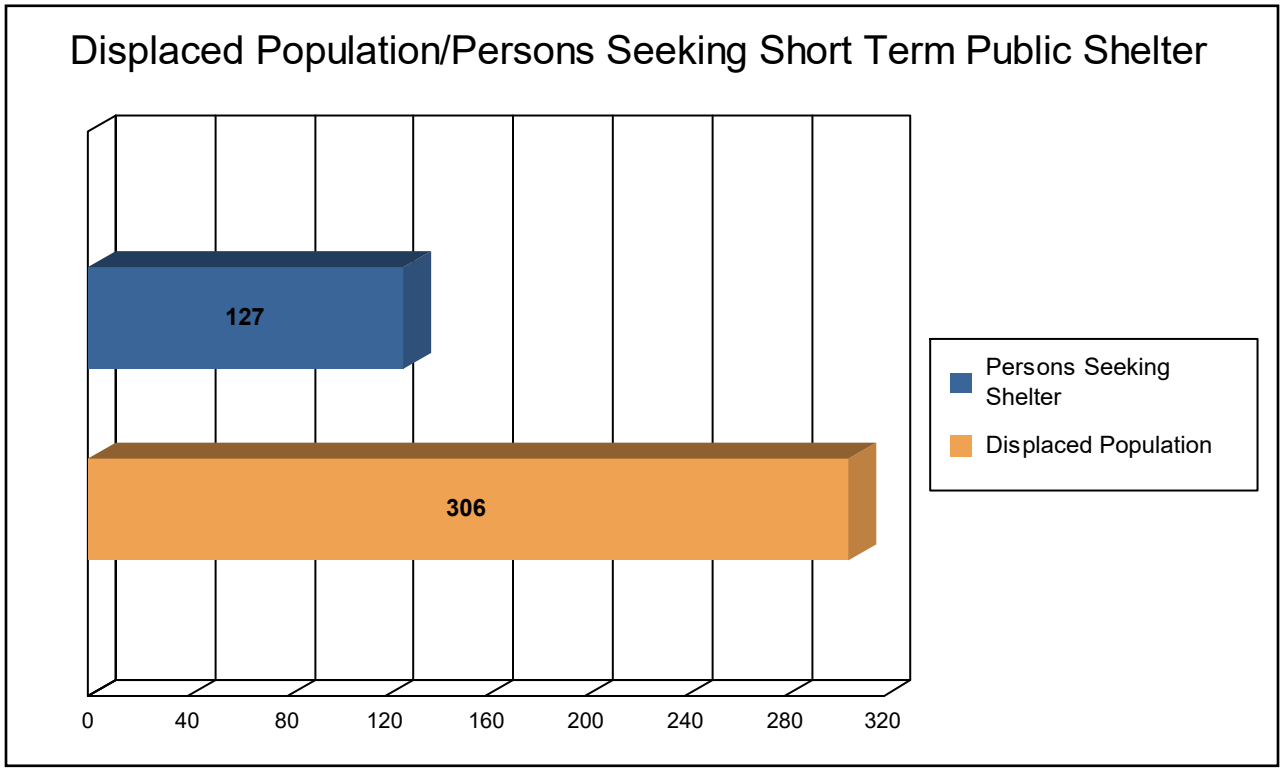


The model estimates that a total of 652 tons of debris will be generated. Of the total amount, Finishes comprises 43% of the total, Structure comprises 33% of the total, and Foundation comprises 24%. If the debris tonnage is converted into an estimated number of truckloads, it will require 27 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 102 households (or 306 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 127 people (out of a total population of 25,892) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 40.05 million dollars, which represents 2.96 % of the total replacement value of the scenario buildings.

Building-Related Losses

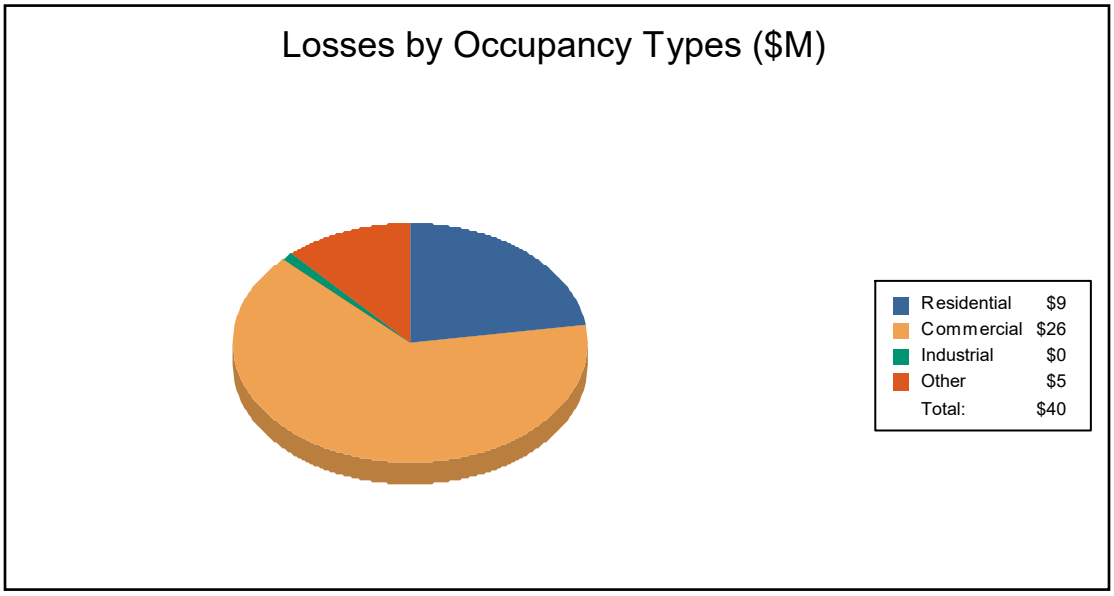
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 20.37 million dollars. 49% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.48% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.94	2.53	0.14	0.17	7.79
	Content	2.36	7.31	0.26	1.03	10.95
	Inventory	0.00	1.59	0.03	0.02	1.64
	Subtotal	**7.30**	**11.42**	**0.42**	**1.22**	**20.37**
Business Interruption						
	Income	0.00	4.41	0.00	0.36	4.78
	Relocation	1.18	1.77	0.00	0.17	3.13
	Rental Income	0.52	0.79	0.00	0.02	1.33
	Wage	0.00	7.49	0.01	2.95	10.45
	Subtotal	**1.70**	**14.45**	**0.02**	**3.50**	**19.68**
ALL	**Total**	**9.00**	**25.88**	**0.44**	**4.72**	**40.05**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,201	3,386,063	5,757,264
Total	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**
Total Study Region	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**

Hazus: Flood Global Risk Report

Region Name: Mansfield_FL

Flood Scenario: Mansfield_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 291 census blocks. The region contains over 6 thousand households and has a total population of 25,892 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,908 buildings in the region with a total building replacement value (excluding contents) of 5,757 million dollars. Approximately 86.08% of the buildings (and 41.19% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,908 buildings in the region which have an aggregate total replacement value of 5,757 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,371,201	41.2%
Commercial	812,824	14.1%
Industrial	63,806	1.1%
Agricultural	13,697	0.2%
Religion	62,630	1.1%
Government	89,848	1.6%
Education	2,343,258	40.7%
Total	**5,757,264**	**100%**

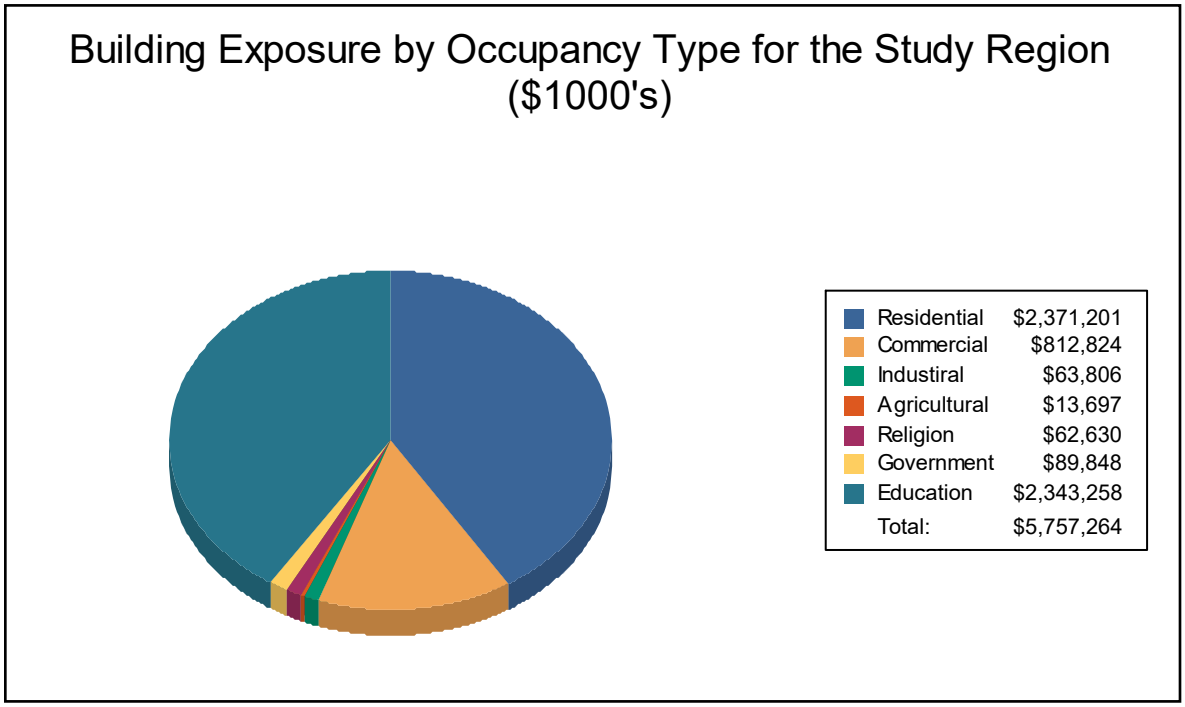
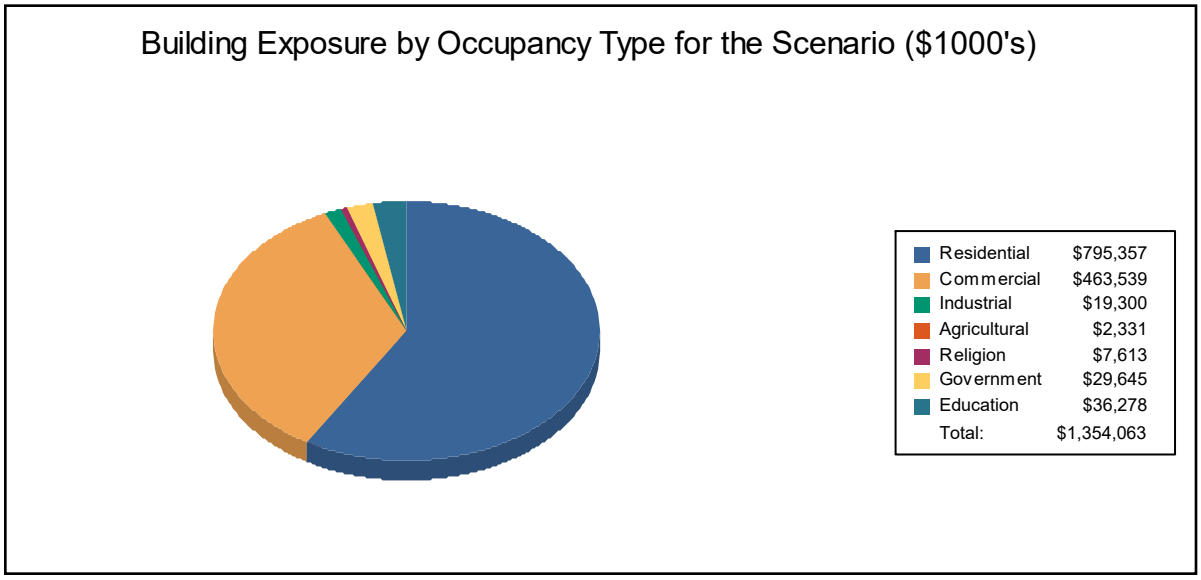


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	795,357	58.7%
Commercial	463,539	34.2%
Industrial	19,300	1.4%
Agricultural	2,331	0.2%
Religion	7,613	0.6%
Government	29,645	2.2%
Education	36,278	2.7%
Total	**1,354,063**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds.
There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

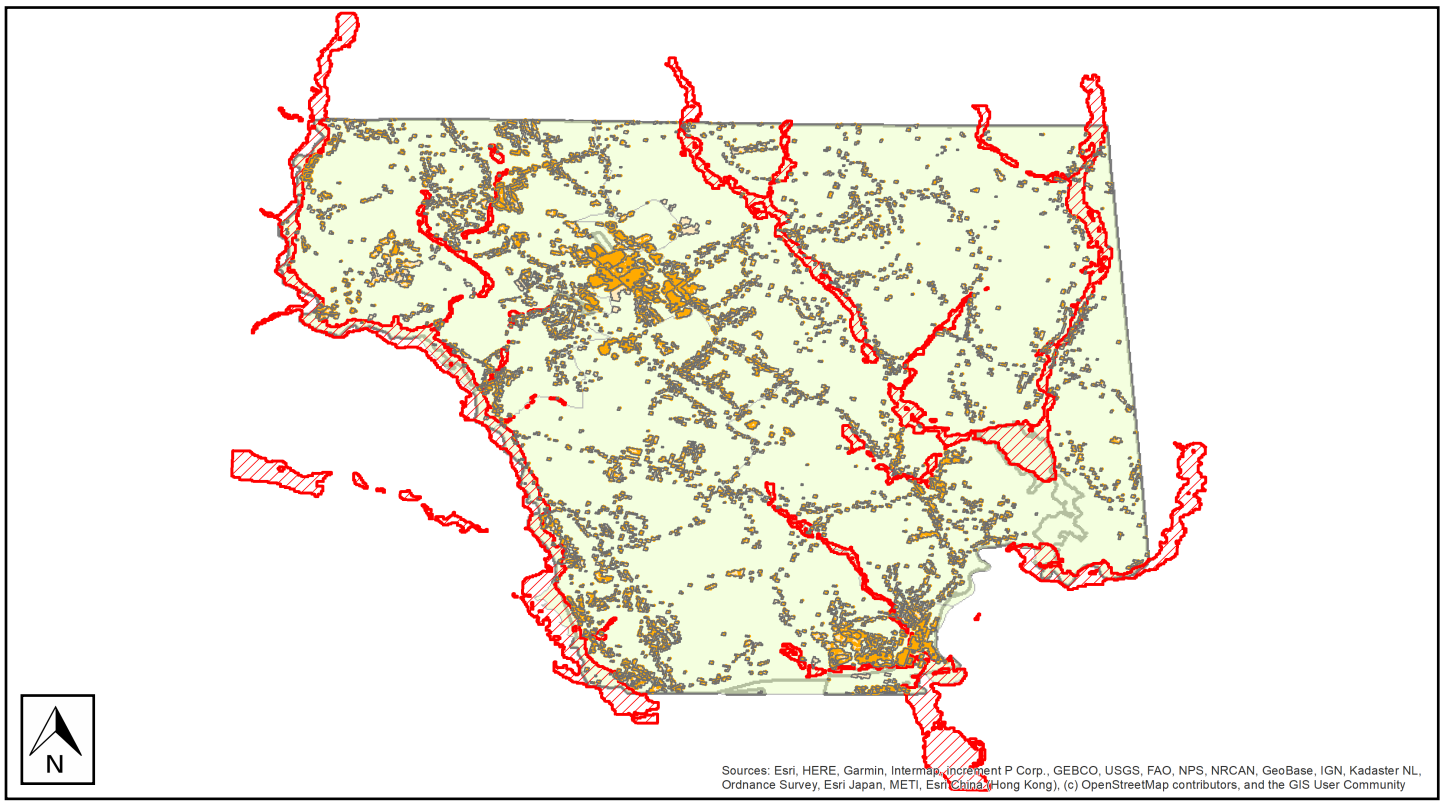
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Mansfield_FL
Scenario Name:	Mansfield_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

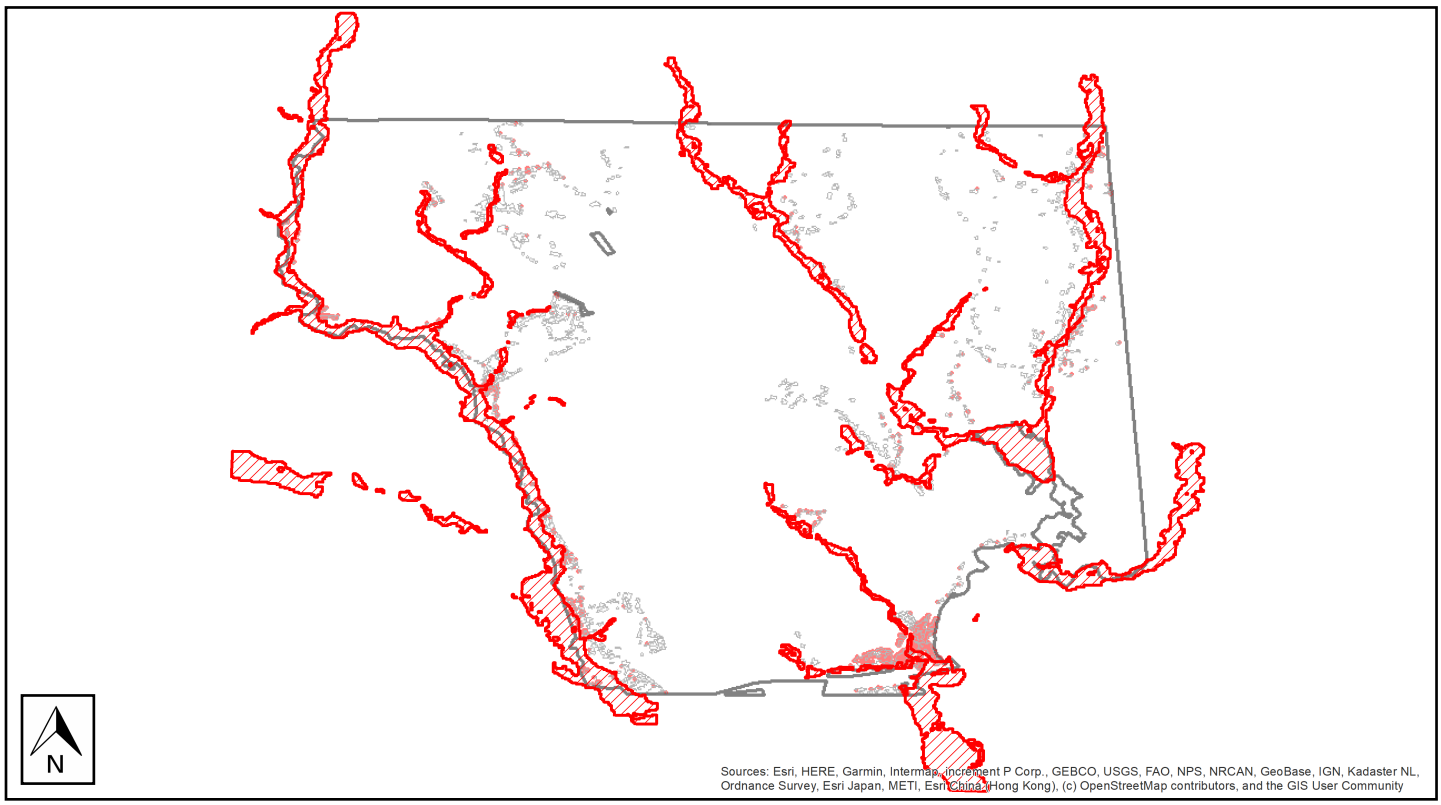


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	3	75	1	25	0	0	0	0	0	0
Total	**0**		**3**		**1**		**0**		**0**		**0**	

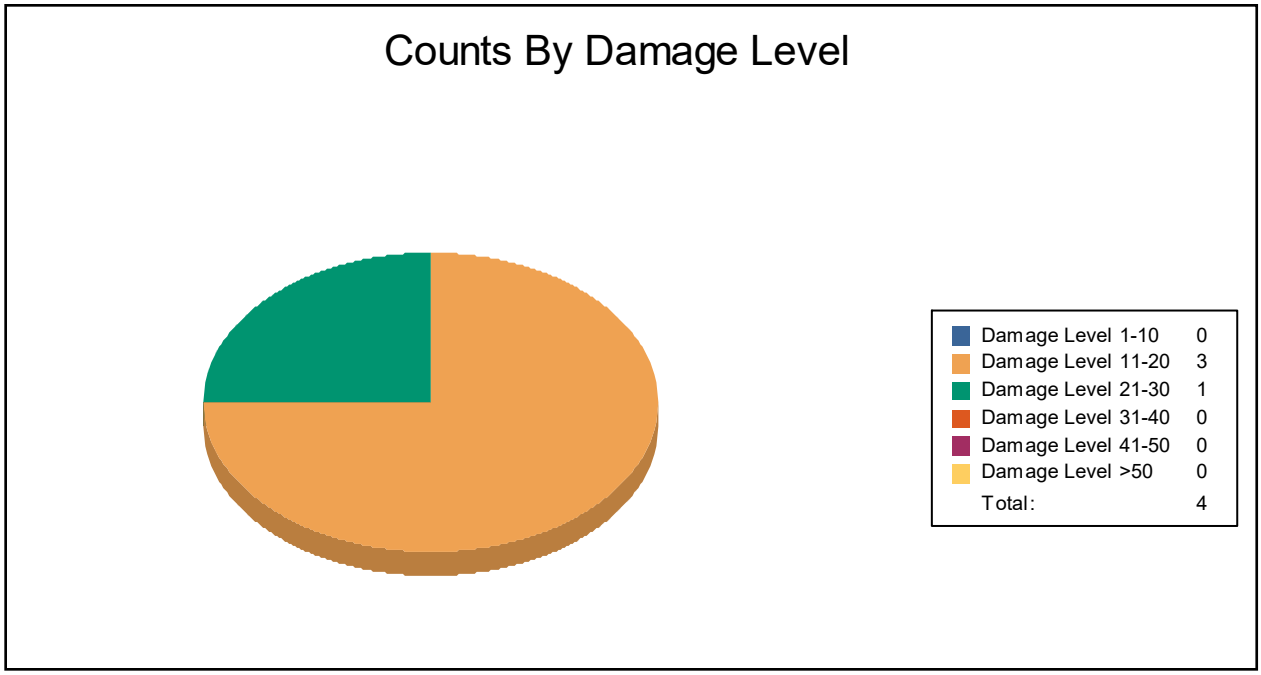


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	3	75	1	25	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 57 hospital beds available for use. On the day of the scenario flood event, the model estimates that 57 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

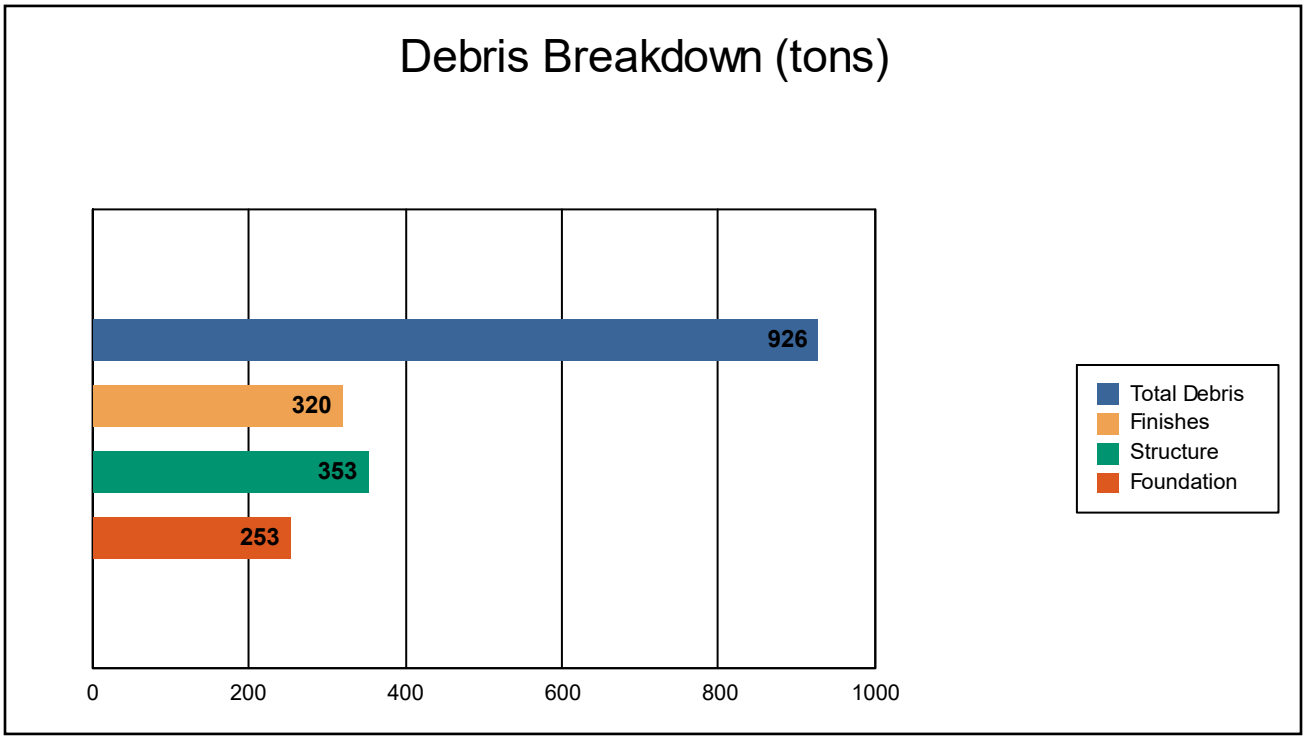
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

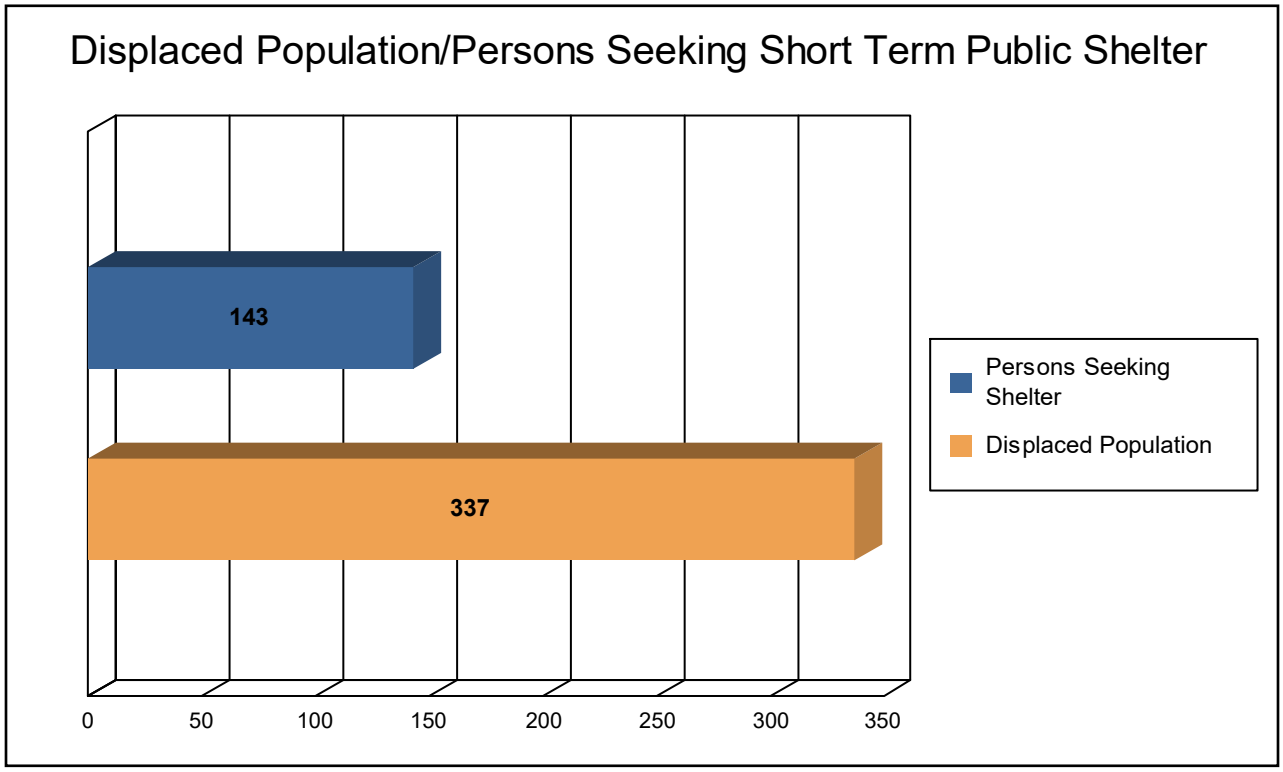


The model estimates that a total of 926 tons of debris will be generated. Of the total amount, Finishes comprises 35% of the total, Structure comprises 38% of the total, and Foundation comprises 27%. If the debris tonnage is converted into an estimated number of truckloads, it will require 38 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 112 households (or 337 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 143 people (out of a total population of 25,892) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 51.32 million dollars, which represents 3.79 % of the total replacement value of the scenario buildings.

Building-Related Losses

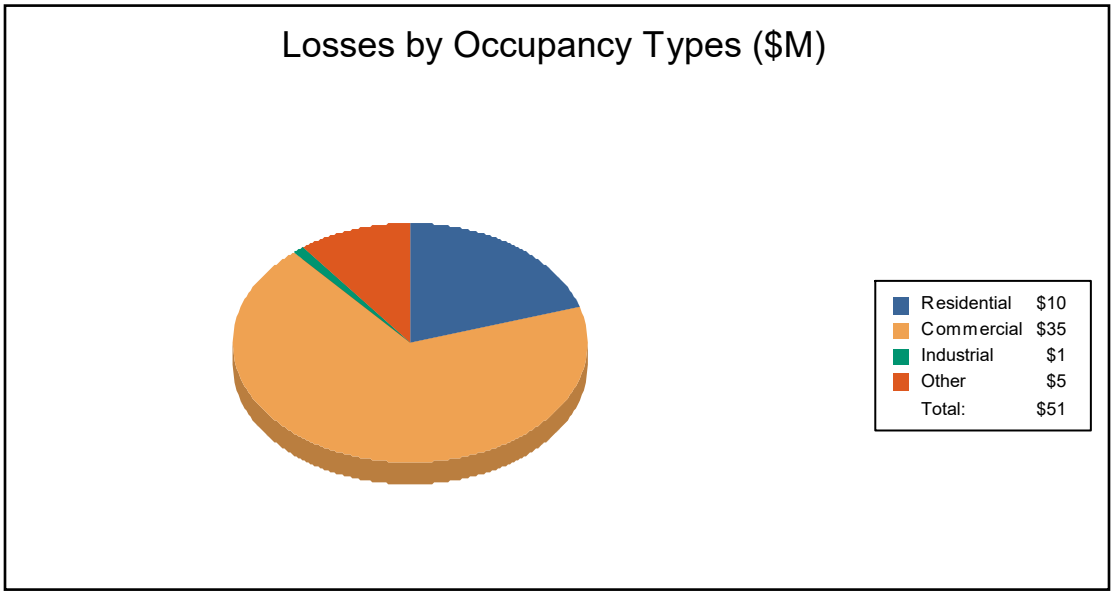
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 25.70 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 20.24% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.73	3.38	0.18	0.20	9.49
	Content	2.74	9.58	0.32	1.10	13.74
	Inventory	0.00	2.41	0.04	0.03	2.47
	Subtotal	**8.47**	**15.37**	**0.54**	**1.32**	**25.70**
Business Interruption						
	Income	0.00	6.05	0.01	0.38	6.44
	Relocation	1.31	2.55	0.01	0.19	4.06
	Rental Income	0.61	1.38	0.00	0.02	2.01
	Wage	0.00	9.70	0.02	3.40	13.11
	Subtotal	**1.92**	**19.67**	**0.03**	**4.00**	**25.62**
ALL	**Total**	**10.39**	**35.04**	**0.57**	**5.32**	**51.32**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,201	3,386,063	5,757,264
Total	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**
Total Study Region	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**

Hazus: Flood Global Risk Report

Region Name: Mansfield_FL

Flood Scenario: Mansfield_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 291 census blocks. The region contains over 6 thousand households and has a total population of 25,892 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,908 buildings in the region with a total building replacement value (excluding contents) of 5,757 million dollars. Approximately 86.08% of the buildings (and 41.19% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,908 buildings in the region which have an aggregate total replacement value of 5,757 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,371,201	41.2%
Commercial	812,824	14.1%
Industrial	63,806	1.1%
Agricultural	13,697	0.2%
Religion	62,630	1.1%
Government	89,848	1.6%
Education	2,343,258	40.7%
Total	**5,757,264**	**100%**

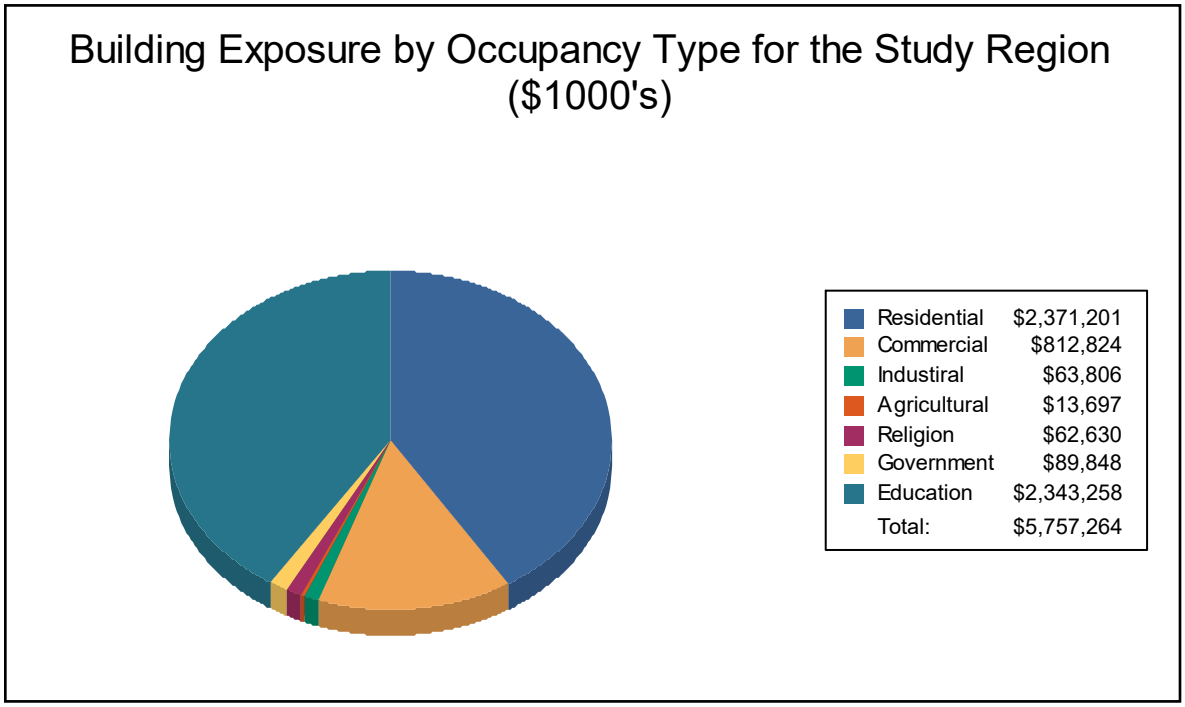
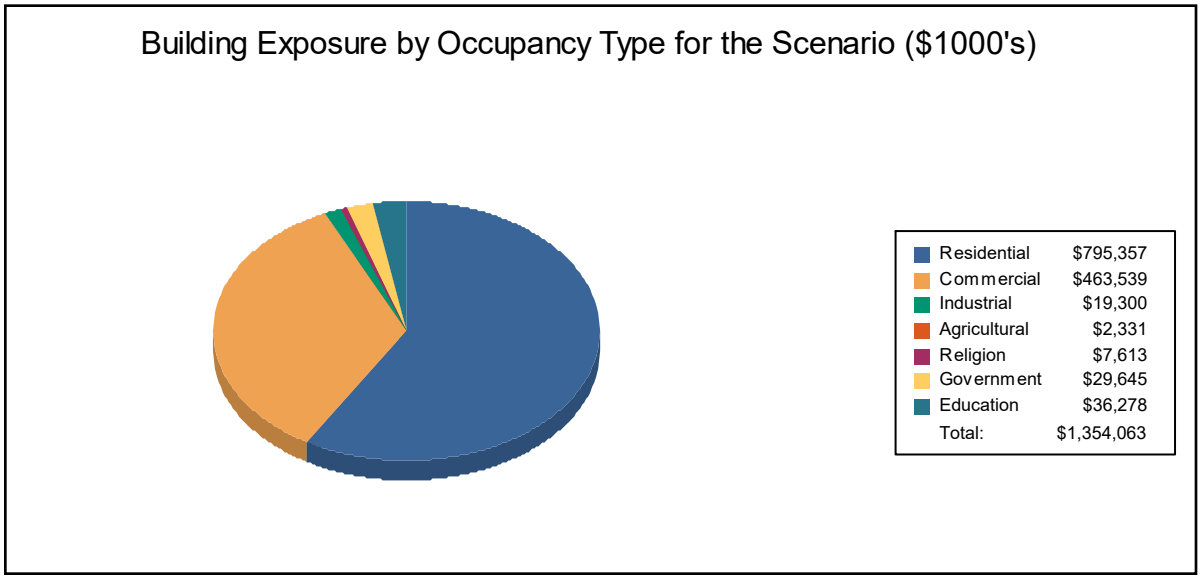


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	795,357	58.7%
Commercial	463,539	34.2%
Industrial	19,300	1.4%
Agricultural	2,331	0.2%
Religion	7,613	0.6%
Government	29,645	2.2%
Education	36,278	2.7%
Total	**1,354,063**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds.
There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

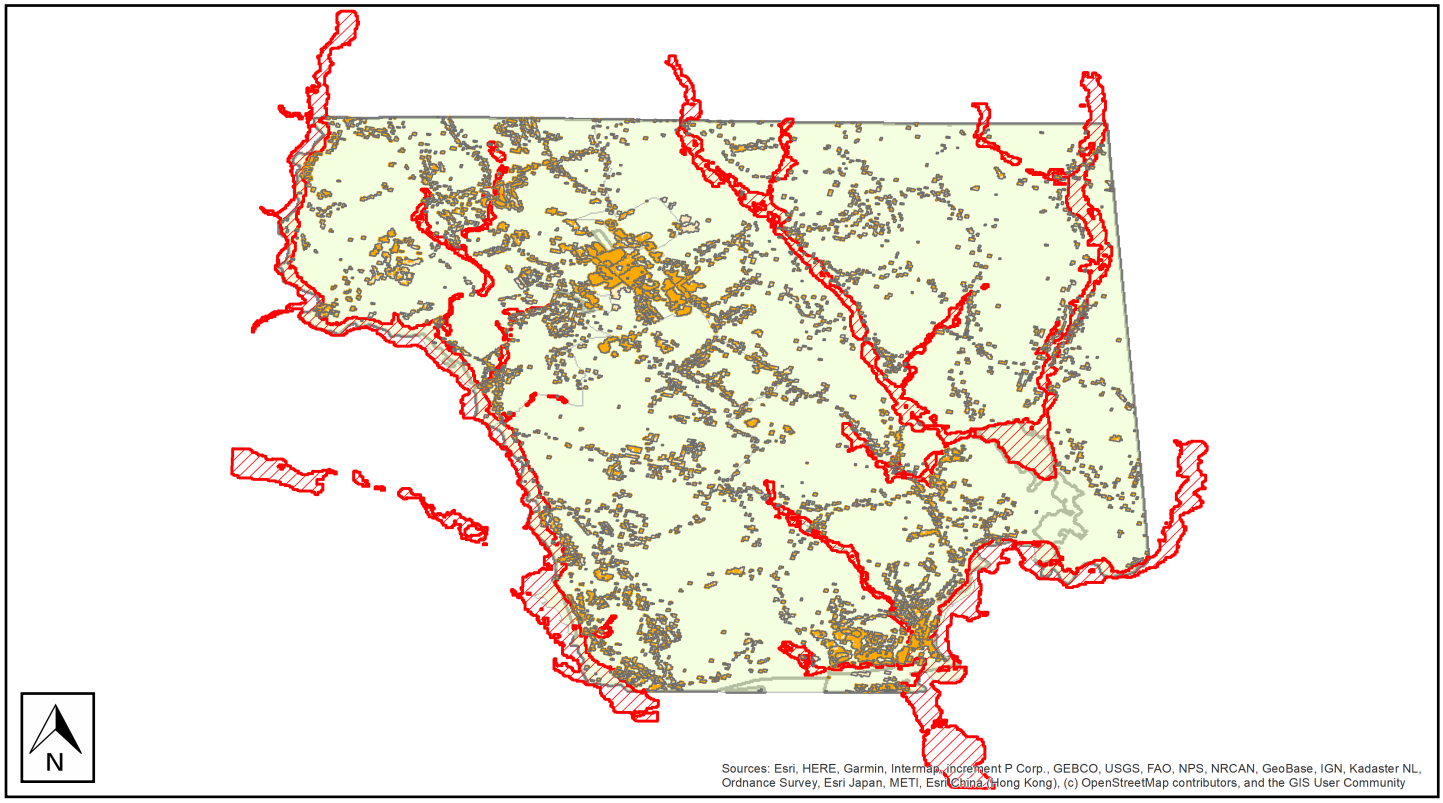
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Mansfield_FL
Scenario Name:	Mansfield_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 22 buildings will be at least moderately damaged. This is over 82% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

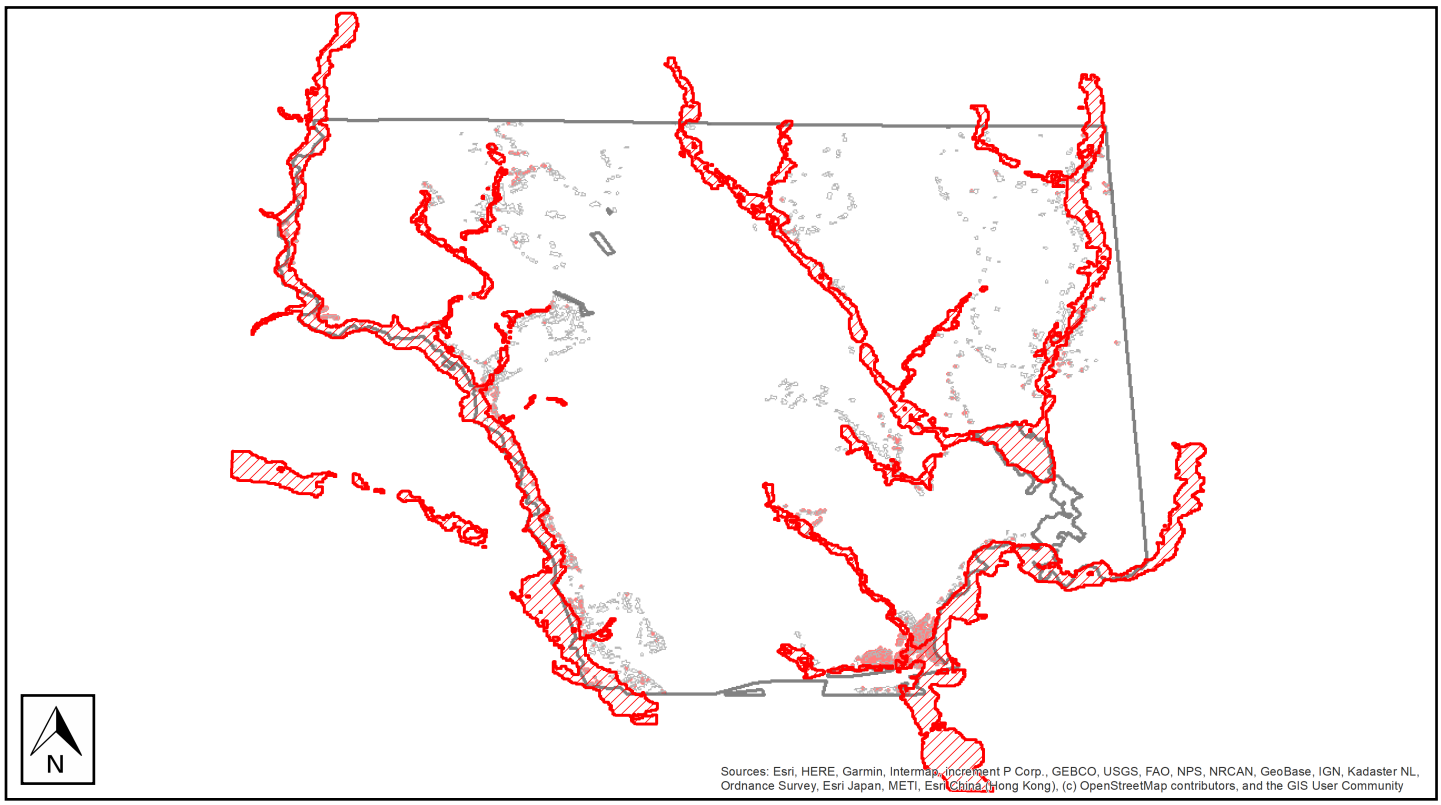


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	10	48	7	33	4	19	0	0	0	0
Total	**0**		**11**		**7**		**4**		**0**		**0**	

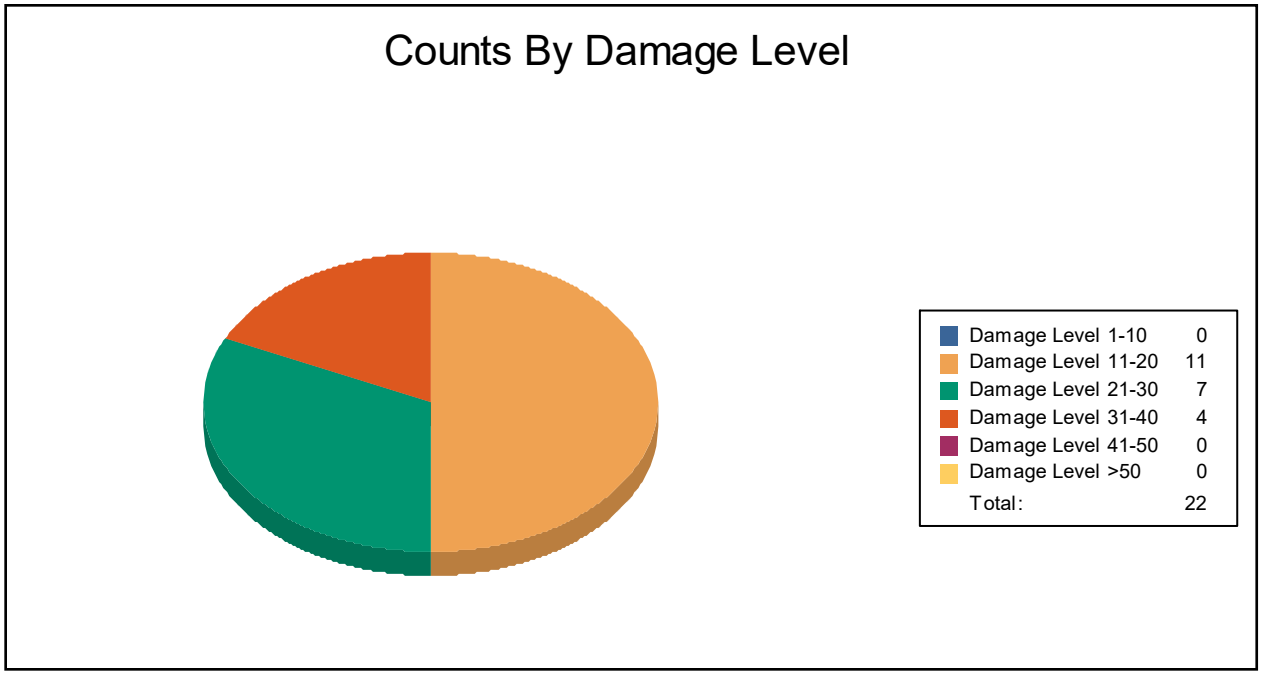


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	1	100	0	0	0	0	0	0	0	0
Steel	0	0	1	100	0	0	0	0	0	0	0	0
Wood	0	0	10	48	7	33	4	19	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 57 hospital beds available for use. On the day of the scenario flood event, the model estimates that 57 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

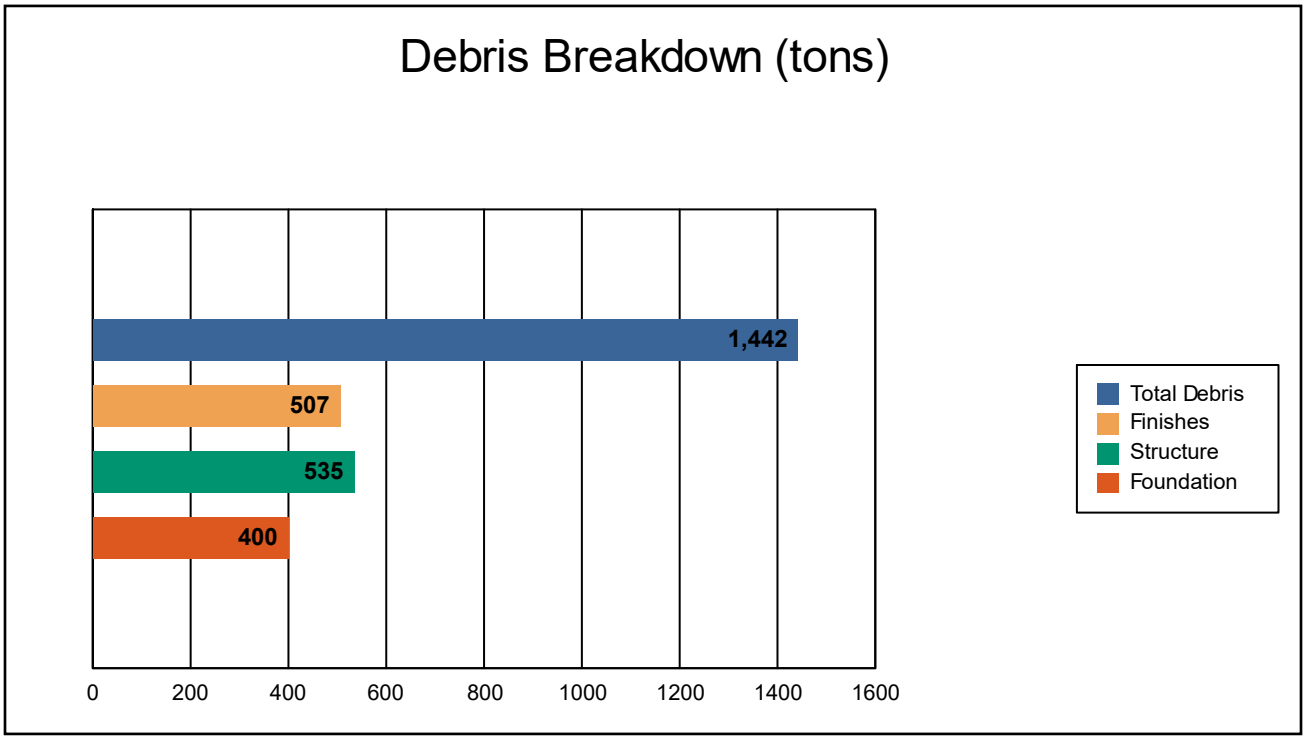
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

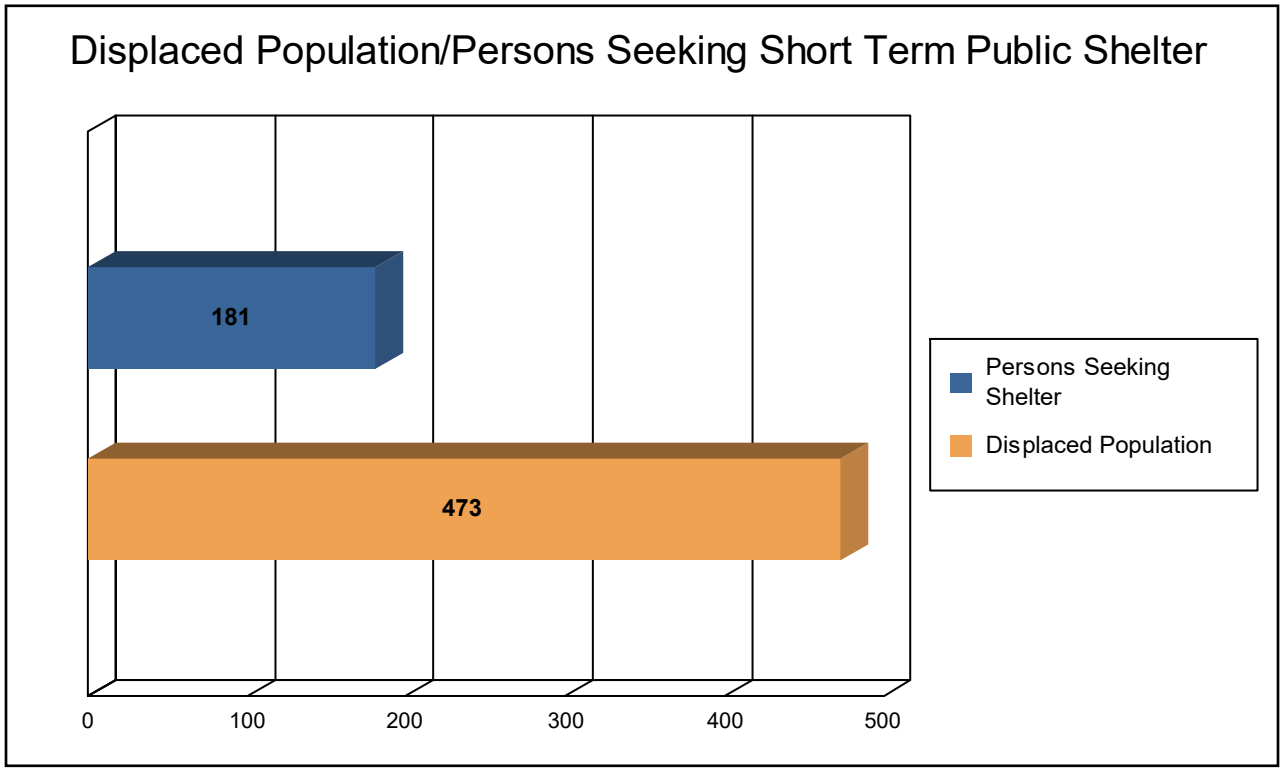


The model estimates that a total of 1,442 tons of debris will be generated. Of the total amount, Finishes comprises 35% of the total, Structure comprises 37% of the total, and Foundation comprises 28%. If the debris tonnage is converted into an estimated number of truckloads, it will require 58 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 158 households (or 473 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 181 people (out of a total population of 25,892) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 117.07 million dollars, which represents 8.65 % of the total replacement value of the scenario buildings.

Building-Related Losses

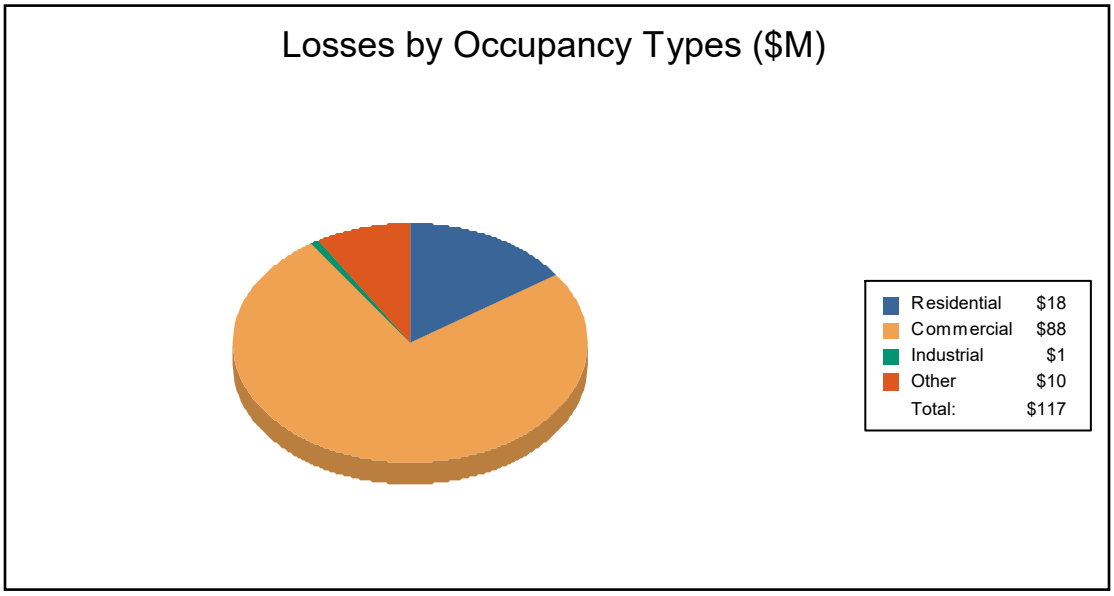
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 58.94 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 15.34% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.46	8.61	0.33	0.41	18.80
	Content	4.60	25.56	0.54	2.16	32.87
	Inventory	0.00	7.17	0.07	0.04	7.27
	Subtotal	**14.06**	**41.34**	**0.93**	**2.61**	**58.94**
Business Interruption						
	Income	0.17	14.17	0.02	0.86	15.21
	Relocation	2.07	6.54	0.01	0.45	9.06
	Rental Income	1.28	3.54	0.00	0.05	4.87
	Wage	0.39	22.45	0.03	6.12	28.99
	Subtotal	**3.90**	**46.70**	**0.05**	**7.47**	**58.13**
ALL	**Total**	**17.96**	**88.04**	**0.99**	**10.09**	**117.07**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,201	3,386,063	5,757,264
Total	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**
Total Study Region	**25,892**	**2,371,201**	**3,386,063**	**5,757,264**

Hazus: Flood Global Risk Report

Region Name: Marlborough_FL

Flood Scenario: Marlborough_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 6,133 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,549 buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 89.96% of the buildings (and 79.72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of 1,235 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	984,355	79.7%
Commercial	144,461	11.7%
Industrial	30,355	2.5%
Agricultural	1,004	0.1%
Religion	11,383	0.9%
Government	34,936	2.8%
Education	28,323	2.3%
Total	**1,234,817**	**100%**

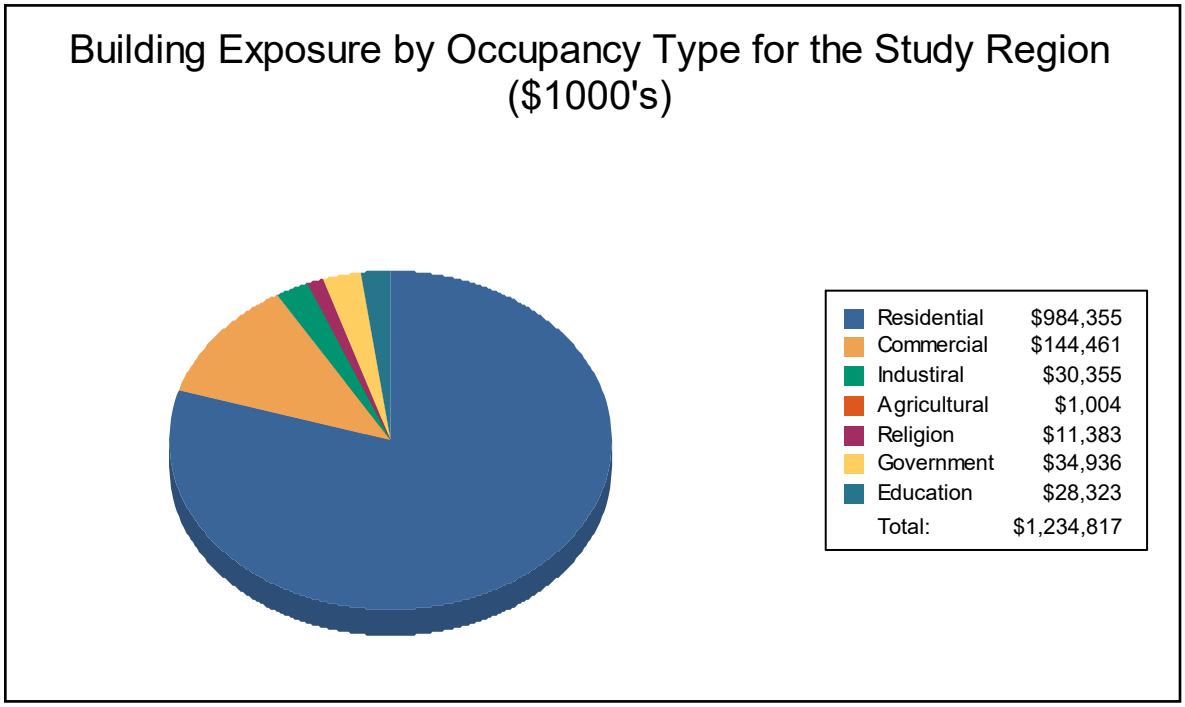
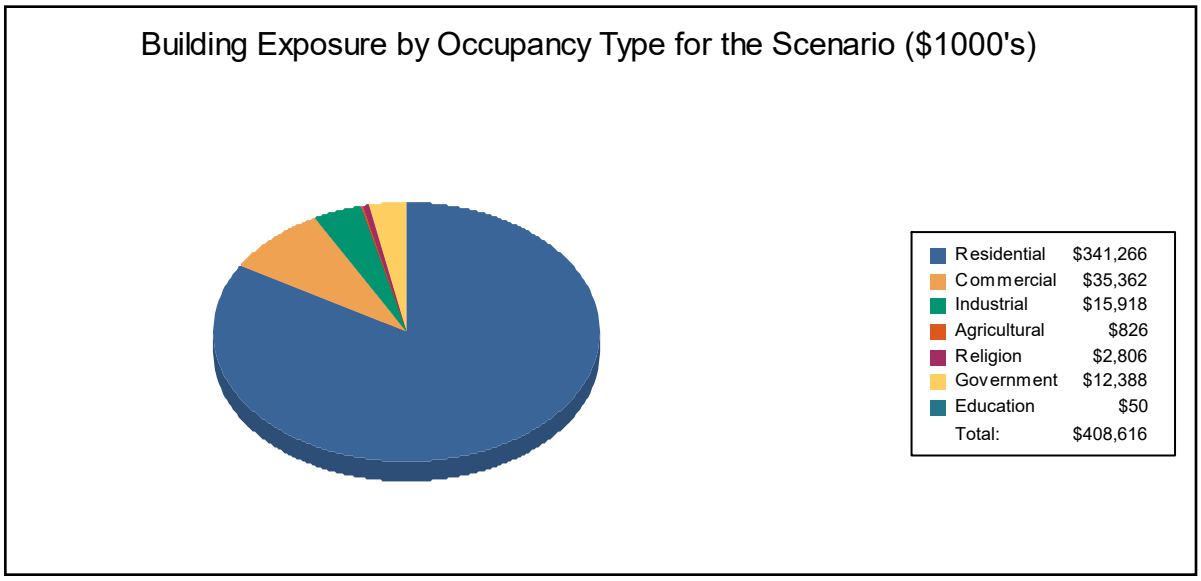


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	341,266	83.5%
Commercial	35,362	8.7%
Industrial	15,918	3.9%
Agricultural	826	0.2%
Religion	2,806	0.7%
Government	12,388	3.0%
Education	50	0.0%
Total	**408,616**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 2 fire stations, 1 police station and 1 emergency operation center.

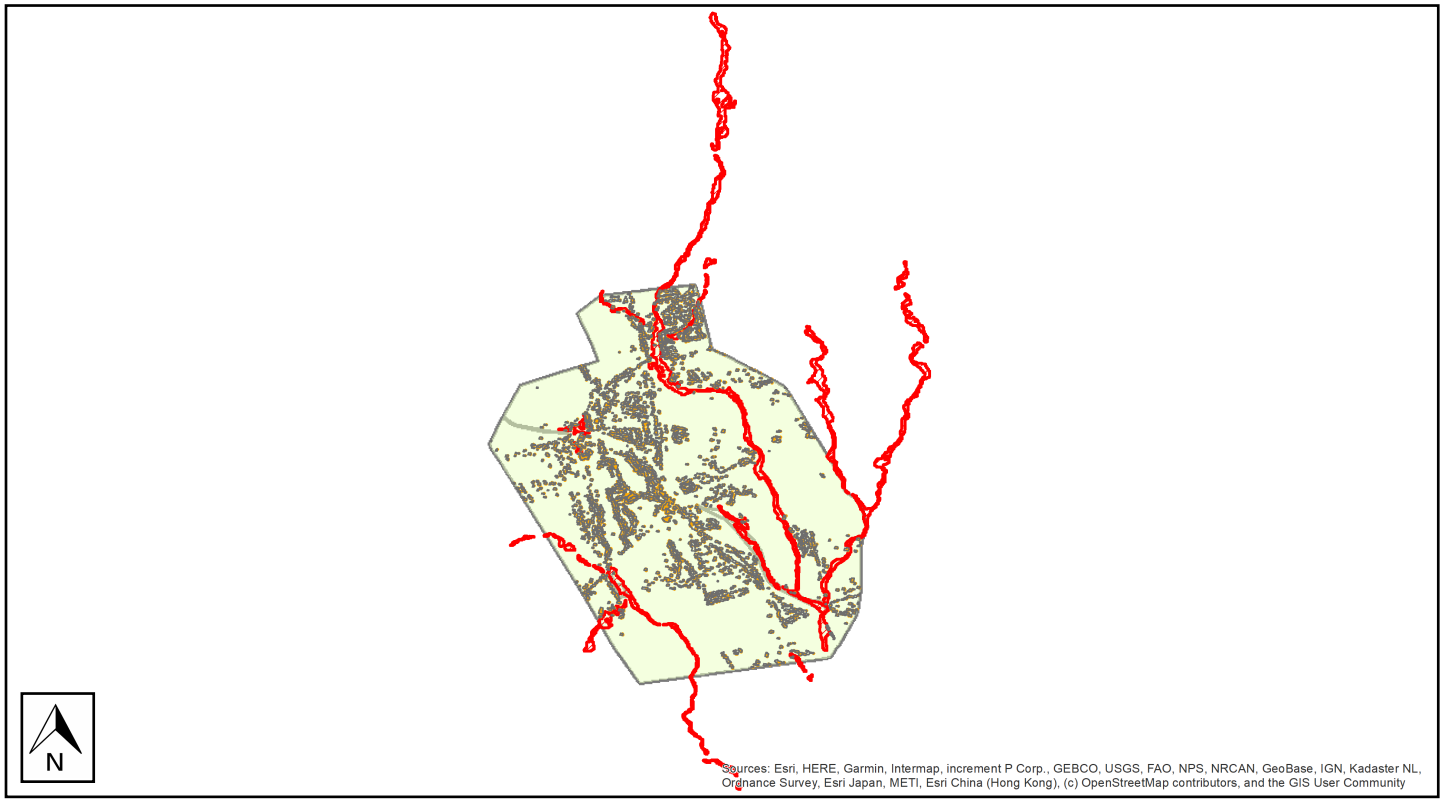
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Marlborough_FL
Scenario Name:	Marlborough_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

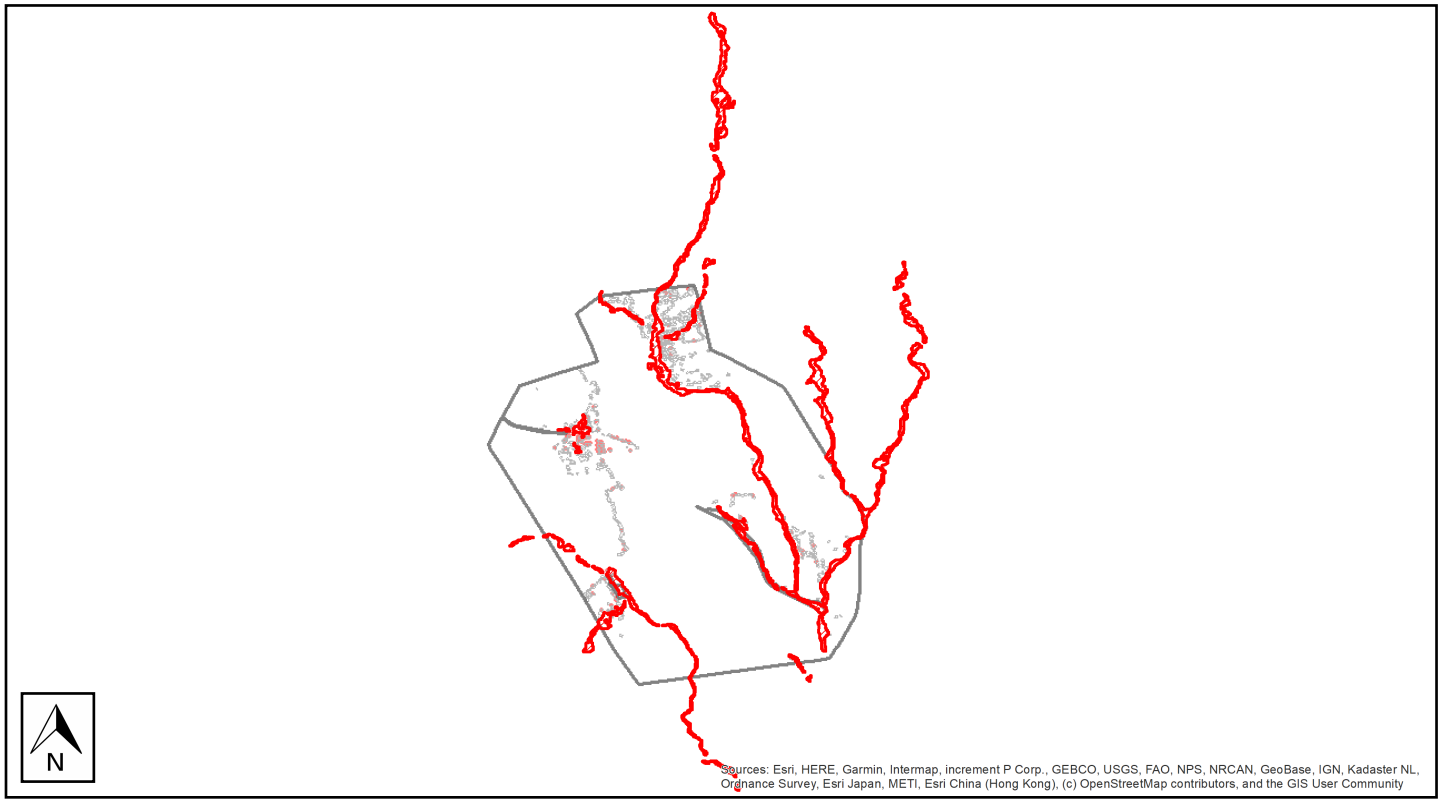


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	100	0	0	0	0	0	0	0	0	0	0
Total	**2**		**0**		**0**		**0**		**0**		**0**	

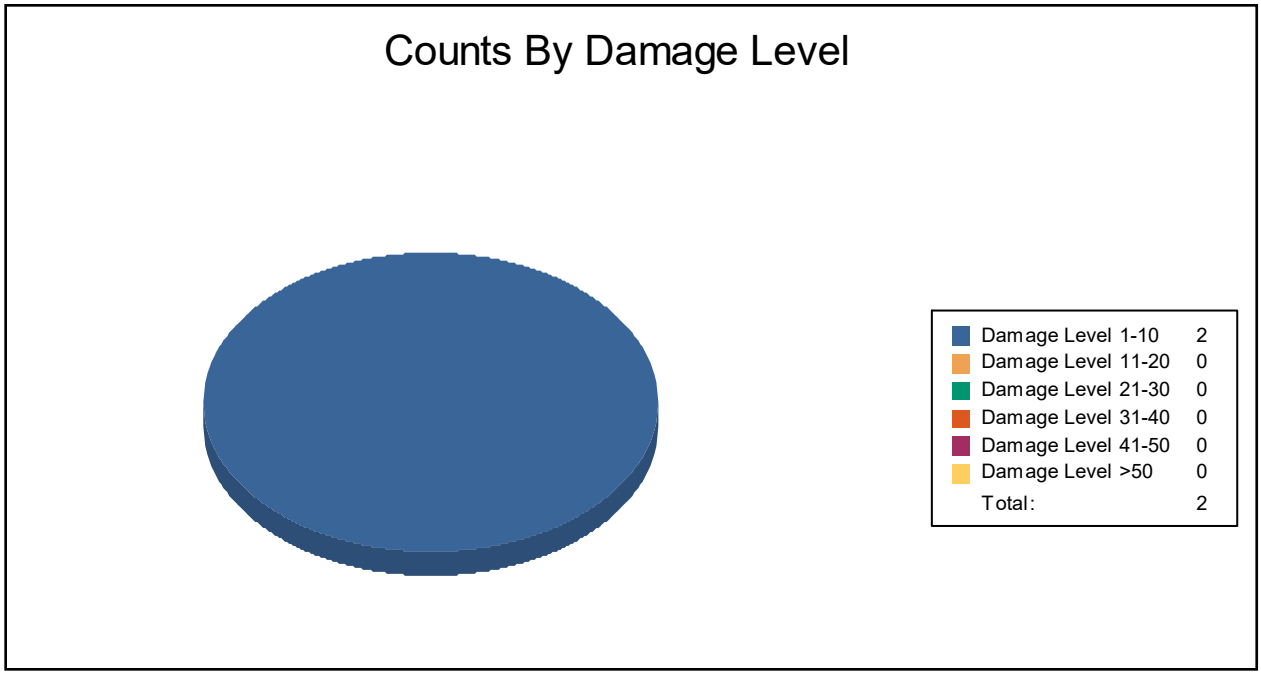


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

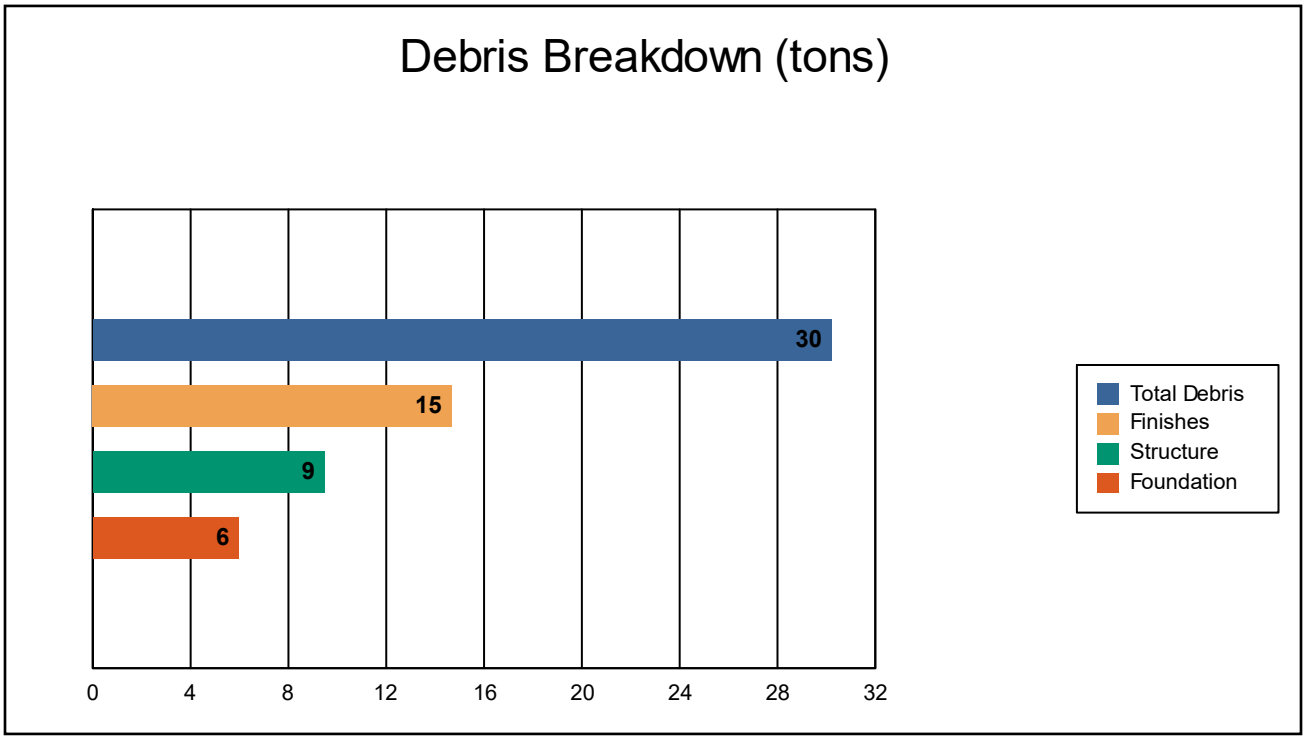
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

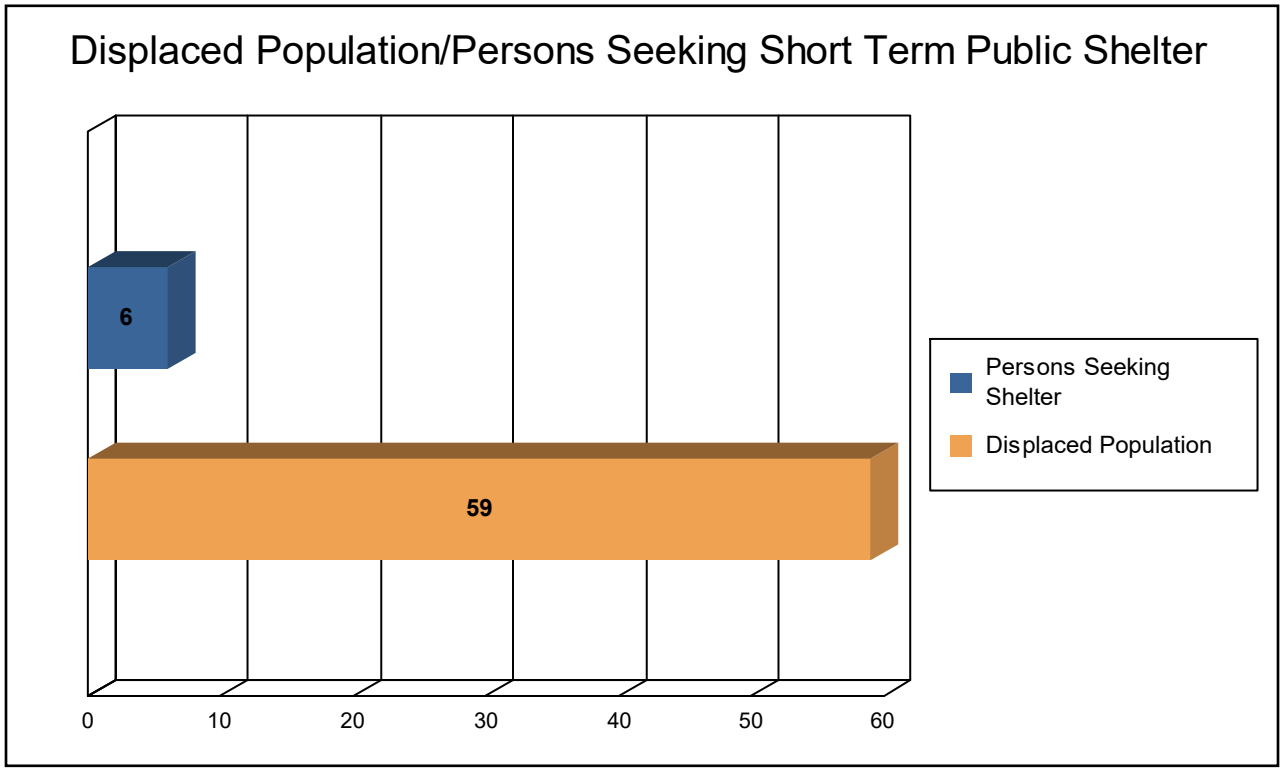


The model estimates that a total of 30 tons of debris will be generated. Of the total amount, Finishes comprises 49% of the total, Structure comprises 31% of the total, and Foundation comprises 20%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 20 households (or 59 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 6 people (out of a total population of 6,133) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 2.59 million dollars, which represents 0.63 % of the total replacement value of the scenario buildings.

Building-Related Losses

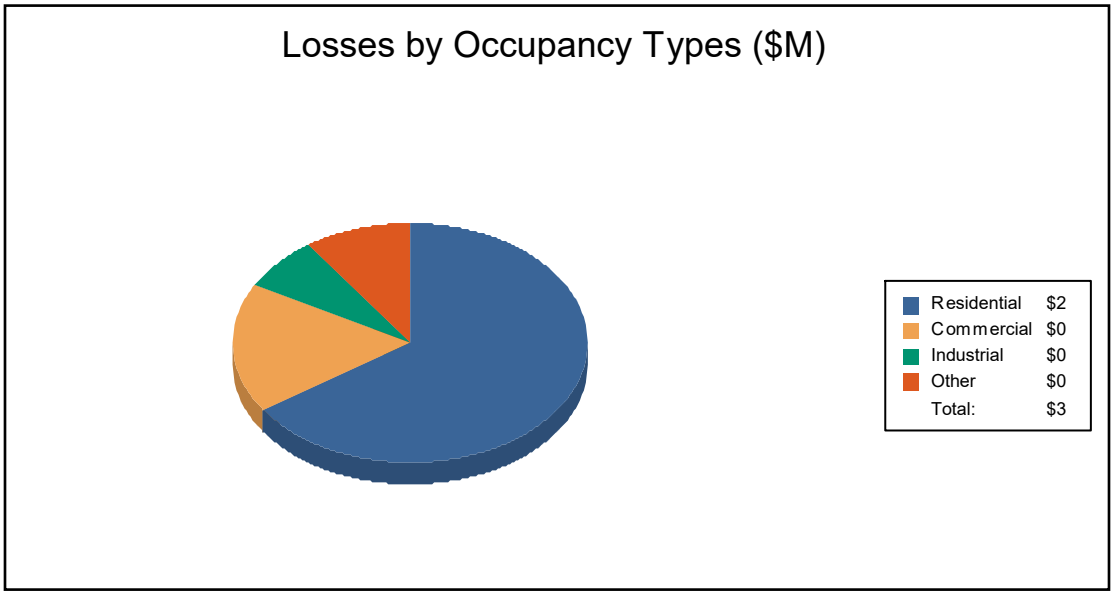
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 1.52 million dollars. 41% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 65.57% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.76	0.04	0.06	0.00	0.86
	Content	0.36	0.12	0.11	0.05	0.64
	Inventory	0.00	0.00	0.01	0.00	0.02
	Subtotal	**1.12**	**0.17**	**0.18**	**0.05**	**1.52**
Business Interruption						
	Income	0.06	0.12	0.00	0.01	0.19
	Relocation	0.28	0.02	0.00	0.00	0.30
	Rental Income	0.10	0.02	0.00	0.00	0.11
	Wage	0.15	0.13	0.00	0.19	0.47
	Subtotal	**0.58**	**0.29**	**0.01**	**0.20**	**1.07**
ALL	**Total**	**1.70**	**0.45**	**0.19**	**0.25**	**2.59**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,355	250,462	1,234,817
Total	**6,133**	**984,355**	**250,462**	**1,234,817**
Total Study Region	**6,133**	**984,355**	**250,462**	**1,234,817**

Hazus: Flood Global Risk Report

Region Name: Marlborough_FL

Flood Scenario: Marlborough_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 6,133 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,549 buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 89.96% of the buildings (and 79.72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of 1,235 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	984,355	79.7%
Commercial	144,461	11.7%
Industrial	30,355	2.5%
Agricultural	1,004	0.1%
Religion	11,383	0.9%
Government	34,936	2.8%
Education	28,323	2.3%
Total	**1,234,817**	**100%**

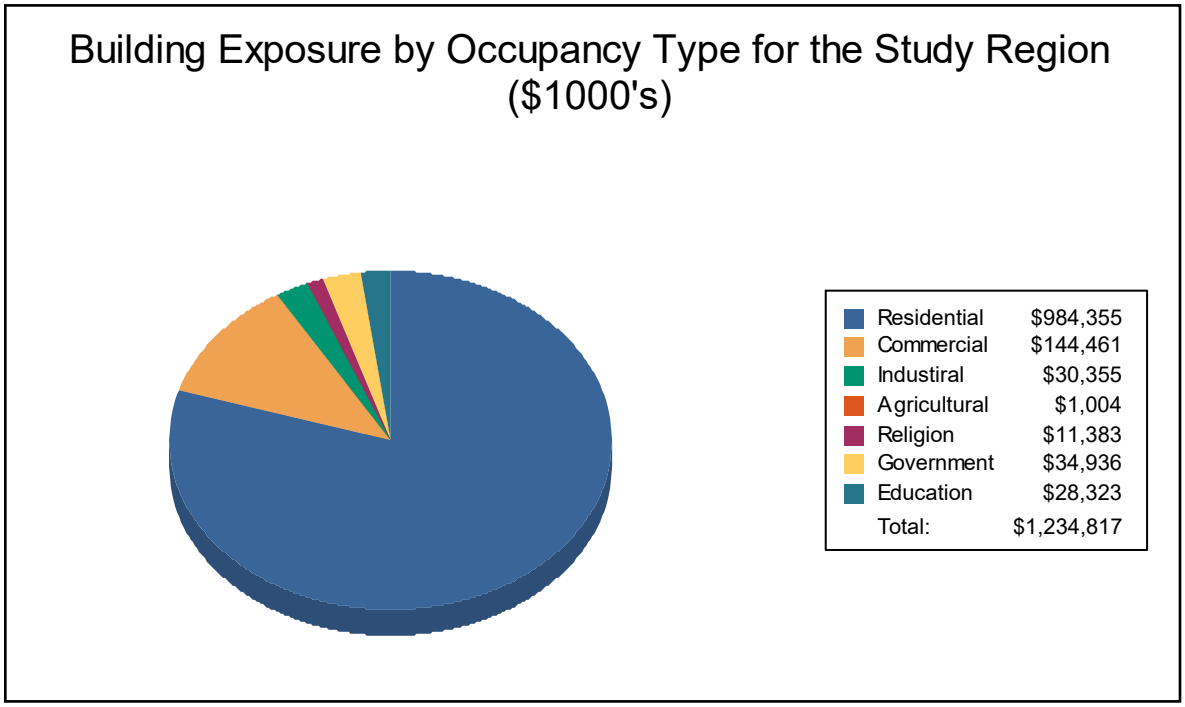
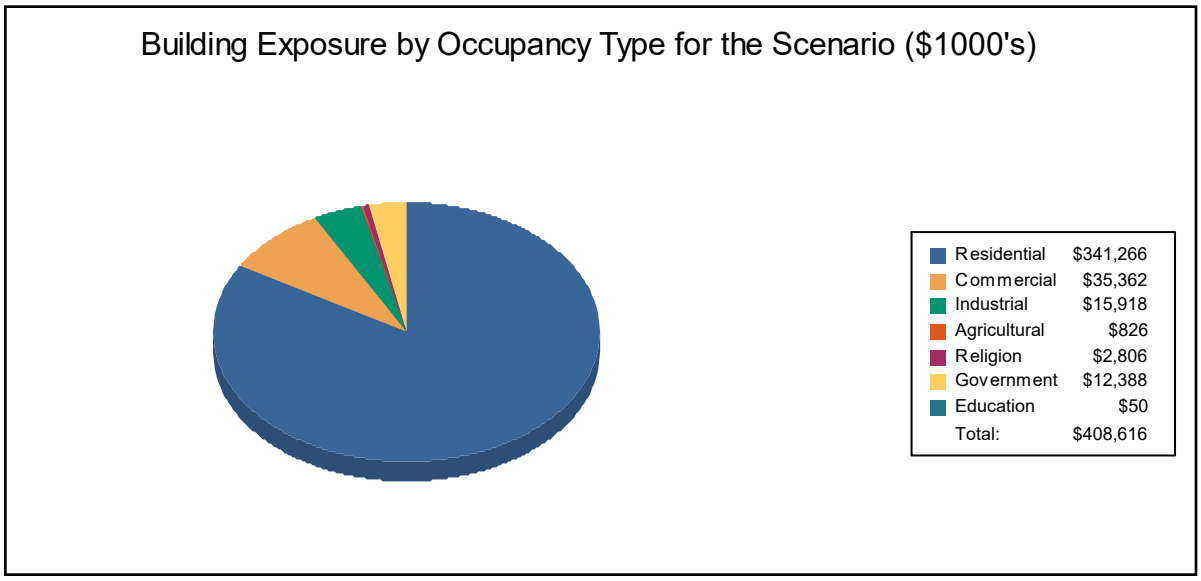


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	341,266	83.5%
Commercial	35,362	8.7%
Industrial	15,918	3.9%
Agricultural	826	0.2%
Religion	2,806	0.7%
Government	12,388	3.0%
Education	50	0.0%
Total	**408,616**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 2 fire stations, 1 police station and 1 emergency operation center.

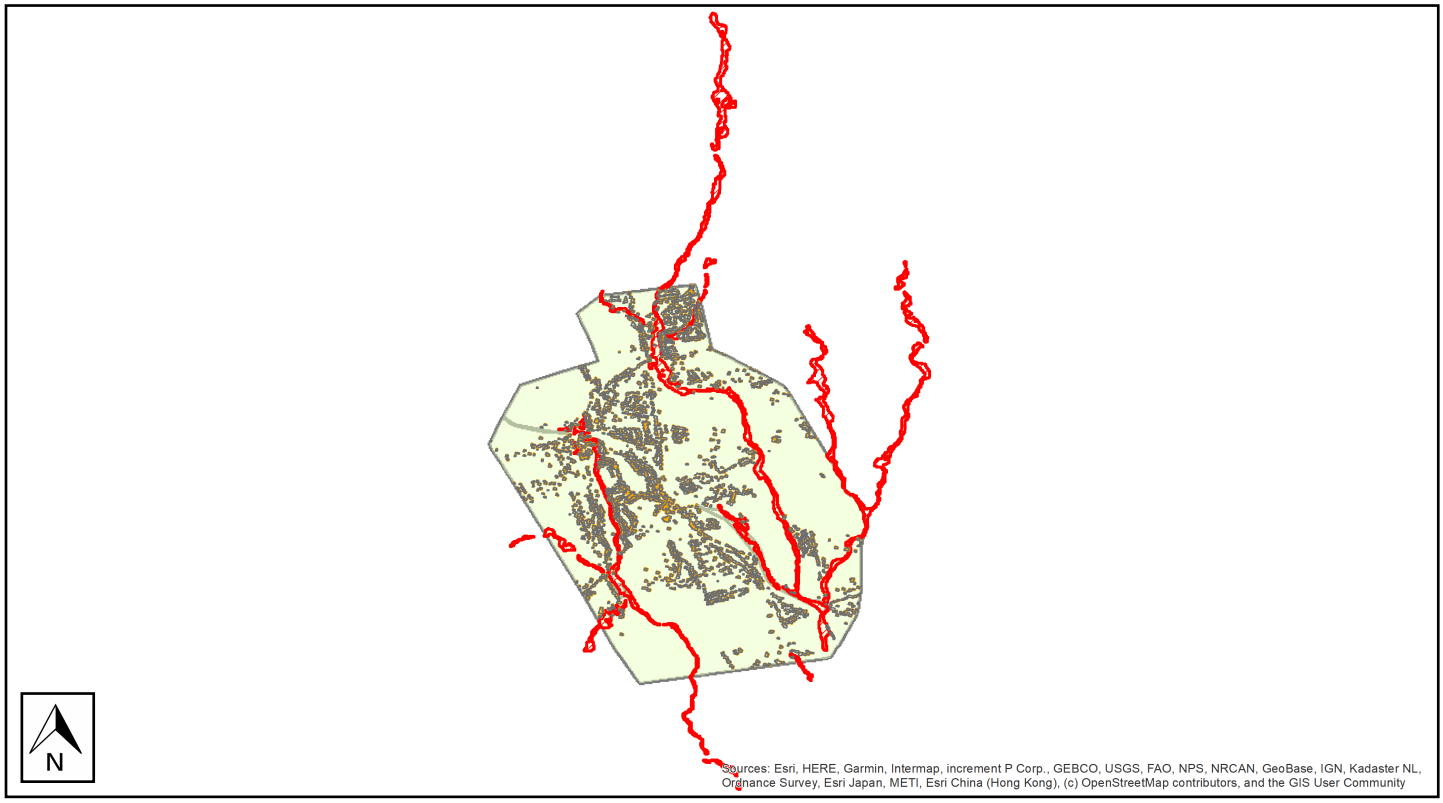
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Marlborough_FL
Scenario Name:	Marlborough_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

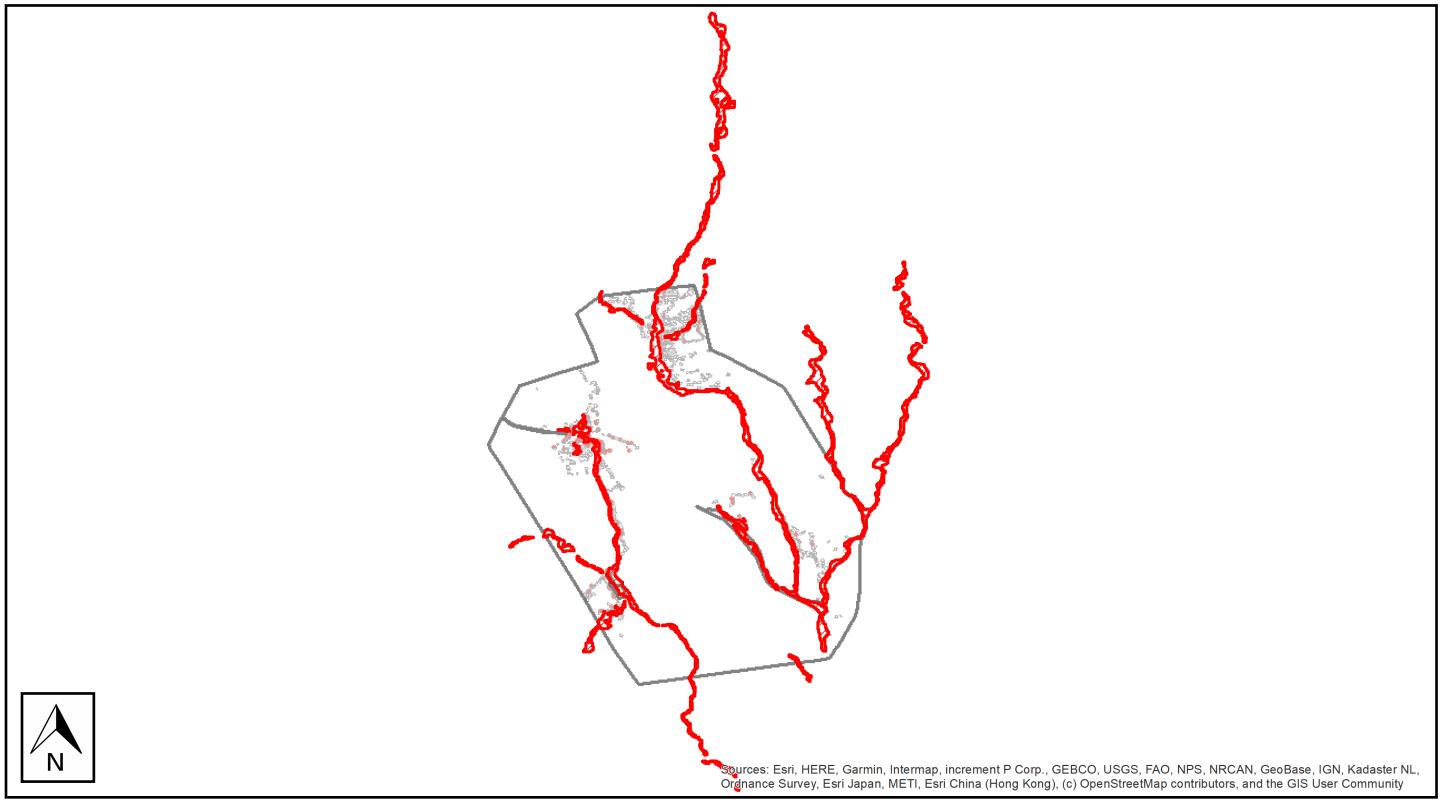


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	100	0	0	0	0	0	0	0	0	0	0
Total	**2**		**0**		**0**		**0**		**0**		**0**	

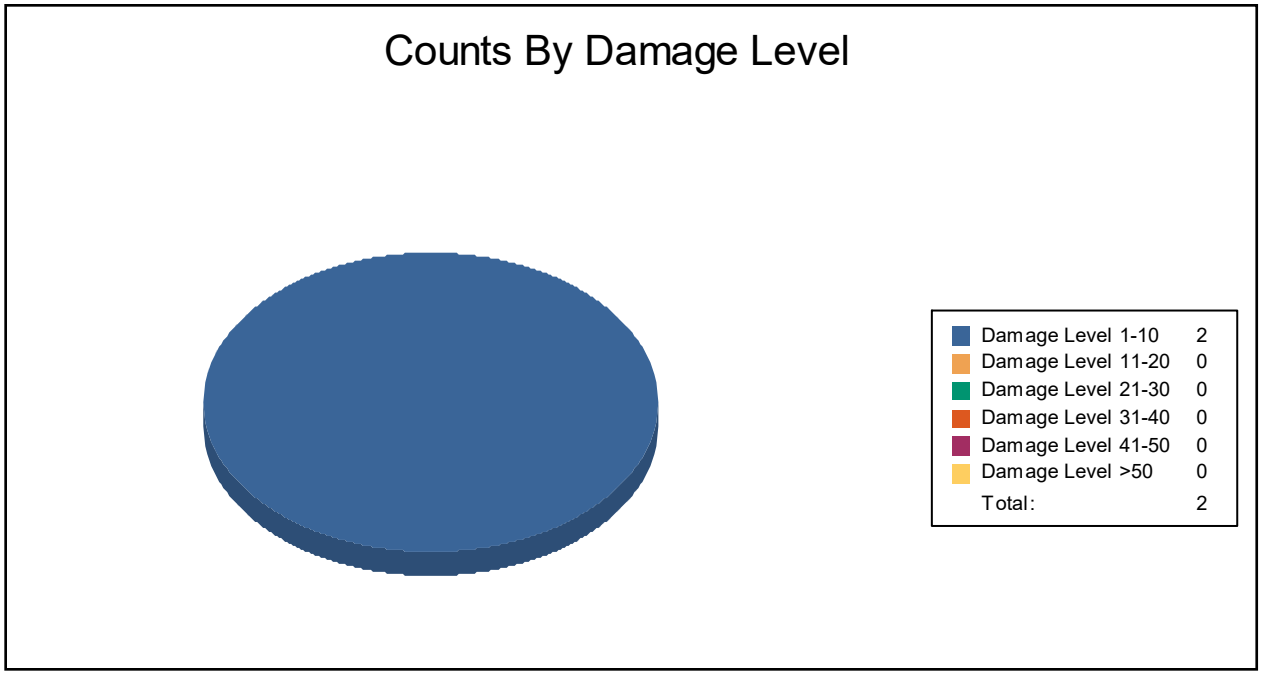


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

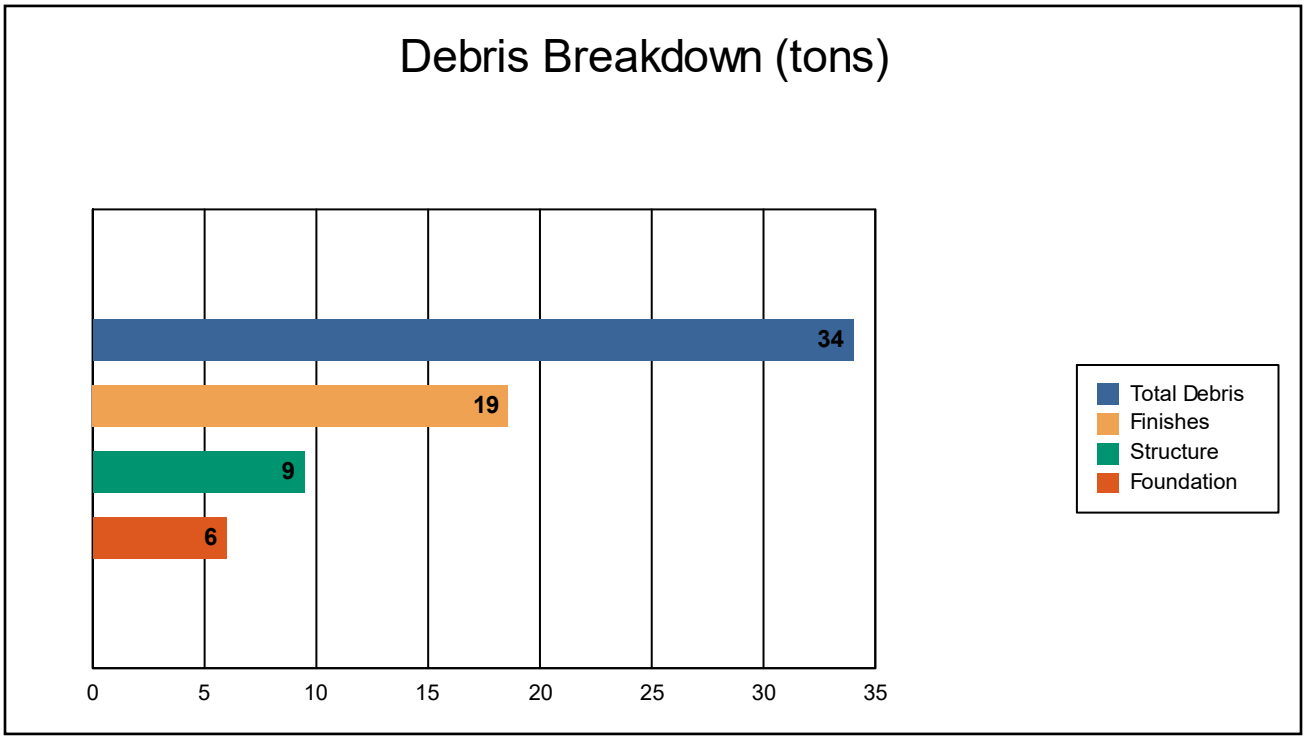
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

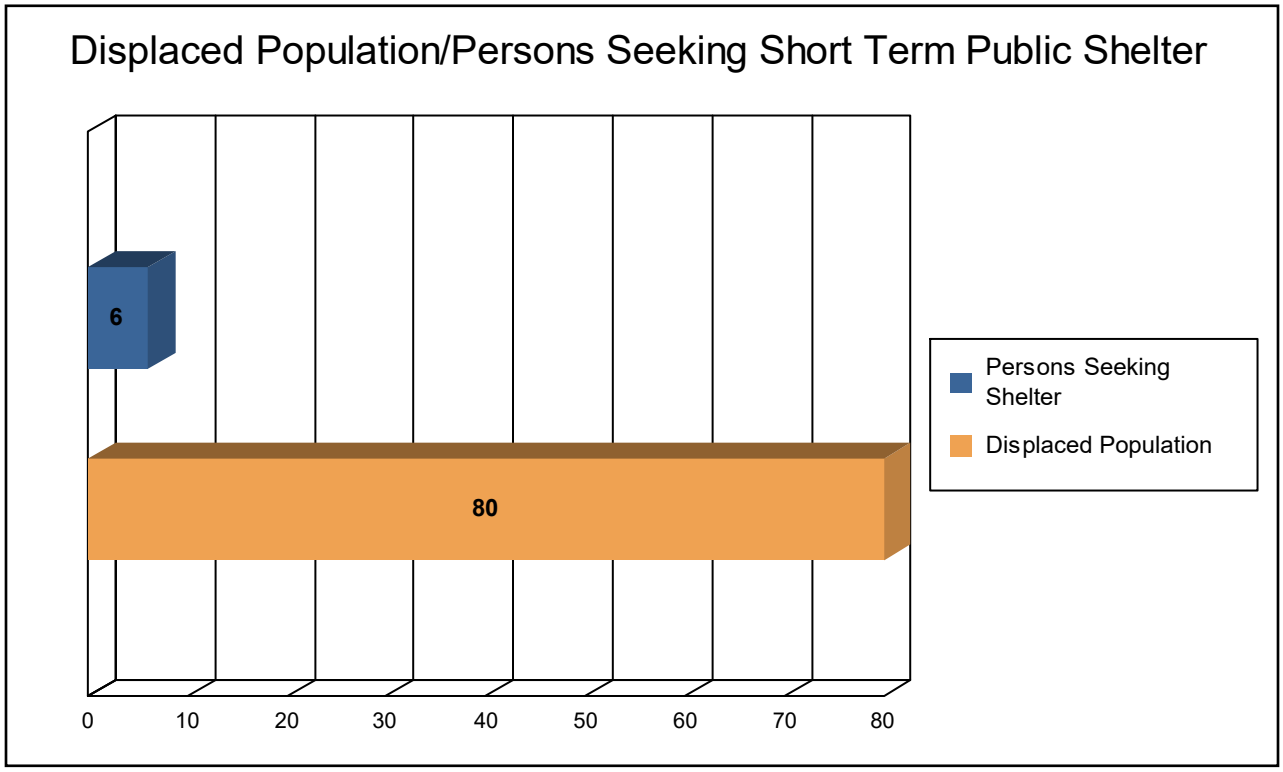


The model estimates that a total of 34 tons of debris will be generated. Of the total amount, Finishes comprises 55% of the total, Structure comprises 28% of the total, and Foundation comprises 18%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 27 households (or 80 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 6 people (out of a total population of 6,133) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 4.88 million dollars, which represents 1.19 % of the total replacement value of the scenario buildings.

Building-Related Losses

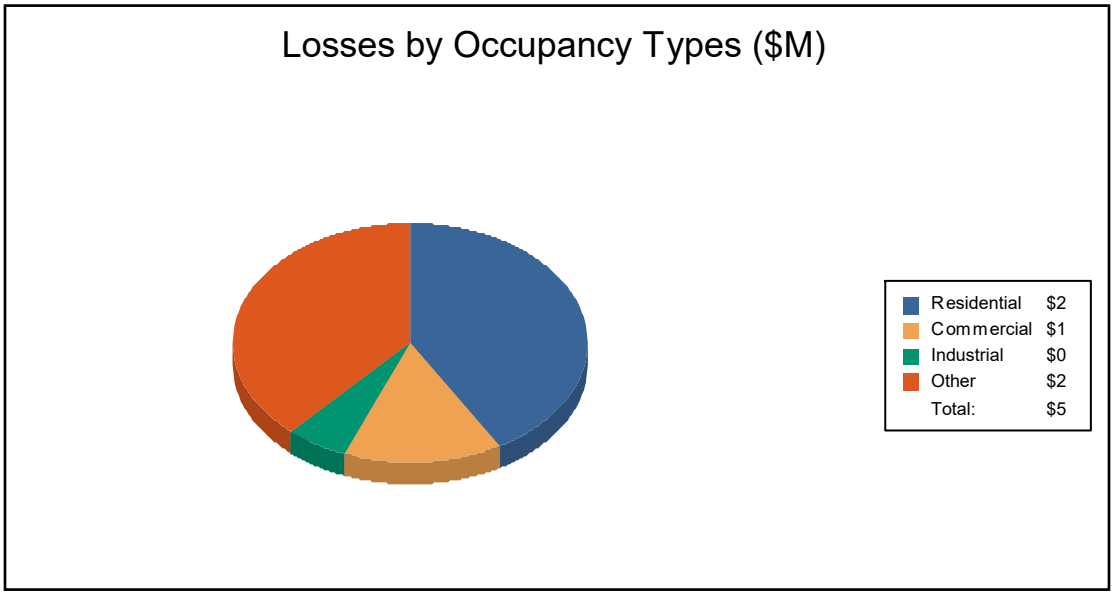
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 2.04 million dollars. 58% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 41.77% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.94	0.05	0.09	0.02	1.10
	Content	0.44	0.17	0.15	0.16	0.91
	Inventory	0.00	0.01	0.02	0.00	0.03
	Subtotal	**1.38**	**0.23**	**0.25**	**0.18**	**2.04**
Business Interruption						
	Income	0.06	0.19	0.01	0.06	0.31
	Relocation	0.34	0.04	0.01	0.07	0.46
	Rental Income	0.11	0.03	0.00	0.03	0.17
	Wage	0.15	0.22	0.01	1.53	1.90
	Subtotal	**0.66**	**0.47**	**0.02**	**1.69**	**2.85**
ALL	**Total**	**2.04**	**0.70**	**0.27**	**1.87**	**4.88**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,355	250,462	1,234,817
Total	**6,133**	**984,355**	**250,462**	**1,234,817**
Total Study Region	**6,133**	**984,355**	**250,462**	**1,234,817**

Hazus: Flood Global Risk Report

Region Name: Marlborough_FL

Flood Scenario: Marlborough_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 6,133 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,549 buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 89.96% of the buildings (and 79.72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of 1,235 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	984,355	79.7%
Commercial	144,461	11.7%
Industrial	30,355	2.5%
Agricultural	1,004	0.1%
Religion	11,383	0.9%
Government	34,936	2.8%
Education	28,323	2.3%
Total	**1,234,817**	**100%**

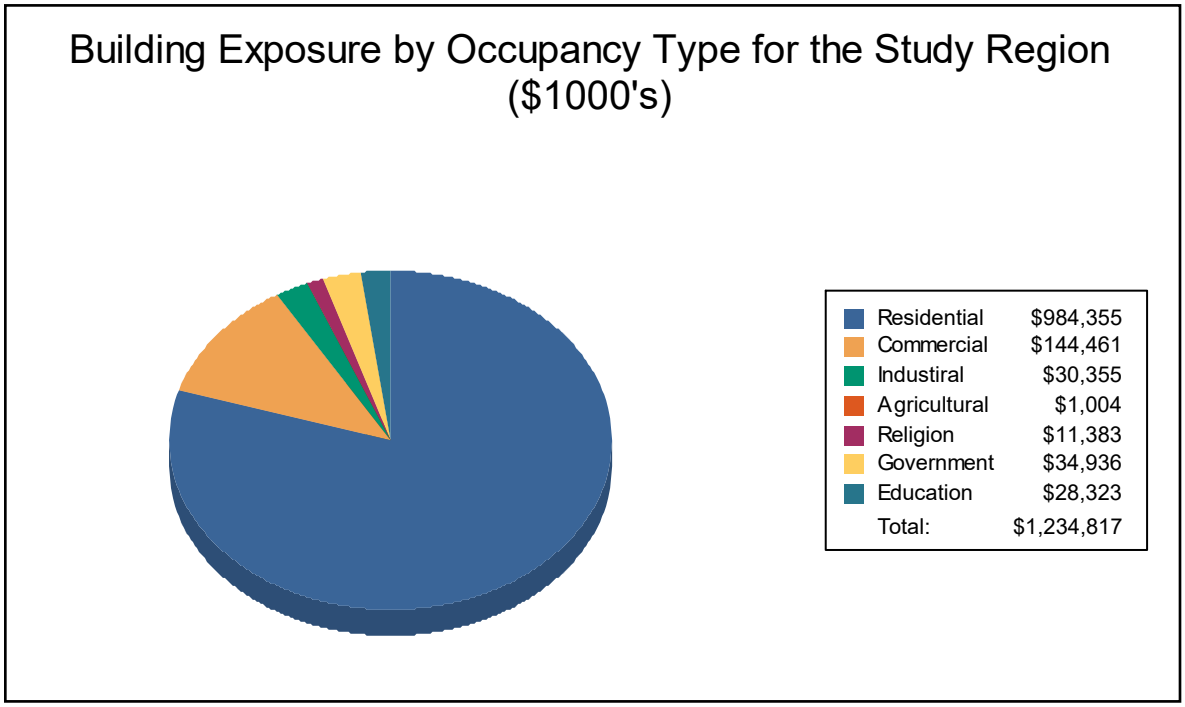
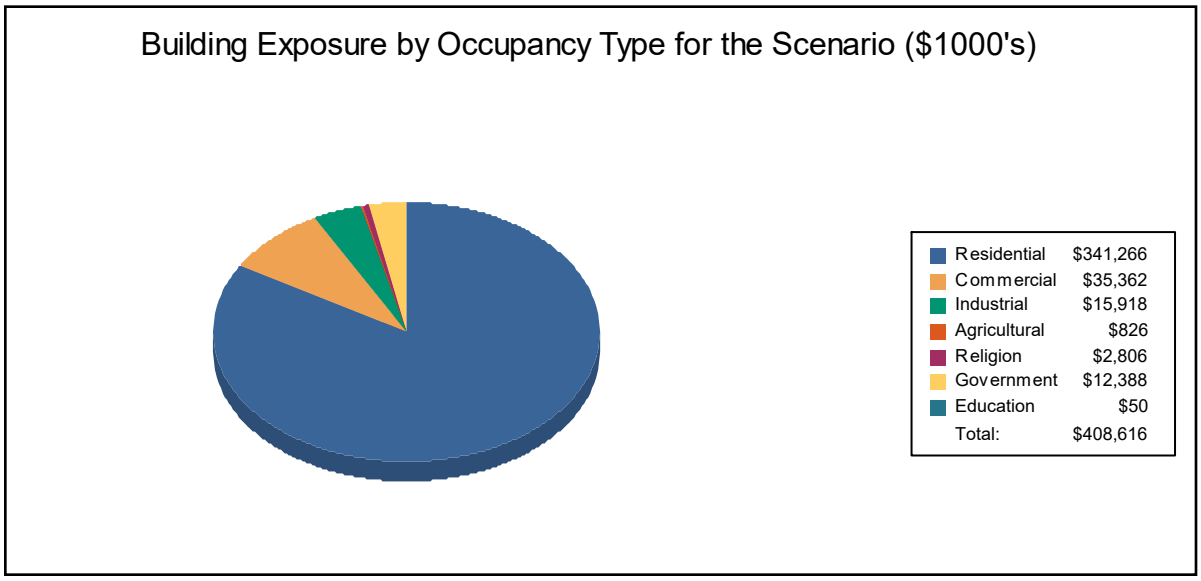


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	341,266	83.5%
Commercial	35,362	8.7%
Industrial	15,918	3.9%
Agricultural	826	0.2%
Religion	2,806	0.7%
Government	12,388	3.0%
Education	50	0.0%
Total	**408,616**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 2 fire stations, 1 police station and 1 emergency operation center.

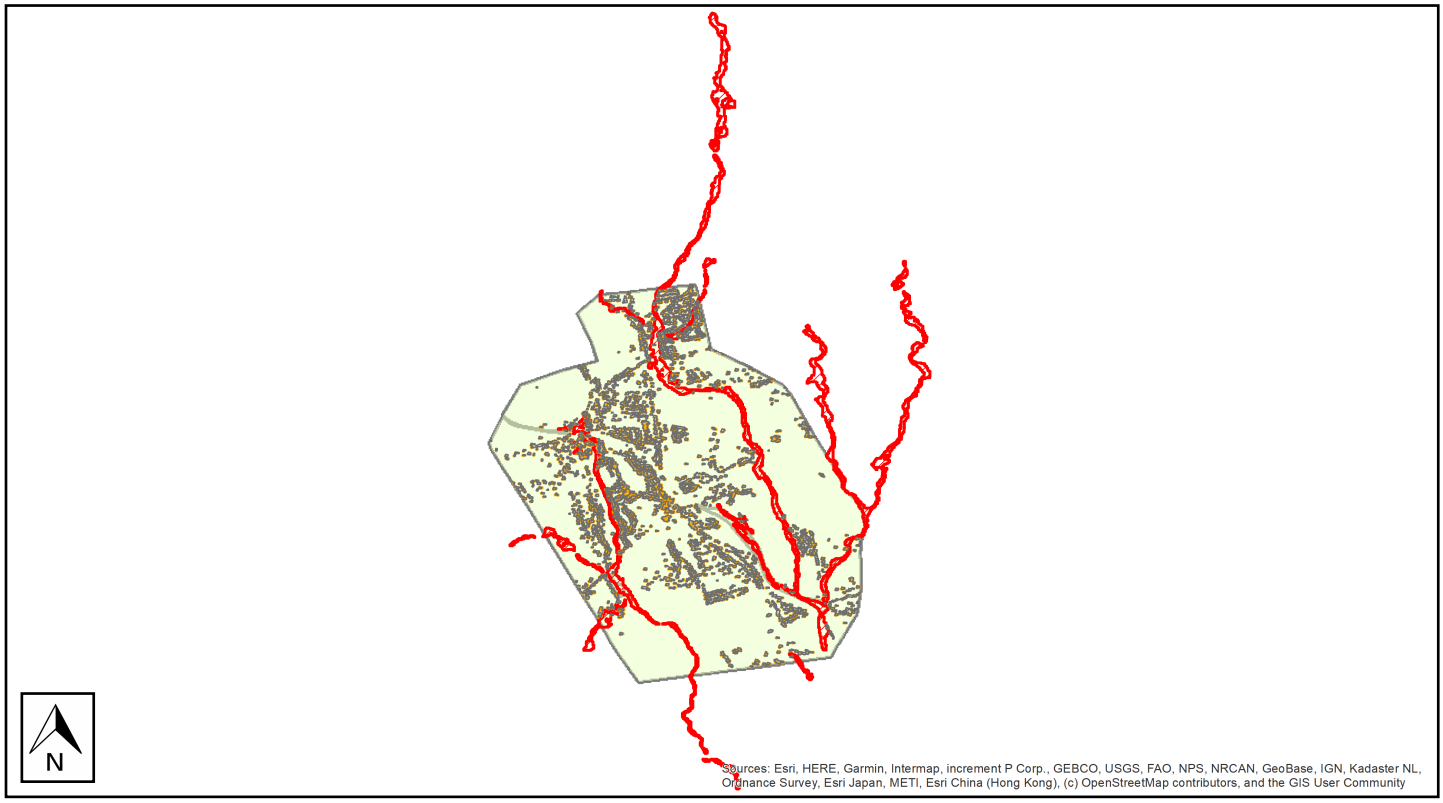
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Marlborough_FL
Scenario Name:	Marlborough_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

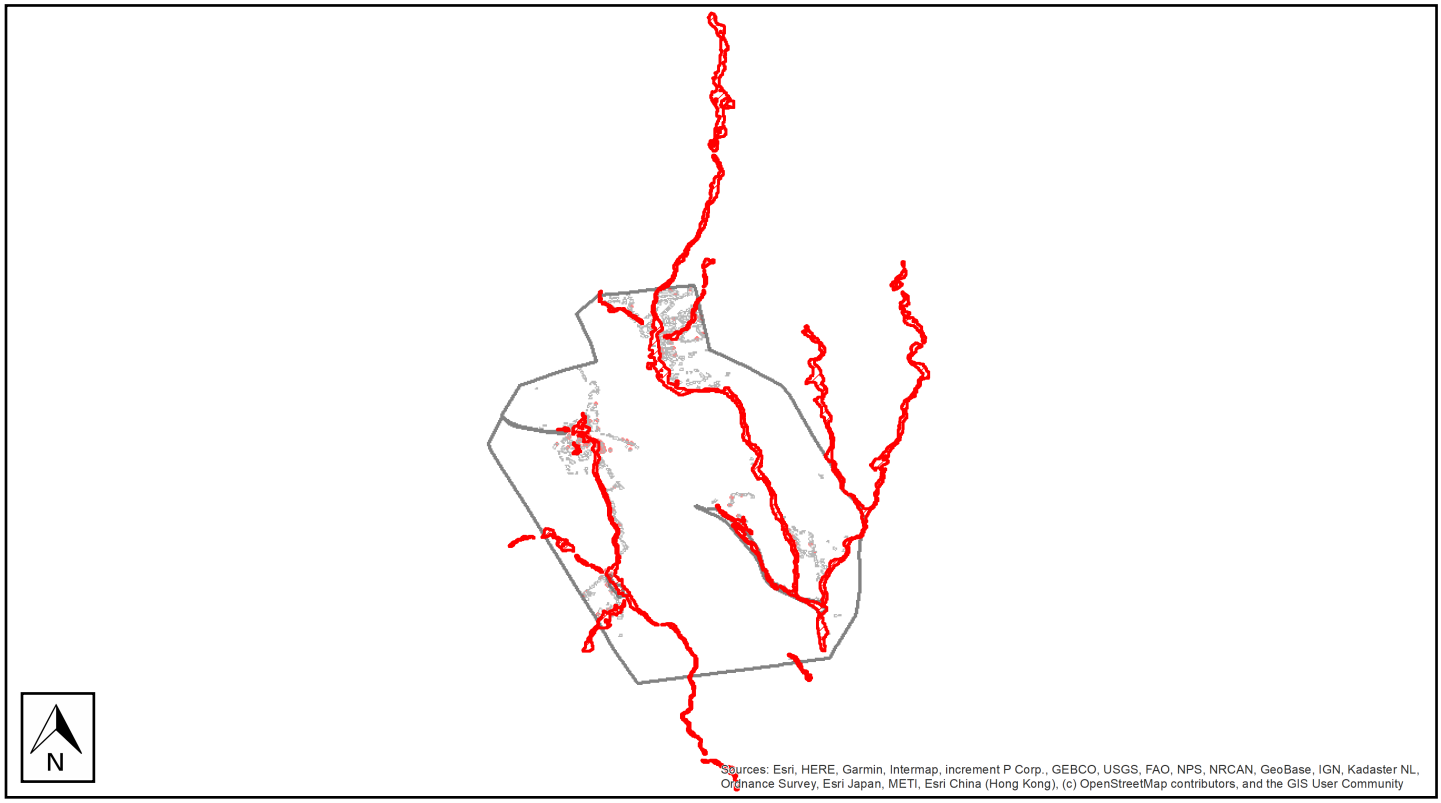


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	50	2	50	0	0	0	0	0	0	0	0
Total	**2**		**2**		**0**		**0**		**0**		**0**	

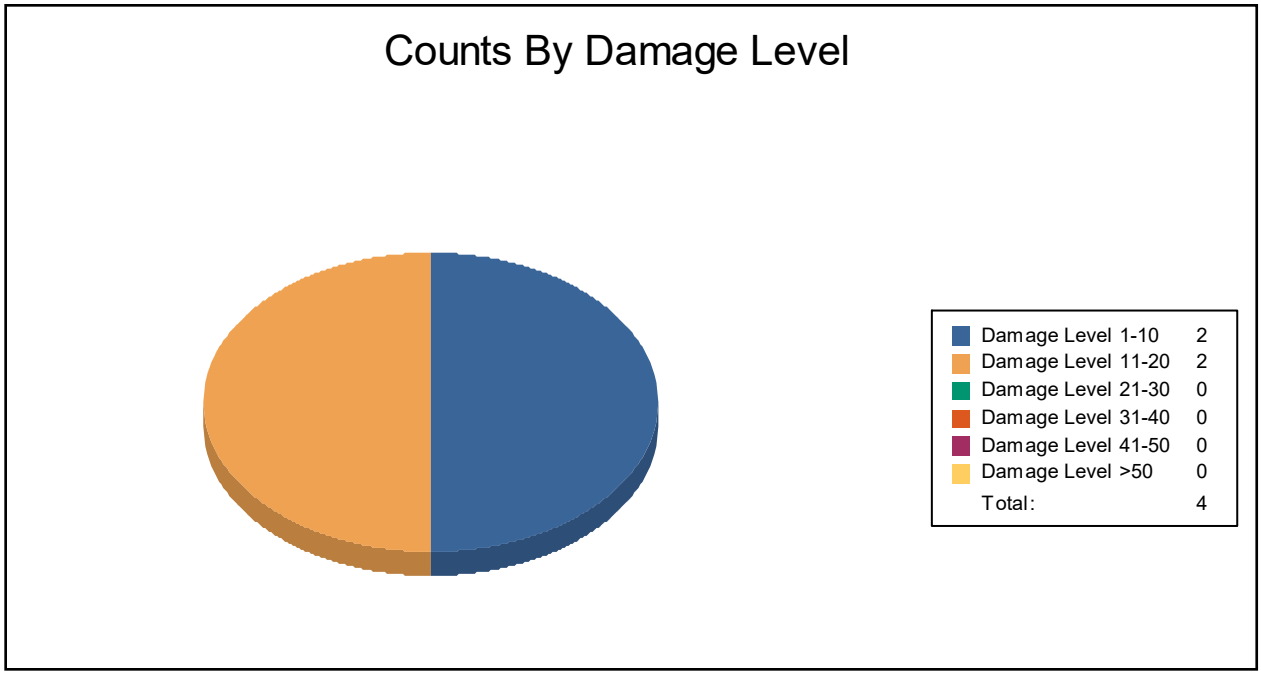


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	50	2	50	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

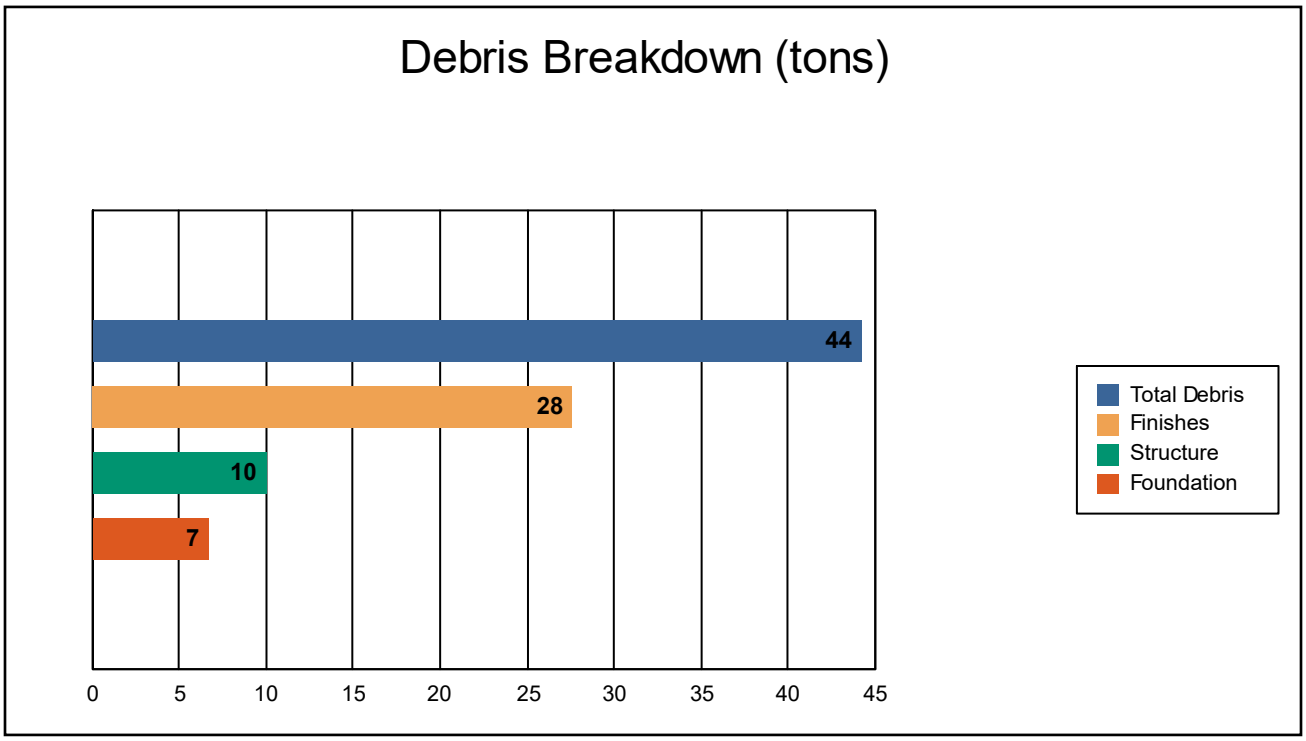
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

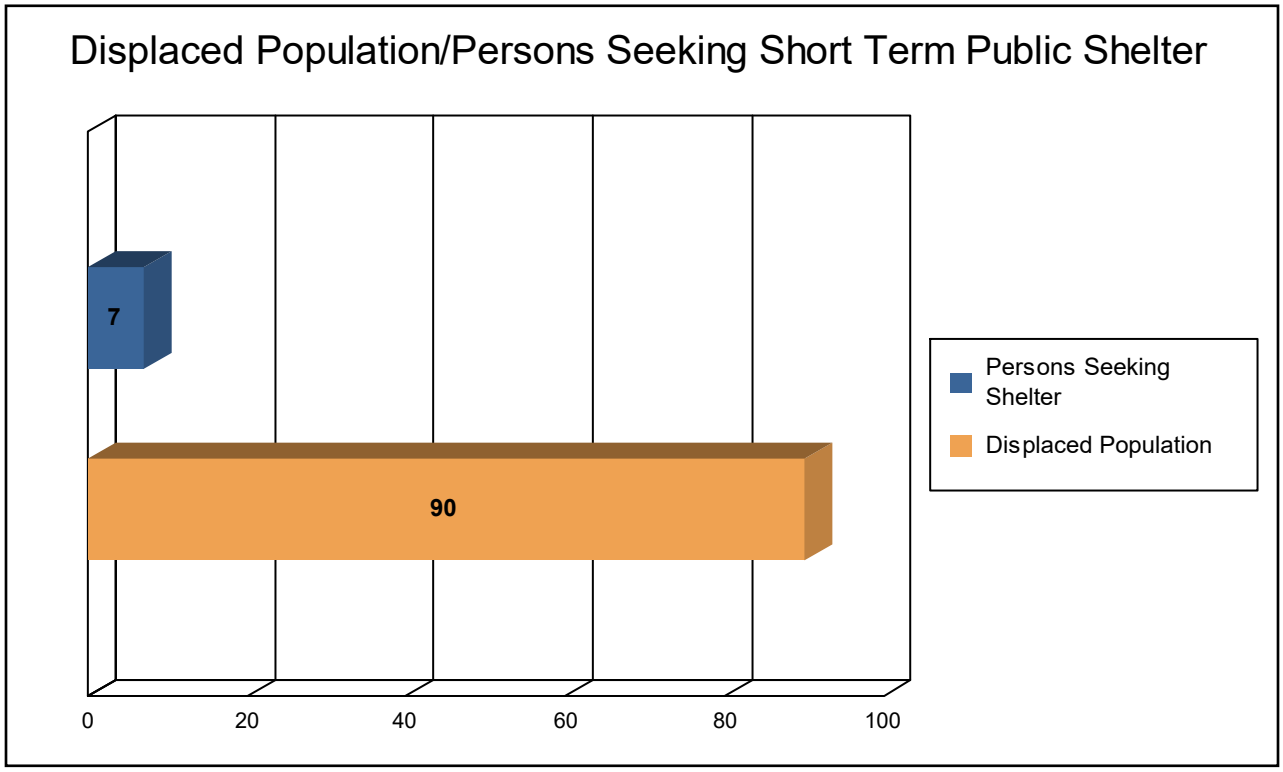


The model estimates that a total of 44 tons of debris will be generated. Of the total amount, Finishes comprises 62% of the total, Structure comprises 23% of the total, and Foundation comprises 15%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 30 households (or 90 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 7 people (out of a total population of 6,133) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 5.82 million dollars, which represents 1.42 % of the total replacement value of the scenario buildings.

Building-Related Losses

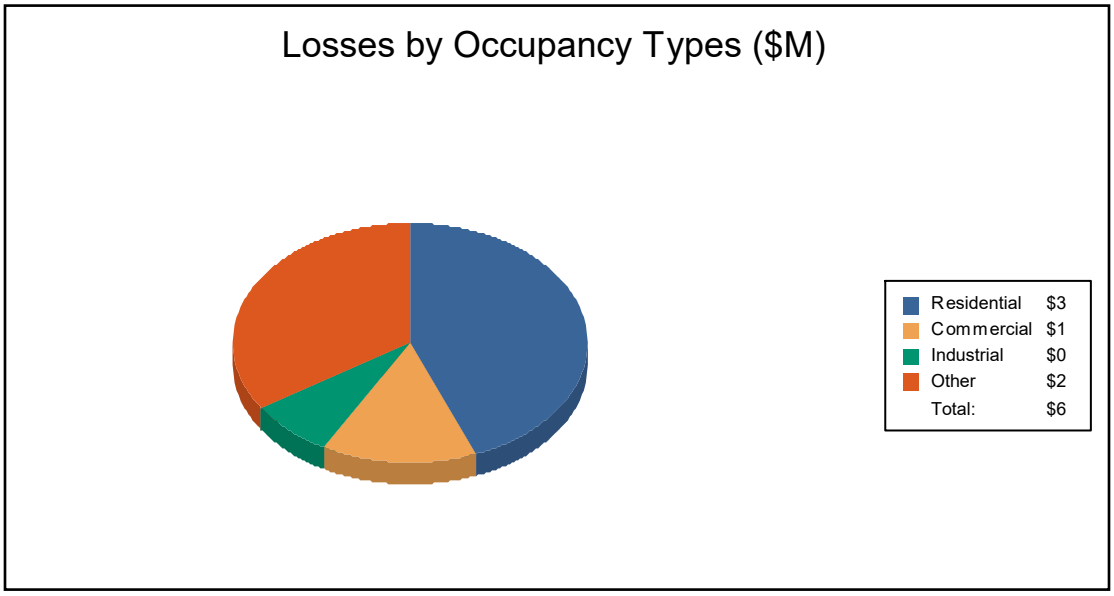
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 2.88 million dollars. 51% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 43.79% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.25	0.08	0.14	0.03	1.50
	Content	0.58	0.25	0.24	0.26	1.33
	Inventory	0.00	0.02	0.03	0.01	0.05
	Subtotal	**1.83**	**0.34**	**0.41**	**0.30**	**2.88**
Business Interruption						
	Income	0.06	0.19	0.01	0.06	0.32
	Relocation	0.39	0.04	0.01	0.07	0.51
	Rental Income	0.12	0.03	0.00	0.03	0.18
	Wage	0.15	0.23	0.02	1.53	1.92
	Subtotal	**0.72**	**0.49**	**0.03**	**1.69**	**2.94**
ALL	**Total**	**2.55**	**0.84**	**0.44**	**1.99**	**5.82**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,355	250,462	1,234,817
Total	**6,133**	**984,355**	**250,462**	**1,234,817**
Total Study Region	**6,133**	**984,355**	**250,462**	**1,234,817**

Hazus: Flood Global Risk Report

Region Name: Marlborough_FL

Flood Scenario: Marlborough_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 6,133 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,549 buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 89.96% of the buildings (and 79.72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of 1,235 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	984,355	79.7%
Commercial	144,461	11.7%
Industrial	30,355	2.5%
Agricultural	1,004	0.1%
Religion	11,383	0.9%
Government	34,936	2.8%
Education	28,323	2.3%
Total	**1,234,817**	**100%**

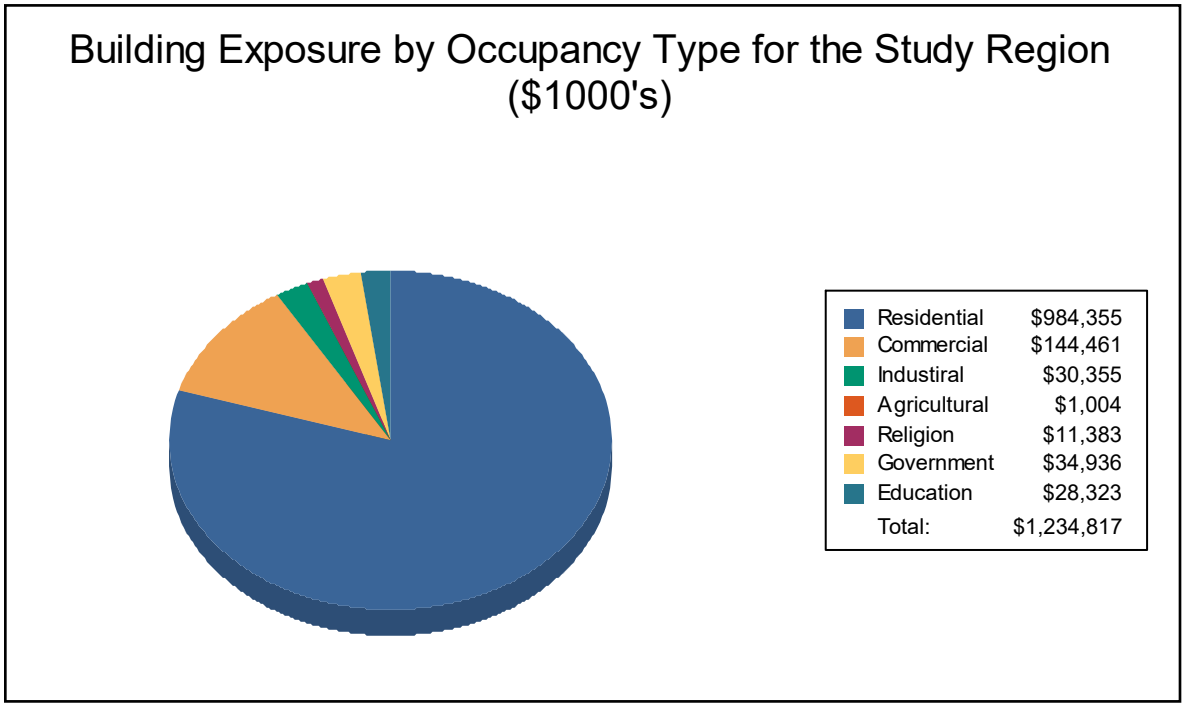
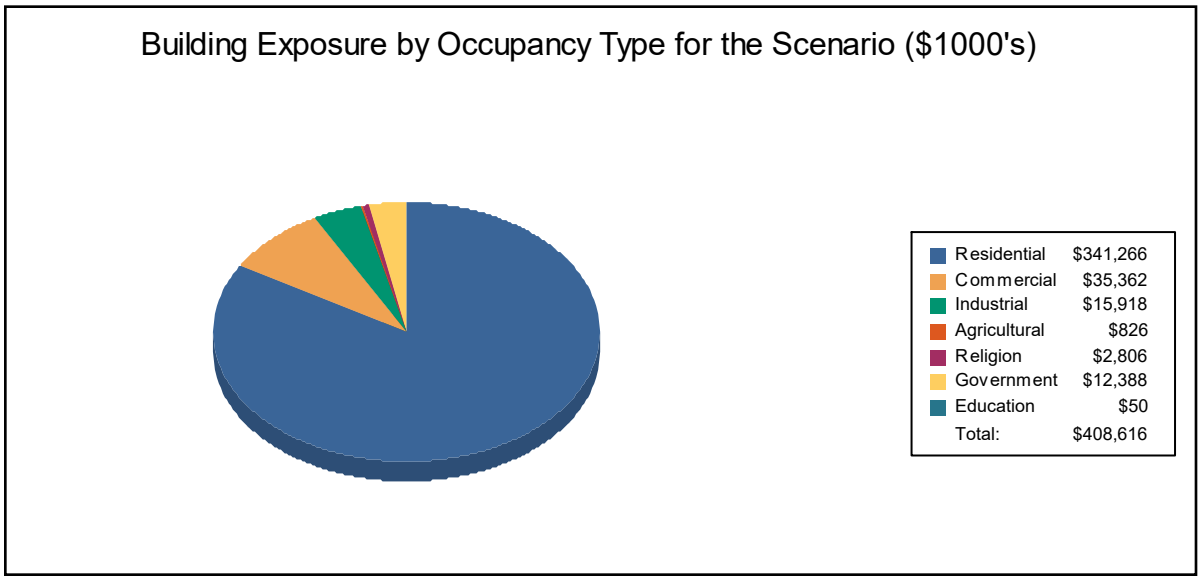


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	341,266	83.5%
Commercial	35,362	8.7%
Industrial	15,918	3.9%
Agricultural	826	0.2%
Religion	2,806	0.7%
Government	12,388	3.0%
Education	50	0.0%
Total	**408,616**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 2 fire stations, 1 police station and 1 emergency operation center.

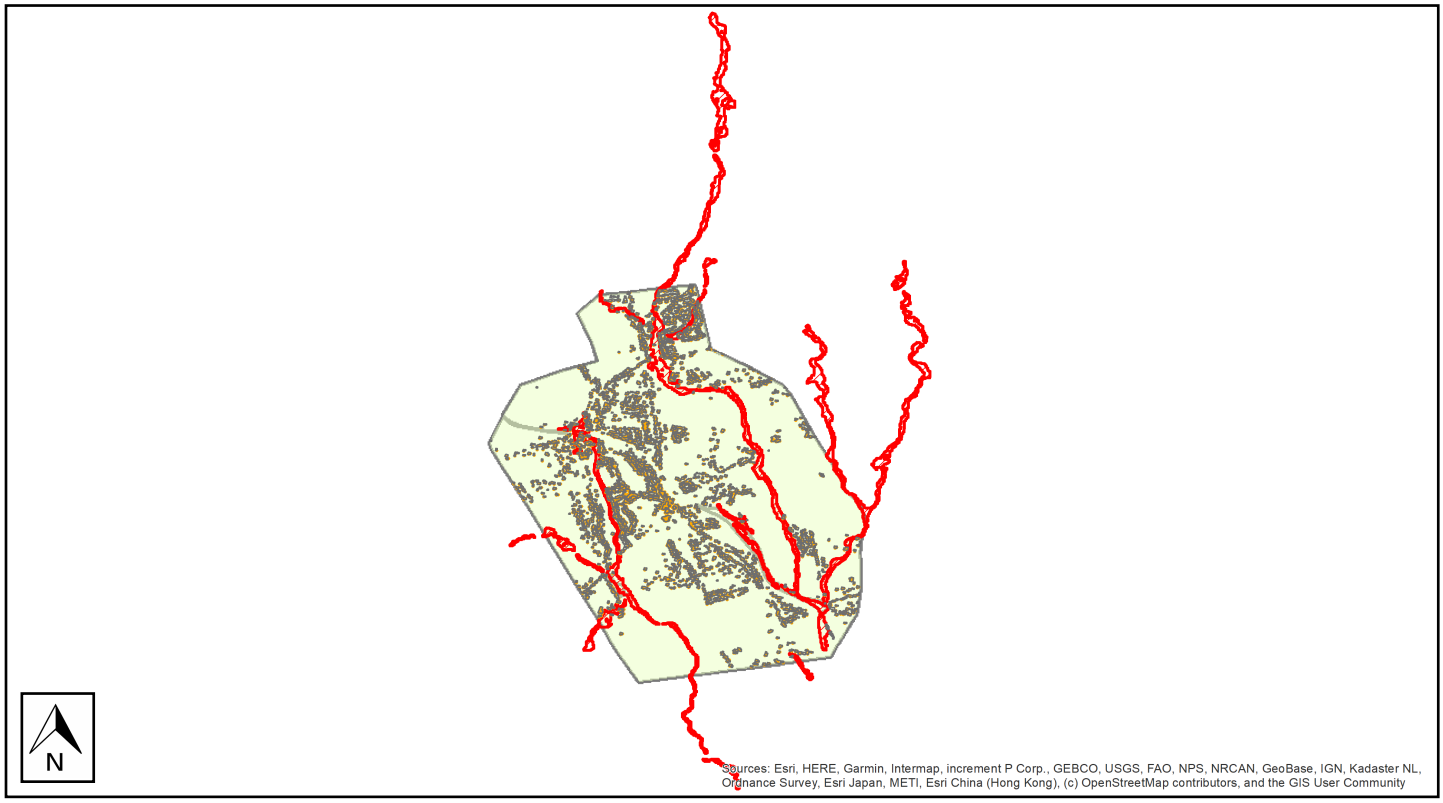
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Marlborough_FL
Scenario Name:	Marlborough_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

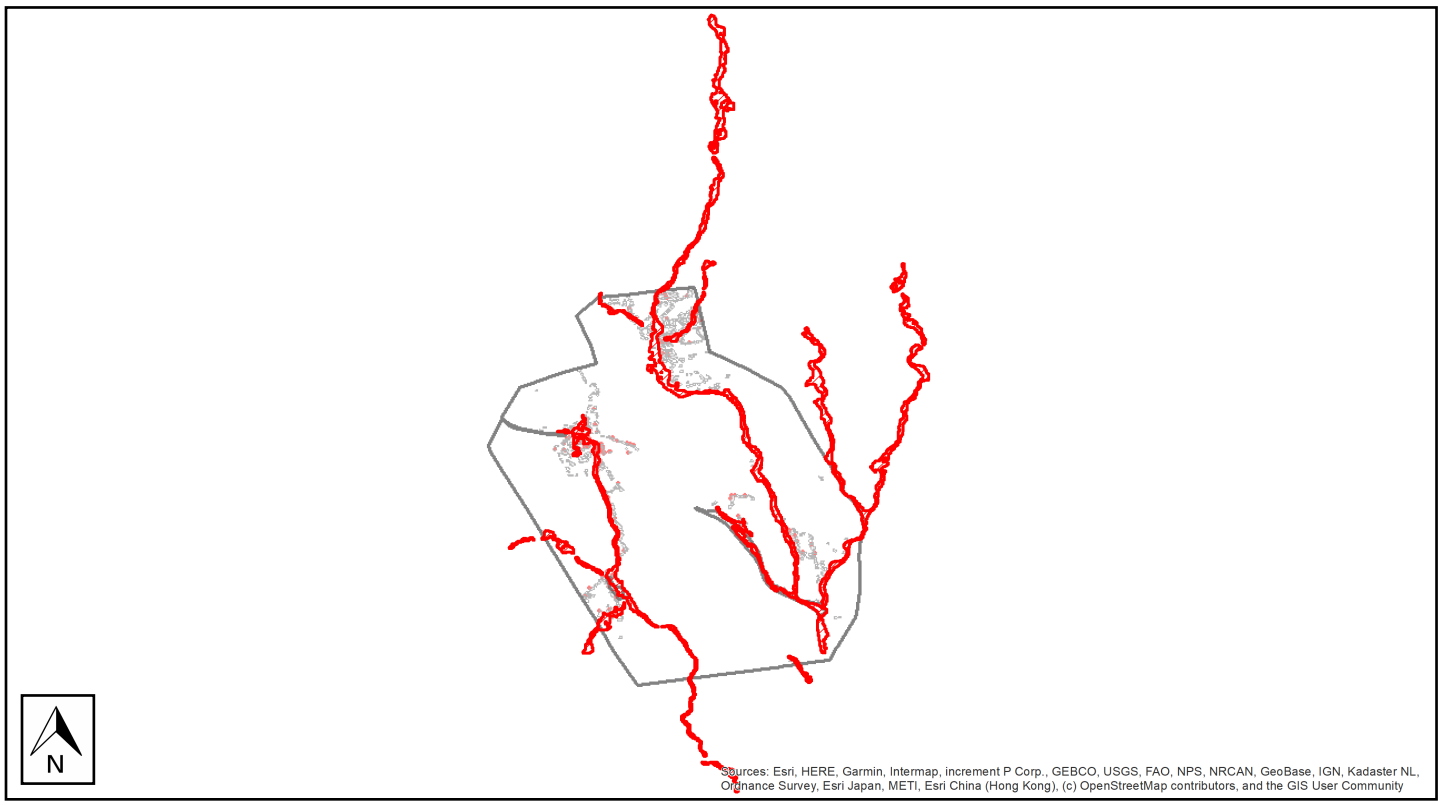


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	50	2	50	0	0	0	0	0	0	0	0
Total	**2**		**2**		**0**		**0**		**0**		**0**	

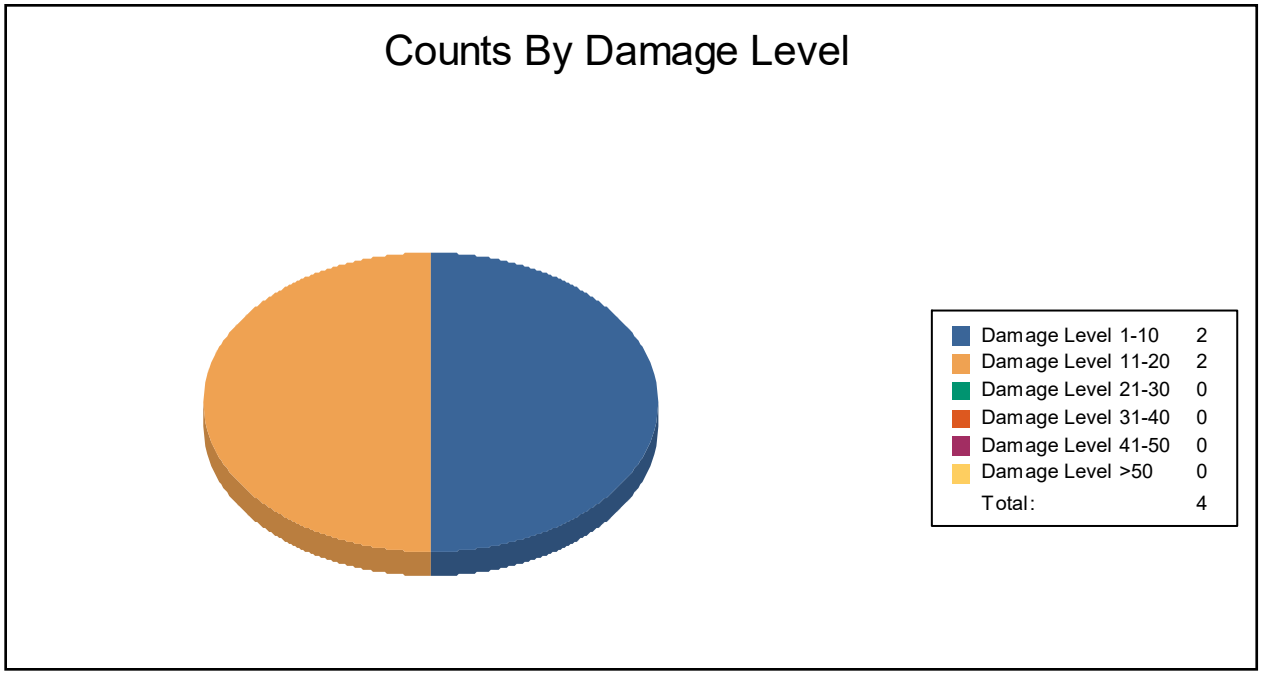


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	50	2	50	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

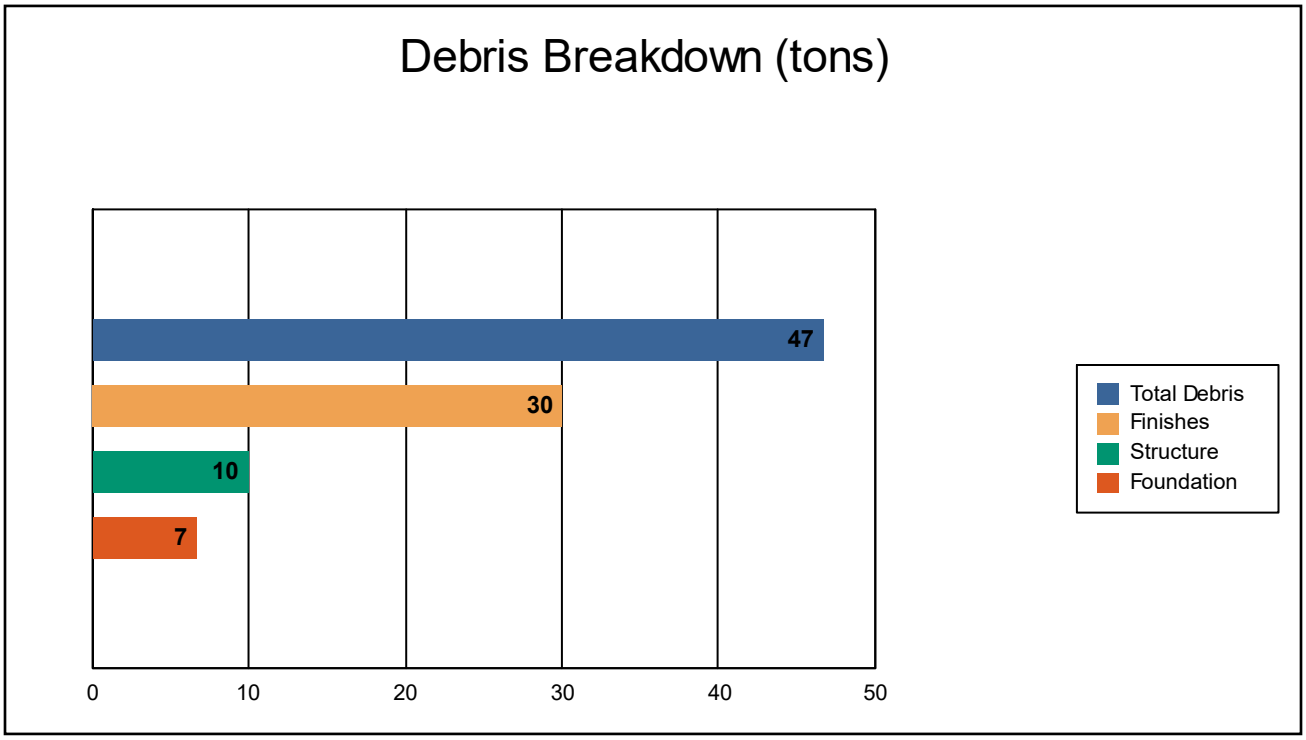
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

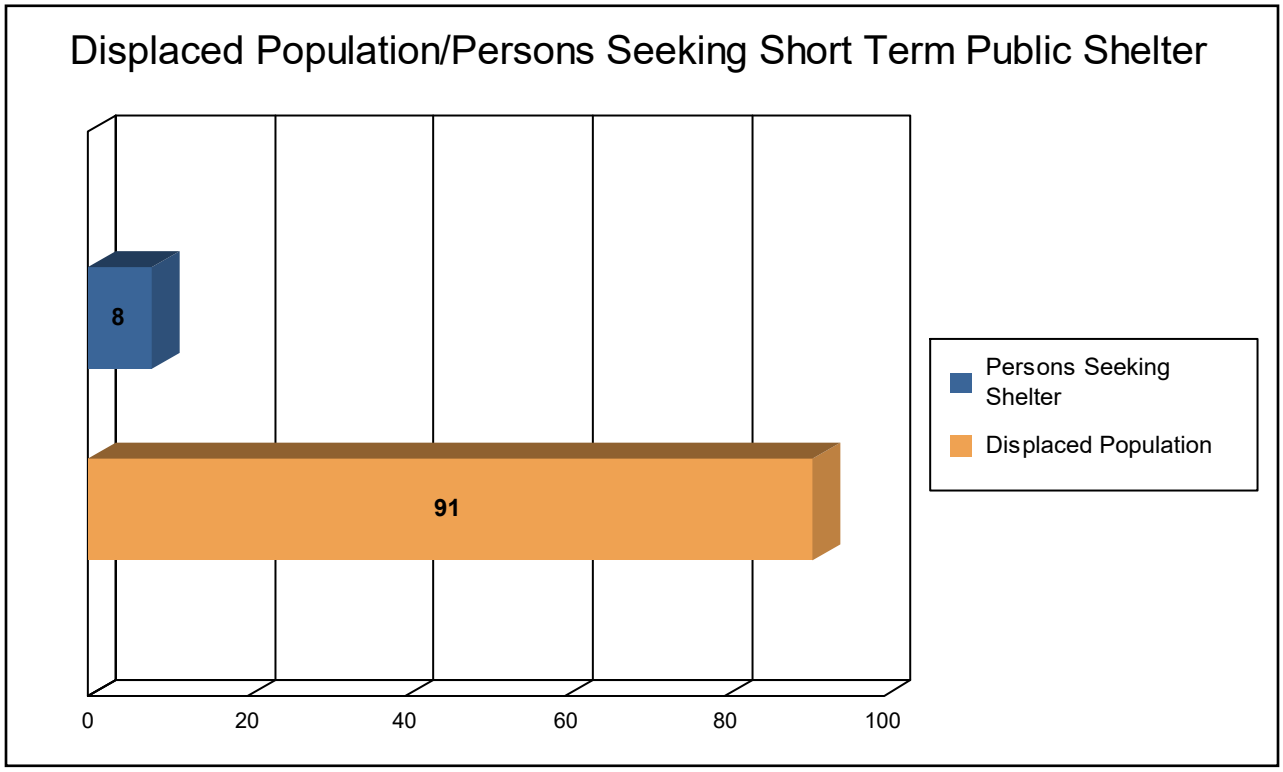


The model estimates that a total of 47 tons of debris will be generated. Of the total amount, Finishes comprises 64% of the total, Structure comprises 21% of the total, and Foundation comprises 14%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 30 households (or 91 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 8 people (out of a total population of 6,133) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 6.73 million dollars, which represents 1.65 % of the total replacement value of the scenario buildings.

Building-Related Losses

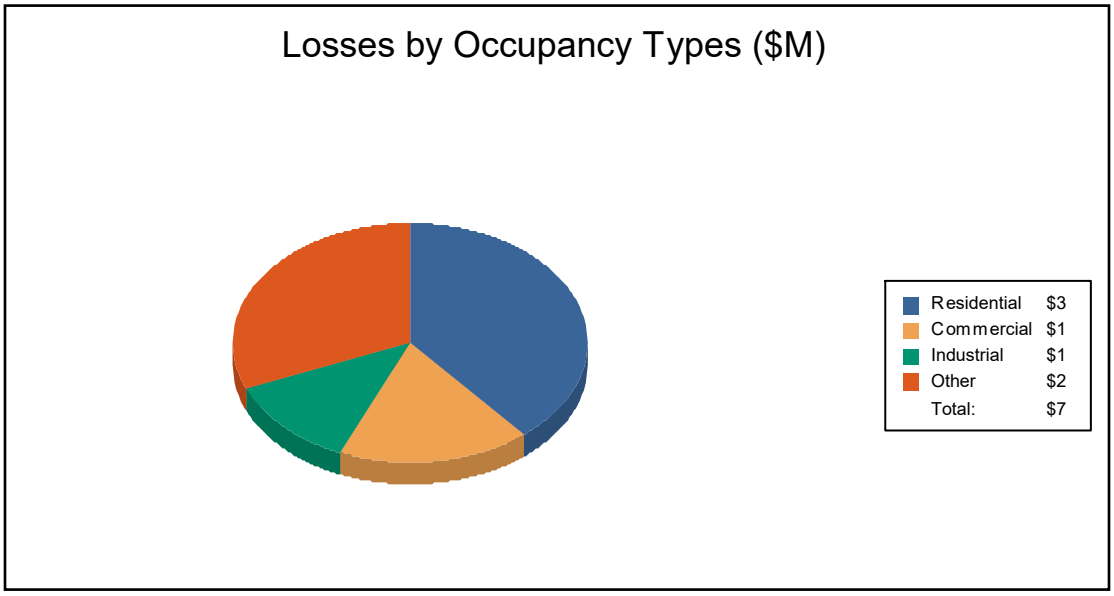
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 3.49 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 39.00% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.29	0.12	0.25	0.04	1.69
	Content	0.60	0.36	0.48	0.27	1.71
	Inventory	0.00	0.03	0.06	0.01	0.09
	Subtotal	**1.89**	**0.51**	**0.78**	**0.31**	**3.49**
Business Interruption						
	Income	0.06	0.26	0.01	0.06	0.40
	Relocation	0.40	0.06	0.01	0.07	0.55
	Rental Income	0.13	0.04	0.00	0.03	0.20
	Wage	0.15	0.30	0.02	1.63	2.10
	Subtotal	**0.74**	**0.66**	**0.04**	**1.80**	**3.24**
ALL	**Total**	**2.63**	**1.17**	**0.82**	**2.11**	**6.73**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,355	250,462	1,234,817
Total	**6,133**	**984,355**	**250,462**	**1,234,817**
Total Study Region	**6,133**	**984,355**	**250,462**	**1,234,817**

Hazus: Flood Global Risk Report

Region Name: Marlborough_FL

Flood Scenario: Marlborough_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 6,133 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,549 buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 89.96% of the buildings (and 79.72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of 1,235 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	984,355	79.7%
Commercial	144,461	11.7%
Industrial	30,355	2.5%
Agricultural	1,004	0.1%
Religion	11,383	0.9%
Government	34,936	2.8%
Education	28,323	2.3%
Total	**1,234,817**	**100%**

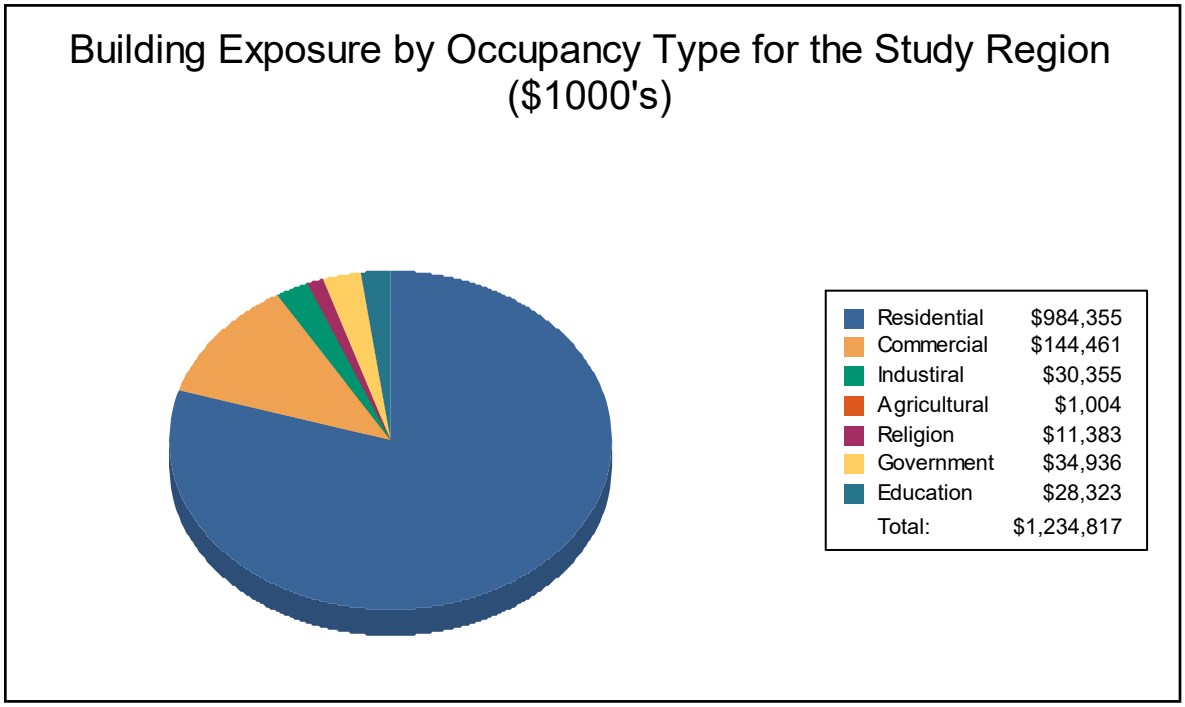
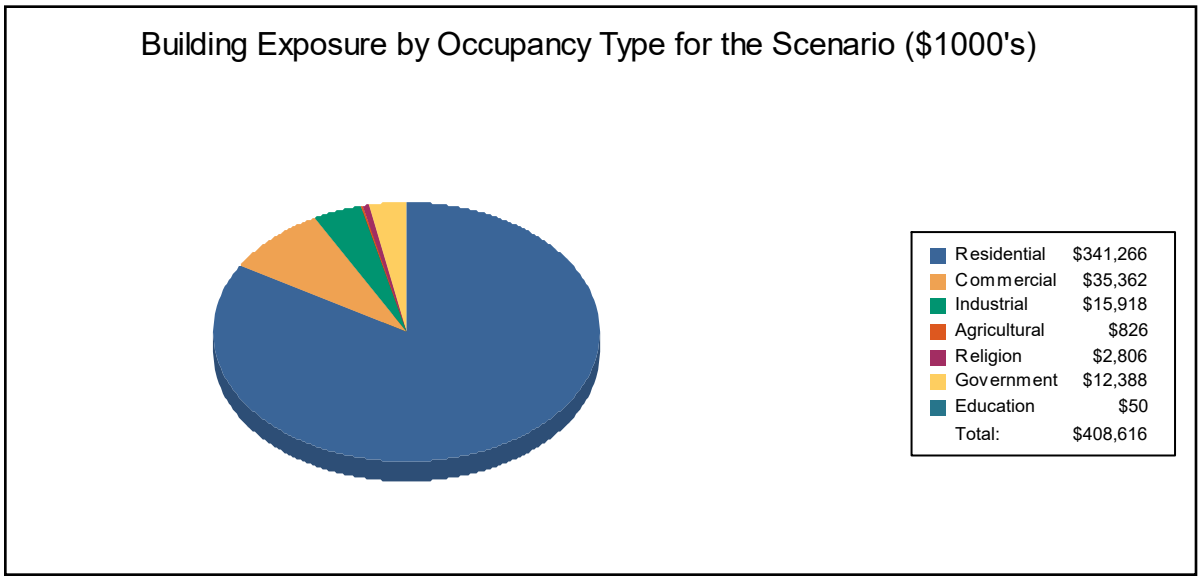


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	341,266	83.5%
Commercial	35,362	8.7%
Industrial	15,918	3.9%
Agricultural	826	0.2%
Religion	2,806	0.7%
Government	12,388	3.0%
Education	50	0.0%
Total	**408,616**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 2 fire stations, 1 police station and 1 emergency operation center.

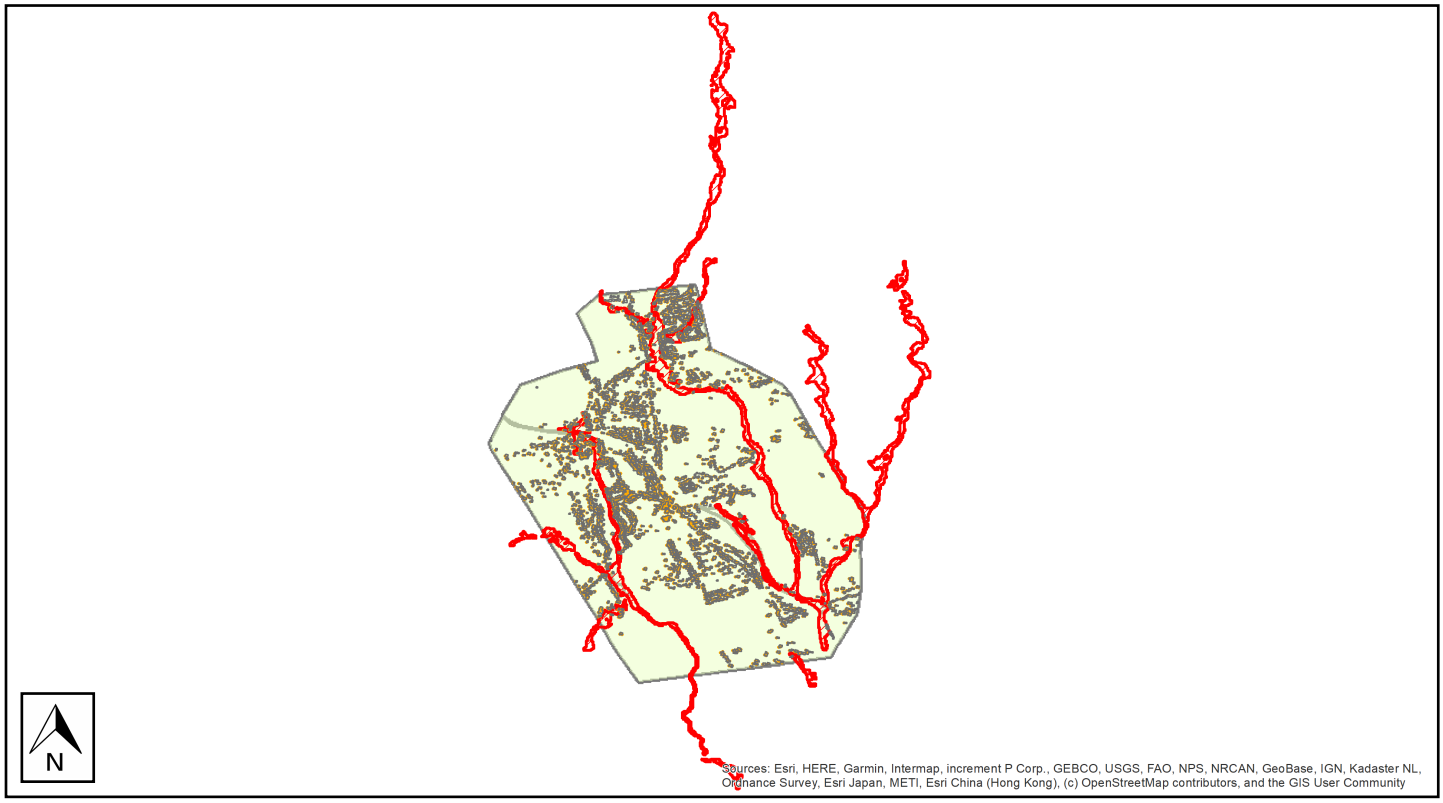
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Marlborough_FL
Scenario Name:	Marlborough_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

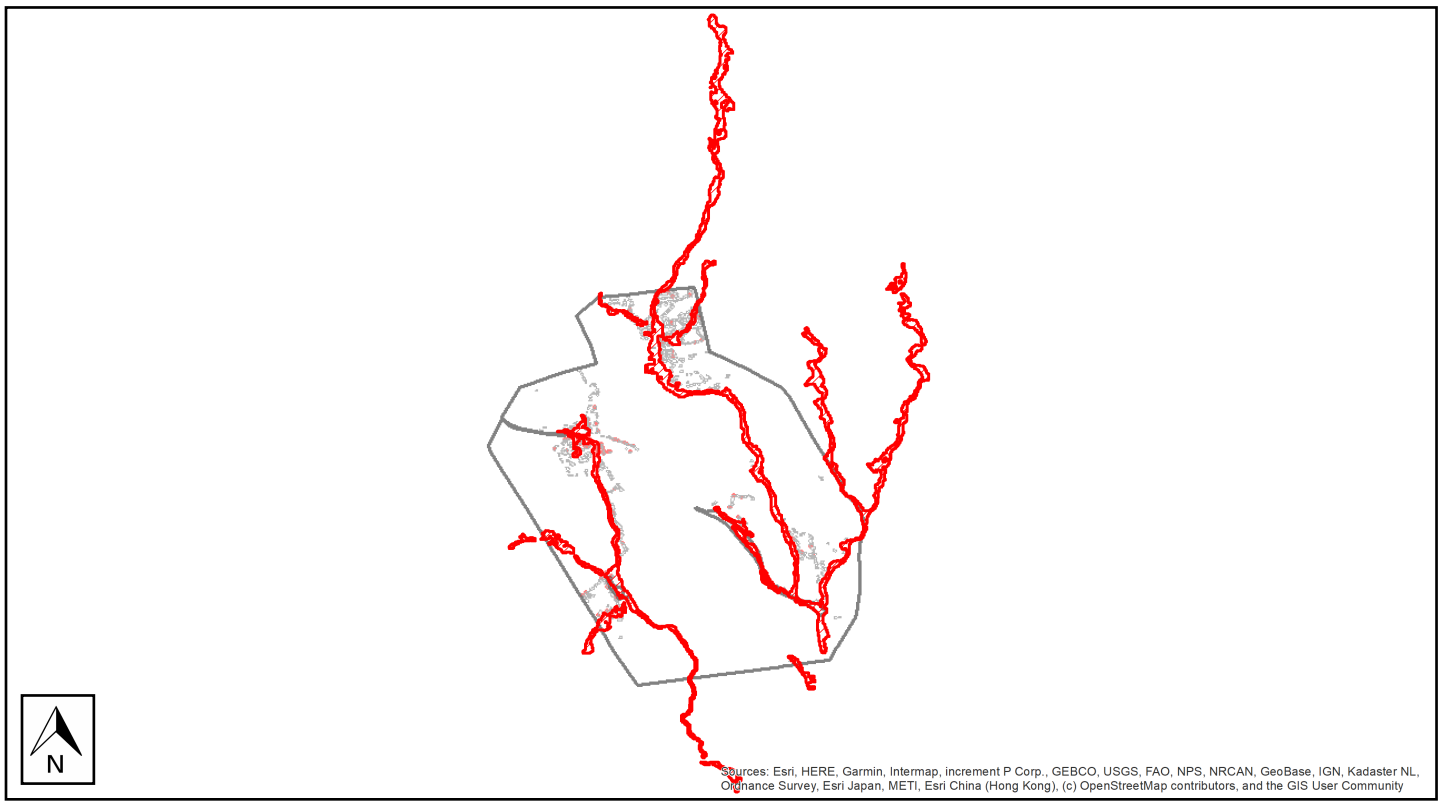


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	50	3	50	0	0	0	0	0	0	0	0
Total	**3**		**3**		**0**		**0**		**0**		**0**	

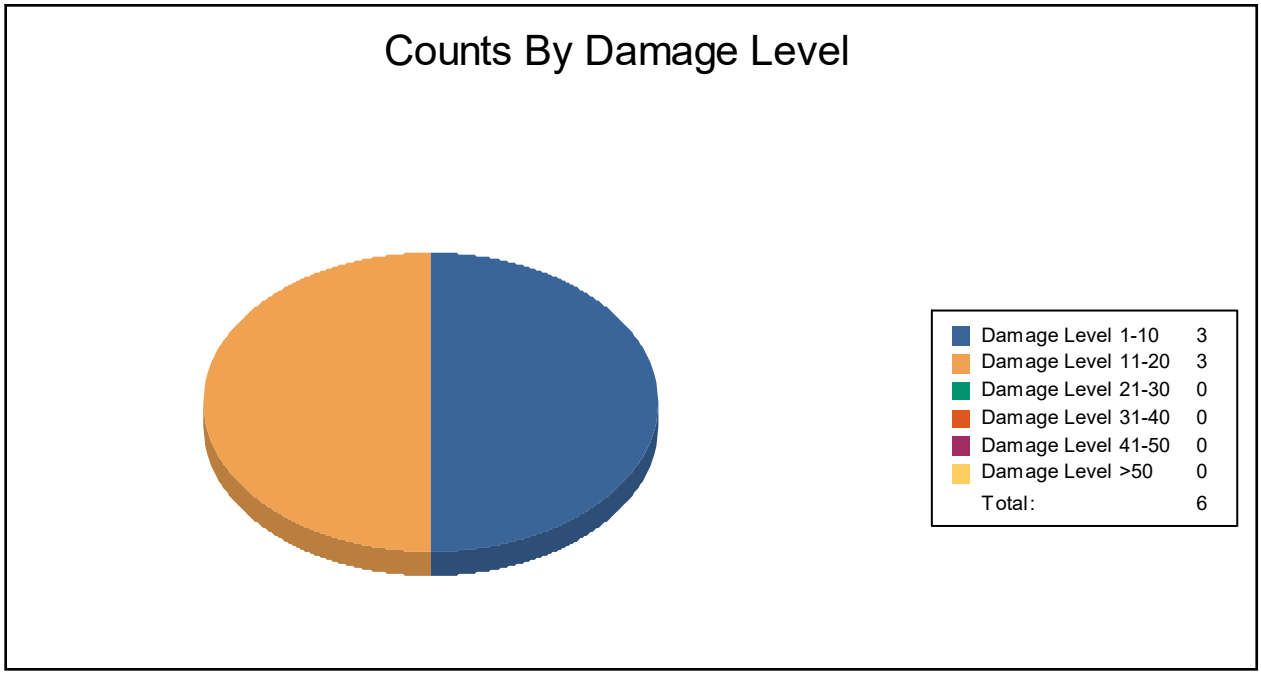


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	50	3	50	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

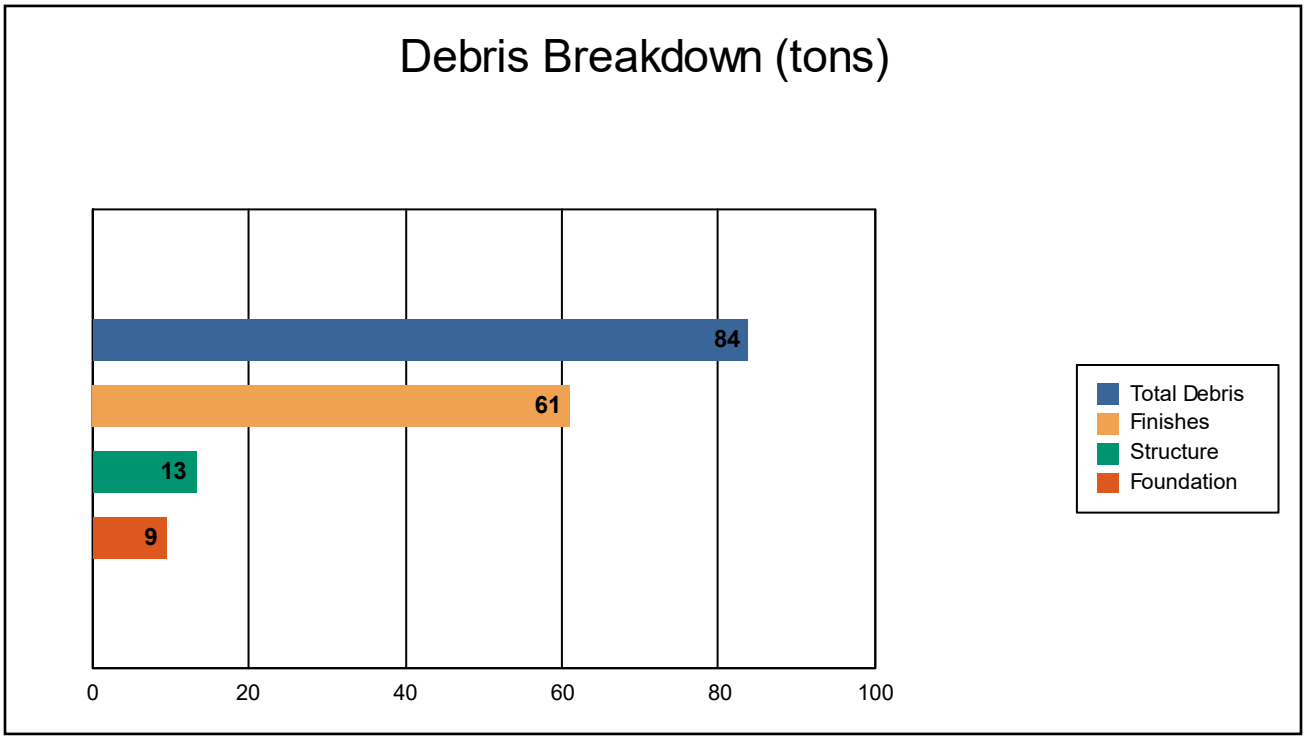
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

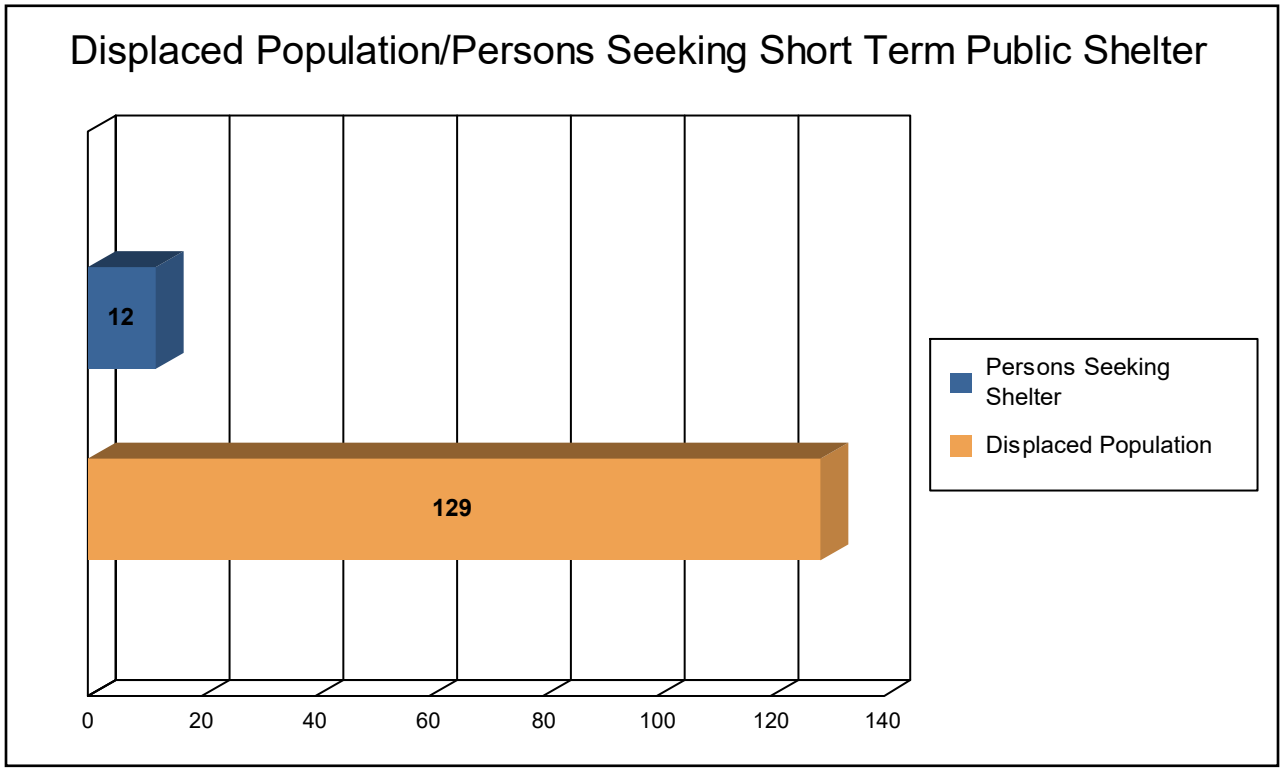


The model estimates that a total of 84 tons of debris will be generated. Of the total amount, Finishes comprises 73% of the total, Structure comprises 16% of the total, and Foundation comprises 11%. If the debris tonnage is converted into an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 43 households (or 129 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 12 people (out of a total population of 6,133) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 11.32 million dollars, which represents 2.77 % of the total replacement value of the scenario buildings.

Building-Related Losses

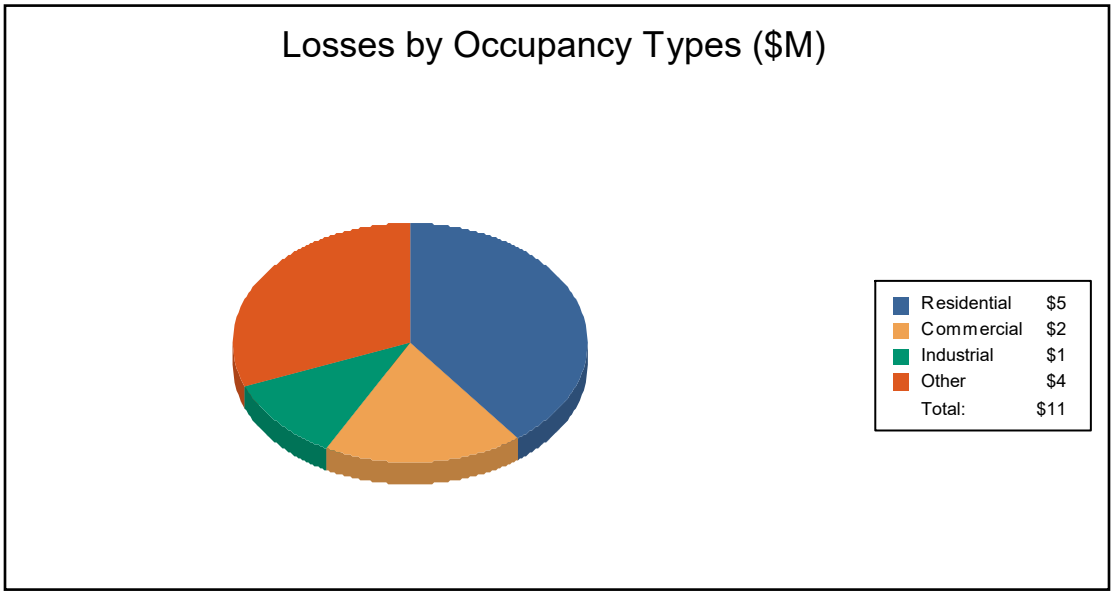
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 6.13 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 39.86% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.23	0.22	0.36	0.08	2.90
	Content	1.08	0.68	0.75	0.56	3.06
	Inventory	0.00	0.06	0.10	0.01	0.17
	Subtotal	**3.31**	**0.96**	**1.21**	**0.65**	**6.13**
Business Interruption						
	Income	0.11	0.43	0.02	0.11	0.66
	Relocation	0.63	0.08	0.02	0.12	0.85
	Rental Income	0.21	0.06	0.00	0.05	0.31
	Wage	0.26	0.50	0.03	2.59	3.37
	Subtotal	**1.20**	**1.07**	**0.06**	**2.87**	**5.20**
ALL	**Total**	**4.51**	**2.03**	**1.27**	**3.52**	**11.32**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,355	250,462	1,234,817
Total	**6,133**	**984,355**	**250,462**	**1,234,817**
Total Study Region	**6,133**	**984,355**	**250,462**	**1,234,817**

Hazus: Flood Global Risk Report

Region Name: New_Britain_FL

Flood Scenario: New_Britain_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 696 census blocks. The region contains over 29 thousand households and has a total population of 73,517 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 16,863 buildings in the region with a total building replacement value (excluding contents) of 10,340 million dollars. Approximately 88.55% of the buildings (and 54.65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,863 buildings in the region which have an aggregate total replacement value of 10,340 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,650,877	54.7%
Commercial	2,272,355	22.0%
Industrial	440,621	4.3%
Agricultural	29,138	0.3%
Religion	244,423	2.4%
Government	338,856	3.3%
Education	1,363,351	13.2%
Total	**10,339,621**	**100%**

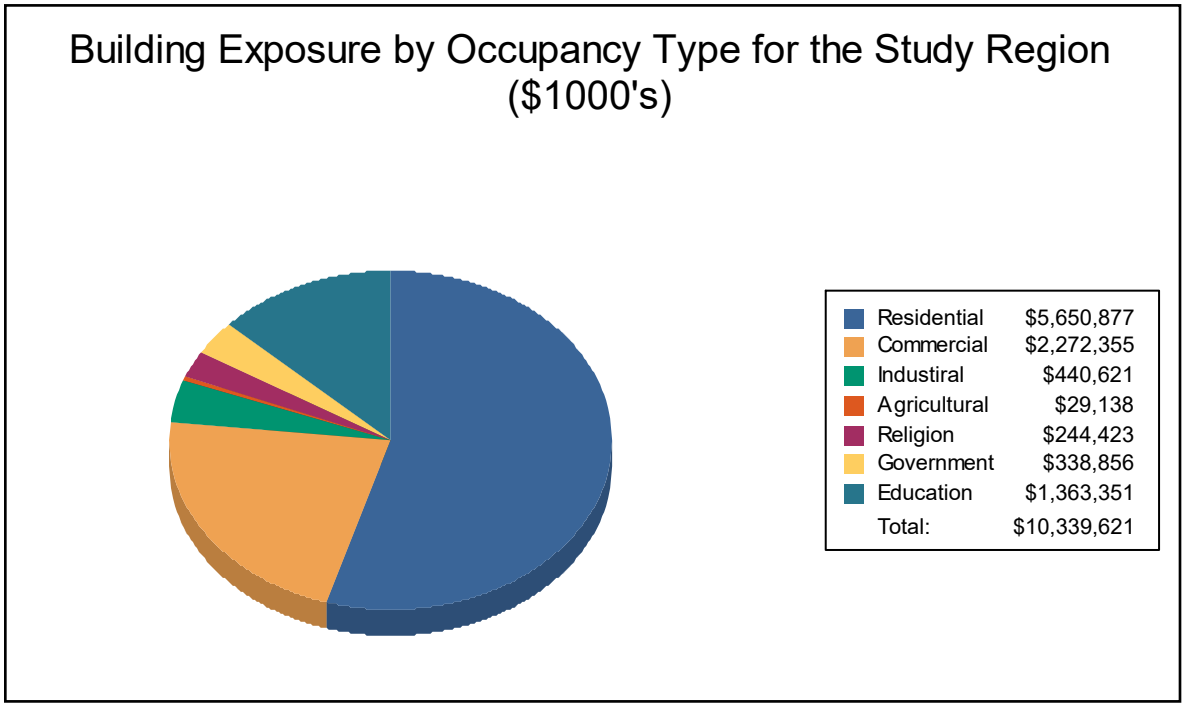
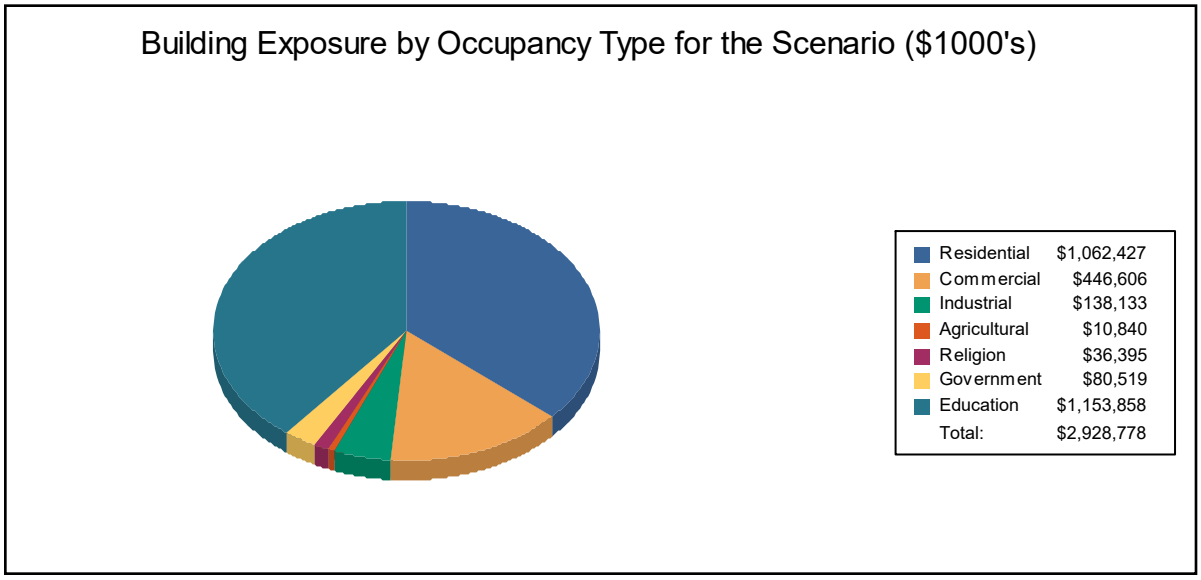


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,062,427	36.3%
Commercial	446,606	15.2%
Industrial	138,133	4.7%
Agricultural	10,840	0.4%
Religion	36,395	1.2%
Government	80,519	2.7%
Education	1,153,858	39.4%
Total	**2,928,778**	**100%**



Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds.
There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

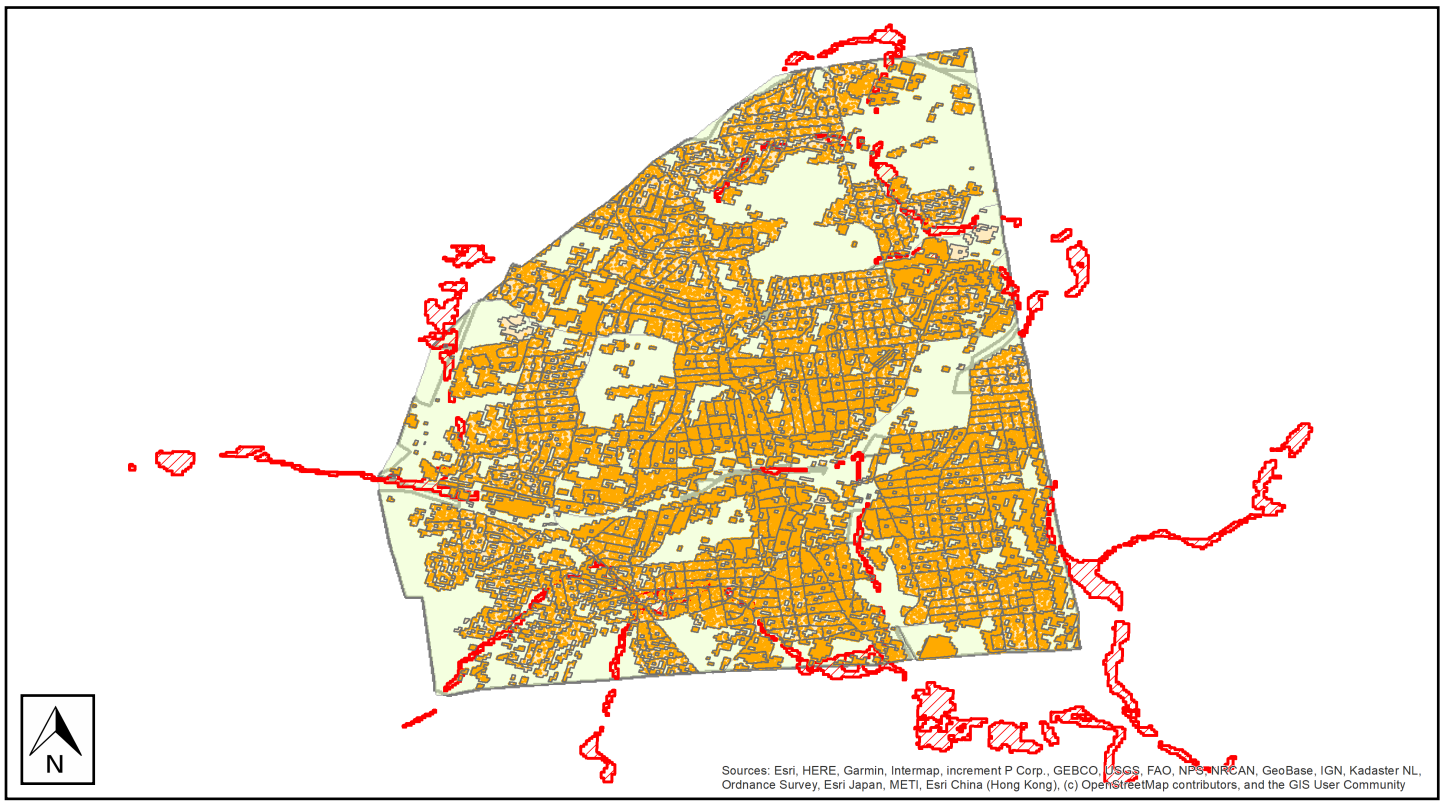
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	New_Britain_FL
Scenario Name:	New_Britain_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 13 buildings will be at least moderately damaged. This is over 73% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

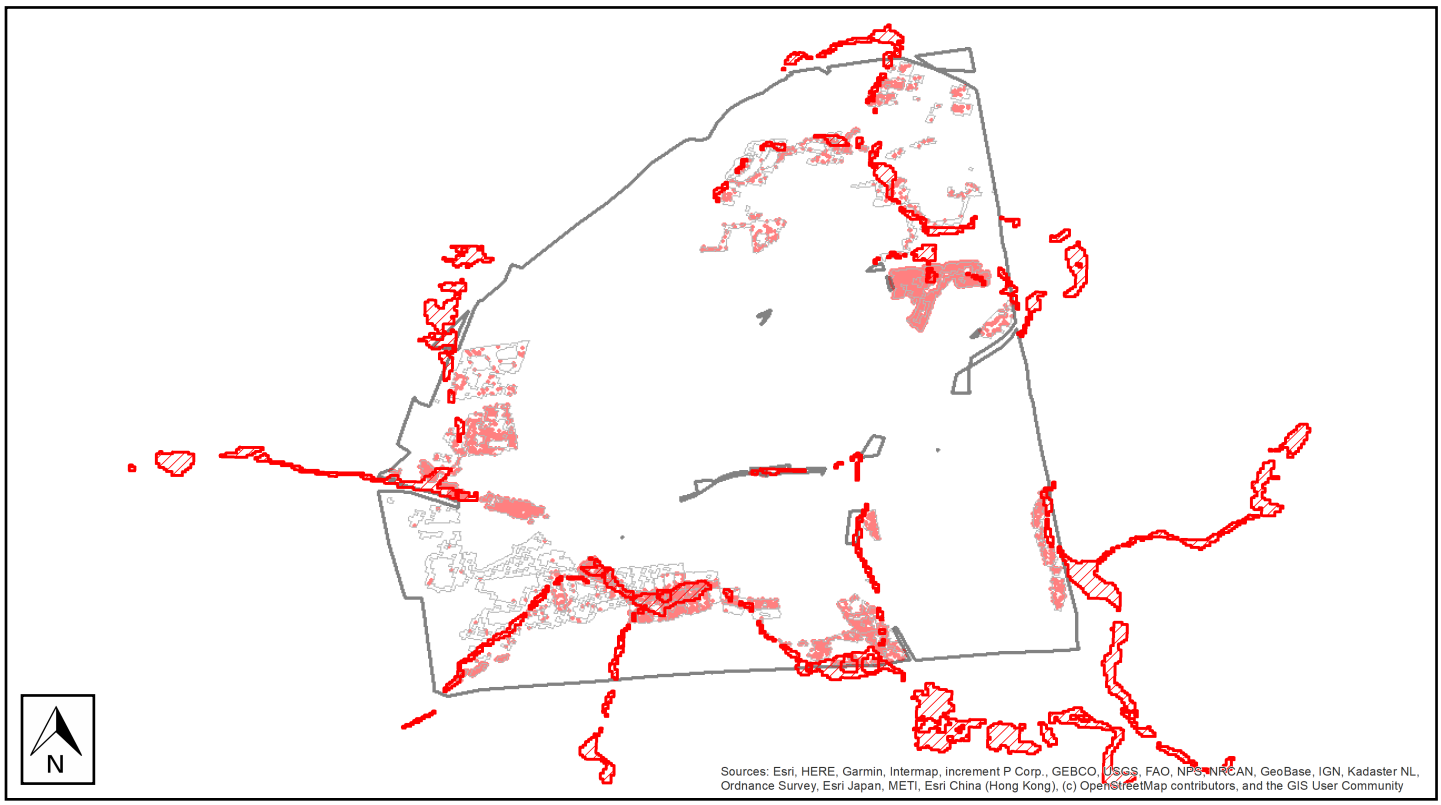


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	50	0	0	0	0	0	0	0	0	1	50
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	1	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	45	79	11	19	1	2	0	0	0	0	0	0
Total	**47**		**11**		**1**		**0**		**0**		**1**	

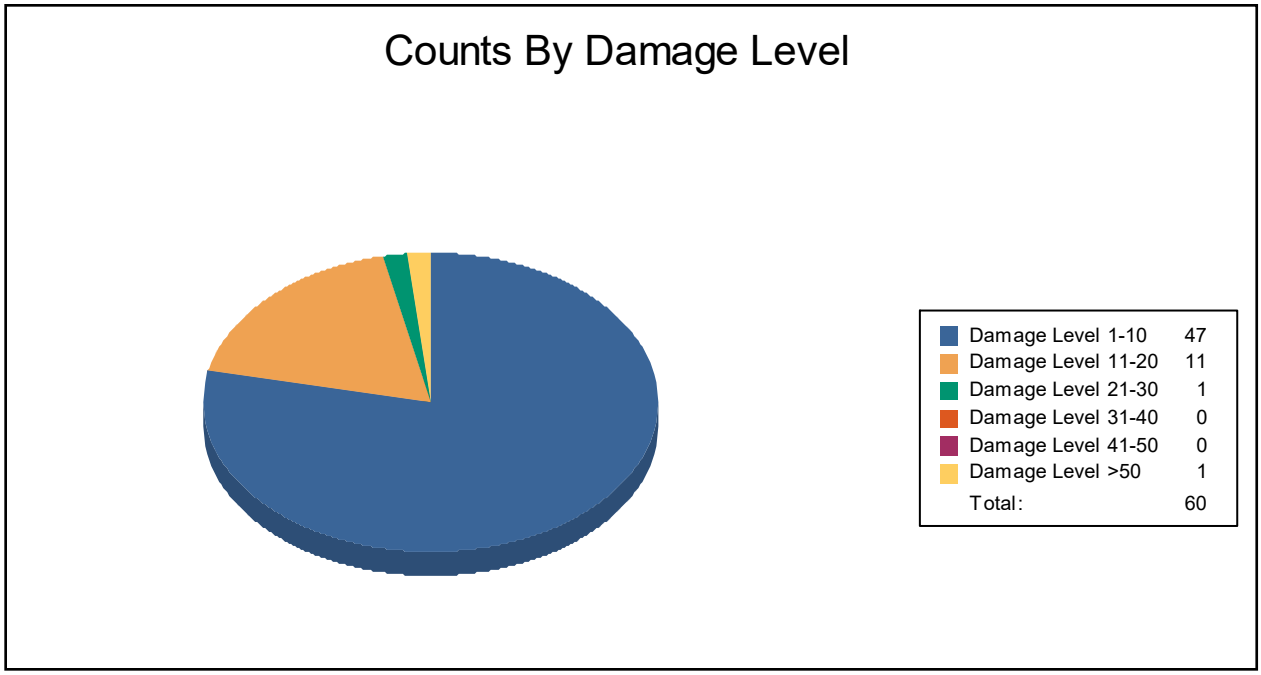


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	2	100	0	0	0	0	0	0	0	0	0	0
Steel	2	100	0	0	0	0	0	0	0	0	0	0
Wood	43	78	11	20	1	2	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 457 hospital beds available for use. On the day of the scenario flood event, the model estimates that 457 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	2	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

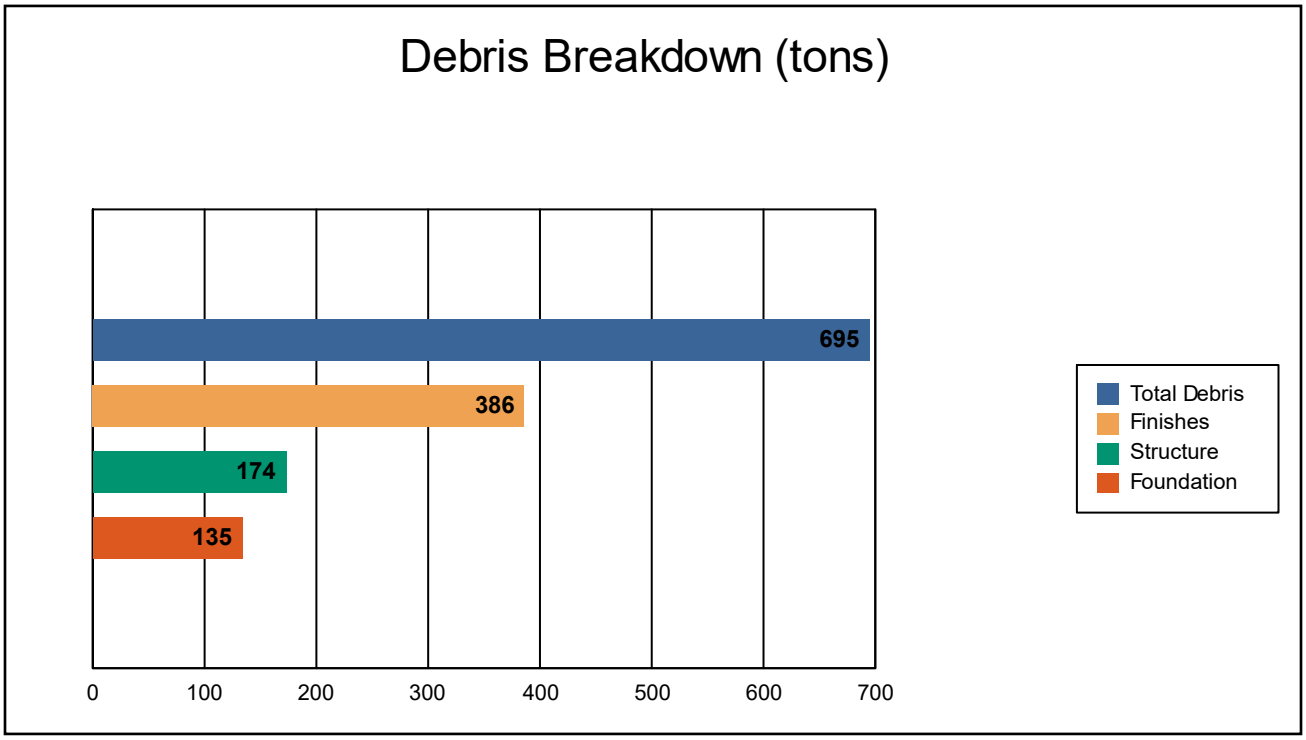
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

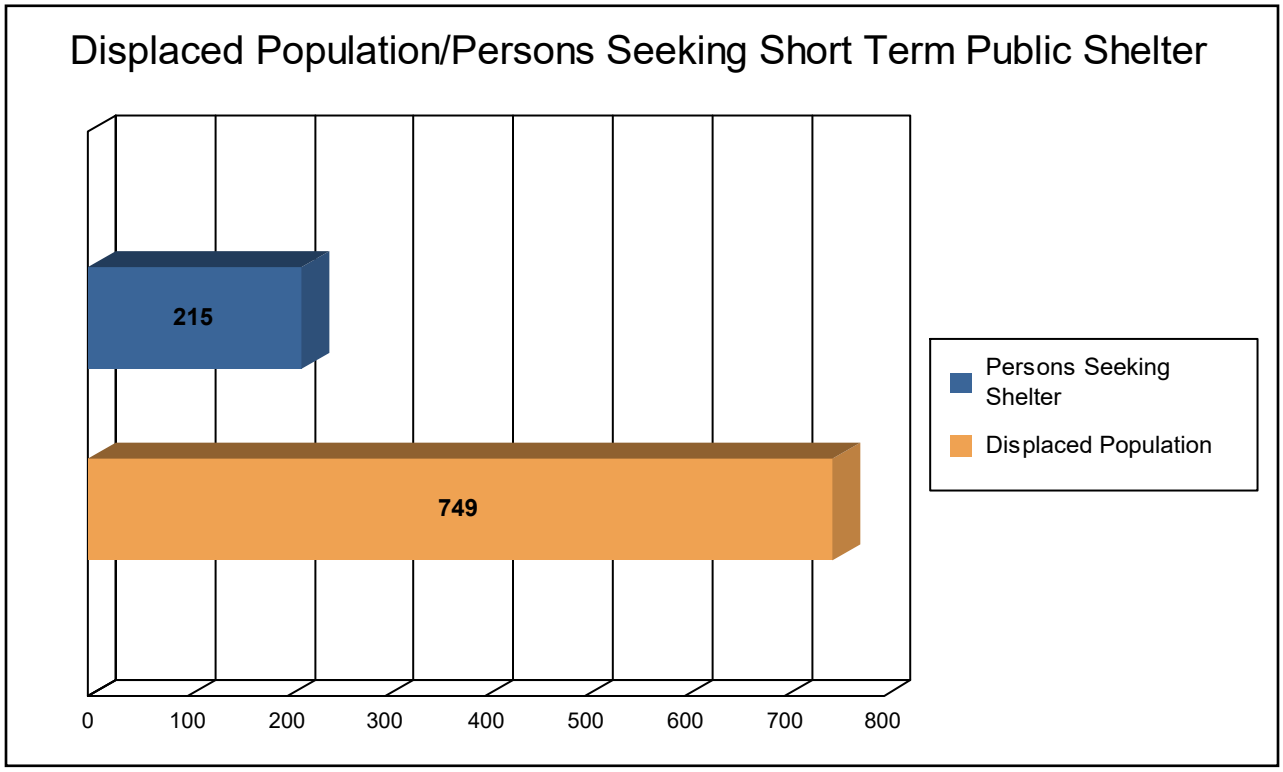


The model estimates that a total of 695 tons of debris will be generated. Of the total amount, Finishes comprises 56% of the total, Structure comprises 25% of the total, and Foundation comprises 19%. If the debris tonnage is converted into an estimated number of truckloads, it will require 28 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 250 households (or 749 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 215 people (out of a total population of 73,517) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 166.35 million dollars, which represents 5.68 % of the total replacement value of the scenario buildings.

Building-Related Losses

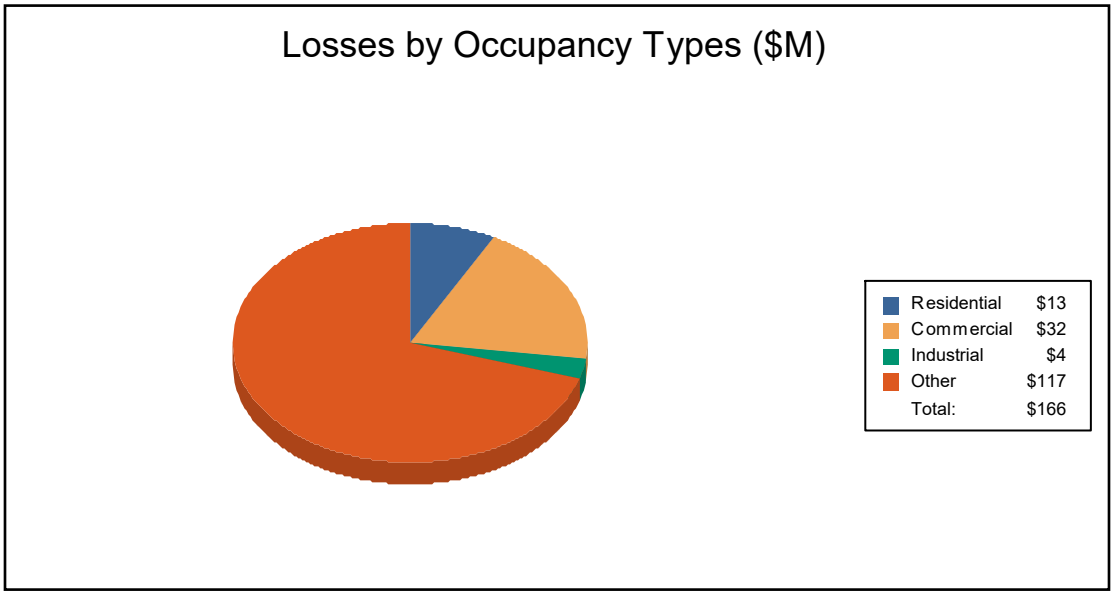
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 45.90 million dollars. 72% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 7.71% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.18	5.89	1.35	2.03	14.45
	Content	3.07	9.31	2.40	12.64	27.41
	Inventory	0.00	3.51	0.29	0.24	4.04
	Subtotal	**8.25**	**18.71**	**4.03**	**14.91**	**45.90**
Business Interruption						
	Income	0.00	4.26	0.03	24.23	28.53
	Relocation	2.73	1.90	0.04	8.93	13.60
	Rental Income	1.84	1.44	0.00	1.06	4.34
	Wage	0.00	6.13	0.06	67.80	73.98
	Subtotal	**4.58**	**13.72**	**0.13**	**102.02**	**120.45**
ALL	**Total**	**12.83**	**32.43**	**4.16**	**116.93**	**166.35**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	73,517	5,650,877	4,688,744	10,339,621
Total	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**
Total Study Region	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**

Hazus: Flood Global Risk Report

Region Name: New_Britain_FL

Flood Scenario: New_Britain_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 696 census blocks. The region contains over 29 thousand households and has a total population of 73,517 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 16,863 buildings in the region with a total building replacement value (excluding contents) of 10,340 million dollars. Approximately 88.55% of the buildings (and 54.65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,863 buildings in the region which have an aggregate total replacement value of 10,340 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,650,877	54.7%
Commercial	2,272,355	22.0%
Industrial	440,621	4.3%
Agricultural	29,138	0.3%
Religion	244,423	2.4%
Government	338,856	3.3%
Education	1,363,351	13.2%
Total	**10,339,621**	**100%**

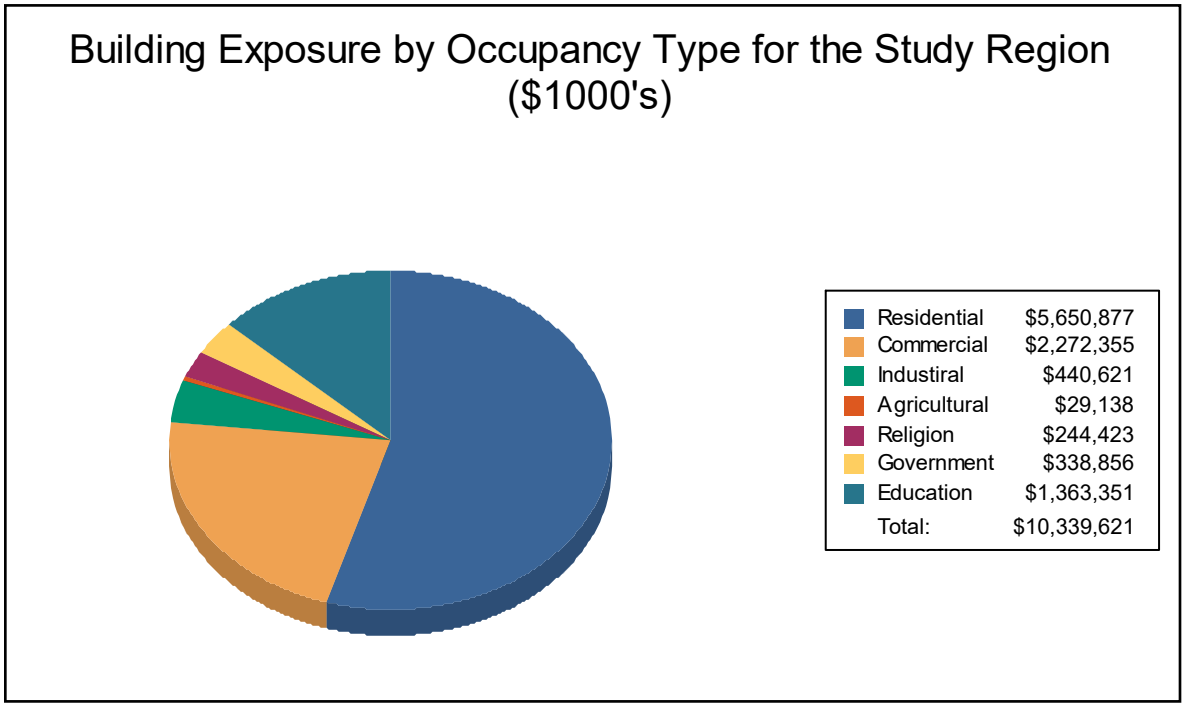
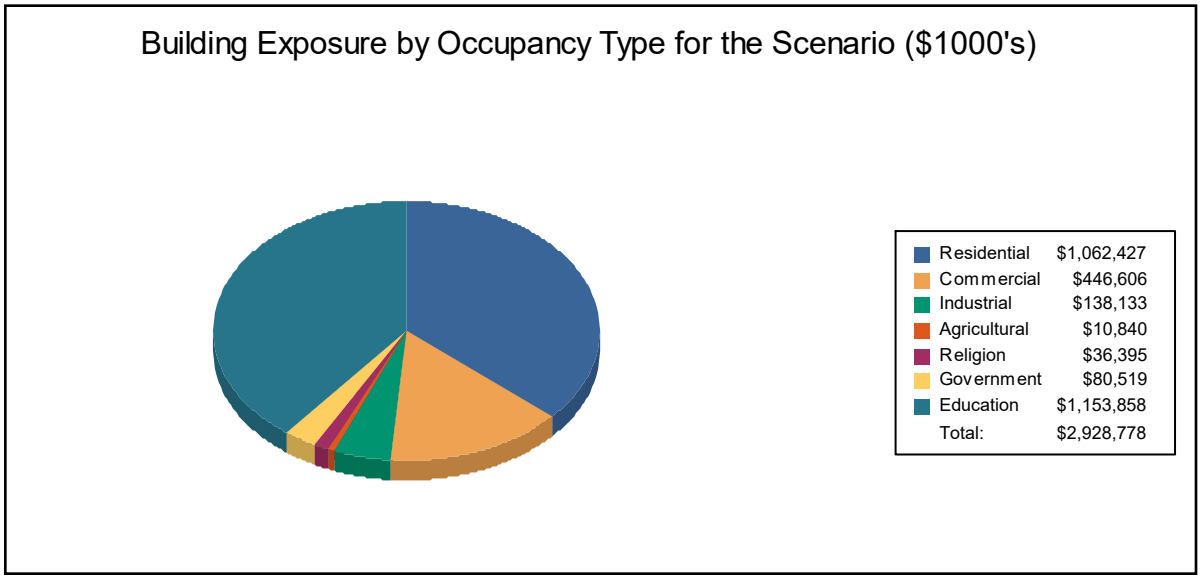


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,062,427	36.3%
Commercial	446,606	15.2%
Industrial	138,133	4.7%
Agricultural	10,840	0.4%
Religion	36,395	1.2%
Government	80,519	2.7%
Education	1,153,858	39.4%
Total	**2,928,778**	**100%**



Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds.
There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

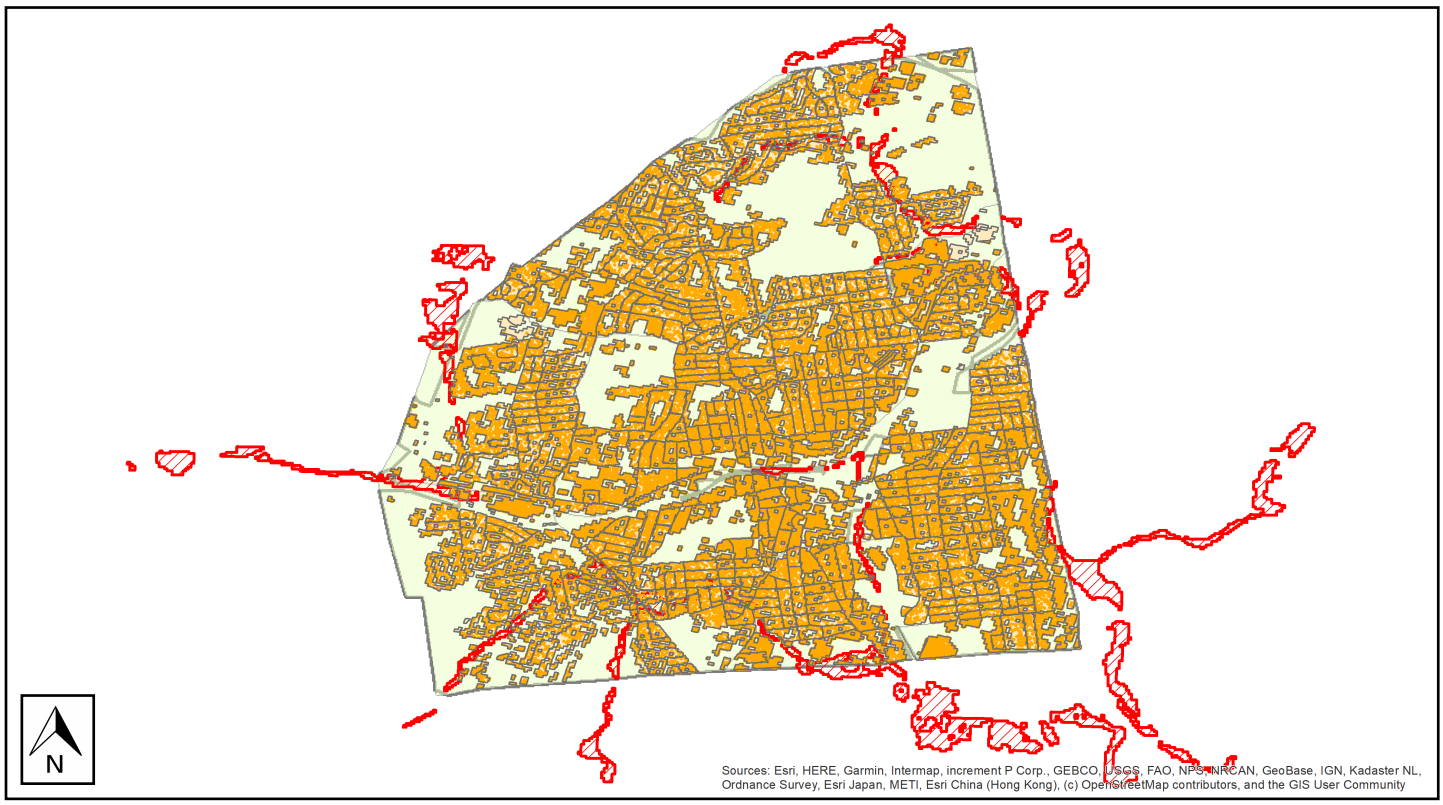
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	New_Britain_FL
Scenario Name:	New_Britain_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 15 buildings will be at least moderately damaged. This is over 72% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

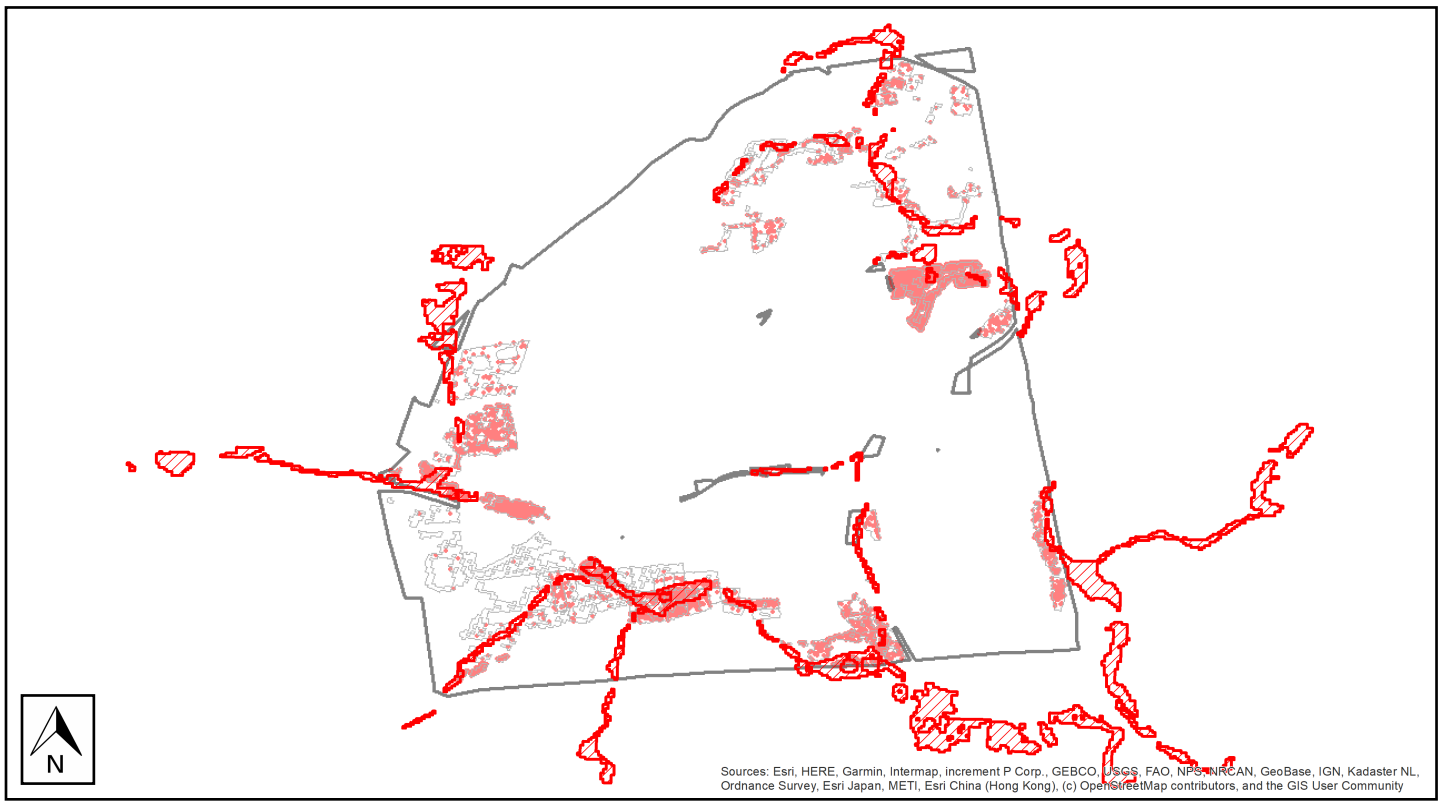


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	50	0	0	0	0	0	0	0	0	1	50
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	1	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	51	78	13	20	1	2	0	0	0	0	0	0
Total	**53**		**13**		**1**		**0**		**0**		**1**	

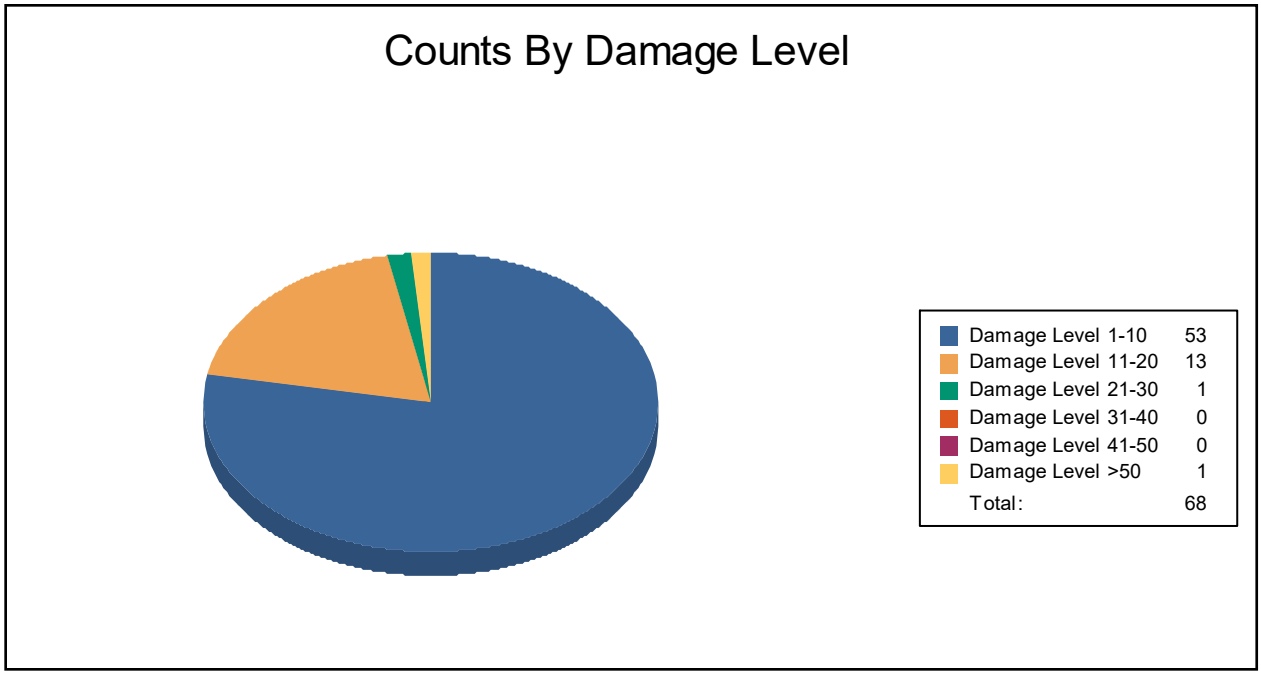


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	2	100	0	0	0	0	0	0	0	0	0	0
Steel	2	100	0	0	0	0	0	0	0	0	0	0
Wood	49	78	13	21	1	2	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 457 hospital beds available for use. On the day of the scenario flood event, the model estimates that 457 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	2	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

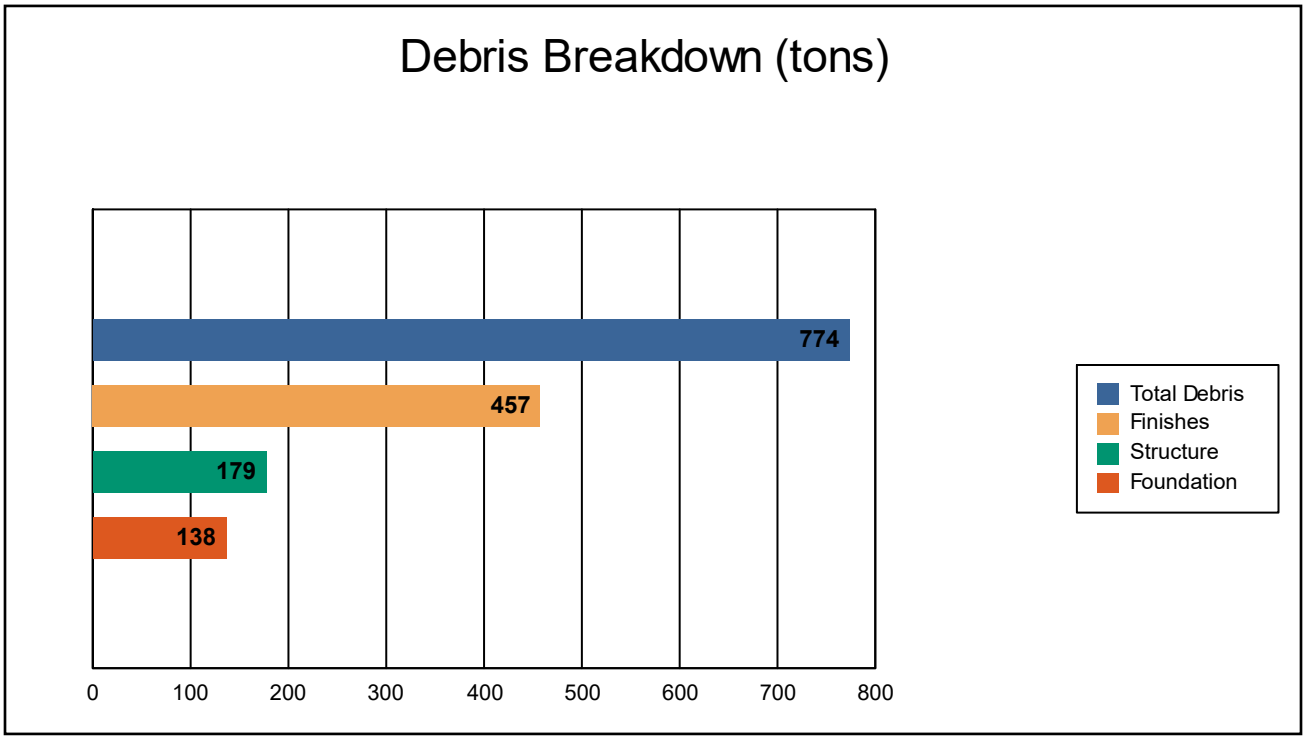
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

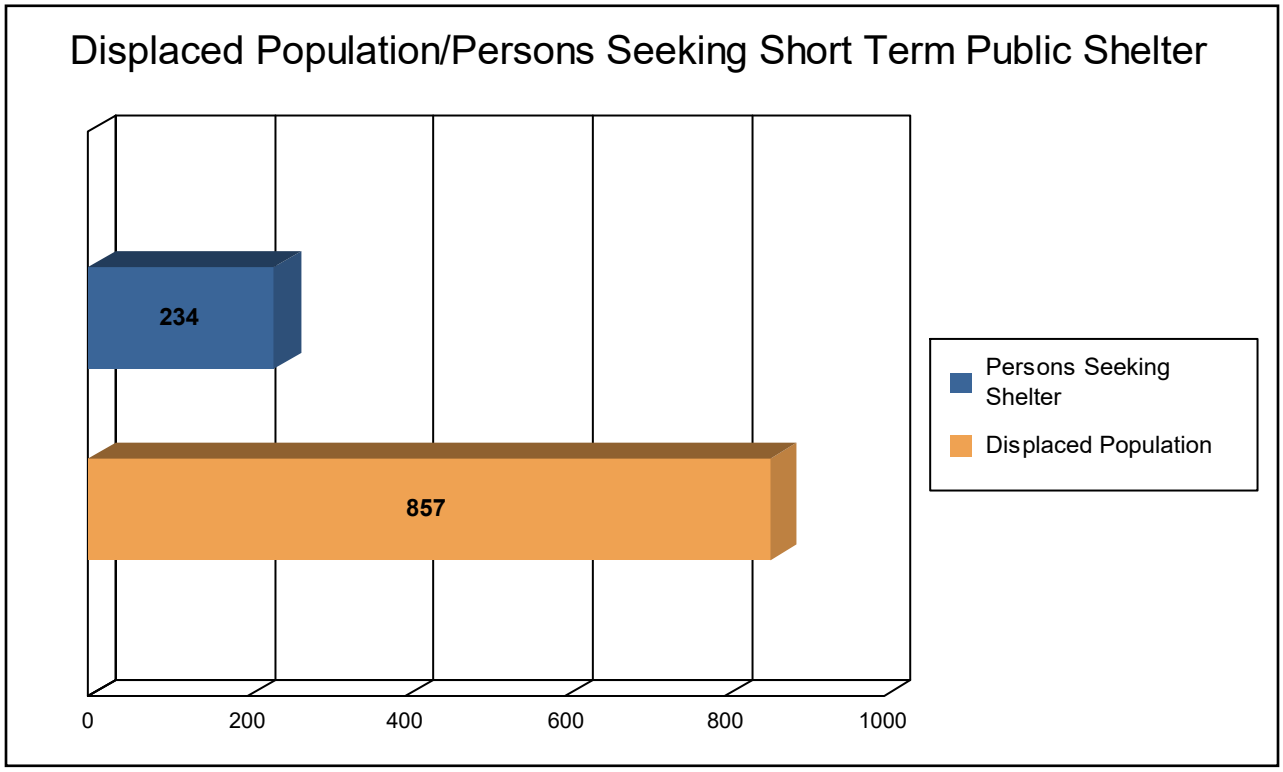


The model estimates that a total of 774 tons of debris will be generated. Of the total amount, Finishes comprises 59% of the total, Structure comprises 23% of the total, and Foundation comprises 18%. If the debris tonnage is converted into an estimated number of truckloads, it will require 31 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 286 households (or 857 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 234 people (out of a total population of 73,517) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 176.99 million dollars, which represents 6.04 % of the total replacement value of the scenario buildings.

Building-Related Losses

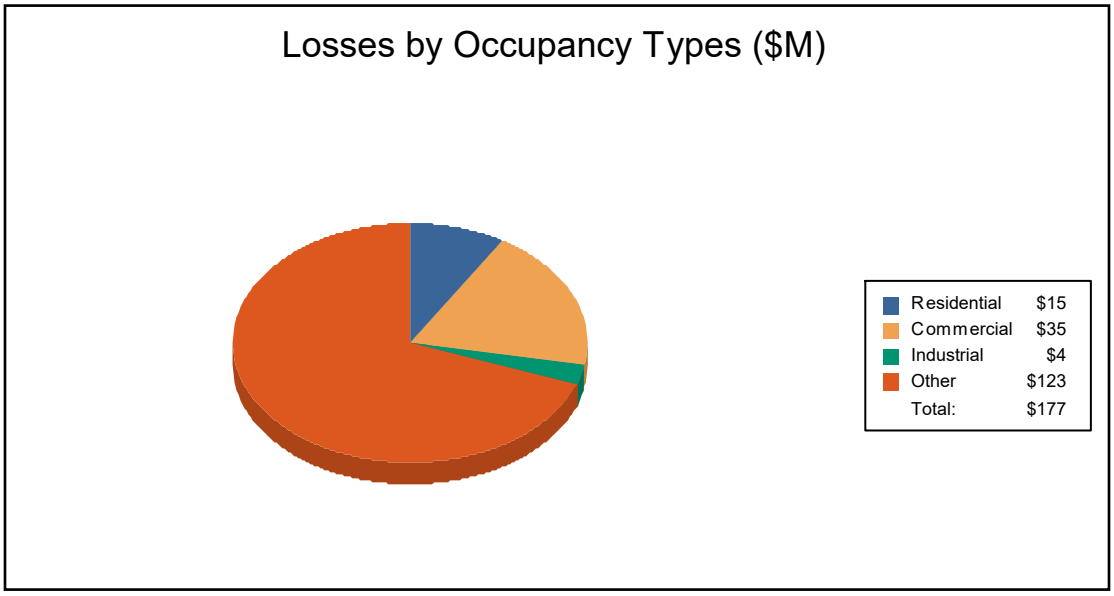
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 51.31 million dollars. 71% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.54% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6.09	6.11	1.41	2.33	15.93
	Content	3.62	9.95	2.53	15.06	31.16
	Inventory	0.00	3.65	0.32	0.25	4.22
	Subtotal	**9.71**	**19.71**	**4.25**	**17.64**	**51.31**
Business Interruption						
	Income	0.07	4.82	0.04	24.80	29.72
	Relocation	3.08	2.03	0.05	9.19	14.34
	Rental Income	2.10	1.52	0.01	1.09	4.73
	Wage	0.15	6.65	0.07	70.02	76.89
	Subtotal	**5.40**	**15.02**	**0.16**	**105.11**	**125.68**
ALL	**Total**	**15.11**	**34.72**	**4.41**	**122.75**	**176.99**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	73,517	5,650,877	4,688,744	10,339,621
Total	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**
Total Study Region	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**

Hazus: Flood Global Risk Report

Region Name: New_Britain_FL

Flood Scenario: New_Britain_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 696 census blocks. The region contains over 29 thousand households and has a total population of 73,517 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 16,863 buildings in the region with a total building replacement value (excluding contents) of 10,340 million dollars. Approximately 88.55% of the buildings (and 54.65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,863 buildings in the region which have an aggregate total replacement value of 10,340 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,650,877	54.7%
Commercial	2,272,355	22.0%
Industrial	440,621	4.3%
Agricultural	29,138	0.3%
Religion	244,423	2.4%
Government	338,856	3.3%
Education	1,363,351	13.2%
Total	**10,339,621**	**100%**

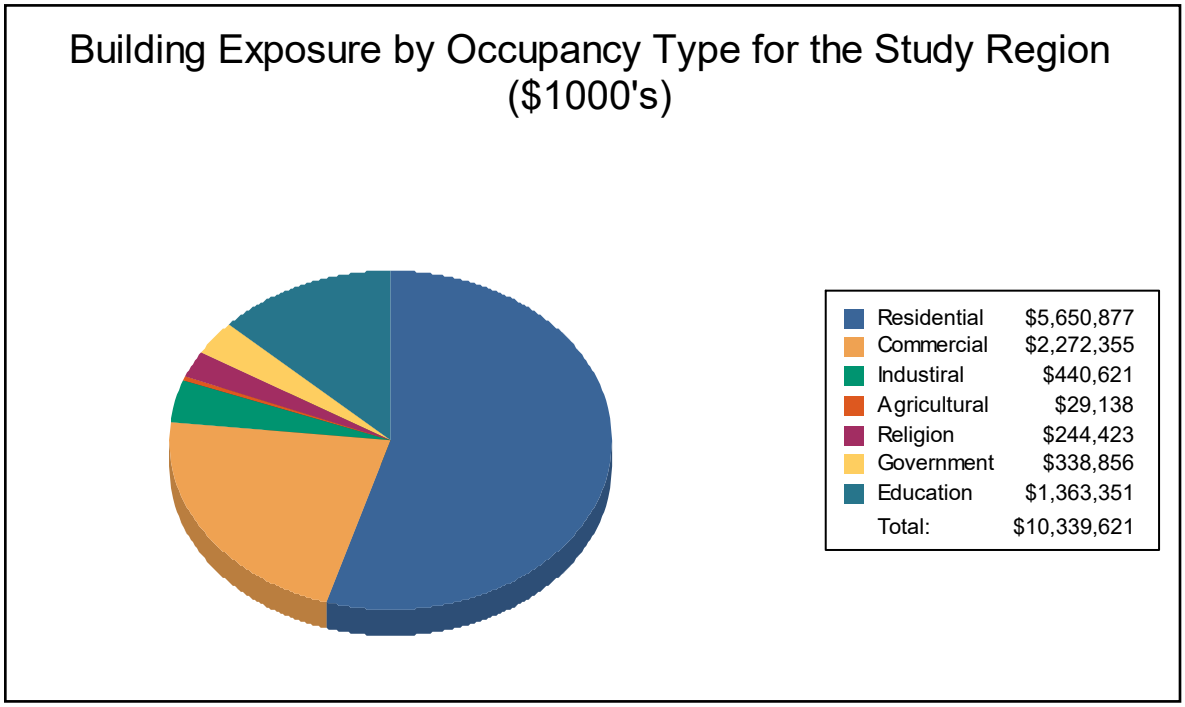
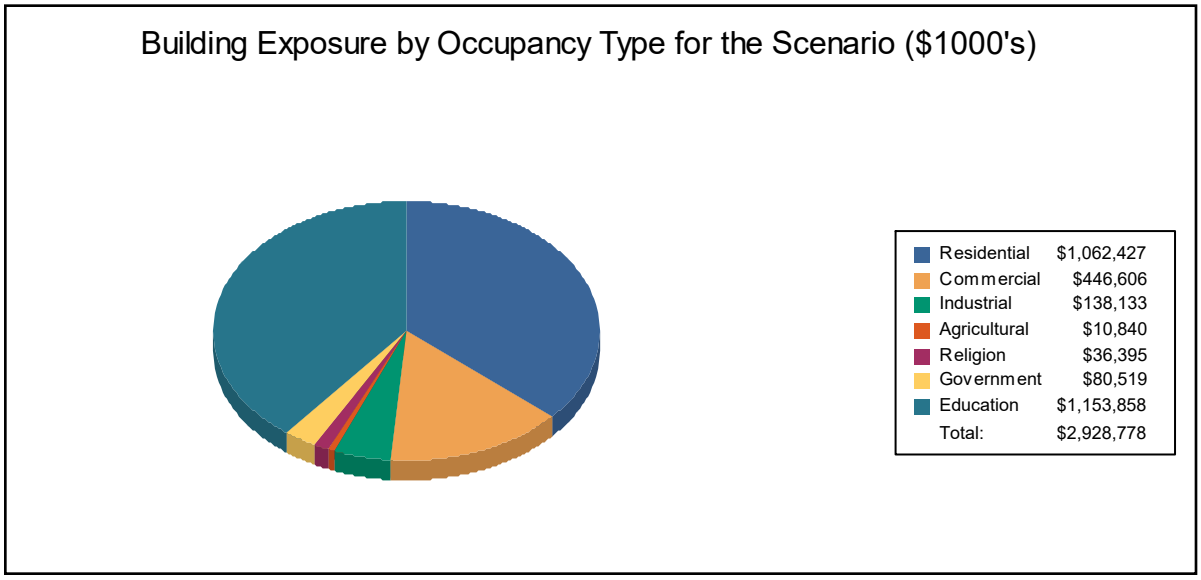


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,062,427	36.3%
Commercial	446,606	15.2%
Industrial	138,133	4.7%
Agricultural	10,840	0.4%
Religion	36,395	1.2%
Government	80,519	2.7%
Education	1,153,858	39.4%
Total	**2,928,778**	**100%**



Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds.
There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

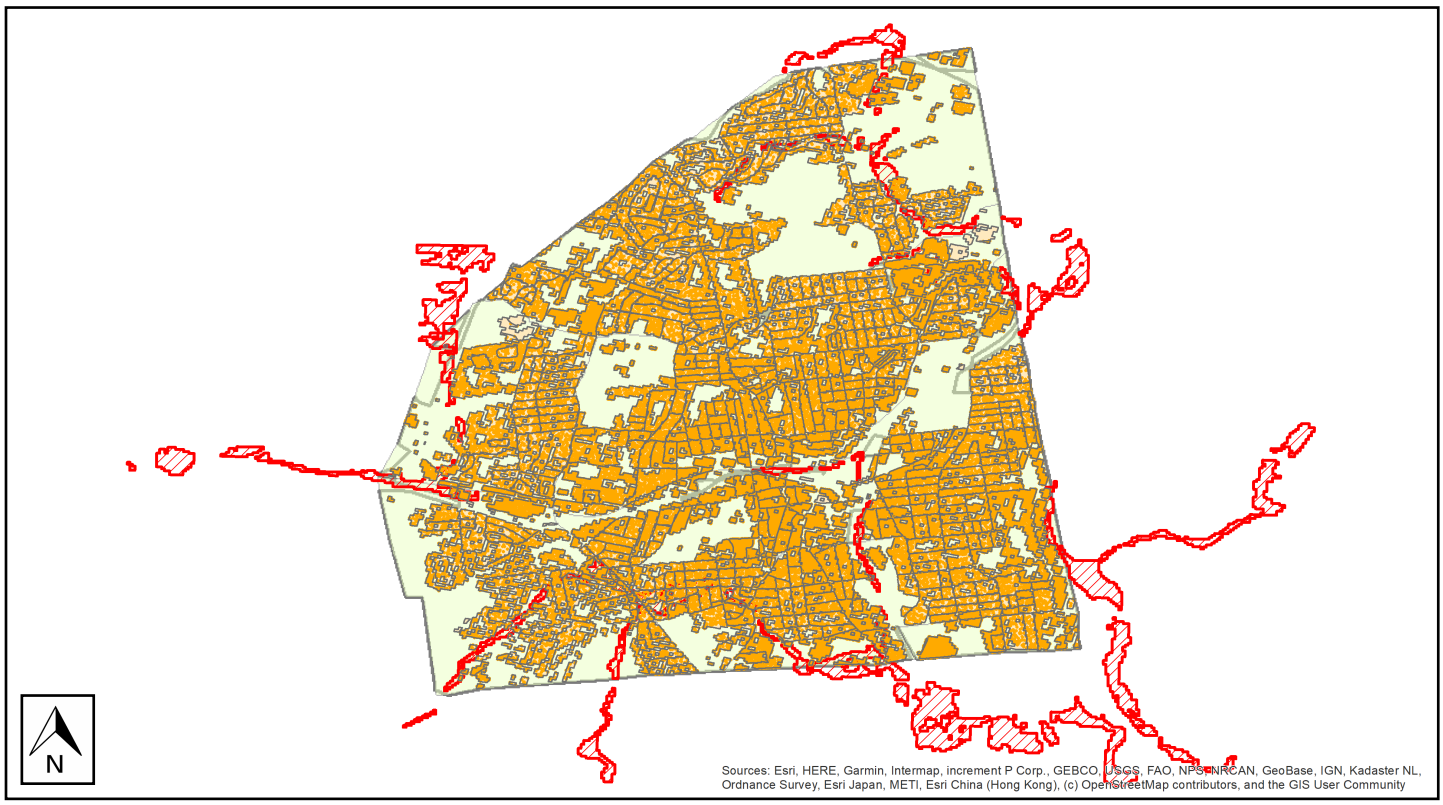
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	New_Britain_FL
Scenario Name:	New_Britain_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 20 buildings will be at least moderately damaged. This is over 76% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

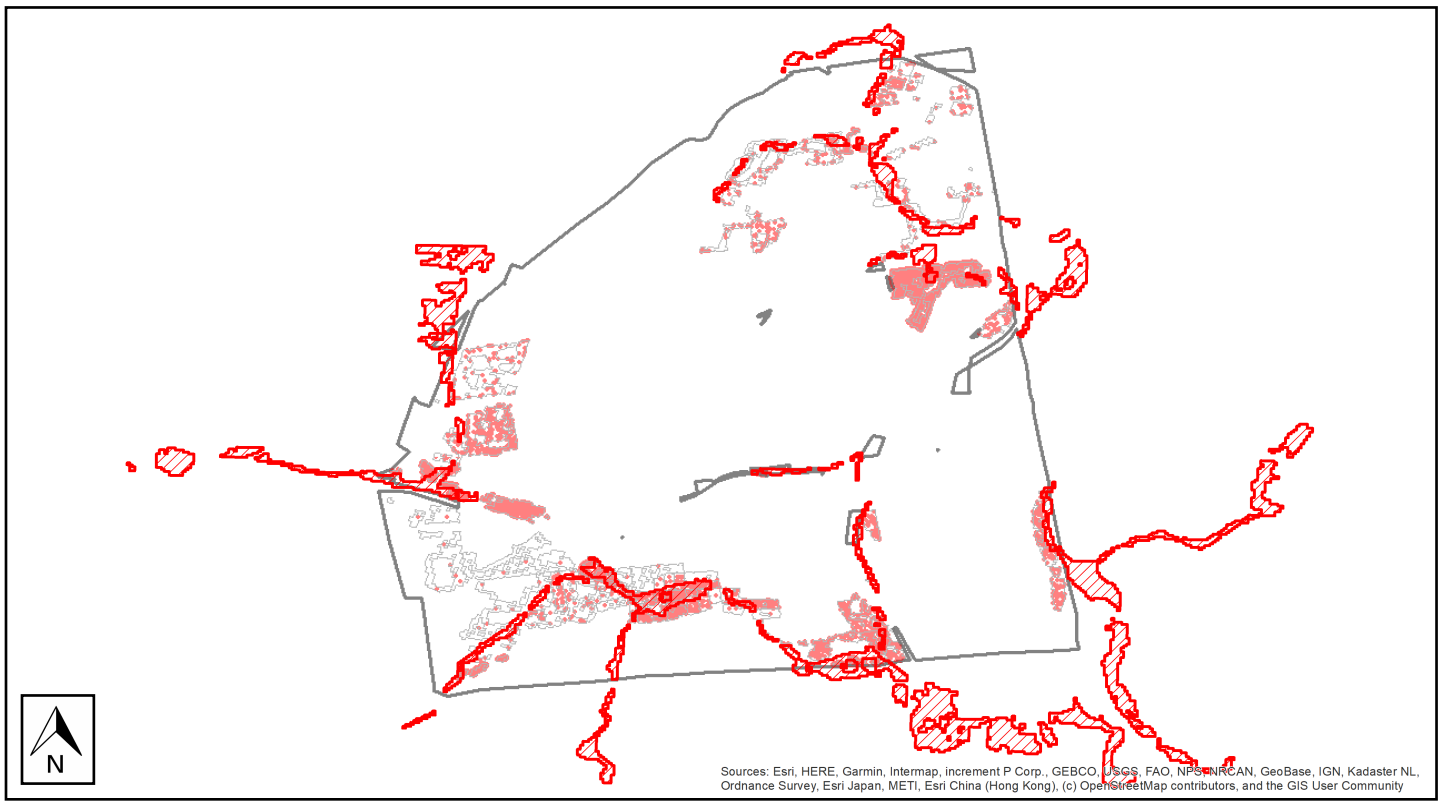


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	33	1	33	0	0	0	0	0	0	1	33
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	1	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	55	75	17	23	1	1	0	0	0	0	0	0
Total	**57**		**18**		**1**		**0**		**0**		**1**	

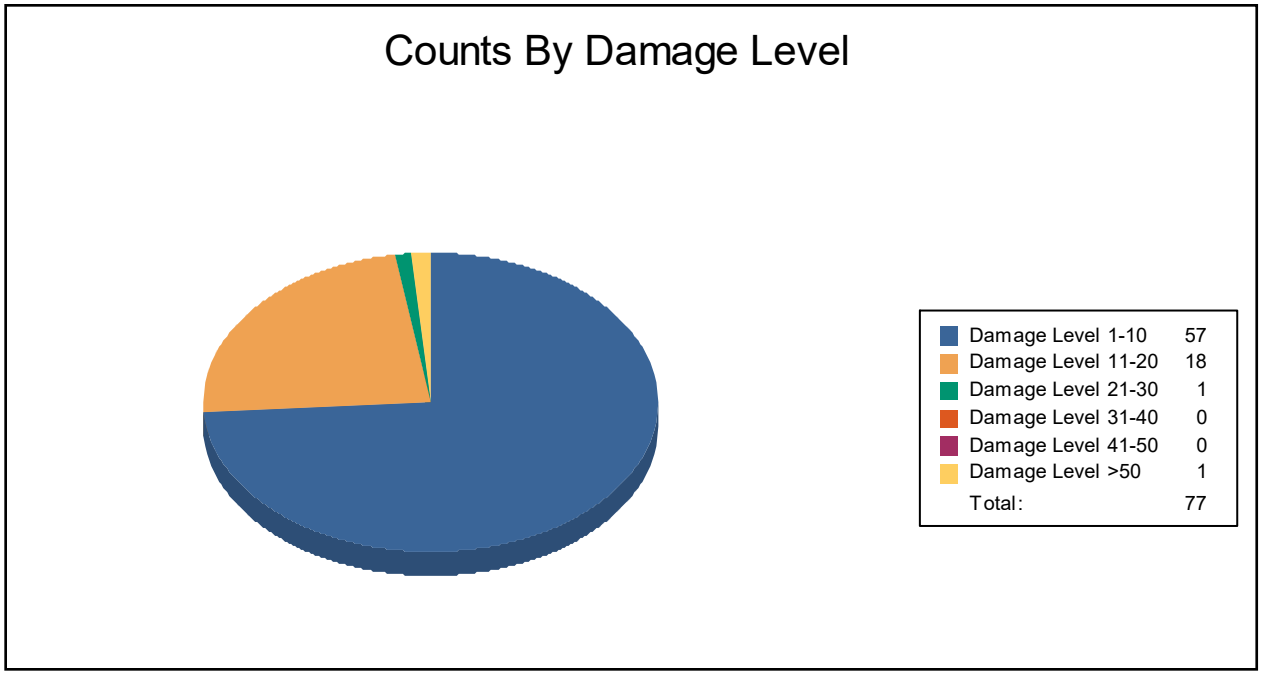


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	3	100	0	0	0	0	0	0	0	0	0	0
Steel	2	100	0	0	0	0	0	0	0	0	0	0
Wood	52	74	17	24	1	1	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 457 hospital beds available for use. On the day of the scenario flood event, the model estimates that 457 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	2	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

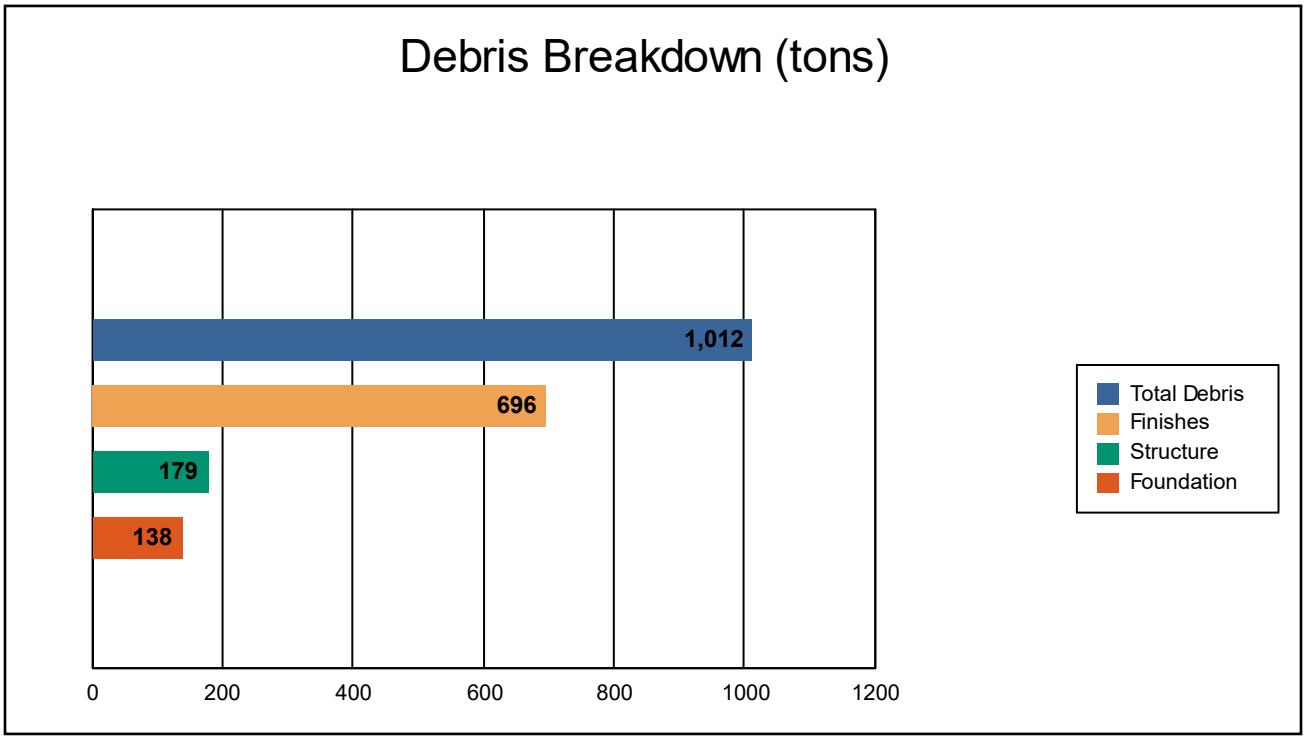
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

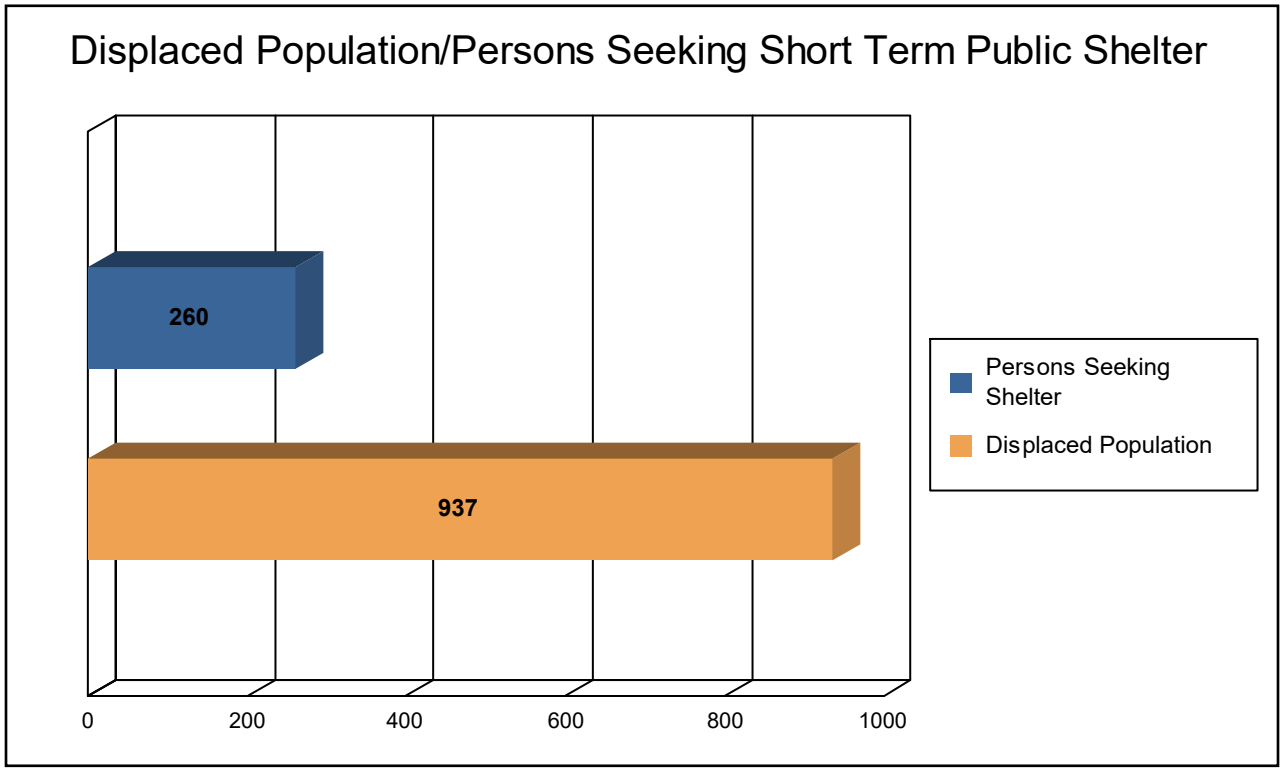


The model estimates that a total of 1,012 tons of debris will be generated. Of the total amount, Finishes comprises 69% of the total, Structure comprises 18% of the total, and Foundation comprises 14%. If the debris tonnage is converted into an estimated number of truckloads, it will require 41 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 312 households (or 937 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 260 people (out of a total population of 73,517) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 221.92 million dollars, which represents 7.58 % of the total replacement value of the scenario buildings.

Building-Related Losses

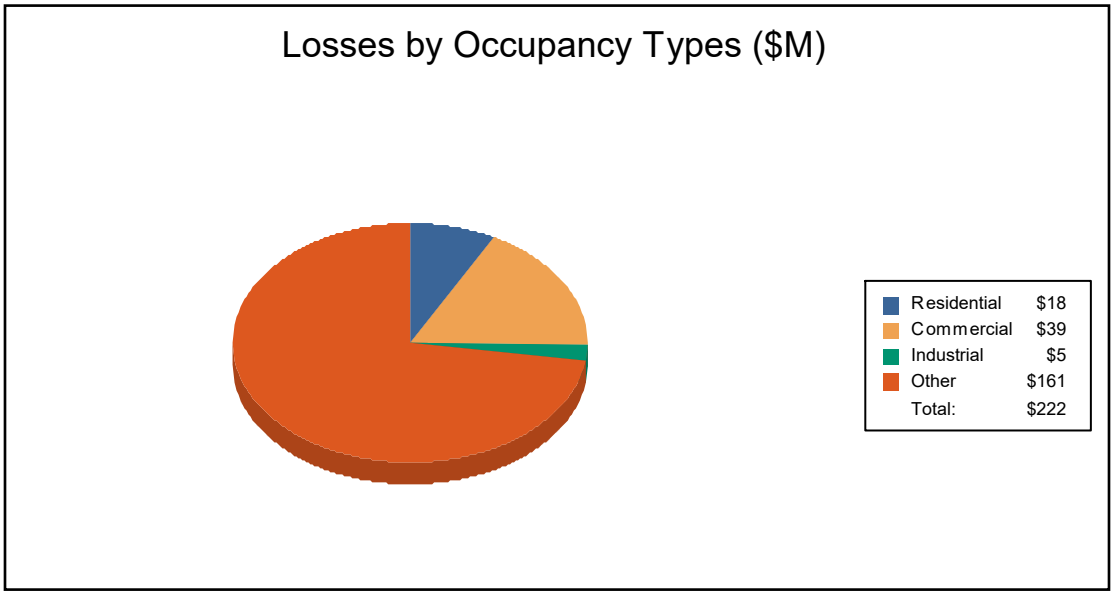
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 61.93 million dollars. 72% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 7.90% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.15	6.41	1.48	3.10	18.14
	Content	4.44	11.03	2.68	21.22	39.37
	Inventory	0.00	3.83	0.34	0.26	4.42
	Subtotal	**11.59**	**21.27**	**4.50**	**24.58**	**61.93**
Business Interruption						
	Income	0.07	5.60	0.05	32.91	38.62
	Relocation	3.35	2.32	0.05	11.98	17.70
	Rental Income	2.37	1.74	0.01	1.41	5.52
	Wage	0.15	7.61	0.08	90.30	98.14
	Subtotal	**5.93**	**17.27**	**0.19**	**136.60**	**159.99**
ALL	**Total**	**17.52**	**38.54**	**4.68**	**161.18**	**221.92**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	73,517	5,650,877	4,688,744	10,339,621
Total	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**
Total Study Region	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**

Hazus: Flood Global Risk Report

Region Name: New_Britain_FL

Flood Scenario: New_Britain_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 696 census blocks. The region contains over 29 thousand households and has a total population of 73,517 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 16,863 buildings in the region with a total building replacement value (excluding contents) of 10,340 million dollars. Approximately 88.55% of the buildings (and 54.65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,863 buildings in the region which have an aggregate total replacement value of 10,340 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,650,877	54.7%
Commercial	2,272,355	22.0%
Industrial	440,621	4.3%
Agricultural	29,138	0.3%
Religion	244,423	2.4%
Government	338,856	3.3%
Education	1,363,351	13.2%
Total	**10,339,621**	**100%**

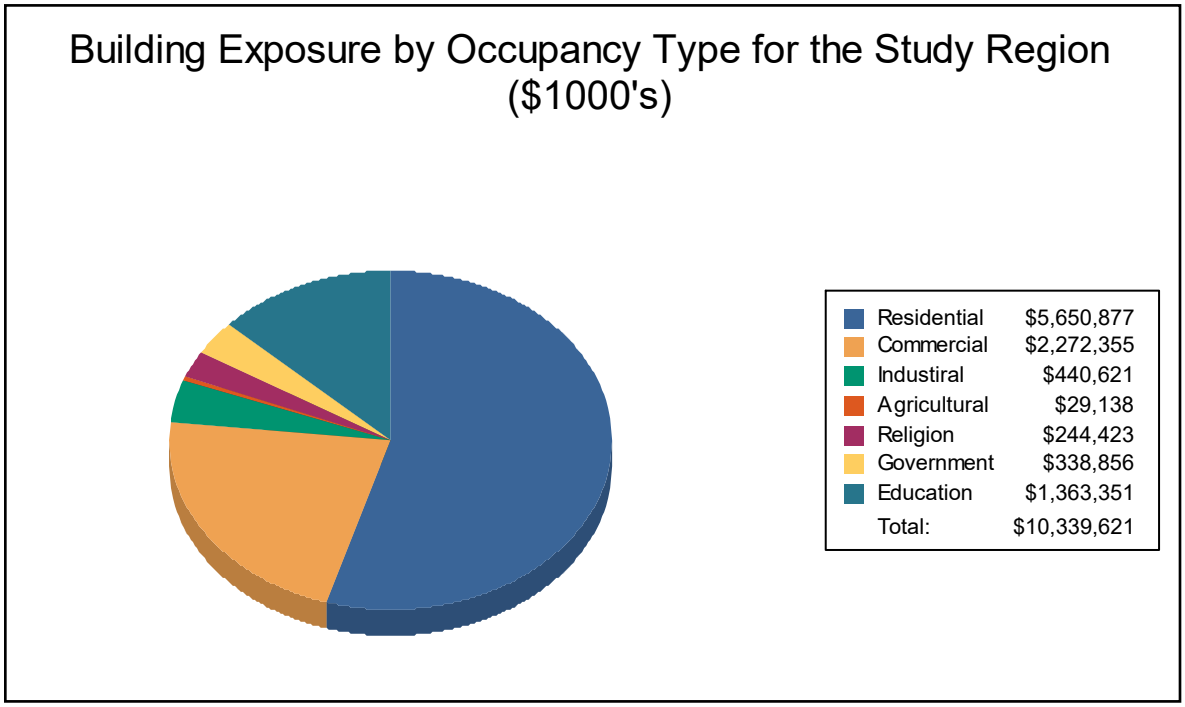
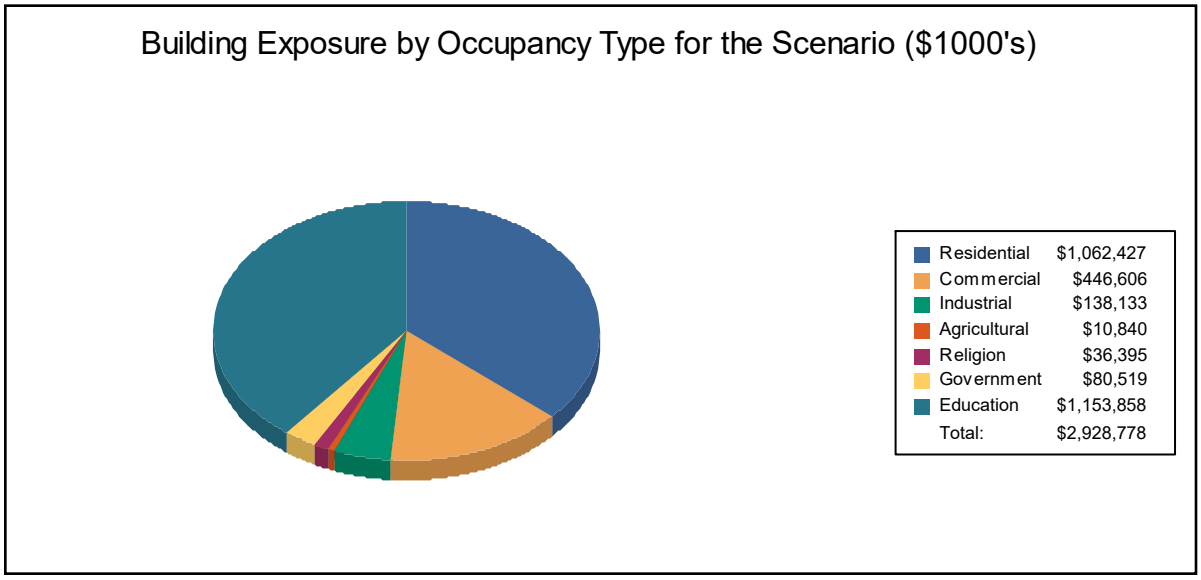


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,062,427	36.3%
Commercial	446,606	15.2%
Industrial	138,133	4.7%
Agricultural	10,840	0.4%
Religion	36,395	1.2%
Government	80,519	2.7%
Education	1,153,858	39.4%
Total	**2,928,778**	**100%**



Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds.
There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

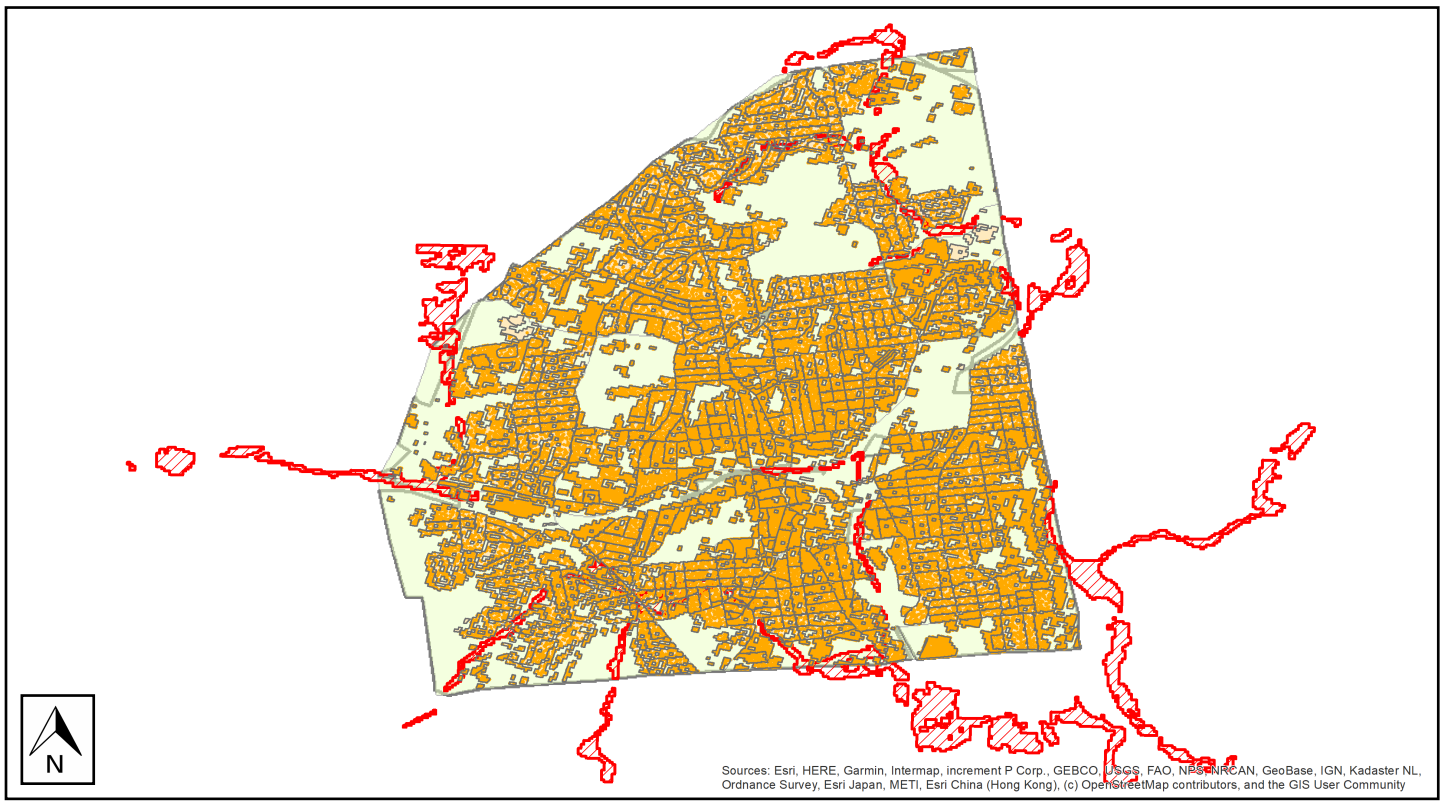
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	New_Britain_FL
Scenario Name:	New_Britain_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 22 buildings will be at least moderately damaged. This is over 78% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

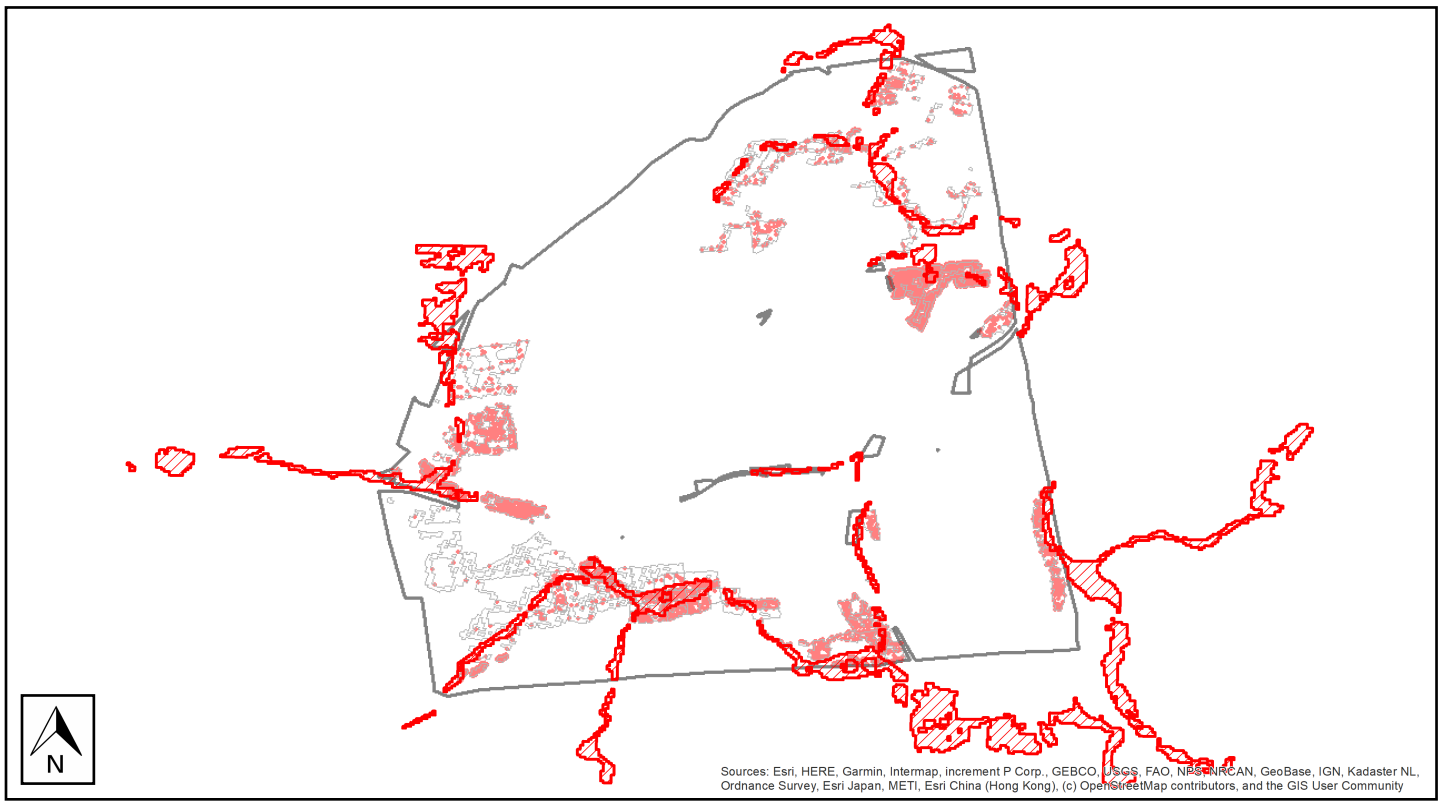


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	33	1	33	0	0	0	0	0	0	1	33
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	2	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	56	74	19	25	1	1	0	0	0	0	0	0
Total	**59**		**20**		**1**		**0**		**0**		**1**	

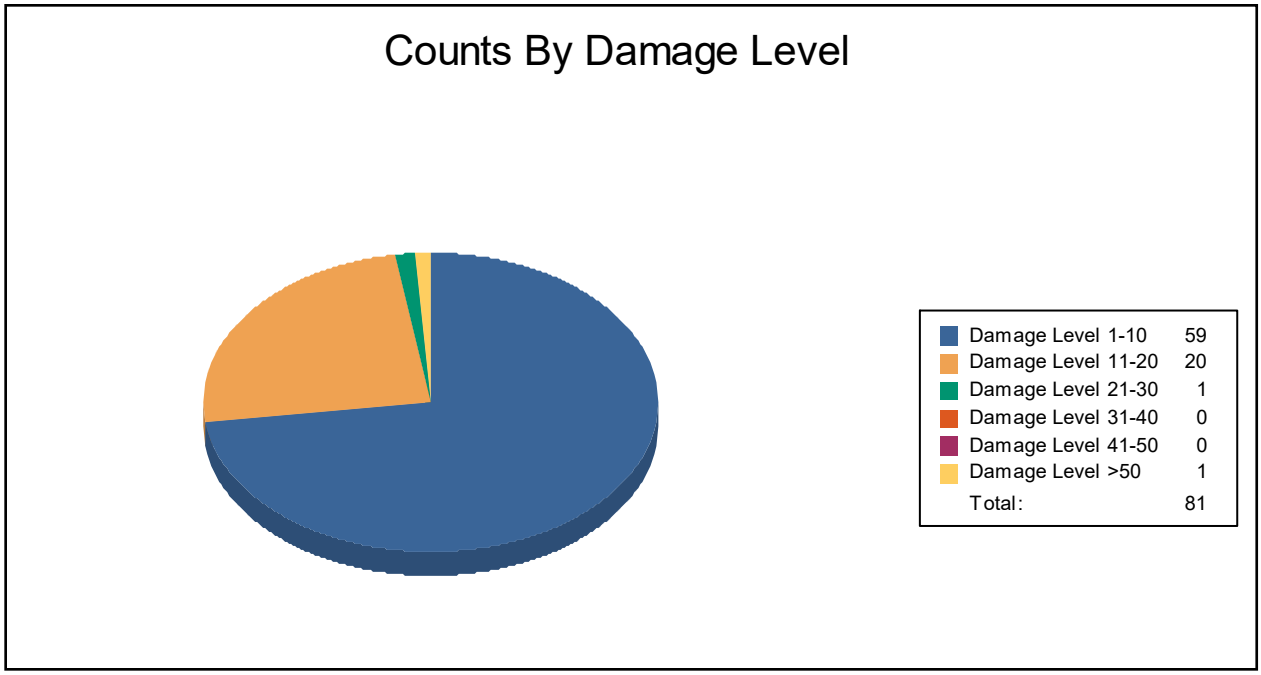


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	3	100	0	0	0	0	0	0	0	0	0	0
Steel	2	100	0	0	0	0	0	0	0	0	0	0
Wood	53	73	19	26	1	1	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 457 hospital beds available for use. On the day of the scenario flood event, the model estimates that 457 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	2	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

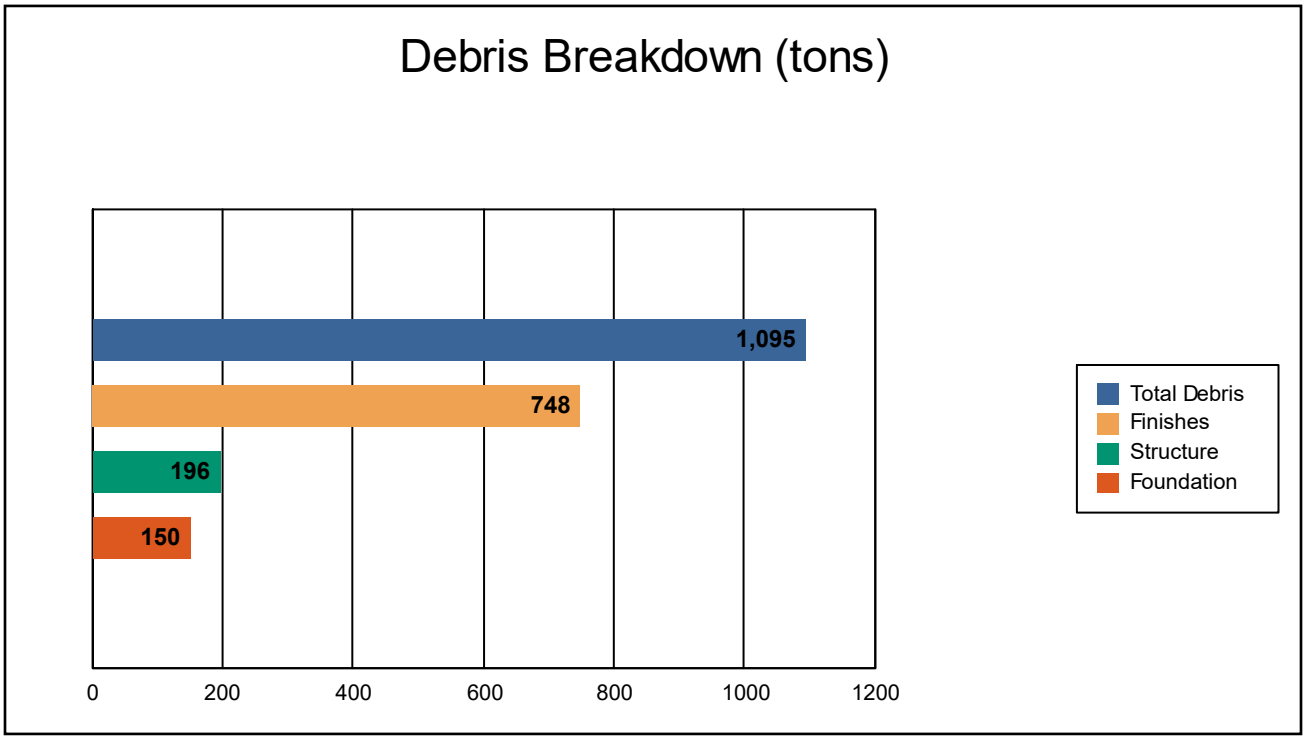
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

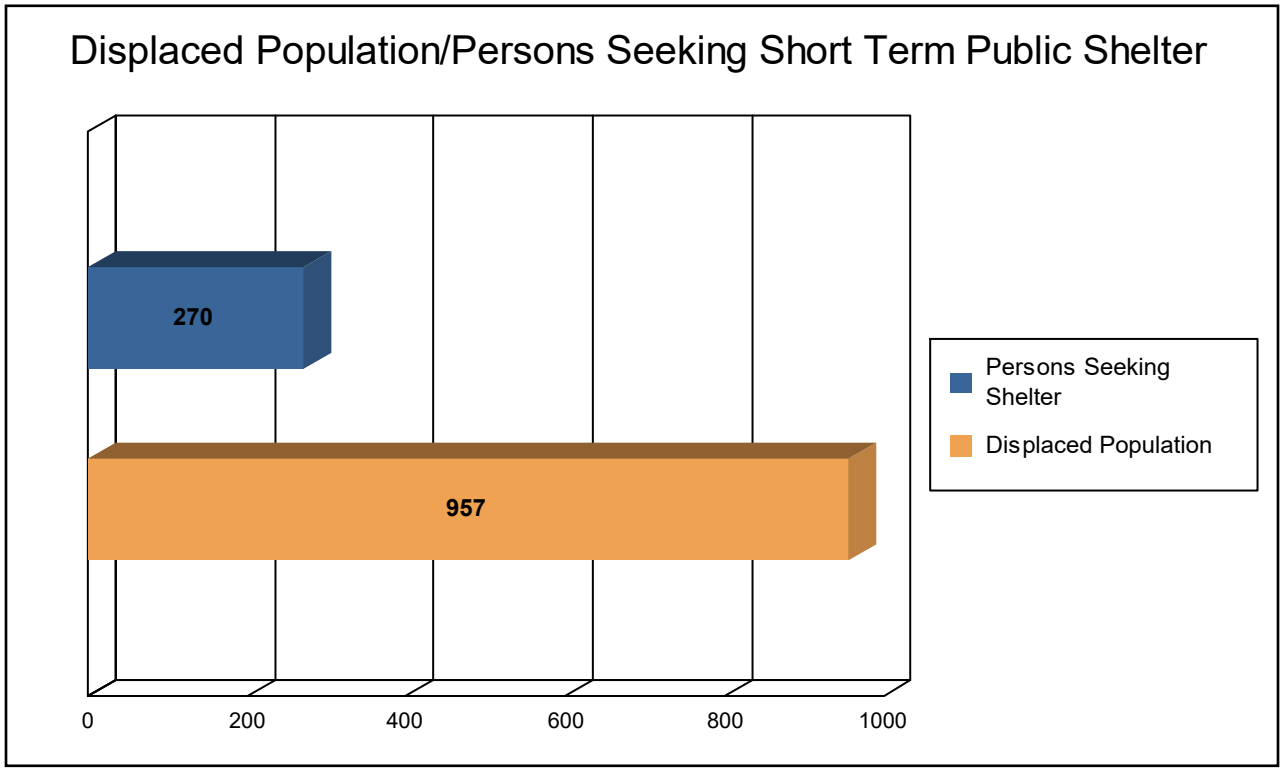


The model estimates that a total of 1,095 tons of debris will be generated. Of the total amount, Finishes comprises 68% of the total, Structure comprises 18% of the total, and Foundation comprises 14%. If the debris tonnage is converted into an estimated number of truckloads, it will require 44 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 319 households (or 957 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 270 people (out of a total population of 73,517) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 226.01 million dollars, which represents 7.72 % of the total replacement value of the scenario buildings.

Building-Related Losses

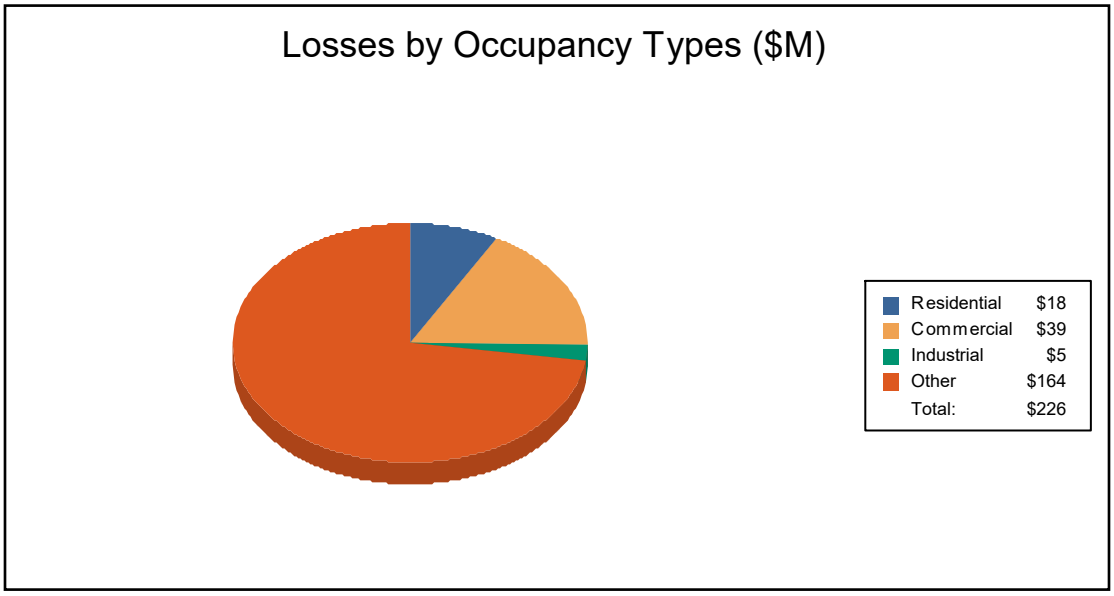
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 63.60 million dollars. 72% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.00% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.43	6.48	1.50	3.20	18.61
	Content	4.59	11.32	2.70	21.92	40.52
	Inventory	0.00	3.86	0.34	0.26	4.46
	Subtotal	**12.02**	**21.66**	**4.54**	**25.38**	**63.60**
Business Interruption						
	Income	0.07	5.77	0.05	33.28	39.17
	Relocation	3.42	2.36	0.05	12.12	17.95
	Rental Income	2.42	1.77	0.01	1.43	5.62
	Wage	0.15	7.80	0.08	91.64	99.67
	Subtotal	**6.06**	**17.69**	**0.19**	**138.47**	**162.41**
ALL	**Total**	**18.08**	**39.35**	**4.72**	**163.85**	**226.01**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	73,517	5,650,877	4,688,744	10,339,621
Total	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**
Total Study Region	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**

Hazus: Flood Global Risk Report

Region Name: New_Britain_FL

Flood Scenario: New_Britain_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

RiskMAP
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

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- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 696 census blocks. The region contains over 29 thousand households and has a total population of 73,517 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 16,863 buildings in the region with a total building replacement value (excluding contents) of 10,340 million dollars. Approximately 88.55% of the buildings (and 54.65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,863 buildings in the region which have an aggregate total replacement value of 10,340 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	5,650,877	54.7%
Commercial	2,272,355	22.0%
Industrial	440,621	4.3%
Agricultural	29,138	0.3%
Religion	244,423	2.4%
Government	338,856	3.3%
Education	1,363,351	13.2%
Total	**10,339,621**	**100%**

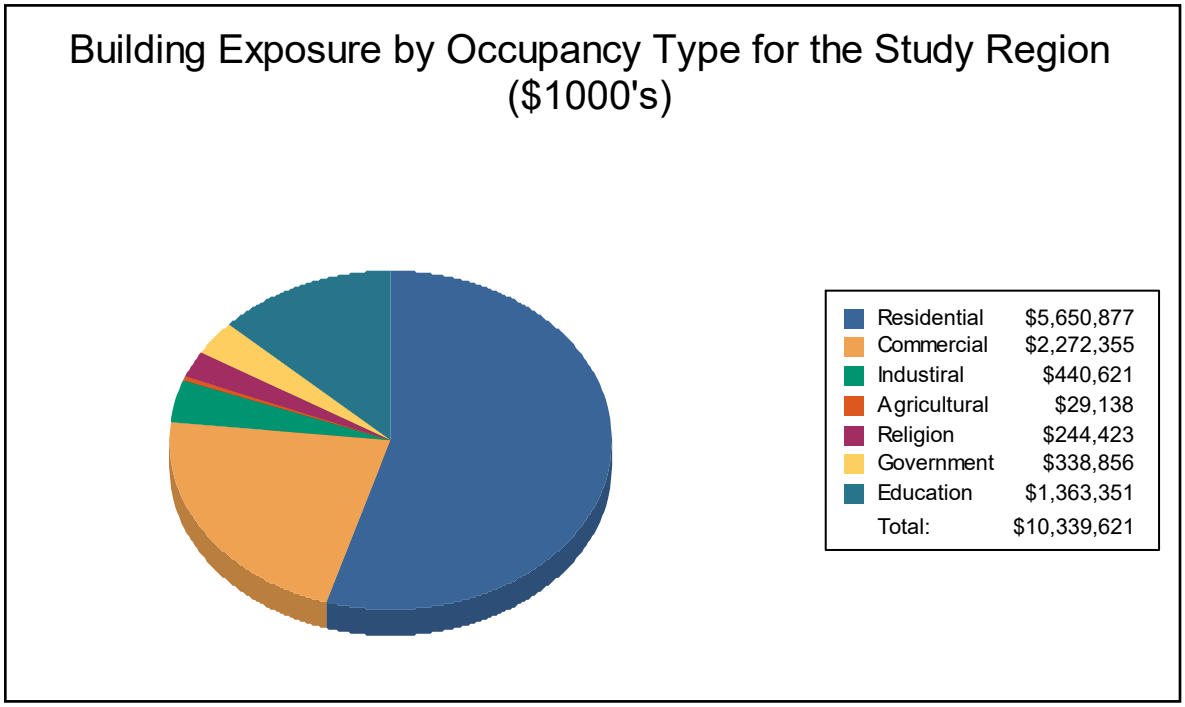
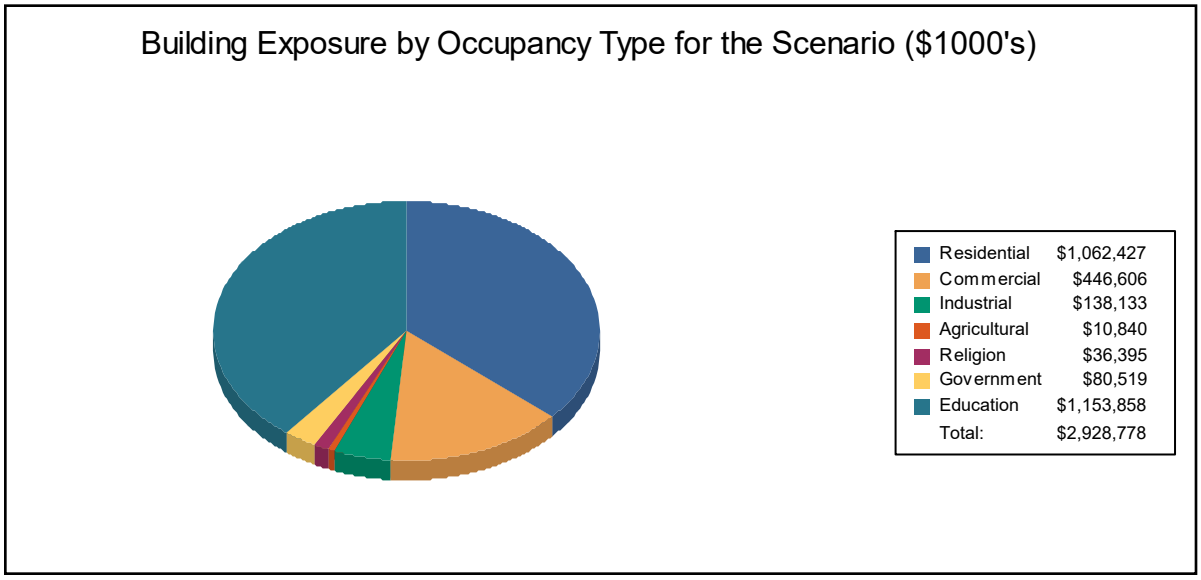


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,062,427	36.3%
Commercial	446,606	15.2%
Industrial	138,133	4.7%
Agricultural	10,840	0.4%
Religion	36,395	1.2%
Government	80,519	2.7%
Education	1,153,858	39.4%
Total	**2,928,778**	**100%**



Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds.
There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation center.

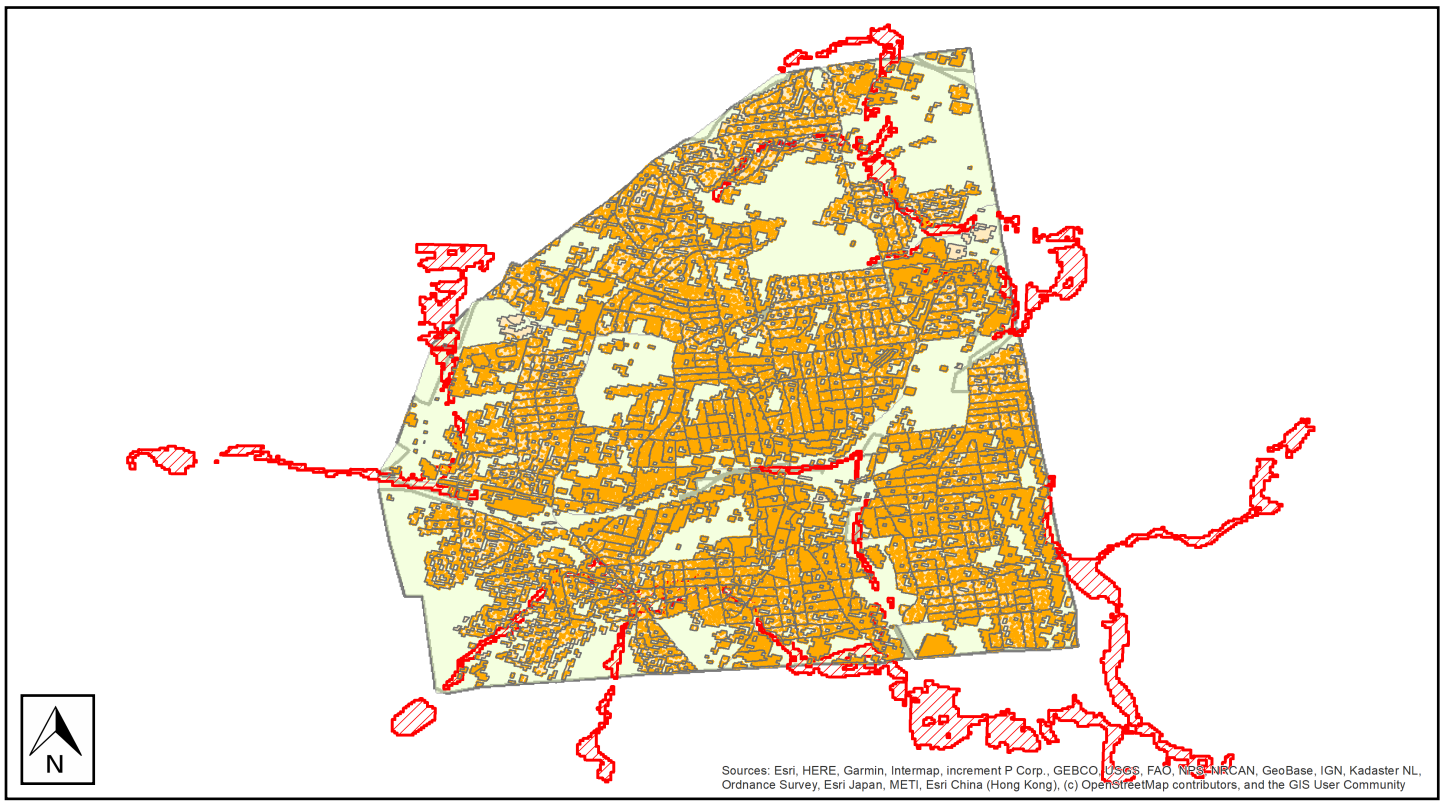
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	New_Britain_FL
Scenario Name:	New_Britain_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 31 buildings will be at least moderately damaged. This is over 85% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

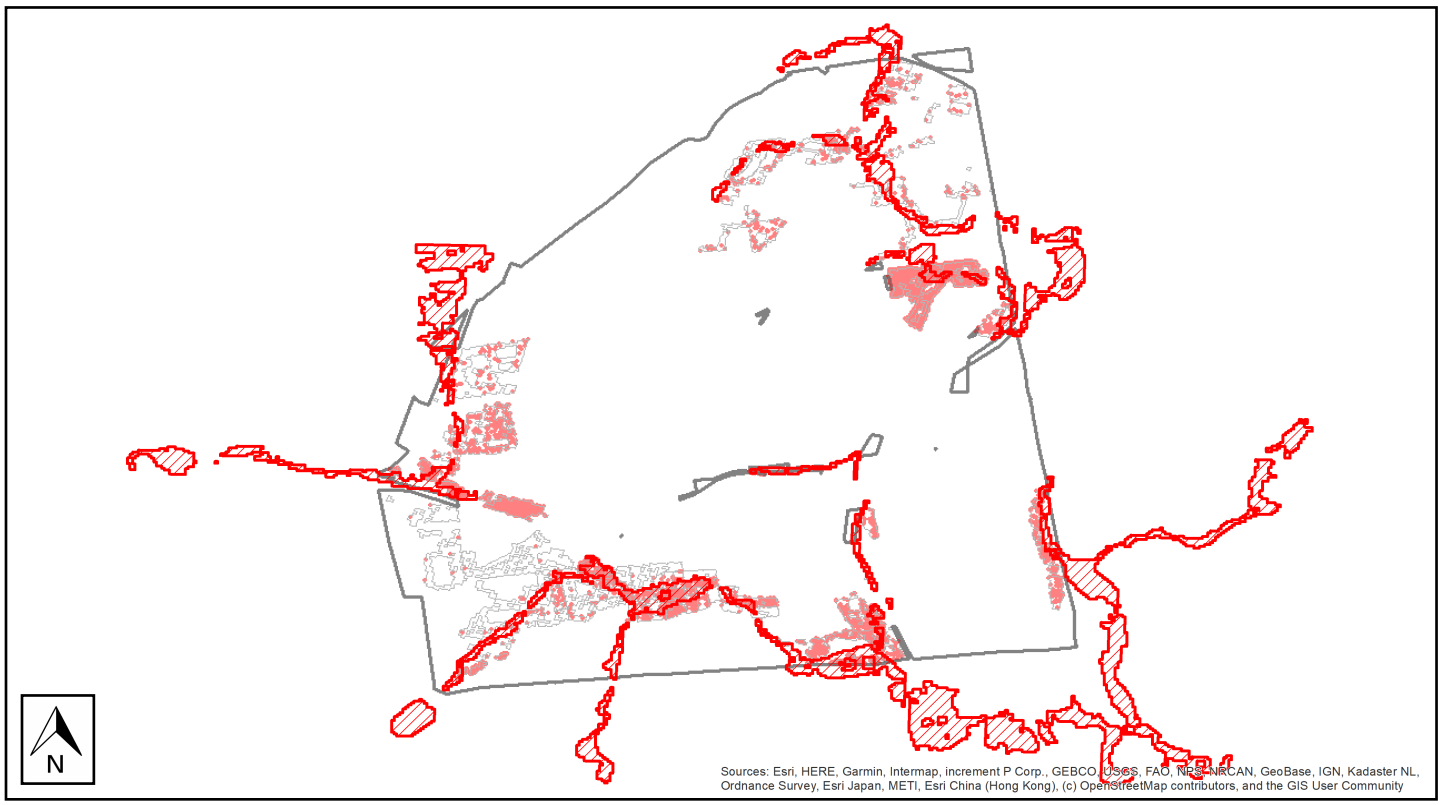


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	33	1	33	0	0	0	0	0	0	1	33
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	2	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	76	72	27	26	2	2	0	0	0	0	0	0
Total	**79**		**28**		**2**		**0**		**0**		**1**	

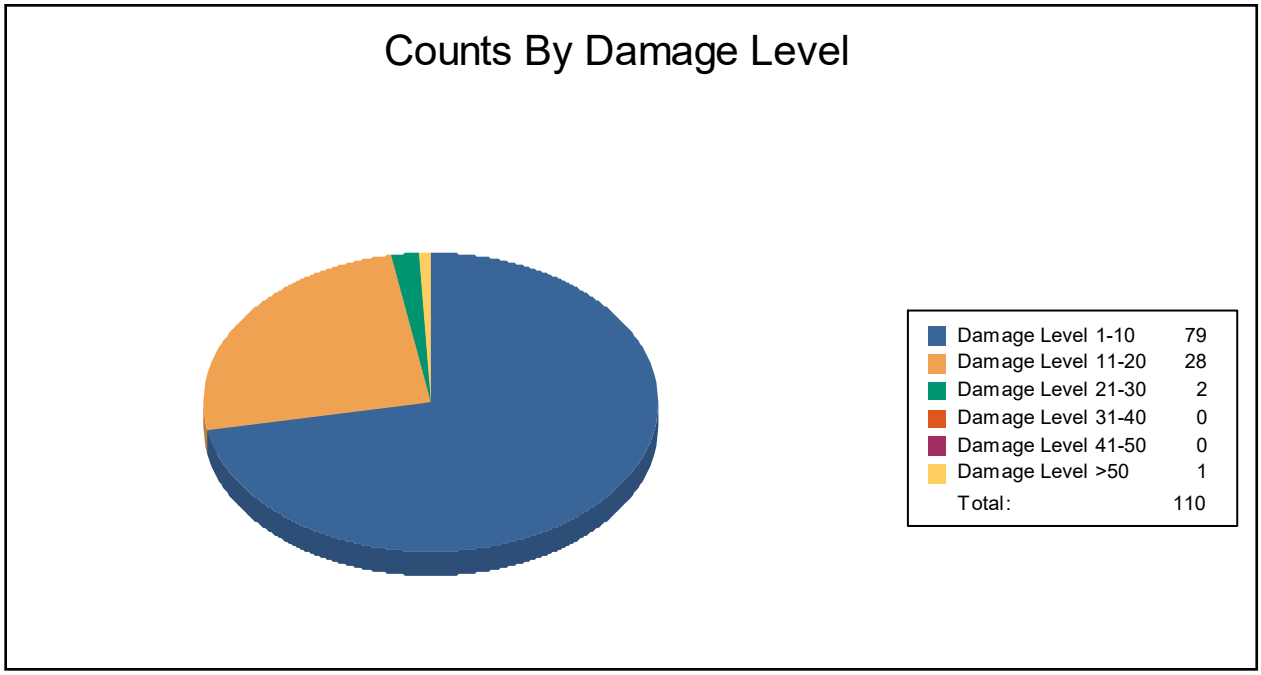


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	4	100	0	0	0	0	0	0	0	0	0	0
Steel	2	100	0	0	0	0	0	0	0	0	0	0
Wood	71	71	27	27	2	2	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 457 hospital beds available for use. On the day of the scenario flood event, the model estimates that 457 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	2	0	0	0
Police Stations	2	0	0	0
Schools	21	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

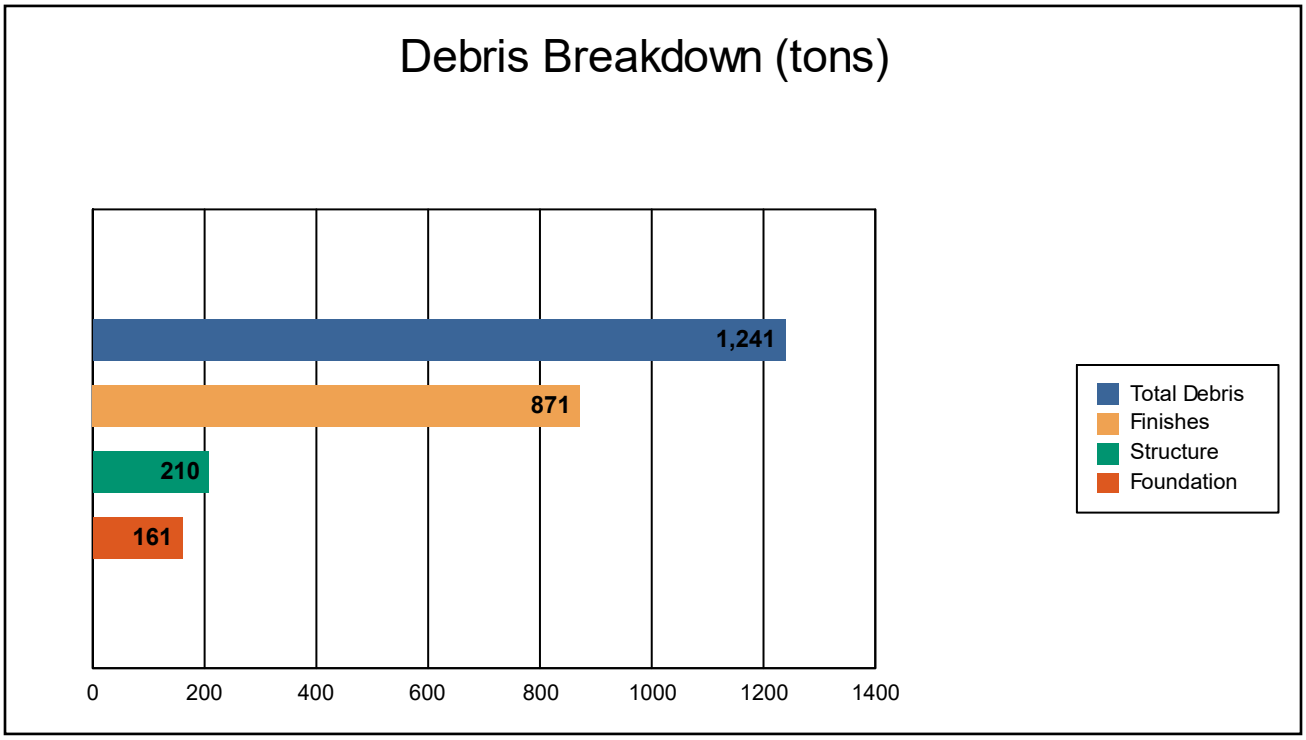
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

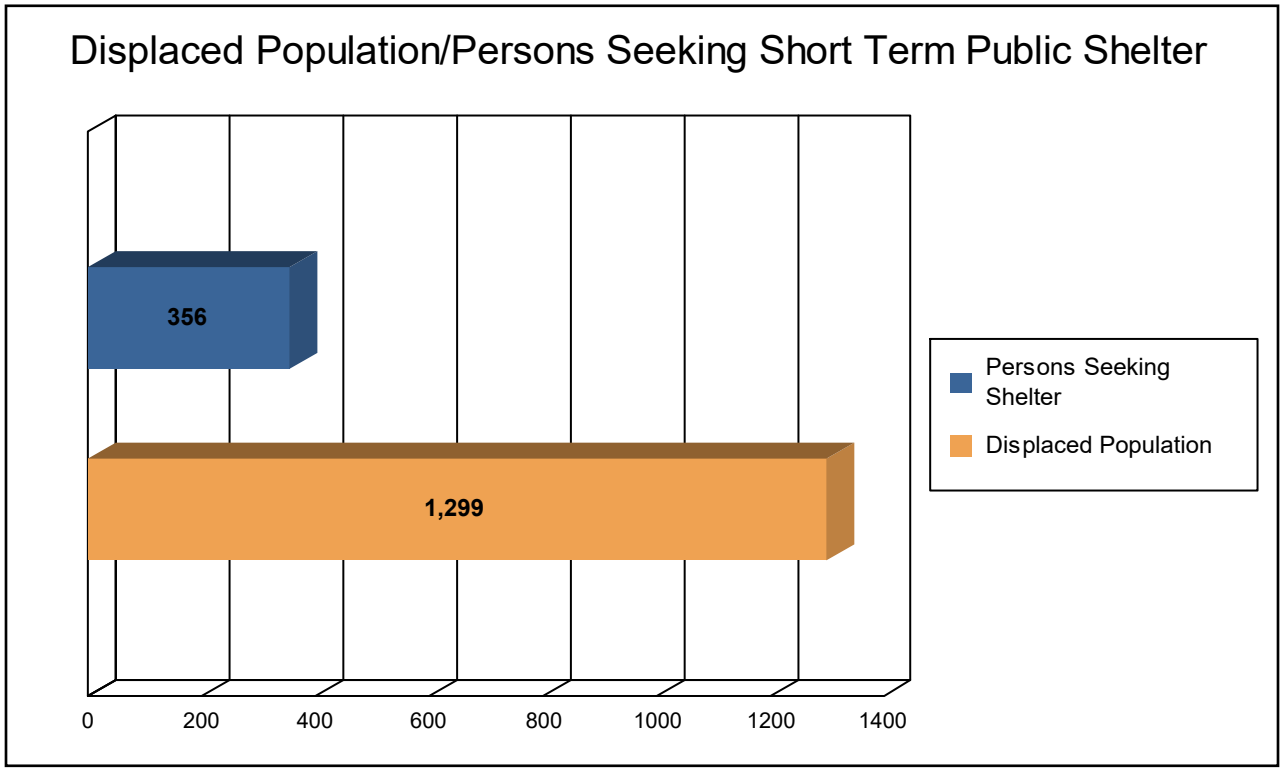


The model estimates that a total of 1,241 tons of debris will be generated. Of the total amount, Finishes comprises 70% of the total, Structure comprises 17% of the total, and Foundation comprises 13%. If the debris tonnage is converted into an estimated number of truckloads, it will require 50 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 433 households (or 1,299 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 356 people (out of a total population of 73,517) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 301.37 million dollars, which represents 10.29 % of the total replacement value of the scenario buildings.

Building-Related Losses

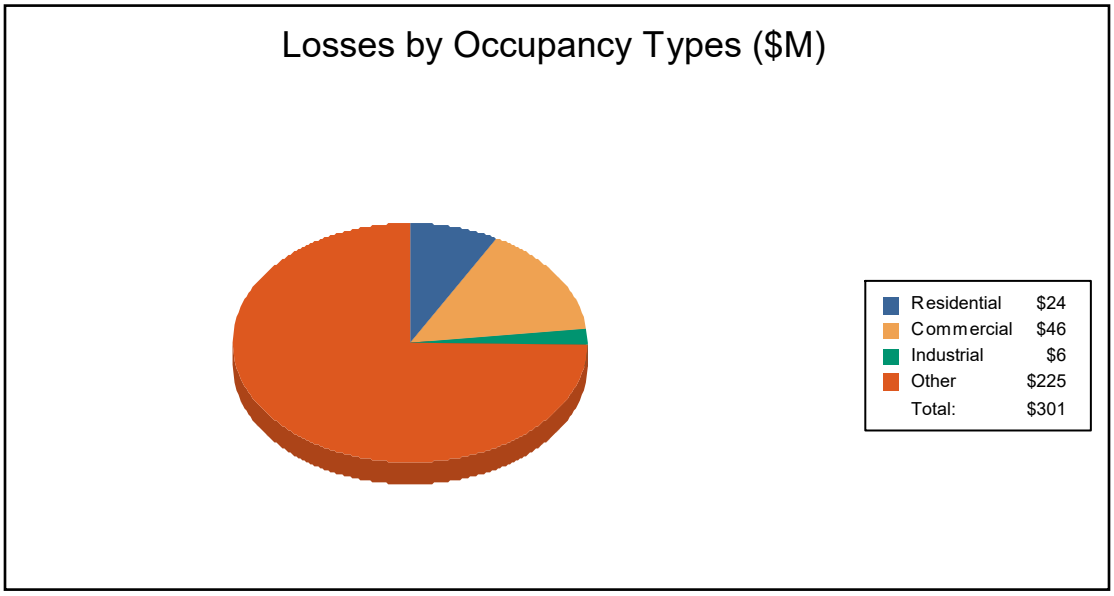
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 82.99 million dollars. 72% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 7.94% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.76	7.07	1.85	4.49	23.17
	Content	6.13	13.13	3.61	31.98	54.86
	Inventory	0.00	4.15	0.48	0.34	4.96
	Subtotal	**15.89**	**24.35**	**5.94**	**36.81**	**82.99**
Business Interruption						
	Income	0.13	7.27	0.06	45.90	53.37
	Relocation	4.43	2.77	0.08	16.51	23.78
	Rental Income	3.18	2.07	0.01	1.92	7.18
	Wage	0.31	9.49	0.11	124.15	134.05
	Subtotal	**8.05**	**21.60**	**0.26**	**188.47**	**218.38**
ALL	**Total**	**23.94**	**45.95**	**6.20**	**225.28**	**301.37**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	73,517	5,650,877	4,688,744	10,339,621
Total	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**
Total Study Region	**73,517**	**5,650,877**	**4,688,744**	**10,339,621**

Hazus: Flood Global Risk Report

Region Name: Newington_FL

Flood Scenario: Newington_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 336 census blocks. The region contains over 13 thousand households and has a total population of 30,486 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,827 buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 87.84% of the buildings (and 53.42% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,827 buildings in the region which have an aggregate total replacement value of 5,260 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,809,887	53.4%
Commercial	1,346,651	25.6%
Industrial	575,425	10.9%
Agricultural	18,207	0.3%
Religion	88,944	1.7%
Government	217,397	4.1%
Education	203,384	3.9%
Total	**5,259,895**	**100%**

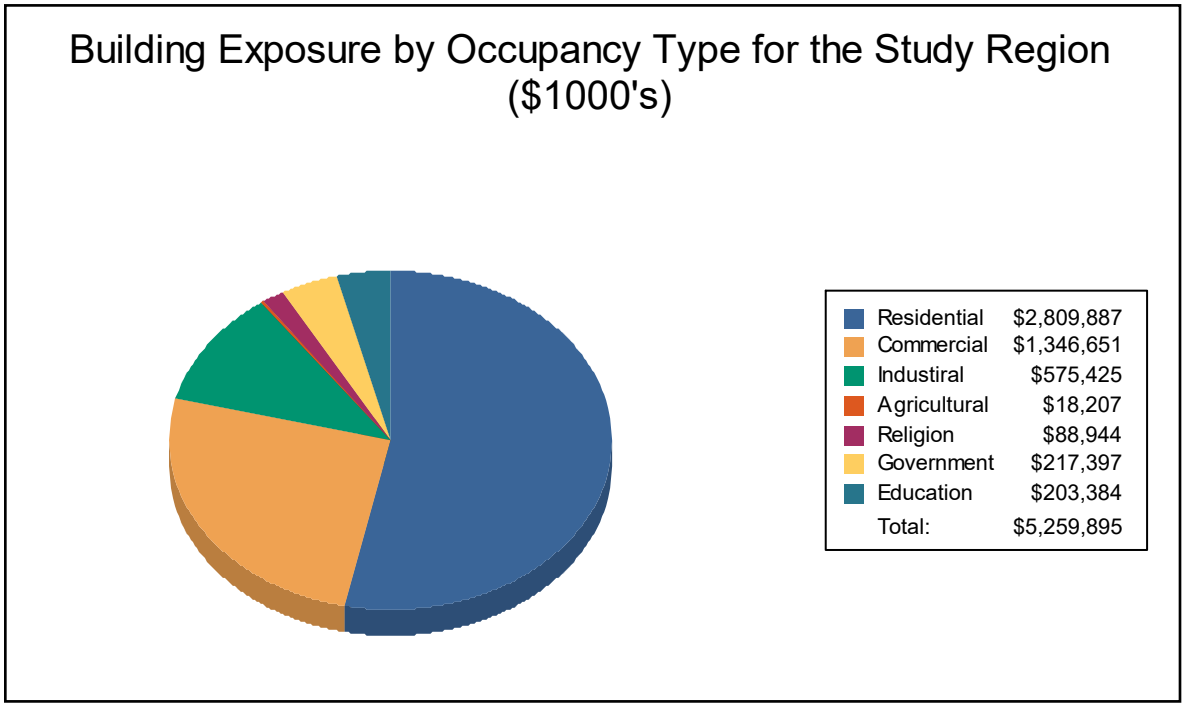
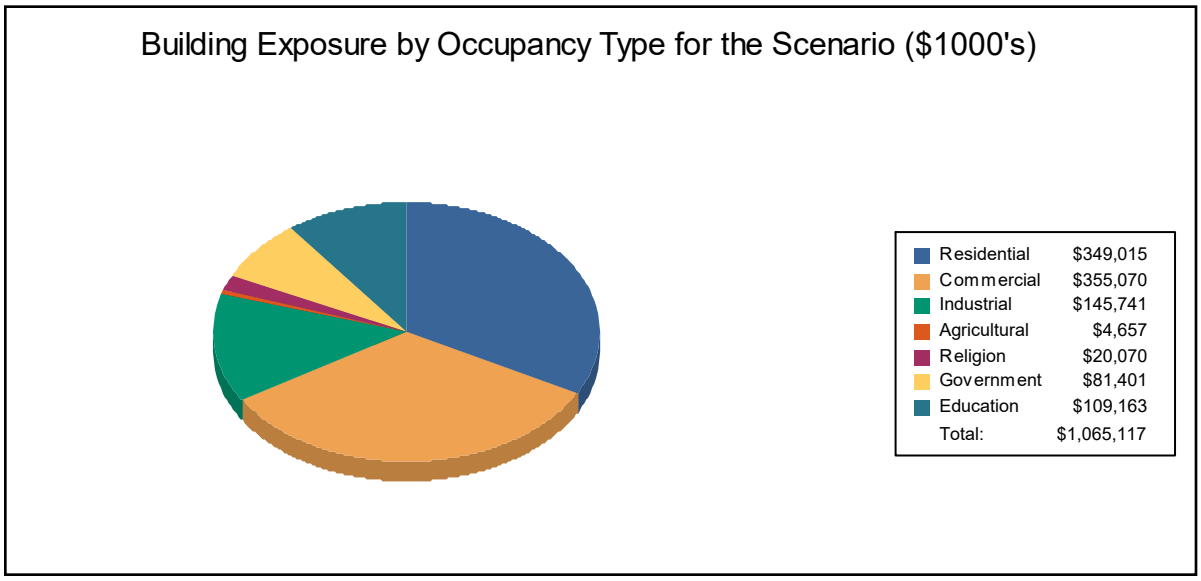


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	349,015	32.8%
Commercial	355,070	33.3%
Industrial	145,741	13.7%
Agricultural	4,657	0.4%
Religion	20,070	1.9%
Government	81,401	7.6%
Education	109,163	10.2%
Total	**1,065,117**	**100%**



Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 5 fire stations, 1 police station and 1 emergency operation center.

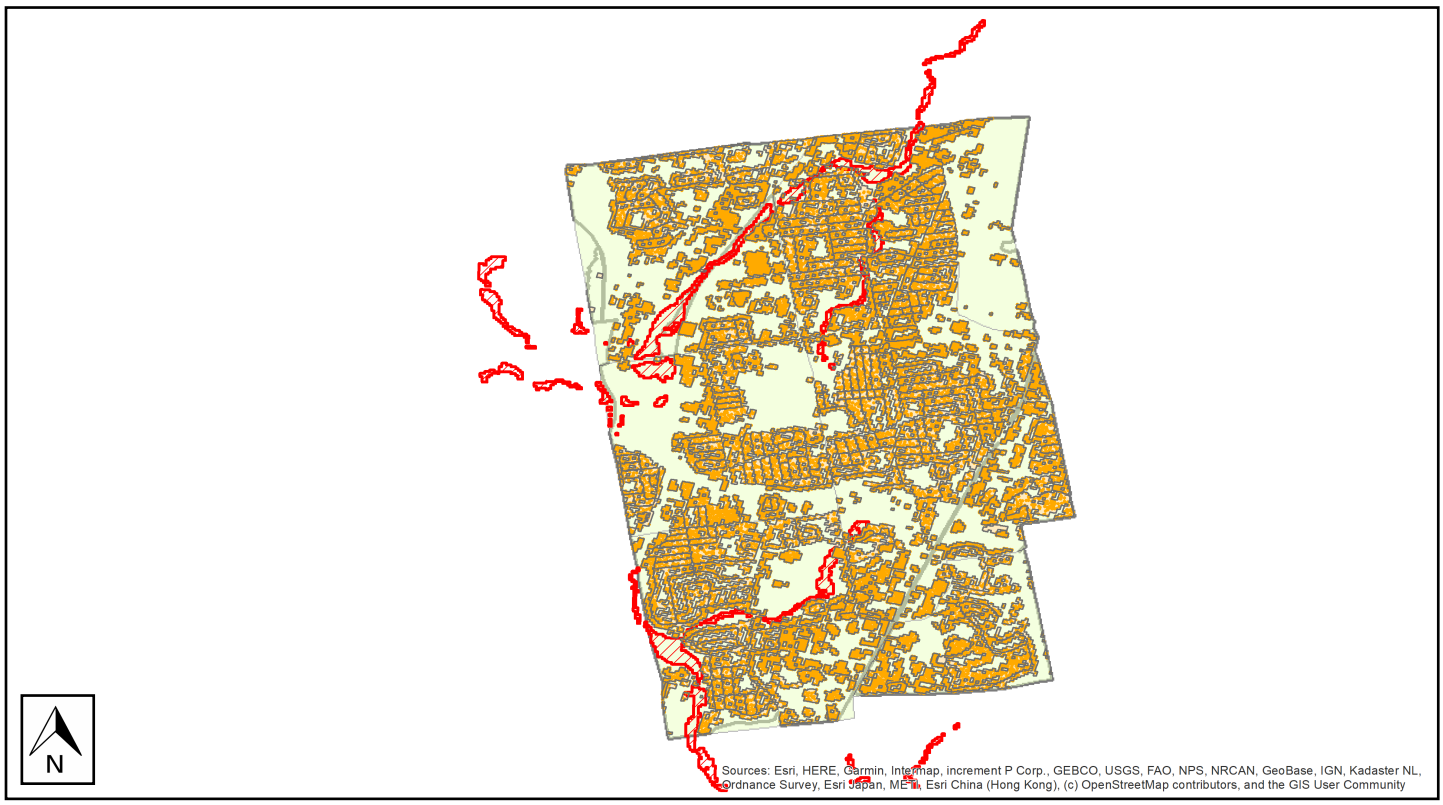
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Newington_FL
Scenario Name:	Newington_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

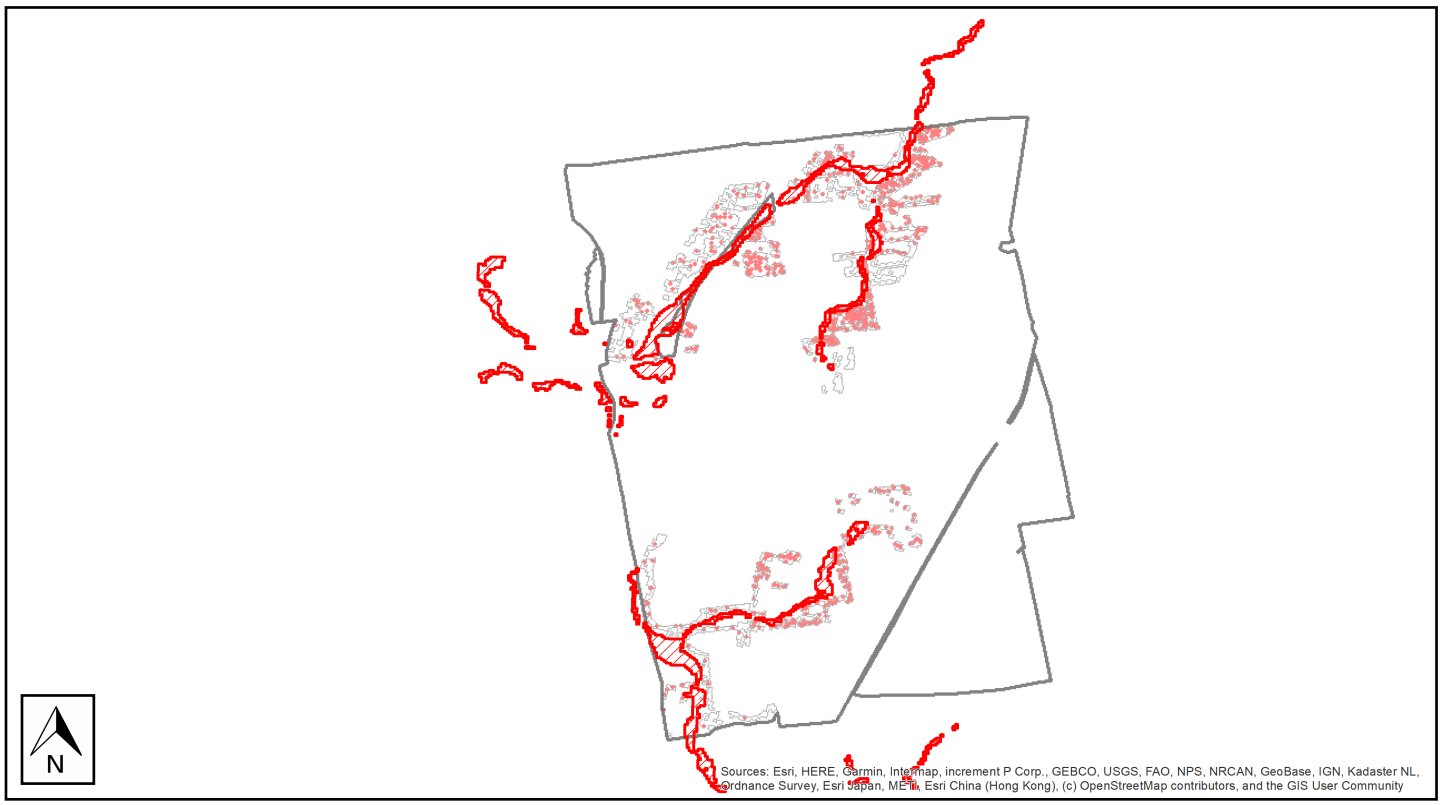


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	100	0	0	0	0	0	0	0	0	0	0
Total	**3**		**0**		**0**		**0**		**0**		**0**	

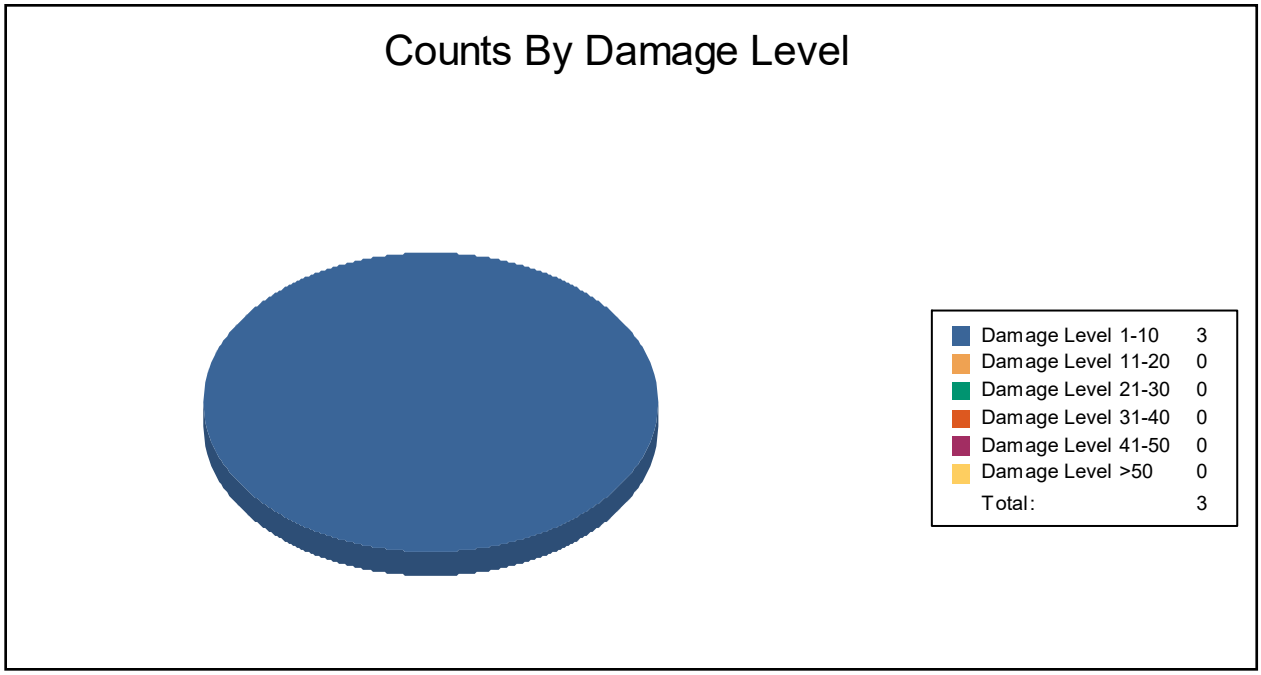


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	2	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

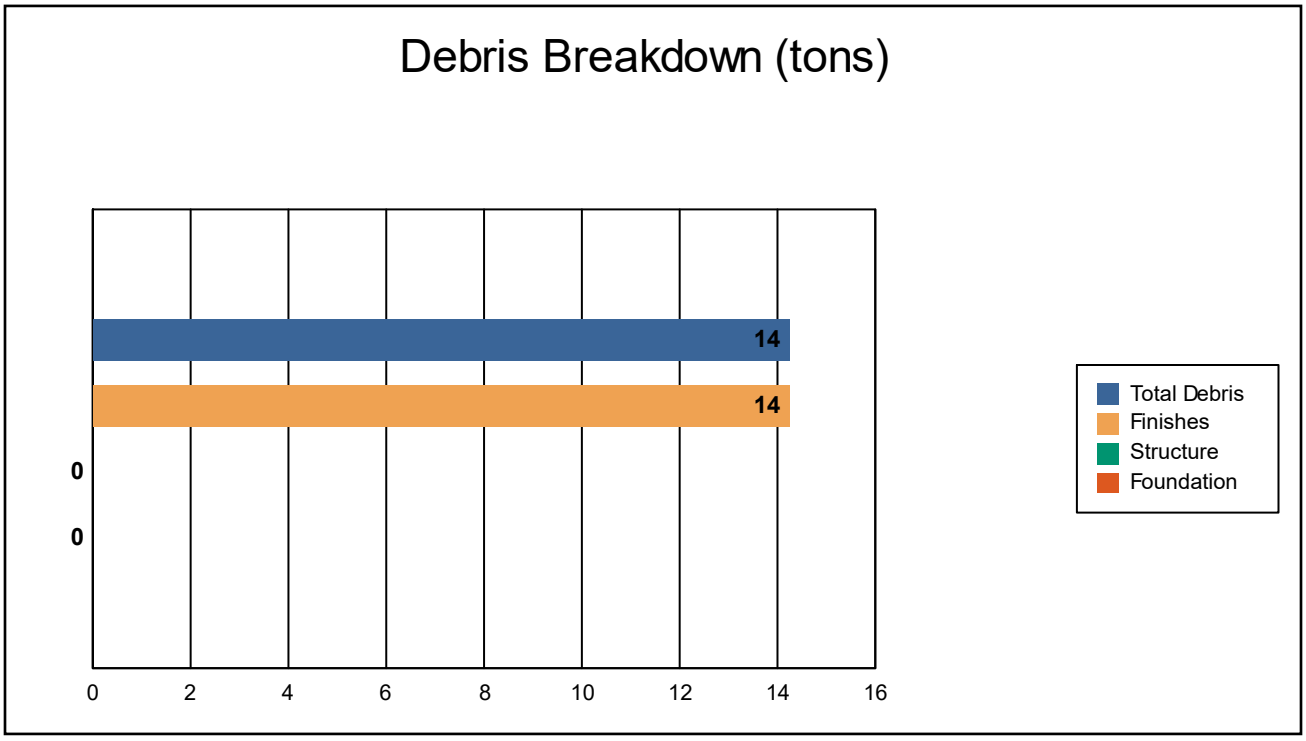
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

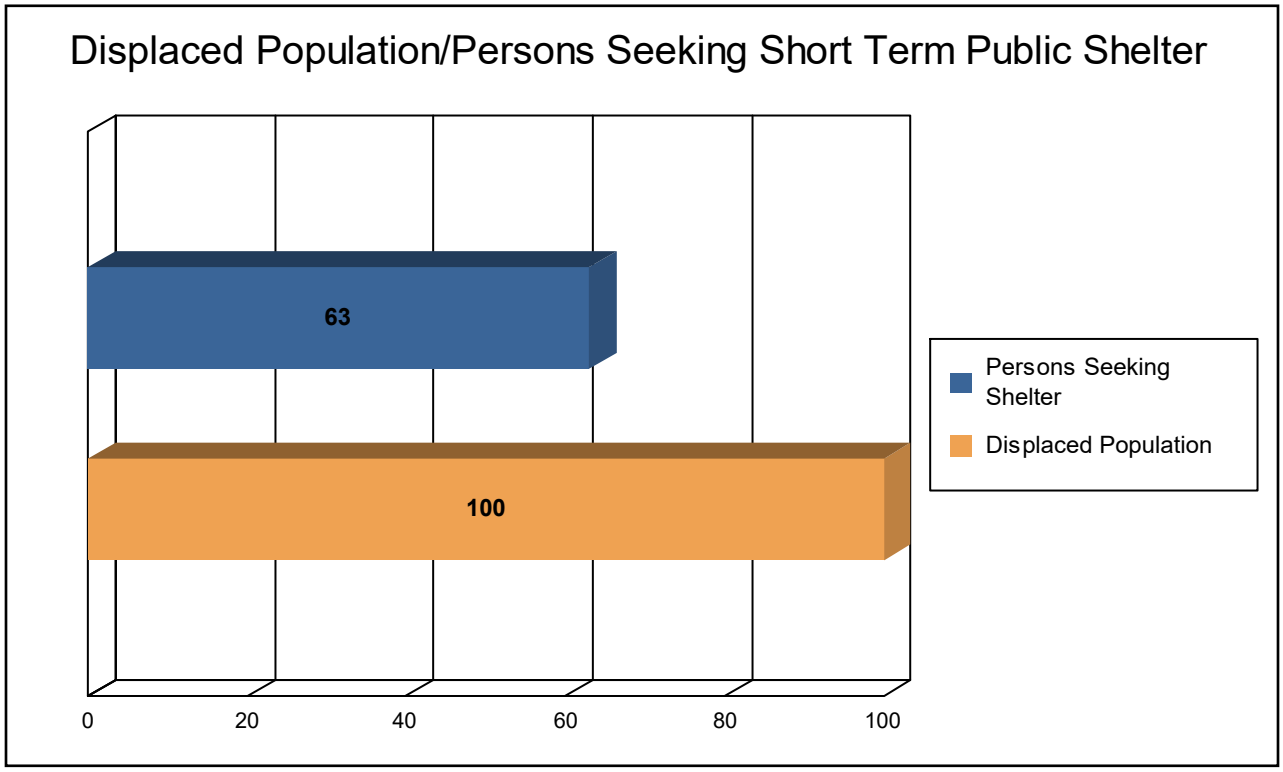


The model estimates that a total of 14 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 33 households (or 100 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 63 people (out of a total population of 30,486) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 3.99 million dollars, which represents 0.37 % of the total replacement value of the scenario buildings.

Building-Related Losses

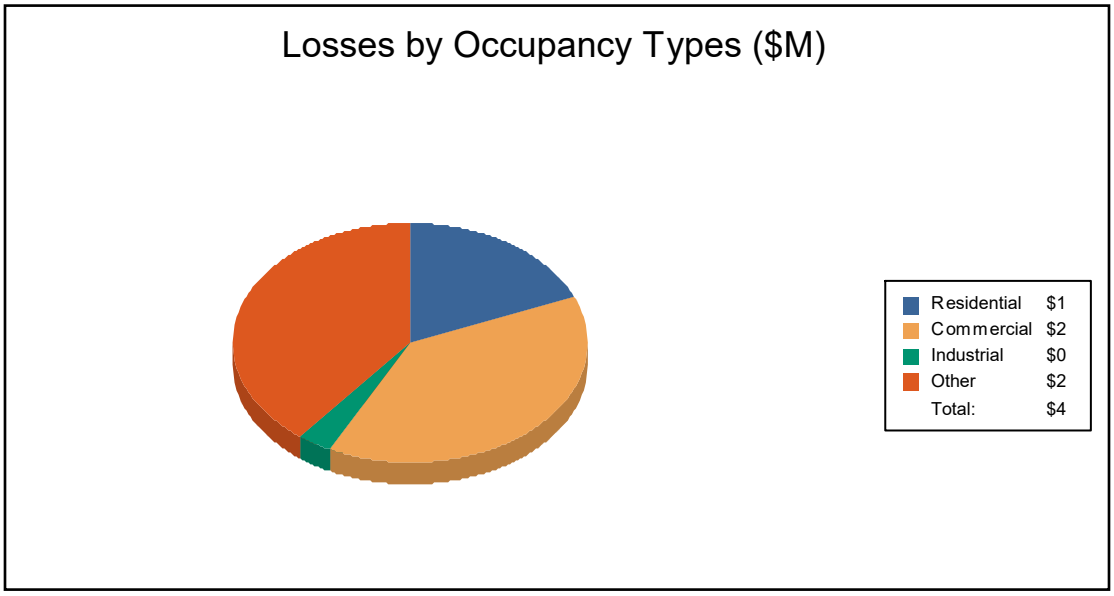
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 1.00 million dollars. 75% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 18.62% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.27	0.13	0.04	0.01	0.44
	Content	0.12	0.27	0.07	0.09	0.54
	Inventory	0.00	0.02	0.01	0.00	0.03
	Subtotal	**0.39**	**0.41**	**0.11**	**0.10**	**1.00**
Business Interruption						
	Income	0.01	0.40	0.00	0.22	0.64
	Relocation	0.23	0.08	0.00	0.13	0.44
	Rental Income	0.08	0.05	0.00	0.01	0.14
	Wage	0.03	0.62	0.00	1.11	1.77
	Subtotal	**0.35**	**1.14**	**0.01**	**1.48**	**2.98**
ALL	**Total**	**0.74**	**1.55**	**0.12**	**1.57**	**3.99**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	30,486	2,809,887	2,450,008	5,259,895
Total	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**
Total Study Region	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**

Hazus: Flood Global Risk Report

Region Name: Newington_FL

Flood Scenario: Newington_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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Note:
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The geographical size of the region is approximately 6 square miles and contains 336 census blocks. The region contains over 13 thousand households and has a total population of 30,486 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,827 buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 87.84% of the buildings (and 53.42% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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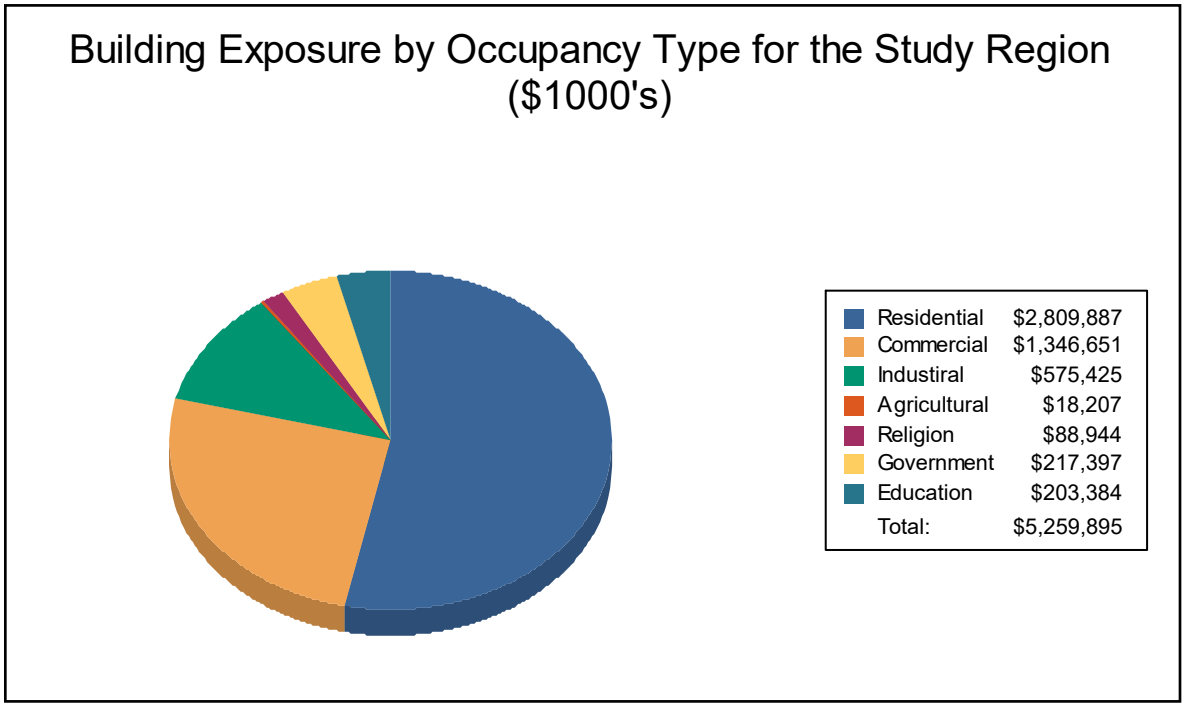

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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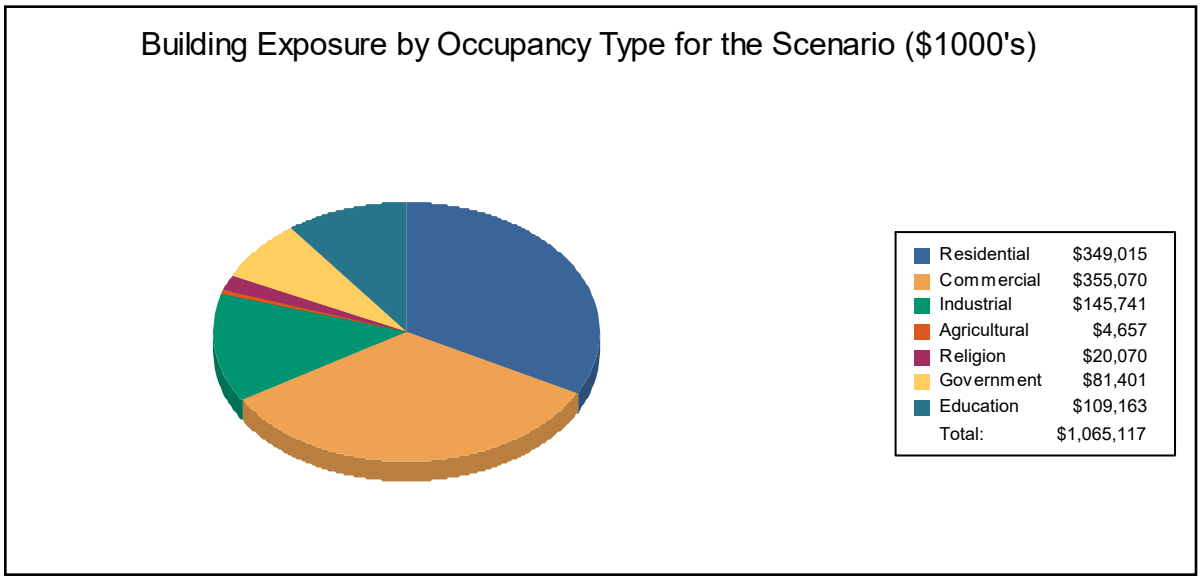


Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 5 fire stations, 1 police station and 1 emergency operation center.

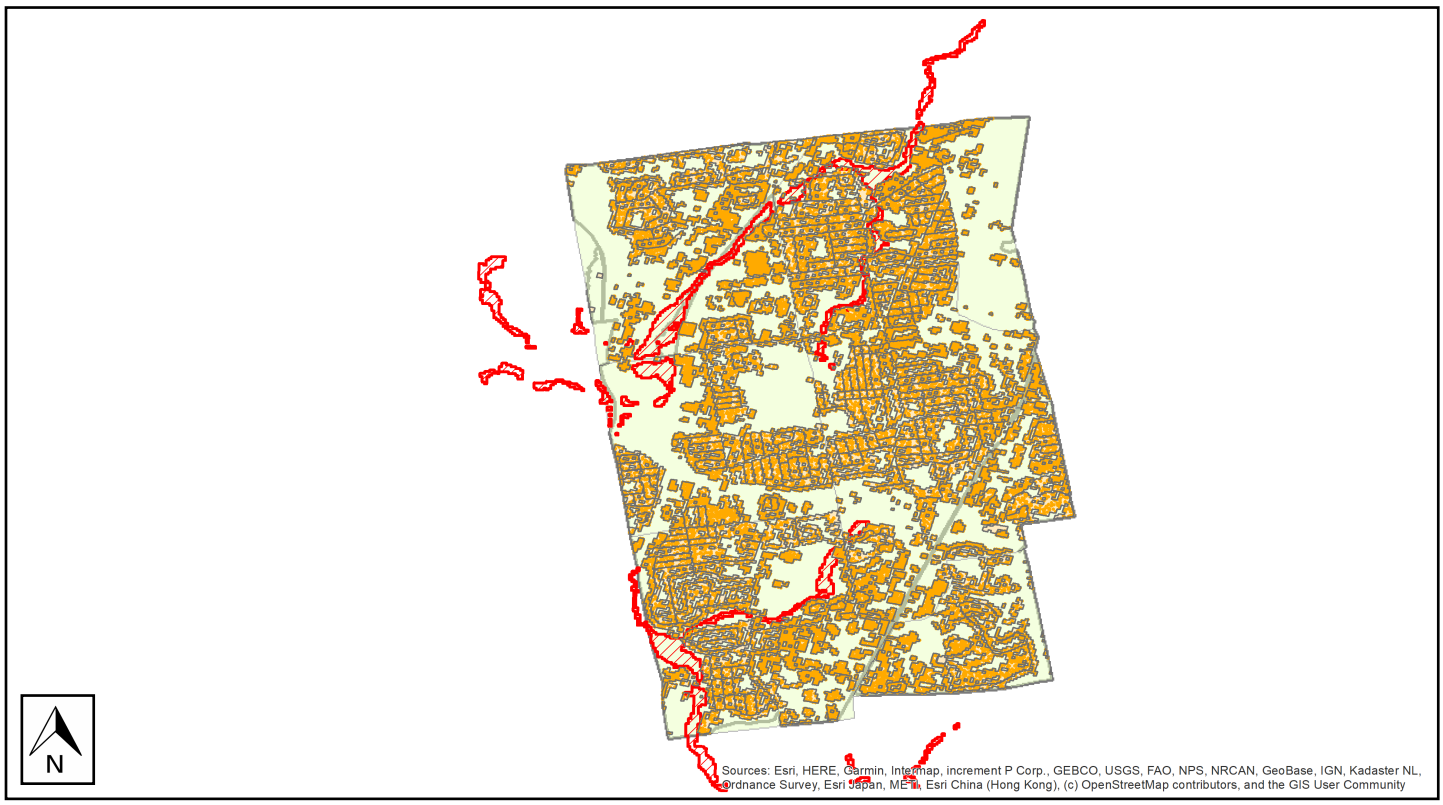
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Newington_FL
Scenario Name:	Newington_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

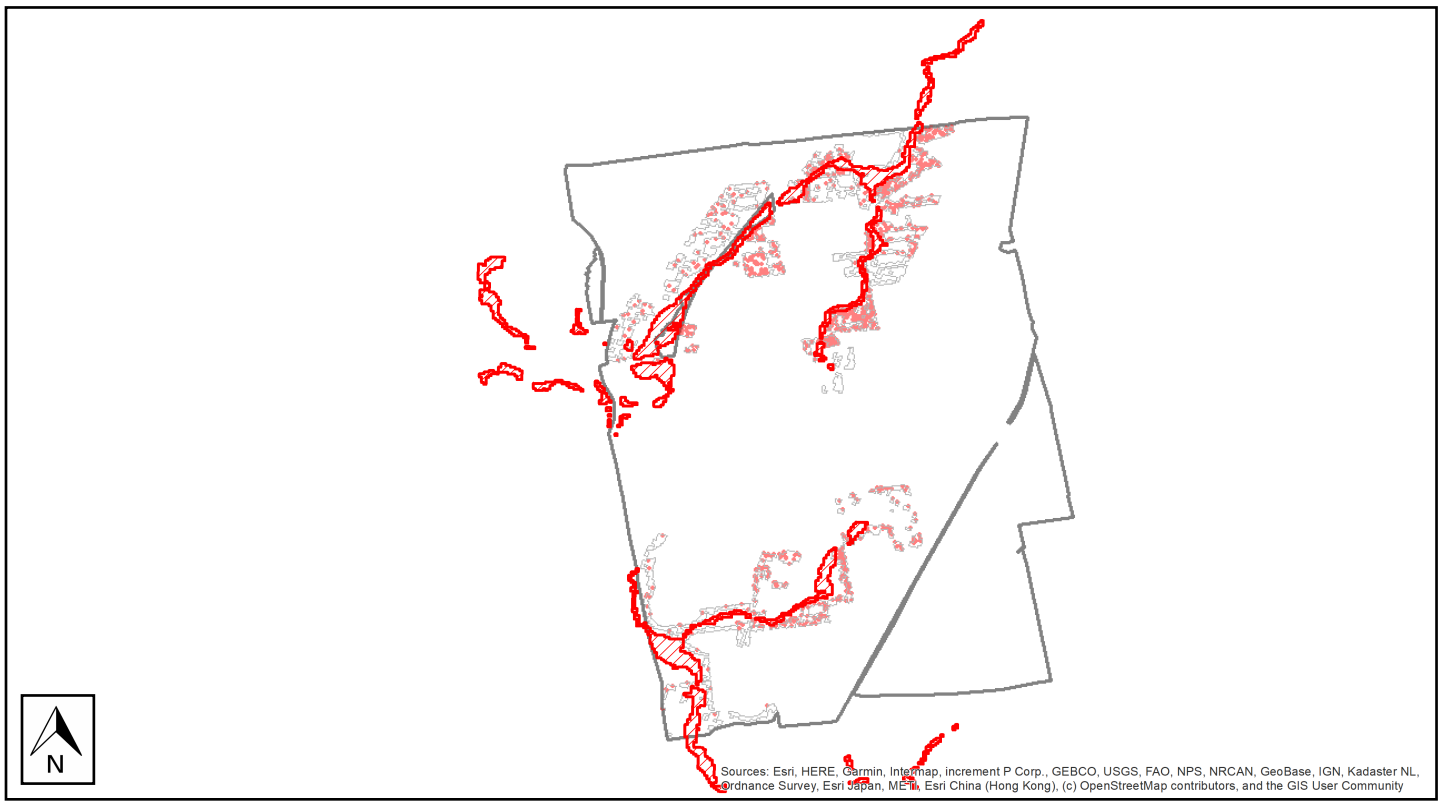


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	100	0	0	0	0	0	0	0	0	0	0
Total	**2**		**0**		**0**		**0**		**0**		**0**	

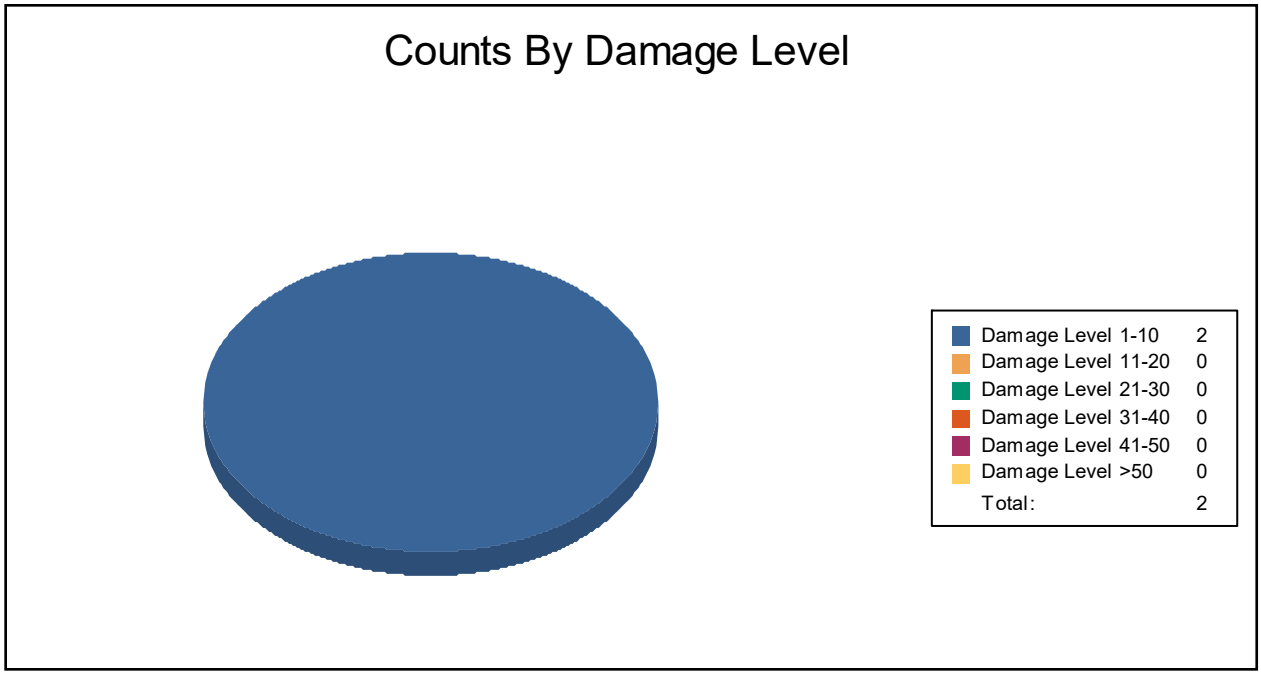


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	2	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

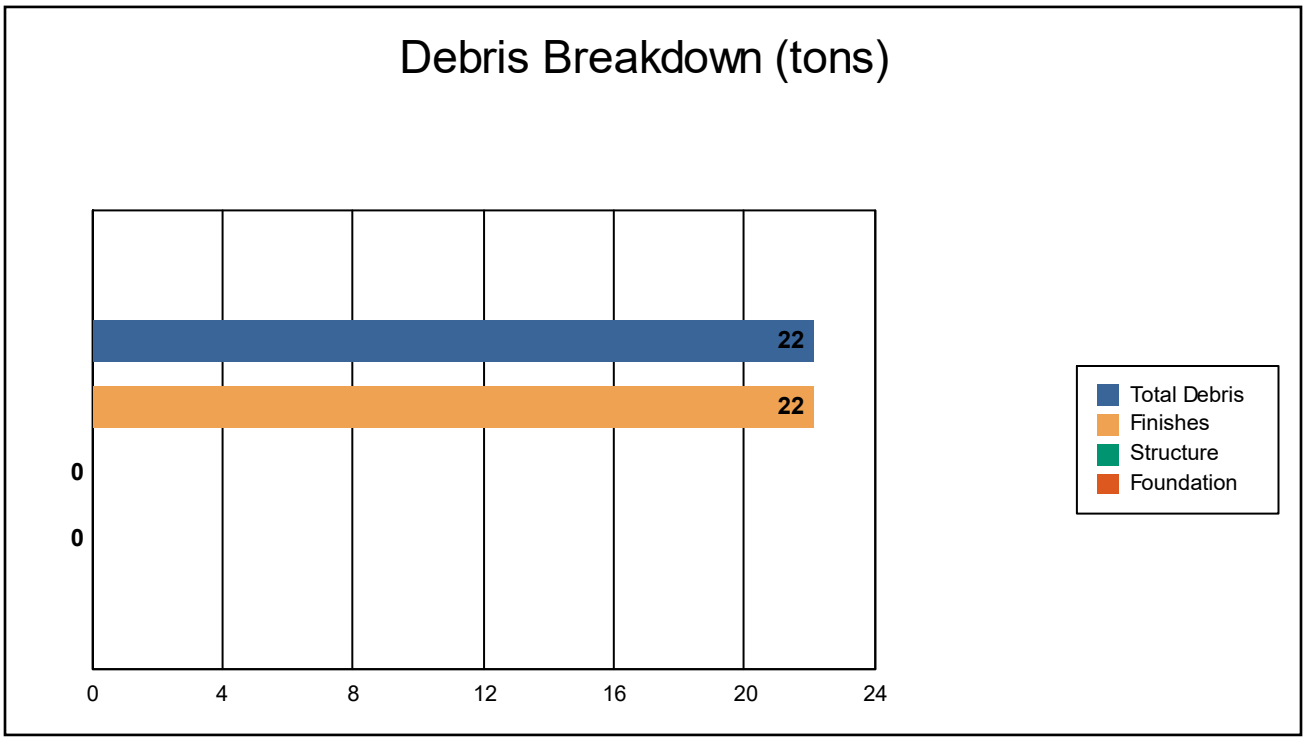
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

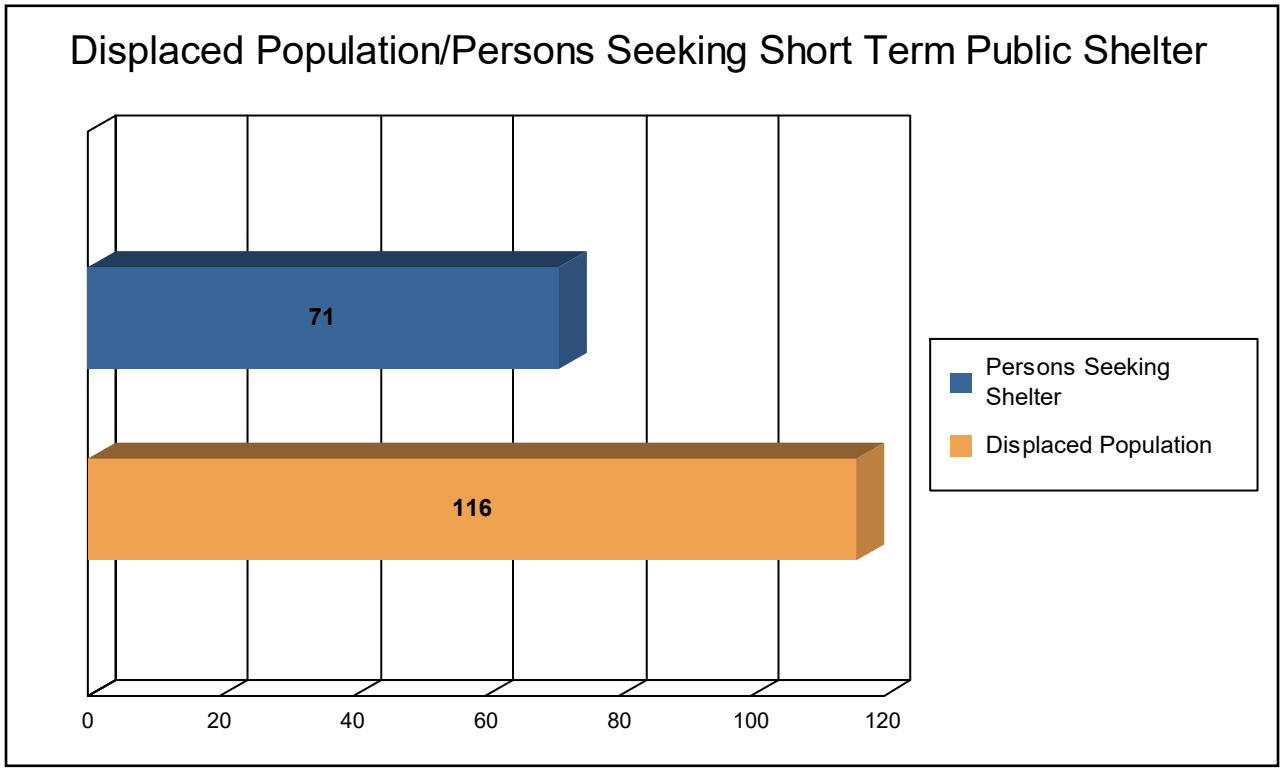


The model estimates that a total of 22 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 39 households (or 116 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 71 people (out of a total population of 30,486) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 5.11 million dollars, which represents 0.48 % of the total replacement value of the scenario buildings.

Building-Related Losses

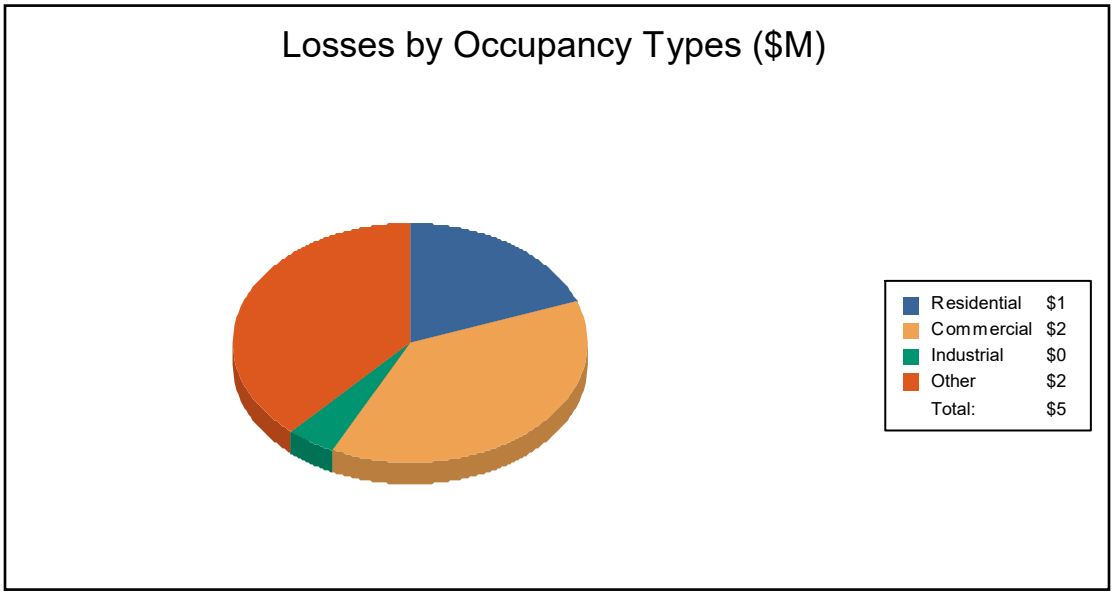
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 1.56 million dollars. 69% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.40% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.41	0.17	0.07	0.01	0.66
	Content	0.18	0.39	0.13	0.14	0.84
	Inventory	0.00	0.04	0.01	0.01	0.06
	Subtotal	**0.60**	**0.60**	**0.21**	**0.16**	**1.56**
Business Interruption						
	Income	0.01	0.47	0.00	0.26	0.74
	Relocation	0.26	0.09	0.01	0.15	0.51
	Rental Income	0.08	0.06	0.00	0.02	0.16
	Wage	0.04	0.72	0.01	1.38	2.14
	Subtotal	**0.40**	**1.34**	**0.02**	**1.80**	**3.55**
ALL	**Total**	**0.99**	**1.94**	**0.22**	**1.96**	**5.11**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	30,486	2,809,887	2,450,008	5,259,895
Total	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**
Total Study Region	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**

Hazus: Flood Global Risk Report

Region Name: Newington_FL

Flood Scenario: Newington_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 336 census blocks. The region contains over 13 thousand households and has a total population of 30,486 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,827 buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 87.84% of the buildings (and 53.42% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,827 buildings in the region which have an aggregate total replacement value of 5,260 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,809,887	53.4%
Commercial	1,346,651	25.6%
Industrial	575,425	10.9%
Agricultural	18,207	0.3%
Religion	88,944	1.7%
Government	217,397	4.1%
Education	203,384	3.9%
Total	**5,259,895**	**100%**

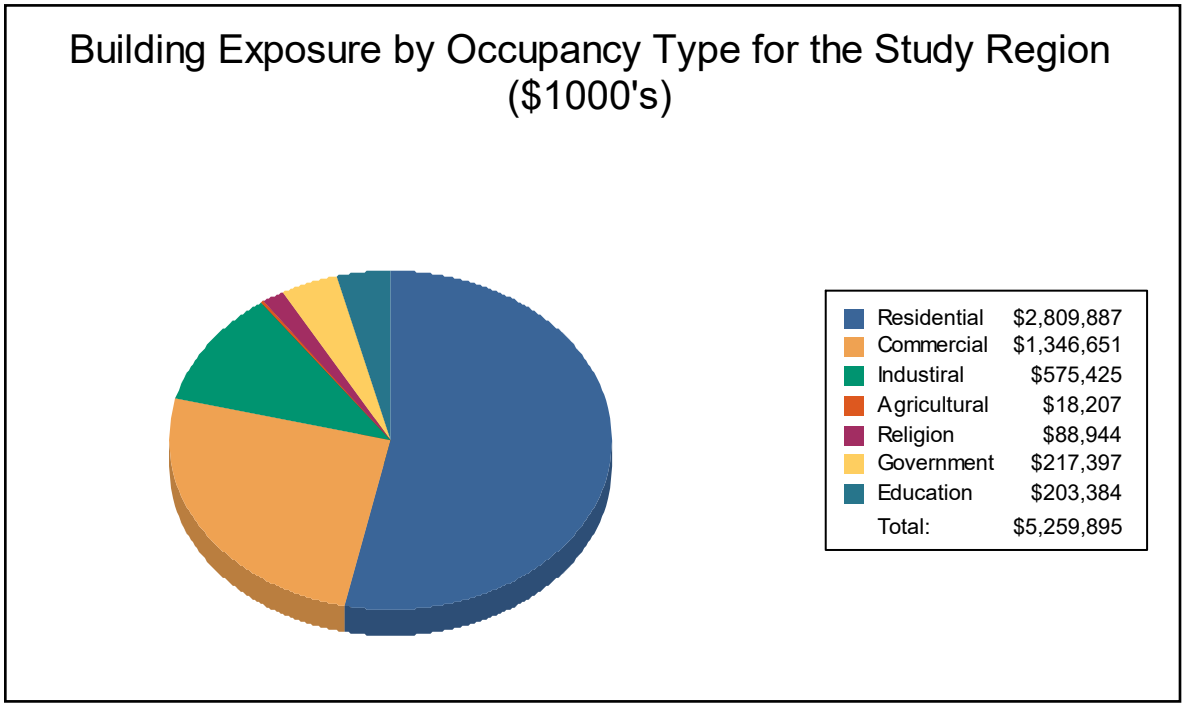
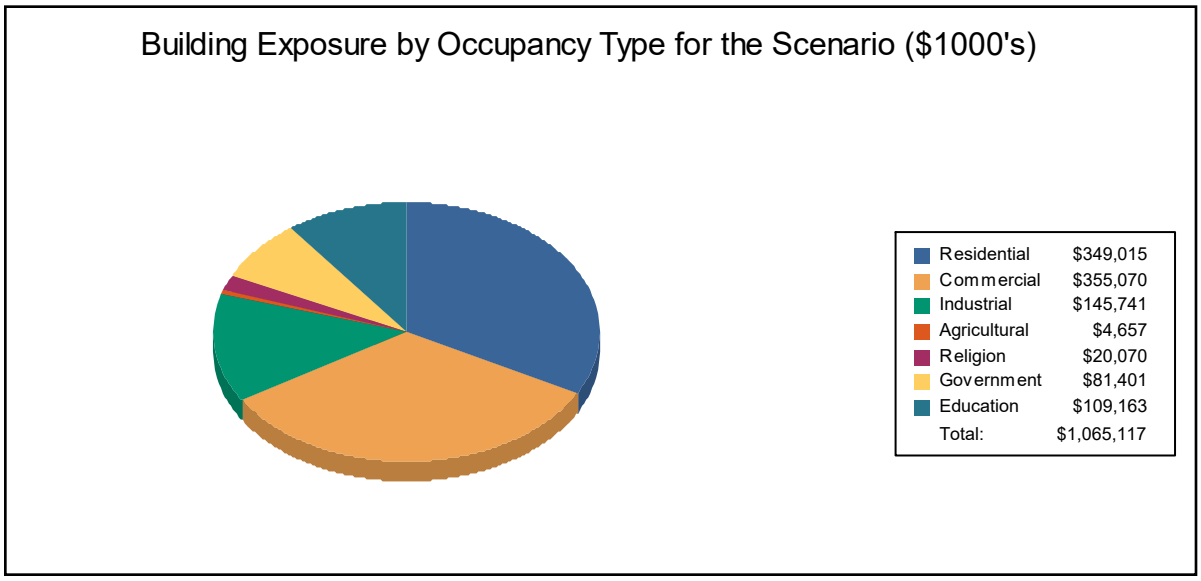


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	349,015	32.8%
Commercial	355,070	33.3%
Industrial	145,741	13.7%
Agricultural	4,657	0.4%
Religion	20,070	1.9%
Government	81,401	7.6%
Education	109,163	10.2%
Total	**1,065,117**	**100%**



Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 5 fire stations, 1 police station and 1 emergency operation center.

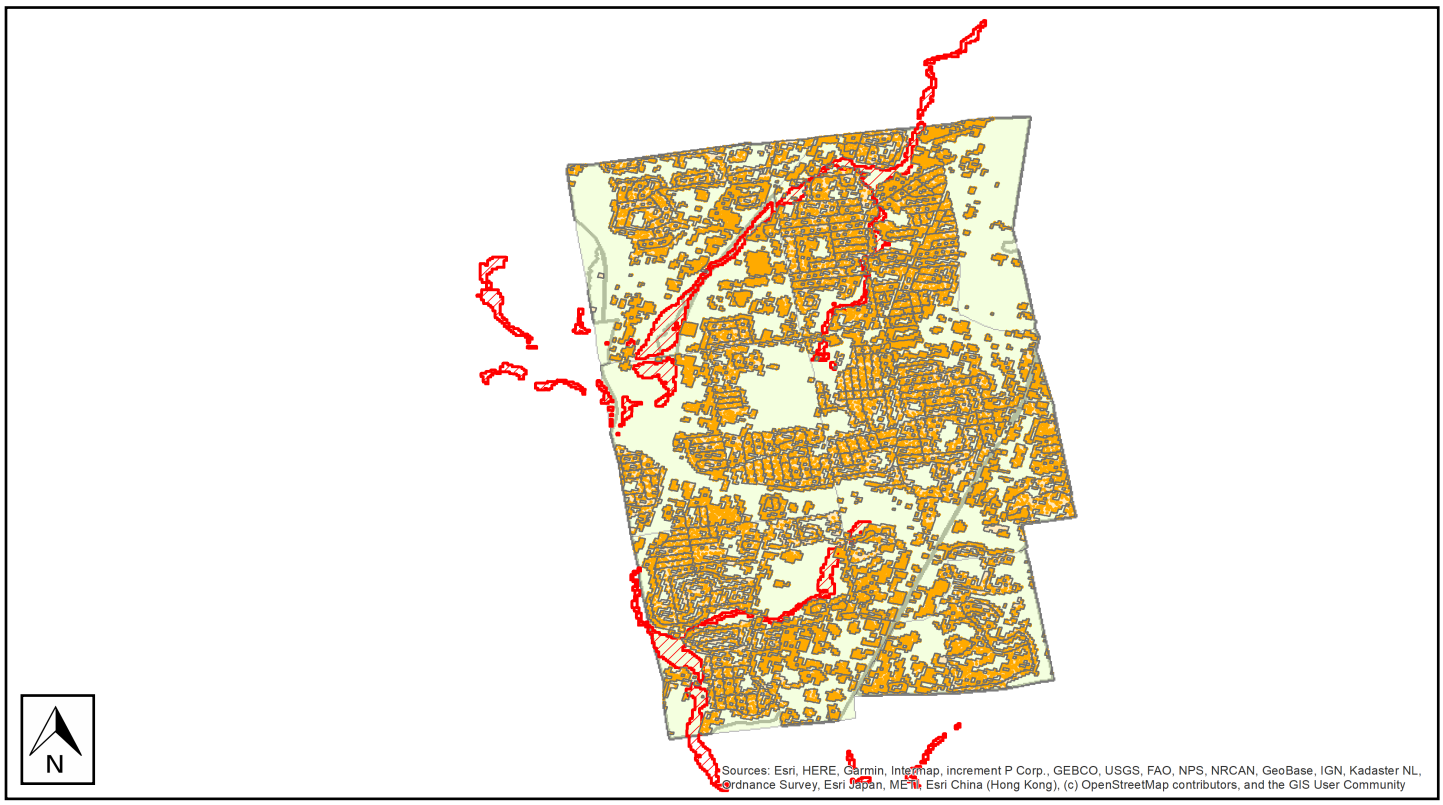
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Newington_FL
Scenario Name:	Newington_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

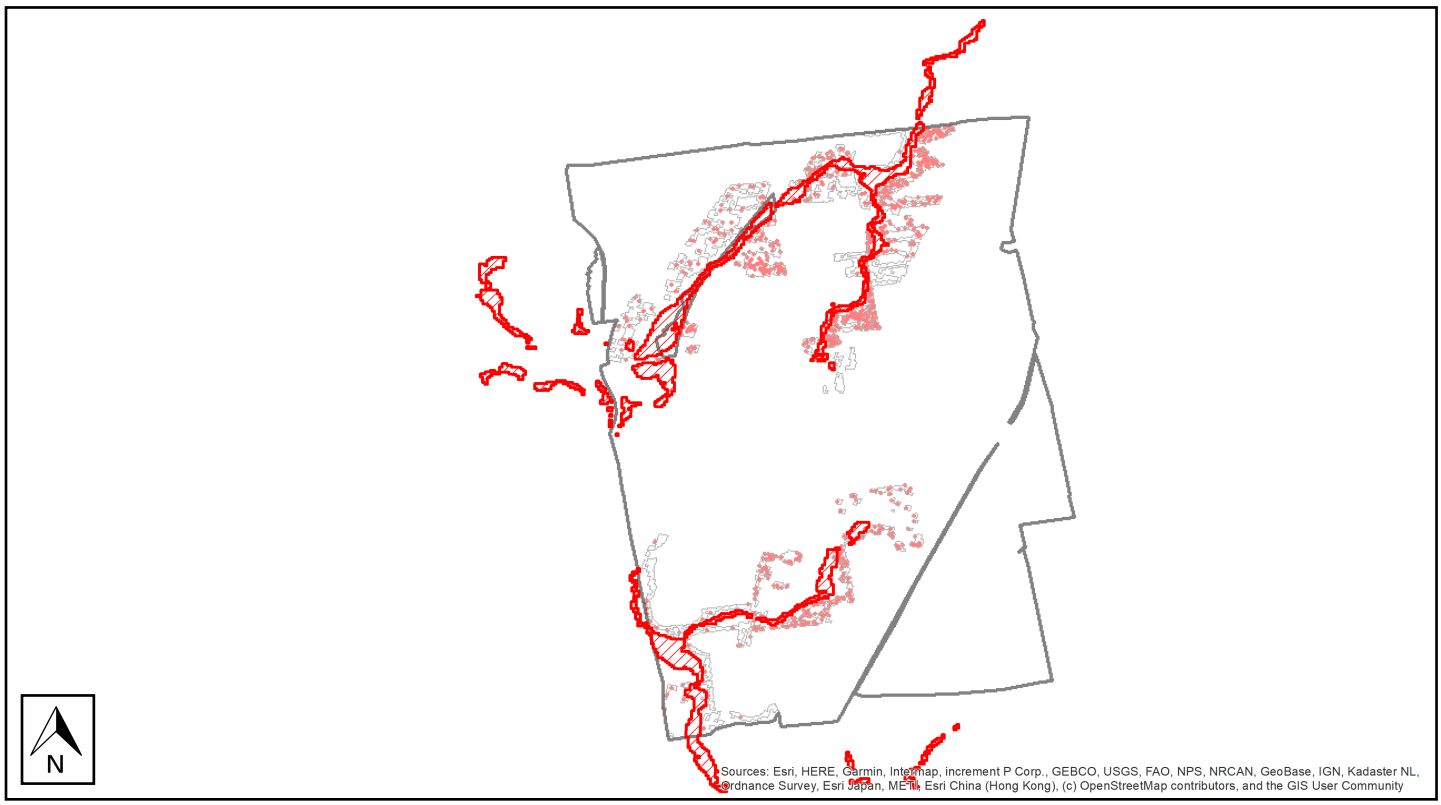


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	100	0	0	0	0	0	0	0	0	0	0
Total	**3**		**0**		**0**		**0**		**0**		**0**	

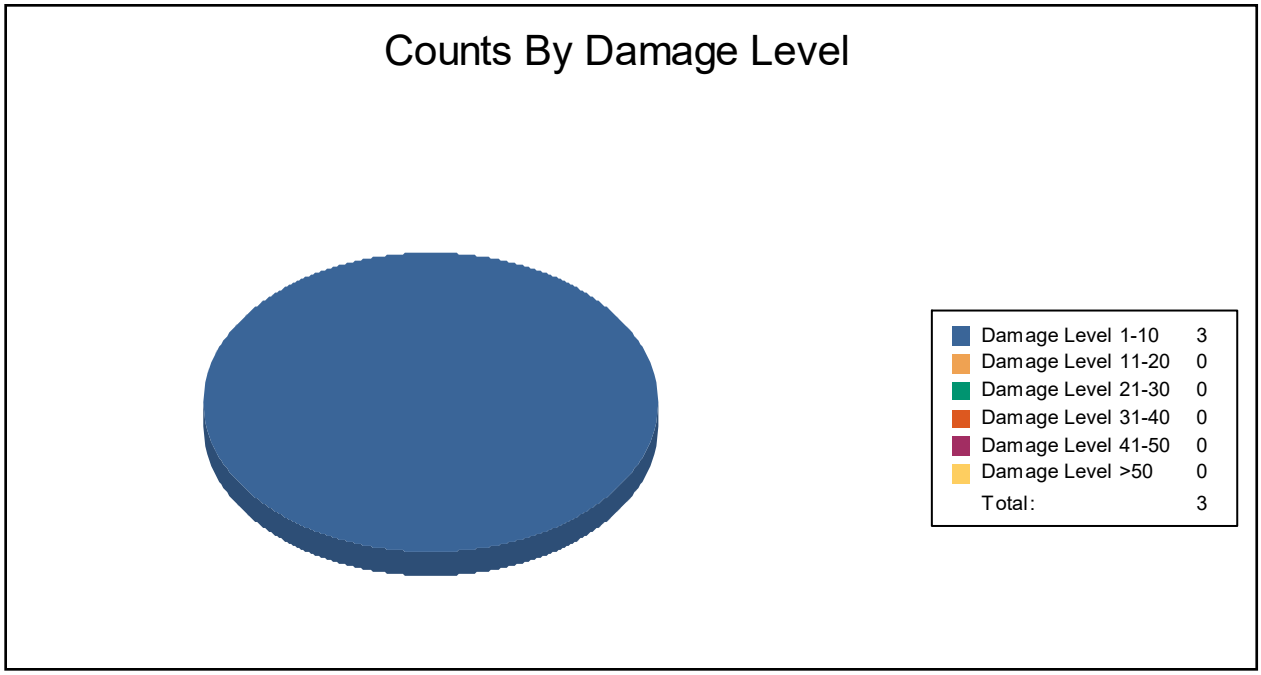


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	100	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	2	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

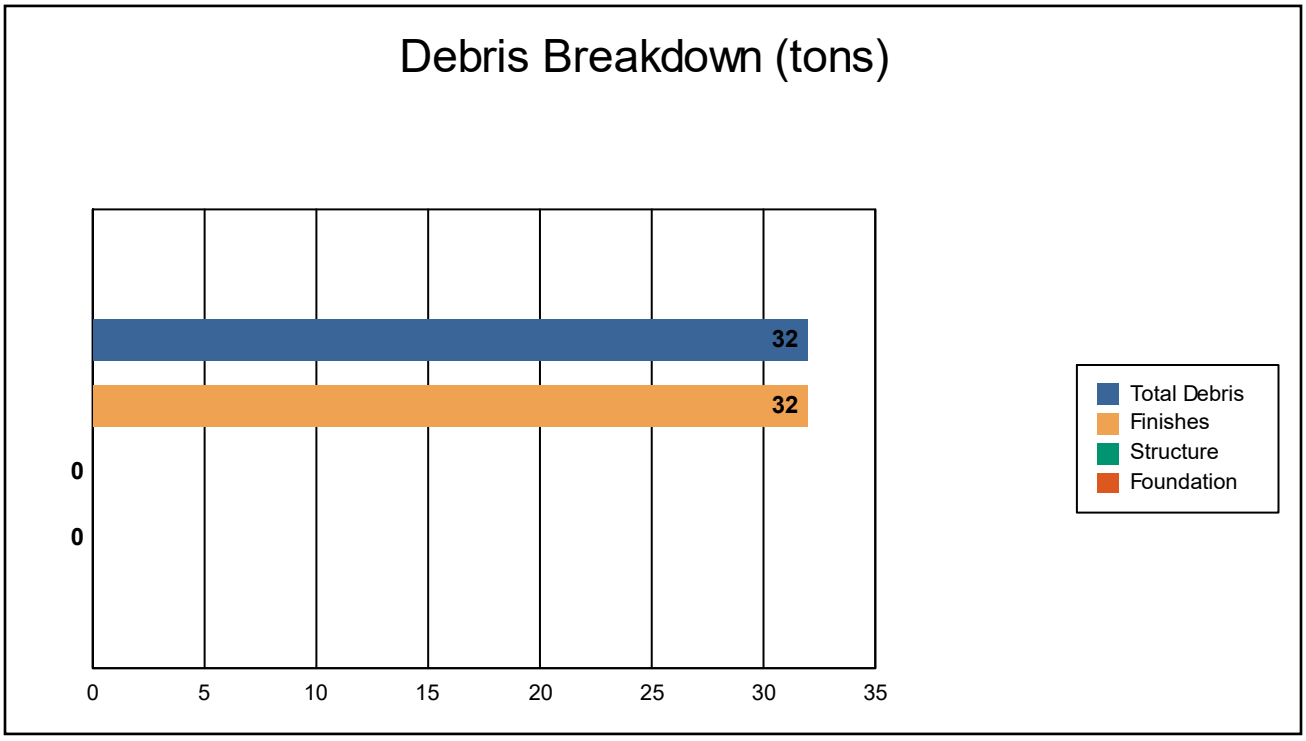
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

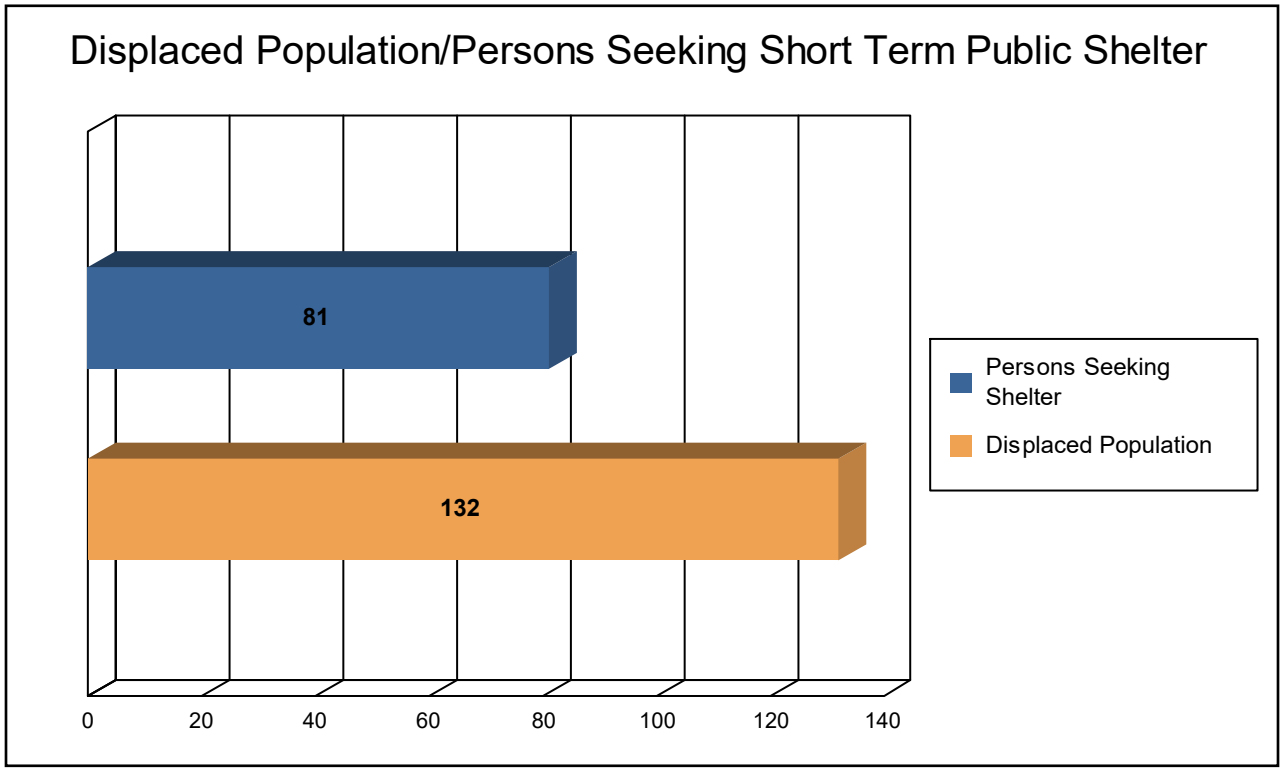


The model estimates that a total of 32 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 44 households (or 132 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 81 people (out of a total population of 30,486) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 6.57 million dollars, which represents 0.62 % of the total replacement value of the scenario buildings.

Building-Related Losses

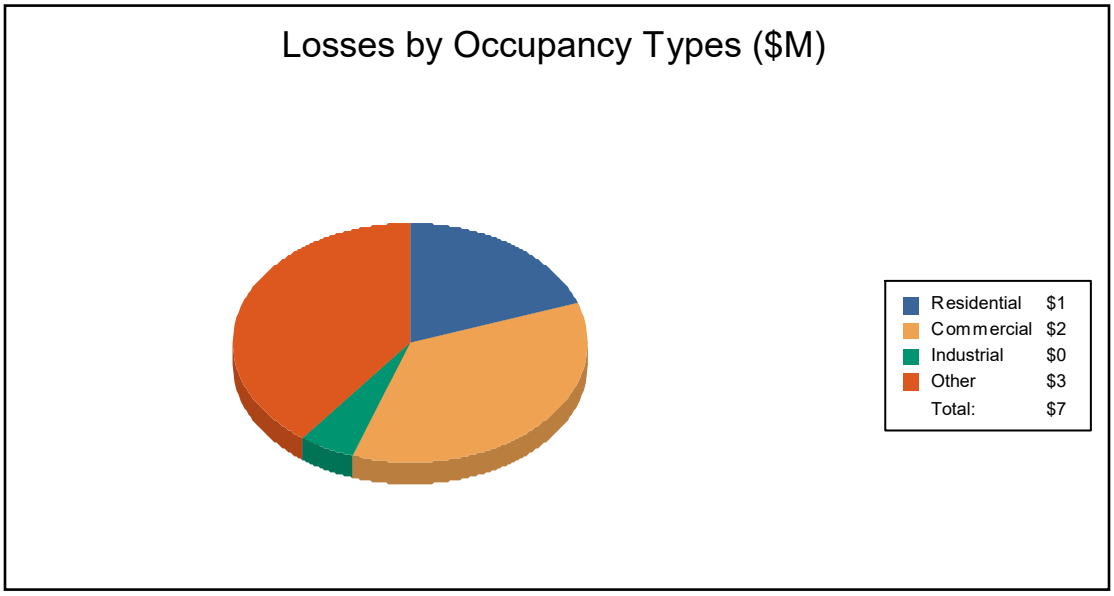
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 2.25 million dollars. 66% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.80% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.58	0.21	0.10	0.03	0.92
	Content	0.26	0.54	0.19	0.25	1.24
	Inventory	0.00	0.06	0.02	0.02	0.10
	Subtotal	**0.84**	**0.80**	**0.32**	**0.30**	**2.25**
Business Interruption						
	Income	0.02	0.52	0.00	0.31	0.85
	Relocation	0.30	0.11	0.01	0.18	0.60
	Rental Income	0.10	0.07	0.00	0.02	0.19
	Wage	0.05	0.84	0.01	1.79	2.68
	Subtotal	**0.46**	**1.53**	**0.02**	**2.30**	**4.32**
ALL	**Total**	**1.30**	**2.33**	**0.34**	**2.60**	**6.57**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	30,486	2,809,887	2,450,008	5,259,895
Total	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**
Total Study Region	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**

Hazus: Flood Global Risk Report

Region Name: Newington_FL

Flood Scenario: Newington_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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Note:
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The geographical size of the region is approximately 6 square miles and contains 336 census blocks. The region contains over 13 thousand households and has a total population of 30,486 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,827 buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 87.84% of the buildings (and 53.42% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,827 buildings in the region which have an aggregate total replacement value of 5,260 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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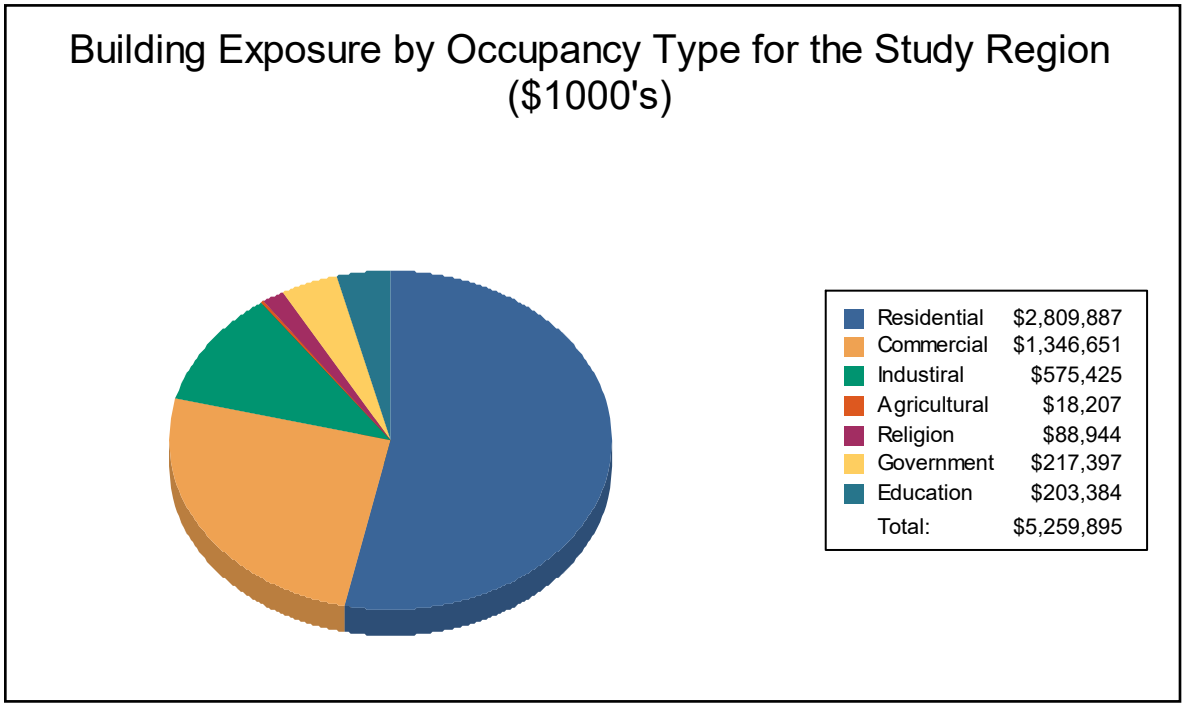

Table 2
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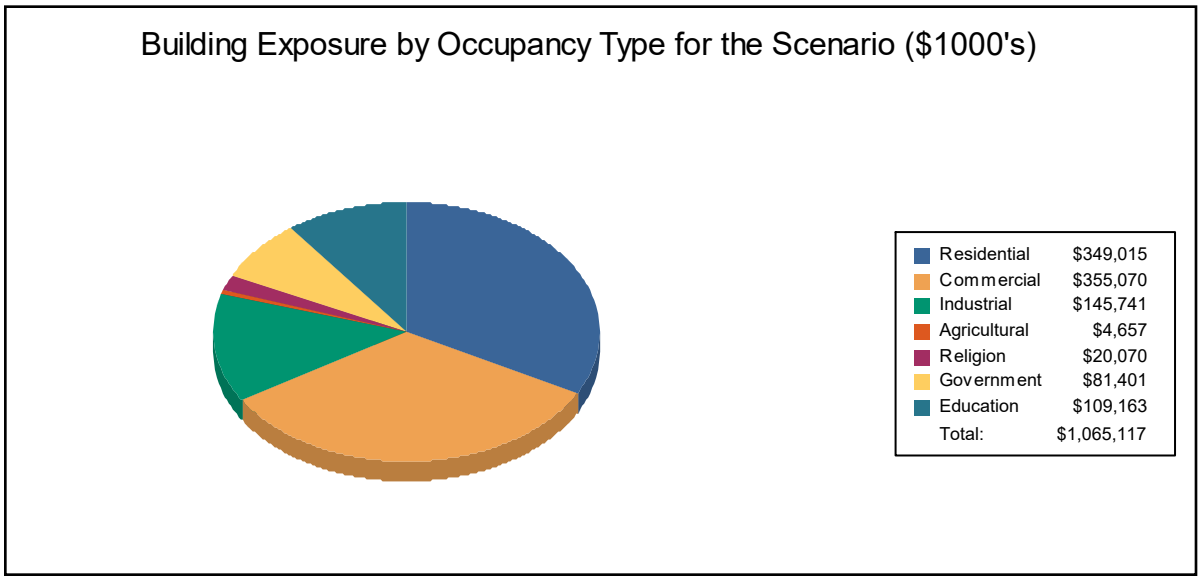


Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 5 fire stations, 1 police station and 1 emergency operation center.

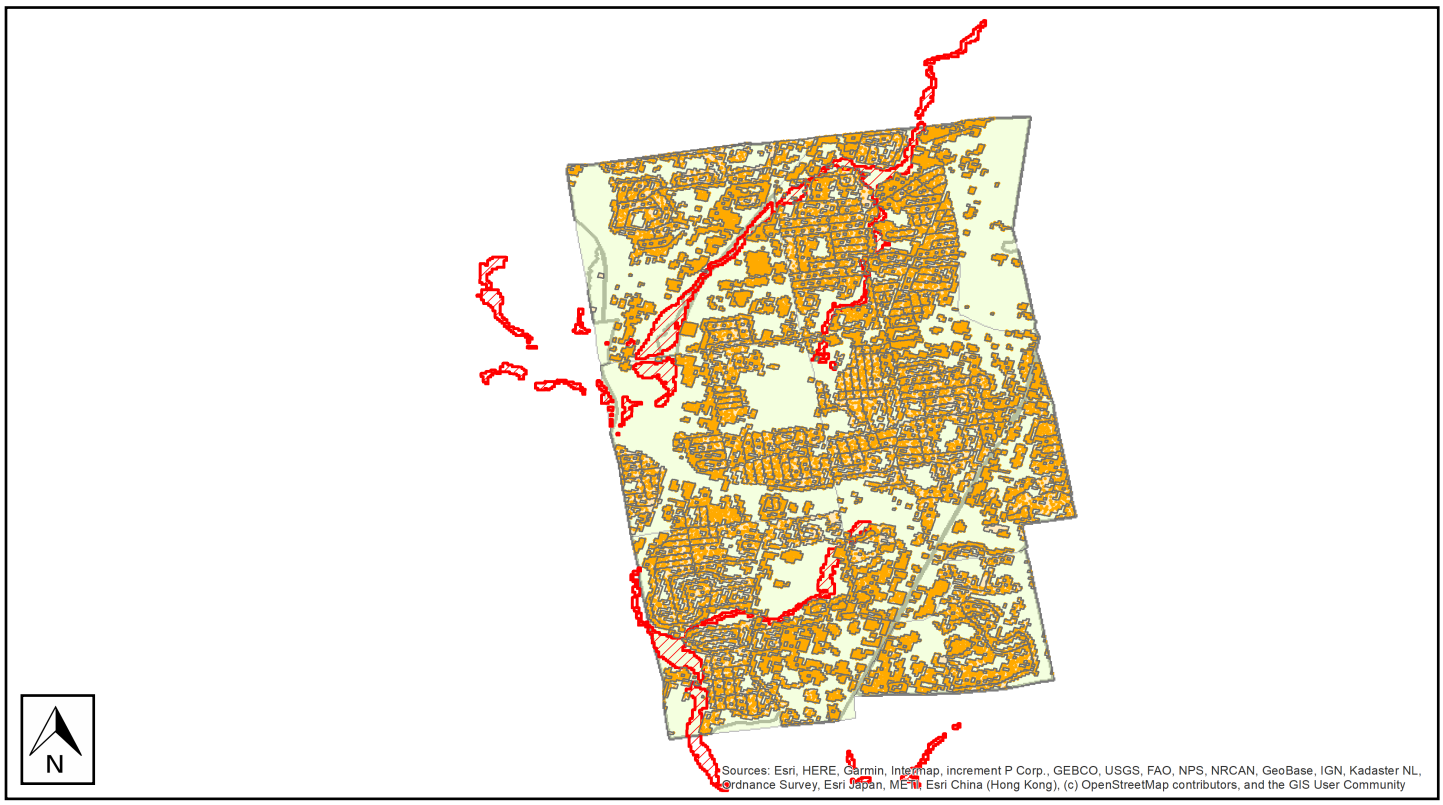
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Newington_FL
Scenario Name:	Newington_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

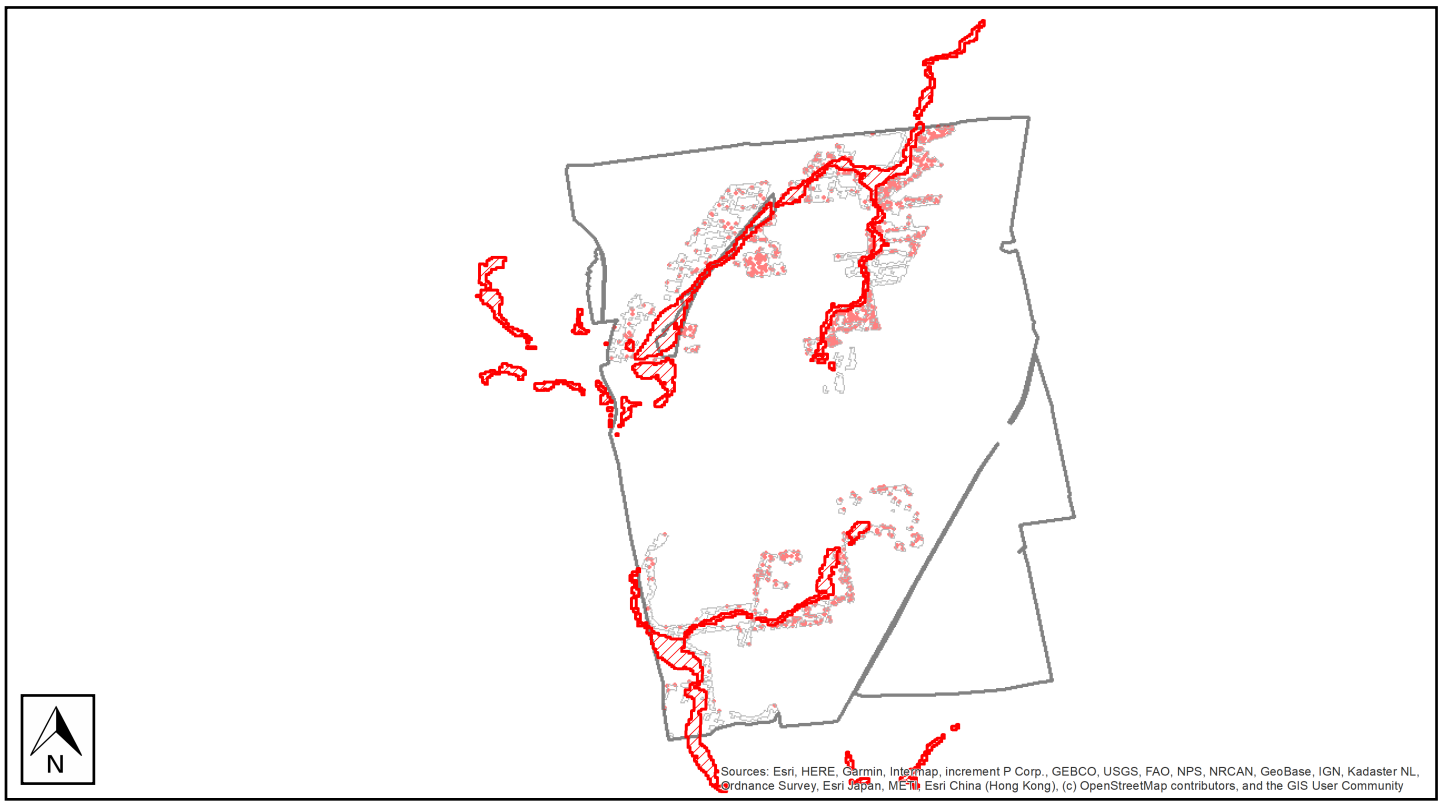


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	75	1	25	0	0	0	0	0	0	0	0
Total	**3**		**1**		**0**		**0**		**0**		**0**	

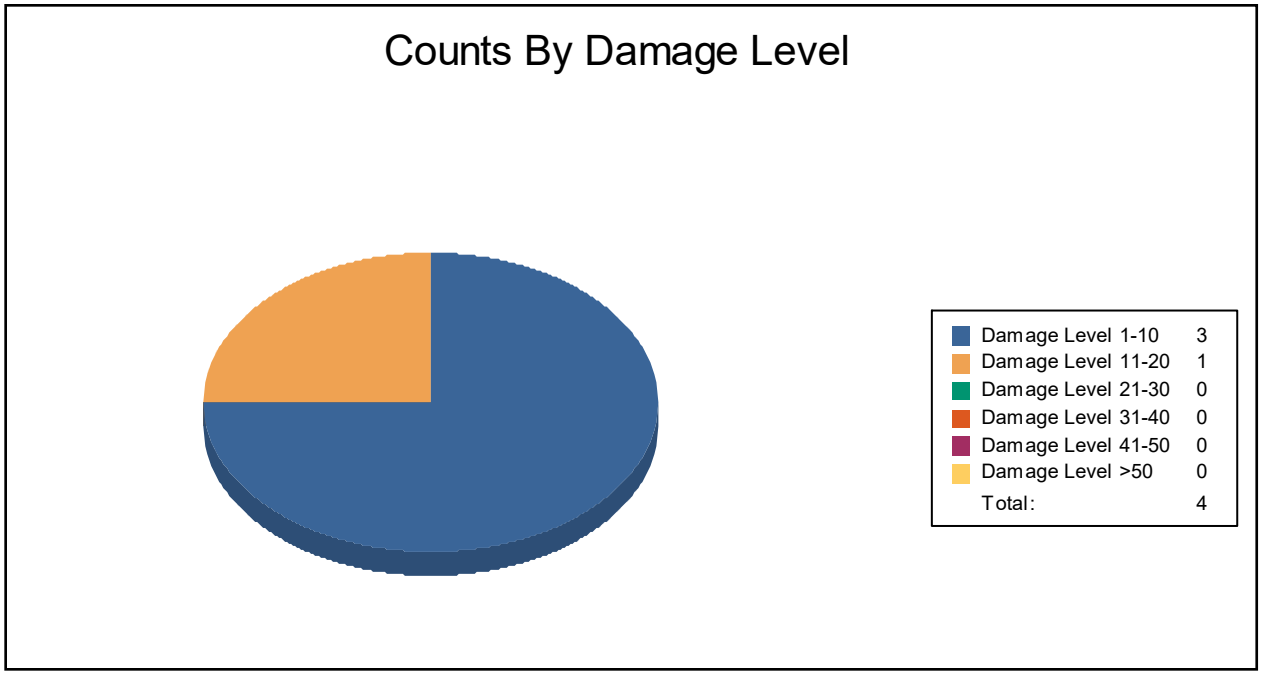


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	75	1	25	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	2	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

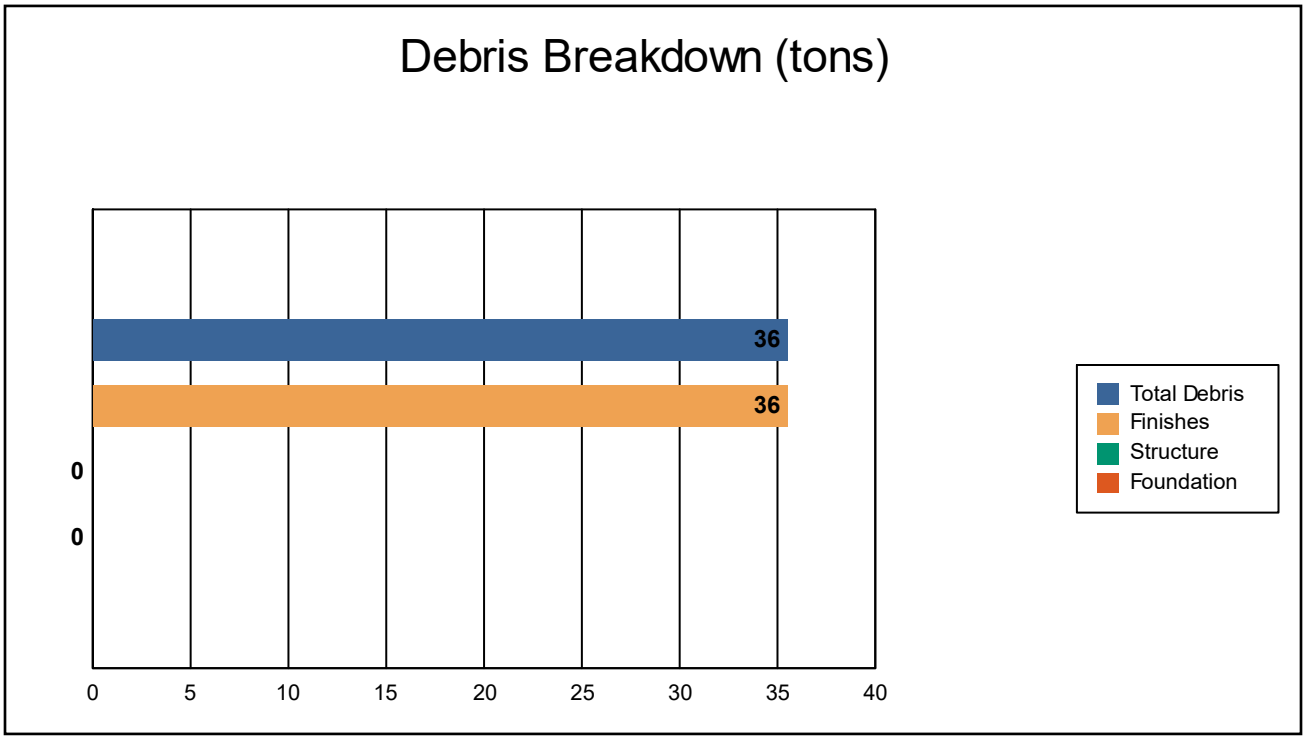
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

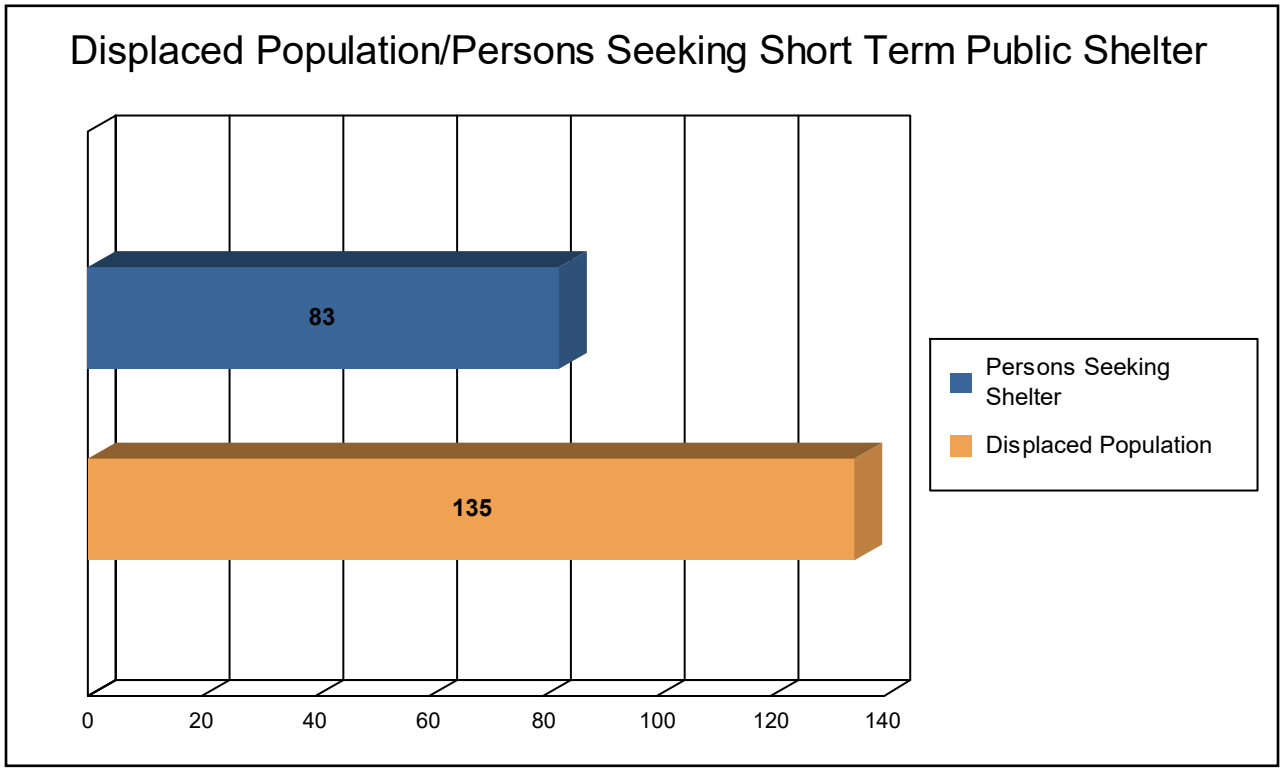


The model estimates that a total of 36 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 45 households (or 135 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 83 people (out of a total population of 30,486) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 7.05 million dollars, which represents 0.66 % of the total replacement value of the scenario buildings.

Building-Related Losses

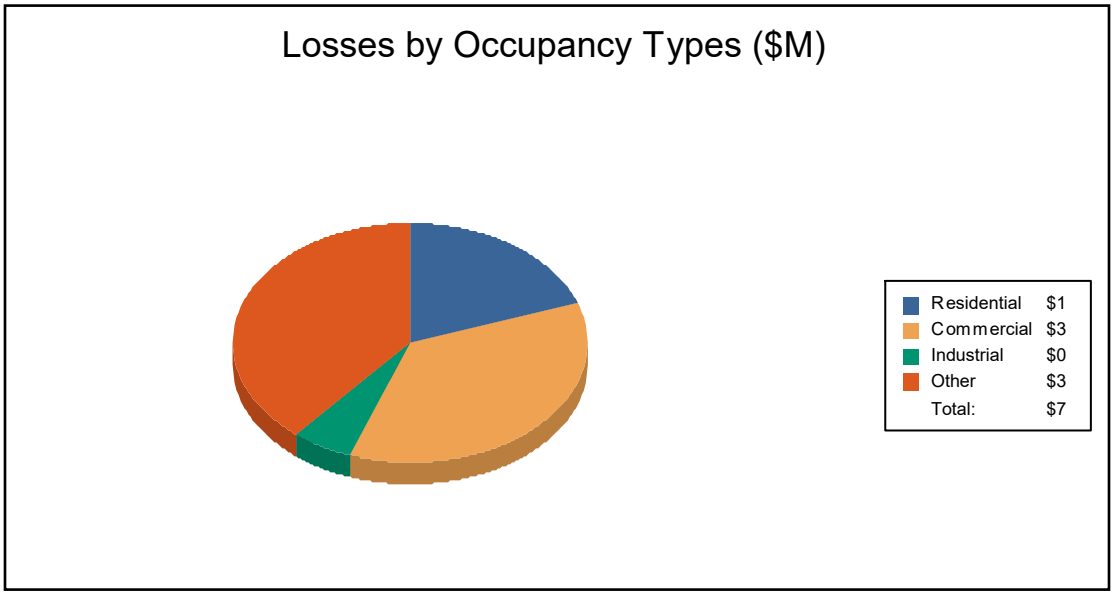
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 2.54 million dollars. 64% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.63% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.63	0.23	0.12	0.04	1.02
	Content	0.28	0.60	0.23	0.31	1.41
	Inventory	0.00	0.06	0.02	0.02	0.11
	Subtotal	**0.92**	**0.89**	**0.37**	**0.37**	**2.54**
Business Interruption						
	Income	0.02	0.55	0.00	0.33	0.91
	Relocation	0.30	0.12	0.01	0.19	0.63
	Rental Income	0.10	0.08	0.00	0.02	0.20
	Wage	0.05	0.88	0.01	1.84	2.78
	Subtotal	**0.47**	**1.64**	**0.02**	**2.38**	**4.51**
ALL	**Total**	**1.38**	**2.52**	**0.39**	**2.75**	**7.05**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	30,486	2,809,887	2,450,008	5,259,895
Total	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**
Total Study Region	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**

Hazus: Flood Global Risk Report

Region Name: Newington_FL

Flood Scenario: Newington_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 336 census blocks. The region contains over 13 thousand households and has a total population of 30,486 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,827 buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 87.84% of the buildings (and 53.42% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,827 buildings in the region which have an aggregate total replacement value of 5,260 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,809,887	53.4%
Commercial	1,346,651	25.6%
Industrial	575,425	10.9%
Agricultural	18,207	0.3%
Religion	88,944	1.7%
Government	217,397	4.1%
Education	203,384	3.9%
Total	**5,259,895**	**100%**

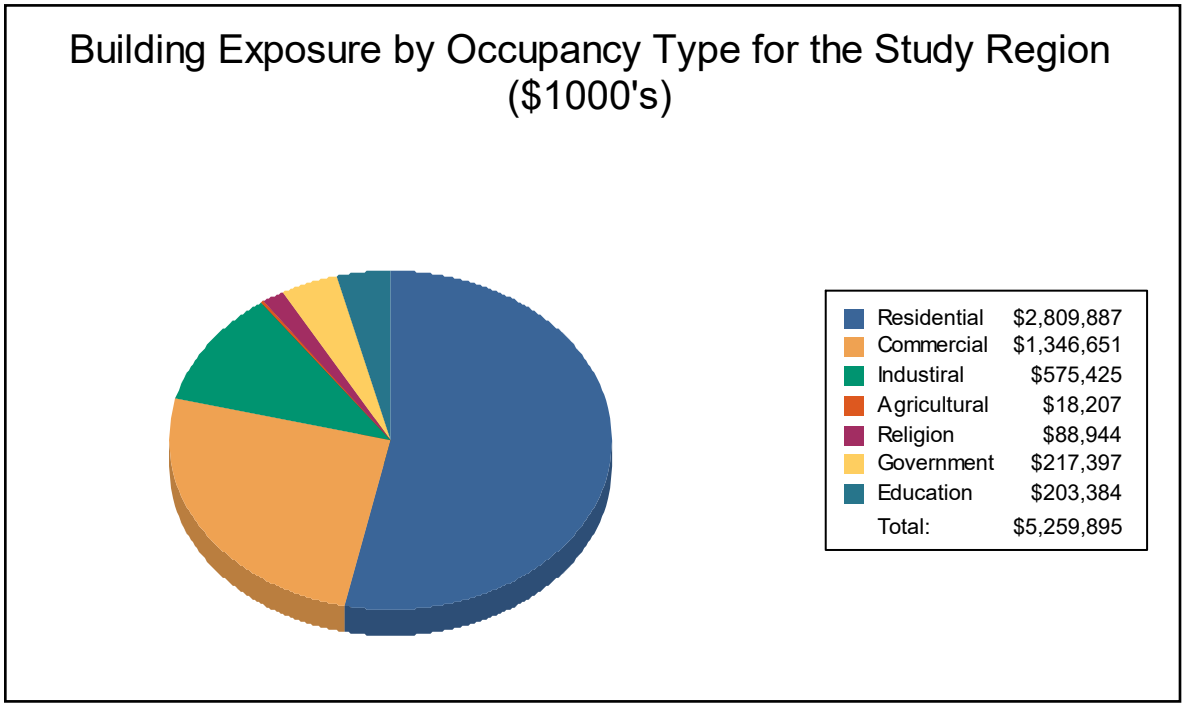
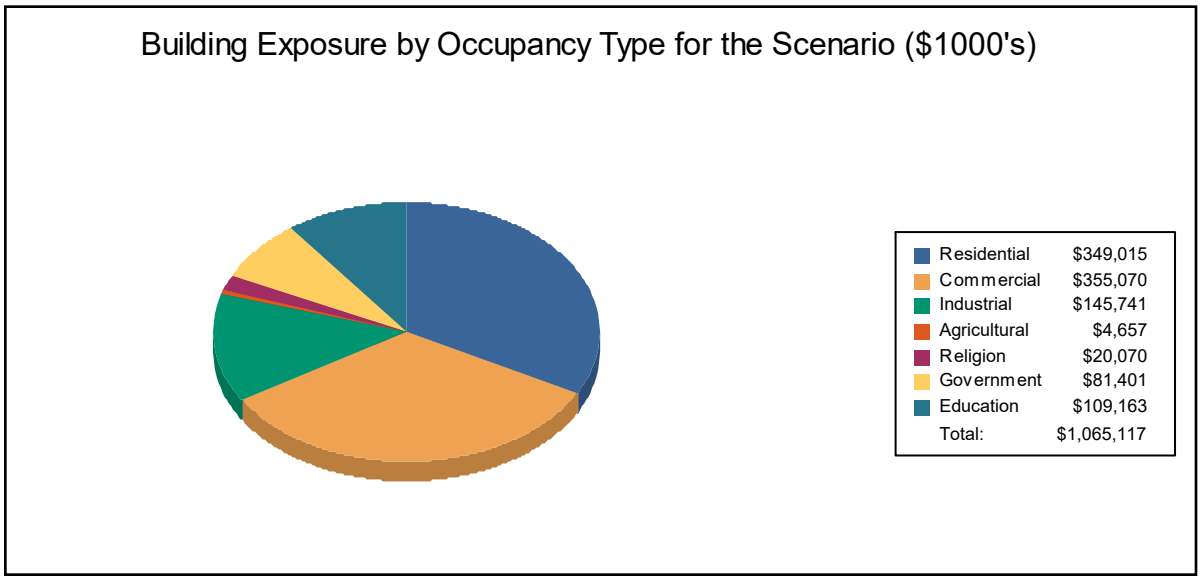


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	349,015	32.8%
Commercial	355,070	33.3%
Industrial	145,741	13.7%
Agricultural	4,657	0.4%
Religion	20,070	1.9%
Government	81,401	7.6%
Education	109,163	10.2%
Total	**1,065,117**	**100%**



Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 5 fire stations, 1 police station and 1 emergency operation center.

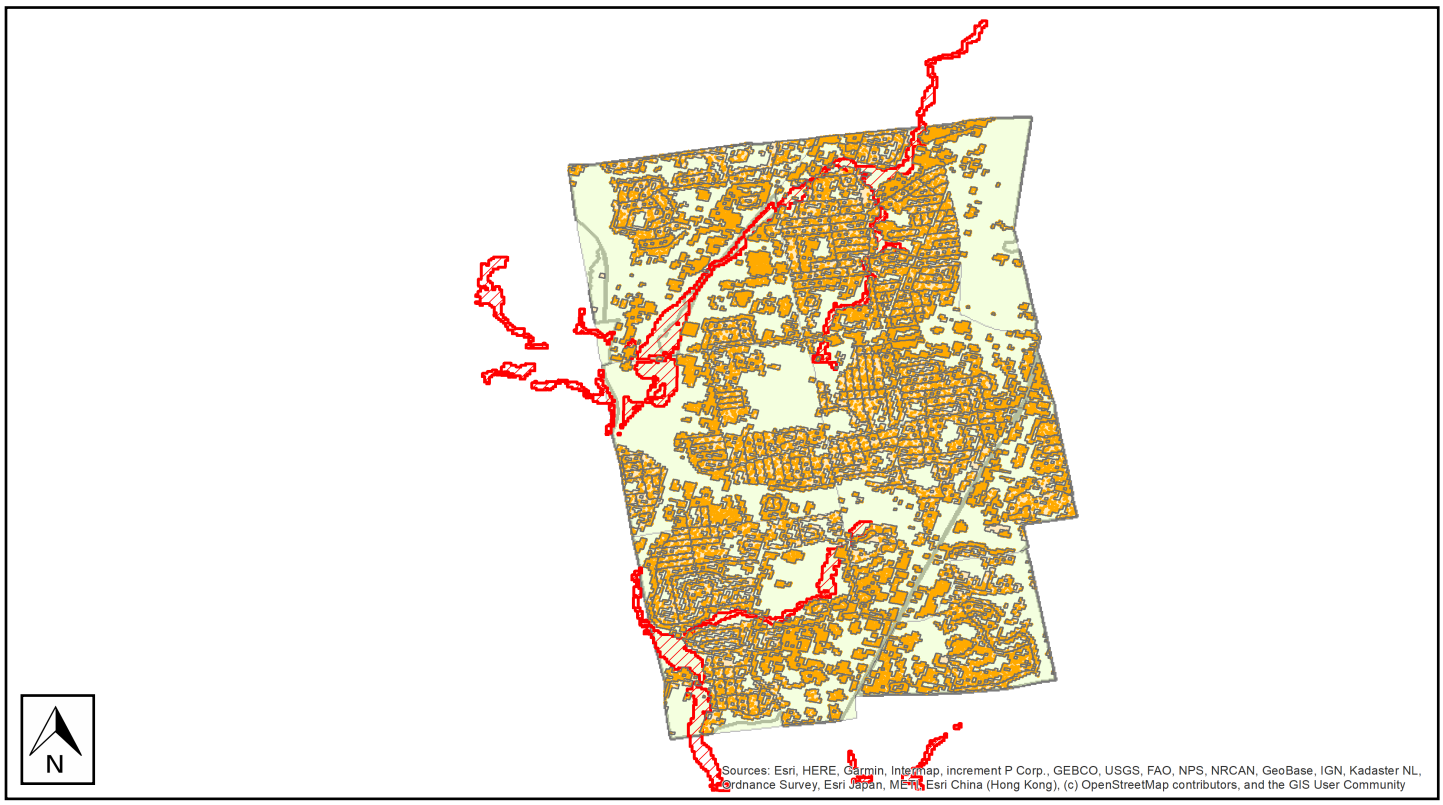
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Newington_FL
Scenario Name:	Newington_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 8 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

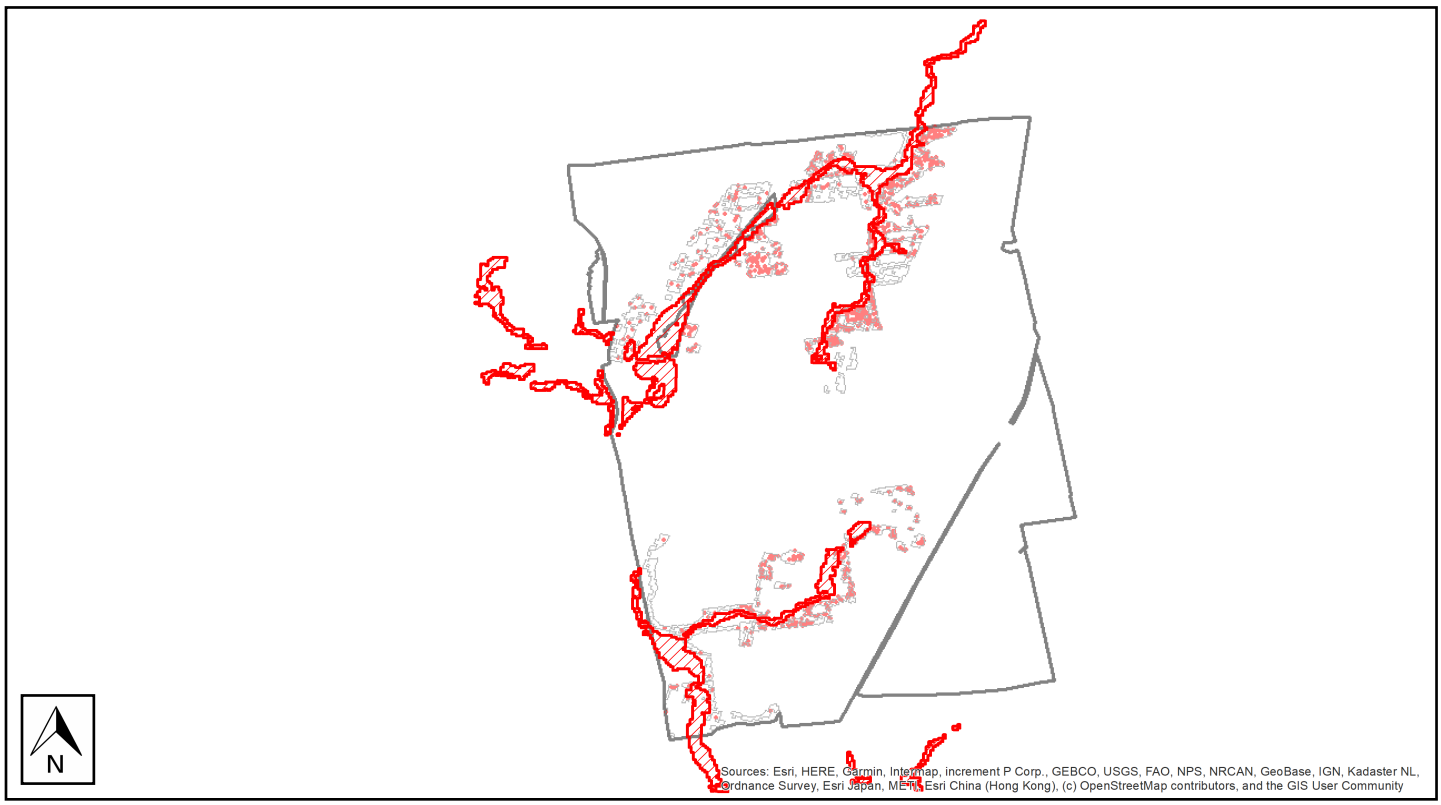


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	9	53	8	47	0	0	0	0	0	0	0	0
Total	**9**		**8**		**0**		**0**		**0**		**0**	

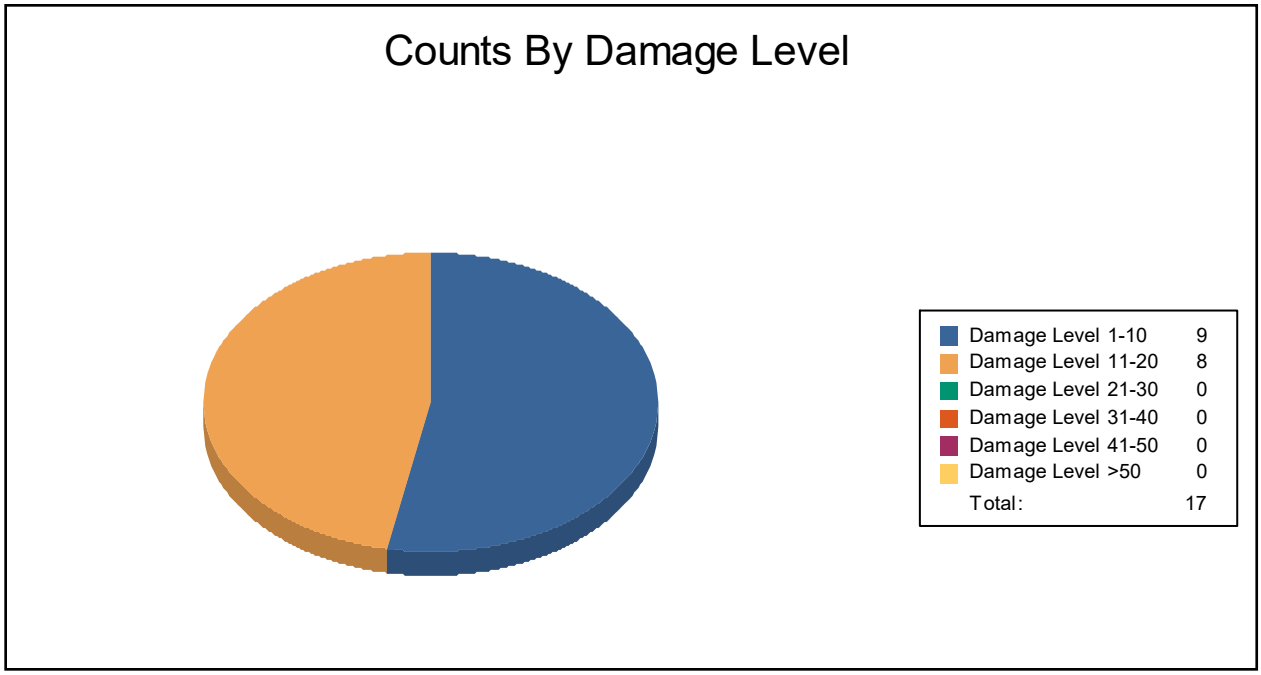


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	9	53	8	47	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	2	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

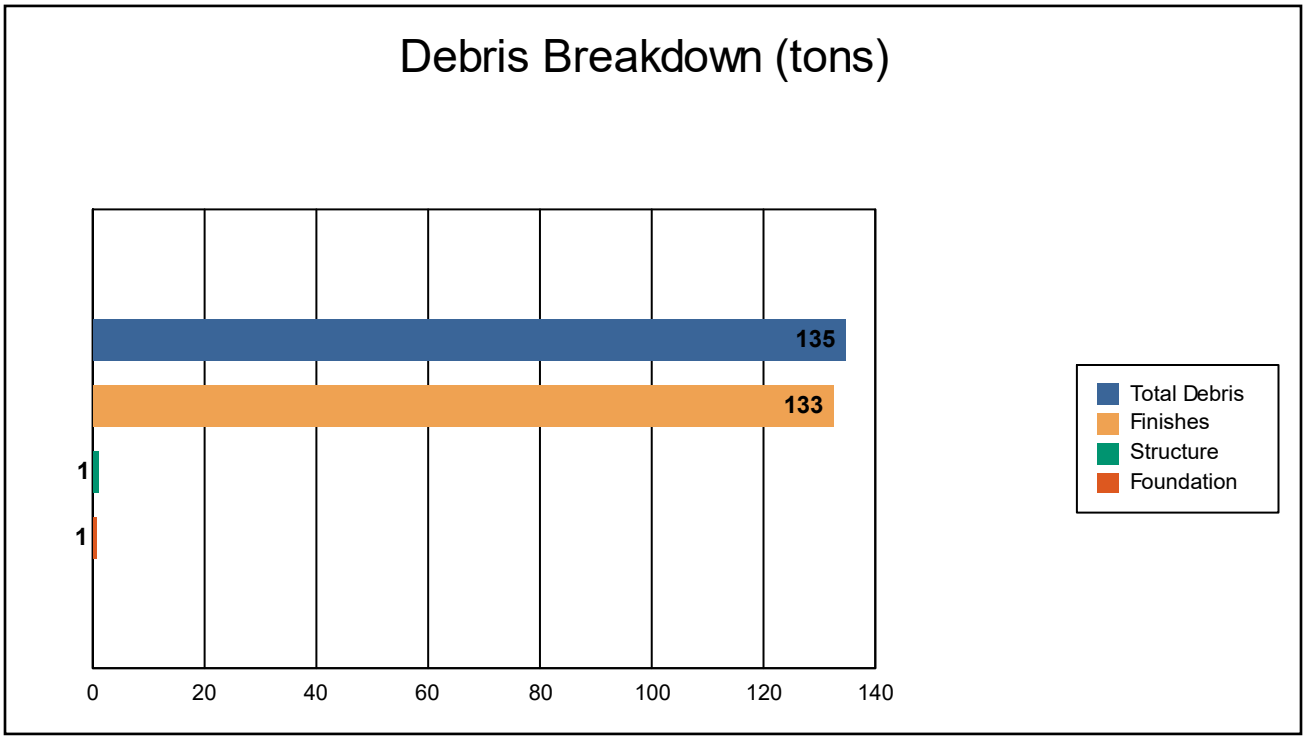
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

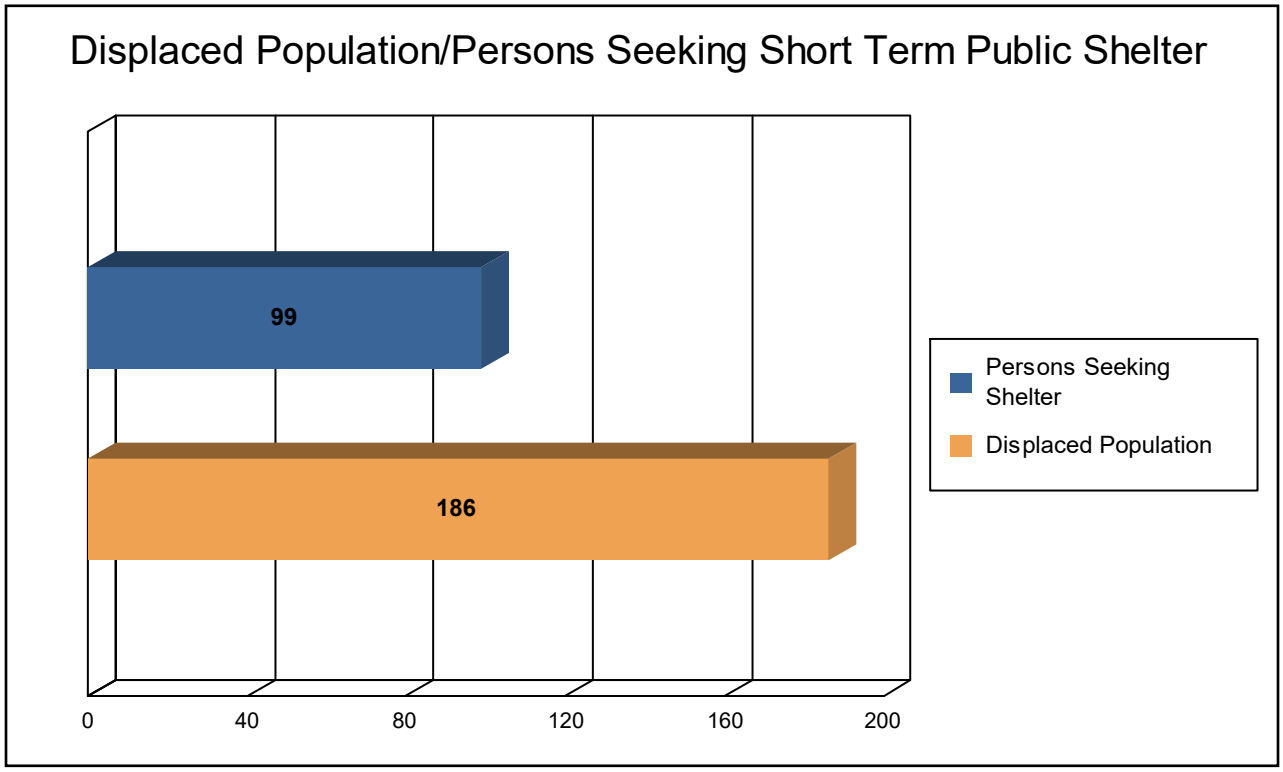


The model estimates that a total of 135 tons of debris will be generated. Of the total amount, Finishes comprises 98% of the total, Structure comprises 1% of the total, and Foundation comprises 1%. If the debris tonnage is converted into an estimated number of truckloads, it will require 6 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 62 households (or 186 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 99 people (out of a total population of 30,486) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 33.47 million dollars, which represents 3.14 % of the total replacement value of the scenario buildings.

Building-Related Losses

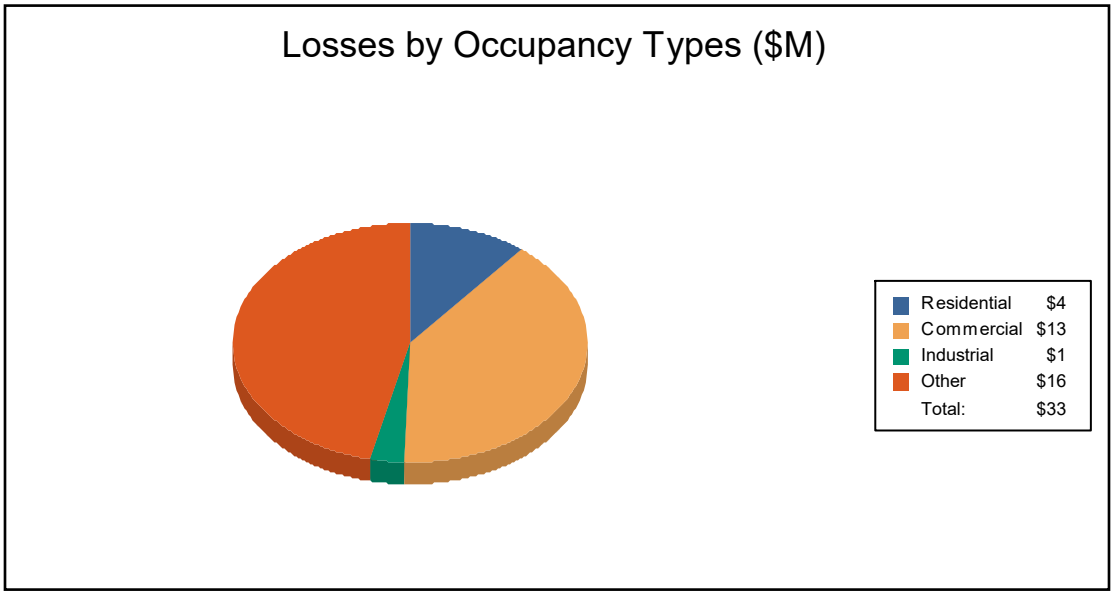
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 11.75 million dollars. 65% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 10.75% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.68	1.33	0.29	0.39	3.68
	Content	0.78	3.30	0.48	2.50	7.06
	Inventory	0.00	0.92	0.06	0.03	1.01
	Subtotal	**2.45**	**5.55**	**0.83**	**2.92**	**11.75**
Business Interruption						
	Income	0.05	2.99	0.02	1.33	4.39
	Relocation	0.72	1.03	0.03	0.93	2.71
	Rental Income	0.26	0.76	0.00	0.18	1.21
	Wage	0.12	3.04	0.06	10.20	13.41
	Subtotal	**1.14**	**7.82**	**0.12**	**12.64**	**21.72**
ALL	**Total**	**3.60**	**13.37**	**0.95**	**15.56**	**33.47**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	30,486	2,809,887	2,450,008	5,259,895
Total	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**
Total Study Region	**30,486**	**2,809,887**	**2,450,008**	**5,259,895**

Hazus: Flood Global Risk Report

Region Name: Plainville_FL

Flood Scenario: Plainville_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 246 census blocks. The region contains over 8 thousand households and has a total population of 17,497 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,555 buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87.28% of the buildings (and 54.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of 3,709 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,011,803	54.2%
Commercial	956,315	25.8%
Industrial	478,910	12.9%
Agricultural	8,106	0.2%
Religion	34,683	0.9%
Government	88,494	2.4%
Education	130,635	3.5%
Total	**3,708,946**	**100%**

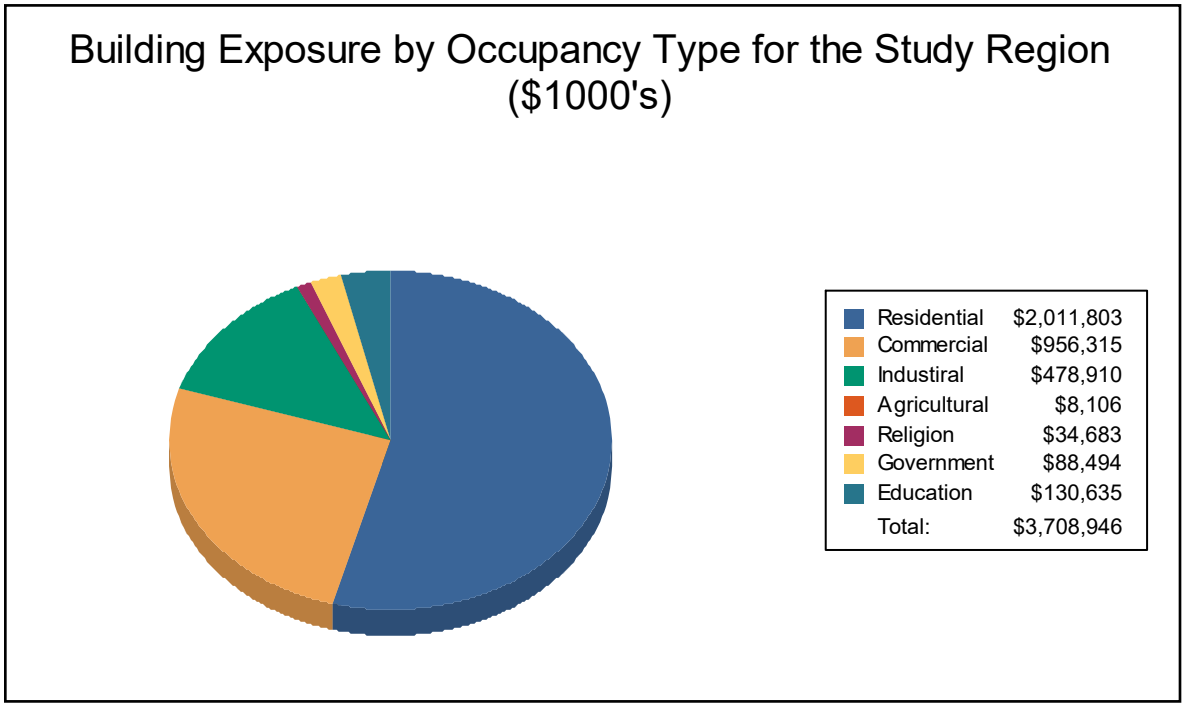
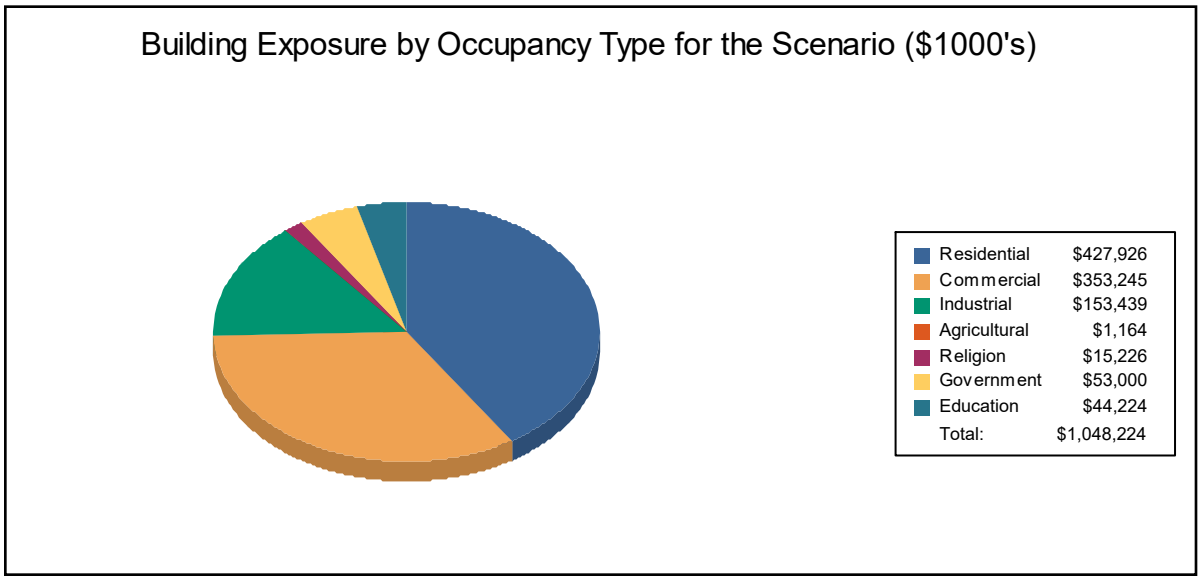


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	427,926	40.8%
Commercial	353,245	33.7%
Industrial	153,439	14.6%
Agricultural	1,164	0.1%
Religion	15,226	1.5%
Government	53,000	5.1%
Education	44,224	4.2%
Total	**1,048,224**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 7 schools, 1 fire station, 1 police station and 1 emergency operation center.

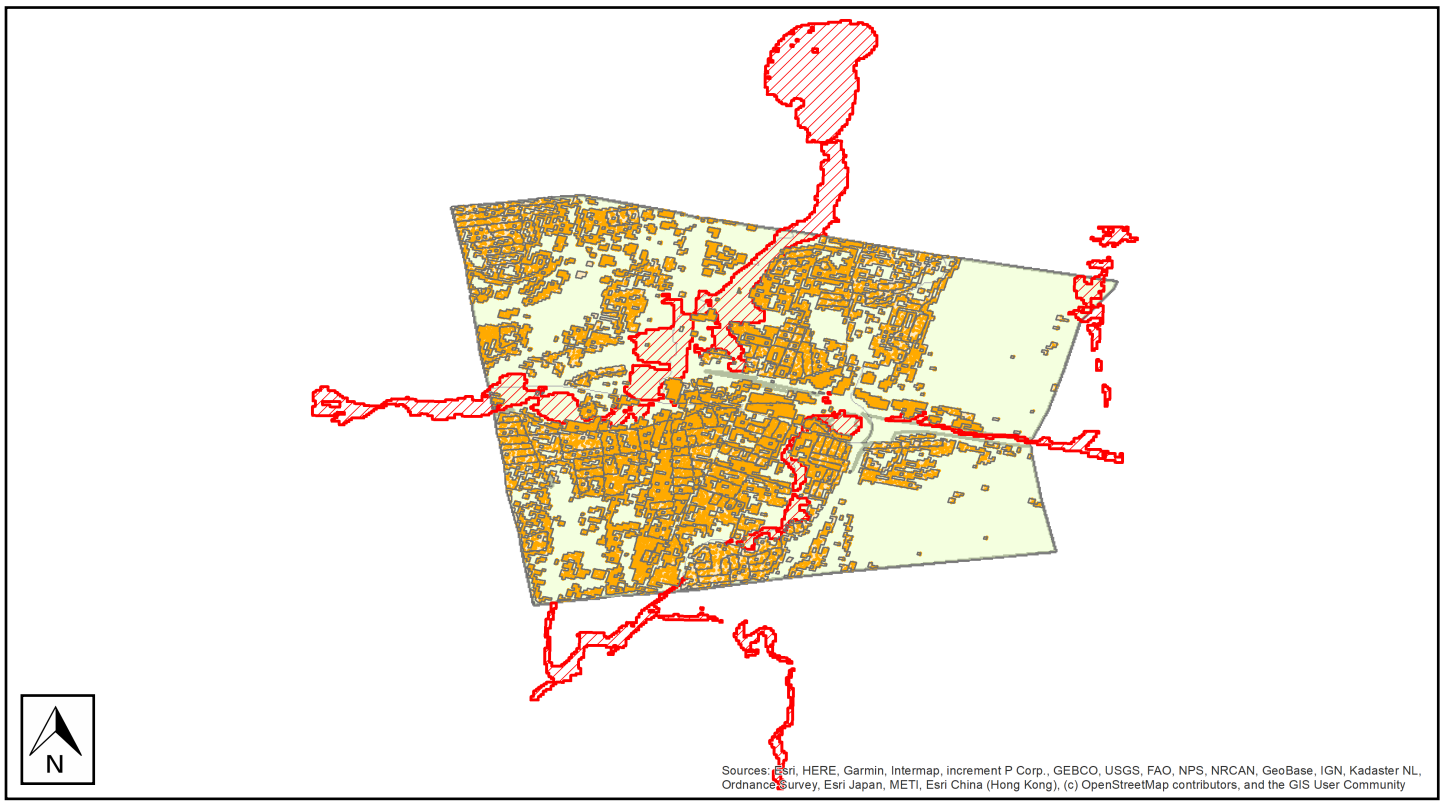
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Plainville_FL
Scenario Name:	Plainville_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

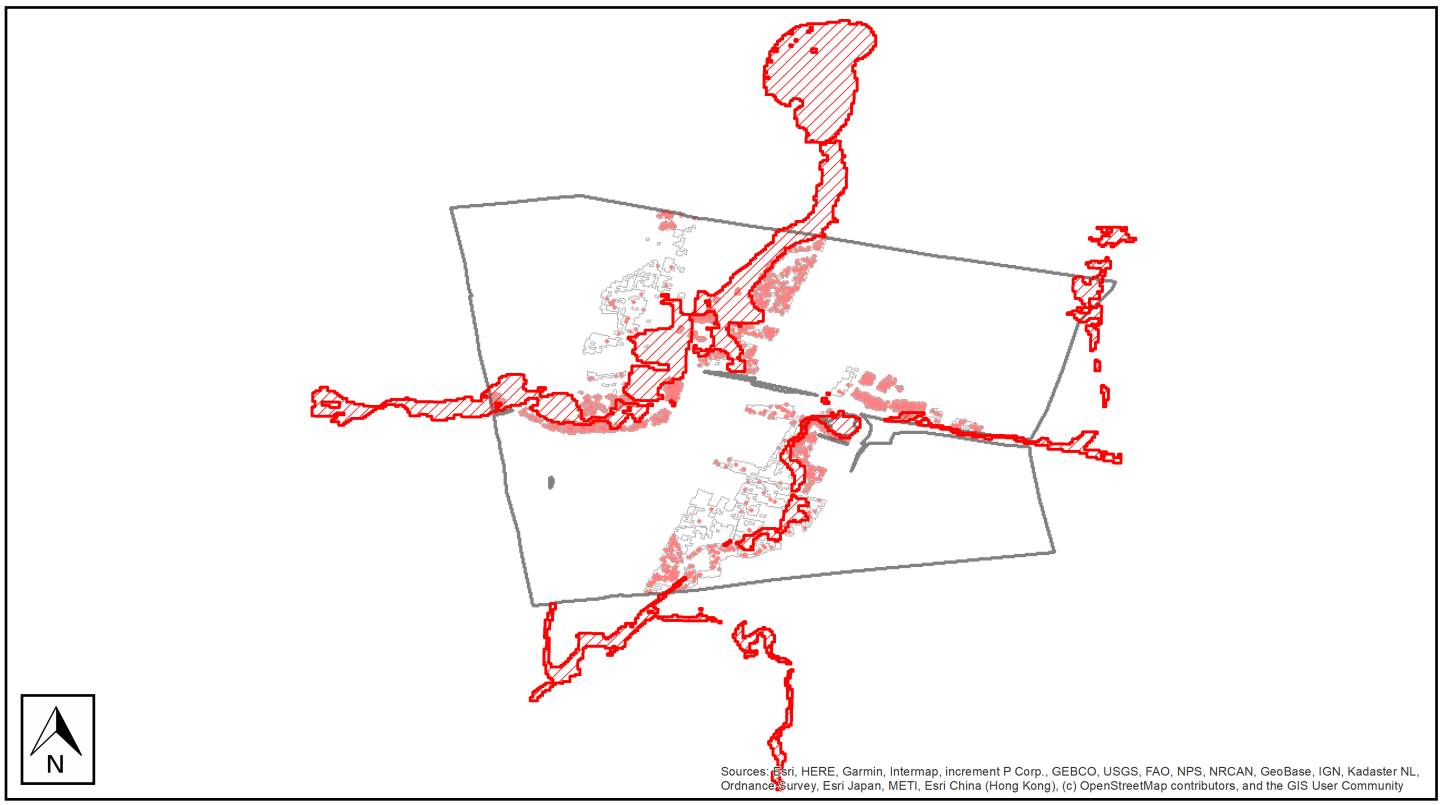


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	2	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	5	45	6	55	0	0	0	0	0	0	0	0
Total	**7**		**6**		**0**		**0**		**0**		**0**	

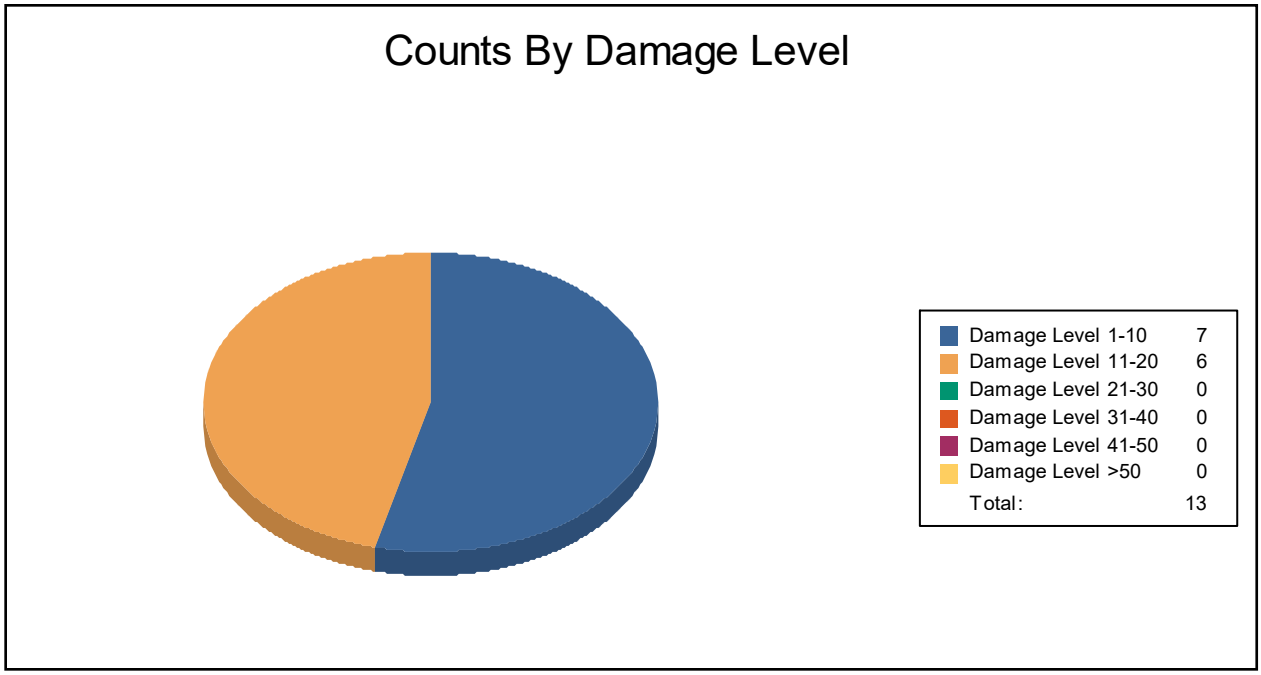


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	2	100	0	0	0	0	0	0	0	0	0	0
Wood	5	45	6	55	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

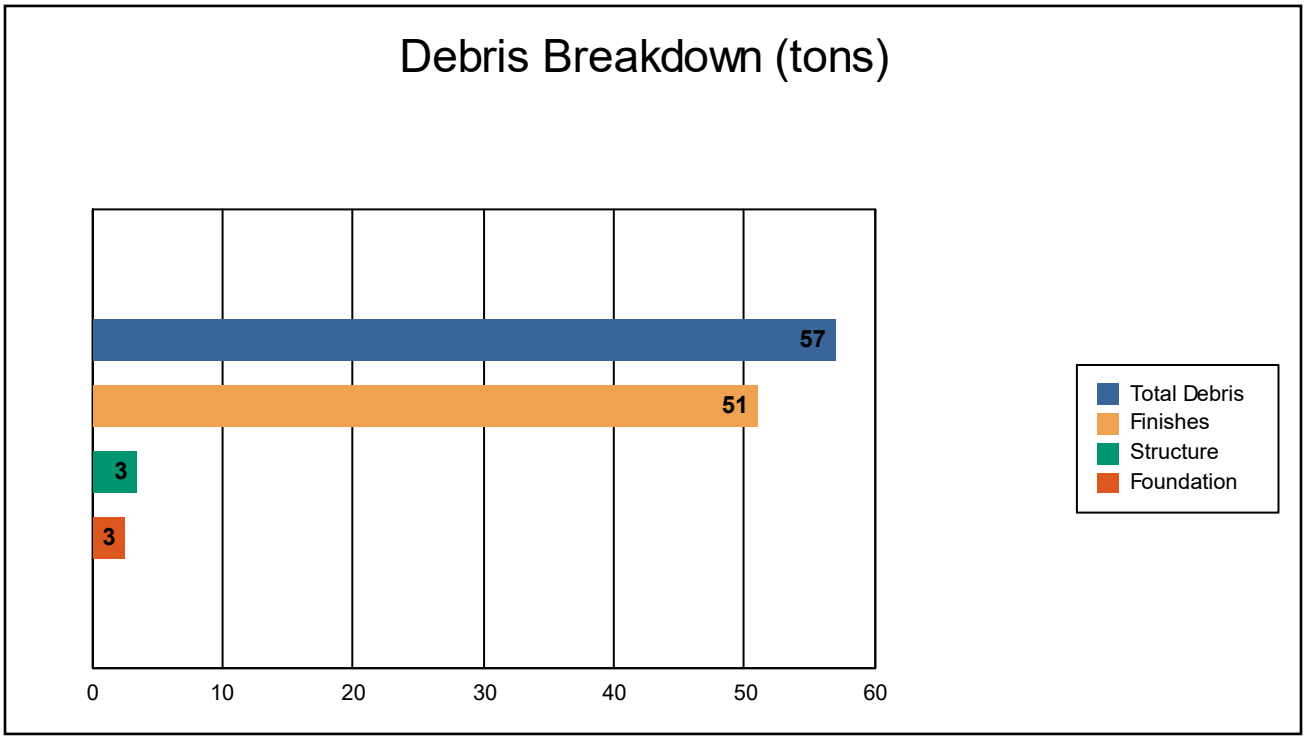
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

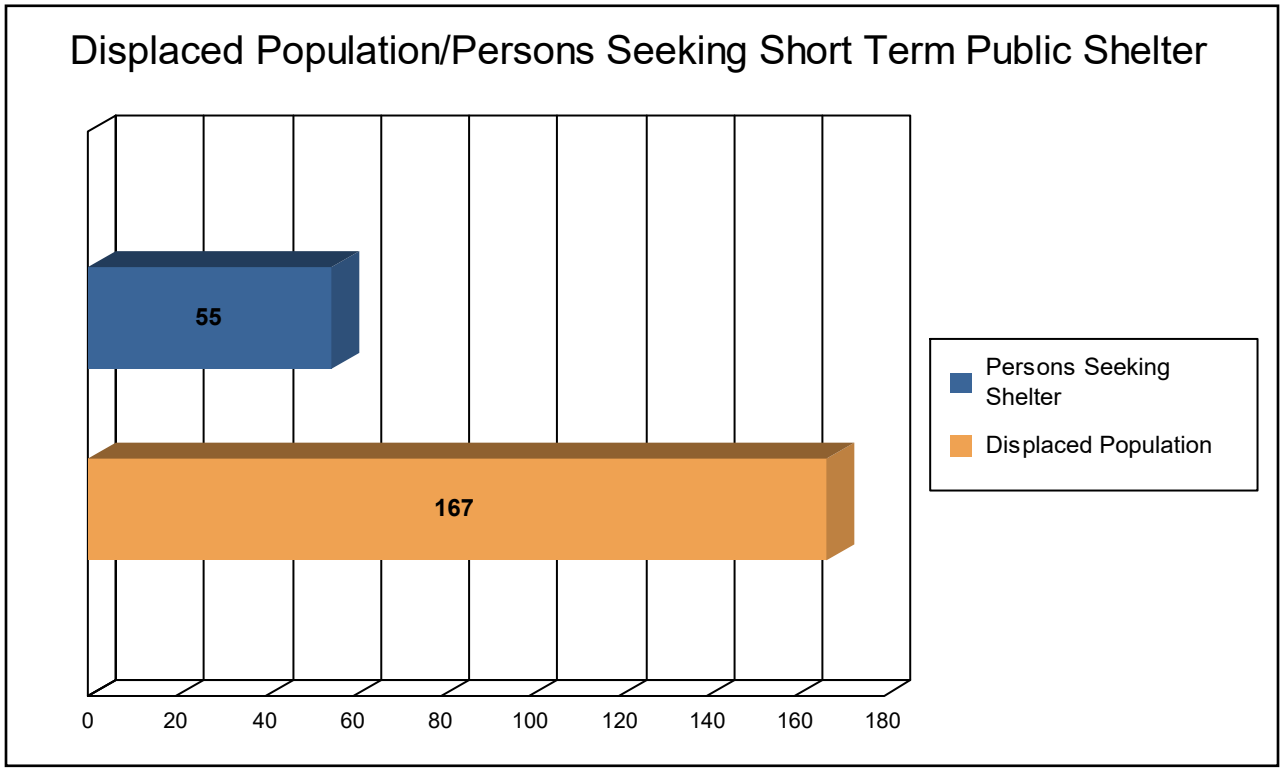


The model estimates that a total of 57 tons of debris will be generated. Of the total amount, Finishes comprises 90% of the total, Structure comprises 6% of the total, and Foundation comprises 4%. If the debris tonnage is converted into an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 56 households (or 167 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 55 people (out of a total population of 17,497) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 30.44 million dollars, which represents 2.90 % of the total replacement value of the scenario buildings.

Building-Related Losses

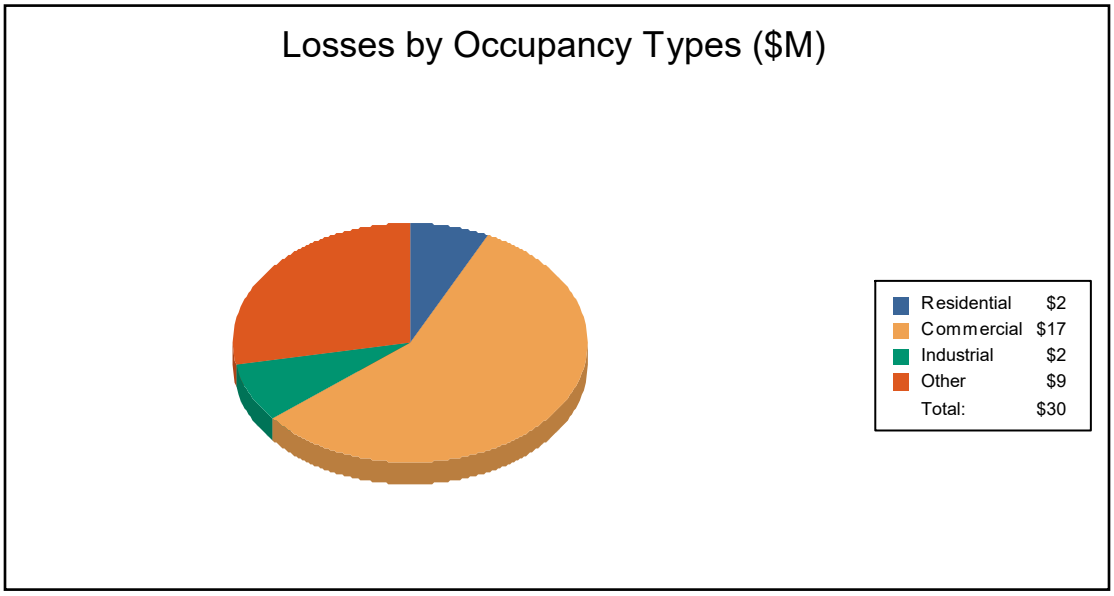
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 13.90 million dollars. 54% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 7.26% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.92	1.51	0.62	0.20	3.25
	Content	0.48	5.05	1.40	1.28	8.20
	Inventory	0.00	2.24	0.21	0.00	2.46
	Subtotal	**1.40**	**8.80**	**2.23**	**1.47**	**13.90**
Business Interruption						
	Income	0.07	3.09	0.04	0.26	3.45
	Relocation	0.40	1.28	0.04	0.33	2.05
	Rental Income	0.18	0.95	0.00	0.13	1.26
	Wage	0.16	3.19	0.07	6.37	9.78
	Subtotal	**0.81**	**8.51**	**0.14**	**7.08**	**16.54**
ALL	**Total**	**2.21**	**17.31**	**2.37**	**8.55**	**30.44**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	17,497	2,011,803	1,697,143	3,708,946
Total	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**
Total Study Region	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**

Hazus: Flood Global Risk Report

Region Name: Plainville_FL

Flood Scenario: Plainville_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 246 census blocks. The region contains over 8 thousand households and has a total population of 17,497 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,555 buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87.28% of the buildings (and 54.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of 3,709 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,011,803	54.2%
Commercial	956,315	25.8%
Industrial	478,910	12.9%
Agricultural	8,106	0.2%
Religion	34,683	0.9%
Government	88,494	2.4%
Education	130,635	3.5%
Total	**3,708,946**	**100%**

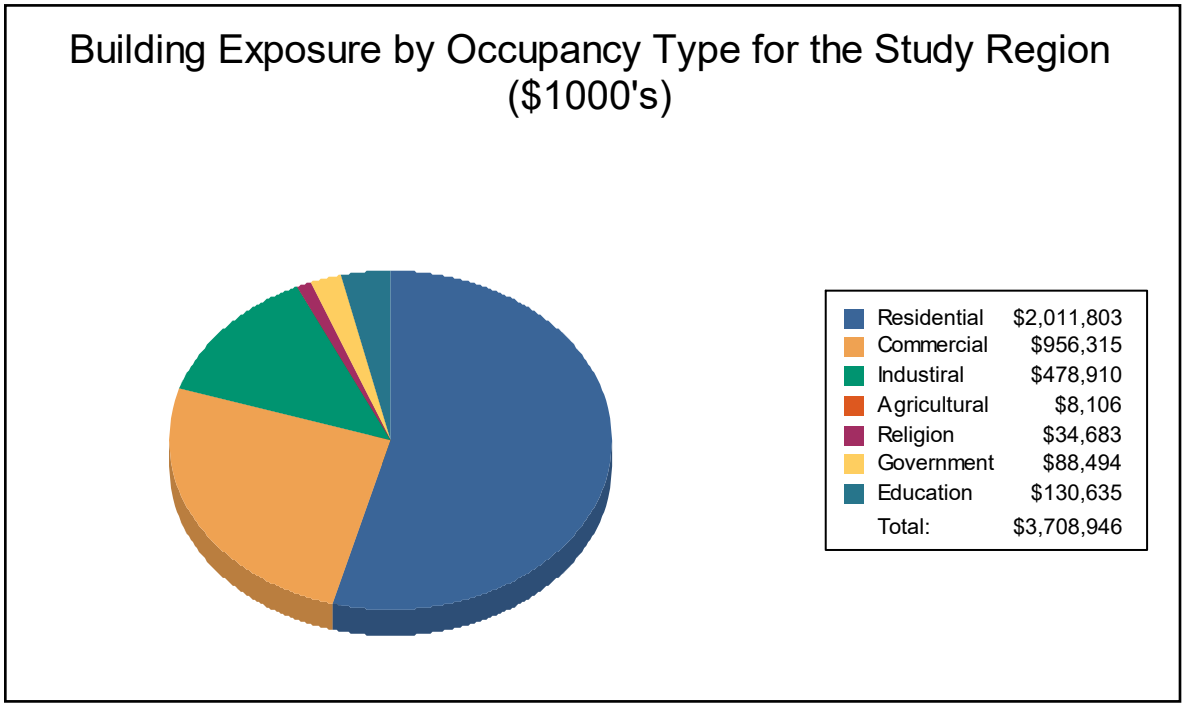
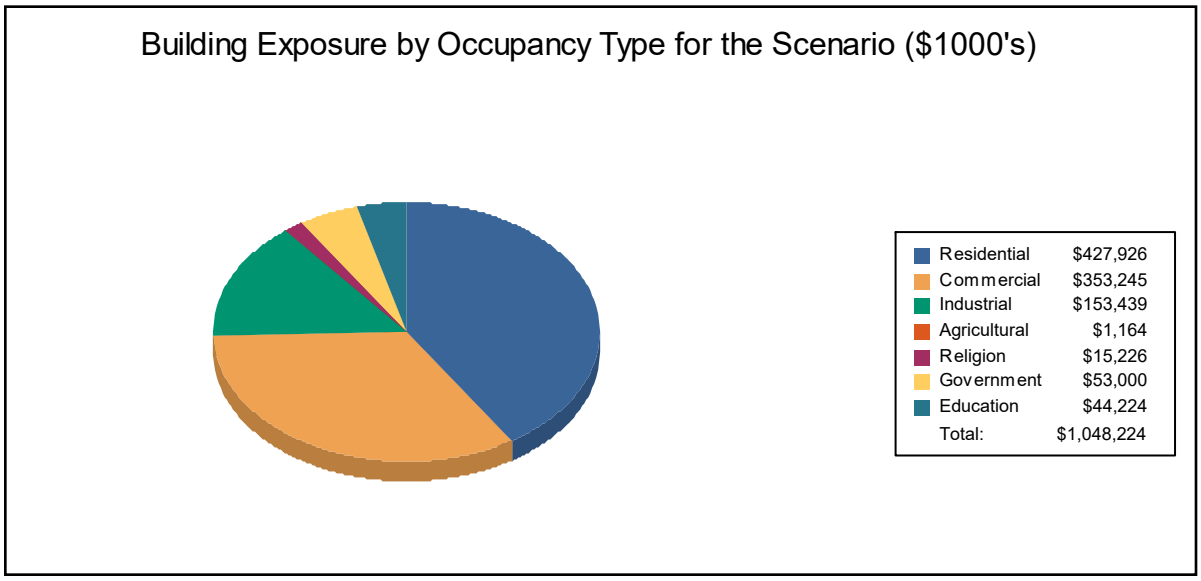


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	427,926	40.8%
Commercial	353,245	33.7%
Industrial	153,439	14.6%
Agricultural	1,164	0.1%
Religion	15,226	1.5%
Government	53,000	5.1%
Education	44,224	4.2%
Total	**1,048,224**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 7 schools, 1 fire station, 1 police station and 1 emergency operation center.

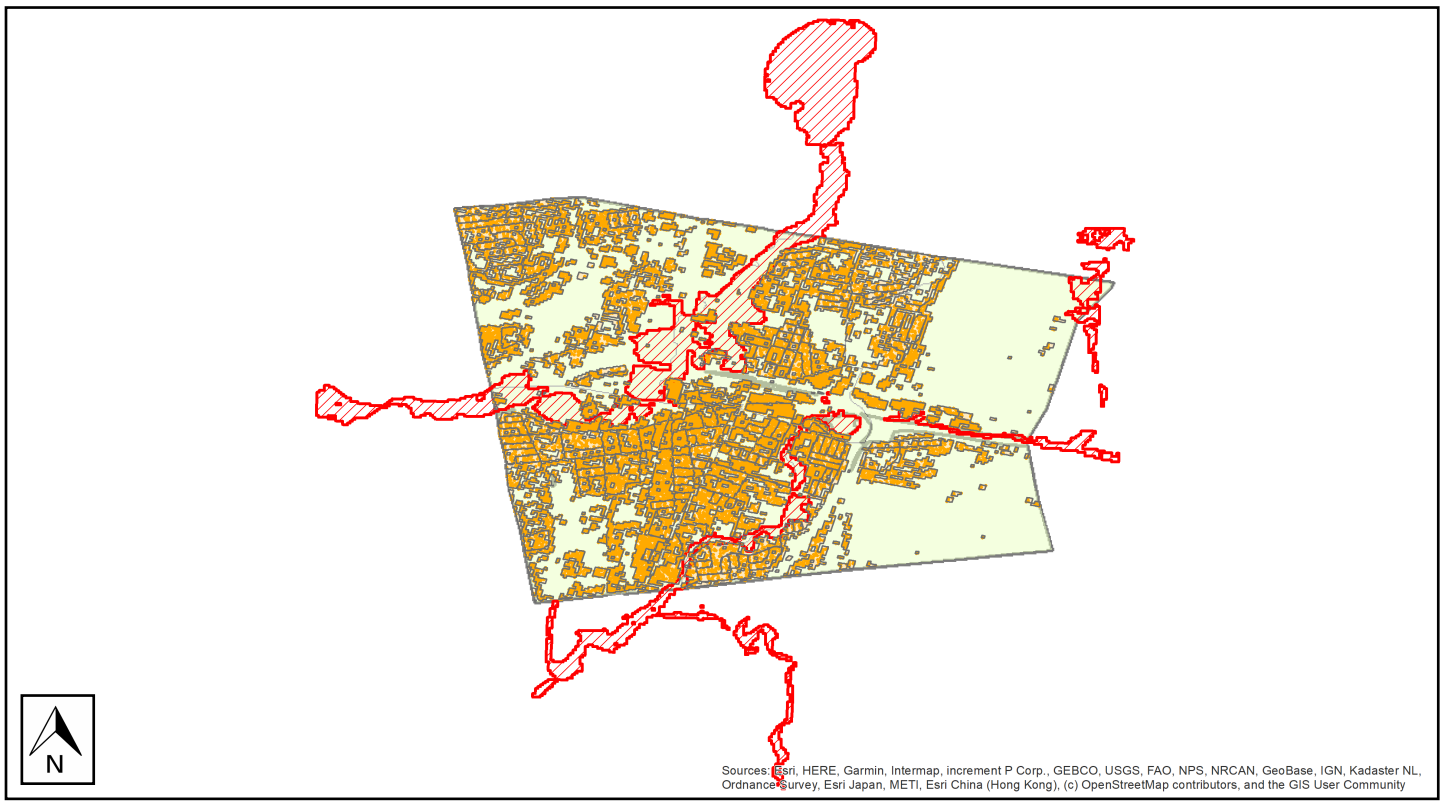
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Plainville_FL
Scenario Name:	Plainville_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

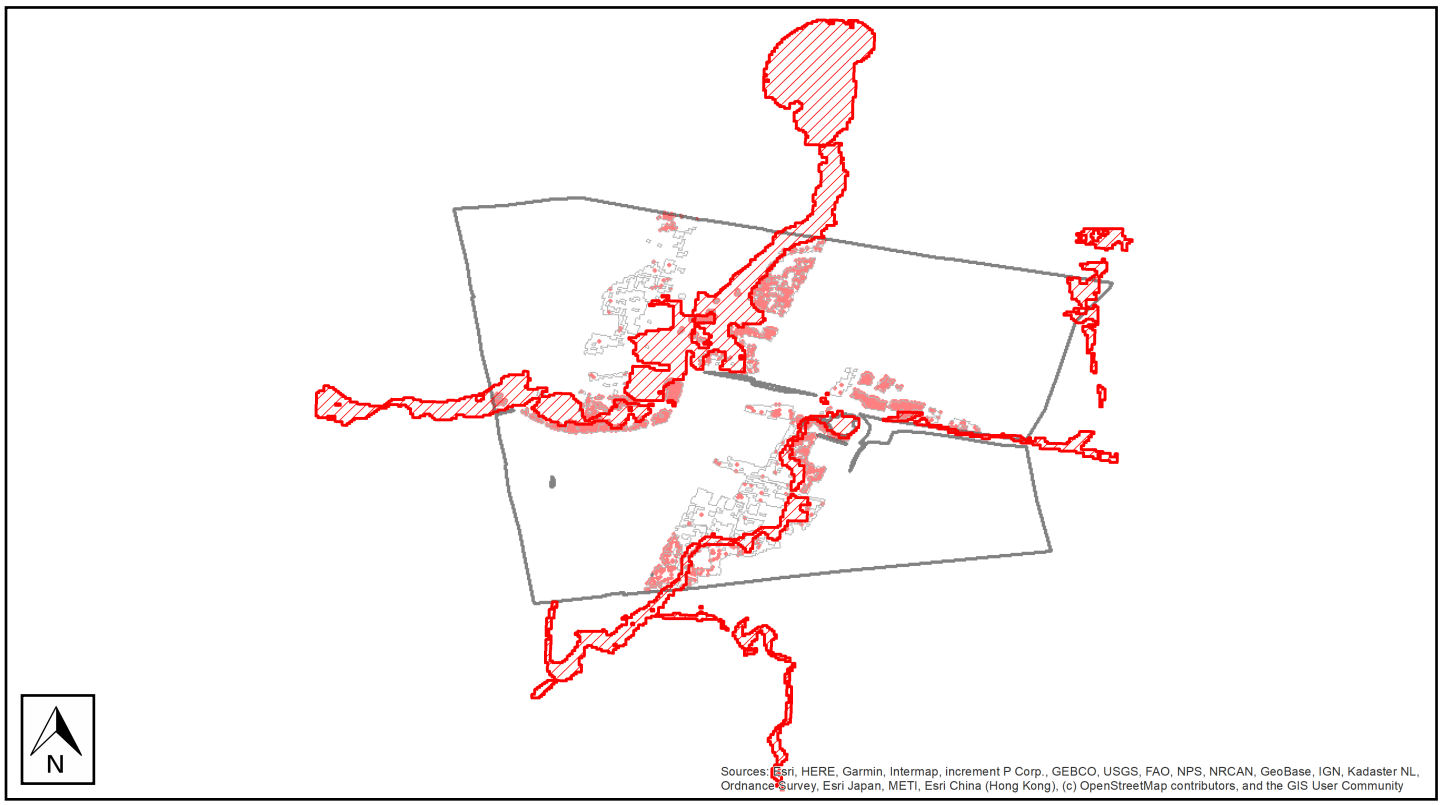


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	1	100	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	9	50	6	33	3	17	0	0	0	0	0	0
Total	**10**		**6**		**3**		**0**		**0**		**0**	

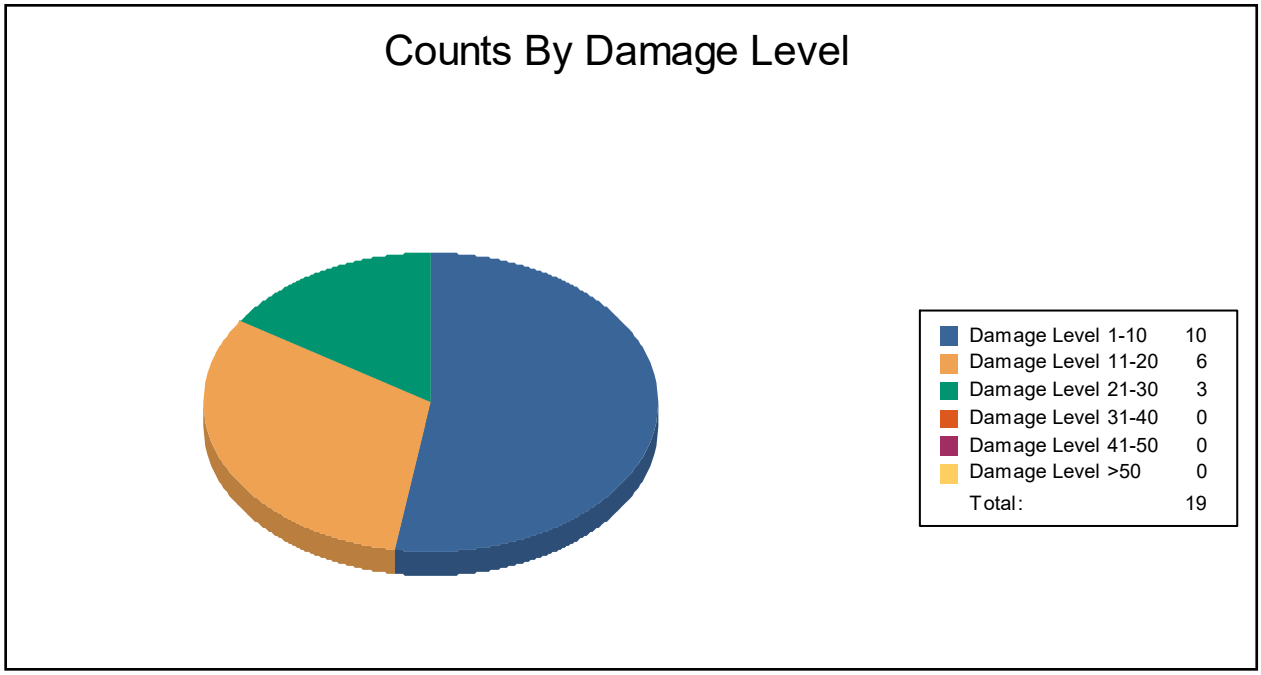


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	1	100	0	0	0	0	0	0	0	0	0	0
Wood	9	50	6	33	3	17	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

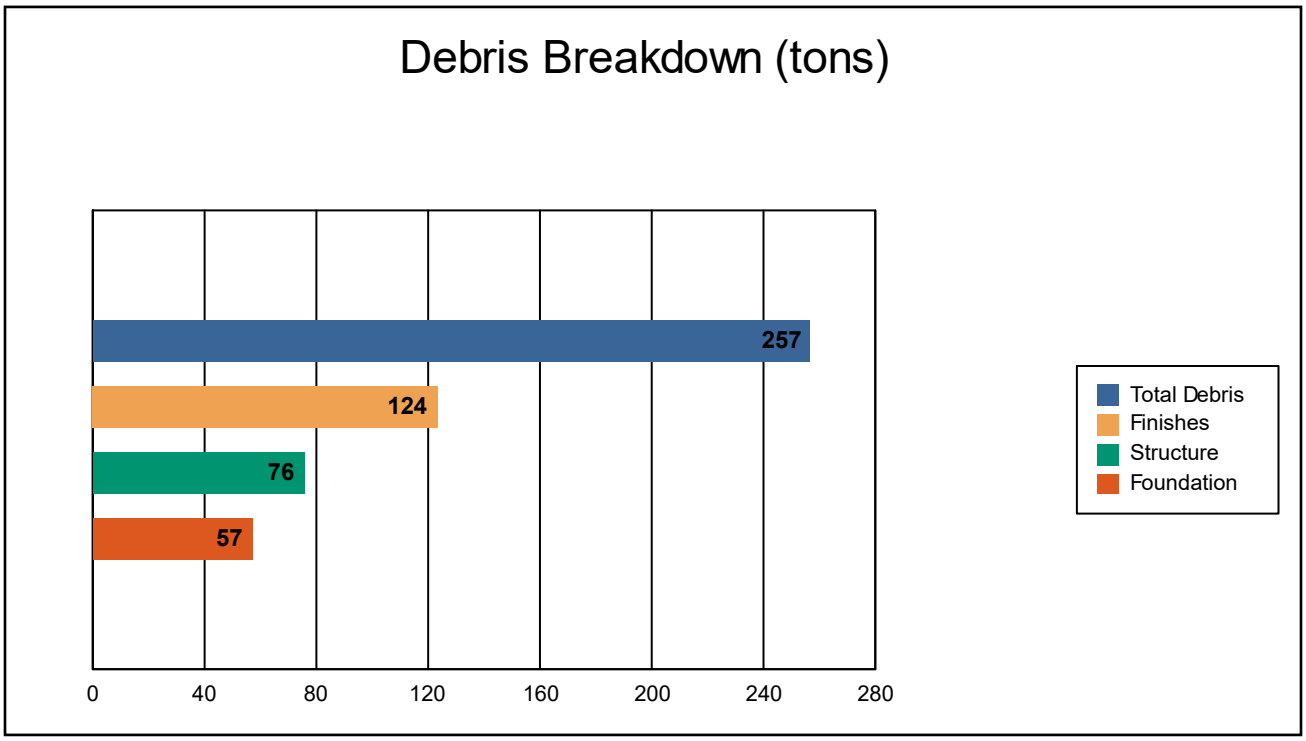
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

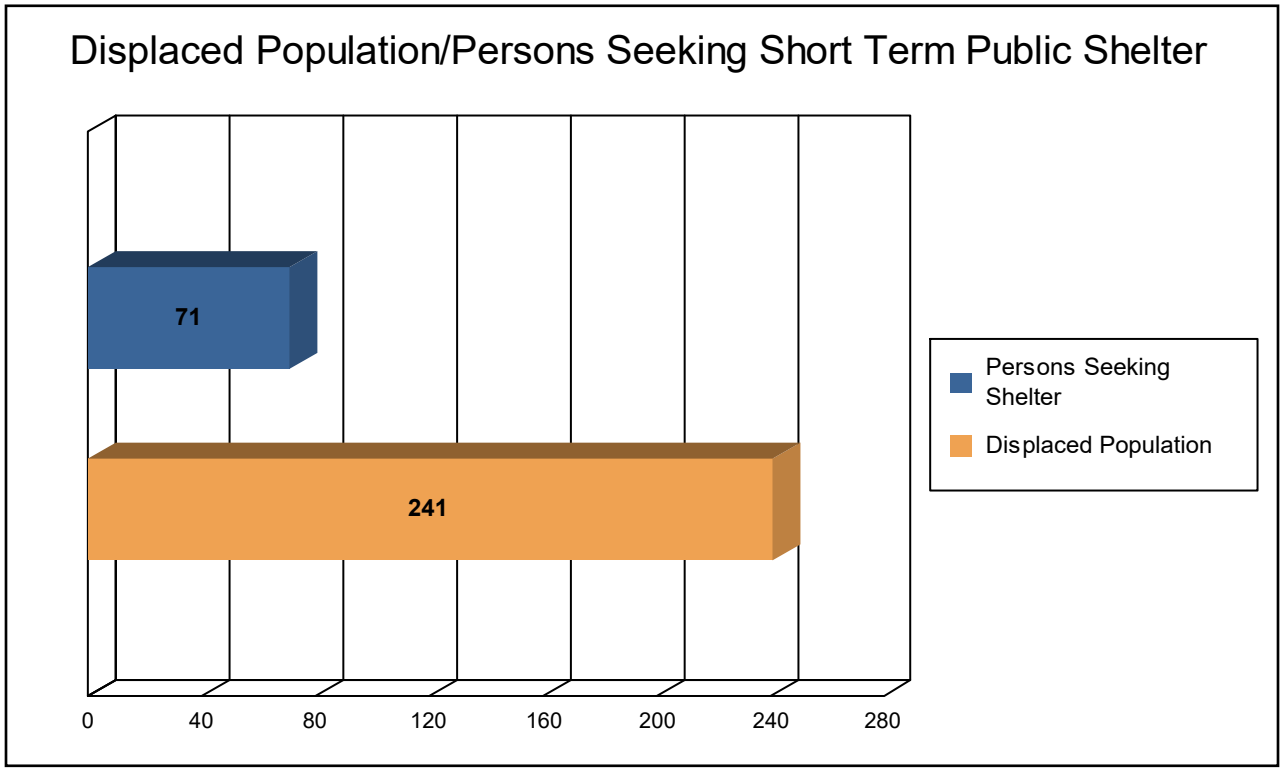


The model estimates that a total of 257 tons of debris will be generated. Of the total amount, Finishes comprises 48% of the total, Structure comprises 30% of the total, and Foundation comprises 22%. If the debris tonnage is converted into an estimated number of truckloads, it will require 11 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 80 households (or 241 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 71 people (out of a total population of 17,497) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 48.12 million dollars, which represents 4.59 % of the total replacement value of the scenario buildings.

Building-Related Losses

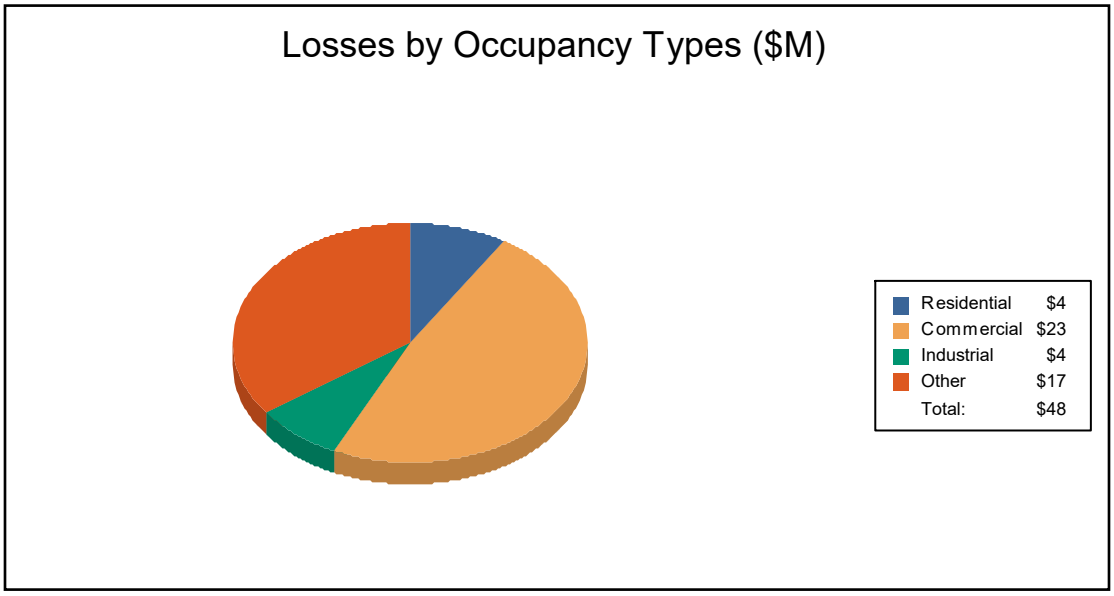
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 21.10 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.87% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.96	2.29	1.07	0.31	5.62
	Content	0.99	7.13	2.34	2.09	12.55
	Inventory	0.00	2.59	0.35	0.00	2.94
	Subtotal	**2.95**	**12.01**	**3.75**	**2.39**	**21.10**
Business Interruption						
	Income	0.10	4.17	0.05	0.51	4.82
	Relocation	0.71	1.55	0.05	0.69	3.00
	Rental Income	0.29	1.16	0.01	0.27	1.73
	Wage	0.22	4.18	0.10	12.96	17.47
	Subtotal	**1.32**	**11.06**	**0.20**	**14.44**	**27.02**
ALL	**Total**	**4.27**	**23.07**	**3.95**	**16.83**	**48.12**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	17,497	2,011,803	1,697,143	3,708,946
Total	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**
Total Study Region	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**

Hazus: Flood Global Risk Report

Region Name: Plainville_FL

Flood Scenario: Plainville_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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Note:
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The geographical size of the region is approximately 4 square miles and contains 246 census blocks. The region contains over 8 thousand households and has a total population of 17,497 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,555 buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87.28% of the buildings (and 54.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of 3,709 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
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Religion	34,683	0.9%
Government	88,494	2.4%
Education	130,635	3.5%
Total	**3,708,946**	**100%**

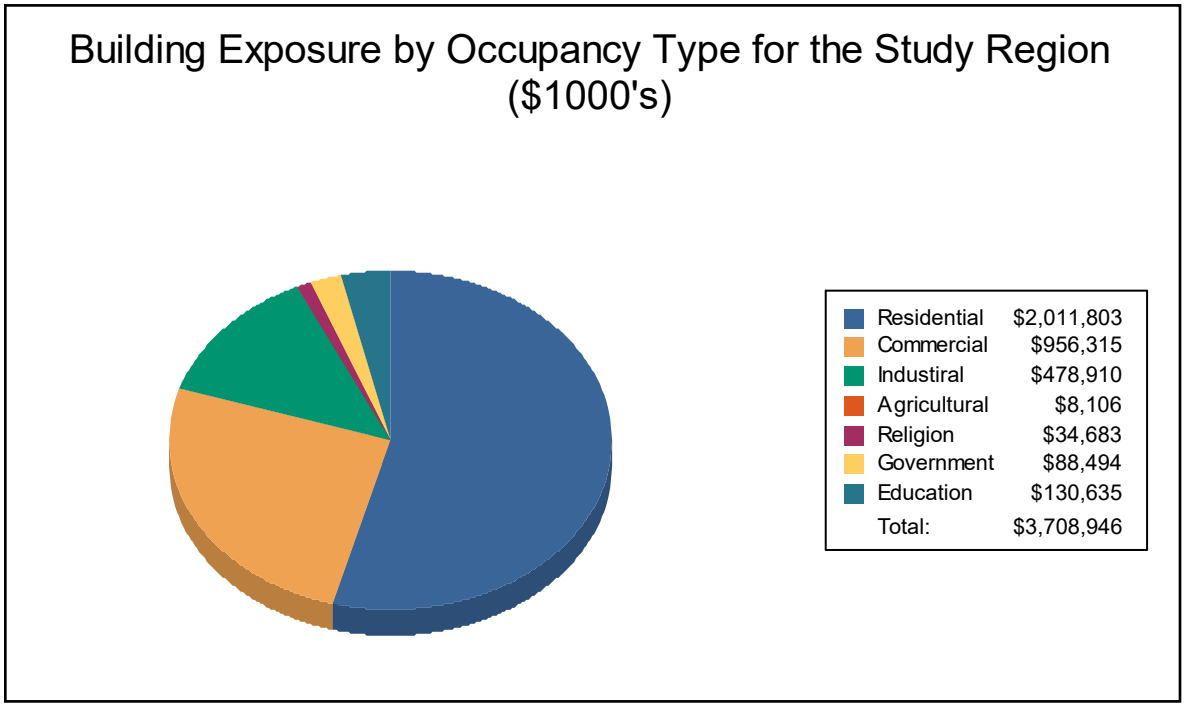

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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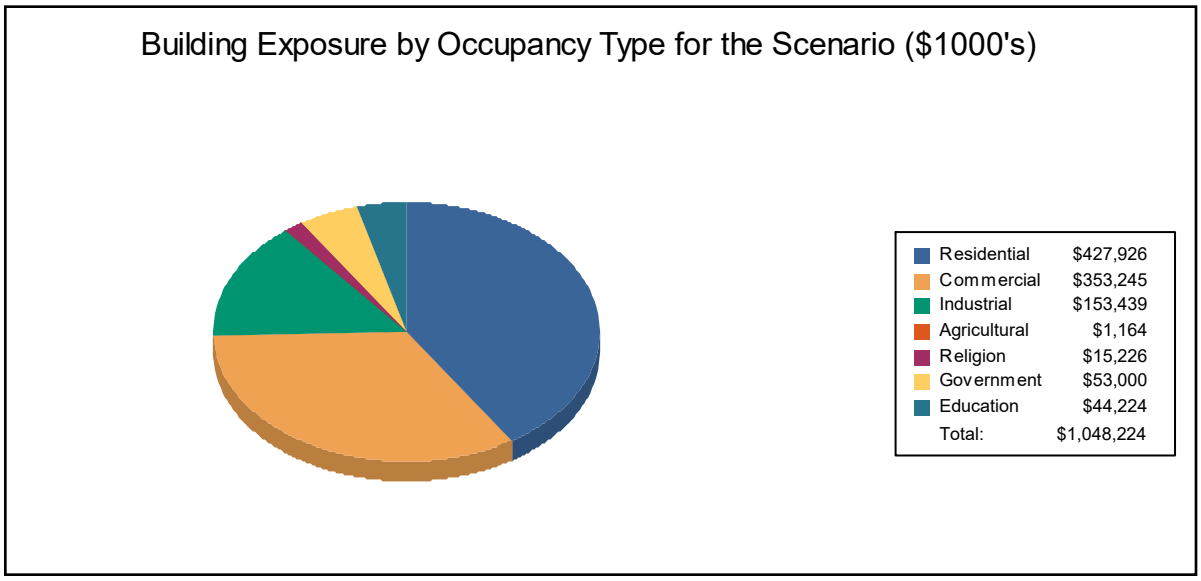
Commercial	353,245	33.7%
Industrial	153,439	14.6%
Agricultural	1,164	0.1%
Religion	15,226	1.5%
Government	53,000	5.1%
Education	44,224	4.2%
Total	**1,048,224**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 7 schools, 1 fire station, 1 police station and 1 emergency operation center.

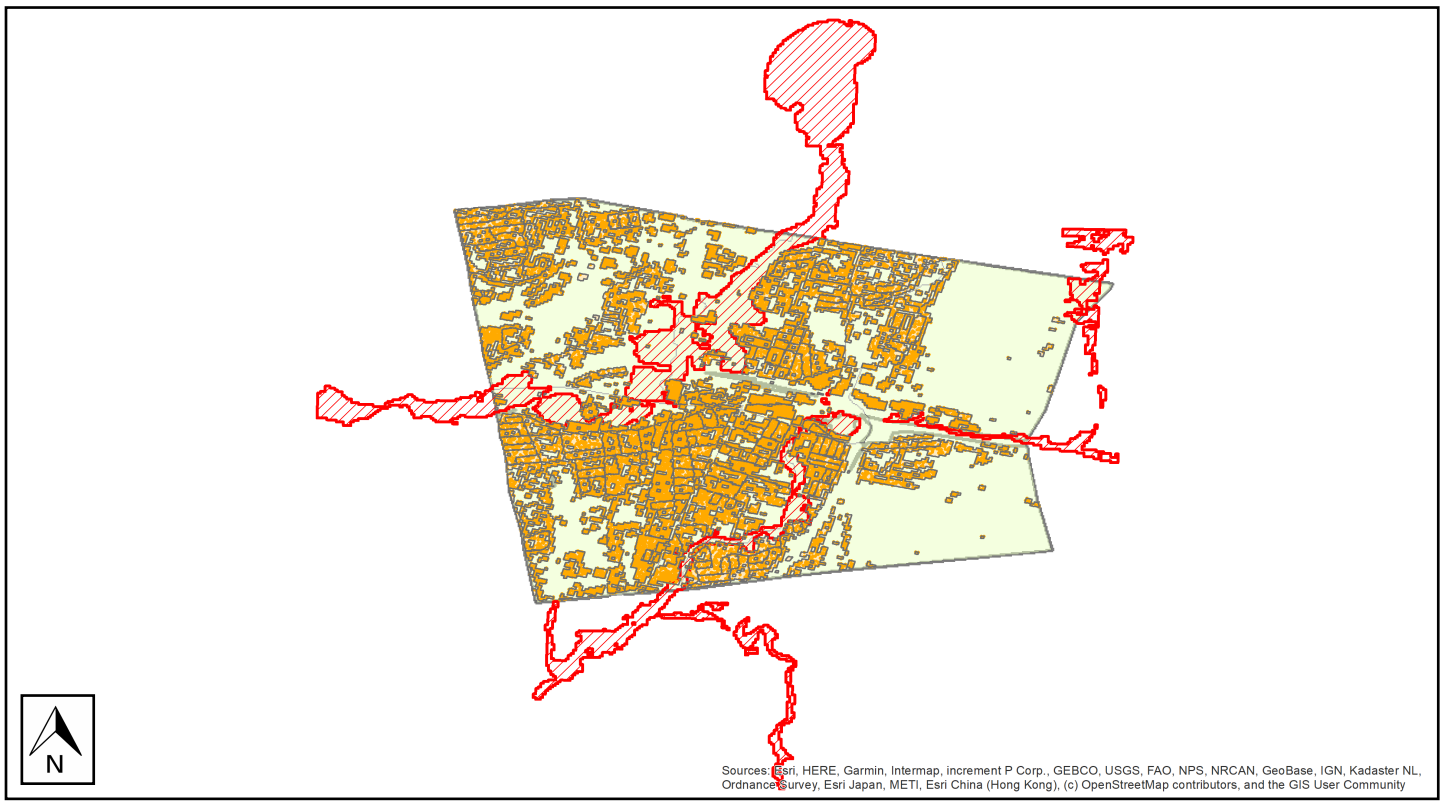
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Plainville_FL
Scenario Name:	Plainville_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 14 buildings will be at least moderately damaged. This is over 84% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

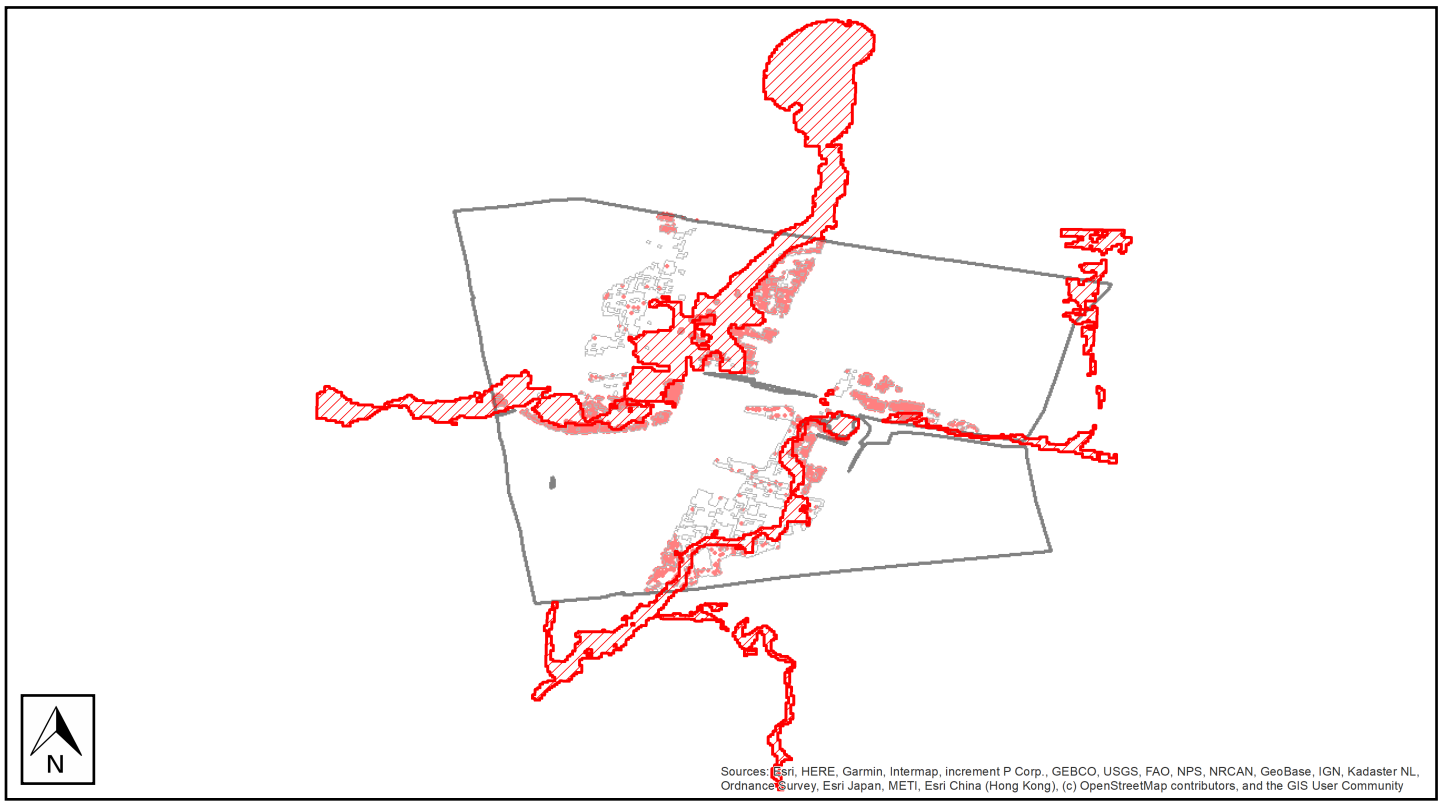


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	1	100	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	13	50	8	31	5	19	0	0	0	0	0	0
Total	**13**		**9**		**5**		**0**		**0**		**0**	

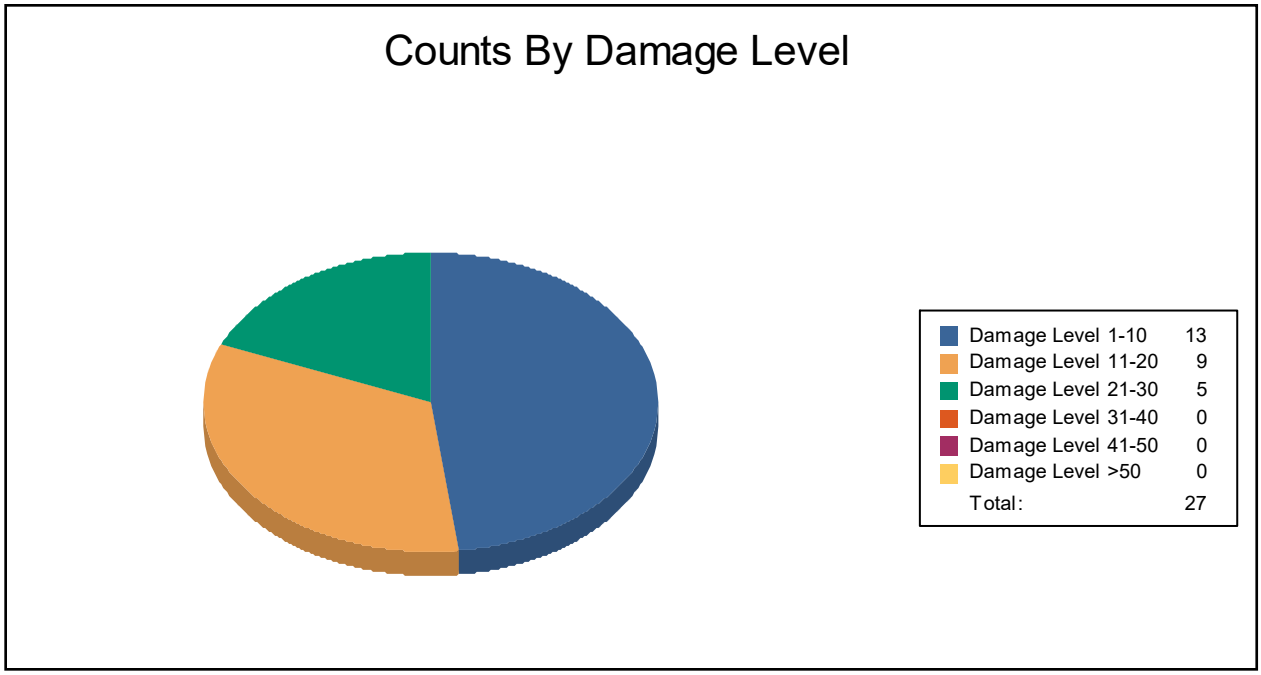


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	1	100	0	0	0	0	0	0	0	0
Wood	13	50	8	31	5	19	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

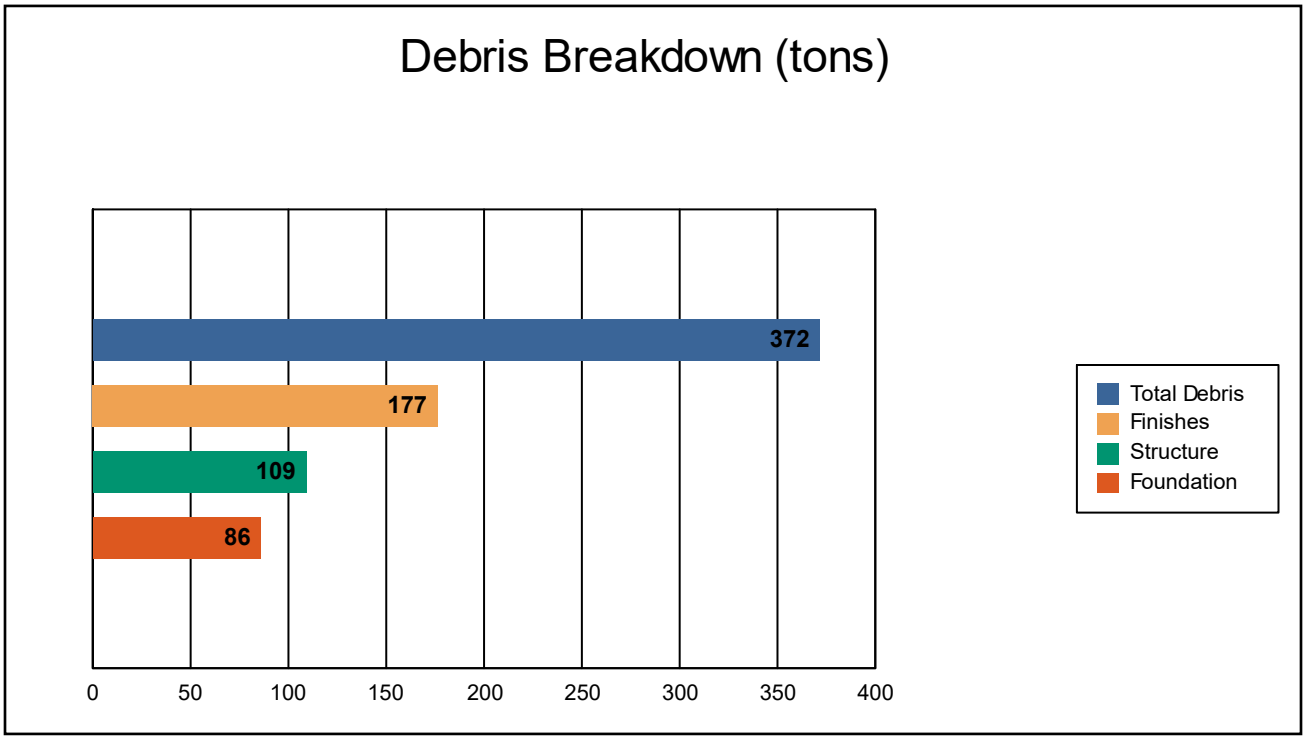
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

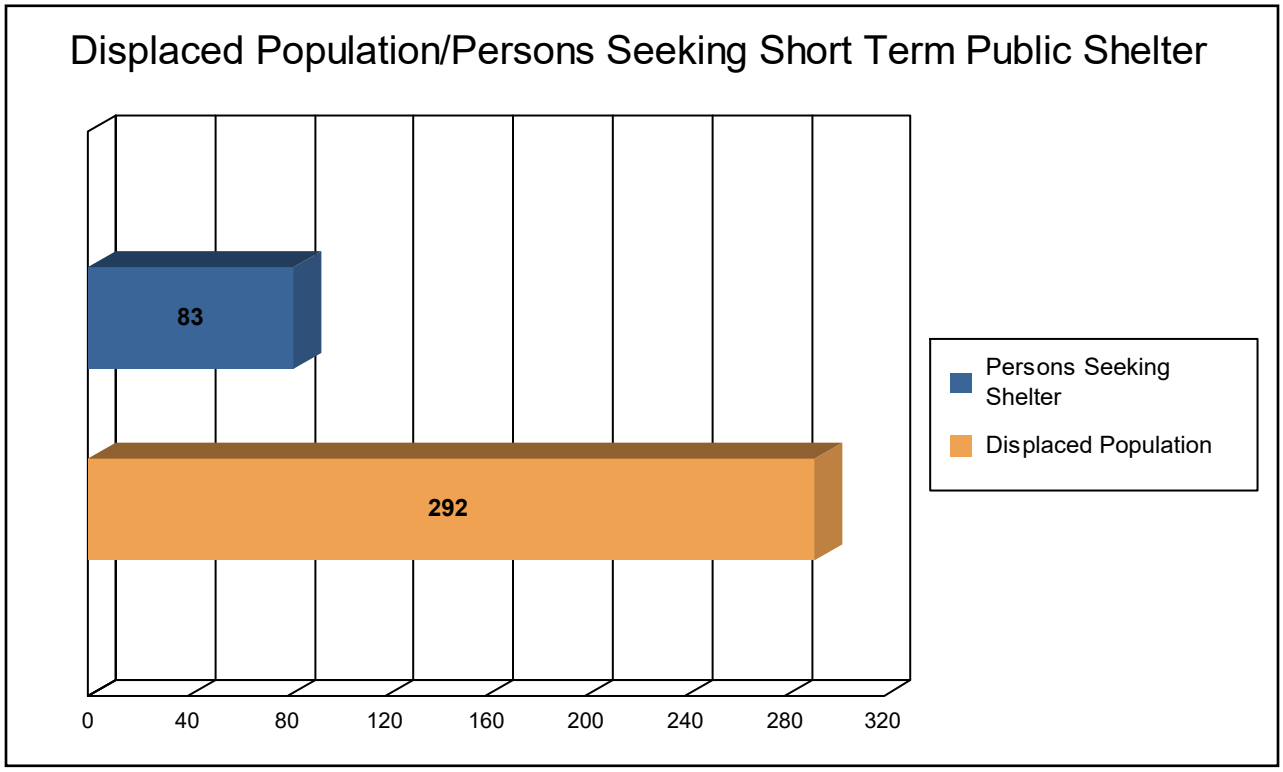


The model estimates that a total of 372 tons of debris will be generated. Of the total amount, Finishes comprises 48% of the total, Structure comprises 29% of the total, and Foundation comprises 23%. If the debris tonnage is converted into an estimated number of truckloads, it will require 15 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 97 households (or 292 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 83 people (out of a total population of 17,497) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 63.64 million dollars, which represents 6.07 % of the total replacement value of the scenario buildings.

Building-Related Losses

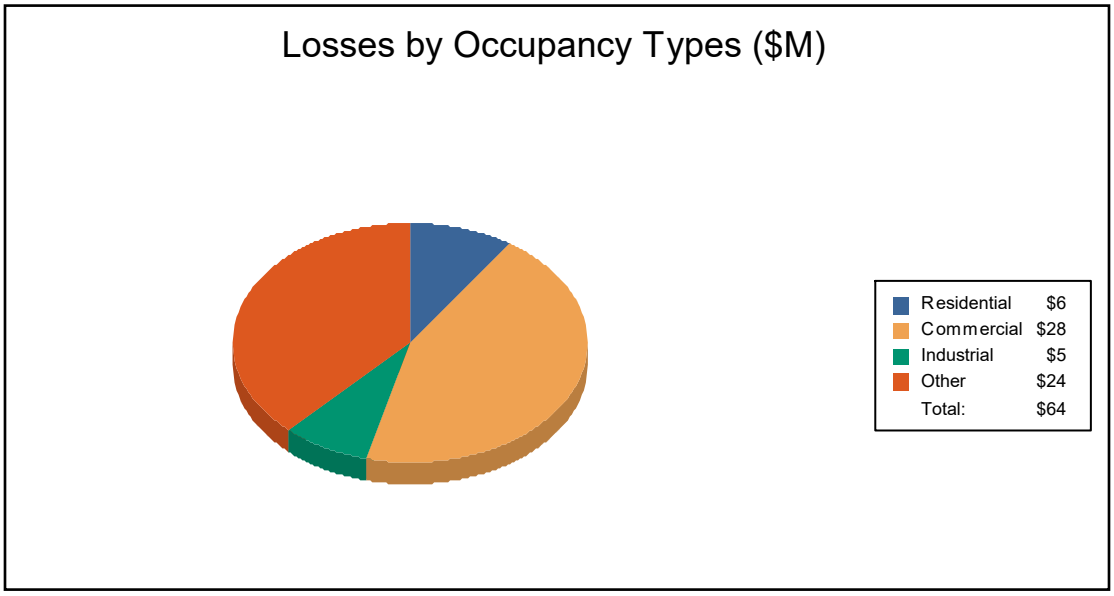
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 27.54 million dollars. 57% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 9.56% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.80	3.03	1.42	0.43	7.69
	Content	1.44	9.10	3.10	2.78	16.42
	Inventory	0.00	2.98	0.45	0.00	3.42
	Subtotal	**4.25**	**15.10**	**4.97**	**3.21**	**27.54**
Business Interruption						
	Income	0.13	5.01	0.06	0.71	5.91
	Relocation	0.98	1.81	0.05	0.98	3.82
	Rental Income	0.42	1.35	0.01	0.39	2.16
	Wage	0.31	4.92	0.11	18.87	24.22
	Subtotal	**1.84**	**13.09**	**0.23**	**20.95**	**36.10**
ALL	**Total**	**6.09**	**28.19**	**5.20**	**24.17**	**63.64**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	17,497	2,011,803	1,697,143	3,708,946
Total	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**
Total Study Region	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**

Hazus: Flood Global Risk Report

Region Name: Plainville_FL

Flood Scenario: Plainville_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 246 census blocks. The region contains over 8 thousand households and has a total population of 17,497 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,555 buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87.28% of the buildings (and 54.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of 3,709 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,011,803	54.2%
Commercial	956,315	25.8%
Industrial	478,910	12.9%
Agricultural	8,106	0.2%
Religion	34,683	0.9%
Government	88,494	2.4%
Education	130,635	3.5%
Total	**3,708,946**	**100%**

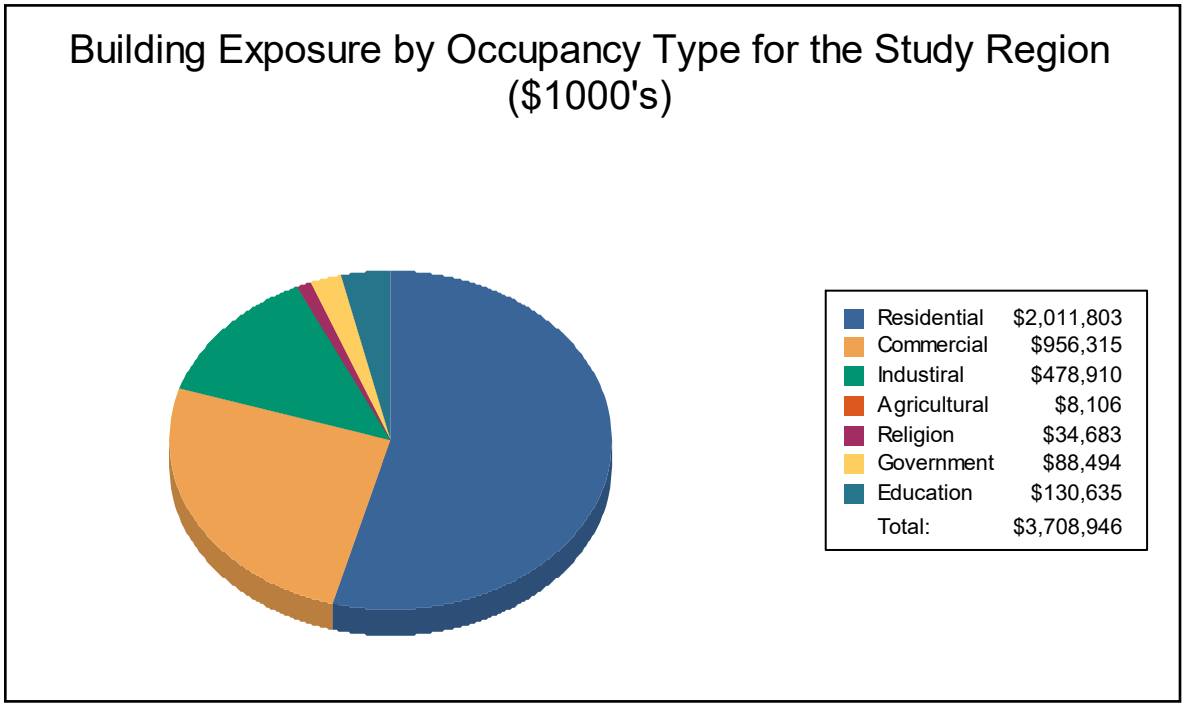
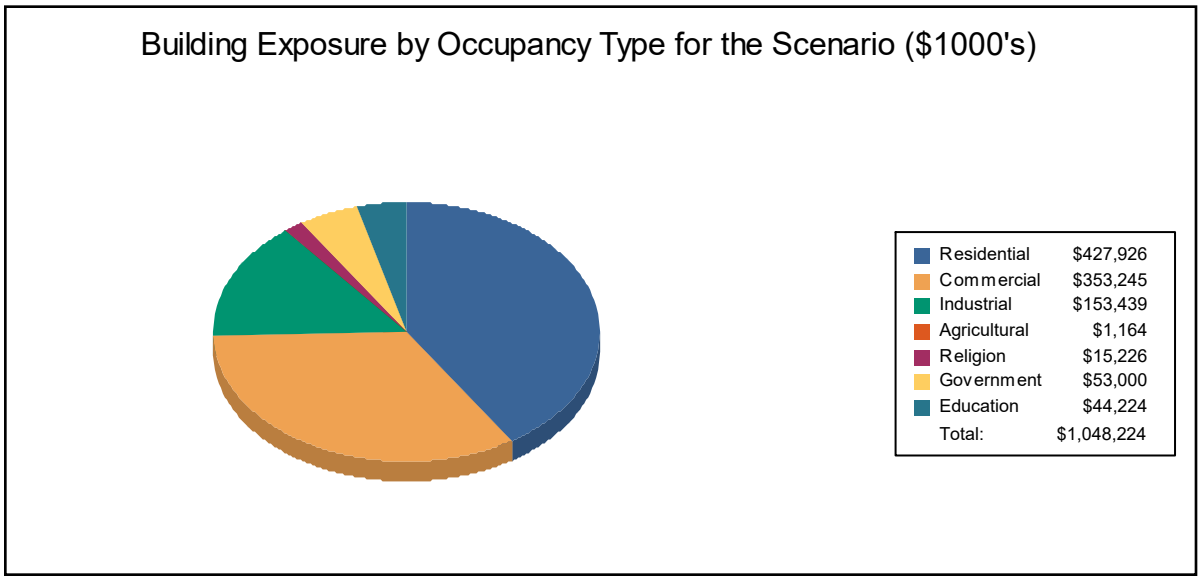


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	427,926	40.8%
Commercial	353,245	33.7%
Industrial	153,439	14.6%
Agricultural	1,164	0.1%
Religion	15,226	1.5%
Government	53,000	5.1%
Education	44,224	4.2%
Total	**1,048,224**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 7 schools, 1 fire station, 1 police station and 1 emergency operation center.

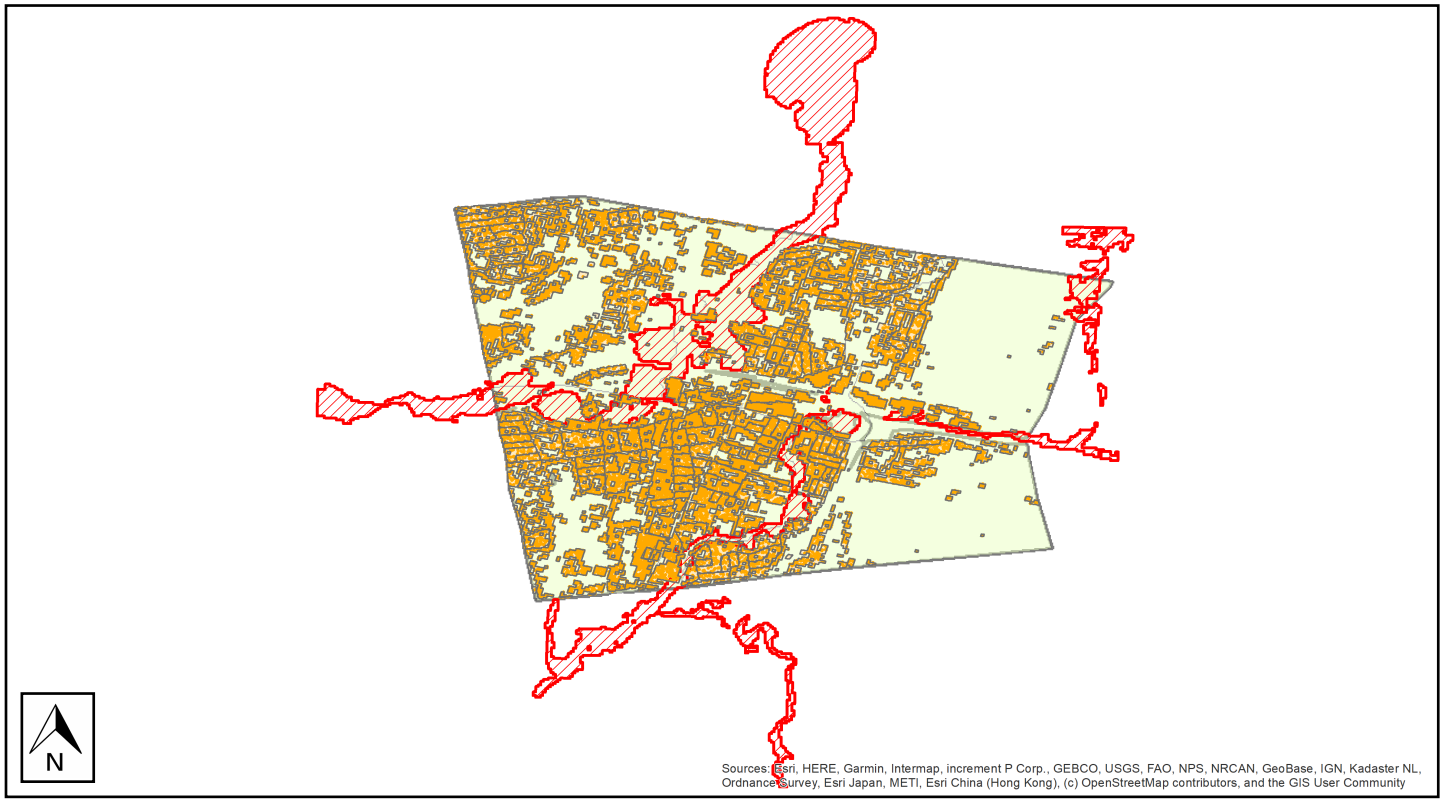
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Plainville_FL
Scenario Name:	Plainville_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 18 buildings will be at least moderately damaged. This is over 86% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

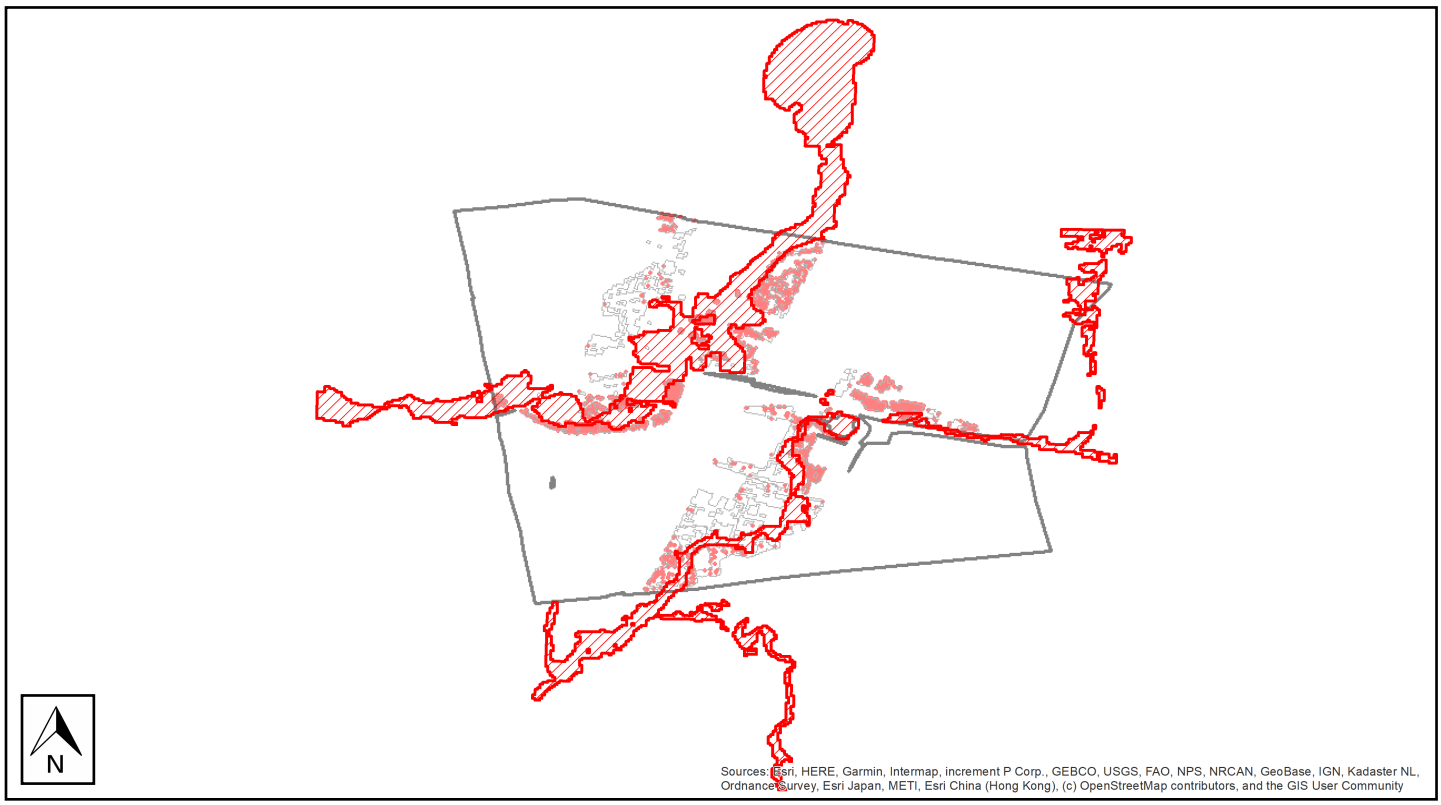


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	1	33	2	67	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	14	47	9	30	6	20	1	3	0	0	0	0
Total	**15**		**11**		**6**		**1**		**0**		**0**	

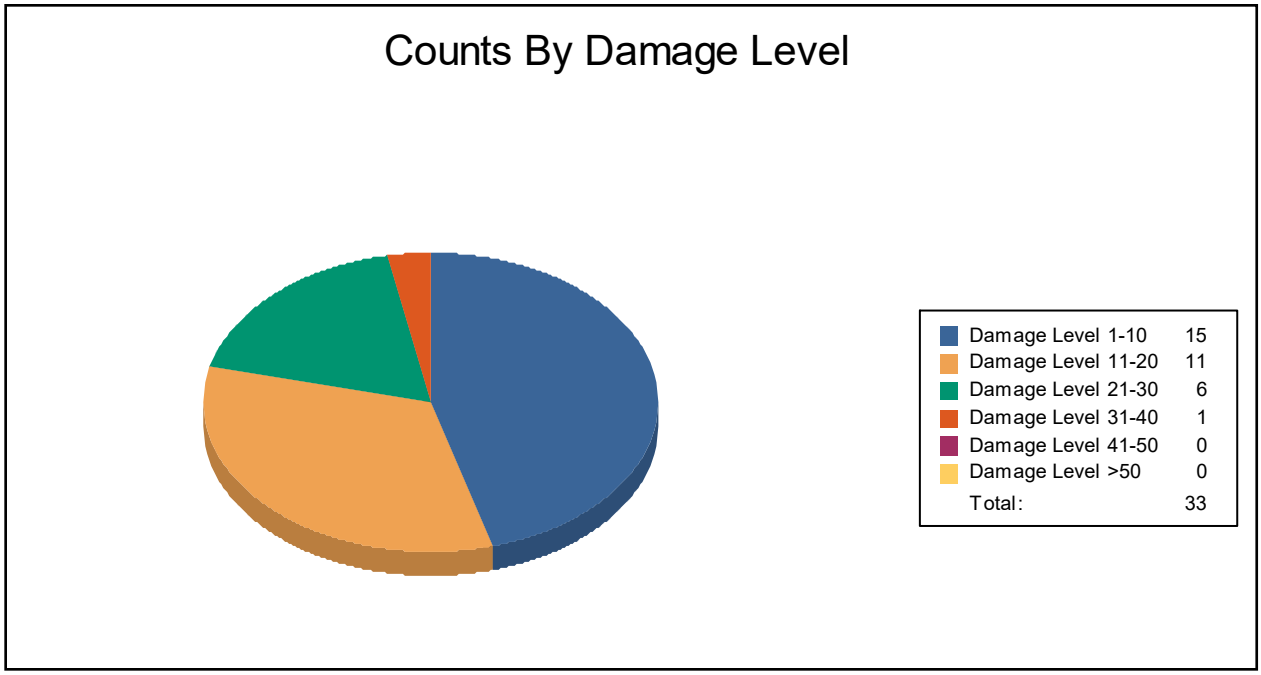


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	1	33	2	67	0	0	0	0	0	0	0	0
Wood	14	47	9	30	6	20	1	3	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

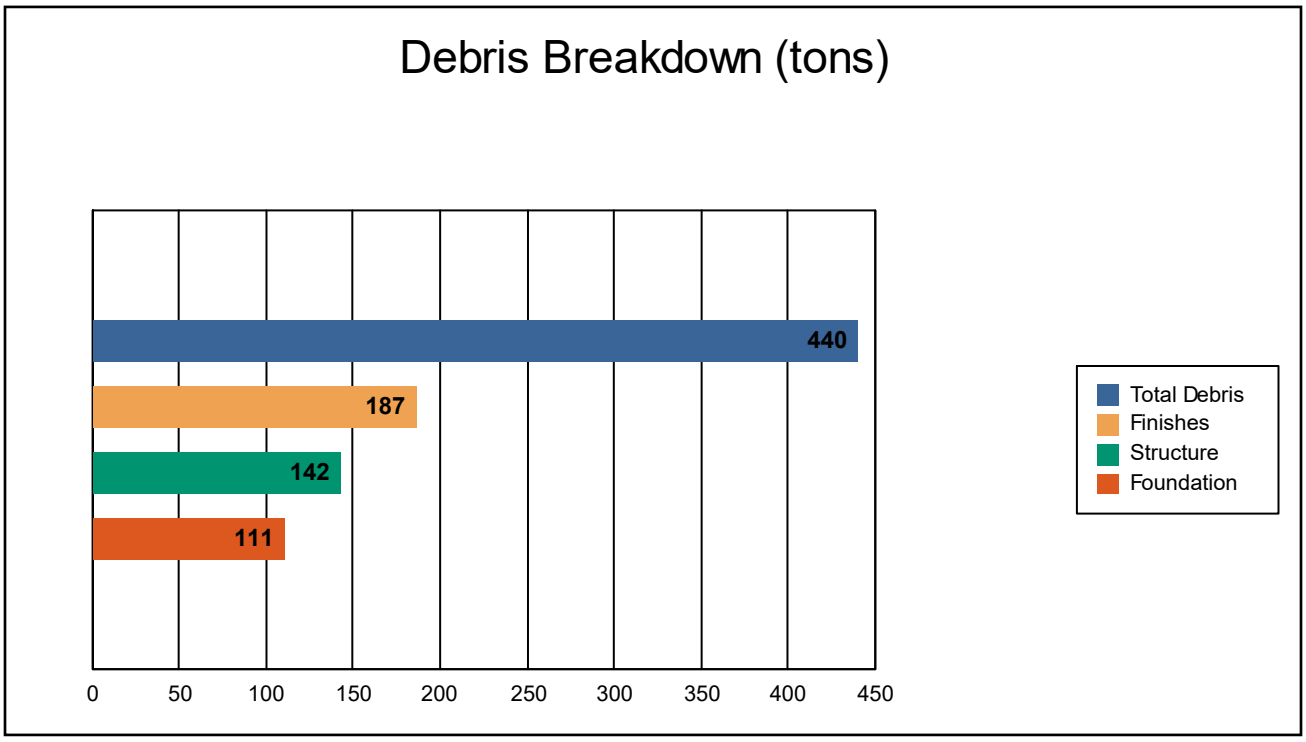
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

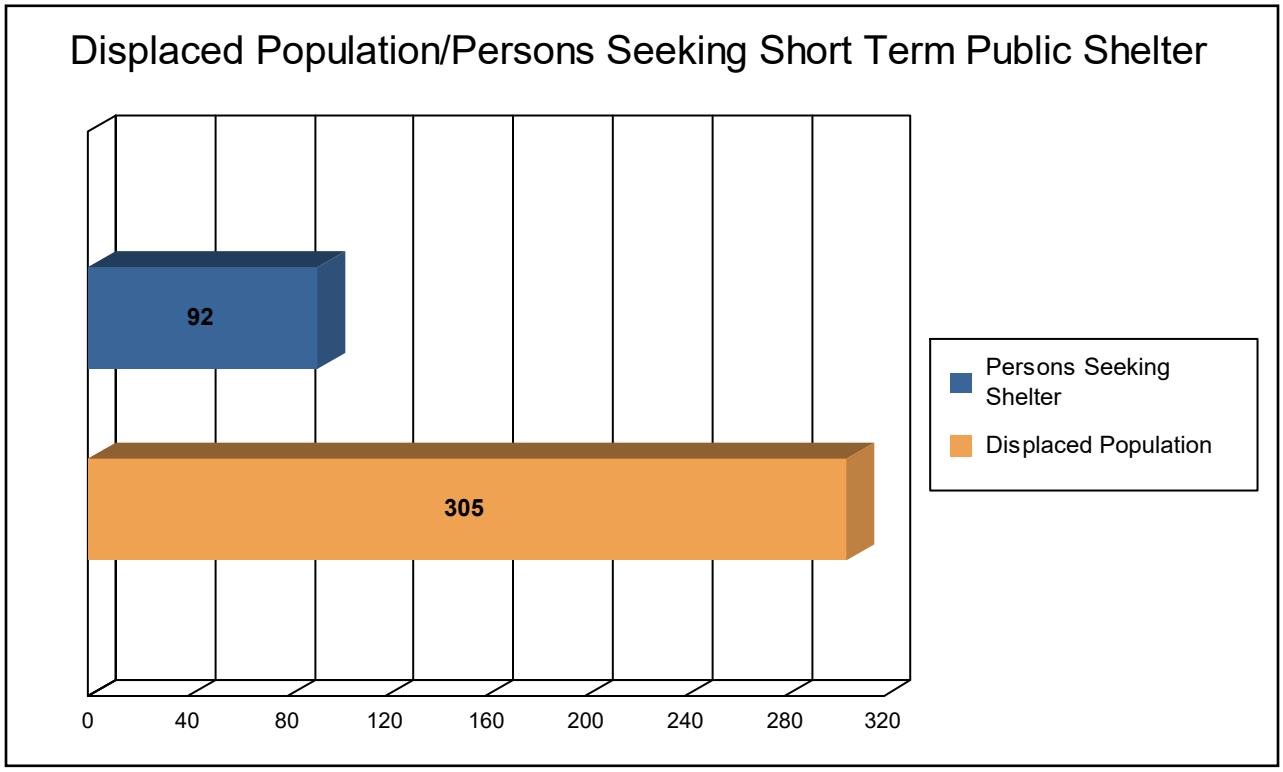


The model estimates that a total of 440 tons of debris will be generated. Of the total amount, Finishes comprises 42% of the total, Structure comprises 32% of the total, and Foundation comprises 25%. If the debris tonnage is converted into an estimated number of truckloads, it will require 18 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 102 households (or 305 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 92 people (out of a total population of 17,497) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 68.00 million dollars, which represents 6.49 % of the total replacement value of the scenario buildings.

Building-Related Losses

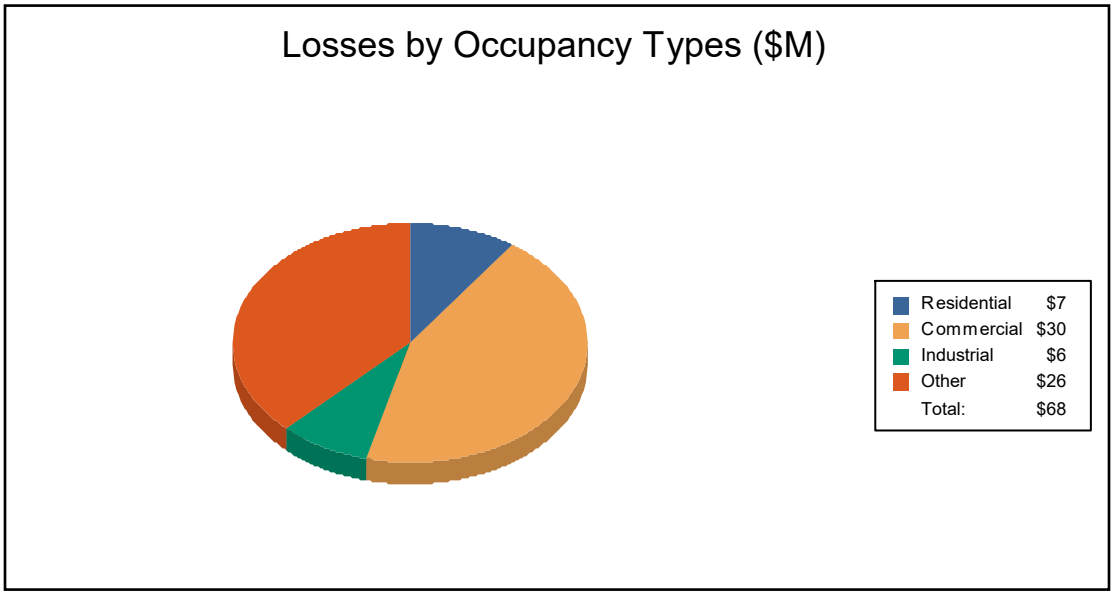
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 30.07 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 9.78% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.12	3.34	1.55	0.50	8.51
	Content	1.59	9.80	3.40	3.19	17.99
	Inventory	0.00	3.08	0.49	0.01	3.57
	Subtotal	**4.71**	**16.22**	**5.44**	**3.70**	**30.07**
Business Interruption						
	Income	0.13	5.37	0.06	0.73	6.29
	Relocation	1.05	1.88	0.05	1.01	3.99
	Rental Income	0.44	1.40	0.01	0.40	2.25
	Wage	0.31	5.12	0.11	19.86	25.40
	Subtotal	**1.94**	**13.76**	**0.23**	**22.00**	**37.93**
ALL	**Total**	**6.65**	**29.99**	**5.67**	**25.70**	**68.00**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	17,497	2,011,803	1,697,143	3,708,946
Total	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**
Total Study Region	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**

Hazus: Flood Global Risk Report

Region Name: Plainville_FL

Flood Scenario: Plainville_Flood

Print Date: Thursday, April 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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Note:
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The geographical size of the region is approximately 4 square miles and contains 246 census blocks. The region contains over 8 thousand households and has a total population of 17,497 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,555 buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87.28% of the buildings (and 54.24% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of 3,709 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
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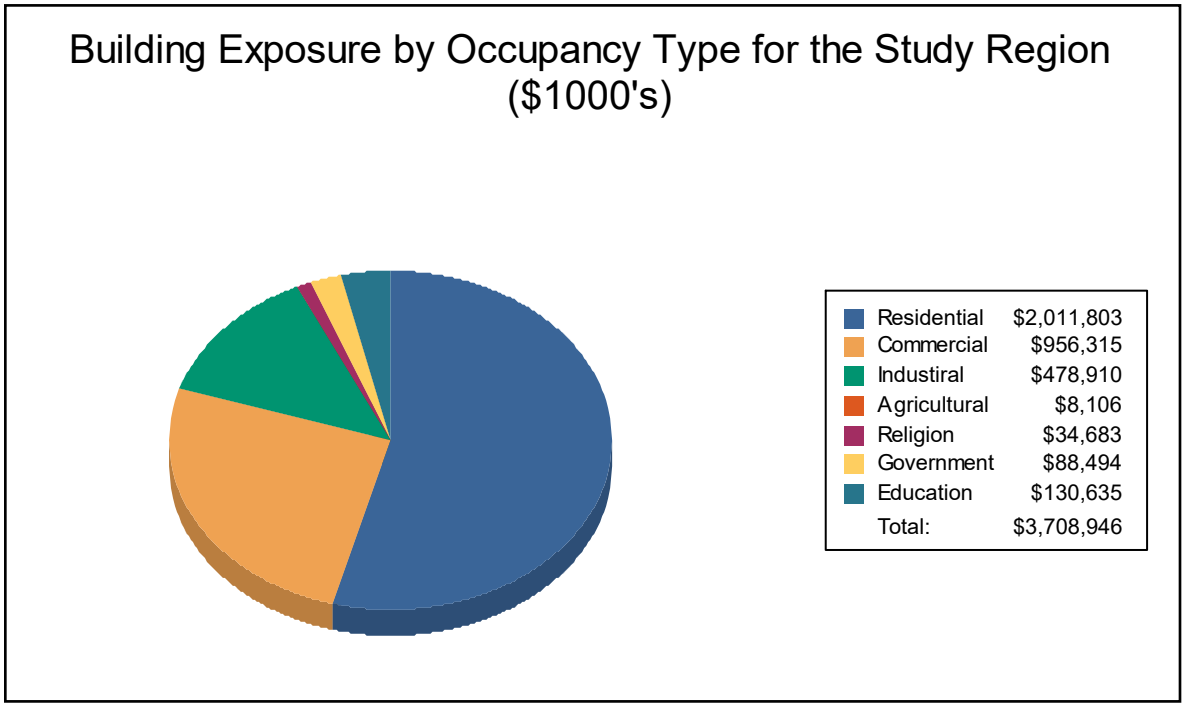
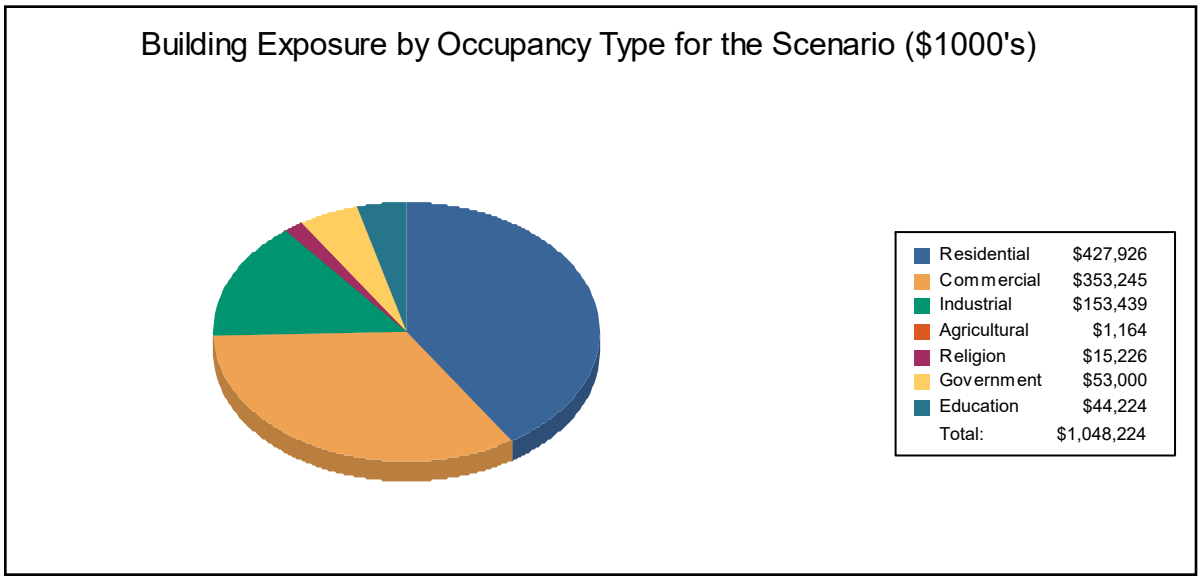


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	427,926	40.8%
Commercial	353,245	33.7%
Industrial	153,439	14.6%
Agricultural	1,164	0.1%
Religion	15,226	1.5%
Government	53,000	5.1%
Education	44,224	4.2%
Total	**1,048,224**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 7 schools, 1 fire station, 1 police station and 1 emergency operation center.

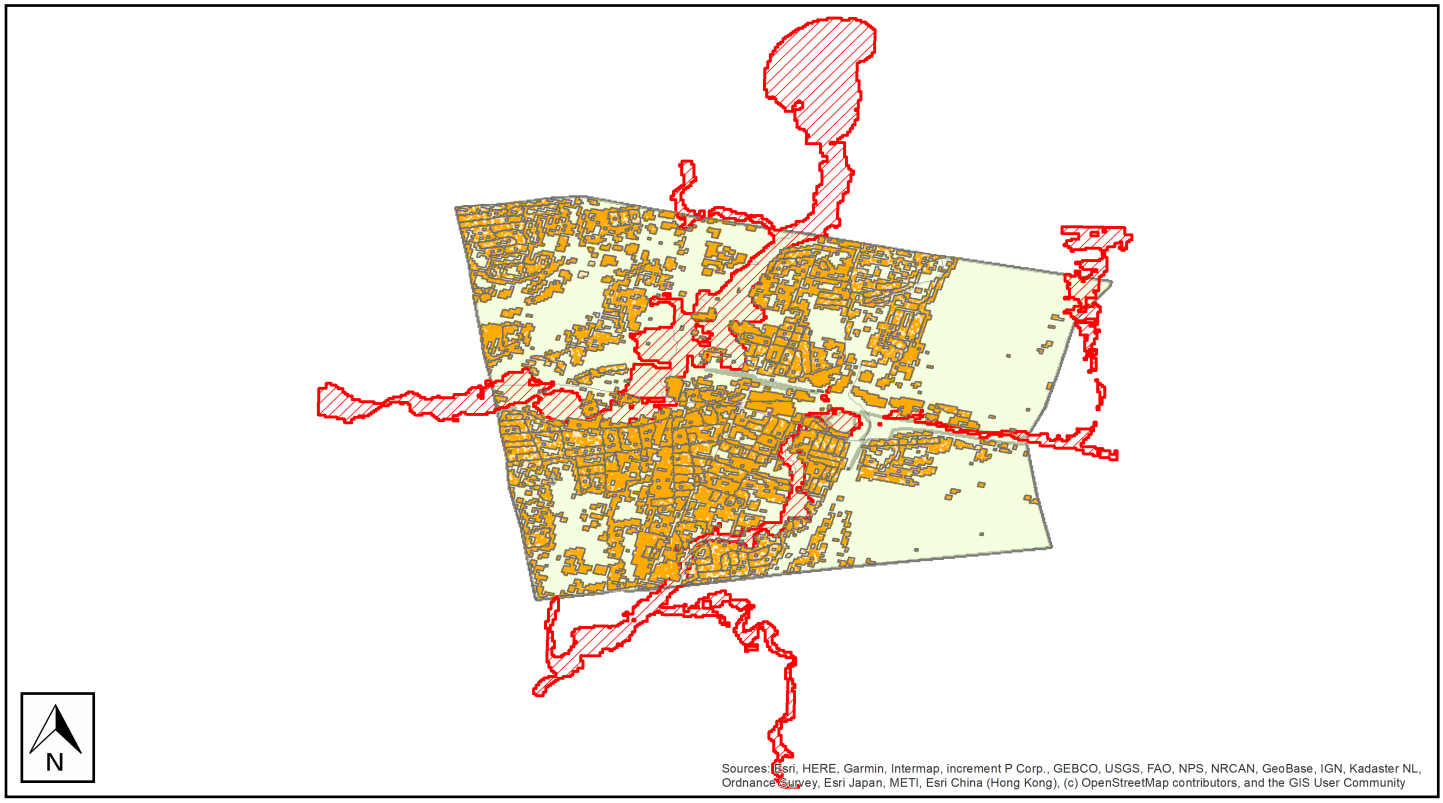
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Plainville_FL
Scenario Name:	Plainville_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 38 buildings will be at least moderately damaged. This is over 84% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

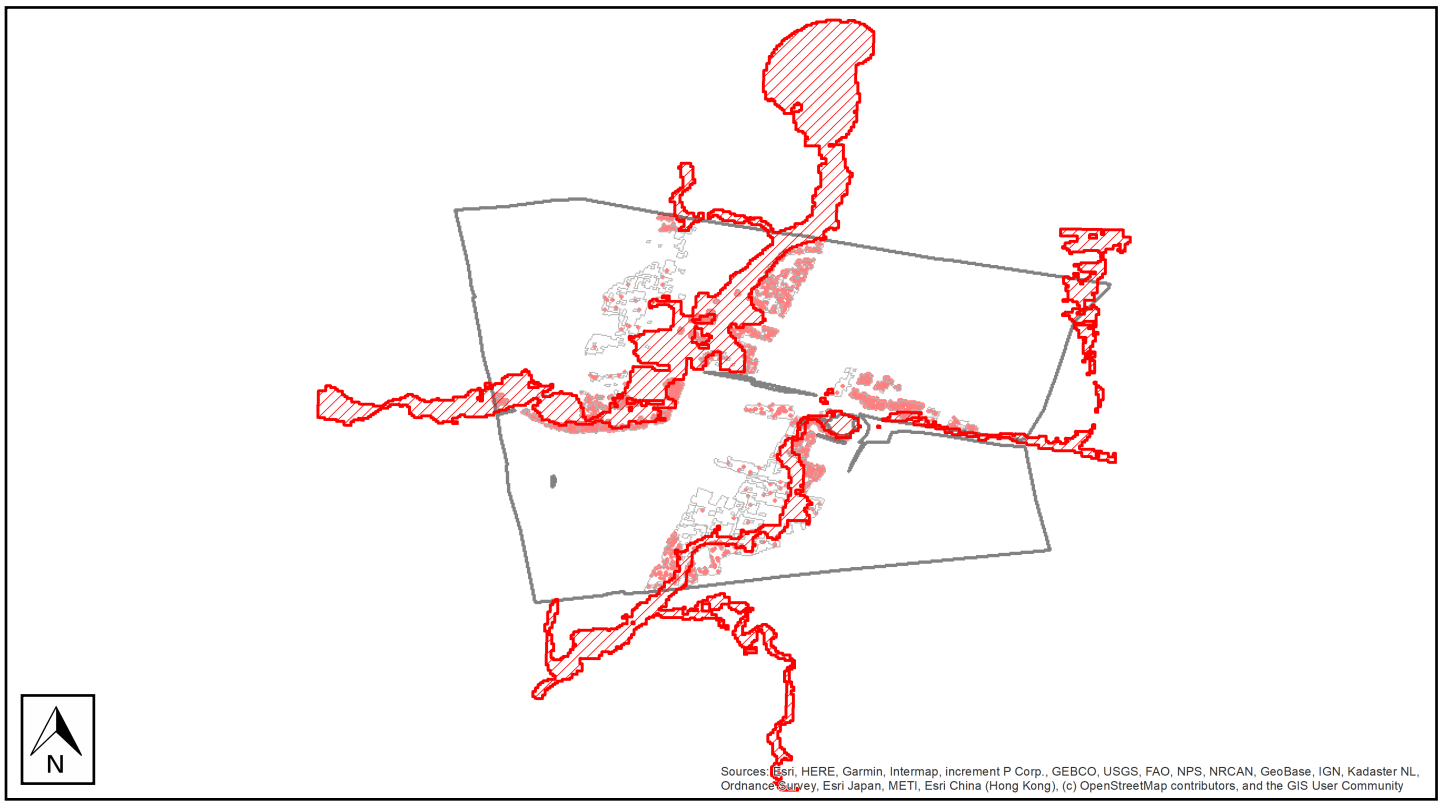


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	1	33	2	67	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	24	40	18	30	12	20	6	10	0	0	0	0
Total	**25**		**20**		**12**		**6**		**0**		**0**	

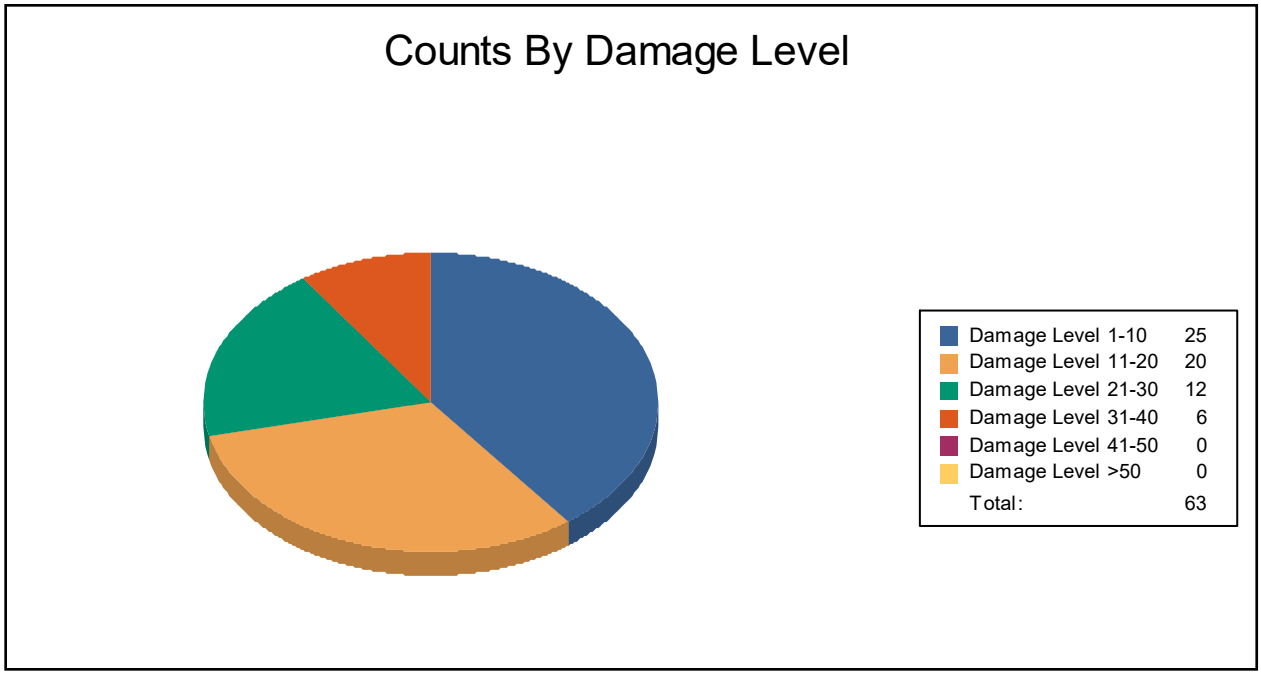


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	1	33	2	67	0	0	0	0	0	0	0	0
Wood	24	40	18	30	12	20	6	10	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

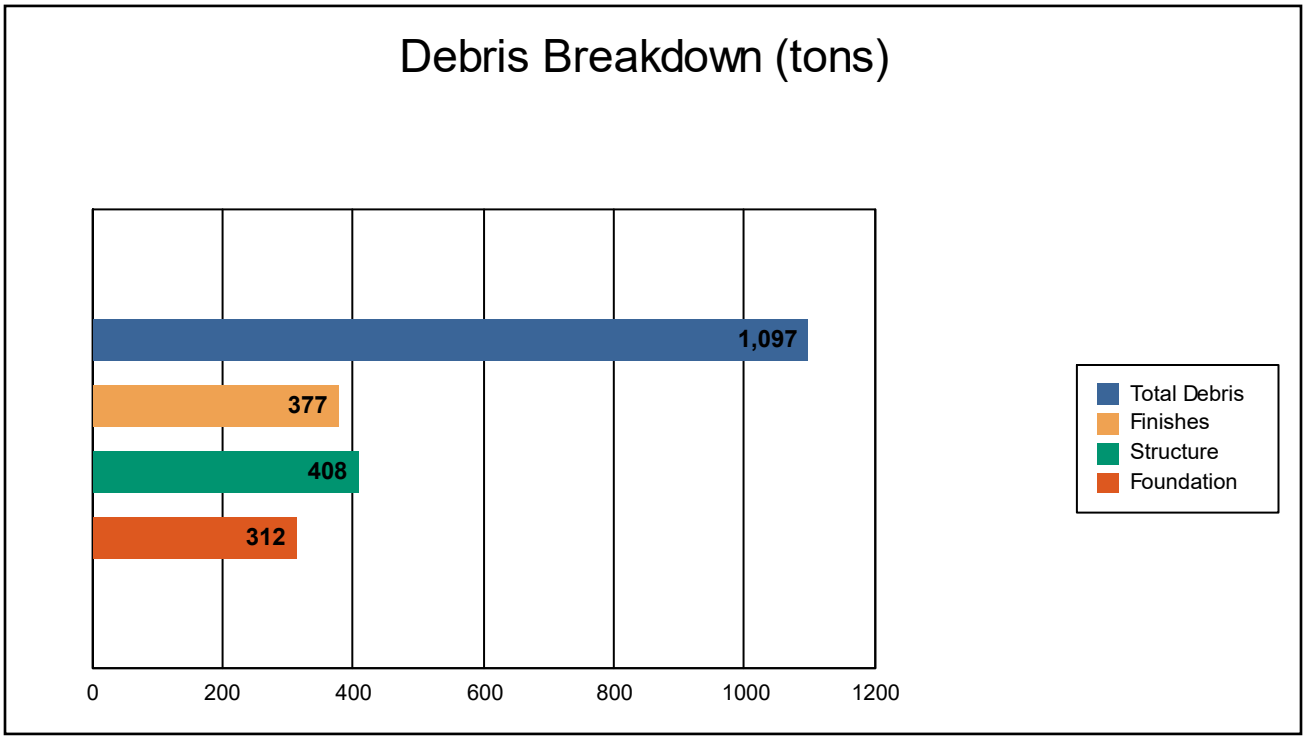
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

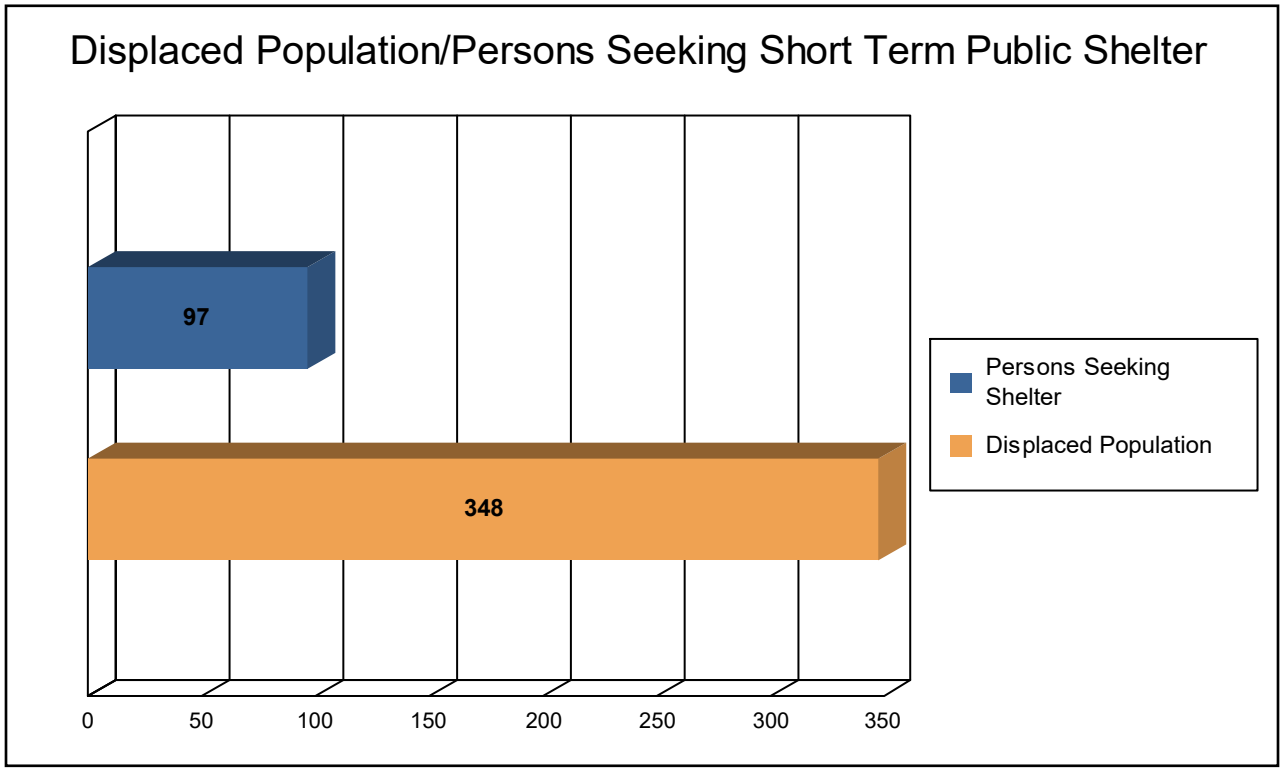


The model estimates that a total of 1,097 tons of debris will be generated. Of the total amount, Finishes comprises 34% of the total, Structure comprises 37% of the total, and Foundation comprises 28%. If the debris tonnage is converted into an estimated number of truckloads, it will require 44 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 116 households (or 348 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 97 people (out of a total population of 17,497) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 96.67 million dollars, which represents 9.22 % of the total replacement value of the scenario buildings.

Building-Related Losses

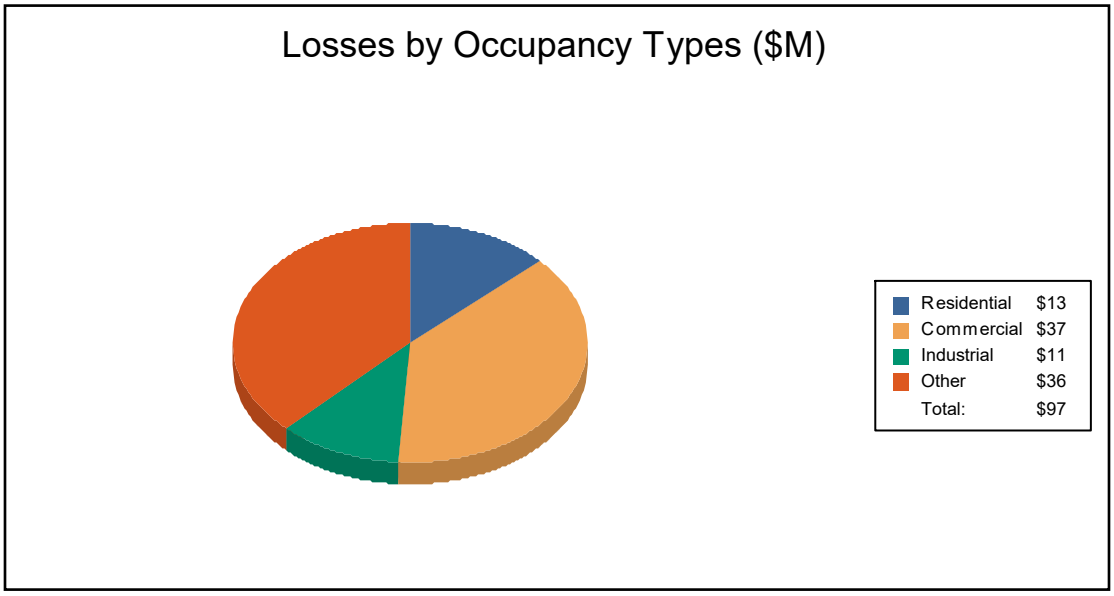
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 43.18 million dollars. 55% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 12.97% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6.05	3.71	3.02	0.82	13.59
	Content	3.14	11.45	6.55	5.08	26.21
	Inventory	0.00	2.43	0.94	0.00	3.37
	Subtotal	**9.18**	**17.58**	**10.51**	**5.90**	**43.18**
Business Interruption						
	Income	0.23	7.35	0.11	1.14	8.83
	Relocation	1.79	2.20	0.11	1.49	5.57
	Rental Income	0.81	1.62	0.02	0.57	3.02
	Wage	0.53	8.00	0.20	27.34	36.07
	Subtotal	**3.35**	**19.16**	**0.44**	**30.53**	**53.49**
ALL	**Total**	**12.54**	**36.75**	**10.95**	**36.43**	**96.67**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	17,497	2,011,803	1,697,143	3,708,946
Total	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**
Total Study Region	**17,497**	**2,011,803**	**1,697,143**	**3,708,946**

Hazus: Flood Global Risk Report

Region Name: Rocky_Hill_FL

Flood Scenario: Rocky_Hill_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 210 census blocks. The region contains over 9 thousand households and has a total population of 20,845 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,707 buildings in the region with a total building replacement value (excluding contents) of 3,942 million dollars. Approximately 83.21% of the buildings (and 61.04% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of 3,942 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,406,303	61.0%
Commercial	999,628	25.4%
Industrial	271,902	6.9%
Agricultural	16,822	0.4%
Religion	51,262	1.3%
Government	70,729	1.8%
Education	125,556	3.2%
Total	**3,942,202**	**100%**

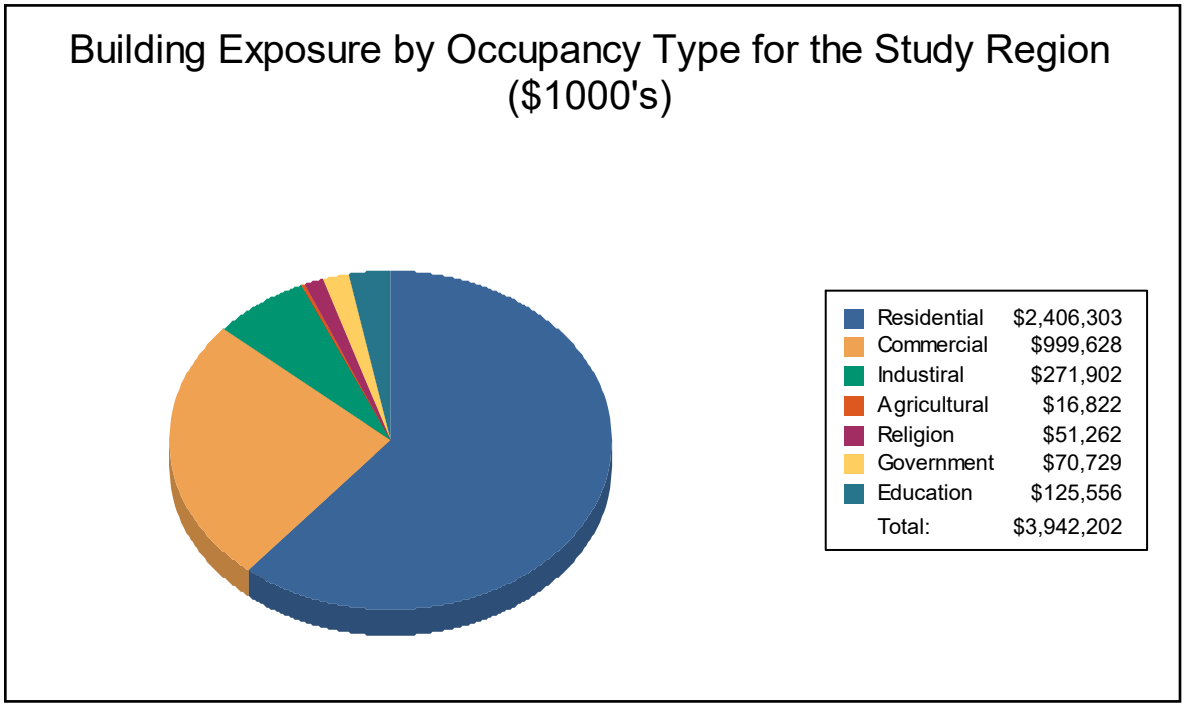
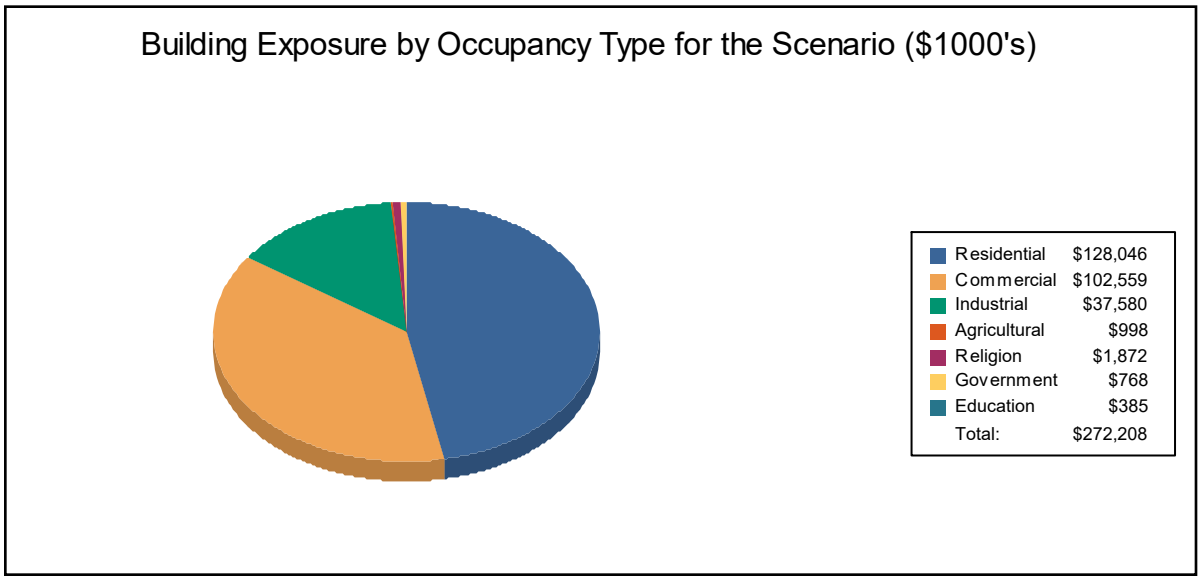


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	128,046	47.0%
Commercial	102,559	37.7%
Industrial	37,580	13.8%
Agricultural	998	0.4%
Religion	1,872	0.7%
Government	768	0.3%
Education	385	0.1%
Total	**272,208**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds.
There are 6 schools, 3 fire stations, 1 police station and 1 emergency operation center.

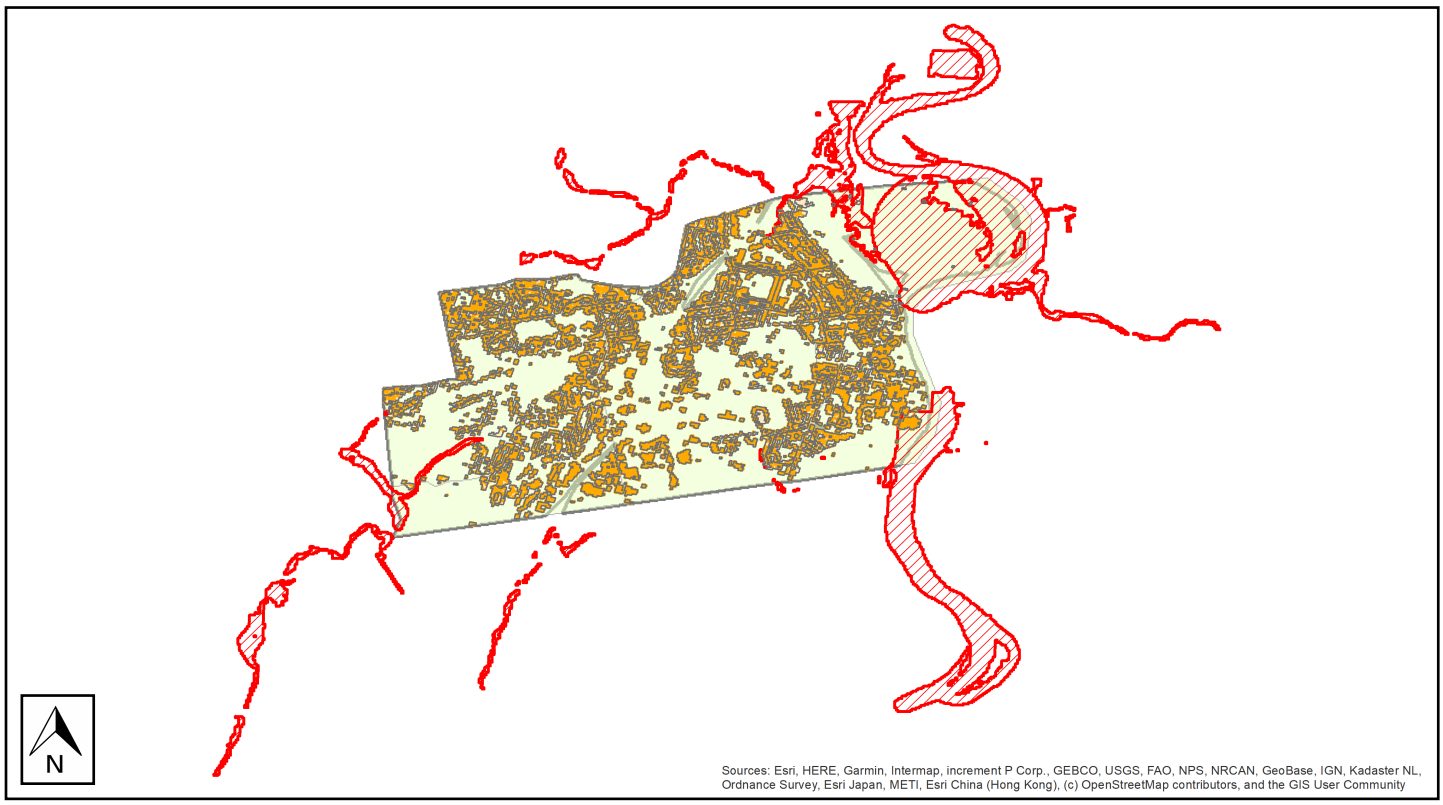
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Rocky_Hill_FL
Scenario Name:	Rocky_Hill_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 5 buildings will be at least moderately damaged. This is over 60% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

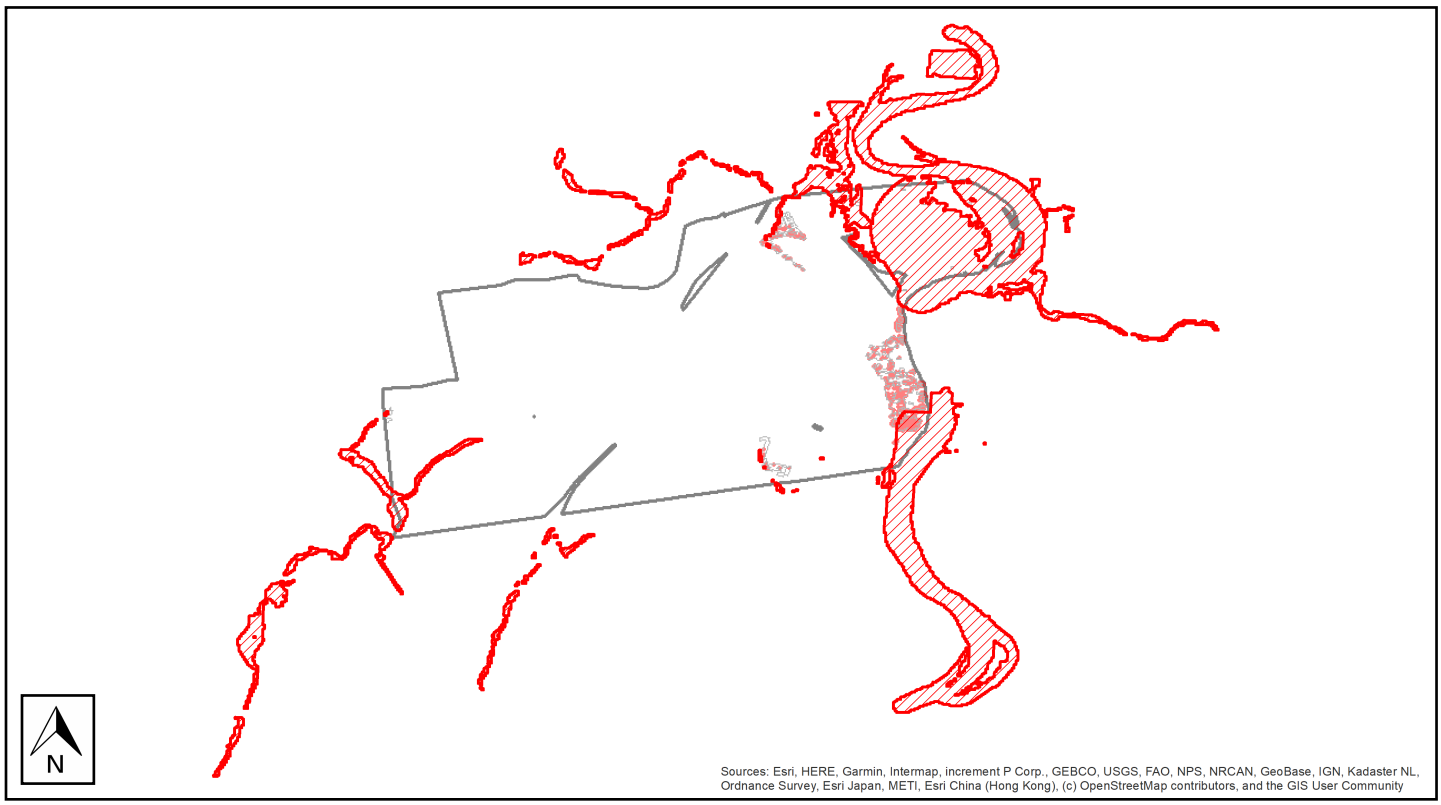


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	2	100	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	1	100	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	2	100	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**1**		**2**		**2**		**0**		**0**	

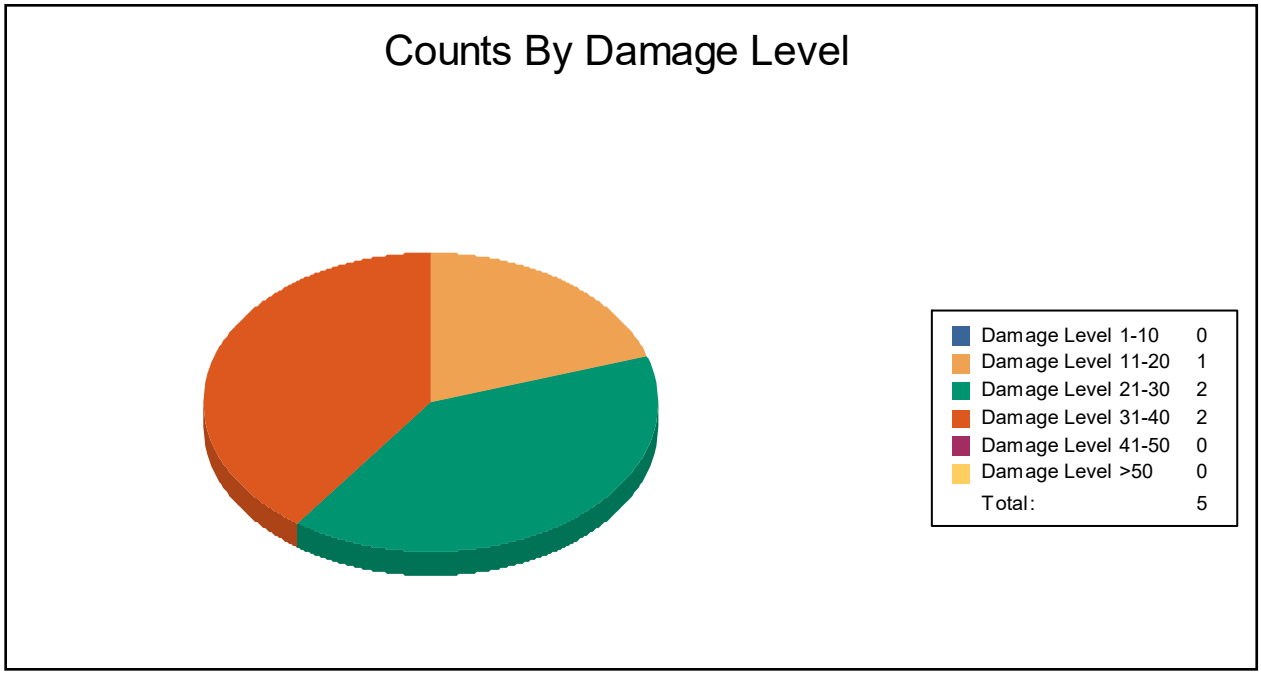


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	1	50	1	50	0	0	0	0
Steel	0	0	1	33	1	33	1	33	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 125 hospital beds available for use. On the day of the scenario flood event, the model estimates that 125 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	6	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

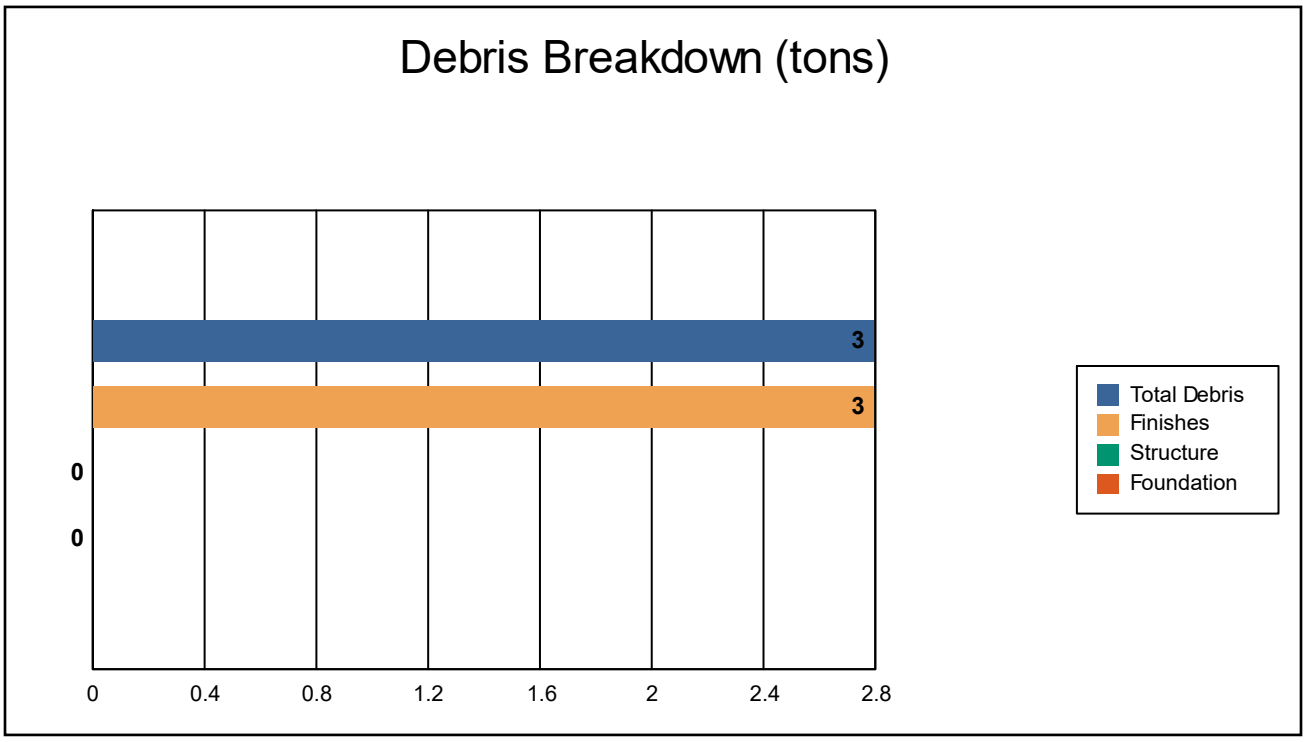
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

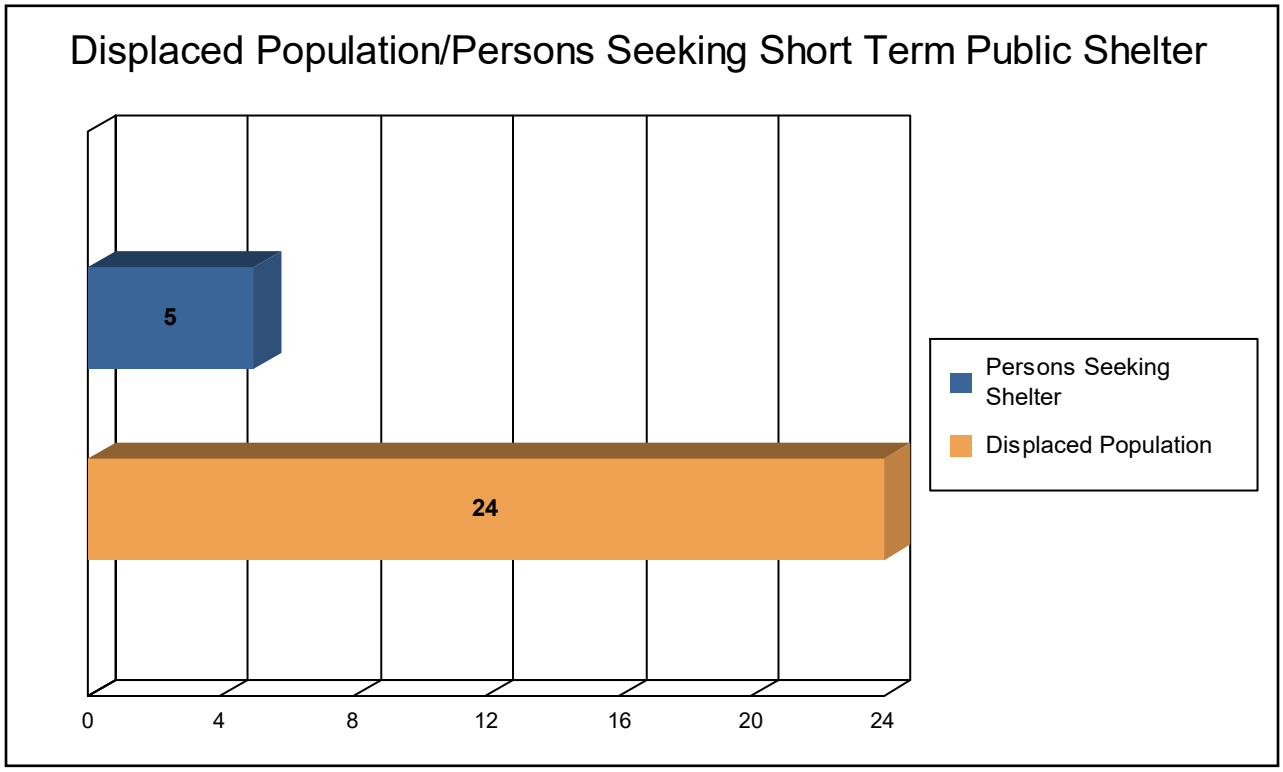


The model estimates that a total of 3 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 8 households (or 24 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 5 people (out of a total population of 20,845) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 51.61 million dollars, which represents 18.96 % of the total replacement value of the scenario buildings.

Building-Related Losses

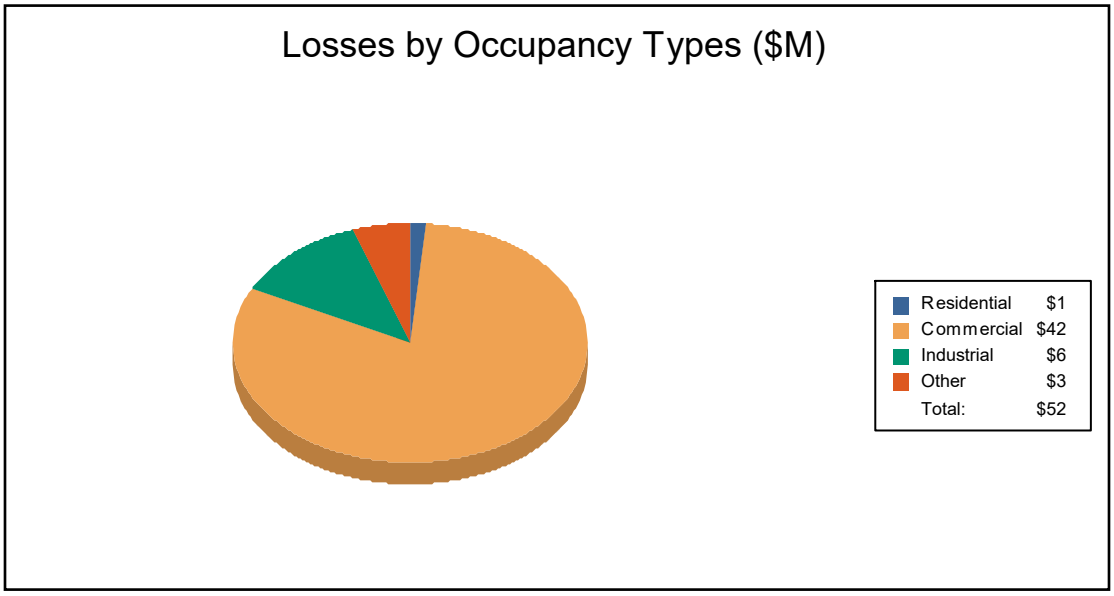
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 36.94 million dollars. 28% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 1.31% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.38	6.14	1.93	0.25	8.70
	Content	0.16	17.44	3.69	0.71	22.01
	Inventory	0.00	5.45	0.45	0.34	6.23
	Subtotal	**0.54**	**29.04**	**6.07**	**1.30**	**36.94**
Business Interruption						
	Income	0.00	2.79	0.05	0.11	2.96
	Relocation	0.10	1.95	0.08	0.05	2.18
	Rental Income	0.03	1.41	0.01	0.02	1.47
	Wage	0.01	6.78	0.10	1.18	8.07
	Subtotal	**0.14**	**12.94**	**0.24**	**1.36**	**14.67**
ALL	**Total**	**0.68**	**41.97**	**6.31**	**2.66**	**51.61**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,303	1,535,899	3,942,202
Total	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**
Total Study Region	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**

Hazus: Flood Global Risk Report

Region Name: Rocky_Hill_FL

Flood Scenario: Rocky_Hill_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 210 census blocks. The region contains over 9 thousand households and has a total population of 20,845 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,707 buildings in the region with a total building replacement value (excluding contents) of 3,942 million dollars. Approximately 83.21% of the buildings (and 61.04% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of 3,942 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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Building Exposure by Occupancy Type for the Study Region

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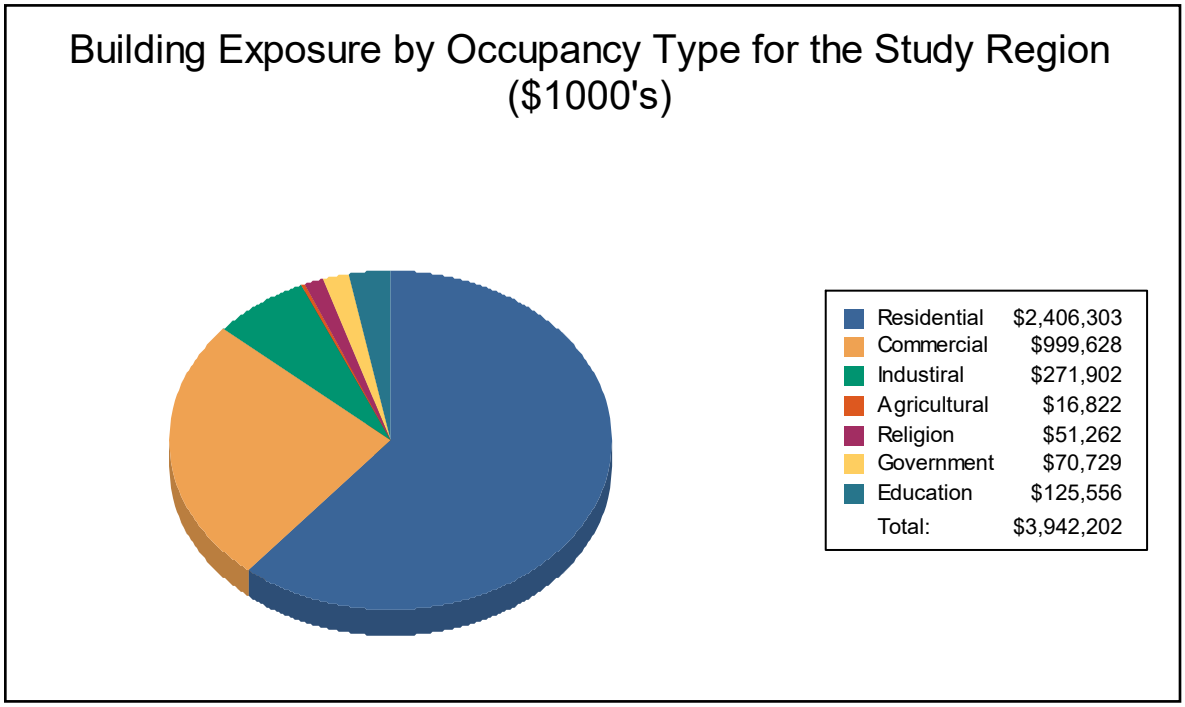

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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Industrial	37,580	13.8%
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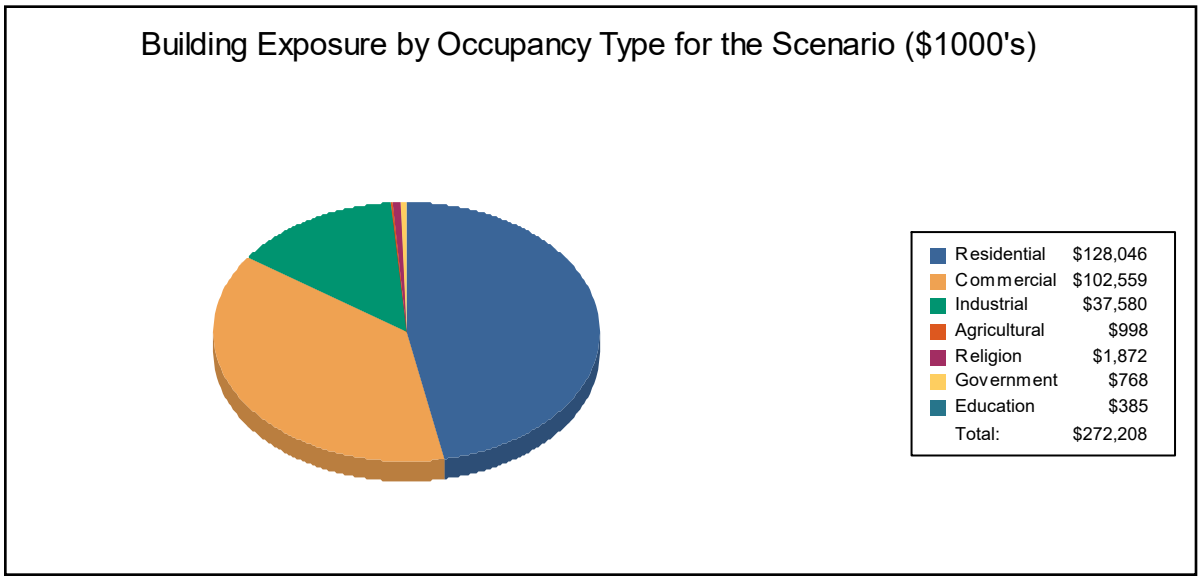
Religion	1,872	0.7%
Government	768	0.3%
Education	385	0.1%
Total	**272,208**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds.
There are 6 schools, 3 fire stations, 1 police station and 1 emergency operation center.

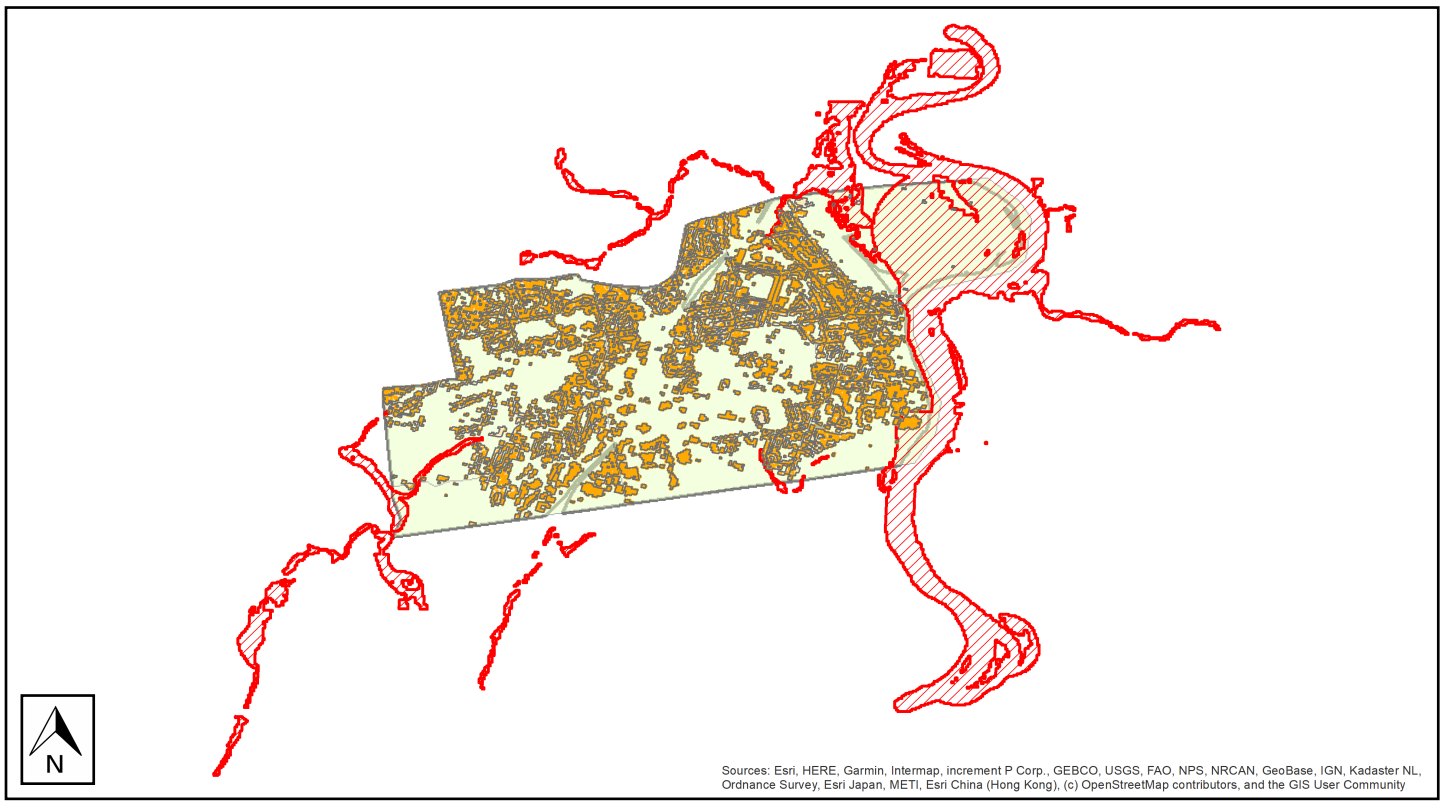
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Rocky_Hill_FL
Scenario Name:	Rocky_Hill_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	2	50	1	25	1	25
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**2**		**1**		**1**	

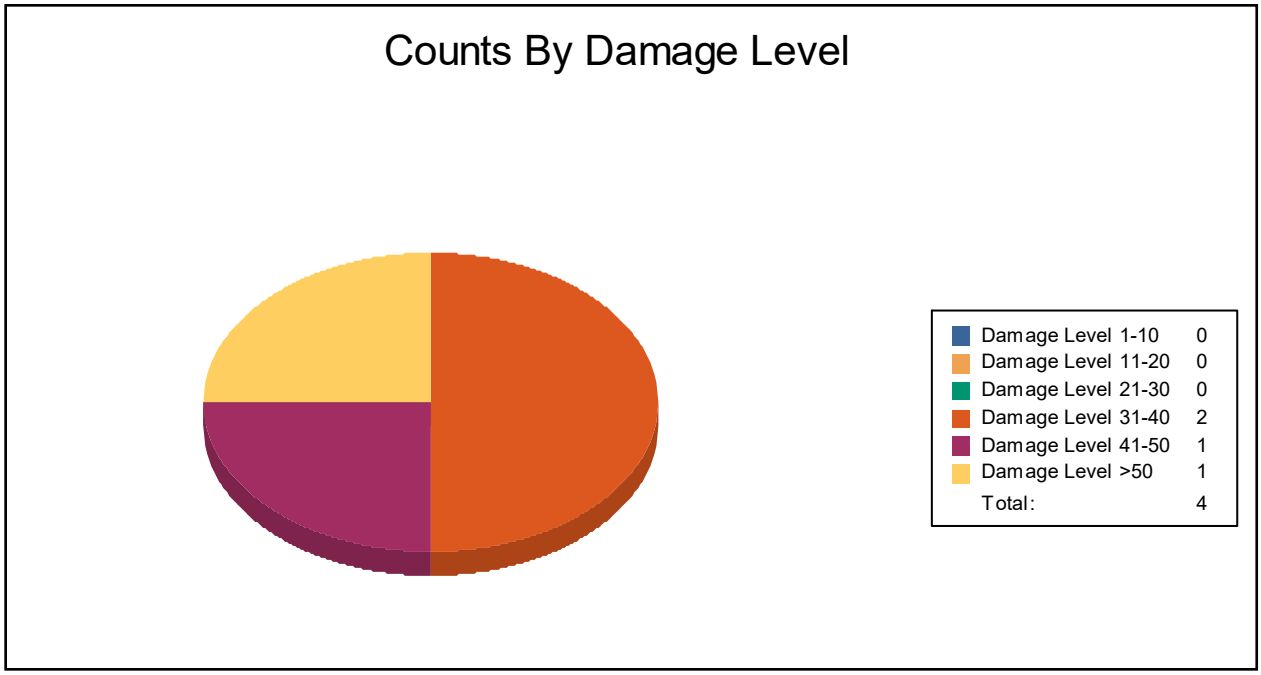


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	1	100	0	0	0	0
Steel	0	0	0	0	0	0	1	33	1	33	1	33
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 125 hospital beds available for use. On the day of the scenario flood event, the model estimates that 125 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	6	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

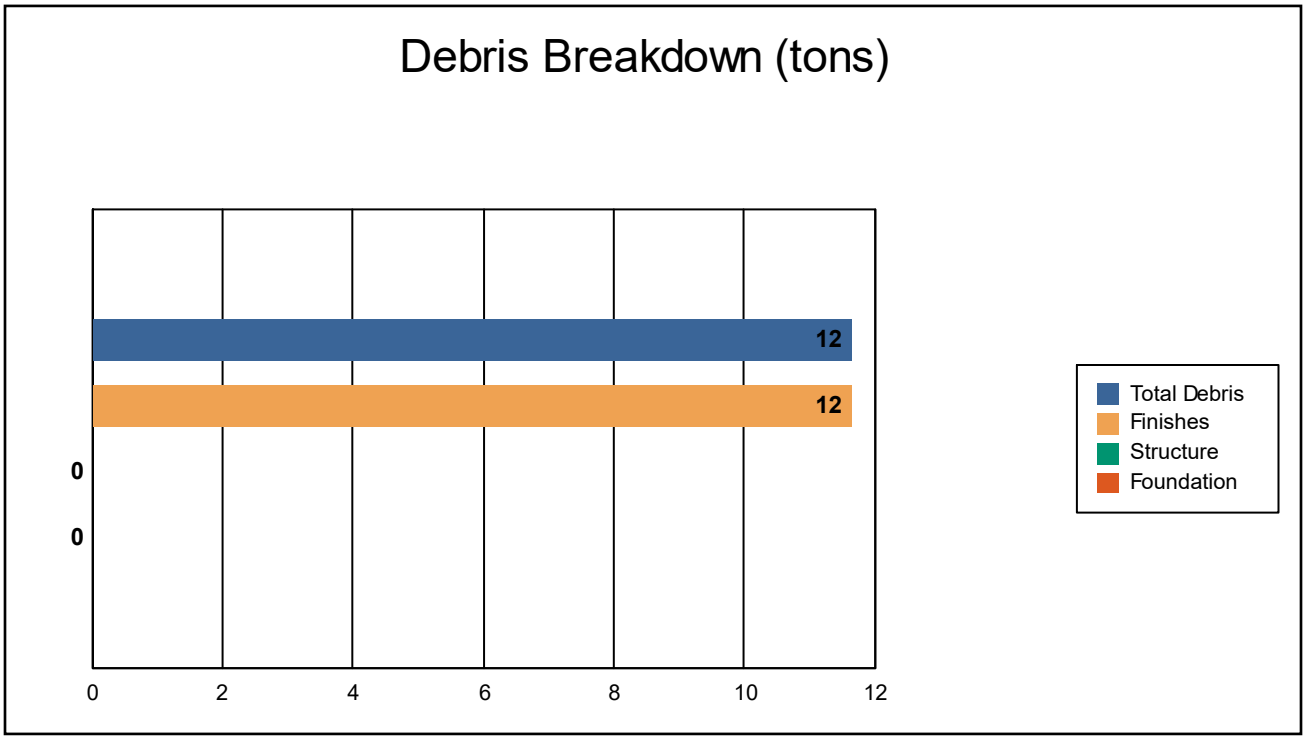
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

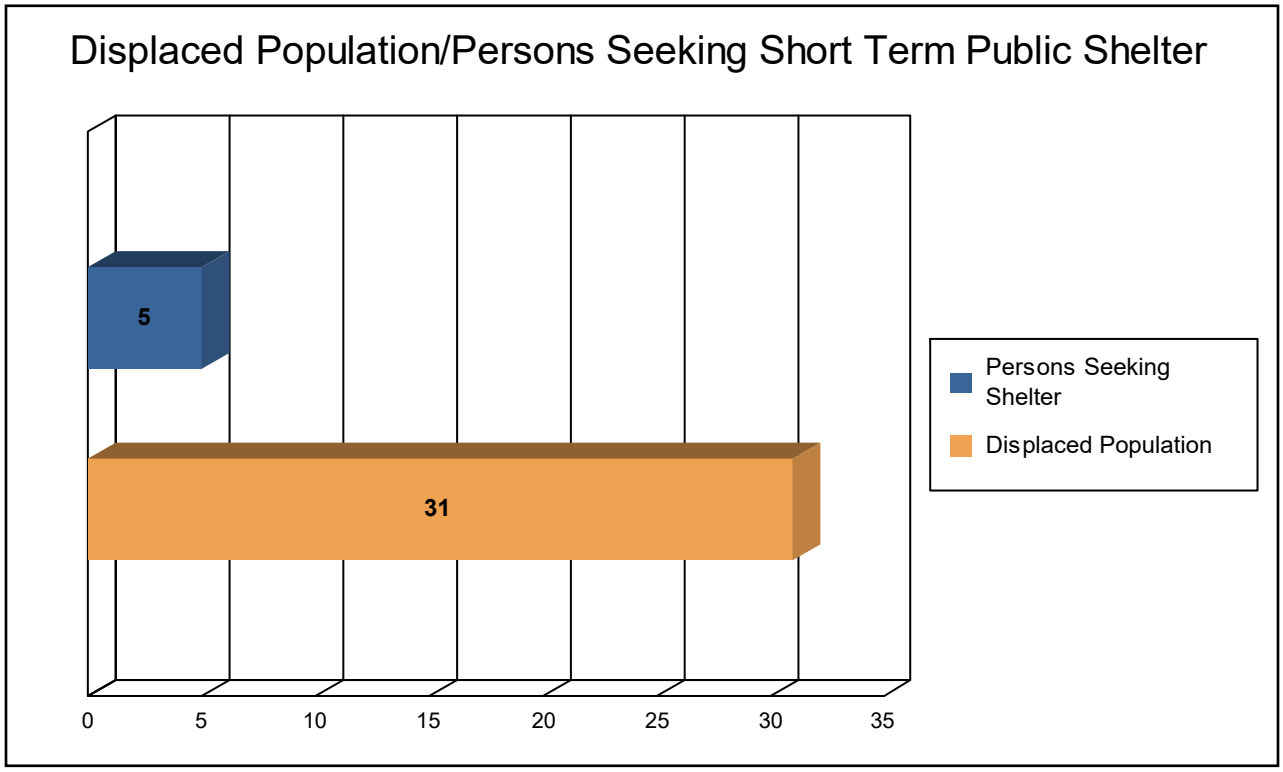


The model estimates that a total of 12 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 10 households (or 31 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 5 people (out of a total population of 20,845) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 58.19 million dollars, which represents 21.38 % of the total replacement value of the scenario buildings.

Building-Related Losses

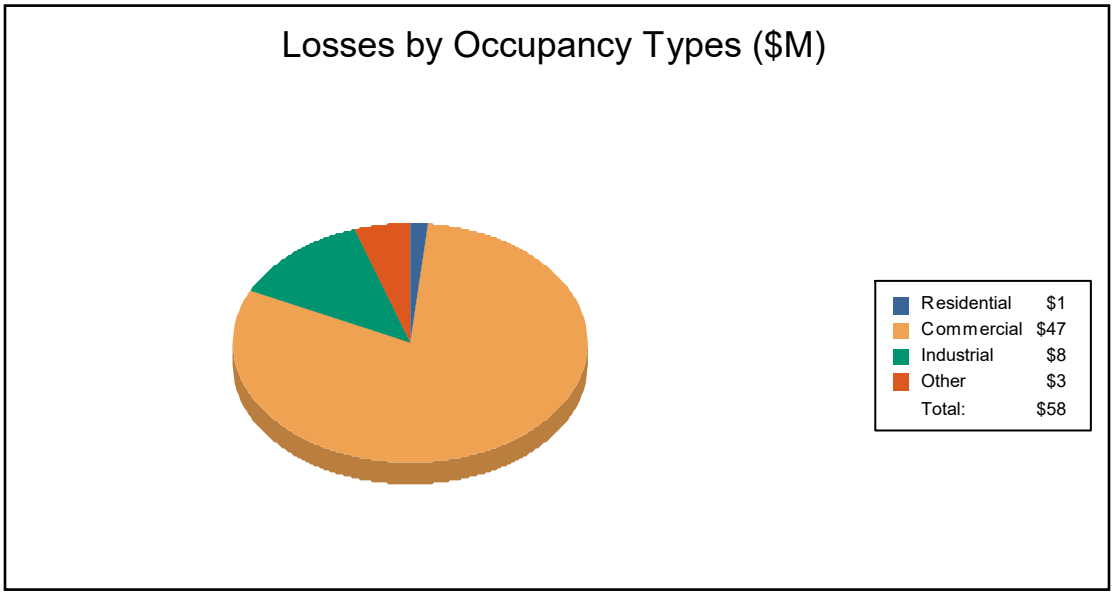
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 42.65 million dollars. 27% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 1.61% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.54	7.90	2.31	0.33	11.09
	Content	0.24	19.32	4.42	0.75	24.73
	Inventory	0.00	5.95	0.54	0.35	6.84
	Subtotal	**0.78**	**33.18**	**7.27**	**1.43**	**42.65**
Business Interruption						
	Income	0.00	2.97	0.06	0.11	3.15
	Relocation	0.11	2.04	0.10	0.05	2.30
	Rental Income	0.04	1.48	0.01	0.01	1.55
	Wage	0.01	7.18	0.11	1.24	8.55
	Subtotal	**0.16**	**13.68**	**0.28**	**1.41**	**15.53**
ALL	**Total**	**0.94**	**46.86**	**7.55**	**2.84**	**58.19**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,303	1,535,899	3,942,202
Total	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**
Total Study Region	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**

Hazus: Flood Global Risk Report

Region Name: Rocky_Hill_FL

Flood Scenario: Rocky_Hill_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

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The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 210 census blocks. The region contains over 9 thousand households and has a total population of 20,845 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,707 buildings in the region with a total building replacement value (excluding contents) of 3,942 million dollars. Approximately 83.21% of the buildings (and 61.04% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of 3,942 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,406,303	61.0%
Commercial	999,628	25.4%
Industrial	271,902	6.9%
Agricultural	16,822	0.4%
Religion	51,262	1.3%
Government	70,729	1.8%
Education	125,556	3.2%
Total	**3,942,202**	**100%**

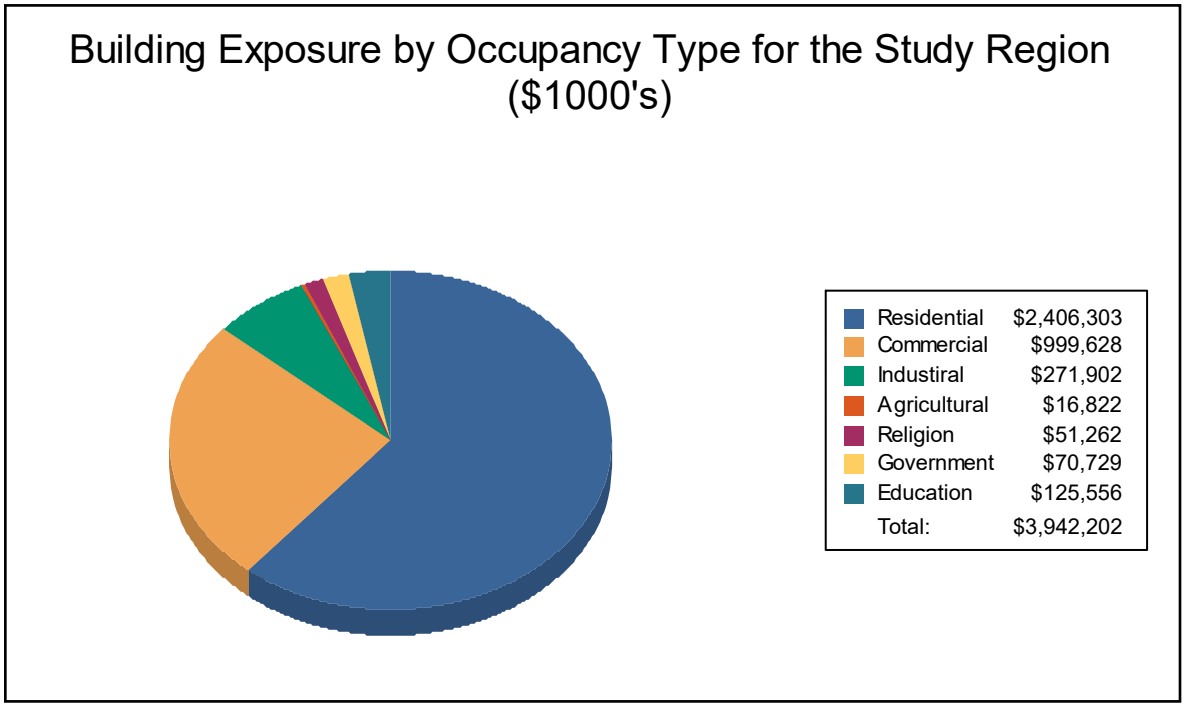
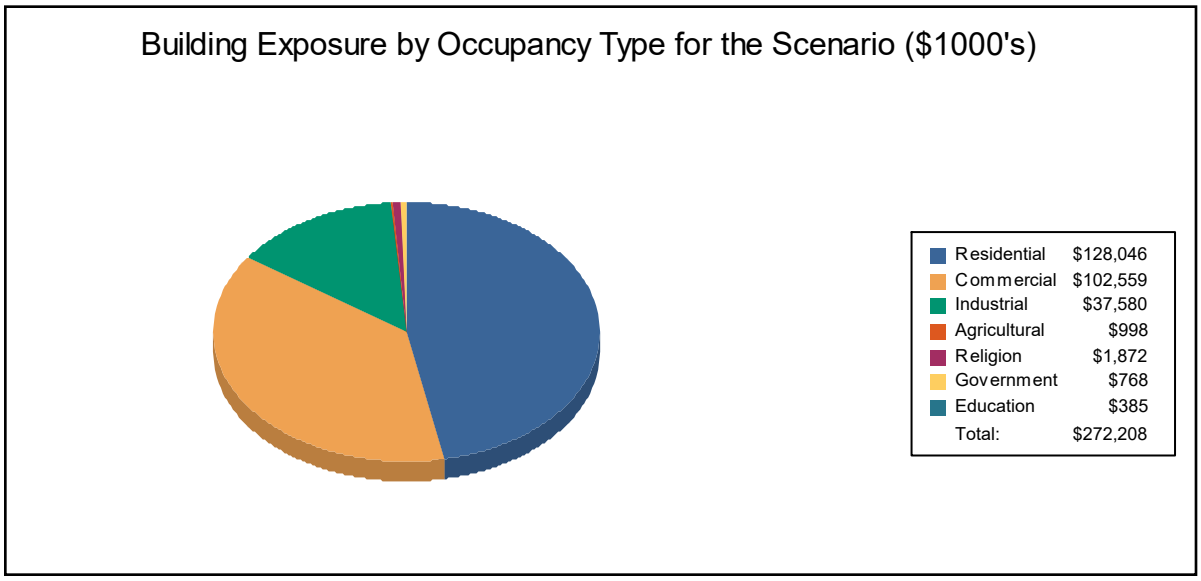


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	128,046	47.0%
Commercial	102,559	37.7%
Industrial	37,580	13.8%
Agricultural	998	0.4%
Religion	1,872	0.7%
Government	768	0.3%
Education	385	0.1%
Total	**272,208**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds.
There are 6 schools, 3 fire stations, 1 police station and 1 emergency operation center.

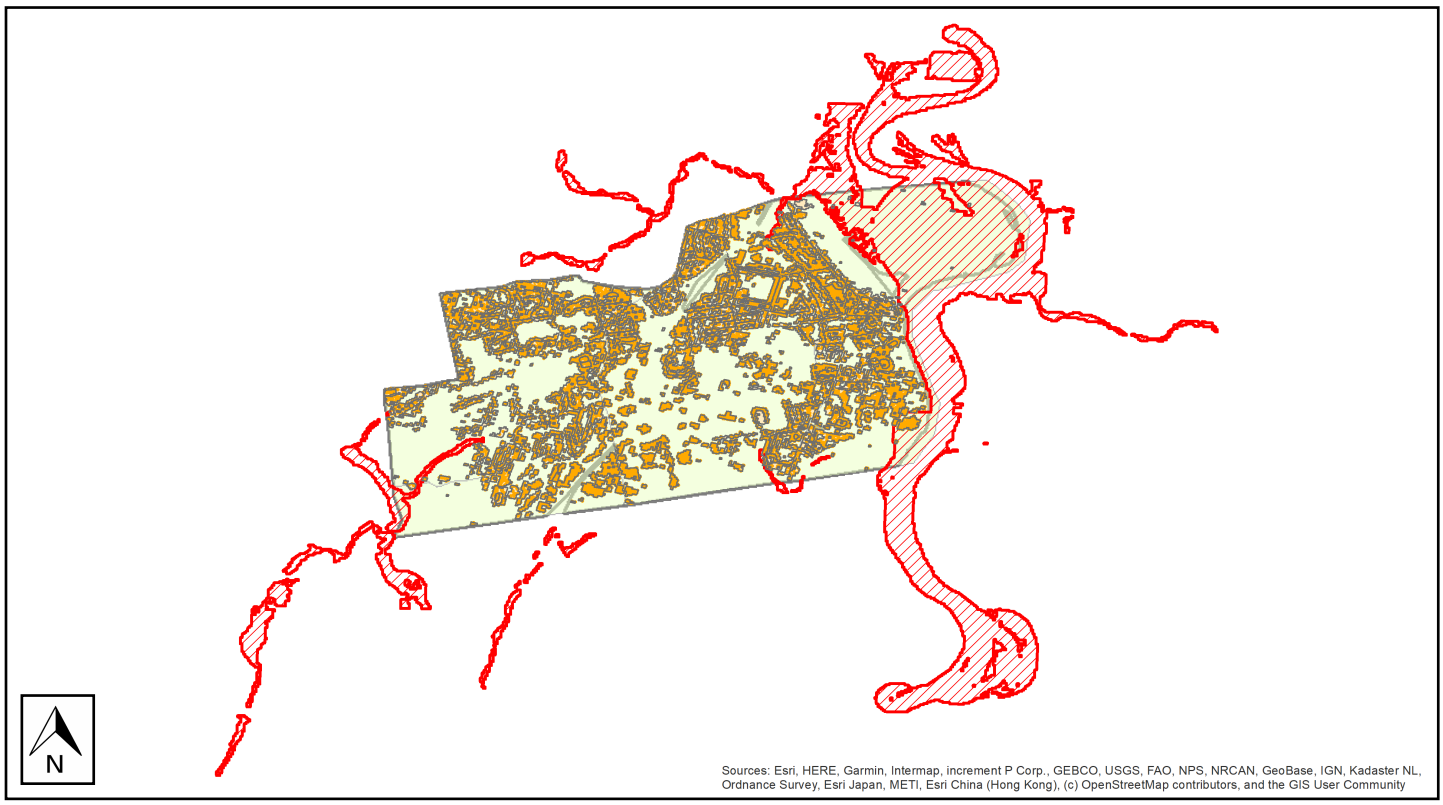
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Rocky_Hill_FL
Scenario Name:	Rocky_Hill_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

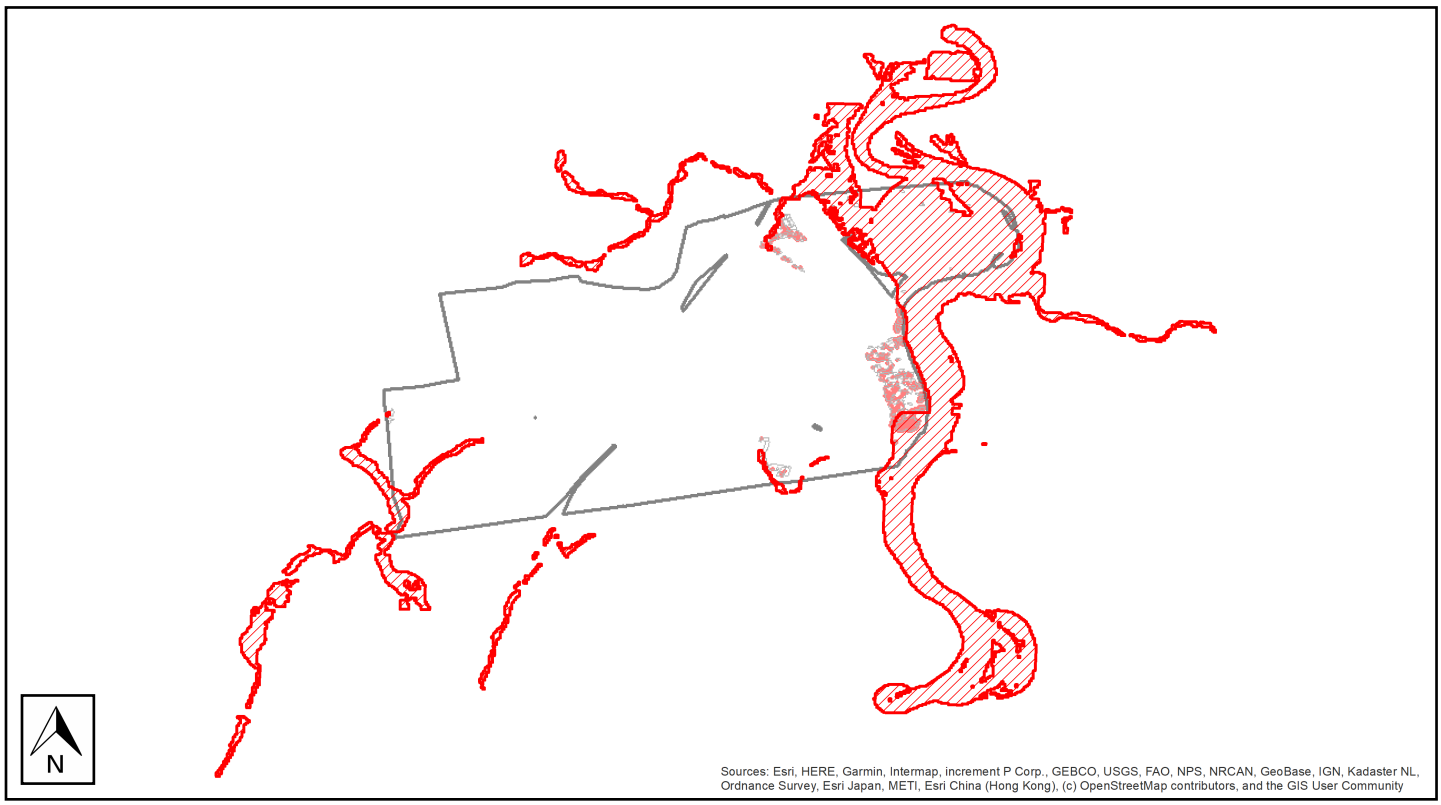


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	2	67	1	33
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**2**		**1**	

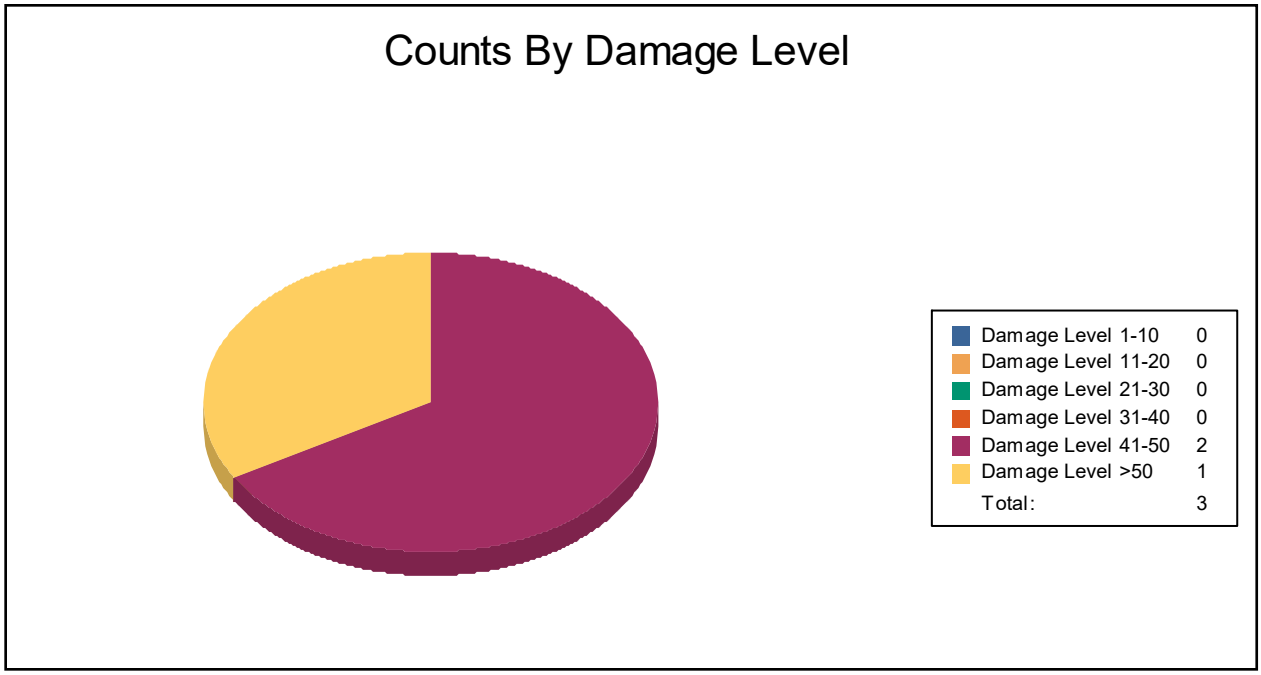


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	1	100	0	0
Steel	0	0	0	0	0	0	0	0	1	50	1	50
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 125 hospital beds available for use. On the day of the scenario flood event, the model estimates that 125 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	6	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

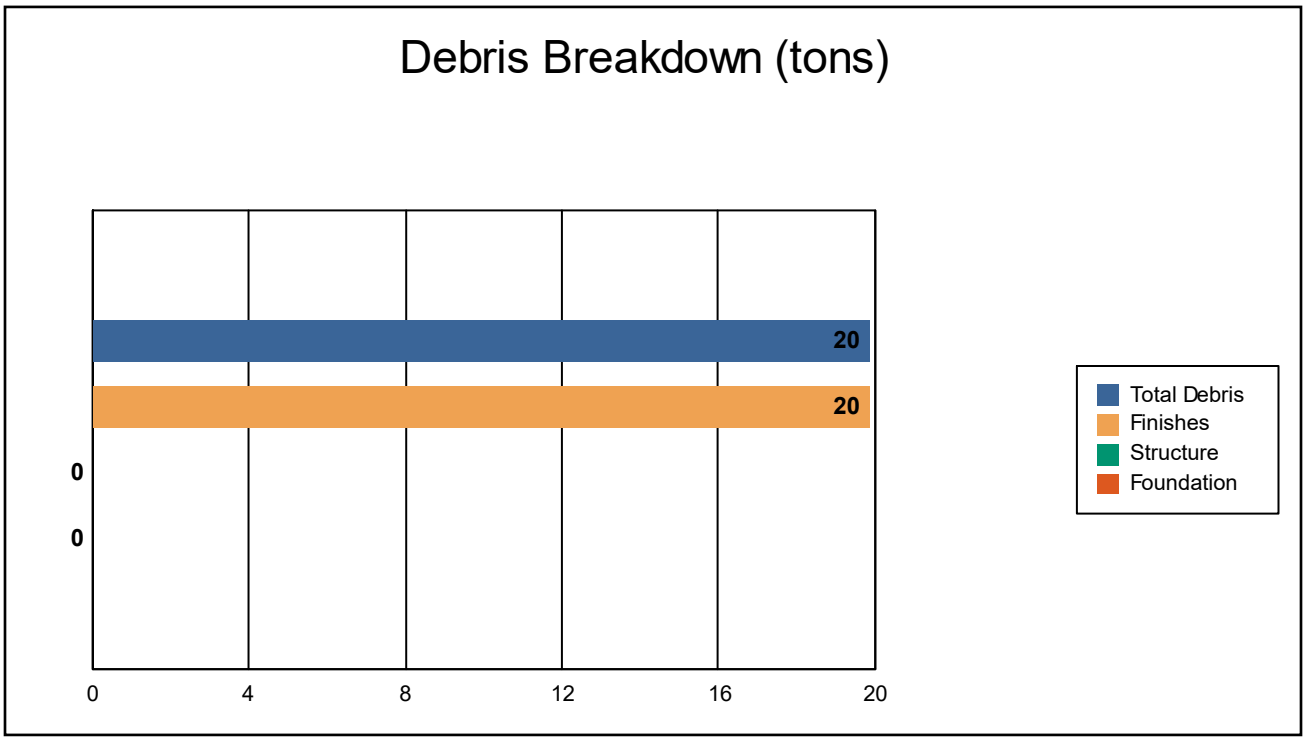
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

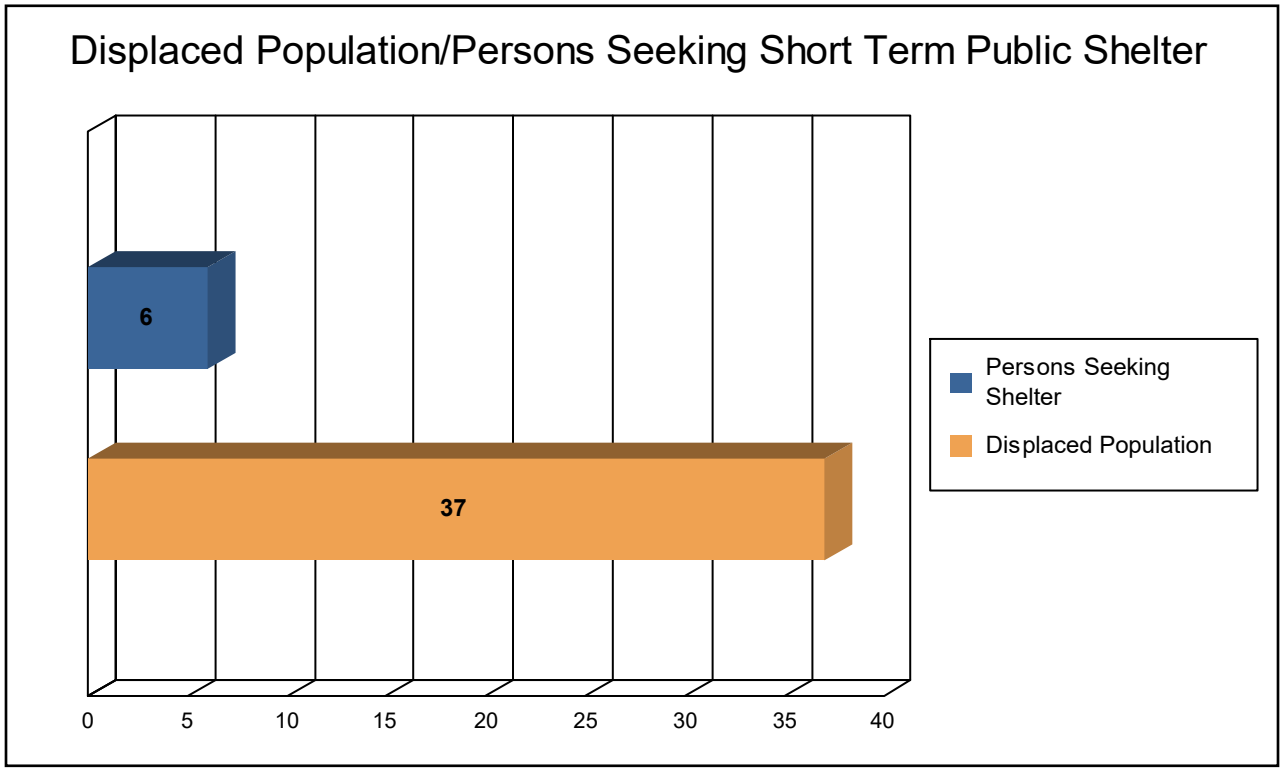


The model estimates that a total of 20 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 12 households (or 37 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 6 people (out of a total population of 20,845) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 67.64 million dollars, which represents 24.85 % of the total replacement value of the scenario buildings.

Building-Related Losses

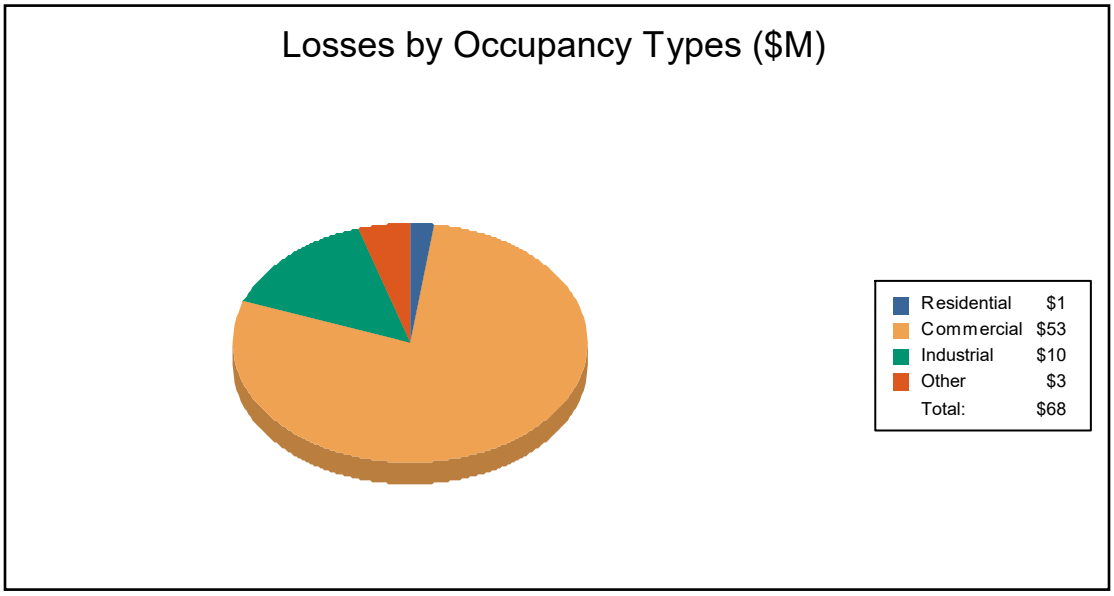
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 49.98 million dollars. 26% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 2.20% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.85	9.99	2.95	0.43	14.21
	Content	0.39	21.14	6.00	0.78	28.31
	Inventory	0.00	6.38	0.72	0.36	7.46
	Subtotal	**1.23**	**37.52**	**9.67**	**1.56**	**49.98**
Business Interruption						
	Income	0.01	3.40	0.07	0.12	3.59
	Relocation	0.17	2.27	0.13	0.06	2.63
	Rental Income	0.06	1.67	0.02	0.02	1.76
	Wage	0.02	8.12	0.12	1.42	9.68
	Subtotal	**0.26**	**15.46**	**0.33**	**1.61**	**17.66**
ALL	**Total**	**1.49**	**52.97**	**10.01**	**3.17**	**67.64**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,303	1,535,899	3,942,202
Total	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**
Total Study Region	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**

Hazus: Flood Global Risk Report

Region Name: Rocky_Hill_FL

Flood Scenario: Rocky_Hill_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 210 census blocks. The region contains over 9 thousand households and has a total population of 20,845 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,707 buildings in the region with a total building replacement value (excluding contents) of 3,942 million dollars. Approximately 83.21% of the buildings (and 61.04% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of 3,942 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

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Government	70,729	1.8%
Education	125,556	3.2%
Total	**3,942,202**	**100%**

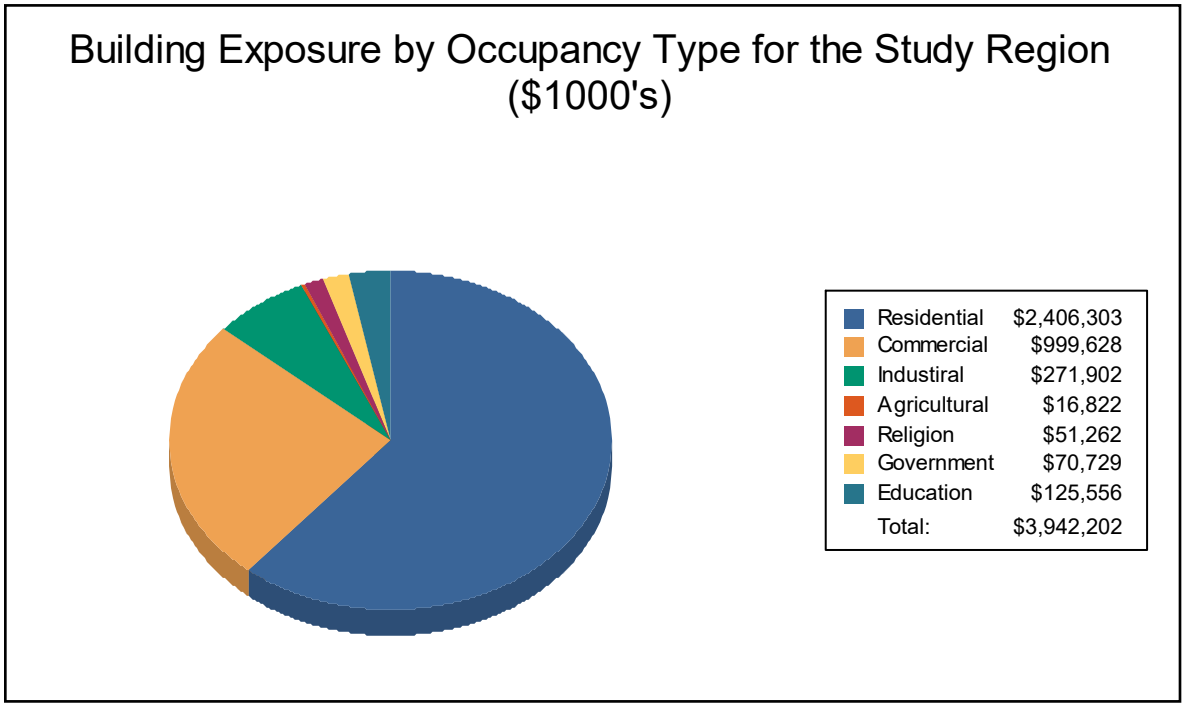

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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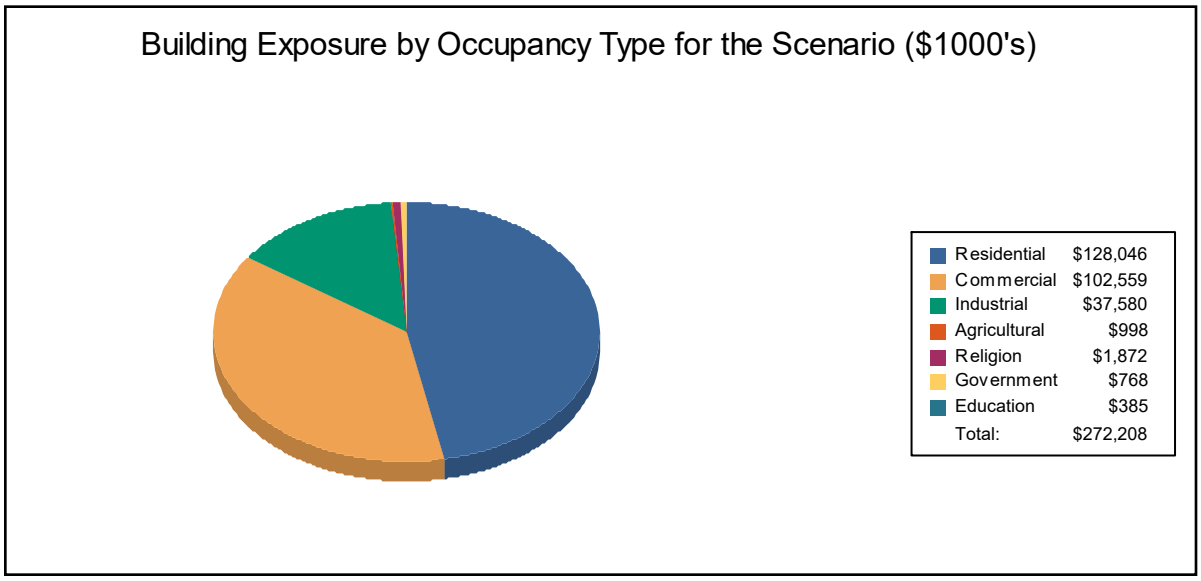
Commercial	102,559	37.7%
Industrial	37,580	13.8%
Agricultural	998	0.4%
Religion	1,872	0.7%
Government	768	0.3%
Education	385	0.1%
Total	**272,208**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds.
There are 6 schools, 3 fire stations, 1 police station and 1 emergency operation center.

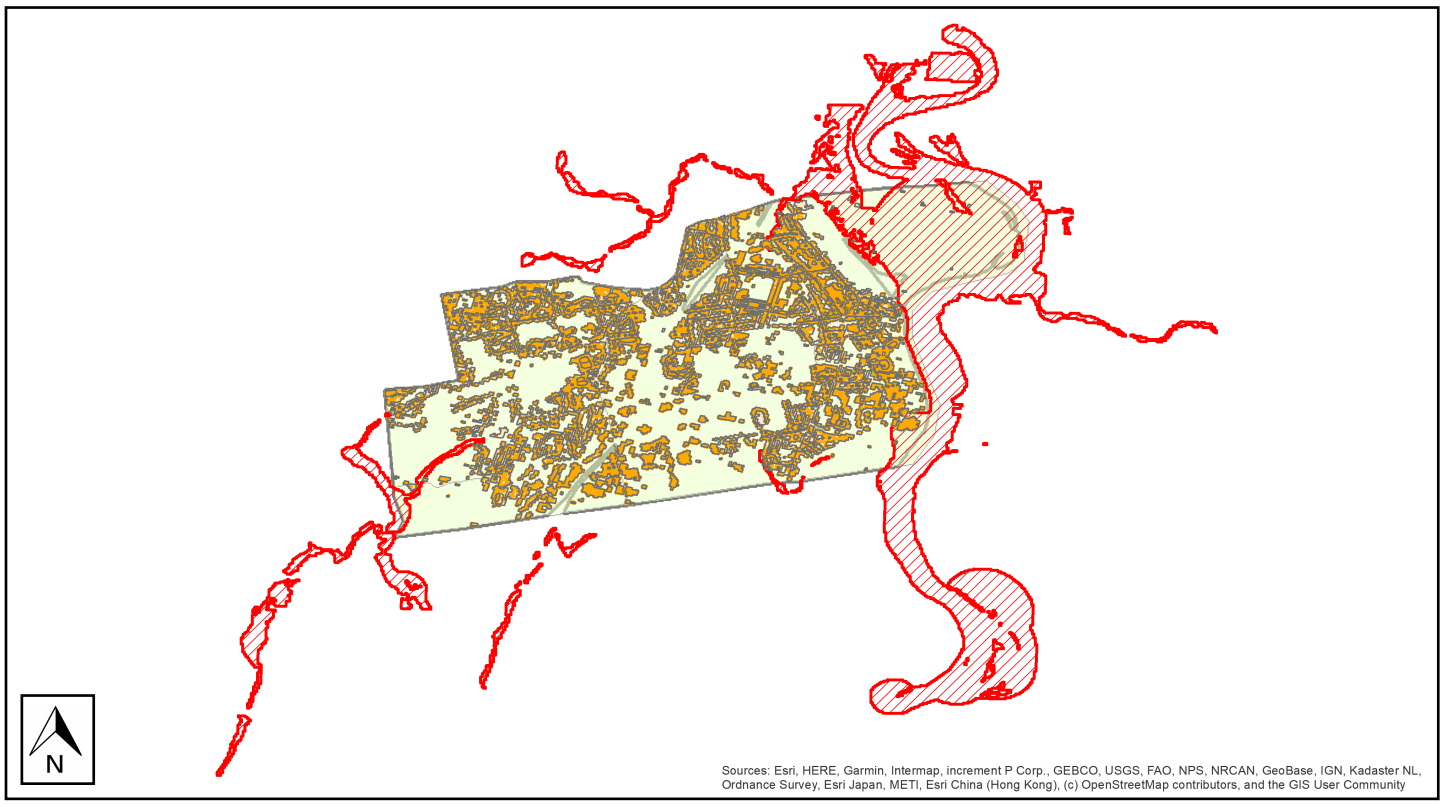
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Rocky_Hill_FL
Scenario Name:	Rocky_Hill_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 5 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

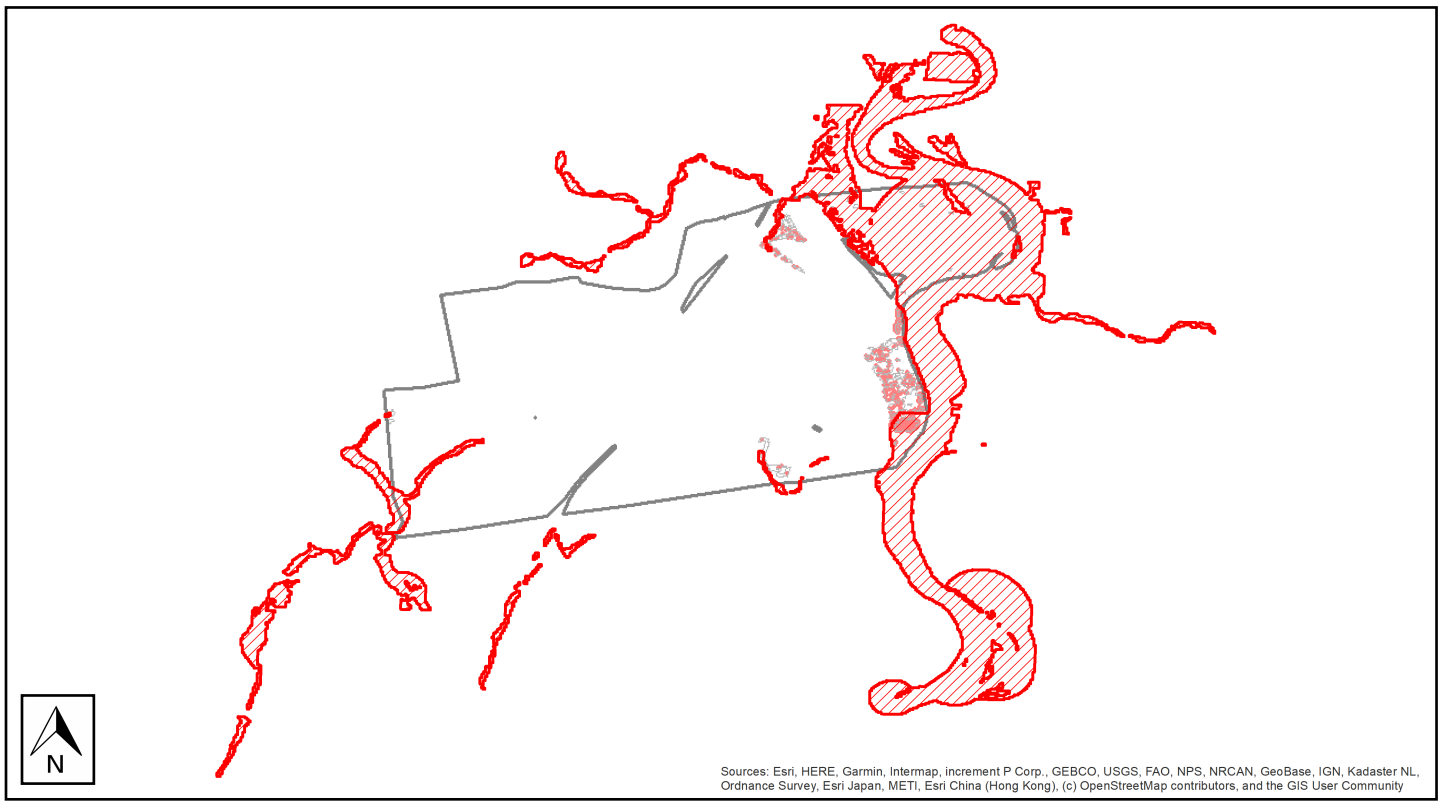


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	1	100	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	2	50	2	50
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**3**		**2**	

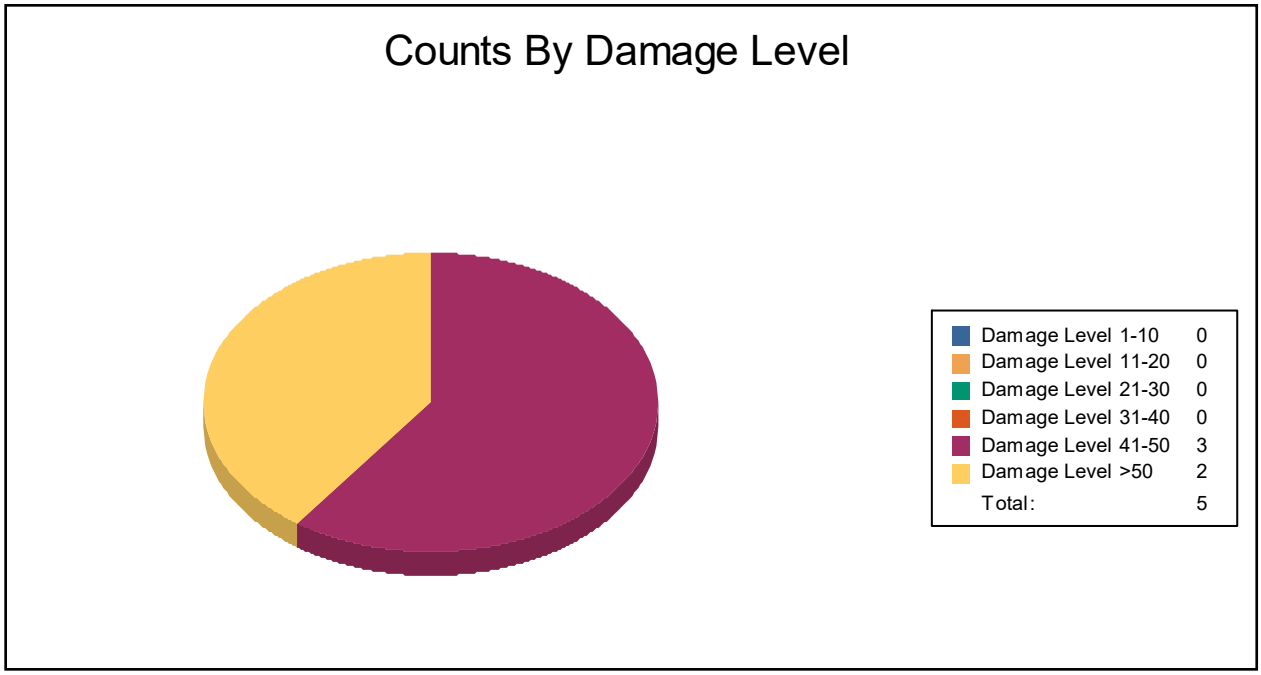


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	1	100	0	0
Steel	0	0	0	0	0	0	0	0	2	50	2	50
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 125 hospital beds available for use. On the day of the scenario flood event, the model estimates that 125 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	6	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

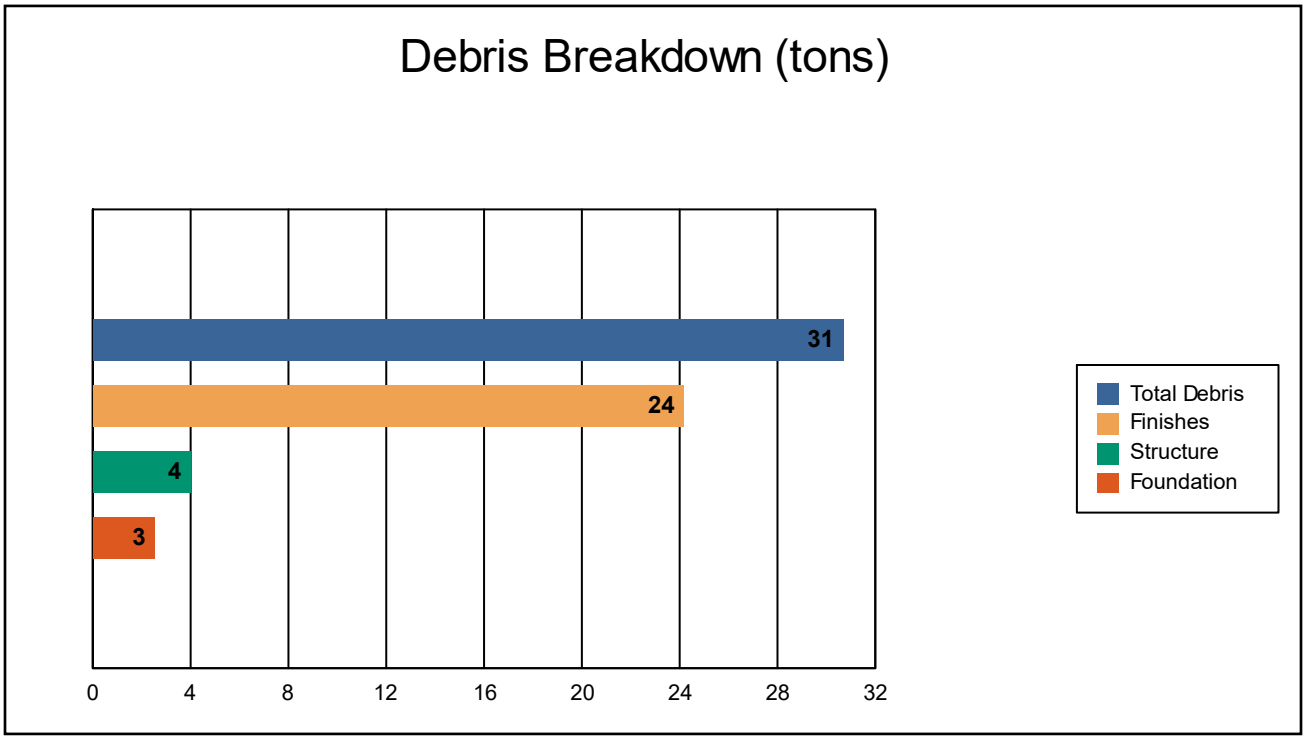
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

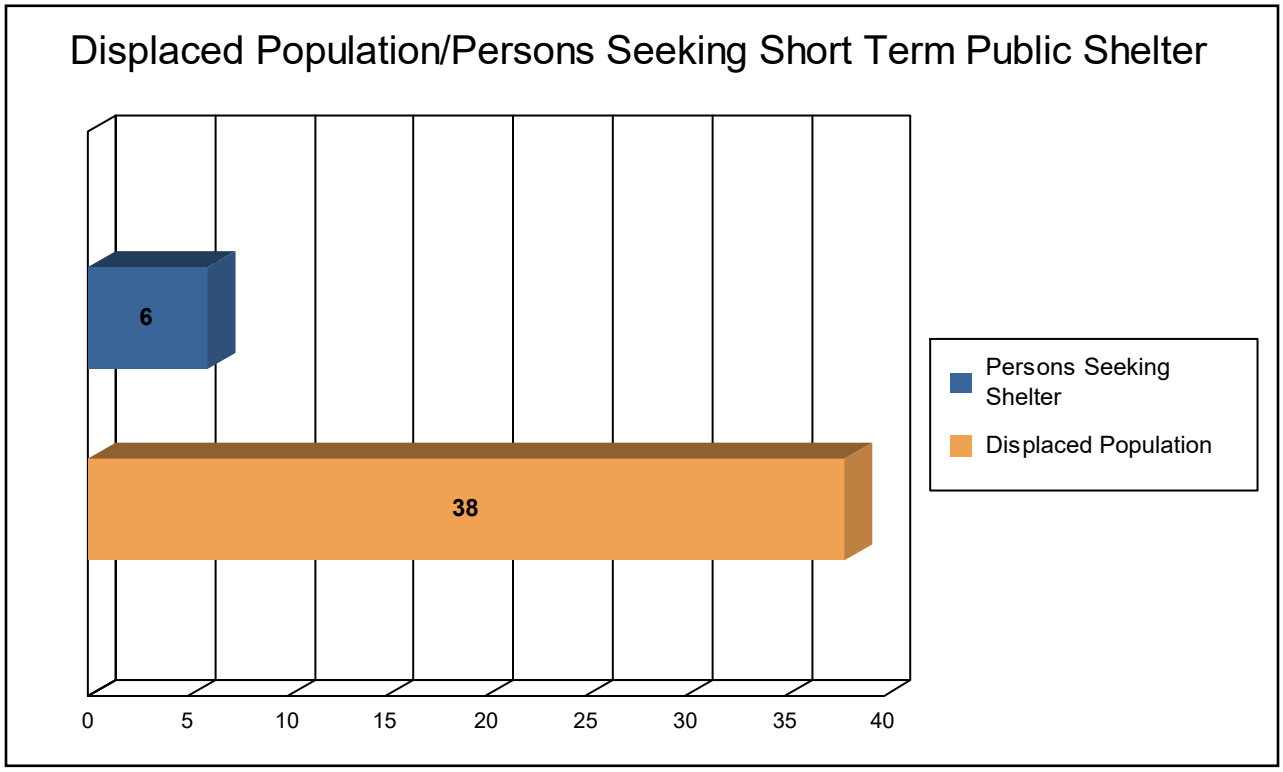


The model estimates that a total of 31 tons of debris will be generated. Of the total amount, Finishes comprises 79% of the total, Structure comprises 13% of the total, and Foundation comprises 8%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 13 households (or 38 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 6 people (out of a total population of 20,845) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 74.92 million dollars, which represents 27.52 % of the total replacement value of the scenario buildings.

Building-Related Losses

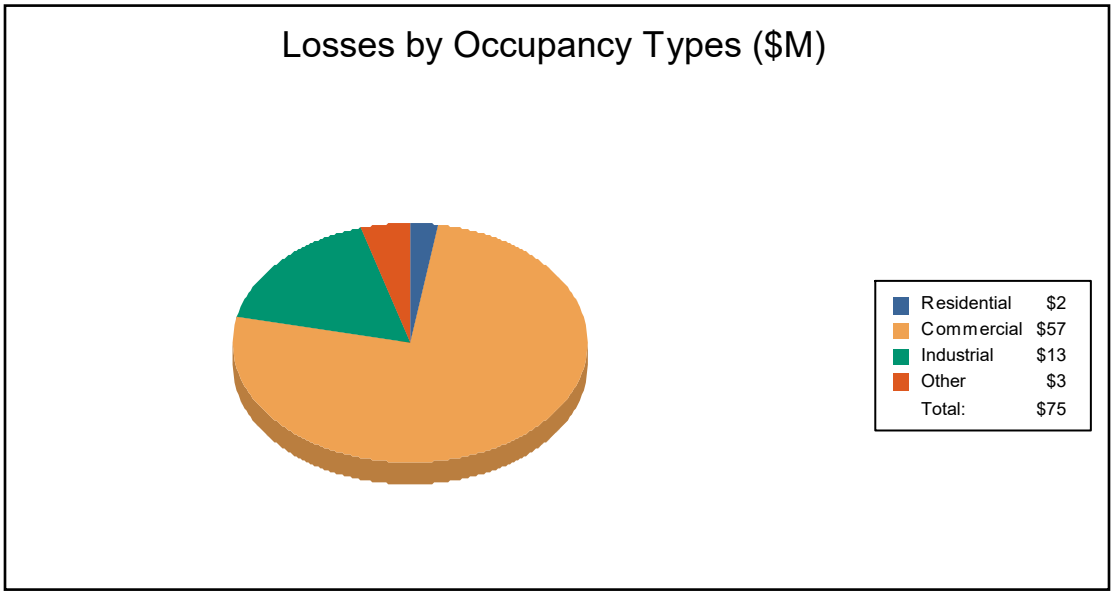
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 56.52 million dollars. 25% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 2.47% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.05	12.16	3.69	0.53	17.43
	Content	0.48	22.20	7.76	0.79	31.23
	Inventory	0.00	6.61	0.89	0.36	7.86
	Subtotal	**1.53**	**40.97**	**12.33**	**1.68**	**56.52**
Business Interruption						
	Income	0.01	3.53	0.08	0.12	3.73
	Relocation	0.21	2.35	0.14	0.06	2.77
	Rental Income	0.08	1.74	0.02	0.02	1.86
	Wage	0.02	8.43	0.14	1.47	10.05
	Subtotal	**0.32**	**16.05**	**0.38**	**1.66**	**18.41**
ALL	**Total**	**1.85**	**57.03**	**12.71**	**3.34**	**74.92**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,303	1,535,899	3,942,202
Total	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**
Total Study Region	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**

Hazus: Flood Global Risk Report

Region Name: Rocky_Hill_FL

Flood Scenario: Rocky_Hill_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 210 census blocks. The region contains over 9 thousand households and has a total population of 20,845 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,707 buildings in the region with a total building replacement value (excluding contents) of 3,942 million dollars. Approximately 83.21% of the buildings (and 61.04% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of 3,942 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,406,303	61.0%
Commercial	999,628	25.4%
Industrial	271,902	6.9%
Agricultural	16,822	0.4%
Religion	51,262	1.3%
Government	70,729	1.8%
Education	125,556	3.2%
Total	**3,942,202**	**100%**

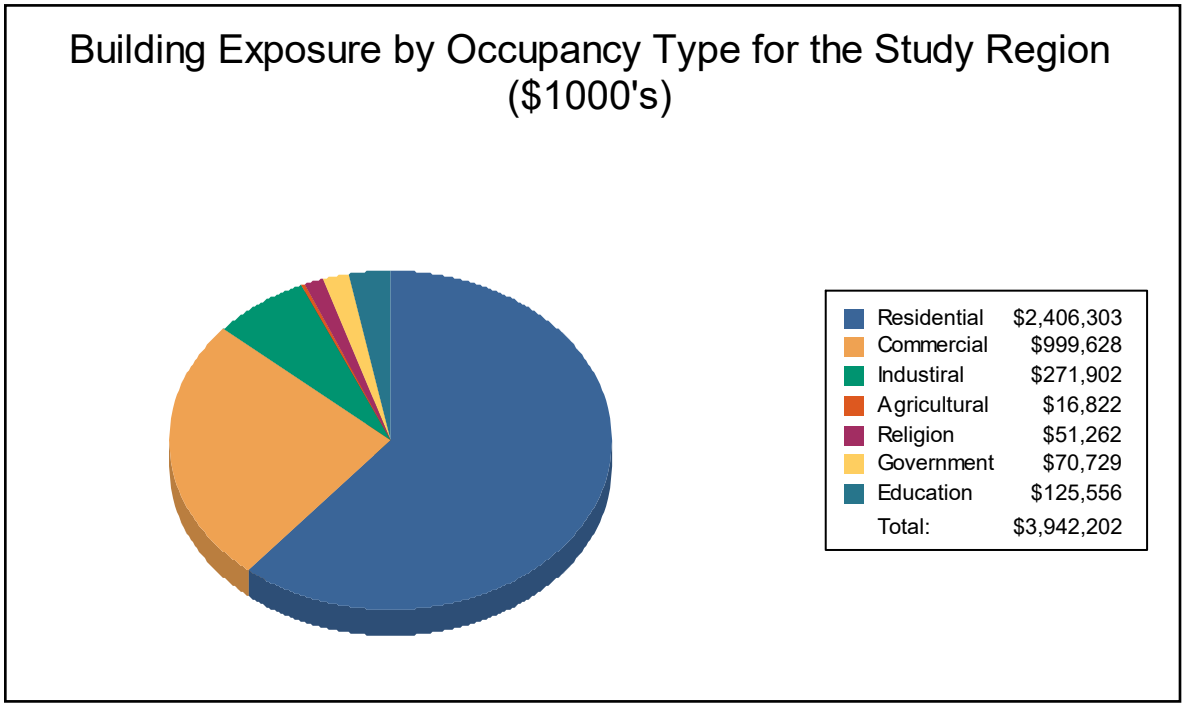
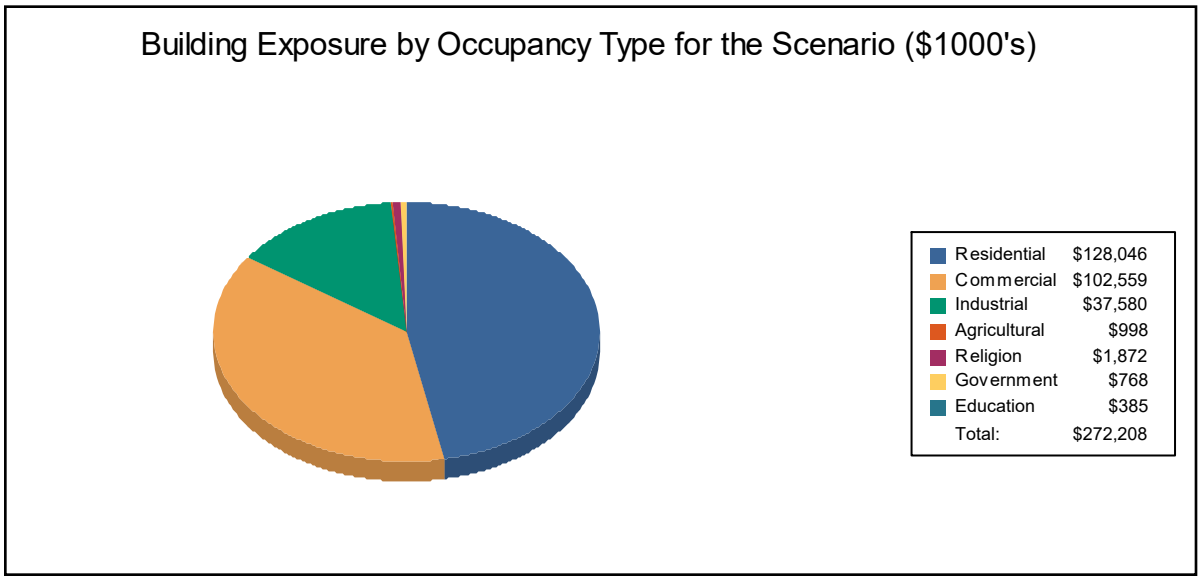


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	128,046	47.0%
Commercial	102,559	37.7%
Industrial	37,580	13.8%
Agricultural	998	0.4%
Religion	1,872	0.7%
Government	768	0.3%
Education	385	0.1%
Total	**272,208**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds.
There are 6 schools, 3 fire stations, 1 police station and 1 emergency operation center.

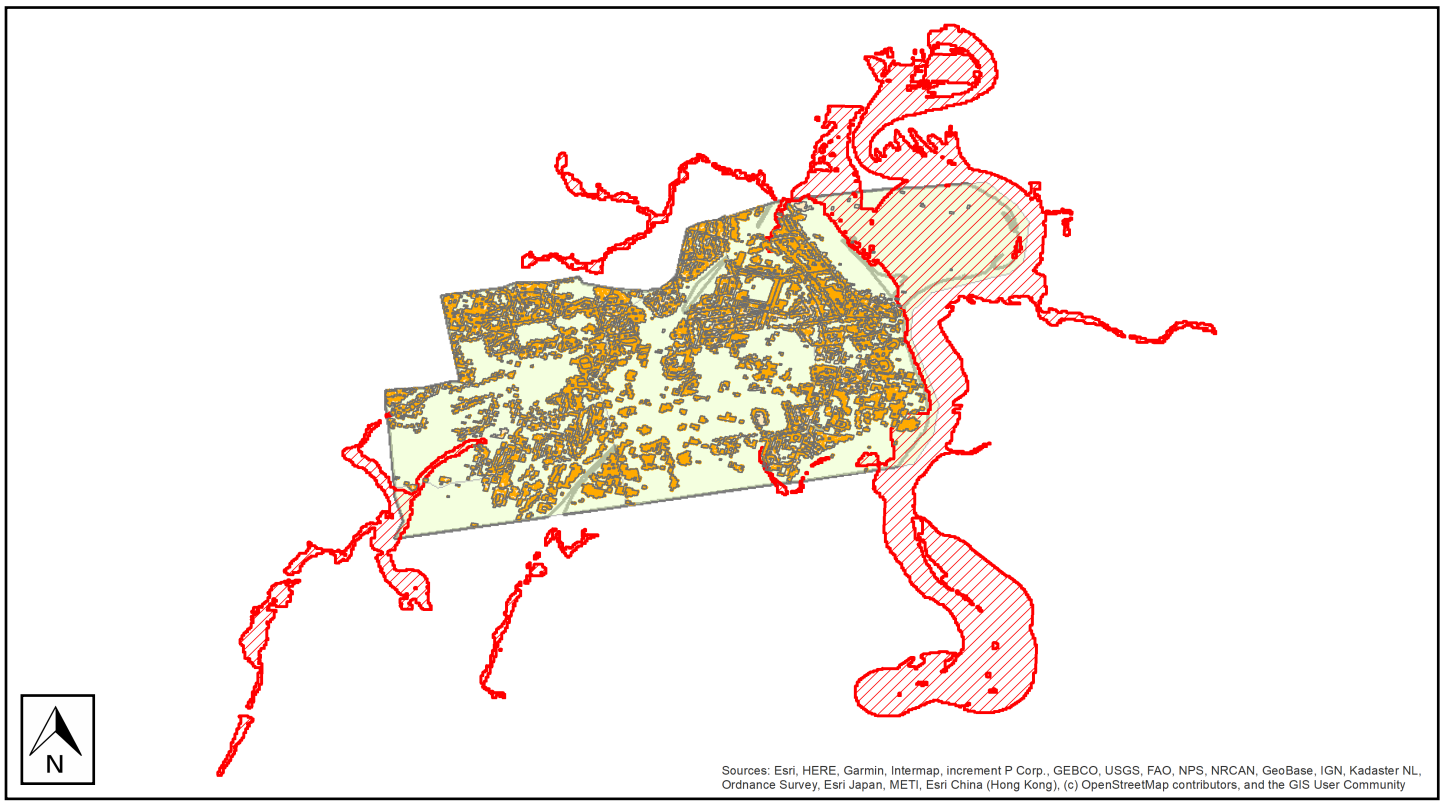
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Rocky_Hill_FL
Scenario Name:	Rocky_Hill_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 8 buildings will be at least moderately damaged. This is over 60% of the total number of buildings in the scenario. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

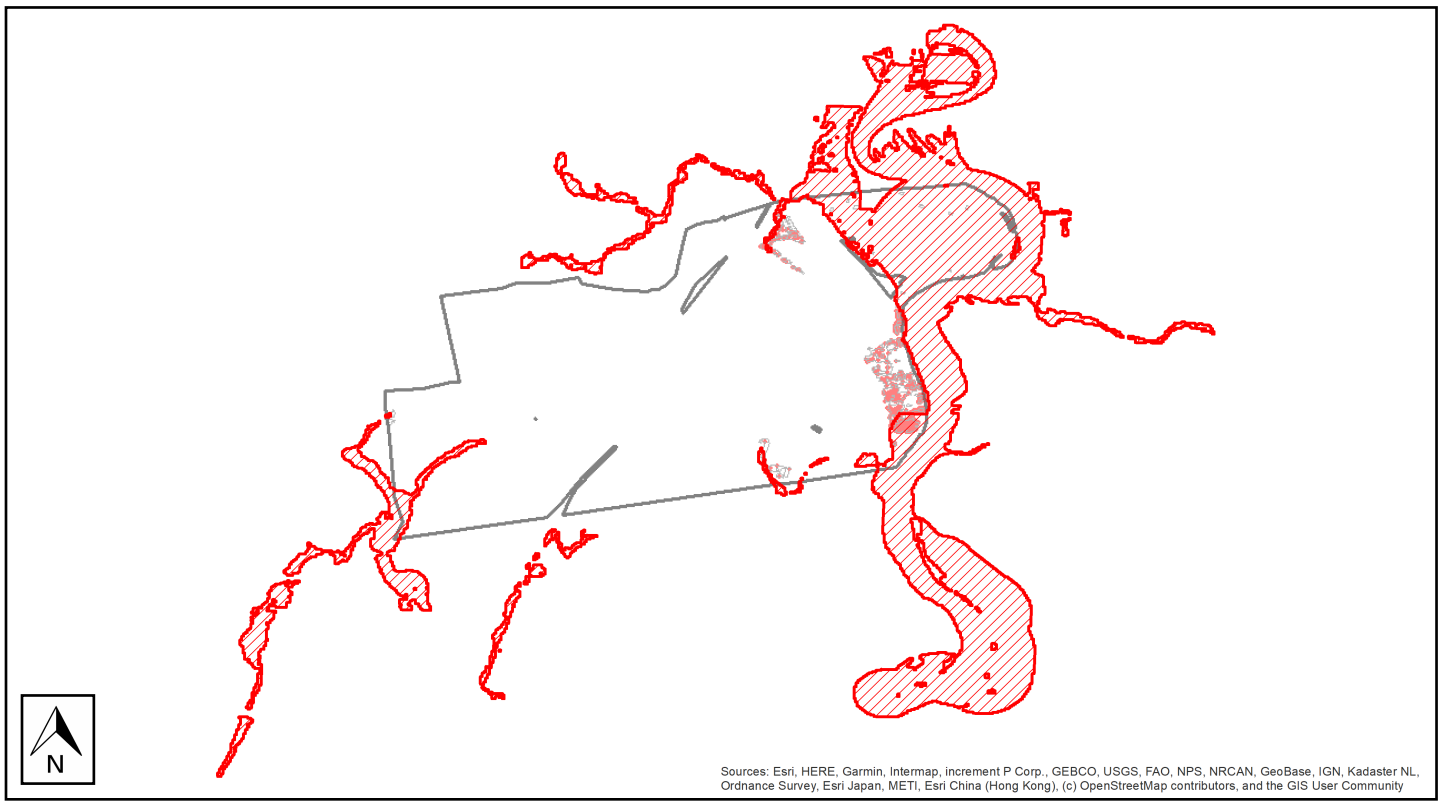


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	1	100
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	3	100
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	33	4	67	0	0	0	0	0	0	0	0
Total	**2**		**4**		**0**		**0**		**0**		**4**	

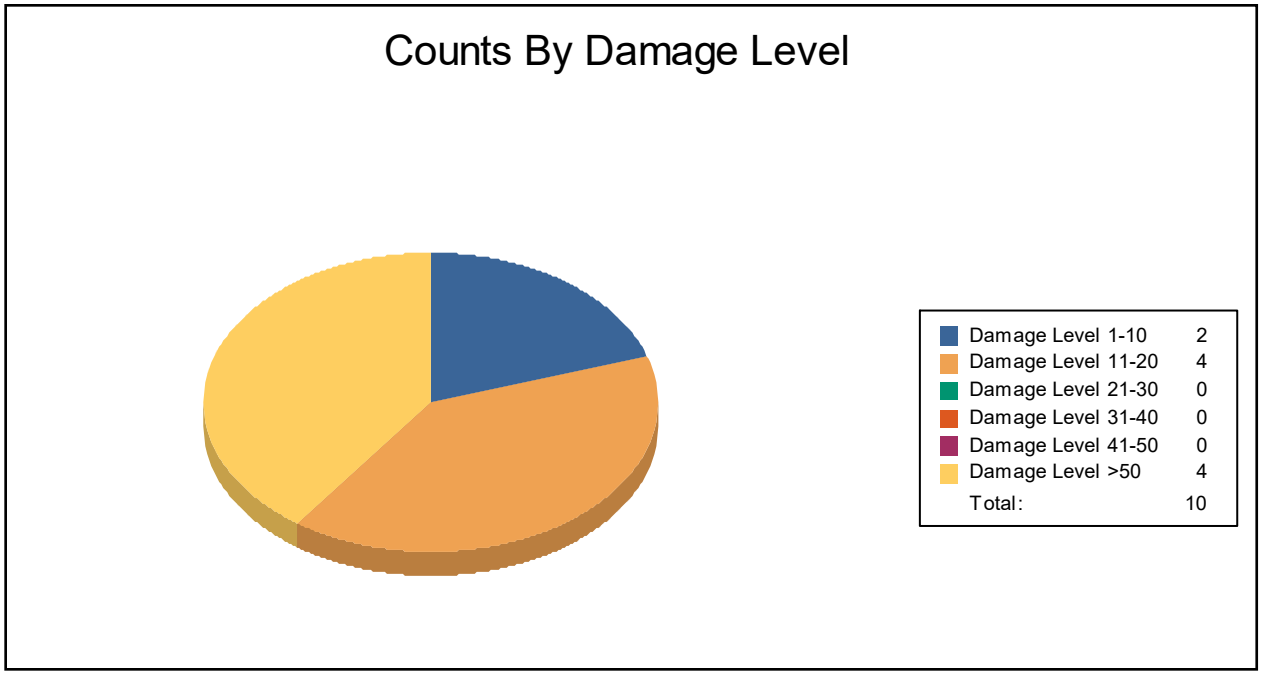


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	1	100
Steel	0	0	0	0	0	0	0	0	0	0	3	100
Wood	2	33	4	67	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 125 hospital beds available for use. On the day of the scenario flood event, the model estimates that 125 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	6	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

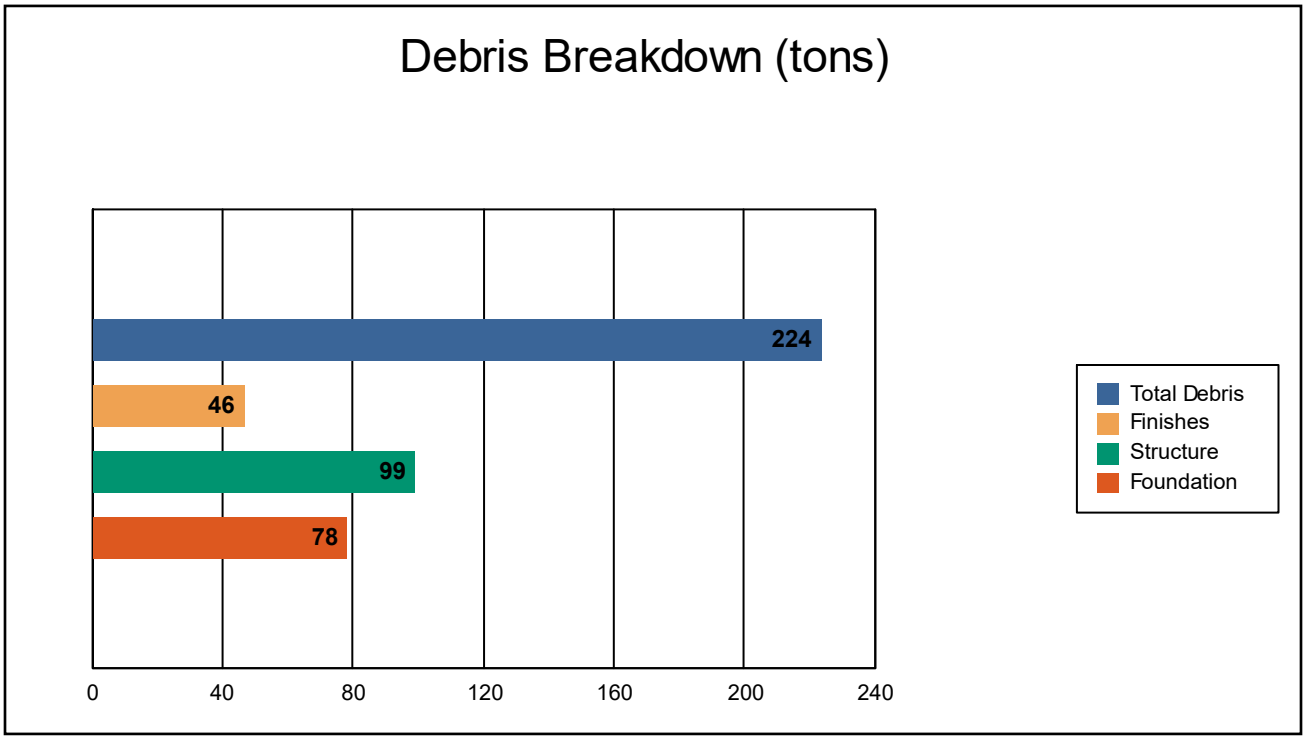
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

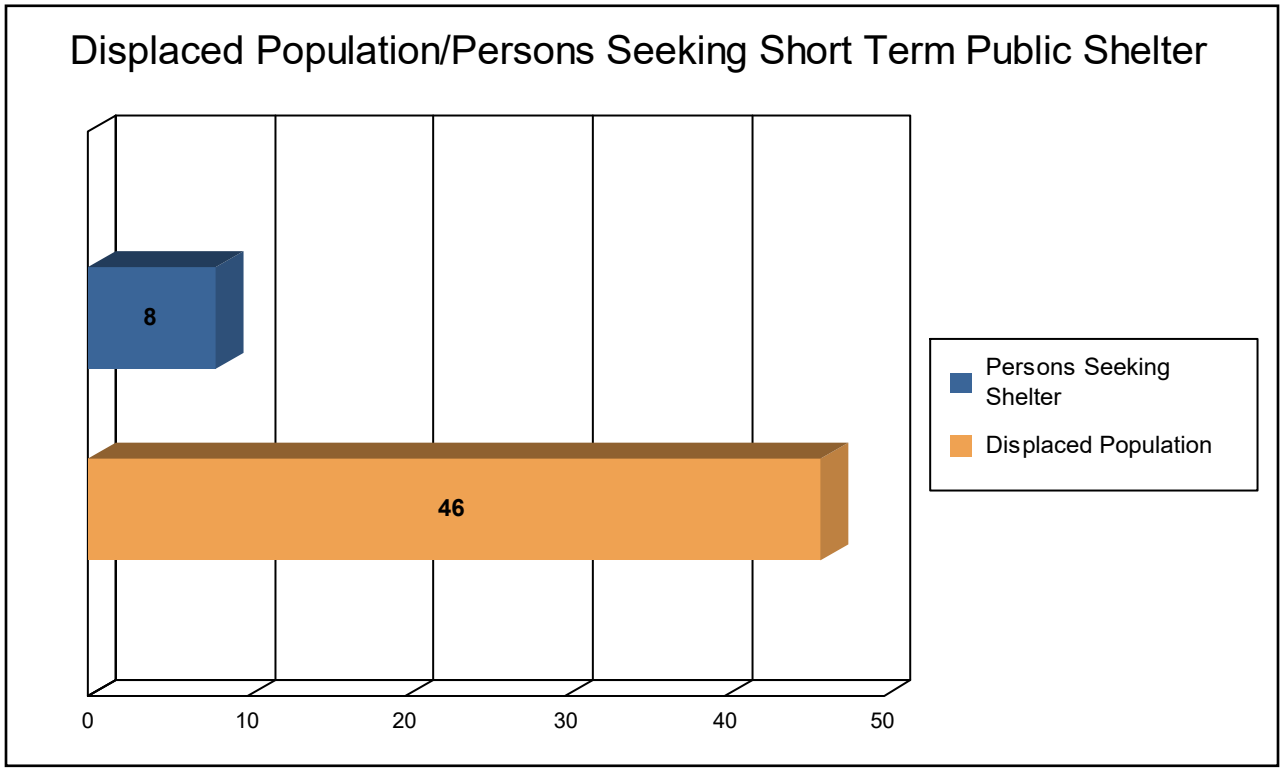


The model estimates that a total of 224 tons of debris will be generated. Of the total amount, Finishes comprises 21% of the total, Structure comprises 44% of the total, and Foundation comprises 35%. If the debris tonnage is converted into an estimated number of truckloads, it will require 9 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 15 households (or 46 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 8 people (out of a total population of 20,845) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 81.87 million dollars, which represents 30.08 % of the total replacement value of the scenario buildings.

Building-Related Losses

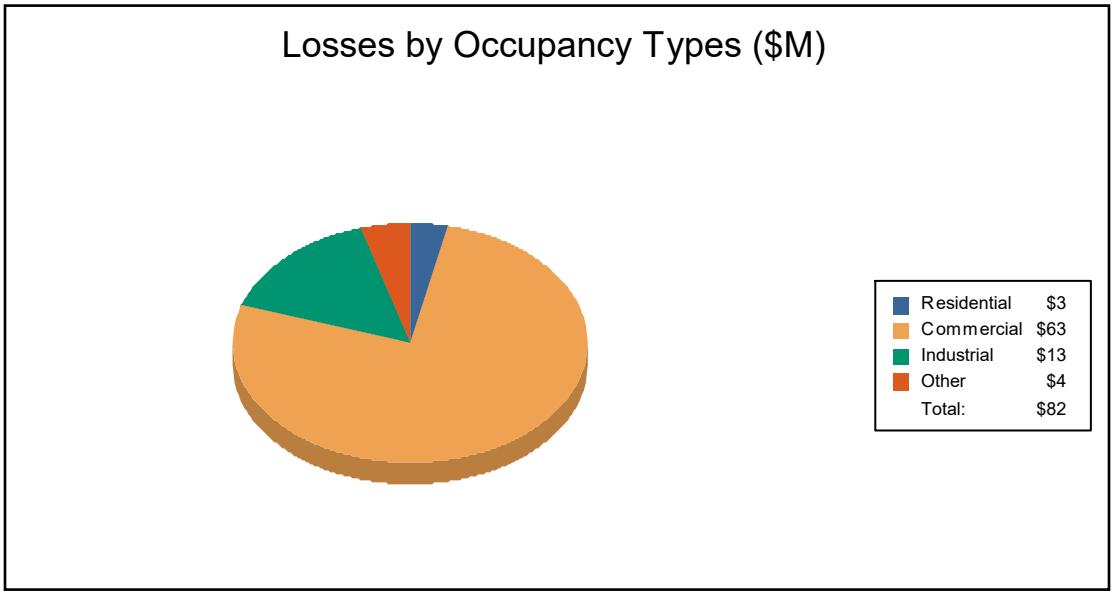
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 61.95 million dollars. 24% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 3.43% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.58	15.55	3.95	0.70	21.77
	Content	0.69	23.09	7.53	0.90	32.22
	Inventory	0.00	6.77	0.84	0.35	7.96
	Subtotal	**2.27**	**45.41**	**12.32**	**1.95**	**61.95**
Business Interruption						
	Income	0.01	3.87	0.07	0.14	4.09
	Relocation	0.36	2.53	0.12	0.07	3.08
	Rental Income	0.13	1.87	0.01	0.02	2.03
	Wage	0.03	9.01	0.12	1.56	10.72
	Subtotal	**0.54**	**17.28**	**0.32**	**1.78**	**19.92**
ALL	**Total**	**2.81**	**62.69**	**12.64**	**3.74**	**81.87**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,303	1,535,899	3,942,202
Total	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**
Total Study Region	**20,845**	**2,406,303**	**1,535,899**	**3,942,202**

Hazus: Flood Global Risk Report

Region Name: Simsbury_FL

Flood Scenario: Simsbury_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 317 census blocks. The region contains over 10 thousand households and has a total population of 24,485 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,907 buildings in the region with a total building replacement value (excluding contents) of 4,616 million dollars. Approximately 85.90% of the buildings (and 71.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,907 buildings in the region which have an aggregate total replacement value of 4,616 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,283,078	71.1%
Commercial	806,053	17.5%
Industrial	121,216	2.6%
Agricultural	18,873	0.4%
Religion	25,882	0.6%
Government	77,909	1.7%
Education	283,085	6.1%
Total	**4,616,096**	**100%**

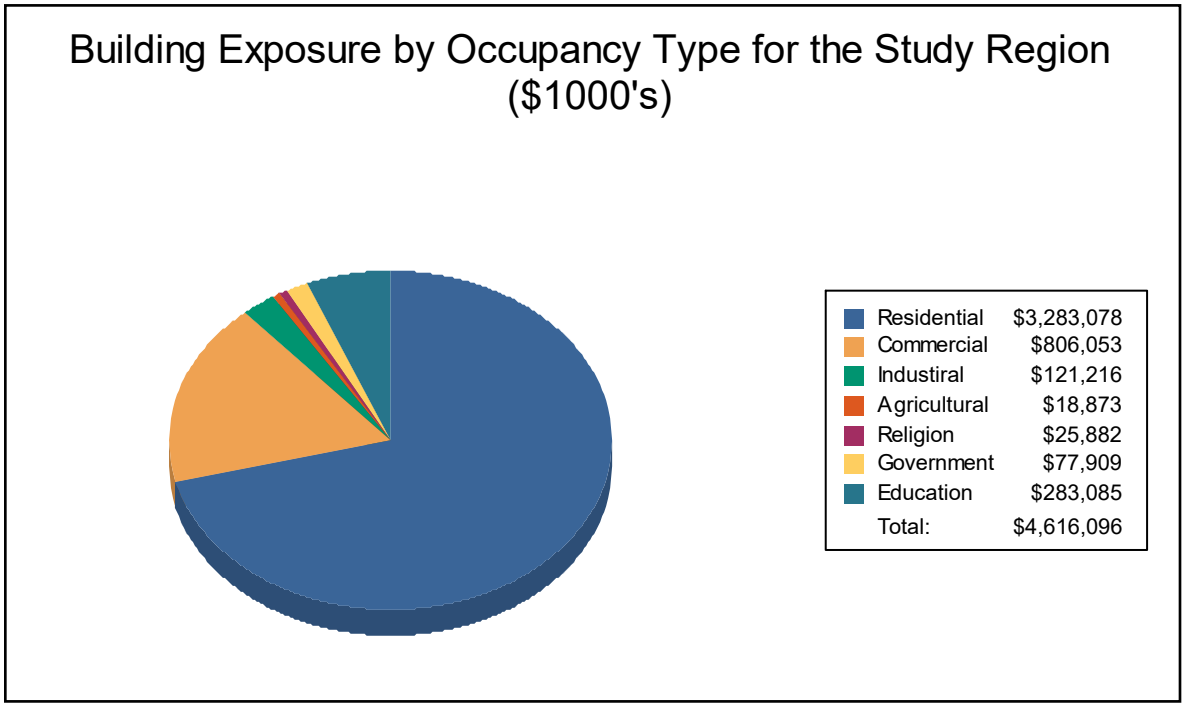
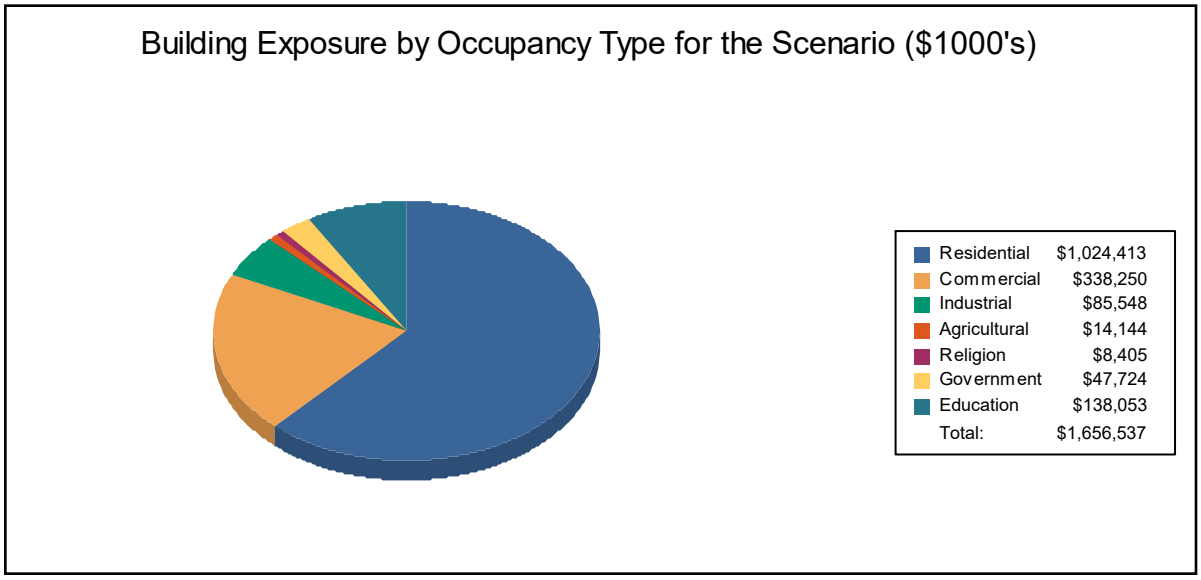


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,024,413	61.8%
Commercial	338,250	20.4%
Industrial	85,548	5.2%
Agricultural	14,144	0.9%
Religion	8,405	0.5%
Government	47,724	2.9%
Education	138,053	8.3%
Total	**1,656,537**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 10 schools, 6 fire stations, 1 police station and 1 emergency operation center.

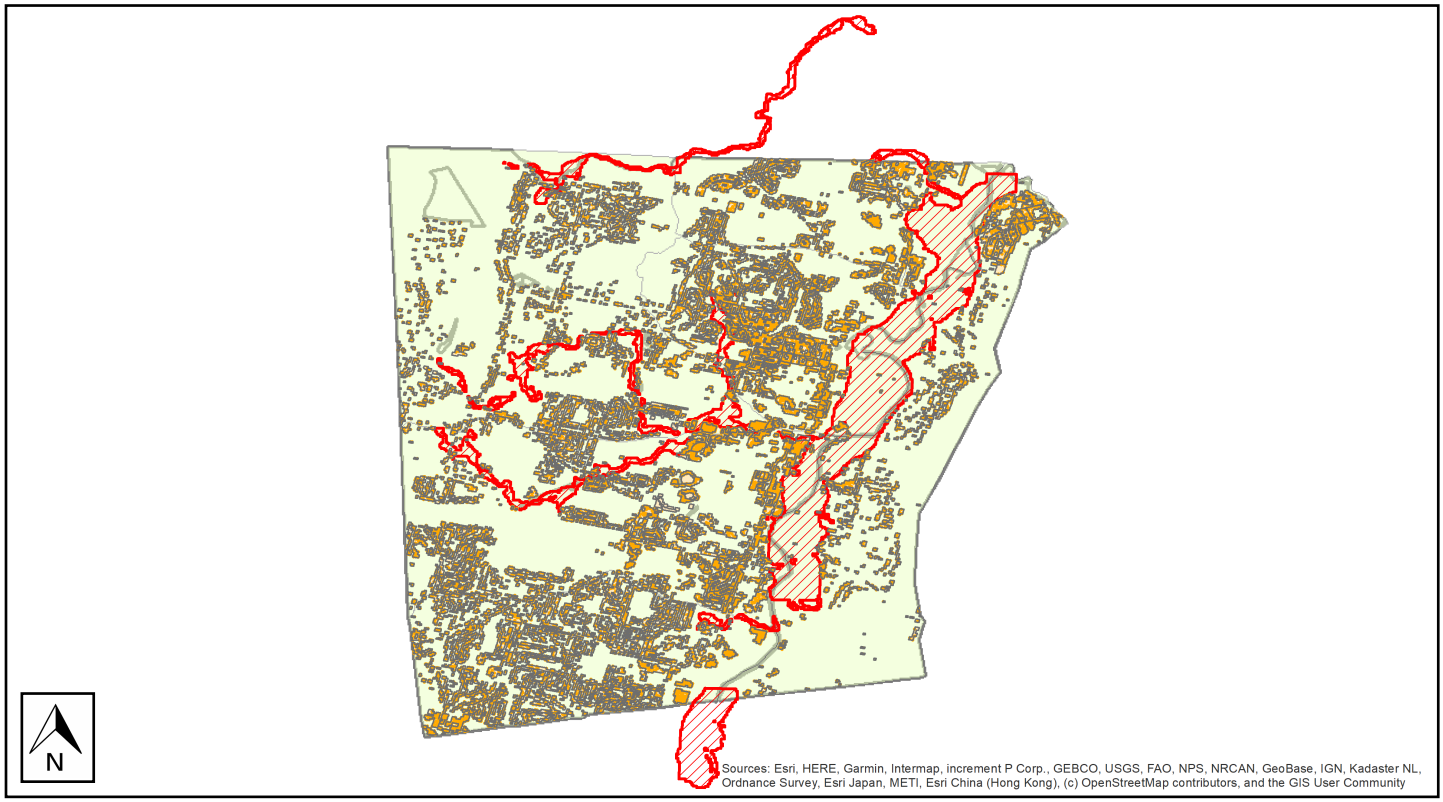
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Simsbury_FL
Scenario Name:	Simsbury_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 13 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

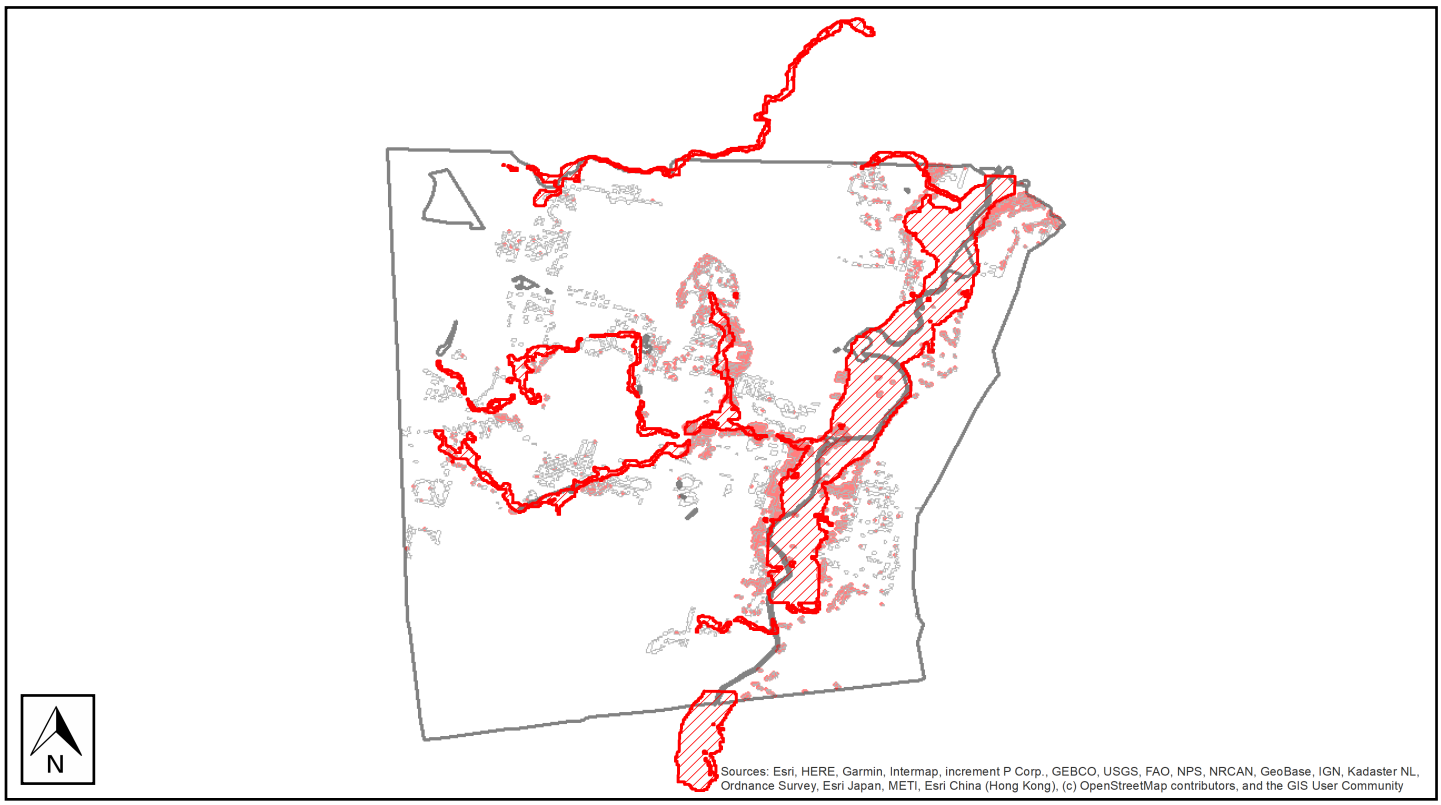


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	1	100	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	8	67	4	33	0	0	0	0	0	0
Total	**0**		**9**		**4**		**0**		**0**		**0**	

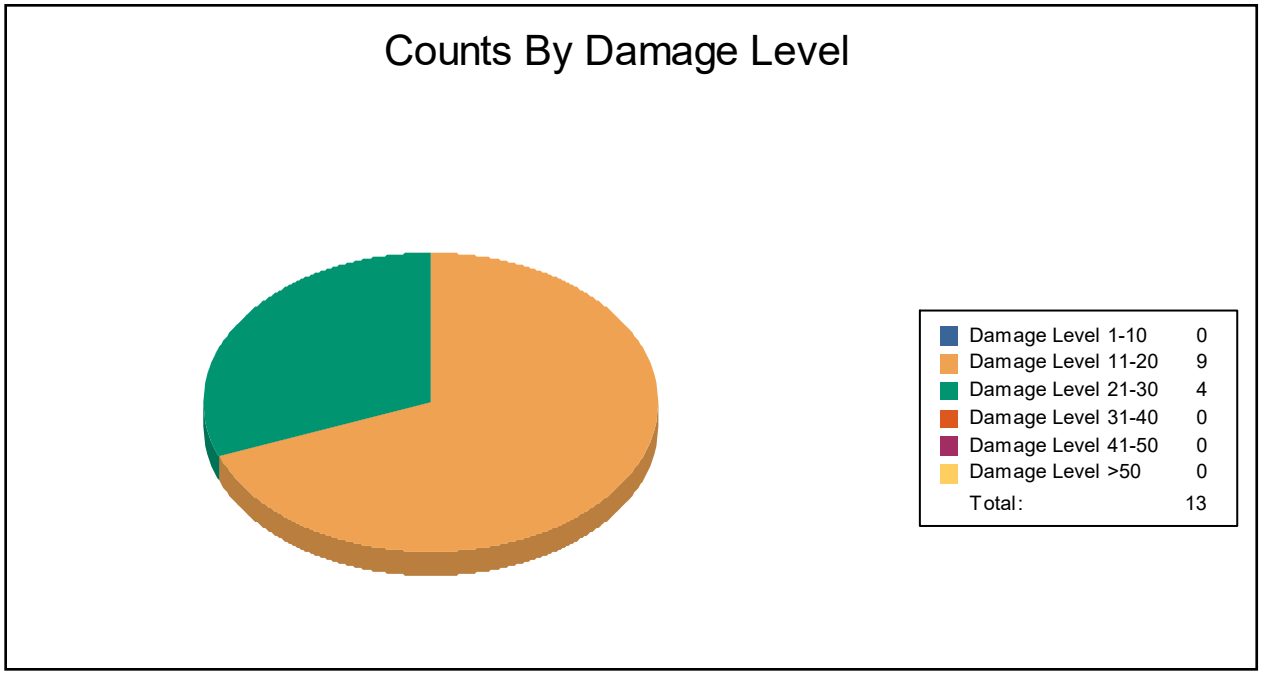


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	1	100	0	0	0	0	0	0	0	0
Wood	0	0	8	67	4	33	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

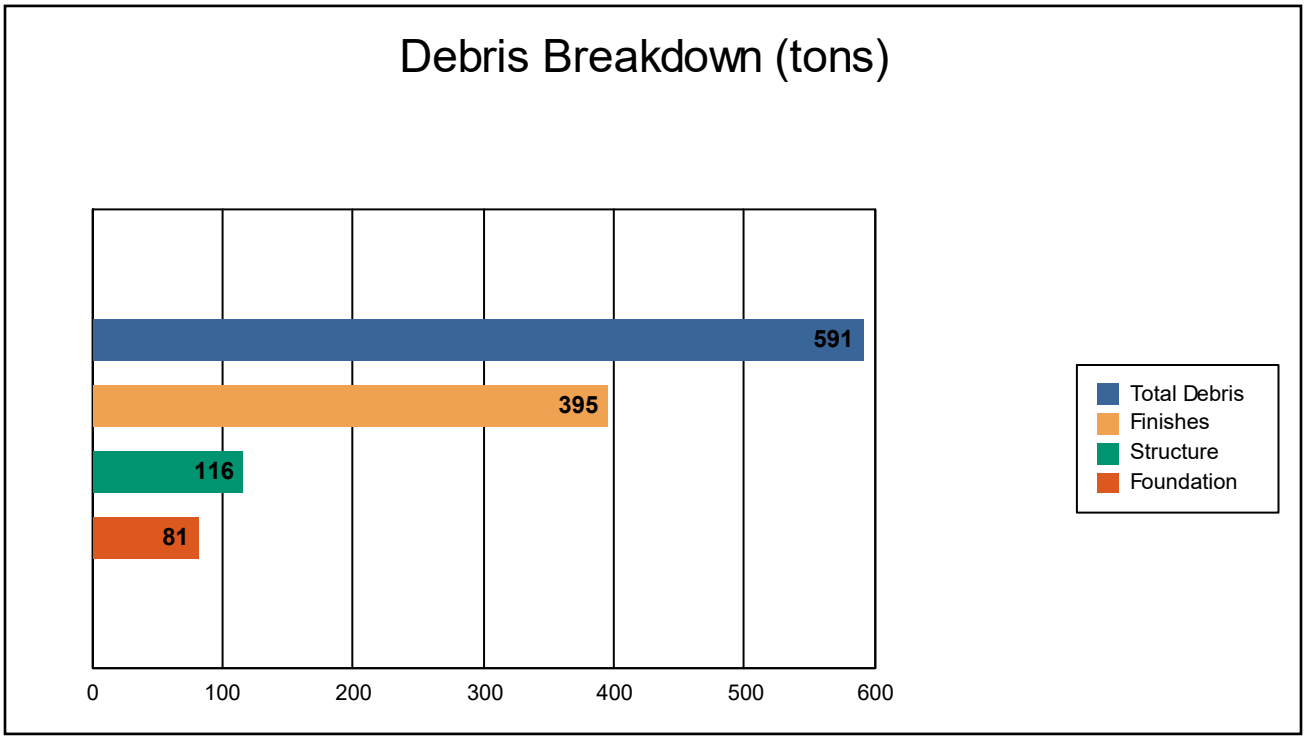
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

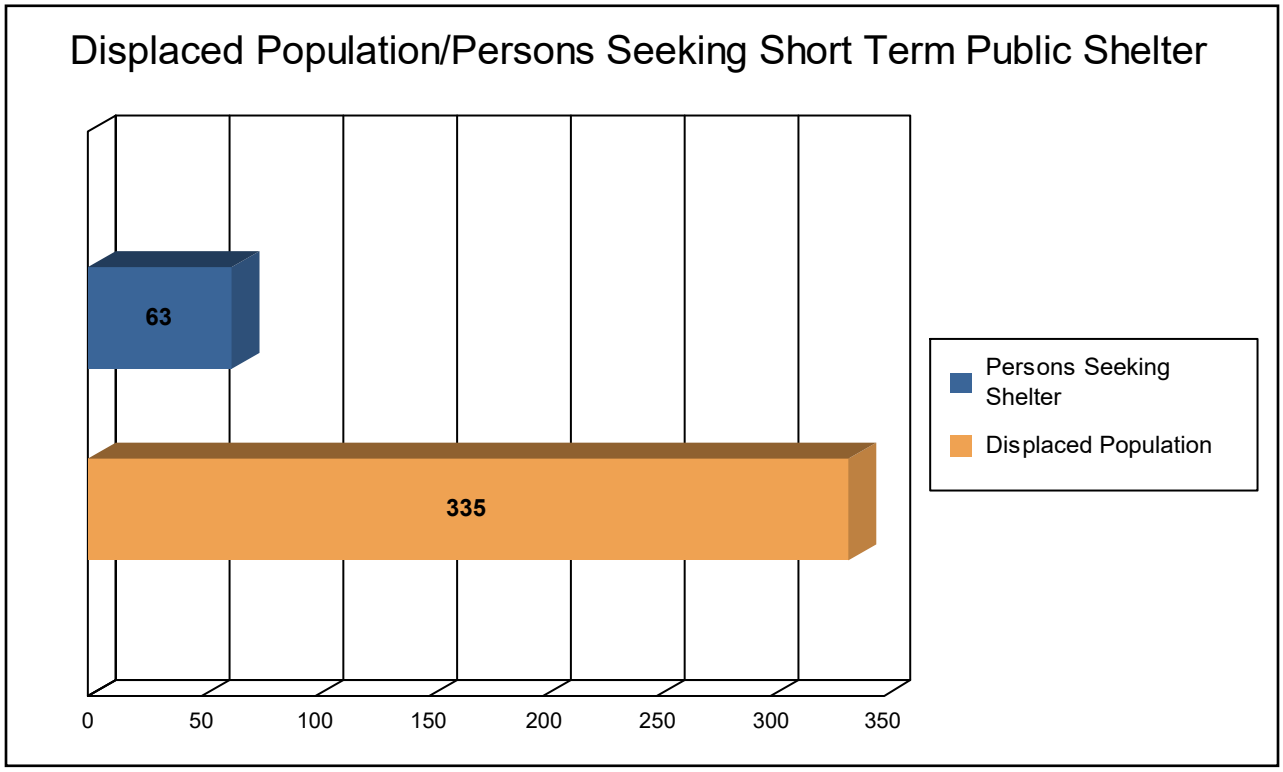


The model estimates that a total of 591 tons of debris will be generated. Of the total amount, Finishes comprises 67% of the total, Structure comprises 20% of the total, and Foundation comprises 14%. If the debris tonnage is converted into an estimated number of truckloads, it will require 24 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 112 households (or 335 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 63 people (out of a total population of 24,485) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 133.85 million dollars, which represents 8.08 % of the total replacement value of the scenario buildings.

Building-Related Losses

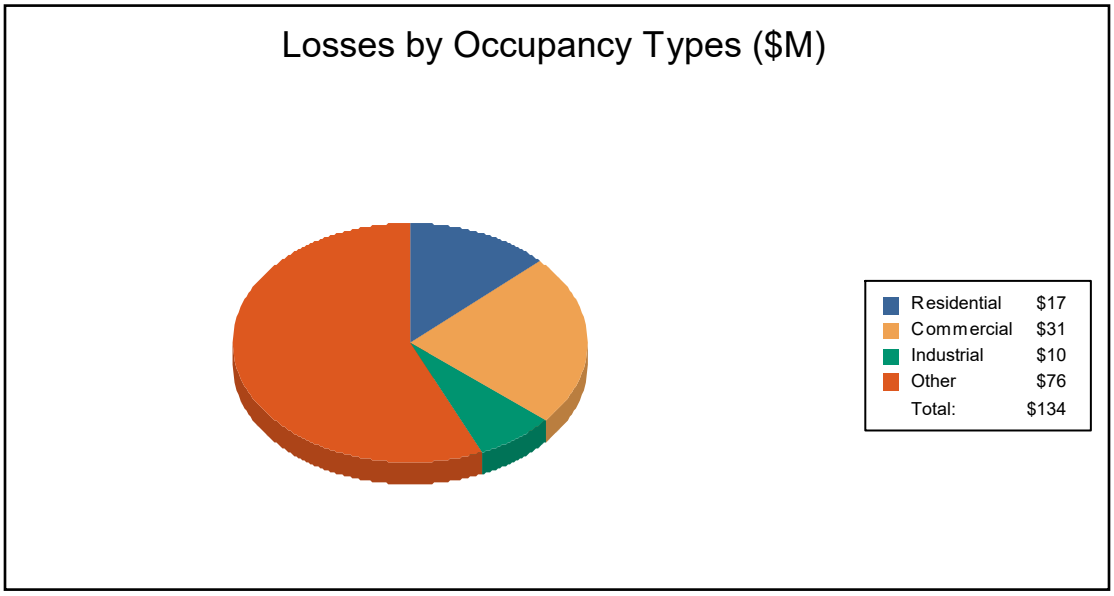
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 54.07 million dollars. 60% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 12.93% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.77	3.53	1.98	2.57	17.85
	Content	4.57	9.21	5.80	14.23	33.81
	Inventory	0.00	1.02	1.14	0.26	2.41
	Subtotal	**14.34**	**13.76**	**8.92**	**17.06**	**54.07**
Business Interruption						
	Income	0.08	8.13	0.16	7.02	15.39
	Relocation	1.90	1.58	0.18	4.05	7.70
	Rental Income	0.81	1.19	0.04	0.32	2.36
	Wage	0.18	6.51	0.27	47.37	54.33
	Subtotal	**2.97**	**17.41**	**0.64**	**58.76**	**79.78**
ALL	**Total**	**17.31**	**31.17**	**9.56**	**75.82**	**133.85**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	24,485	3,283,078	1,333,018	4,616,096
Total	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**
Total Study Region	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**

Hazus: Flood Global Risk Report

Region Name: Simsbury_FL

Flood Scenario: Simsbury_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 317 census blocks. The region contains over 10 thousand households and has a total population of 24,485 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,907 buildings in the region with a total building replacement value (excluding contents) of 4,616 million dollars. Approximately 85.90% of the buildings (and 71.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,907 buildings in the region which have an aggregate total replacement value of 4,616 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,283,078	71.1%
Commercial	806,053	17.5%
Industrial	121,216	2.6%
Agricultural	18,873	0.4%
Religion	25,882	0.6%
Government	77,909	1.7%
Education	283,085	6.1%
Total	**4,616,096**	**100%**

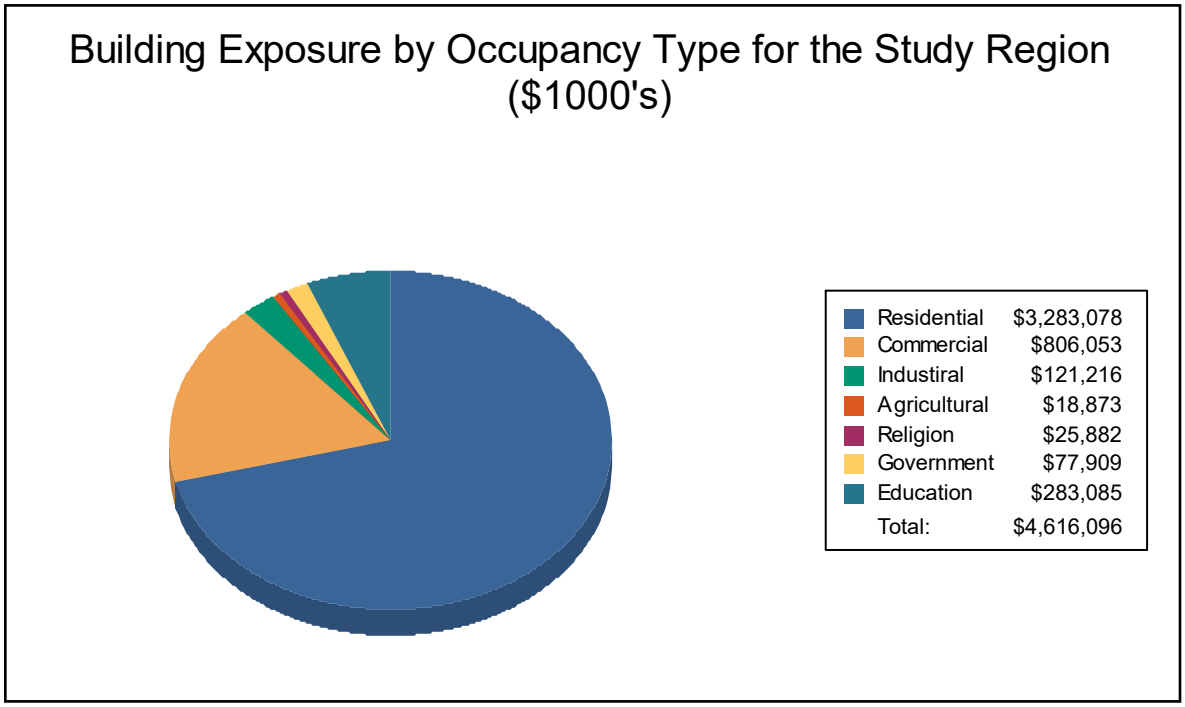
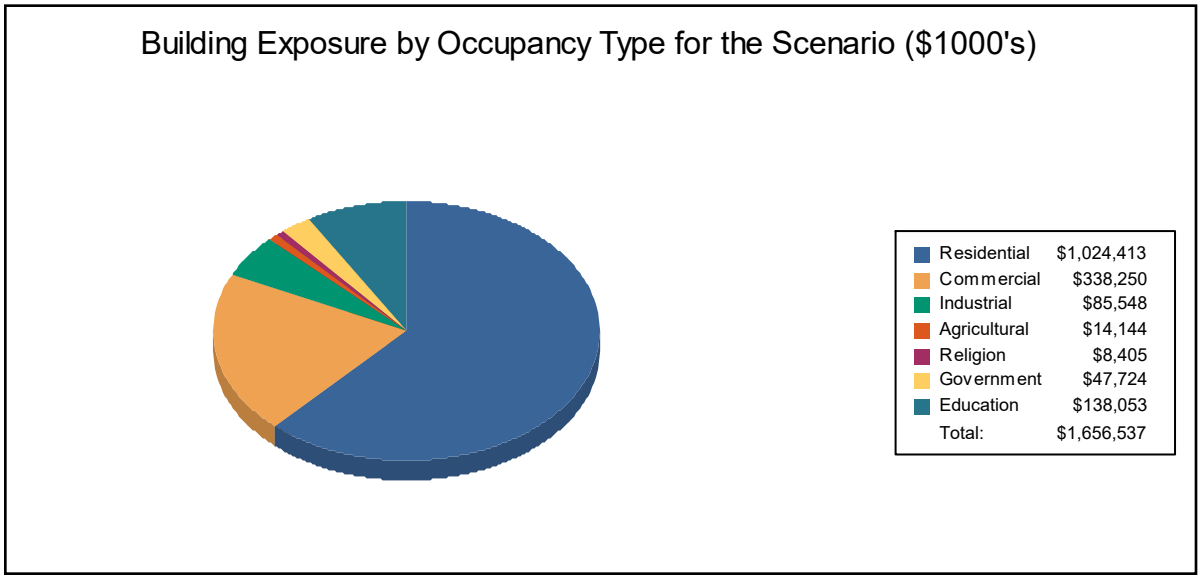


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,024,413	61.8%
Commercial	338,250	20.4%
Industrial	85,548	5.2%
Agricultural	14,144	0.9%
Religion	8,405	0.5%
Government	47,724	2.9%
Education	138,053	8.3%
Total	**1,656,537**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 10 schools, 6 fire stations, 1 police station and 1 emergency operation center.

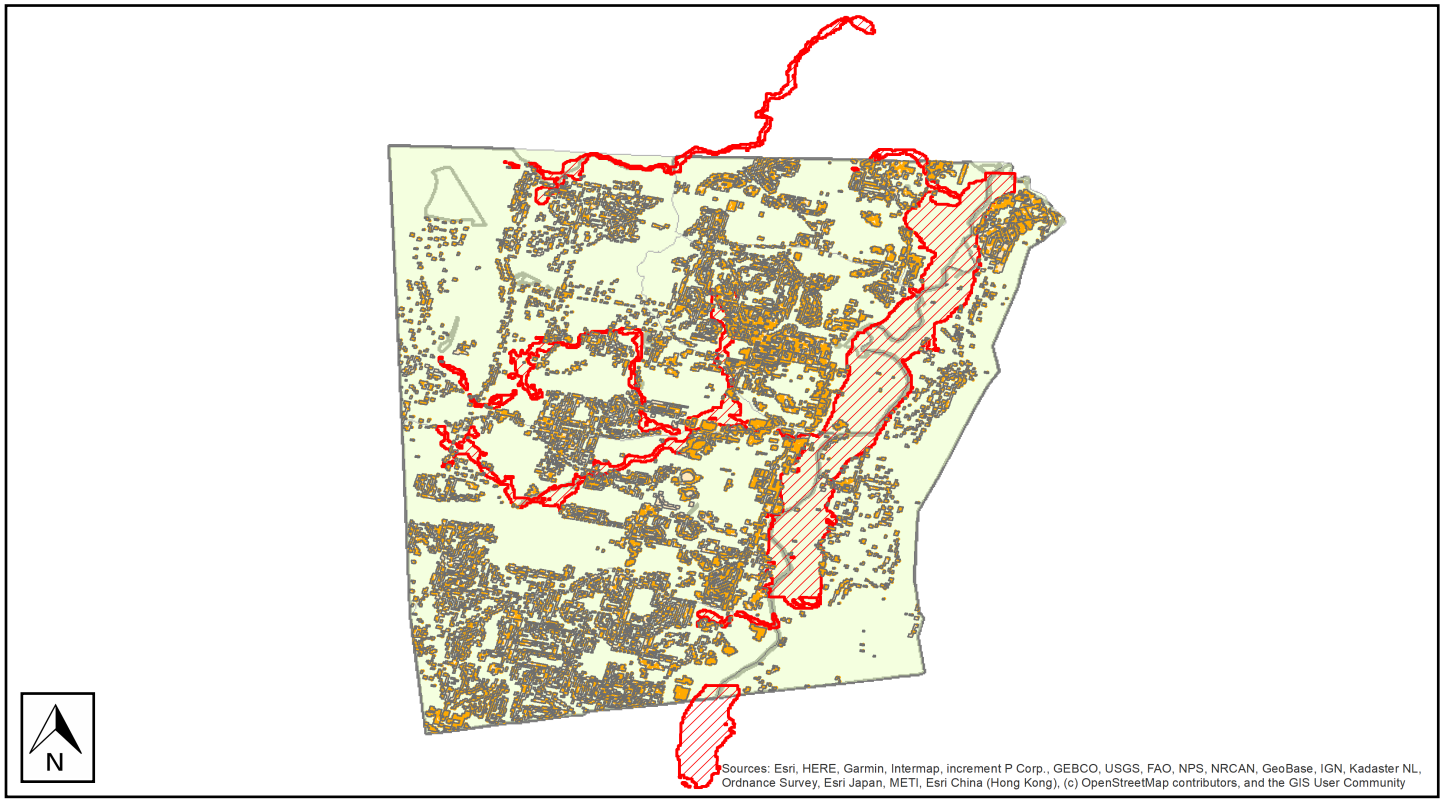
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Simsbury_FL
Scenario Name:	Simsbury_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 17 buildings will be at least moderately damaged. This is over 76% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

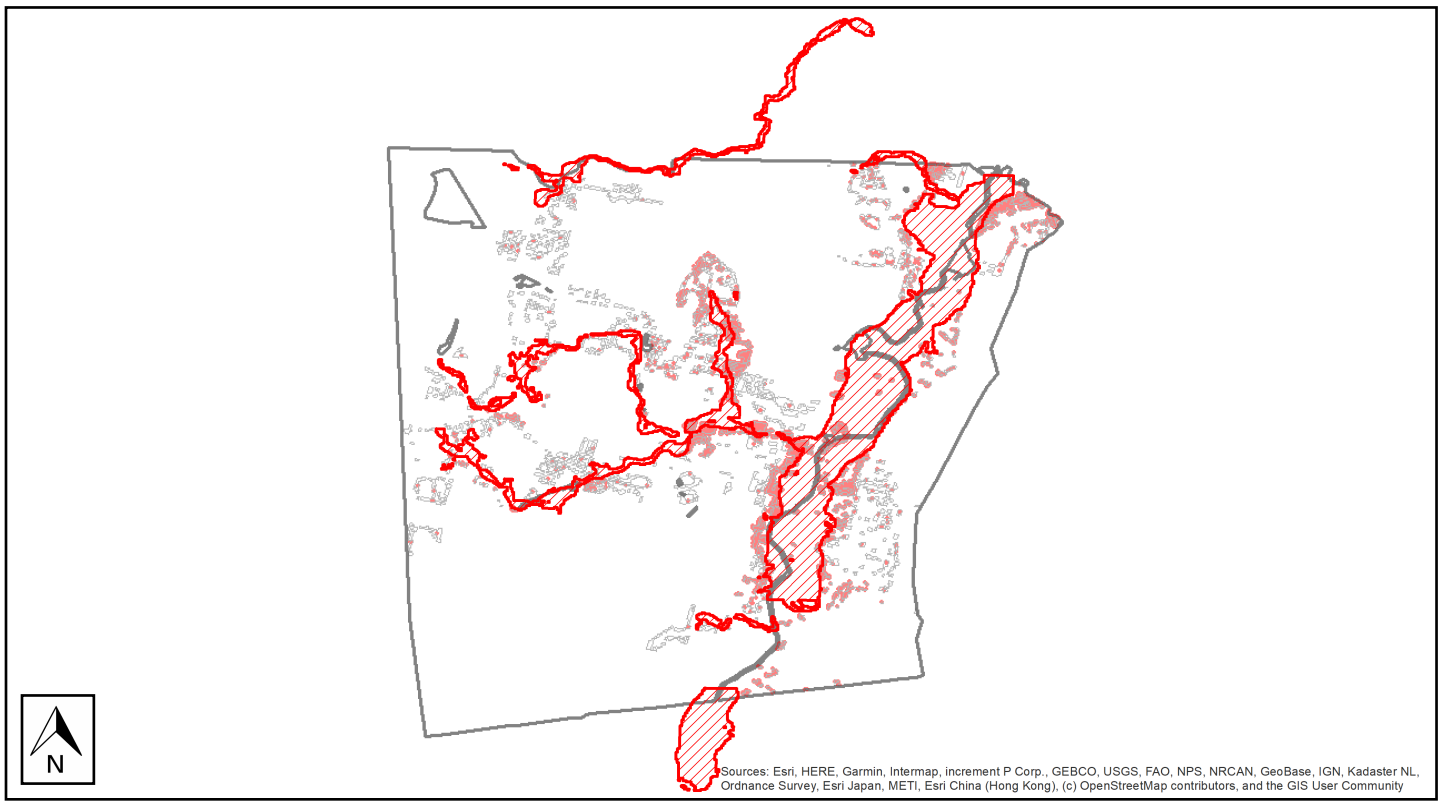


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	1	100	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	5	31	7	44	4	25	0	0	0	0
Total	**0**		**6**		**7**		**4**		**0**		**0**	

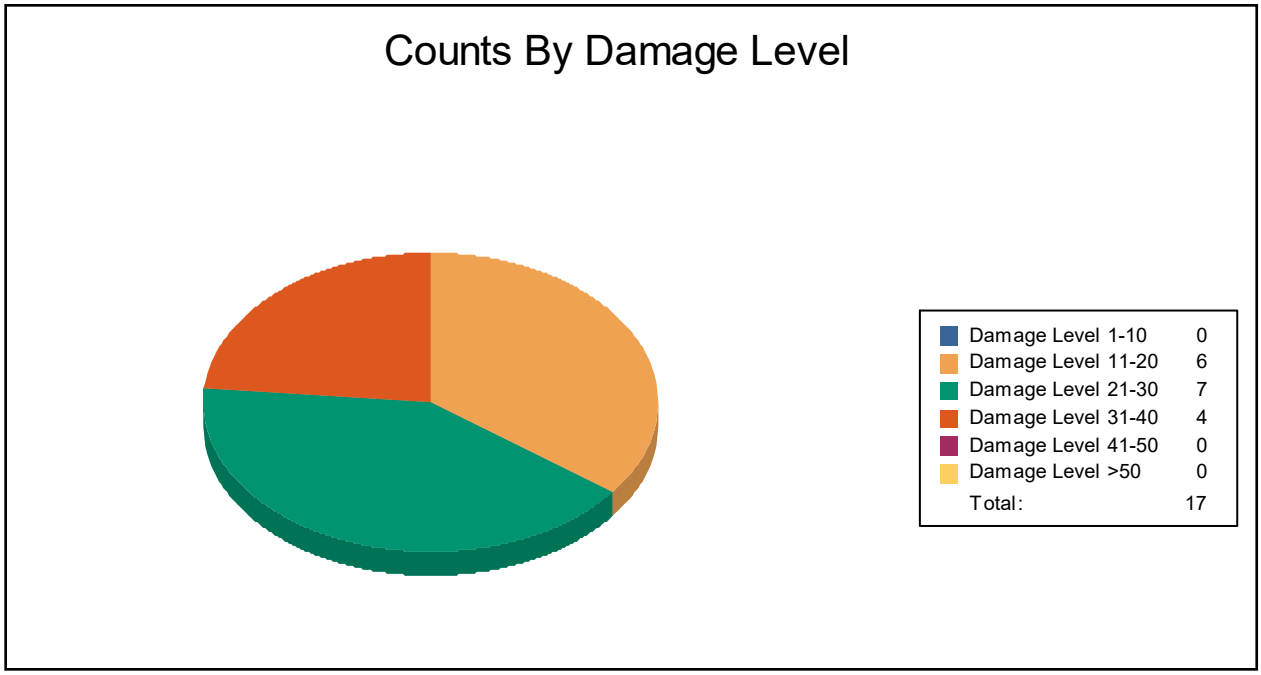


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	1	100	0	0	0	0	0	0	0	0
Wood	0	0	5	31	7	44	4	25	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

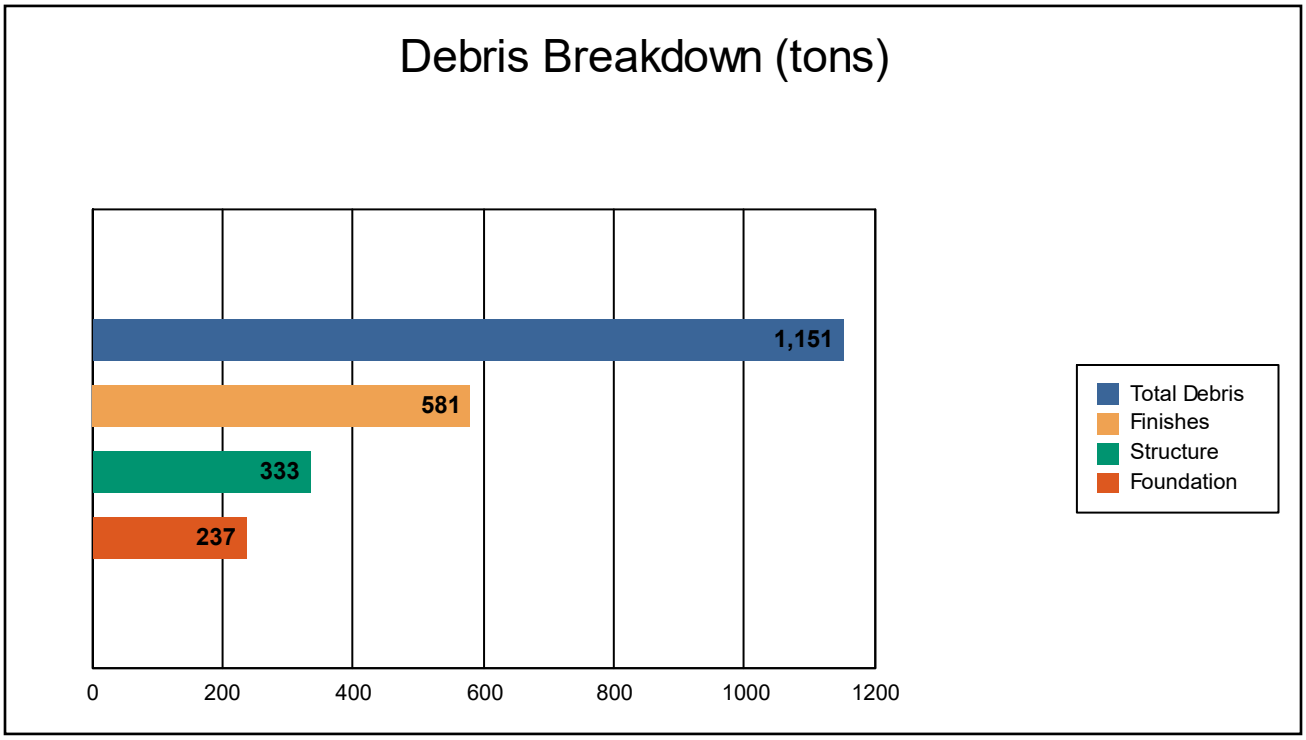
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

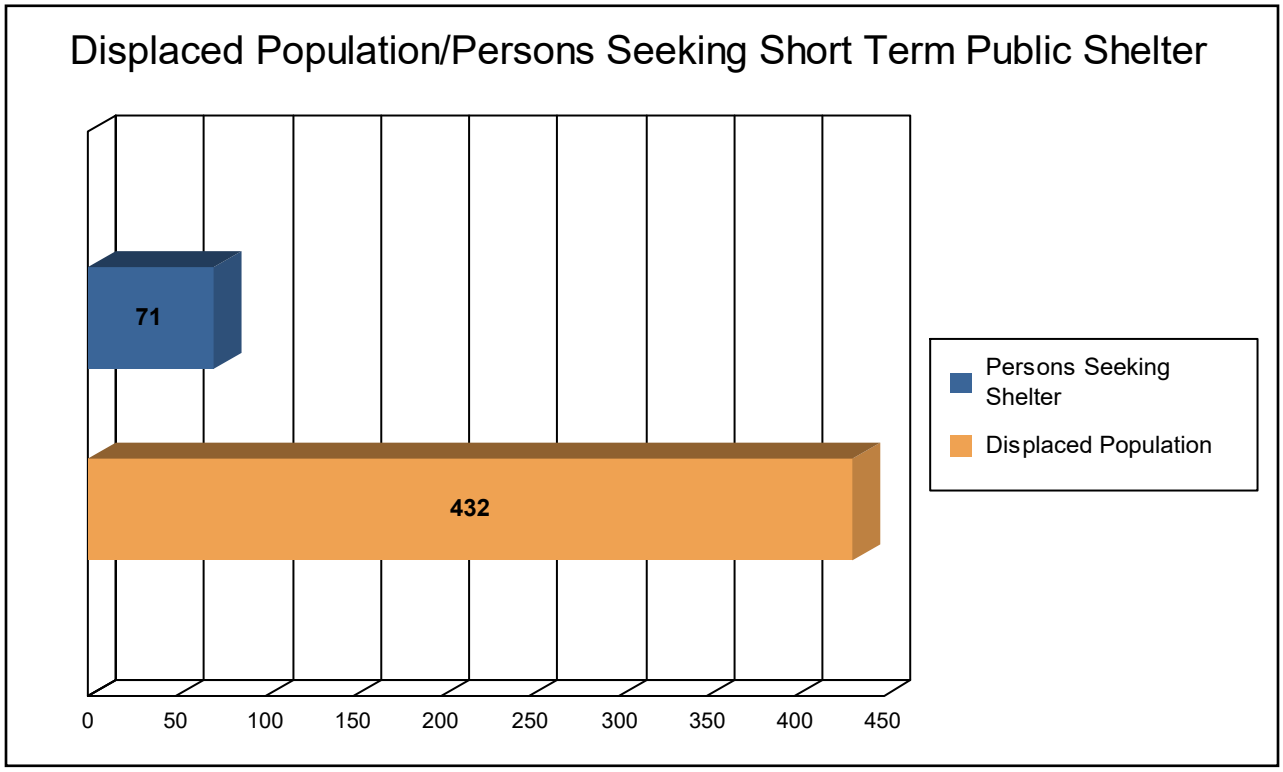


The model estimates that a total of 1,151 tons of debris will be generated. Of the total amount, Finishes comprises 50% of the total, Structure comprises 29% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 47 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 144 households (or 432 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 71 people (out of a total population of 24,485) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 183.04 million dollars, which represents 11.05 % of the total replacement value of the scenario buildings.

Building-Related Losses

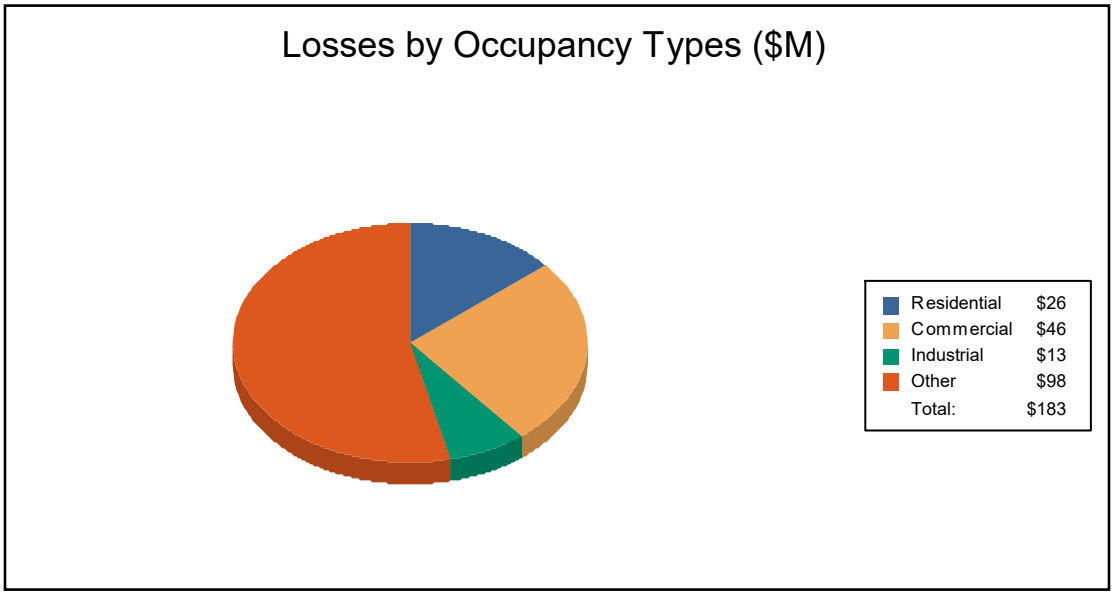
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 80.08 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 14.02% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	14.70	5.82	2.81	3.89	27.22
	Content	6.89	14.08	7.90	20.52	49.38
	Inventory	0.00	1.62	1.49	0.37	3.48
	Subtotal	**21.59**	**21.52**	**12.20**	**24.78**	**80.08**
Business Interruption						
	Income	0.11	11.52	0.20	8.61	20.44
	Relocation	2.60	2.31	0.22	4.99	10.12
	Rental Income	1.10	1.76	0.06	0.43	3.34
	Wage	0.26	9.09	0.34	59.35	69.05
	Subtotal	**4.08**	**24.68**	**0.82**	**73.38**	**102.95**
ALL	**Total**	**25.67**	**46.20**	**13.02**	**98.16**	**183.04**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	24,485	3,283,078	1,333,018	4,616,096
Total	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**
Total Study Region	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**

Hazus: Flood Global Risk Report

Region Name: Simsbury_FL

Flood Scenario: Simsbury_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 317 census blocks. The region contains over 10 thousand households and has a total population of 24,485 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,907 buildings in the region with a total building replacement value (excluding contents) of 4,616 million dollars. Approximately 85.90% of the buildings (and 71.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,907 buildings in the region which have an aggregate total replacement value of 4,616 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,283,078	71.1%
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Agricultural	18,873	0.4%
Religion	25,882	0.6%
Government	77,909	1.7%
Education	283,085	6.1%
Total	**4,616,096**	**100%**

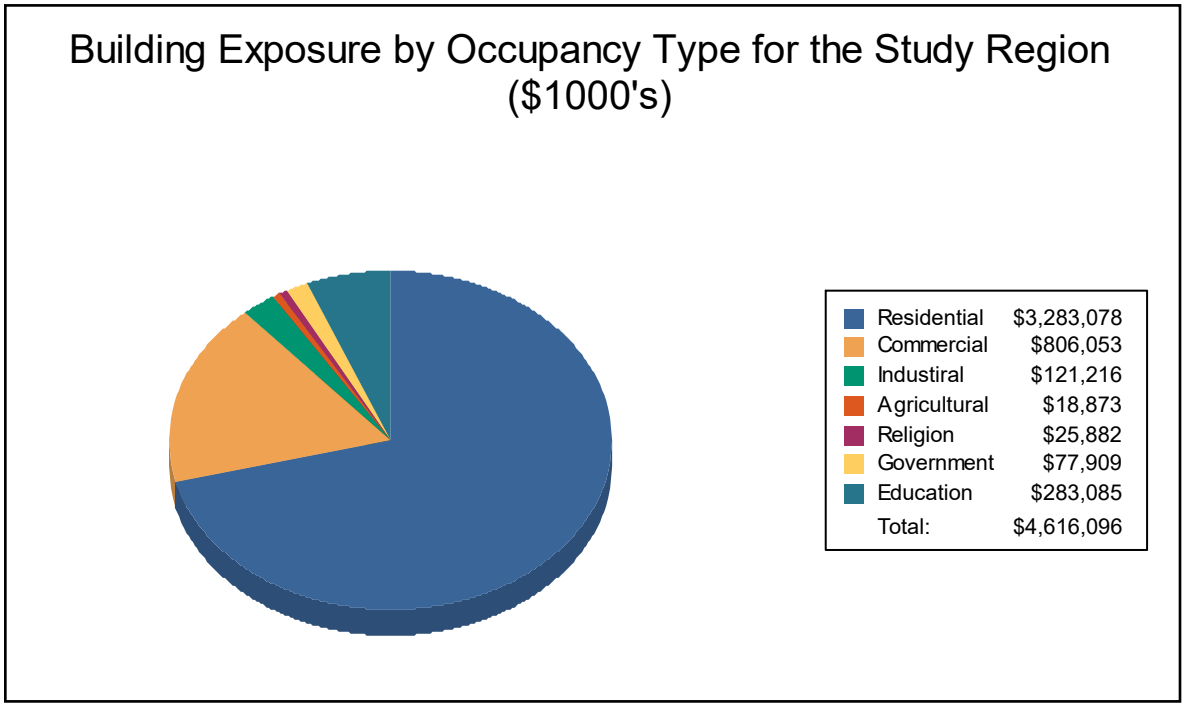
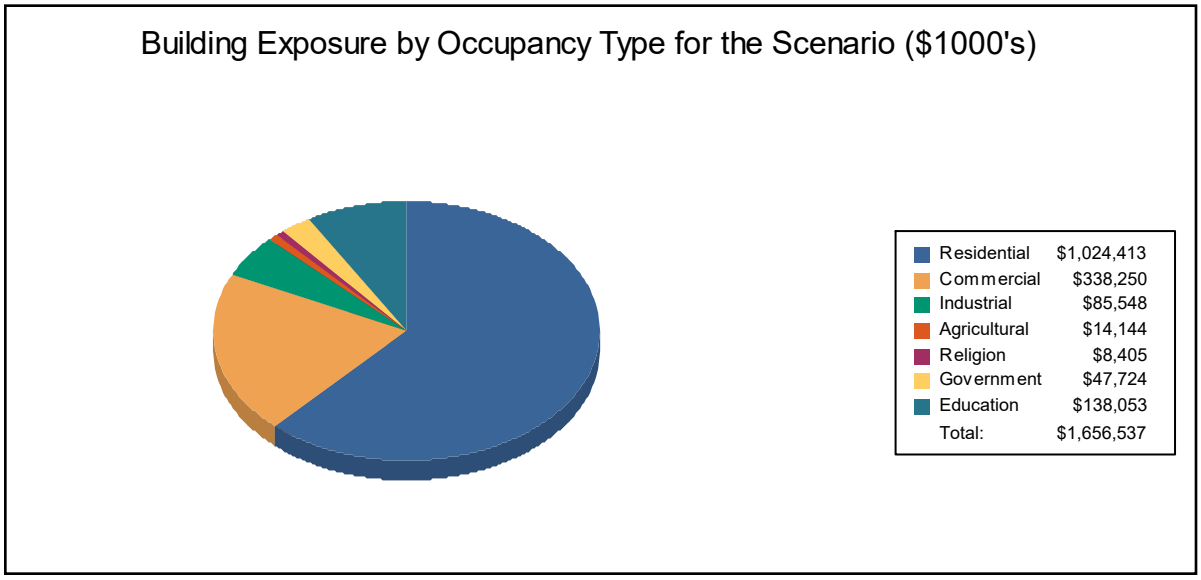


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,024,413	61.8%
Commercial	338,250	20.4%
Industrial	85,548	5.2%
Agricultural	14,144	0.9%
Religion	8,405	0.5%
Government	47,724	2.9%
Education	138,053	8.3%
Total	**1,656,537**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 10 schools, 6 fire stations, 1 police station and 1 emergency operation center.

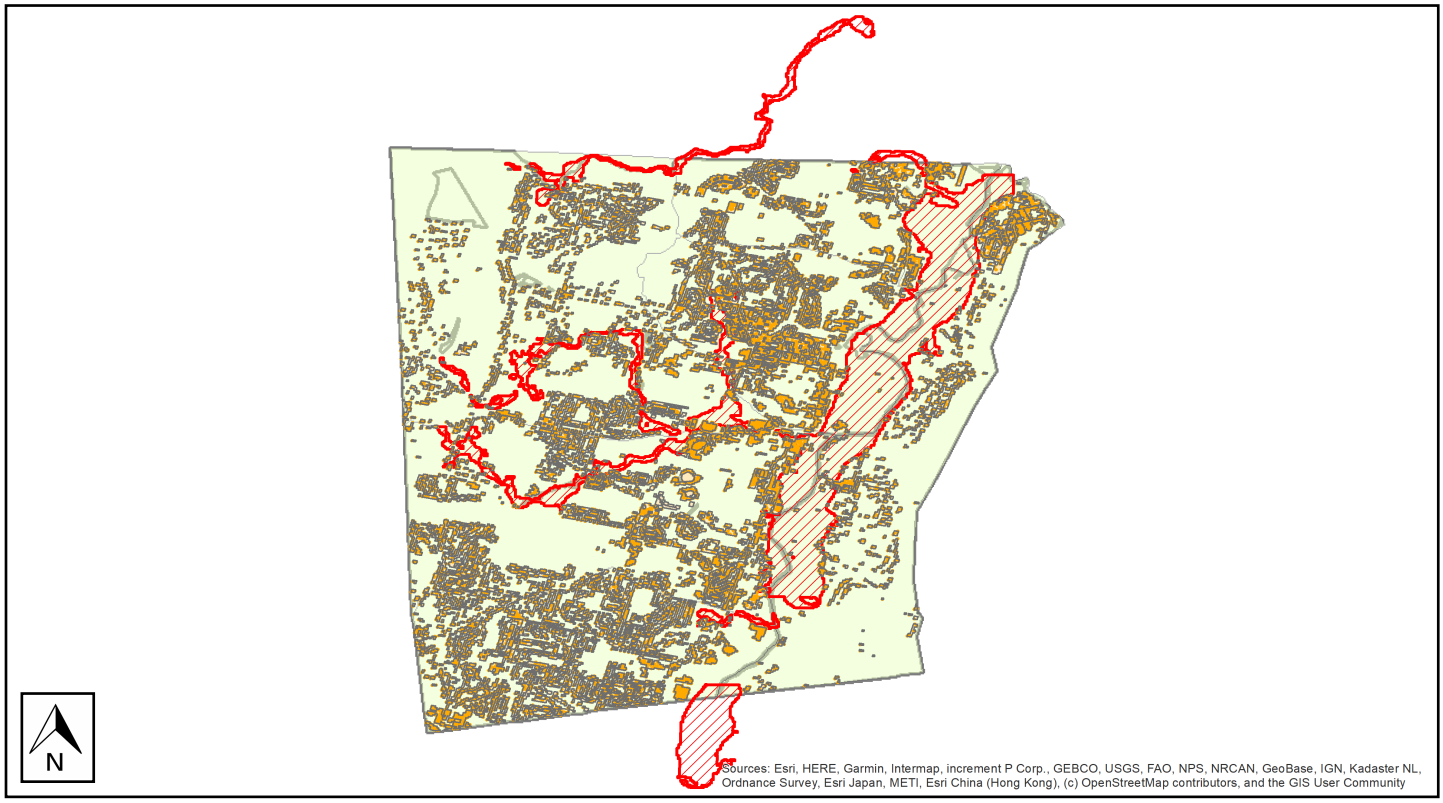
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Simsbury_FL
Scenario Name:	Simsbury_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 18 buildings will be at least moderately damaged. This is over 72% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

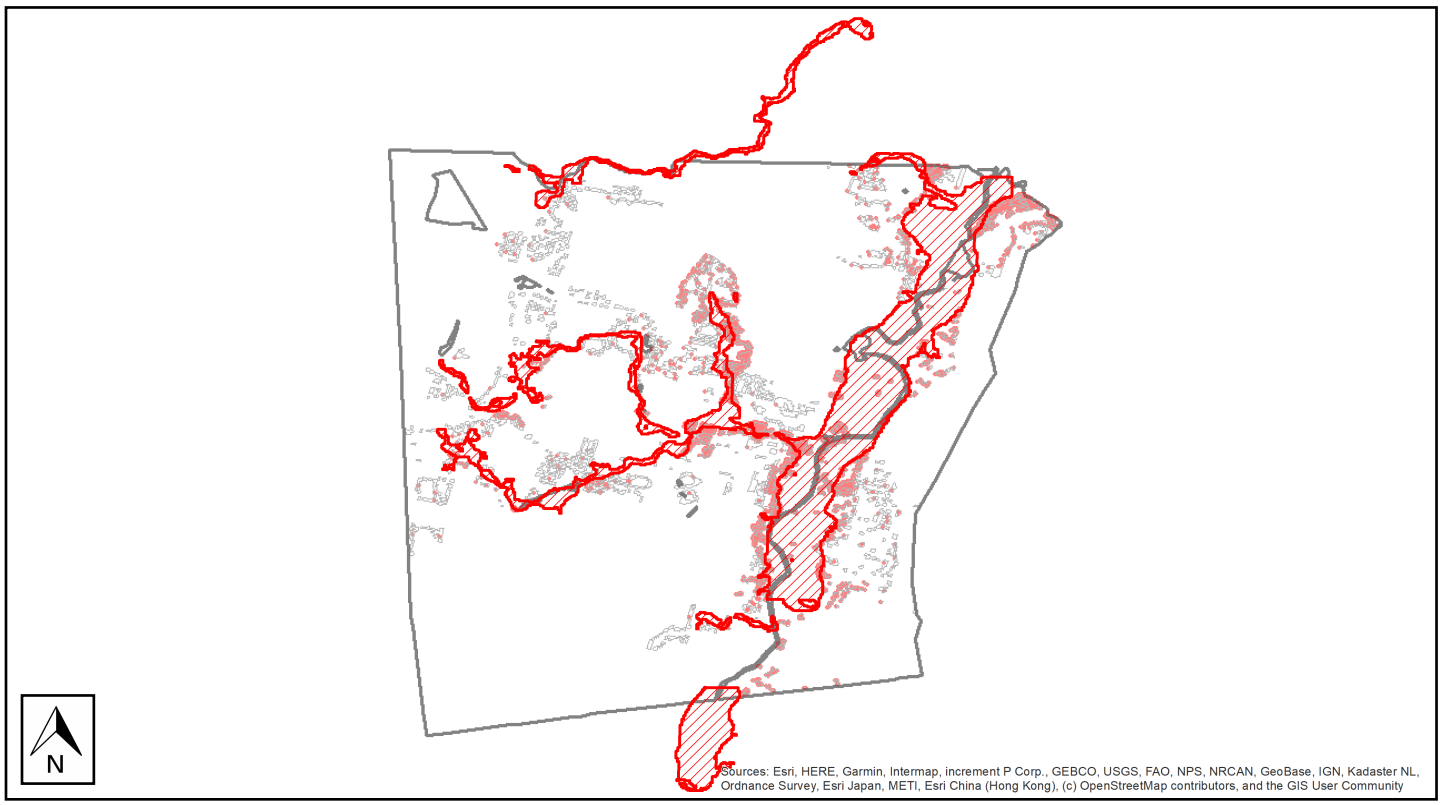


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	1	100	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	1	100	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	6	38	5	31	4	25	1	6	0	0
Total	**0**		**7**		**6**		**4**		**1**		**0**	

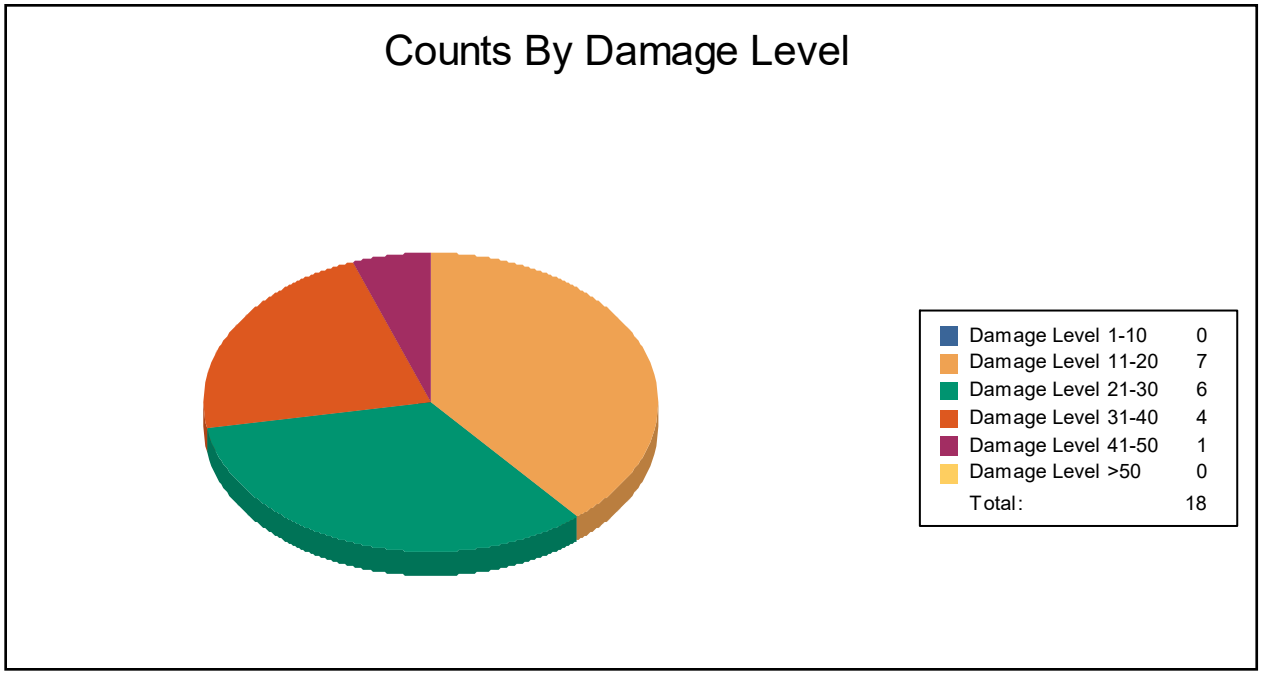


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	1	50	1	50	0	0	0	0	0	0
Wood	0	0	6	38	5	31	4	25	1	6	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

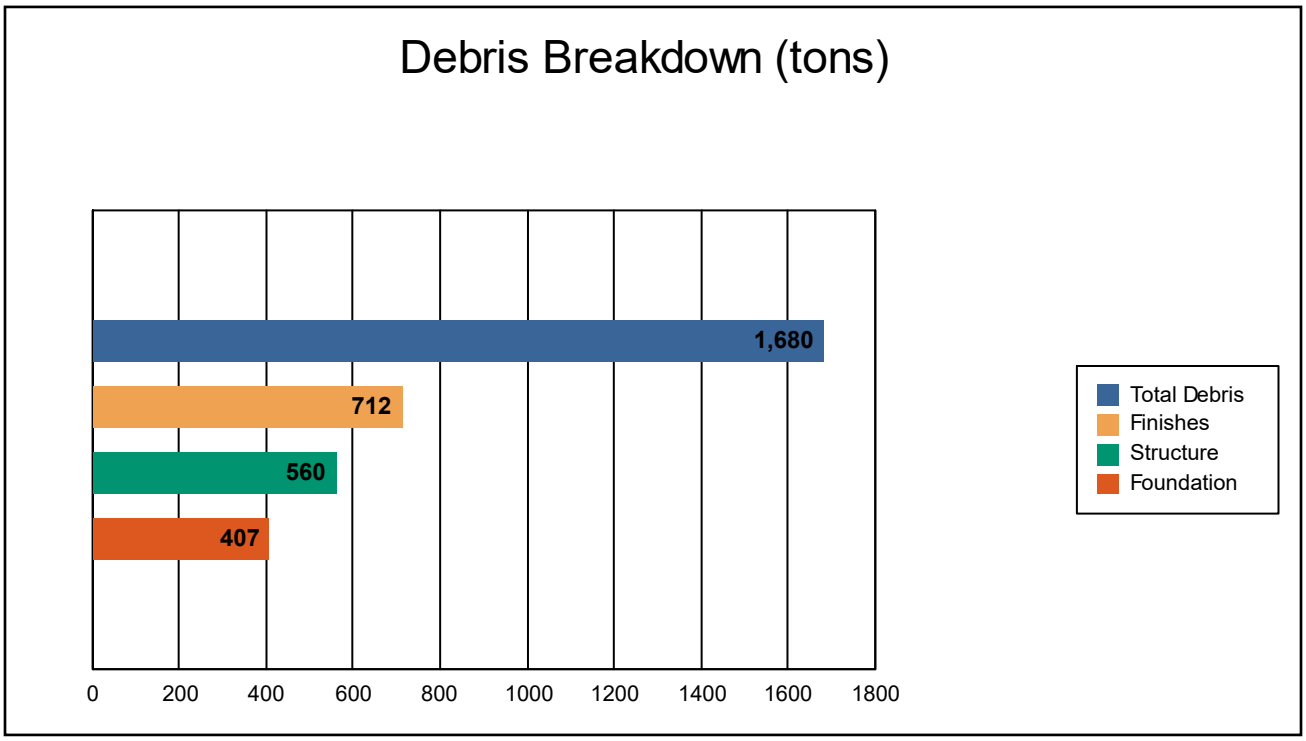
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

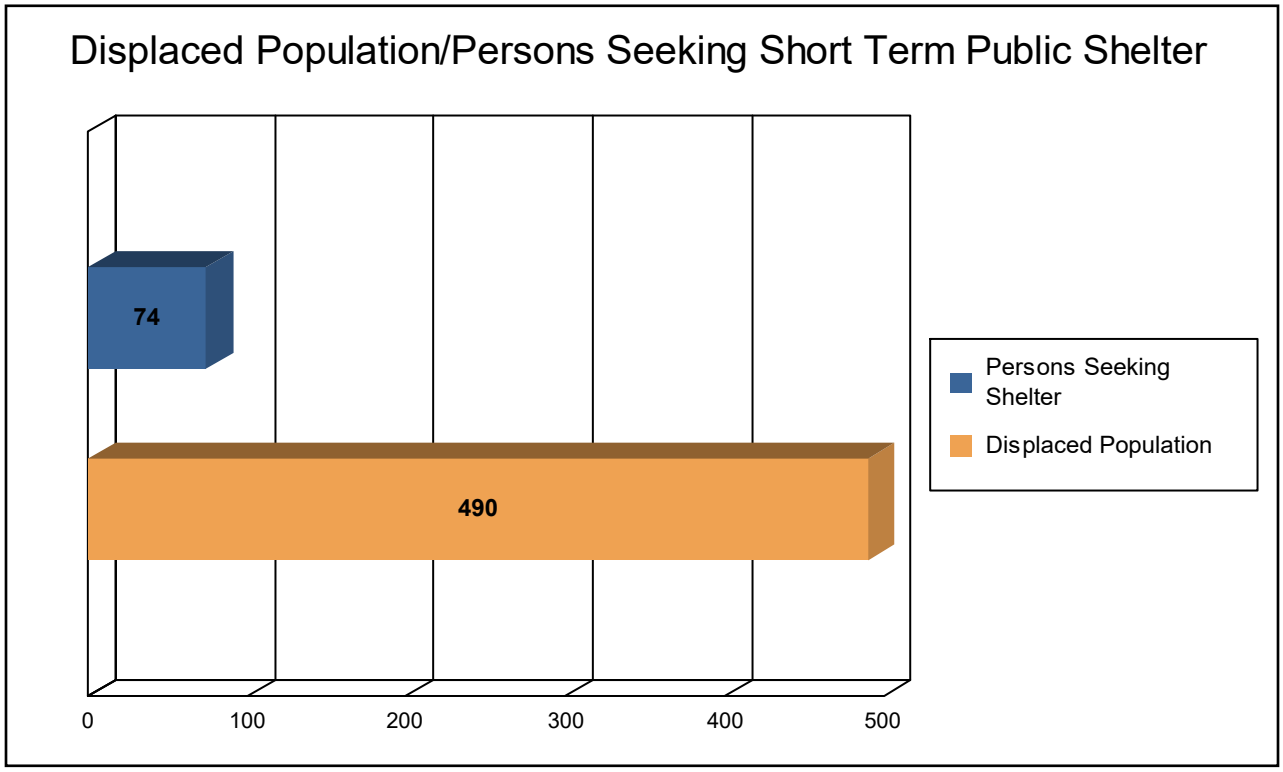


The model estimates that a total of 1,680 tons of debris will be generated. Of the total amount, Finishes comprises 42% of the total, Structure comprises 33% of the total, and Foundation comprises 24%. If the debris tonnage is converted into an estimated number of truckloads, it will require 68 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 163 households (or 490 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 74 people (out of a total population of 24,485) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 220.40 million dollars, which represents 13.31 % of the total replacement value of the scenario buildings.

Building-Related Losses

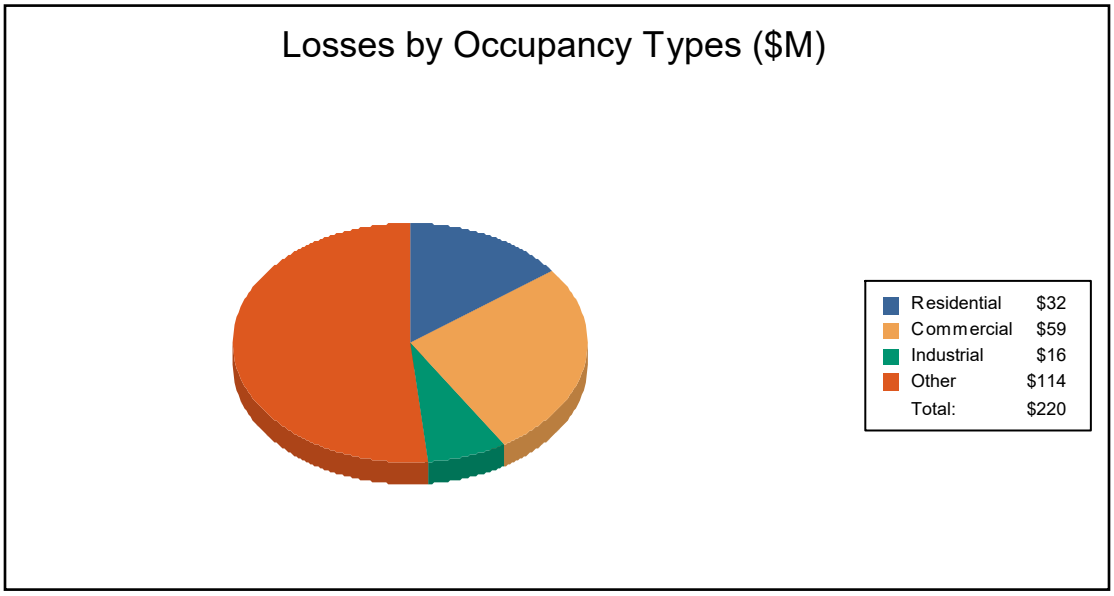
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 100.44 million dollars. 54% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 14.68% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	18.81	7.74	3.44	4.95	34.95
	Content	8.77	18.15	9.47	24.74	61.12
	Inventory	0.00	2.18	1.73	0.46	4.37
	Subtotal	**27.58**	**28.07**	**14.65**	**30.15**	**100.44**
Business Interruption						
	Income	0.13	14.22	0.23	9.67	24.24
	Relocation	3.06	2.91	0.26	5.67	11.89
	Rental Income	1.28	2.22	0.06	0.53	4.10
	Wage	0.30	11.14	0.39	67.91	79.74
	Subtotal	**4.77**	**30.48**	**0.94**	**83.77**	**119.96**
ALL	**Total**	**32.35**	**58.55**	**15.59**	**113.92**	**220.40**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	24,485	3,283,078	1,333,018	4,616,096
Total	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**
Total Study Region	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**

Hazus: Flood Global Risk Report

Region Name: Simsbury_FL

Flood Scenario: Simsbury_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 317 census blocks. The region contains over 10 thousand households and has a total population of 24,485 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,907 buildings in the region with a total building replacement value (excluding contents) of 4,616 million dollars. Approximately 85.90% of the buildings (and 71.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,907 buildings in the region which have an aggregate total replacement value of 4,616 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,283,078	71.1%
Commercial	806,053	17.5%
Industrial	121,216	2.6%
Agricultural	18,873	0.4%
Religion	25,882	0.6%
Government	77,909	1.7%
Education	283,085	6.1%
Total	**4,616,096**	**100%**

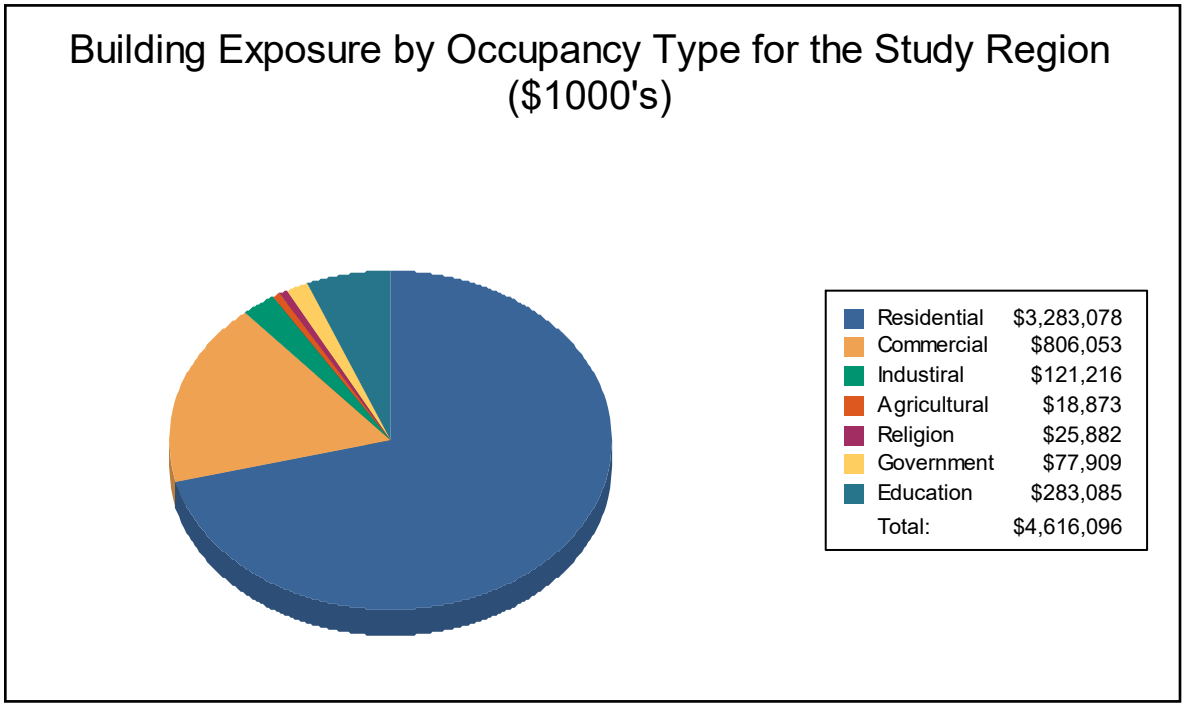
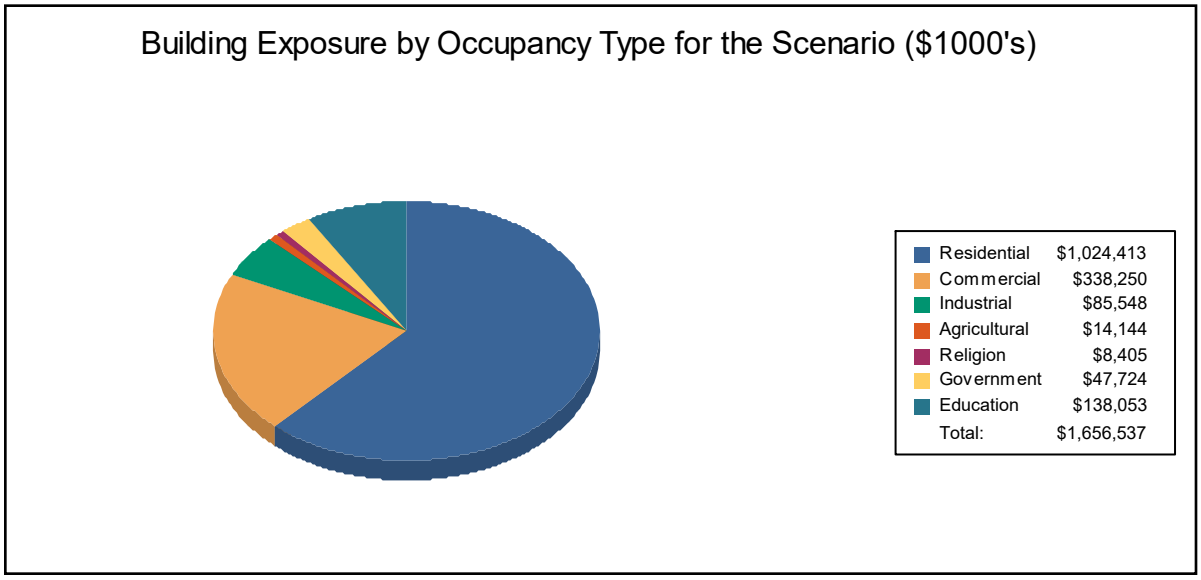


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,024,413	61.8%
Commercial	338,250	20.4%
Industrial	85,548	5.2%
Agricultural	14,144	0.9%
Religion	8,405	0.5%
Government	47,724	2.9%
Education	138,053	8.3%
Total	**1,656,537**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 10 schools, 6 fire stations, 1 police station and 1 emergency operation center.

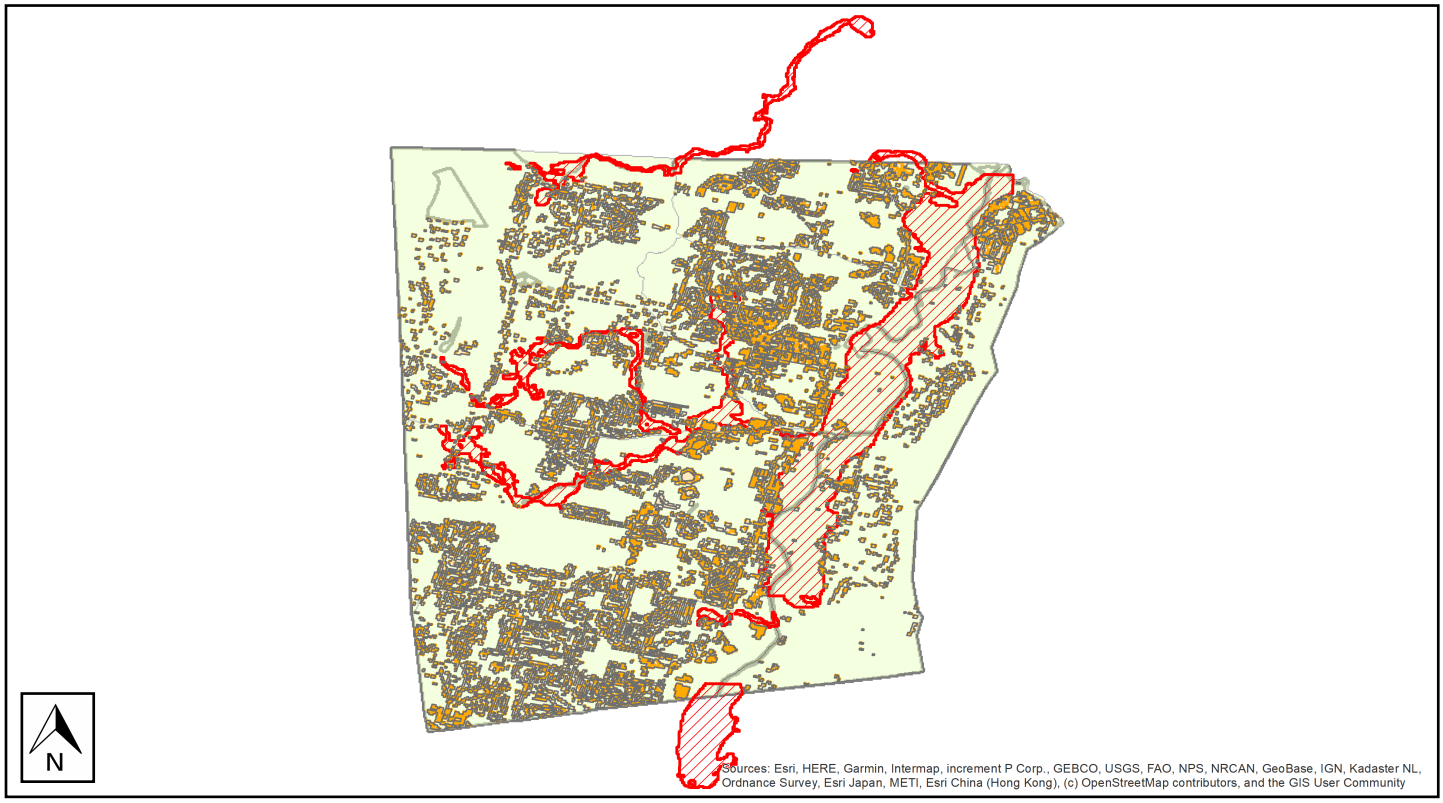
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Simsbury_FL
Scenario Name:	Simsbury_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 21 buildings will be at least moderately damaged. This is over 71% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

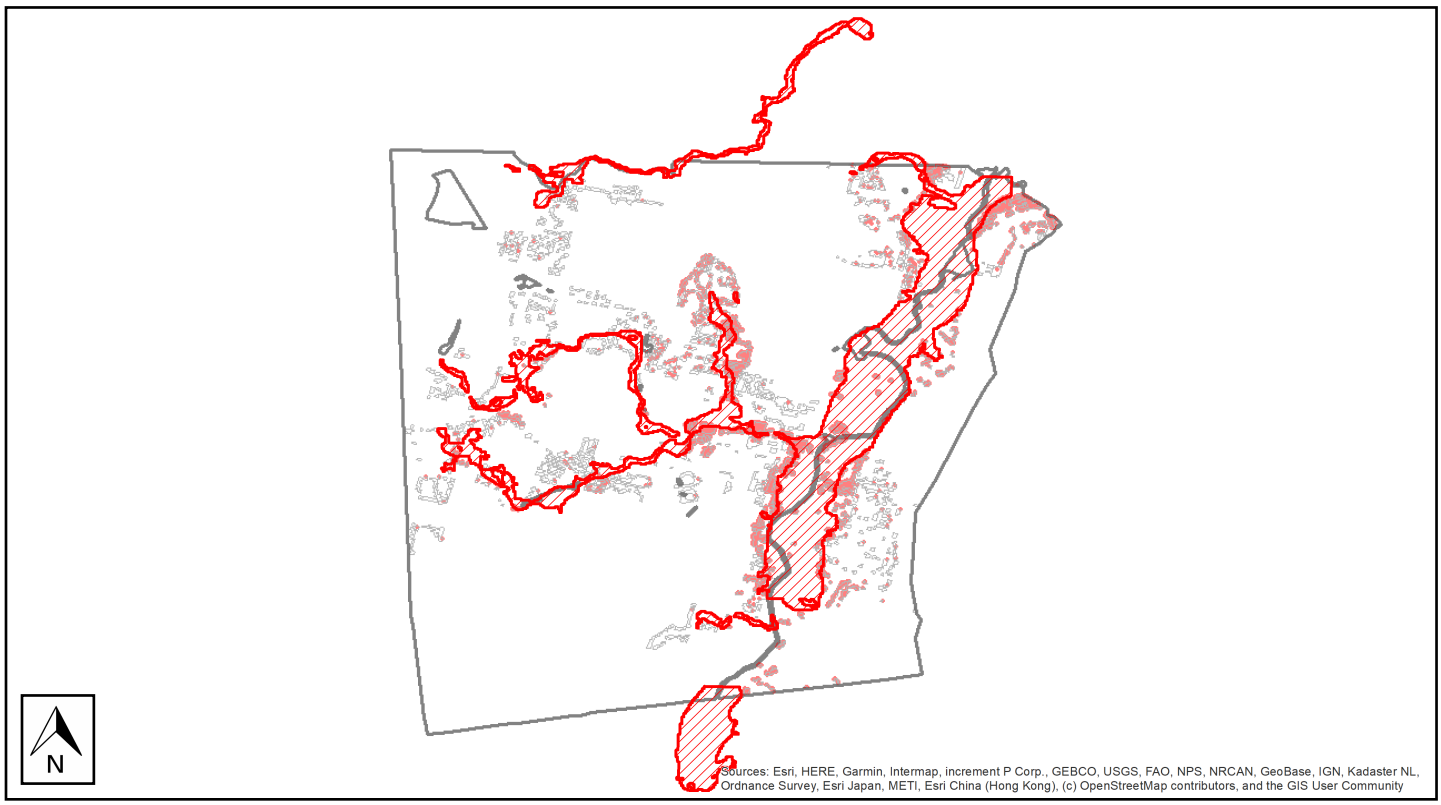


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	13	7	29	7	29	3	13	3	13	1	4
Total	**3**		**7**		**7**		**3**		**3**		**1**	

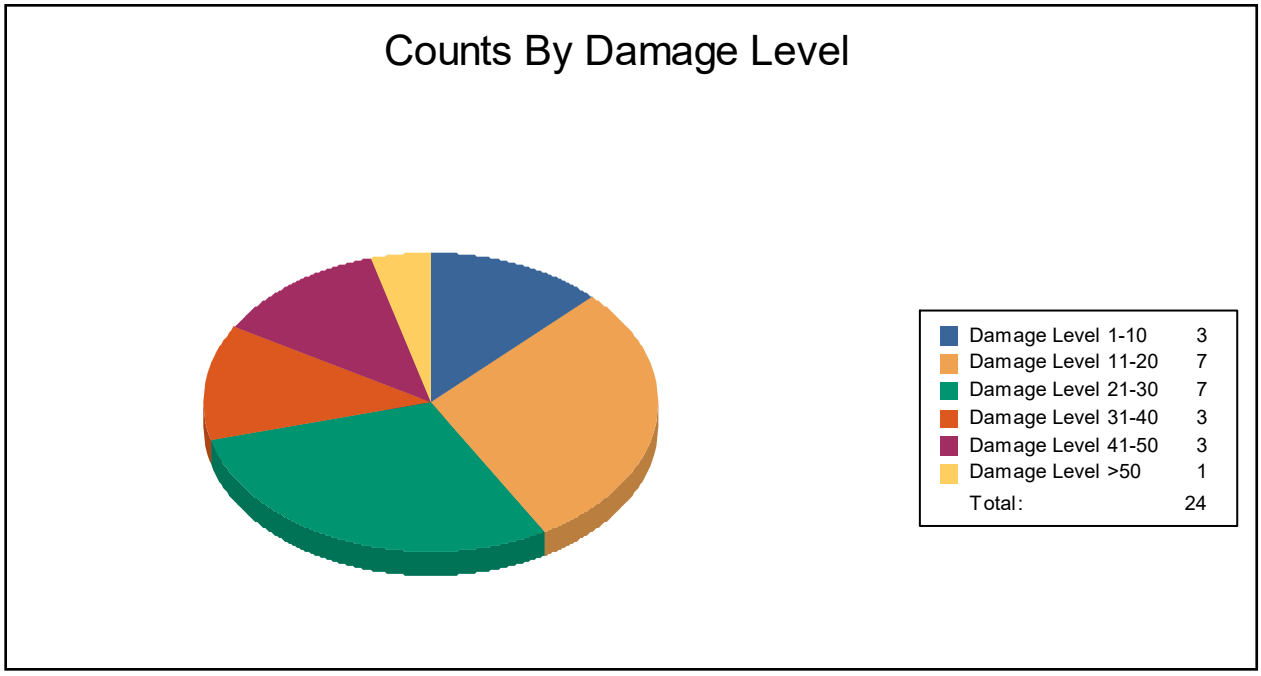


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	13	7	29	7	29	3	13	3	13	1	4

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

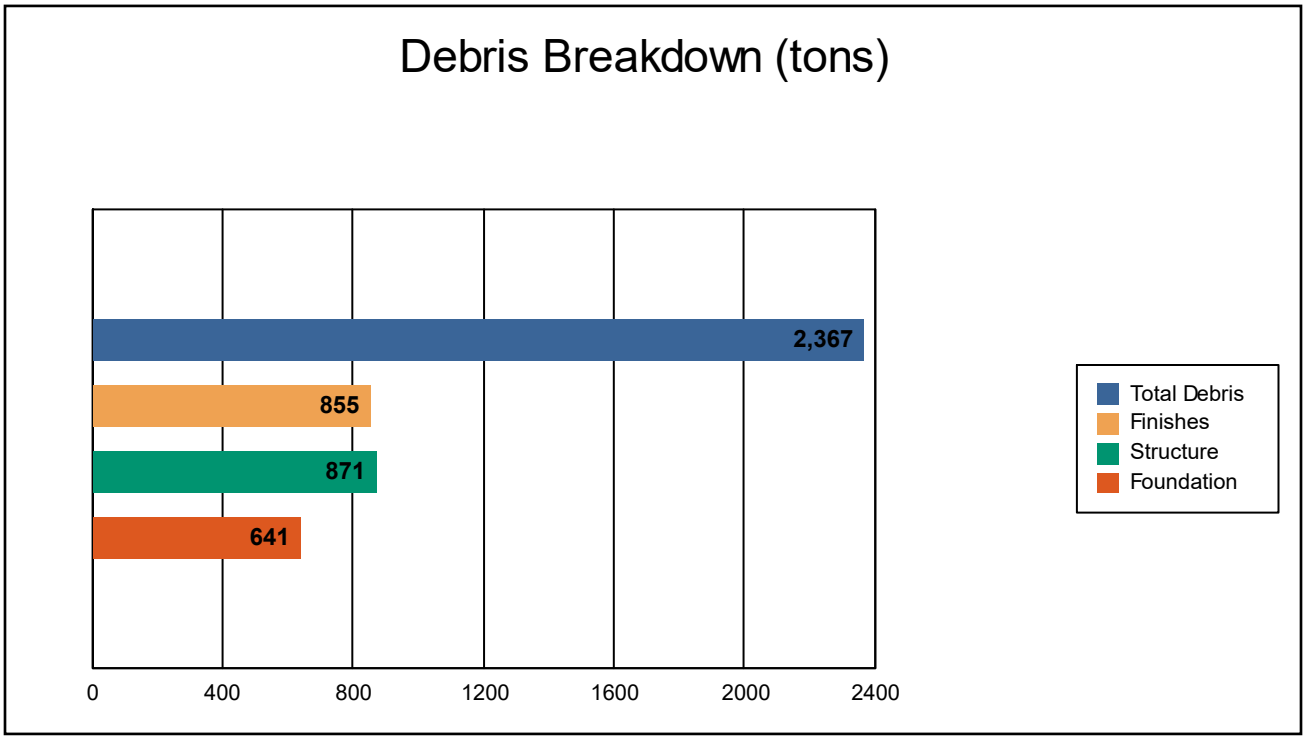
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

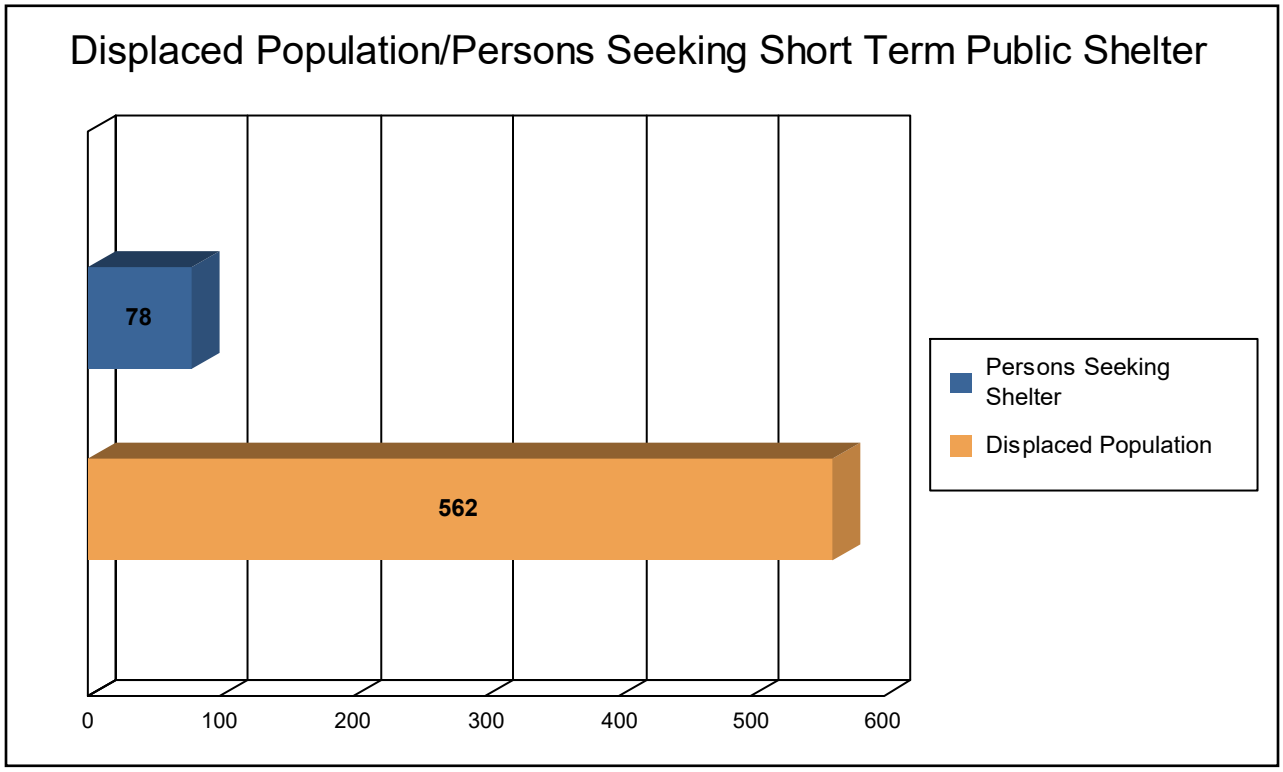


The model estimates that a total of 2,367 tons of debris will be generated. Of the total amount, Finishes comprises 36% of the total, Structure comprises 37% of the total, and Foundation comprises 27%. If the debris tonnage is converted into an estimated number of truckloads, it will require 95 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 187 households (or 562 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 78 people (out of a total population of 24,485) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 249.10 million dollars, which represents 15.04 % of the total replacement value of the scenario buildings.

Building-Related Losses

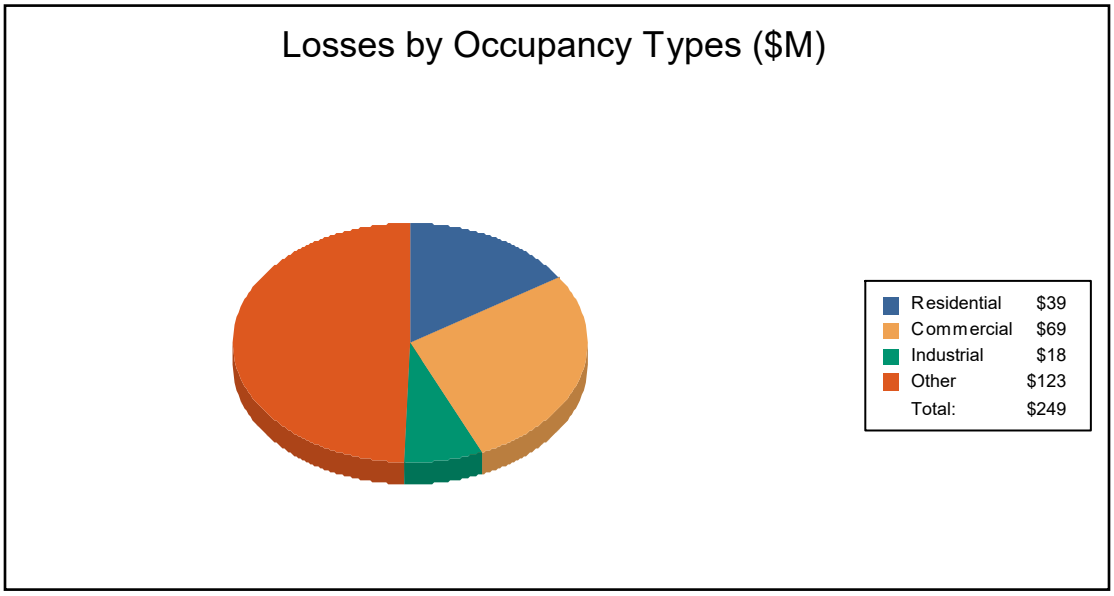
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 119.99 million dollars. 52% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 15.71% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	22.91	9.52	4.10	6.04	42.57
	Content	10.66	21.79	11.02	28.81	72.28
	Inventory	0.00	2.64	1.95	0.54	5.13
	Subtotal	**33.57**	**33.95**	**17.07**	**35.39**	**119.99**
Business Interruption						
	Income	0.13	16.11	0.25	10.17	26.67
	Relocation	3.63	3.29	0.28	5.92	13.12
	Rental Income	1.49	2.51	0.07	0.56	4.63
	Wage	0.31	12.70	0.44	71.25	84.69
	Subtotal	**5.56**	**34.61**	**1.04**	**87.90**	**129.11**
ALL	**Total**	**39.13**	**68.56**	**18.12**	**123.28**	**249.10**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	24,485	3,283,078	1,333,018	4,616,096
Total	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**
Total Study Region	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**

Hazus: Flood Global Risk Report

Region Name: Simsbury_FL

Flood Scenario: Simsbury_Flood

Print Date: Friday, April 14, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

RiskMAP
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 7 square miles and contains 317 census blocks. The region contains over 10 thousand households and has a total population of 24,485 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,907 buildings in the region with a total building replacement value (excluding contents) of 4,616 million dollars. Approximately 85.90% of the buildings (and 71.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,907 buildings in the region which have an aggregate total replacement value of 4,616 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,283,078	71.1%
Commercial	806,053	17.5%
Industrial	121,216	2.6%
Agricultural	18,873	0.4%
Religion	25,882	0.6%
Government	77,909	1.7%
Education	283,085	6.1%
Total	**4,616,096**	**100%**

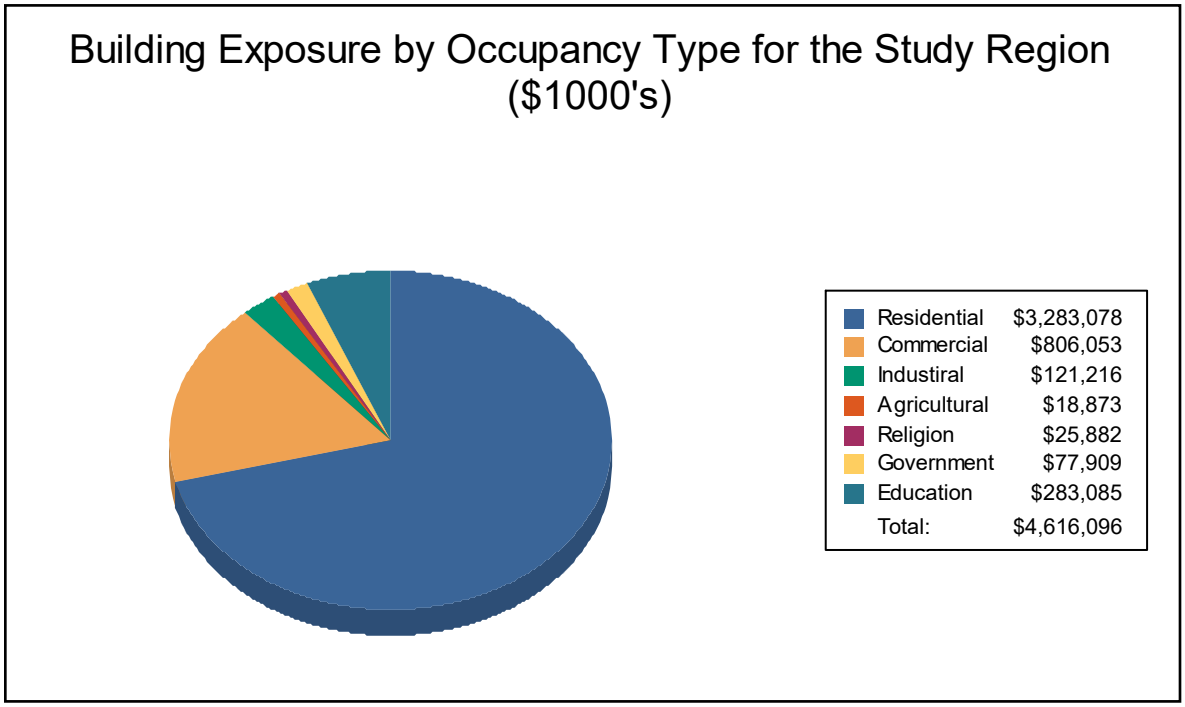
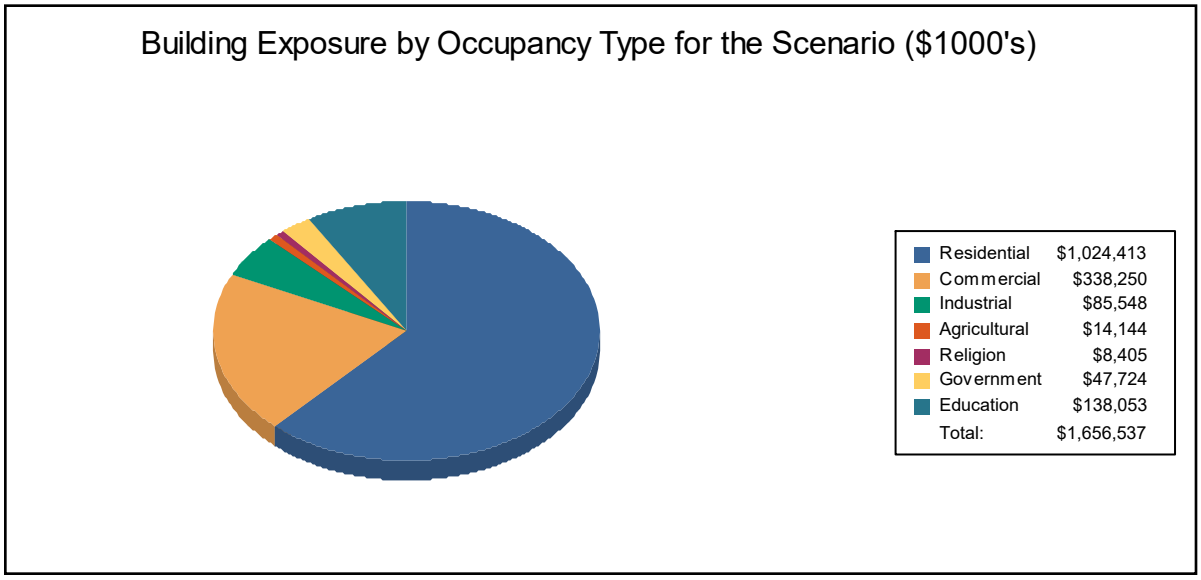


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,024,413	61.8%
Commercial	338,250	20.4%
Industrial	85,548	5.2%
Agricultural	14,144	0.9%
Religion	8,405	0.5%
Government	47,724	2.9%
Education	138,053	8.3%
Total	**1,656,537**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 10 schools, 6 fire stations, 1 police station and 1 emergency operation center.

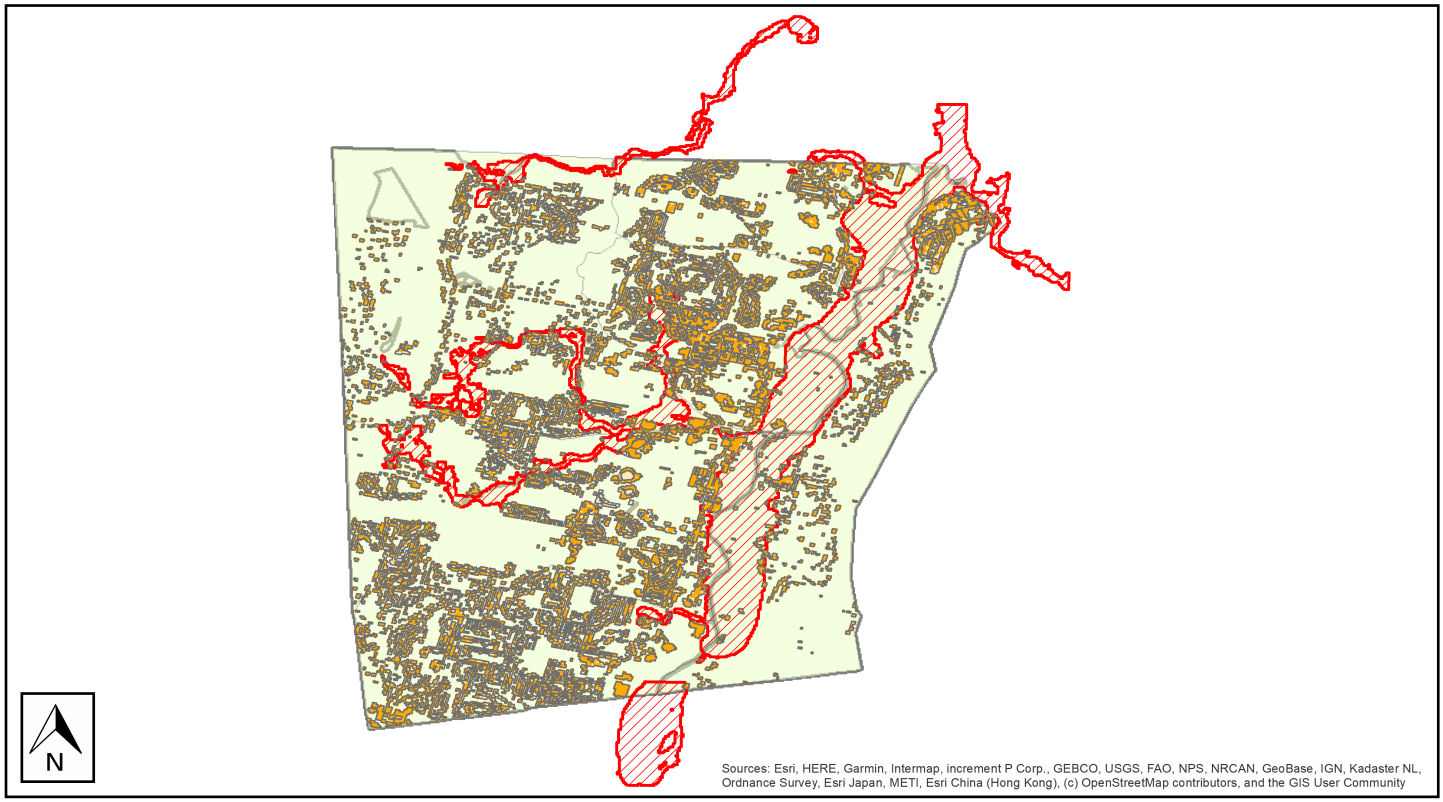
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Simsbury_FL
Scenario Name:	Simsbury_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 32 buildings will be at least moderately damaged. This is over 57% of the total number of buildings in the scenario. There are an estimated 8 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

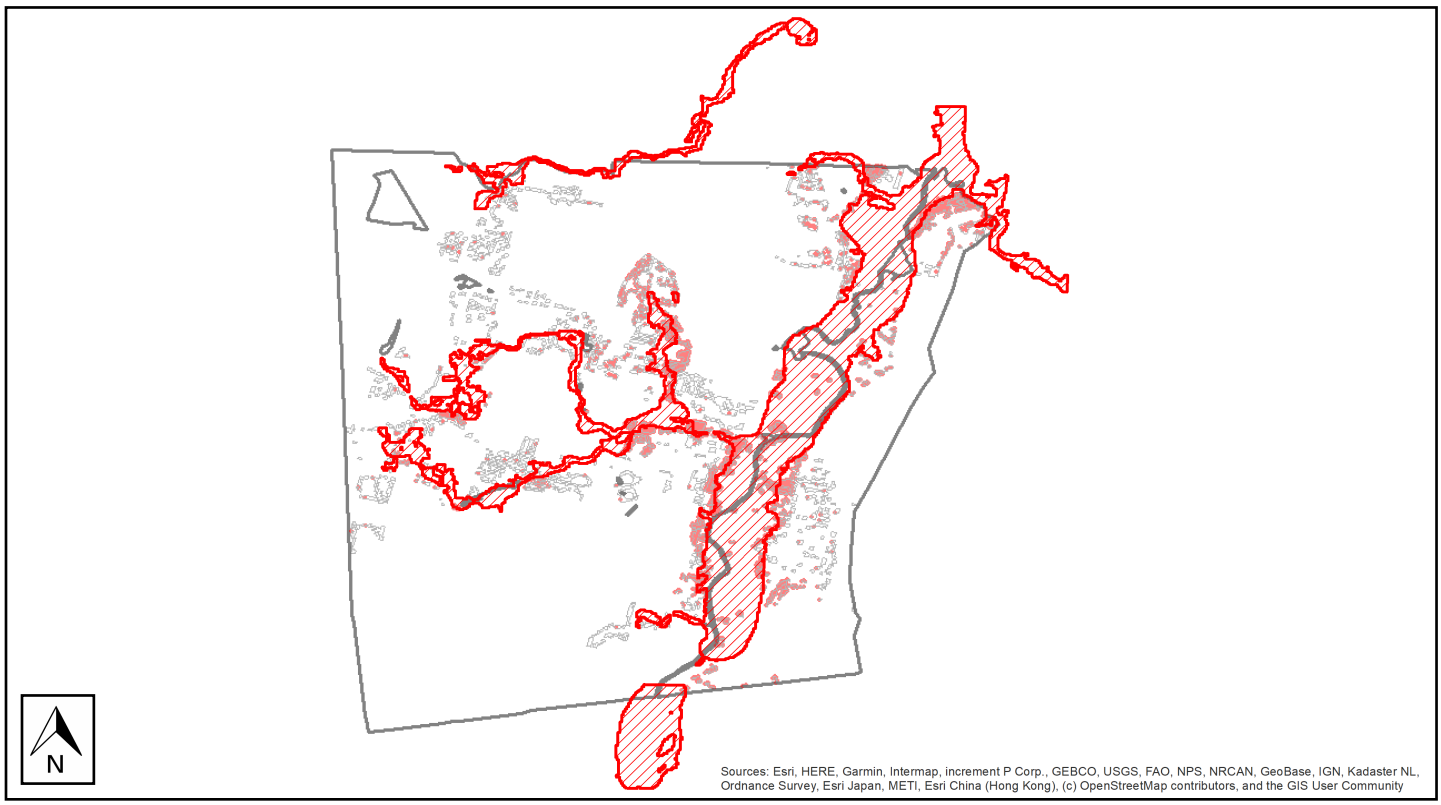


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	1	100	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	9	10	29	7	21	4	12	2	6	8	24
Total	**3**		**10**		**7**		**4**		**3**		**8**	

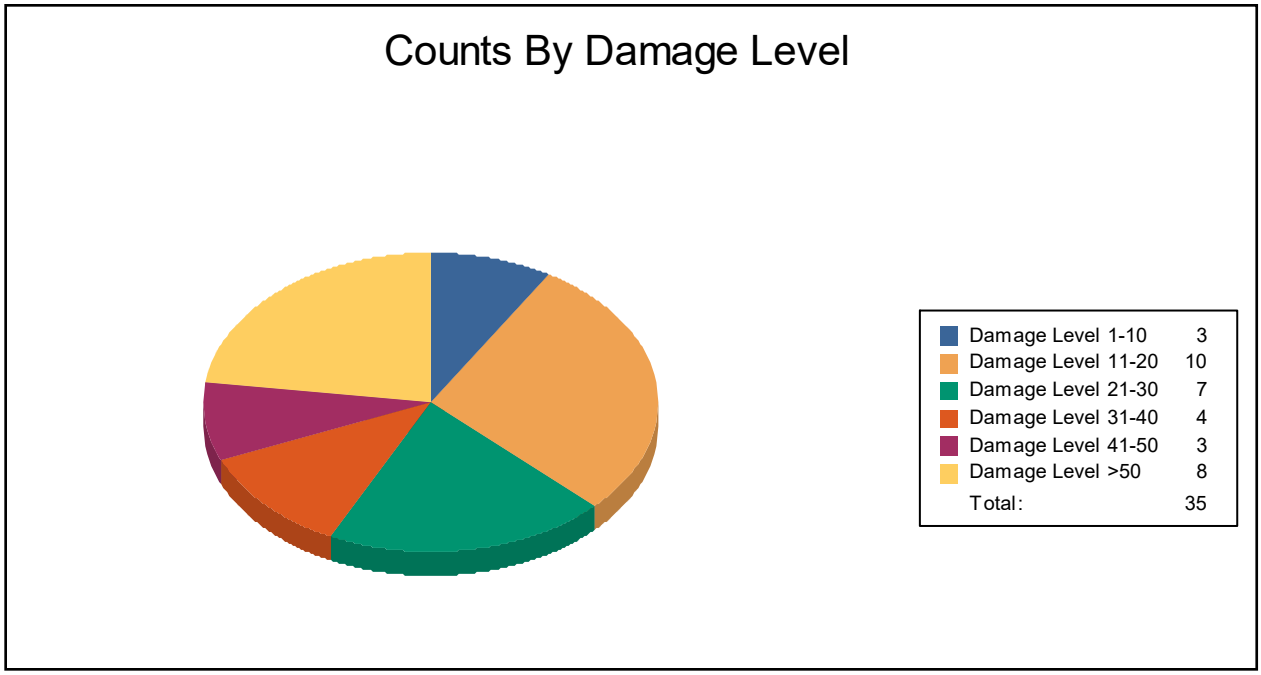


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	1	100	0	0
Wood	3	9	10	29	7	21	4	12	2	6	8	24

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

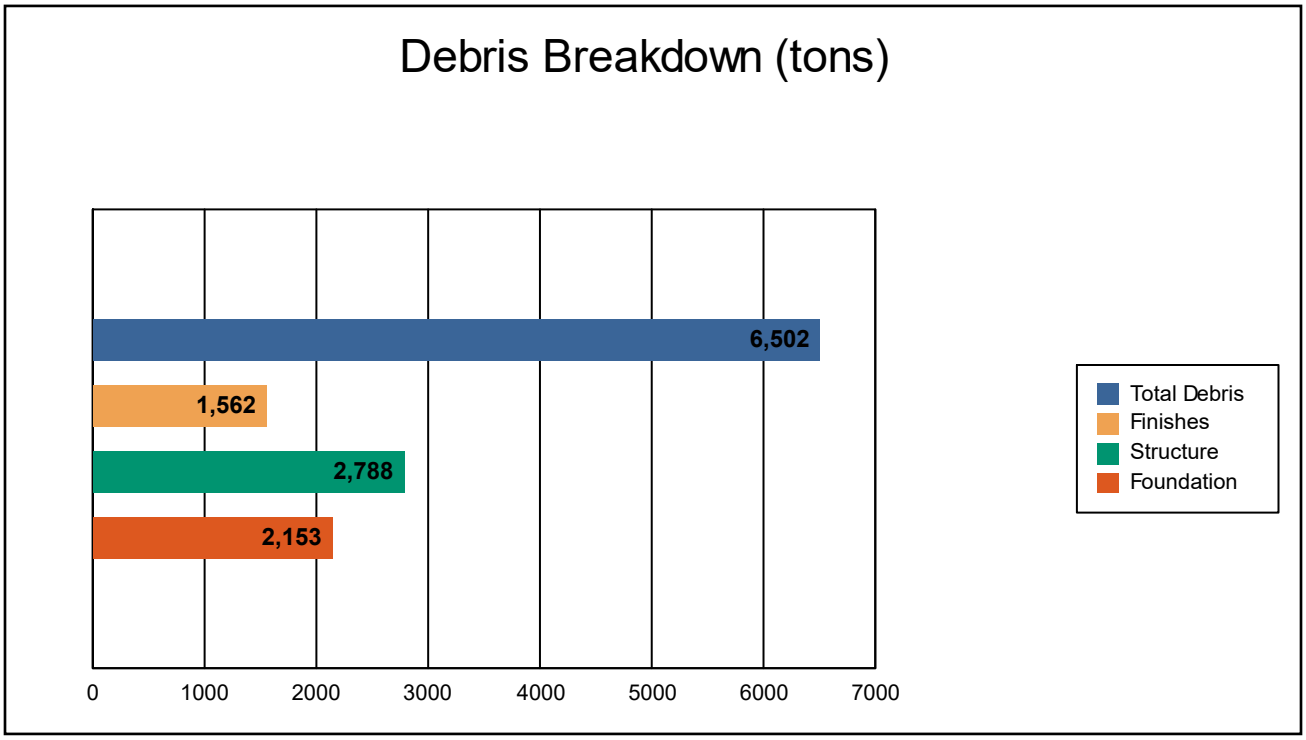
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

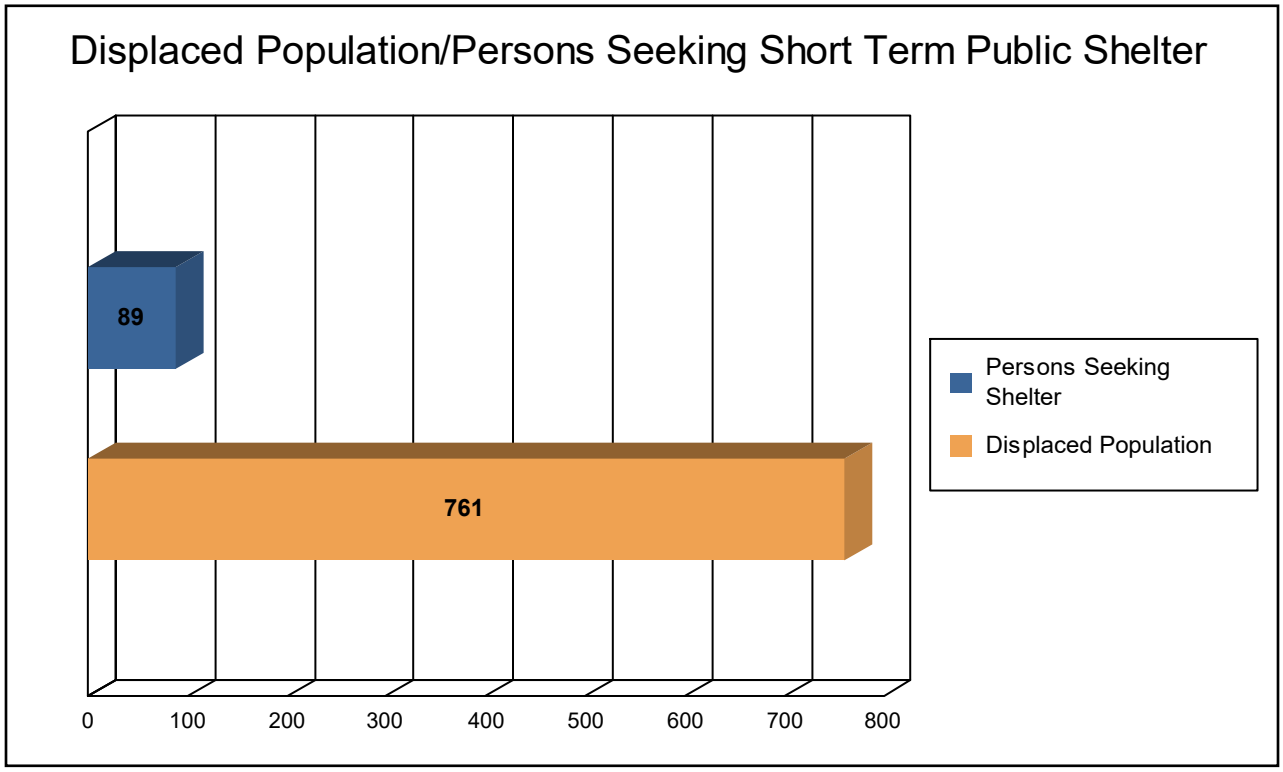


The model estimates that a total of 6,502 tons of debris will be generated. Of the total amount, Finishes comprises 24% of the total, Structure comprises 43% of the total, and Foundation comprises 33%. If the debris tonnage is converted into an estimated number of truckloads, it will require 261 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 254 households (or 761 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 89 people (out of a total population of 24,485) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 360.69 million dollars, which represents 21.77 % of the total replacement value of the scenario buildings.

Building-Related Losses

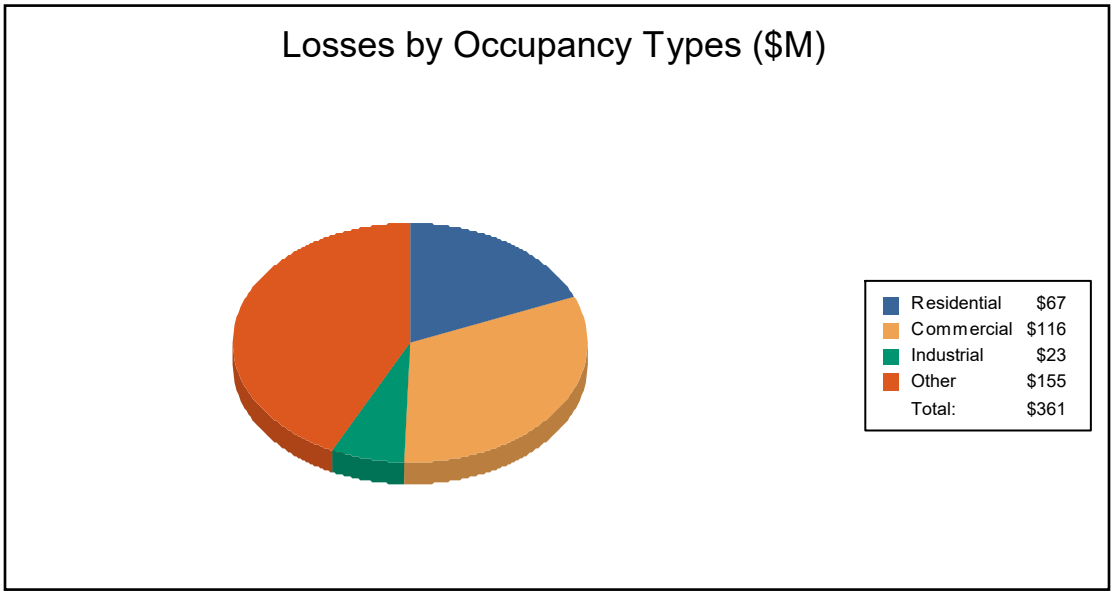
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 186.76 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 18.53% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	39.49	18.56	5.58	9.03	72.67
	Content	18.44	36.39	14.07	37.57	106.46
	Inventory	0.00	4.58	2.36	0.68	7.63
	Subtotal	**57.93**	**59.54**	**22.01**	**47.28**	**186.76**
Business Interruption						
	Income	0.29	26.13	0.31	11.92	38.64
	Relocation	5.52	5.54	0.34	7.06	18.45
	Rental Income	2.43	4.27	0.09	0.75	7.54
	Wage	0.68	20.38	0.53	87.71	109.31
	Subtotal	**8.92**	**56.31**	**1.27**	**107.44**	**173.94**
ALL	**Total**	**66.85**	**115.85**	**23.28**	**154.72**	**360.69**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	24,485	3,283,078	1,333,018	4,616,096
Total	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**
Total Study Region	**24,485**	**3,283,078**	**1,333,018**	**4,616,096**

Hazus: Flood Global Risk Report

Region Name: Somers_FL

Flood Scenario: Somers_Flood

Print Date: Friday, April 14, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 172 census blocks. The region contains over 3 thousand households and has a total population of 10,255 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,732 buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88.32% of the buildings (and 69.36% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of 2,304 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,597,858	69.4%
Commercial	459,167	19.9%
Industrial	58,794	2.6%
Agricultural	9,496	0.4%
Religion	7,163	0.3%
Government	77,221	3.4%
Education	93,901	4.1%
Total	**2,303,600**	**100%**

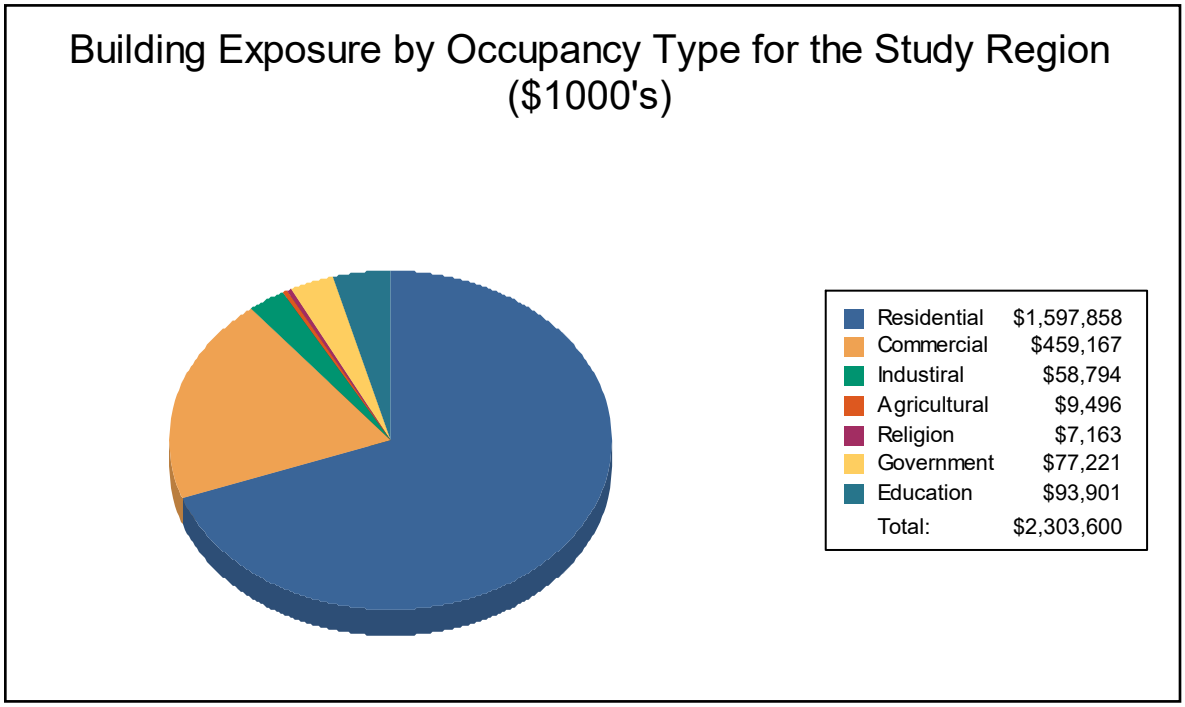
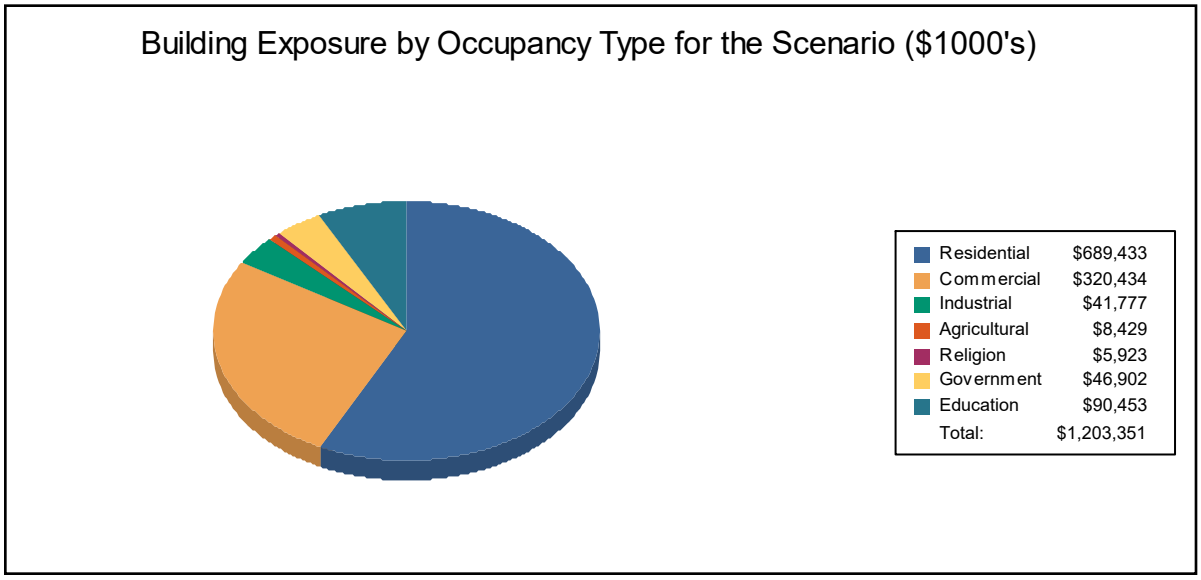


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	689,433	57.3%
Commercial	320,434	26.6%
Industrial	41,777	3.5%
Agricultural	8,429	0.7%
Religion	5,923	0.5%
Government	46,902	3.9%
Education	90,453	7.5%
Total	**1,203,351**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 1 fire station, 1 police station and 1 emergency operation center.

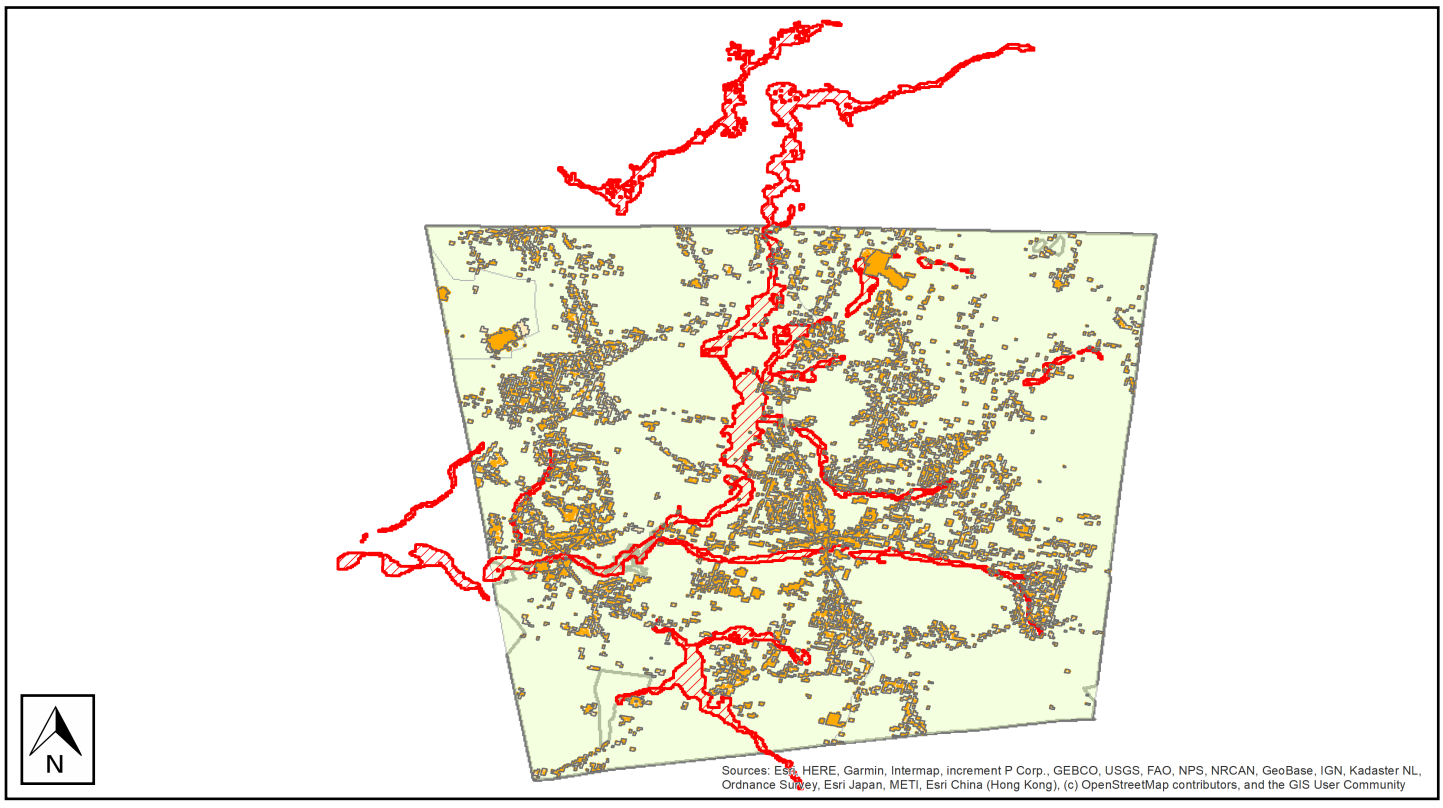
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Somers_FL
Scenario Name:	Somers_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

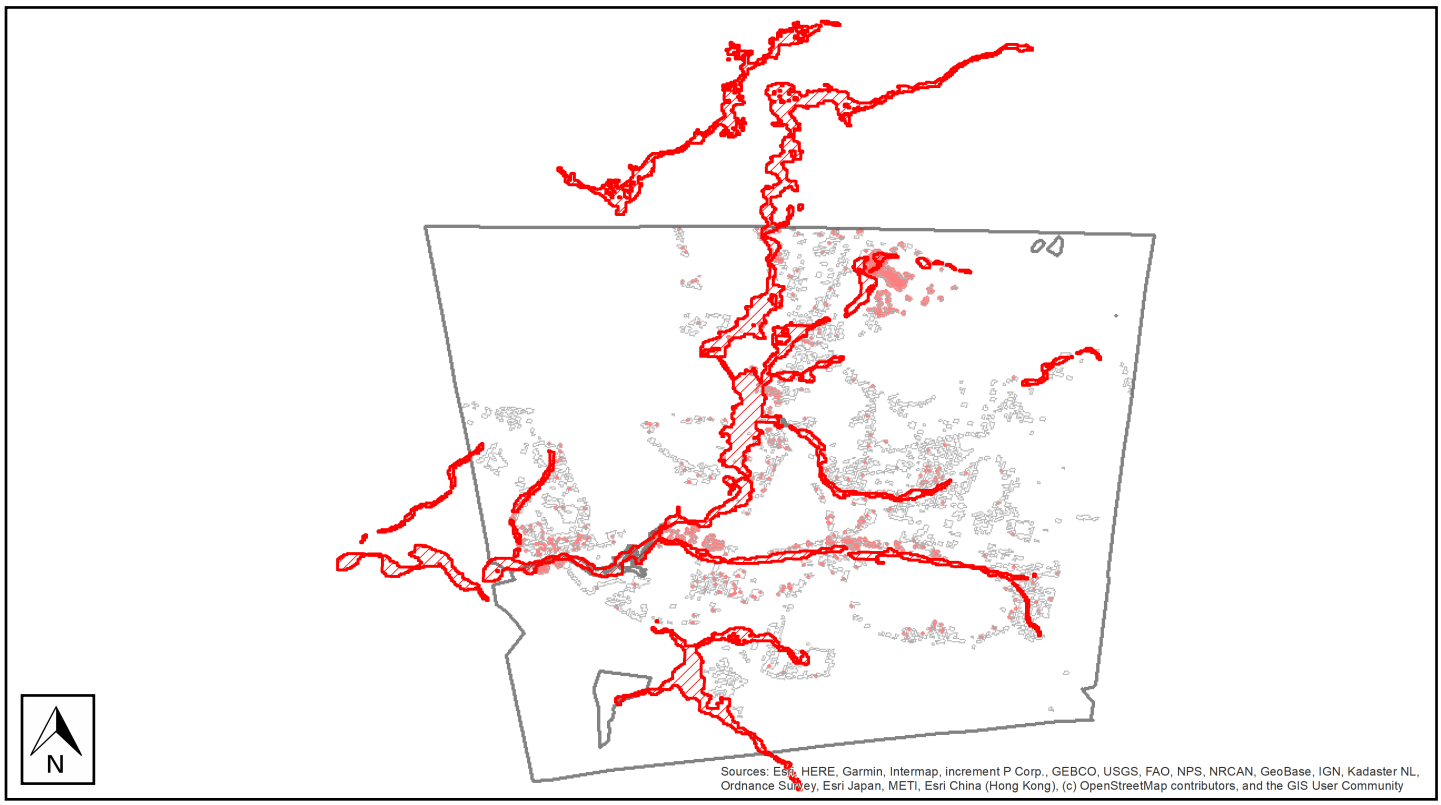


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	4	80	1	20	0	0	0	0	0	0	0	0
Total	**4**		**1**		**0**		**0**		**0**		**0**	

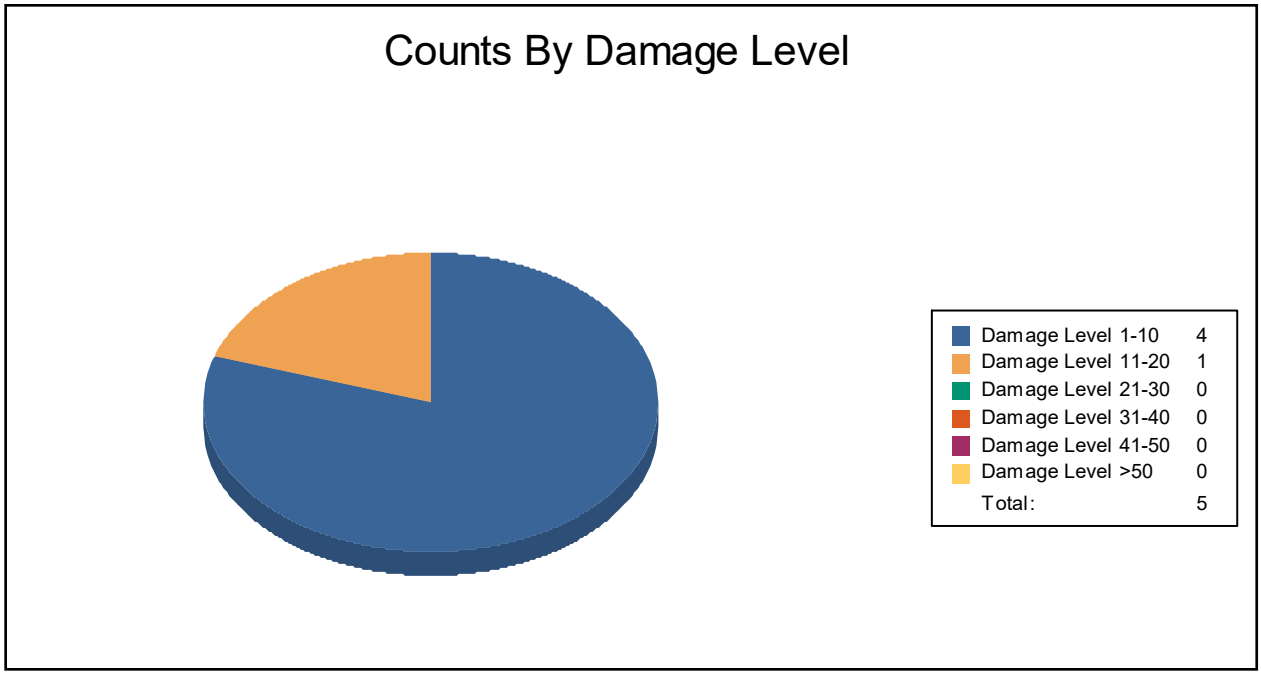


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	4	80	1	20	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

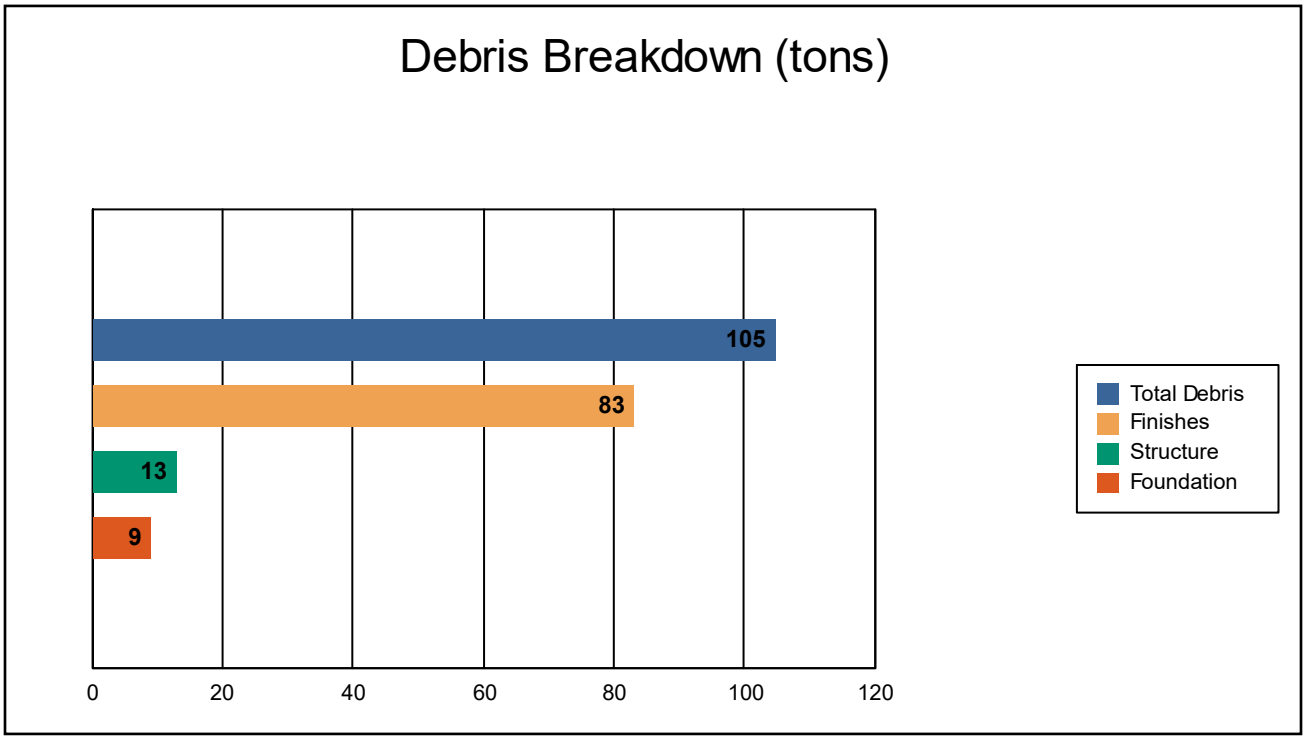
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

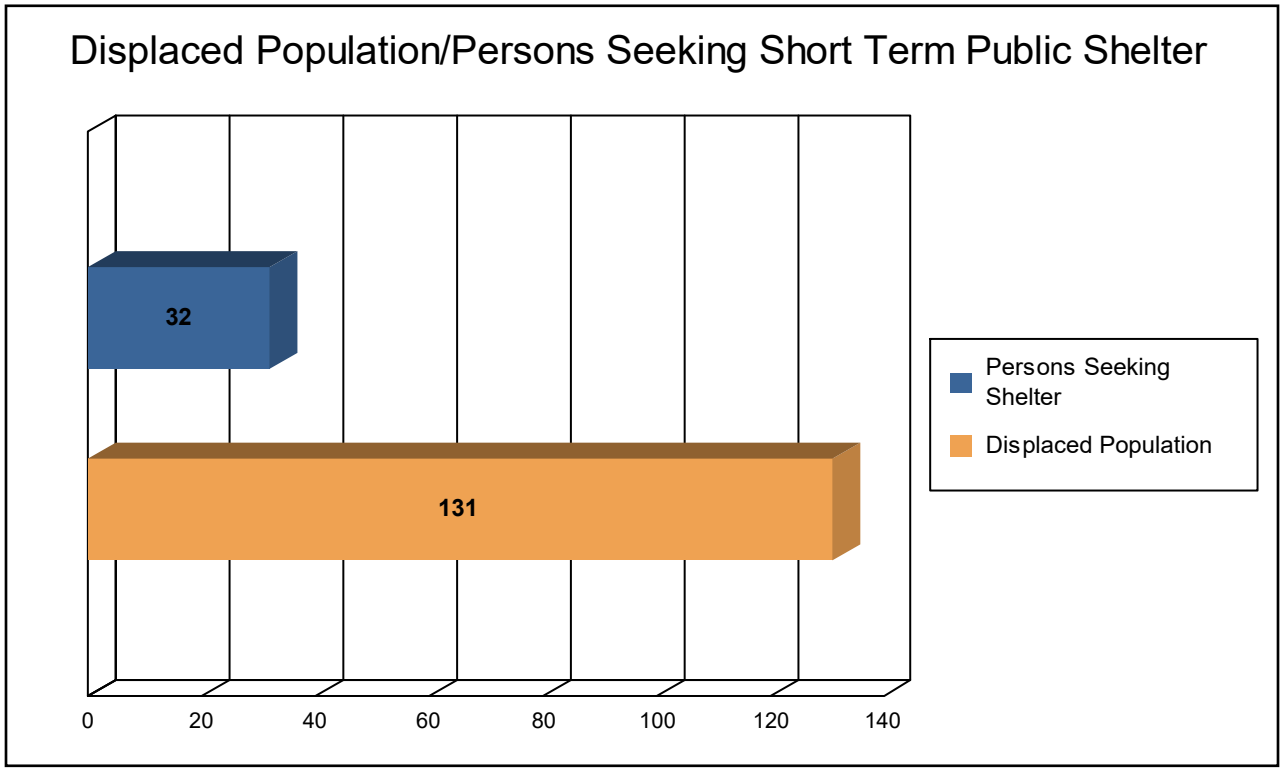


The model estimates that a total of 105 tons of debris will be generated. Of the total amount, Finishes comprises 79% of the total, Structure comprises 12% of the total, and Foundation comprises 9%. If the debris tonnage is converted into an estimated number of truckloads, it will require 5 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 44 households (or 131 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 32 people (out of a total population of 10,255) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 26.86 million dollars, which represents 2.23 % of the total replacement value of the scenario buildings.

Building-Related Losses

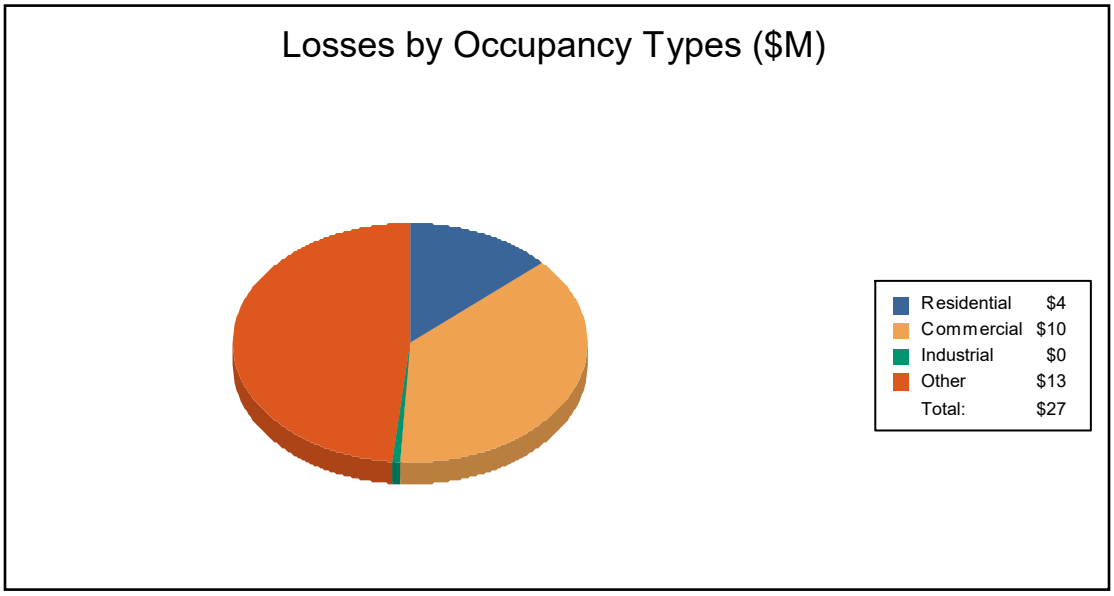
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 11.32 million dollars. 58% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.36% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.74	0.69	0.08	0.58	3.09
	Content	0.75	2.65	0.11	2.61	6.12
	Inventory	0.00	1.04	0.01	1.05	2.11
	Subtotal	**2.49**	**4.39**	**0.21**	**4.24**	**11.32**
Business Interruption						
	Income	0.00	1.54	0.01	0.79	2.34
	Relocation	0.81	0.75	0.00	0.55	2.12
	Rental Income	0.28	0.52	0.00	0.13	0.93
	Wage	0.00	2.86	0.01	7.28	10.15
	Subtotal	**1.10**	**5.67**	**0.02**	**8.75**	**15.54**
ALL	**Total**	**3.59**	**10.06**	**0.23**	**12.98**	**26.86**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,858	705,742	2,303,600
Total	**10,255**	**1,597,858**	**705,742**	**2,303,600**
Total Study Region	**10,255**	**1,597,858**	**705,742**	**2,303,600**

Hazus: Flood Global Risk Report

Region Name: Somers_FL

Flood Scenario: Somers_Flood

Print Date: Friday, April 14, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 172 census blocks. The region contains over 3 thousand households and has a total population of 10,255 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,732 buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88.32% of the buildings (and 69.36% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of 2,304 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,597,858	69.4%
Commercial	459,167	19.9%
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Agricultural	9,496	0.4%
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Government	77,221	3.4%
Education	93,901	4.1%
Total	**2,303,600**	**100%**

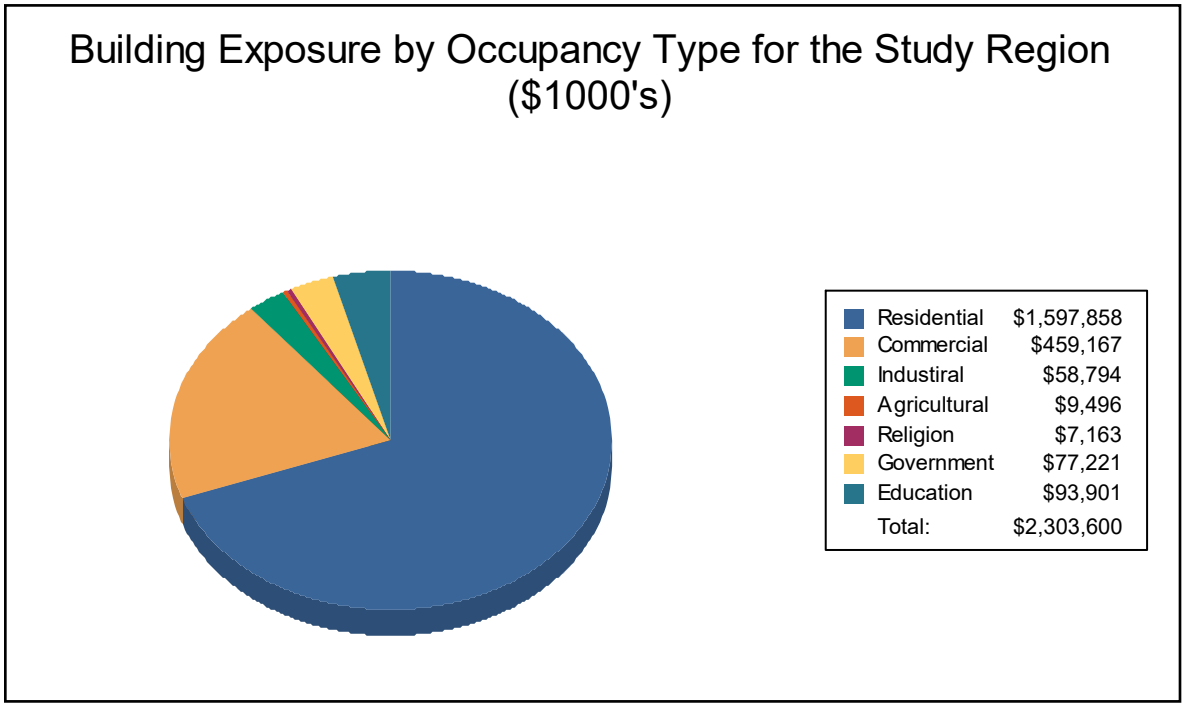

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	689,433	57.3%
Commercial	320,434	26.6%
Industrial	41,777	3.5%
Agricultural	8,429	0.7%
Religion	5,923	0.5%
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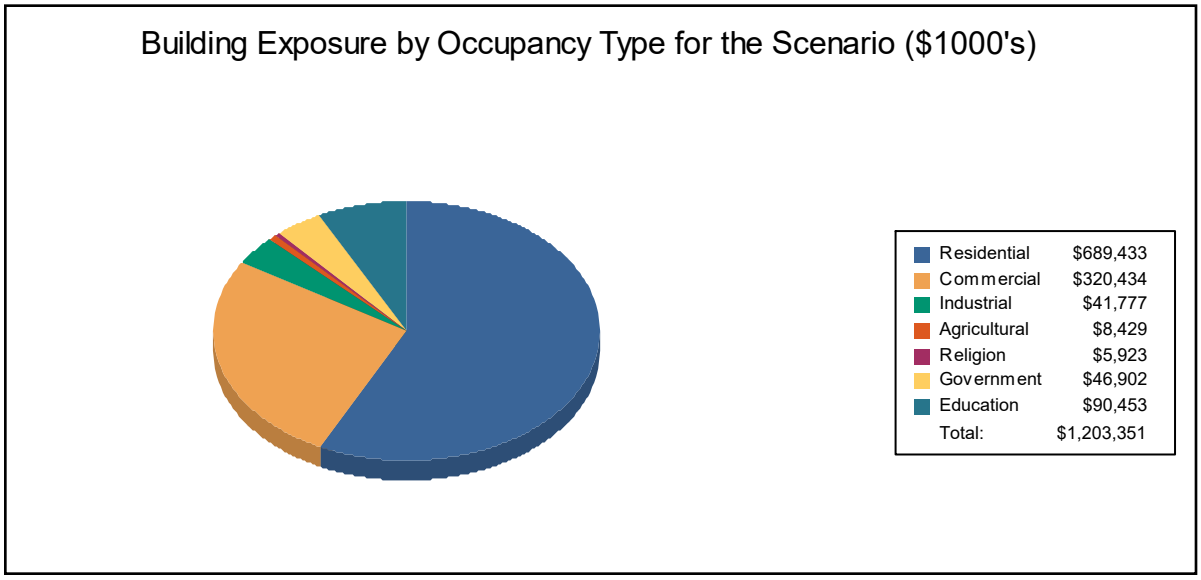
Education	90,453	7.5%
Total	**1,203,351**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 1 fire station, 1 police station and 1 emergency operation center.

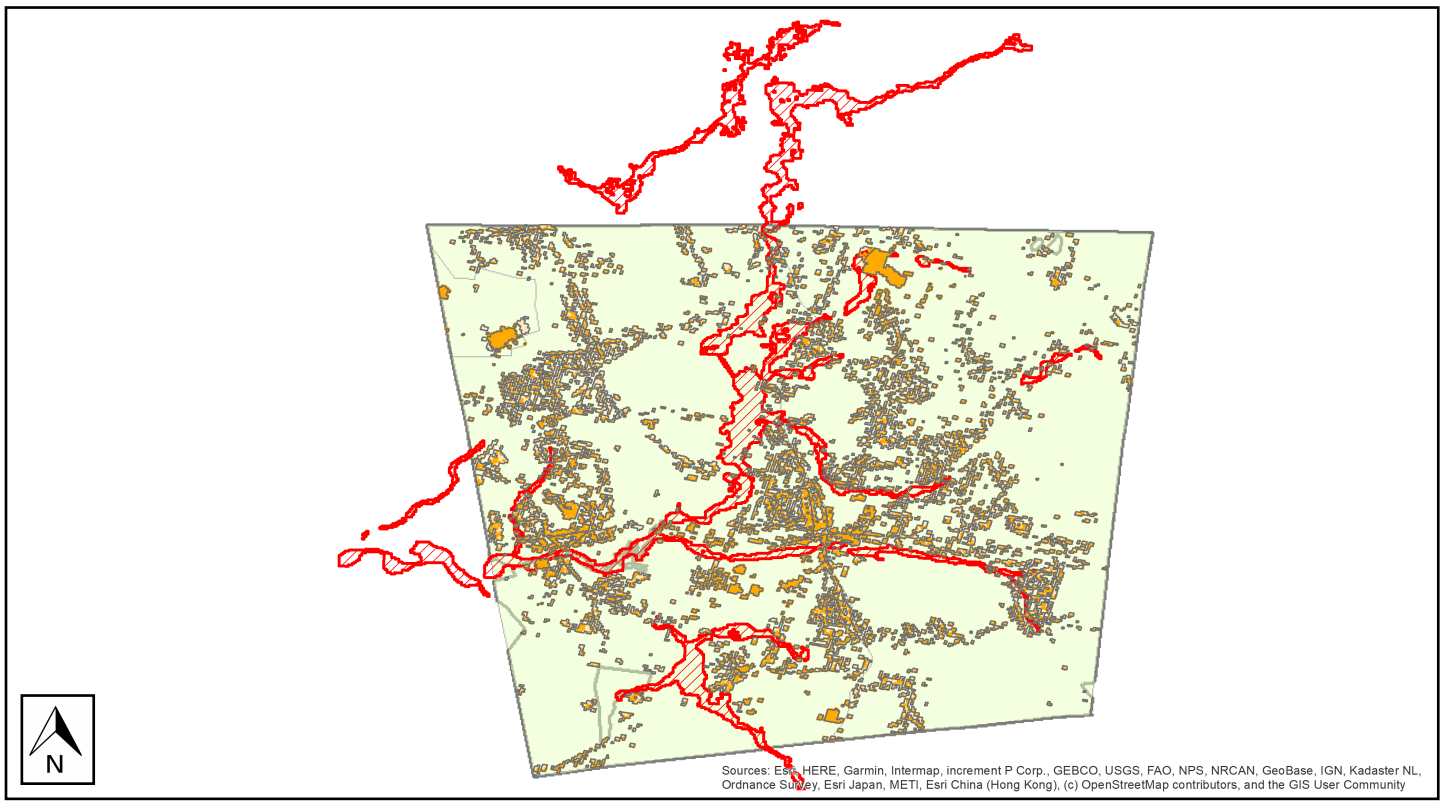
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Somers_FL
Scenario Name:	Somers_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

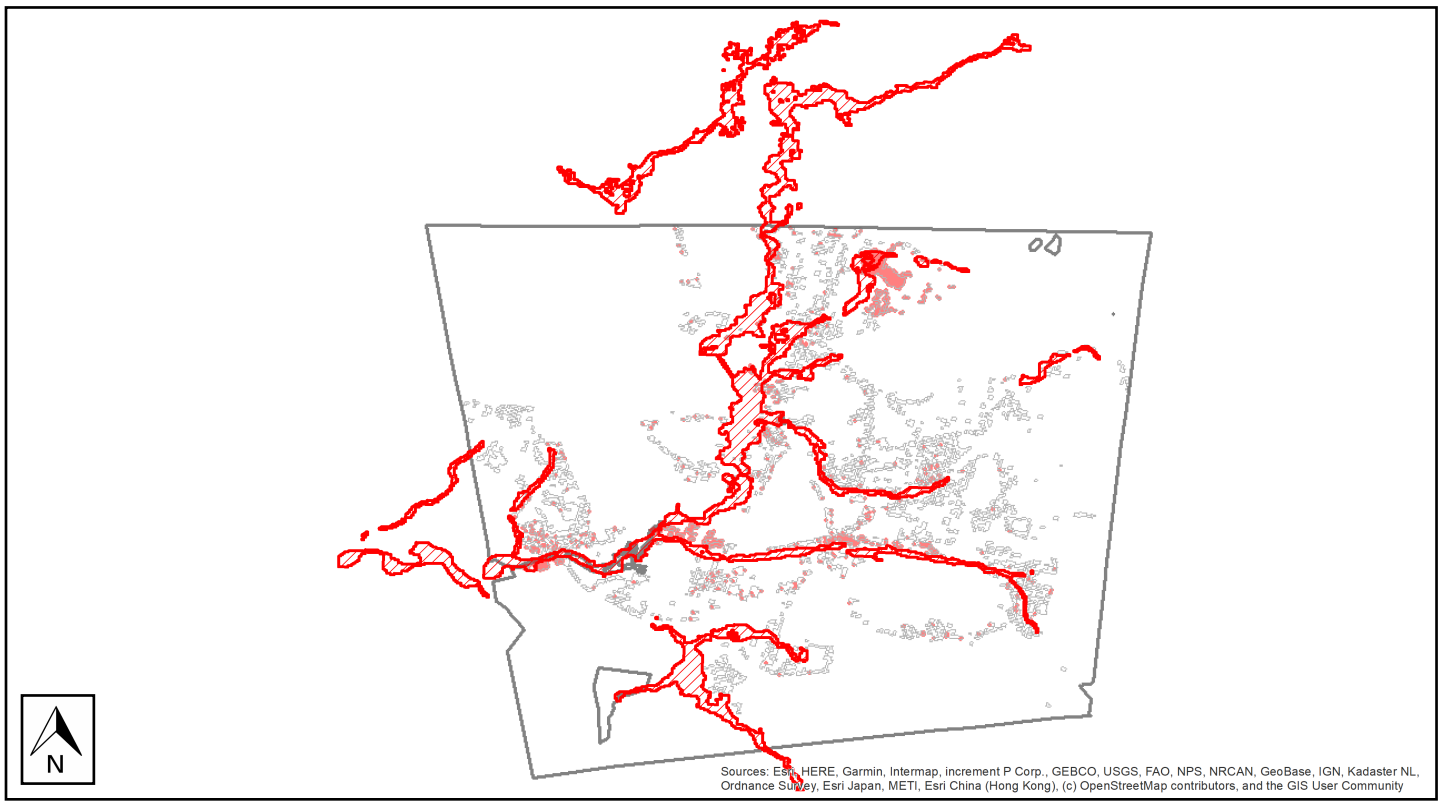


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	5	83	1	17	0	0	0	0	0	0	0	0
Total	**5**		**1**		**0**		**0**		**0**		**0**	

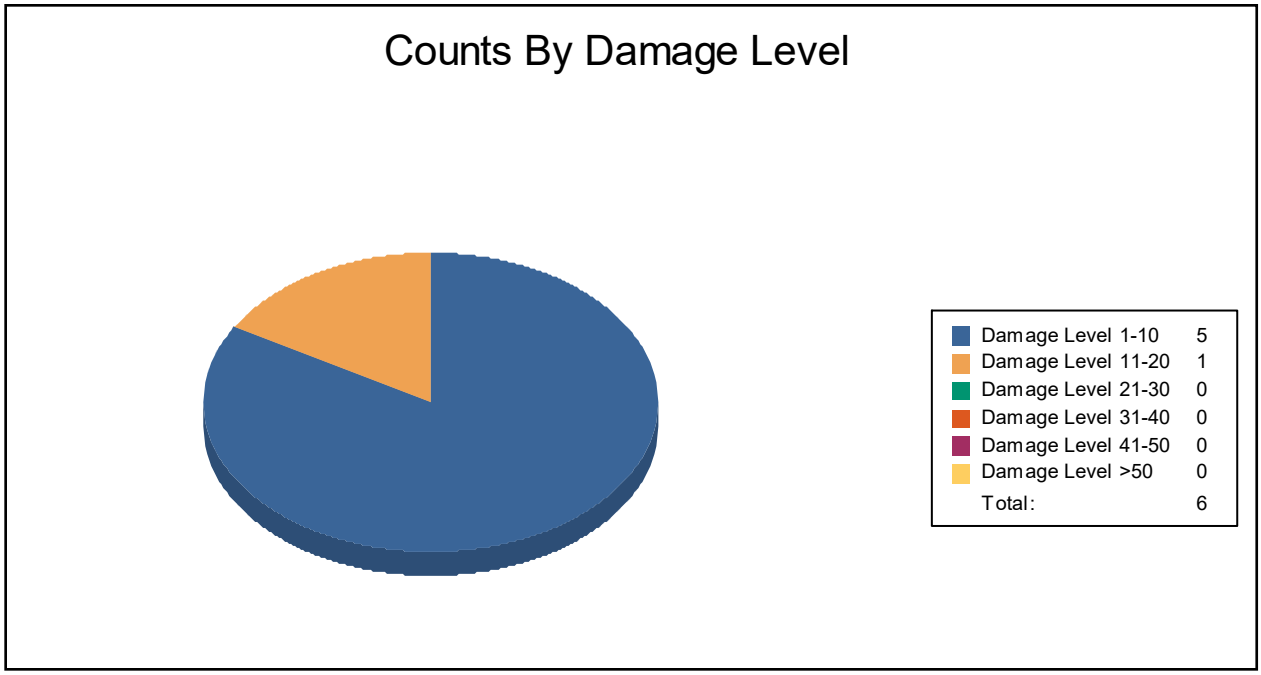


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	5	83	1	17	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

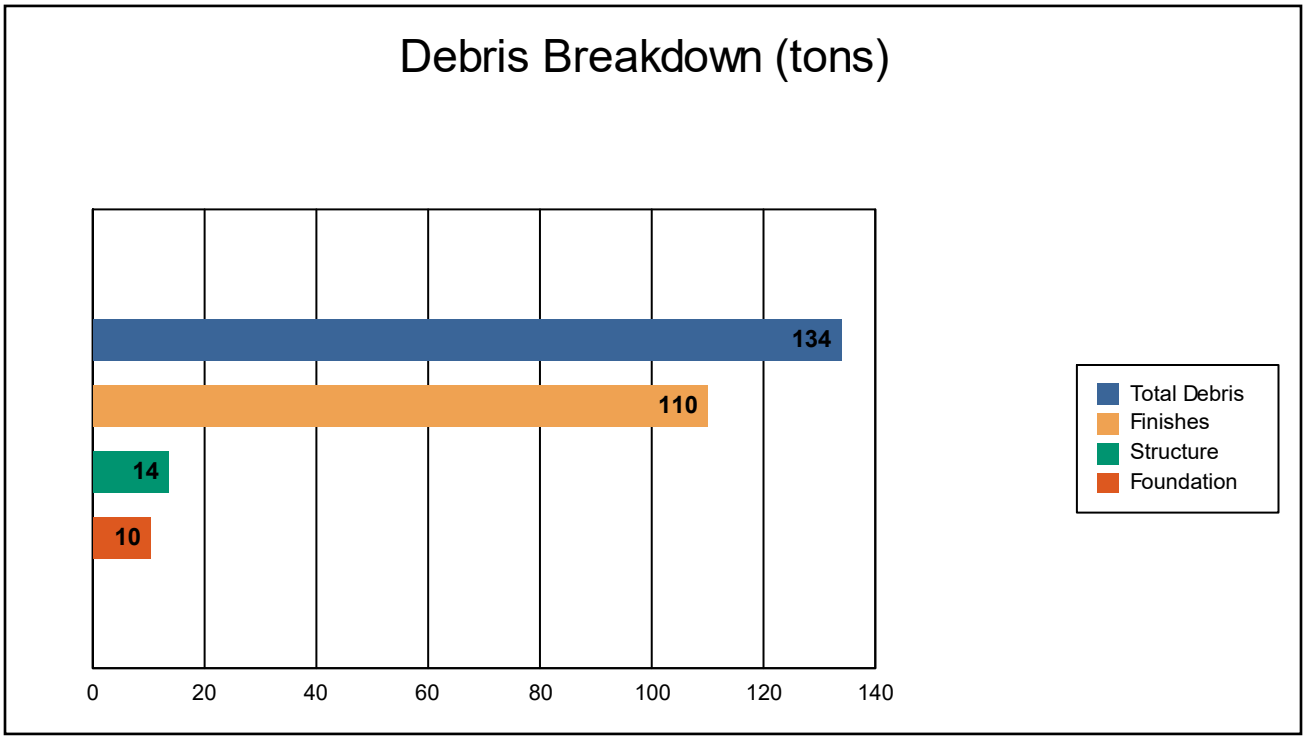
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

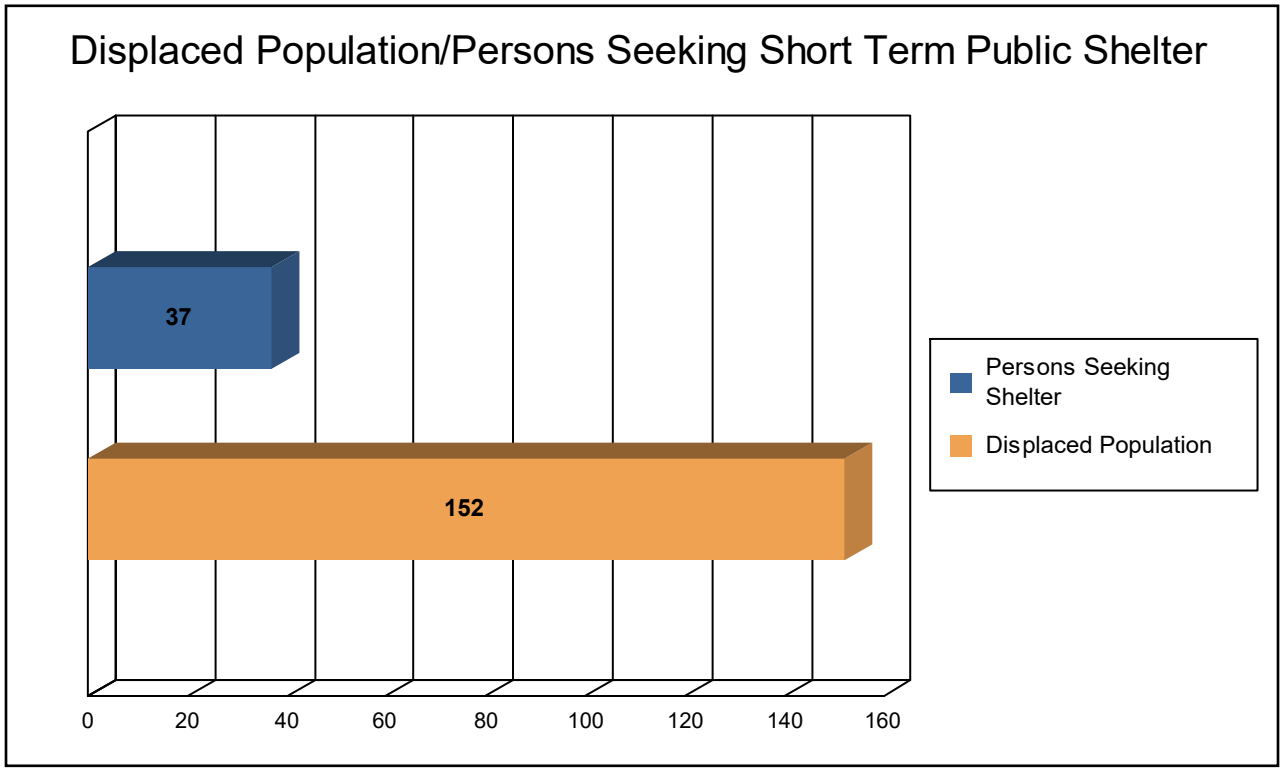


The model estimates that a total of 134 tons of debris will be generated. Of the total amount, Finishes comprises 82% of the total, Structure comprises 10% of the total, and Foundation comprises 8%. If the debris tonnage is converted into an estimated number of truckloads, it will require 6 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 51 households (or 152 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 37 people (out of a total population of 10,255) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 35.54 million dollars, which represents 2.95 % of the total replacement value of the scenario buildings.

Building-Related Losses

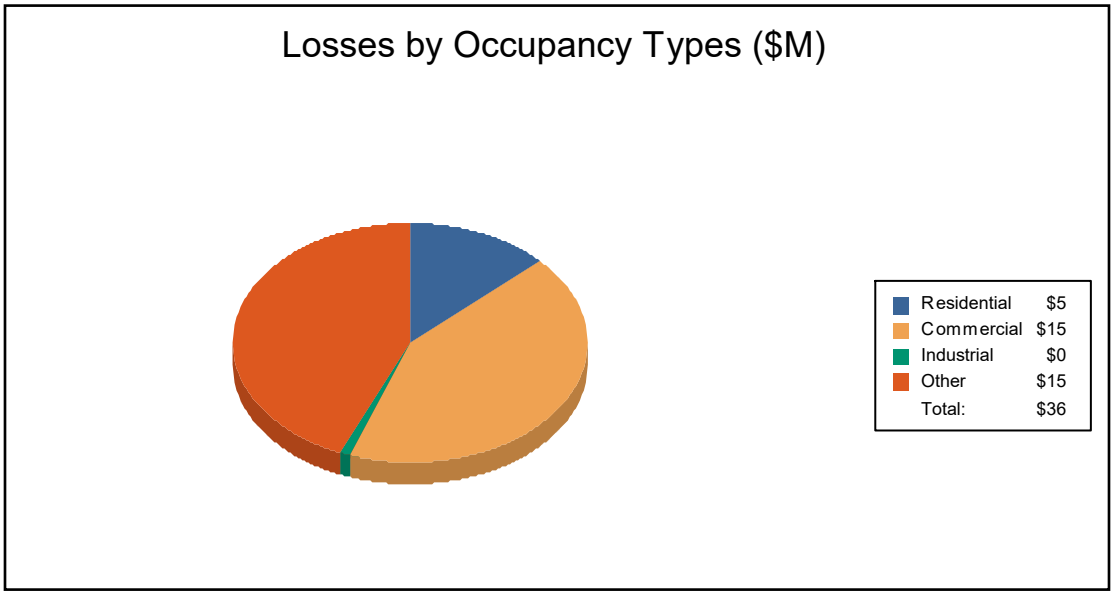
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 15.30 million dollars. 57% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.15% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.35	1.00	0.13	0.80	4.27
	Content	1.01	3.89	0.17	3.36	8.44
	Inventory	0.00	1.42	0.02	1.14	2.58
	Subtotal	**3.36**	**6.31**	**0.32**	**5.30**	**15.30**
Business Interruption						
	Income	0.00	2.26	0.01	0.86	3.13
	Relocation	0.98	1.21	0.00	0.62	2.81
	Rental Income	0.34	0.84	0.00	0.15	1.33
	Wage	0.00	4.44	0.02	8.52	12.98
	Subtotal	**1.31**	**8.75**	**0.03**	**10.16**	**20.25**
ALL	**Total**	**4.67**	**15.07**	**0.35**	**15.45**	**35.54**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,858	705,742	2,303,600
Total	**10,255**	**1,597,858**	**705,742**	**2,303,600**
Total Study Region	**10,255**	**1,597,858**	**705,742**	**2,303,600**

Hazus: Flood Global Risk Report

Region Name: Somers_FL

Flood Scenario: Somers_Flood

Print Date: Friday, April 14, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
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Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 172 census blocks. The region contains over 3 thousand households and has a total population of 10,255 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,732 buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88.32% of the buildings (and 69.36% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of 2,304 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,597,858	69.4%
Commercial	459,167	19.9%
Industrial	58,794	2.6%
Agricultural	9,496	0.4%
Religion	7,163	0.3%
Government	77,221	3.4%
Education	93,901	4.1%
Total	**2,303,600**	**100%**

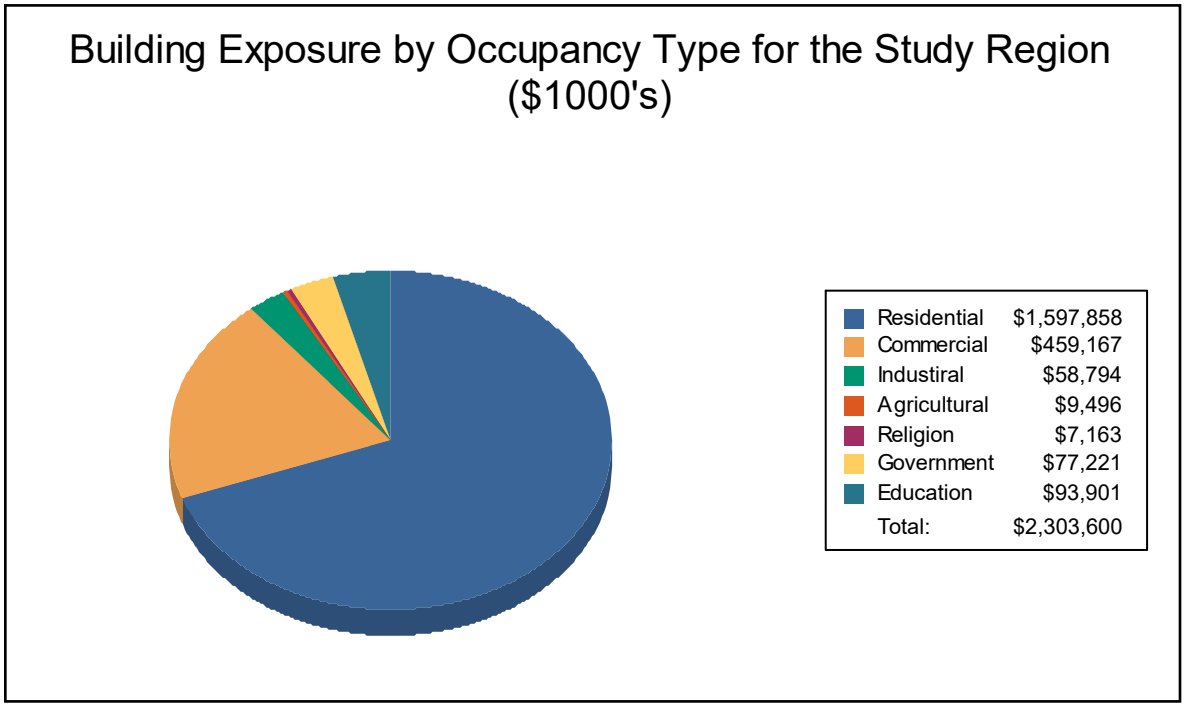
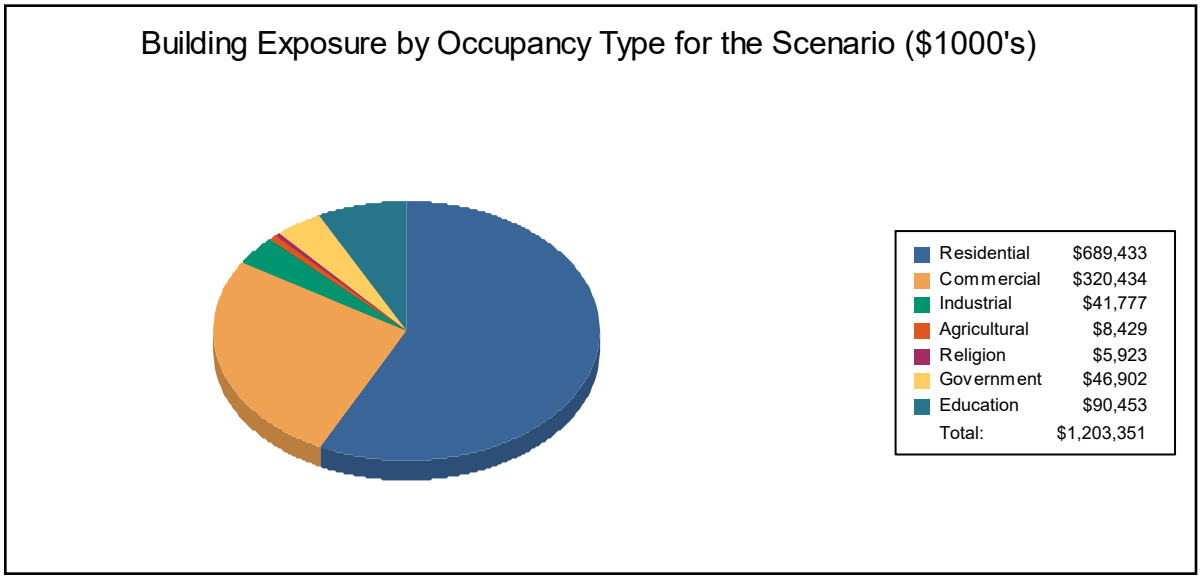


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	689,433	57.3%
Commercial	320,434	26.6%
Industrial	41,777	3.5%
Agricultural	8,429	0.7%
Religion	5,923	0.5%
Government	46,902	3.9%
Education	90,453	7.5%
Total	**1,203,351**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 1 fire station, 1 police station and 1 emergency operation center.

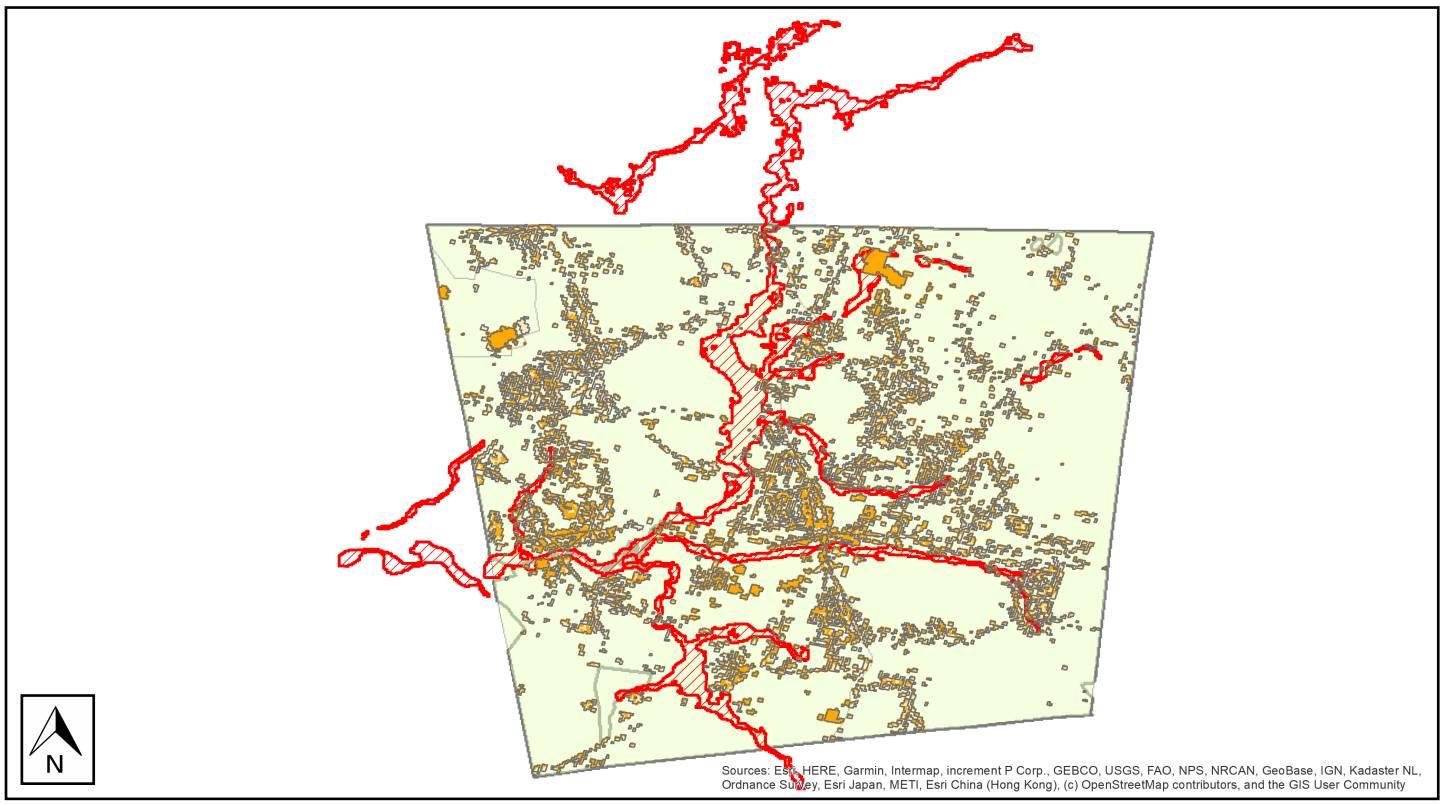
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Somers_FL
Scenario Name:	Somers_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

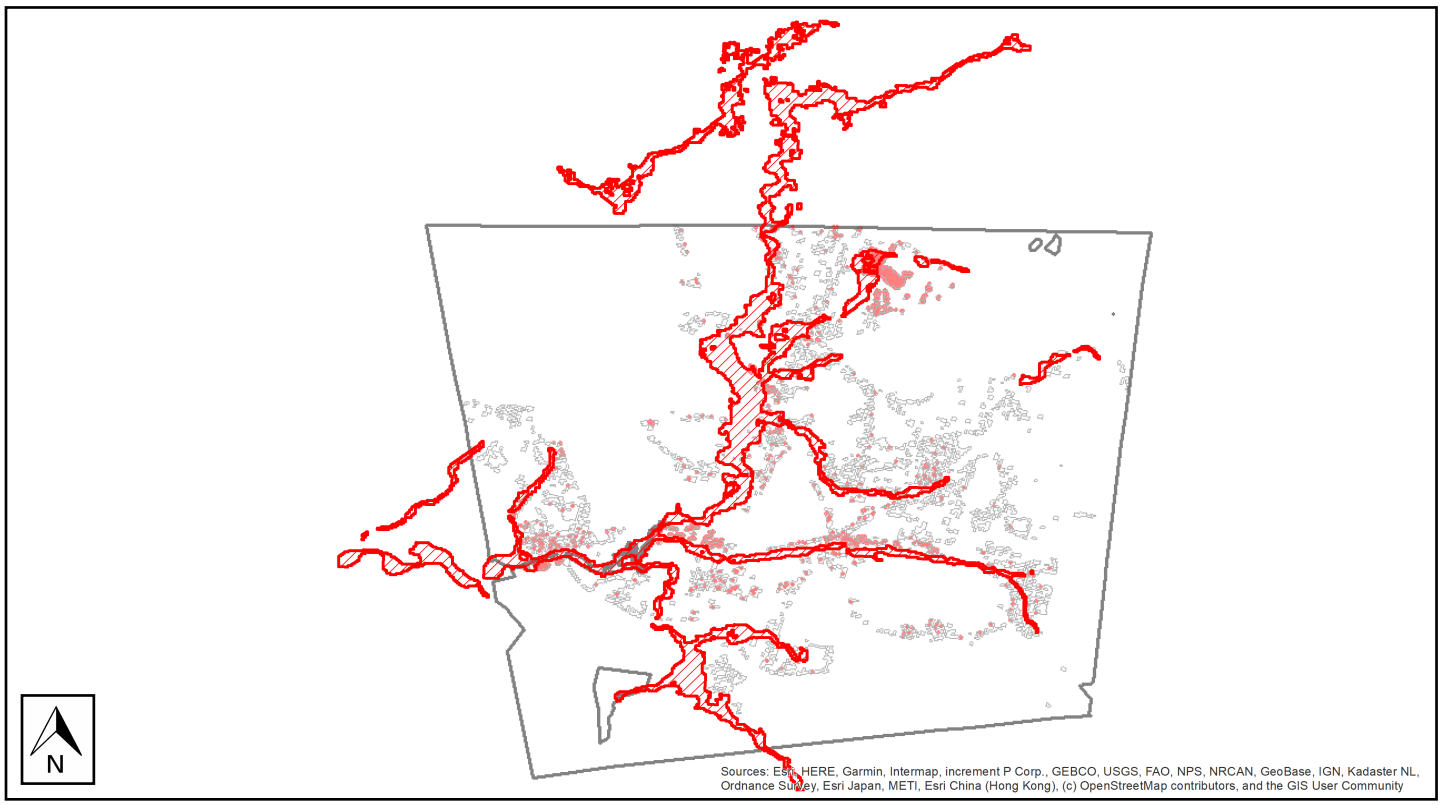


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	7	78	2	22	0	0	0	0	0	0	0	0
Total	**7**		**2**		**0**		**0**		**0**		**0**	

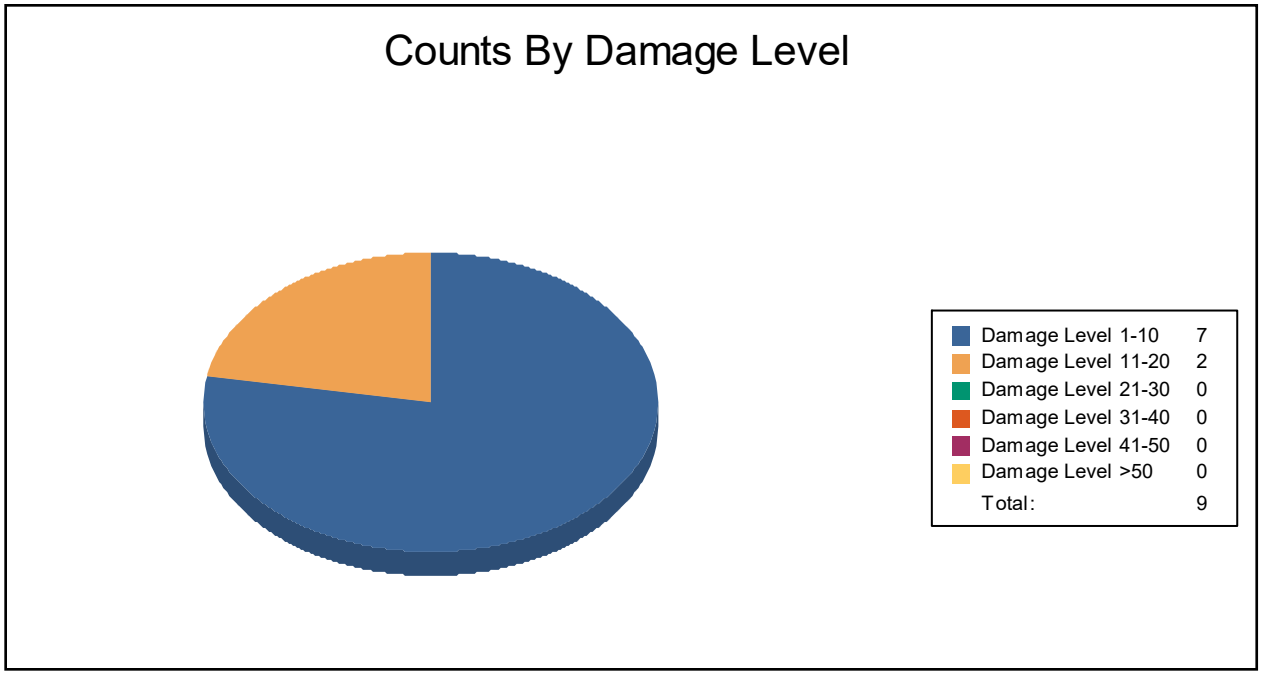


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	7	78	2	22	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

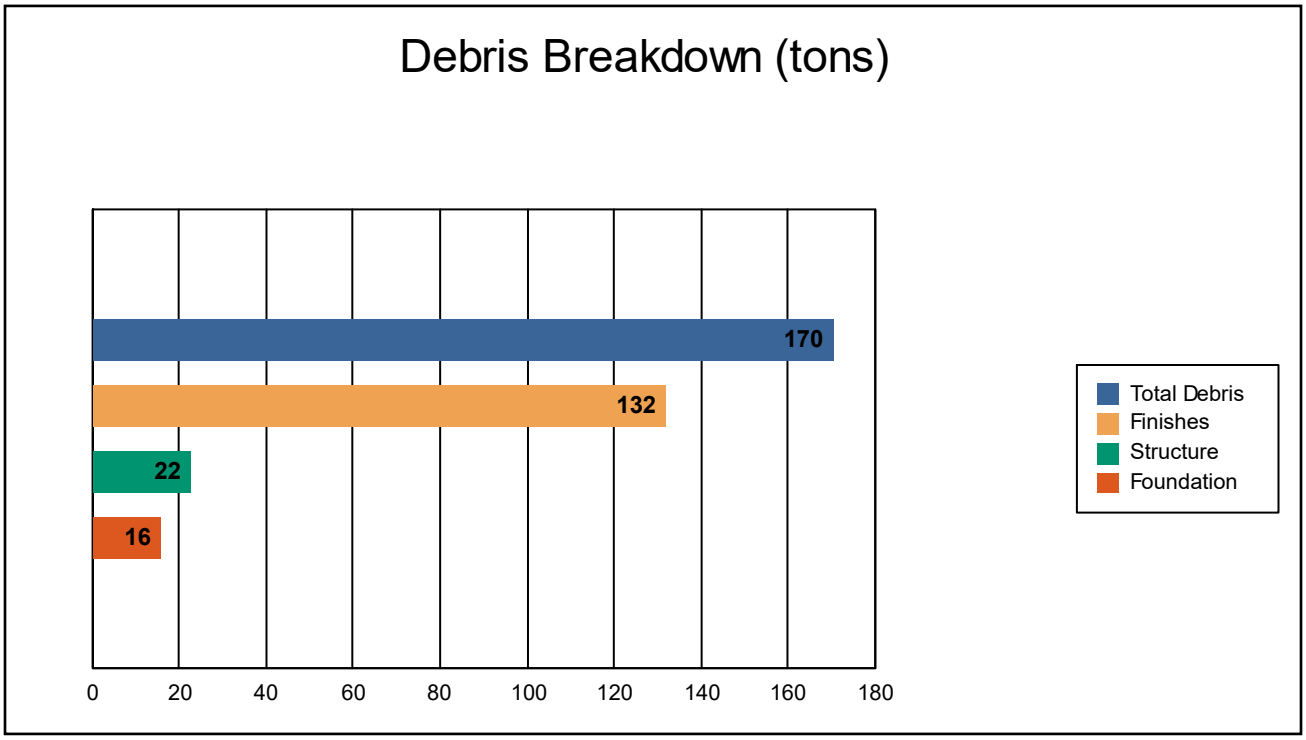
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

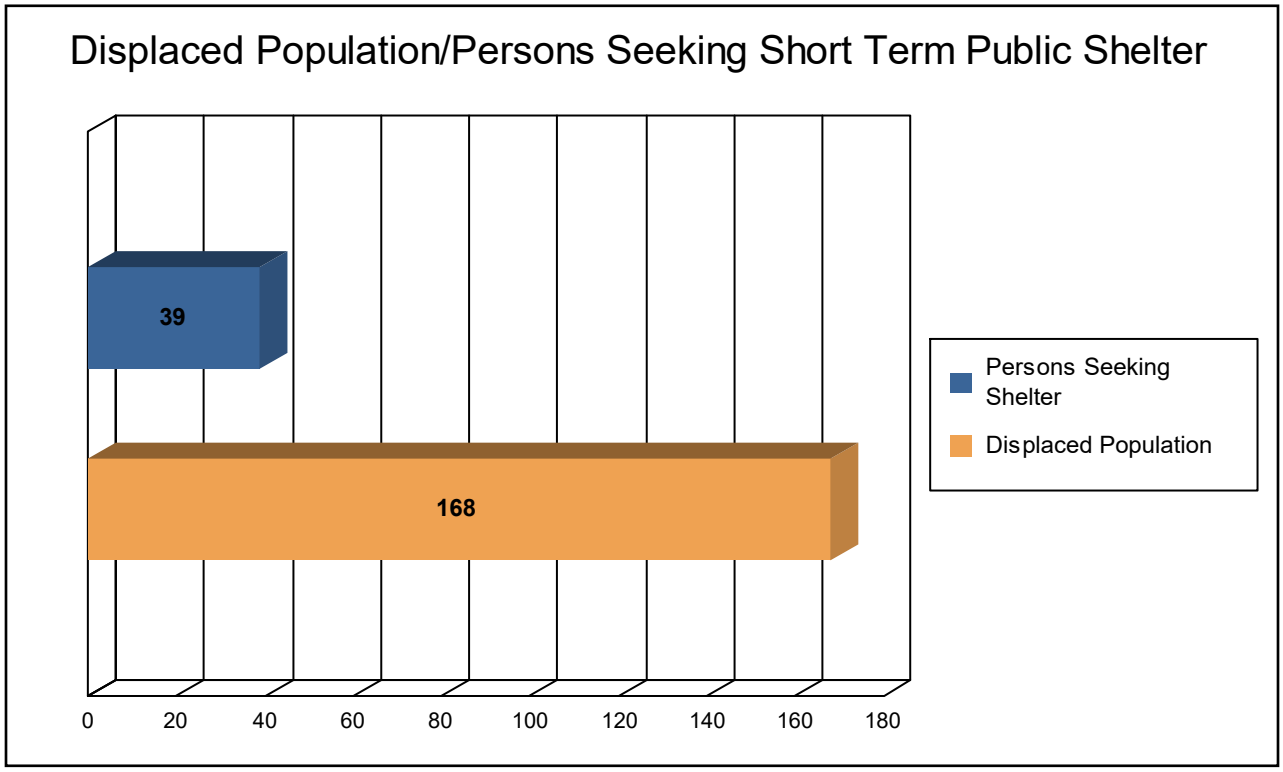


The model estimates that a total of 170 tons of debris will be generated. Of the total amount, Finishes comprises 78% of the total, Structure comprises 13% of the total, and Foundation comprises 9%. If the debris tonnage is converted into an estimated number of truckloads, it will require 7 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 56 households (or 168 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 39 people (out of a total population of 10,255) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 41.34 million dollars, which represents 3.44 % of the total replacement value of the scenario buildings.

Building-Related Losses

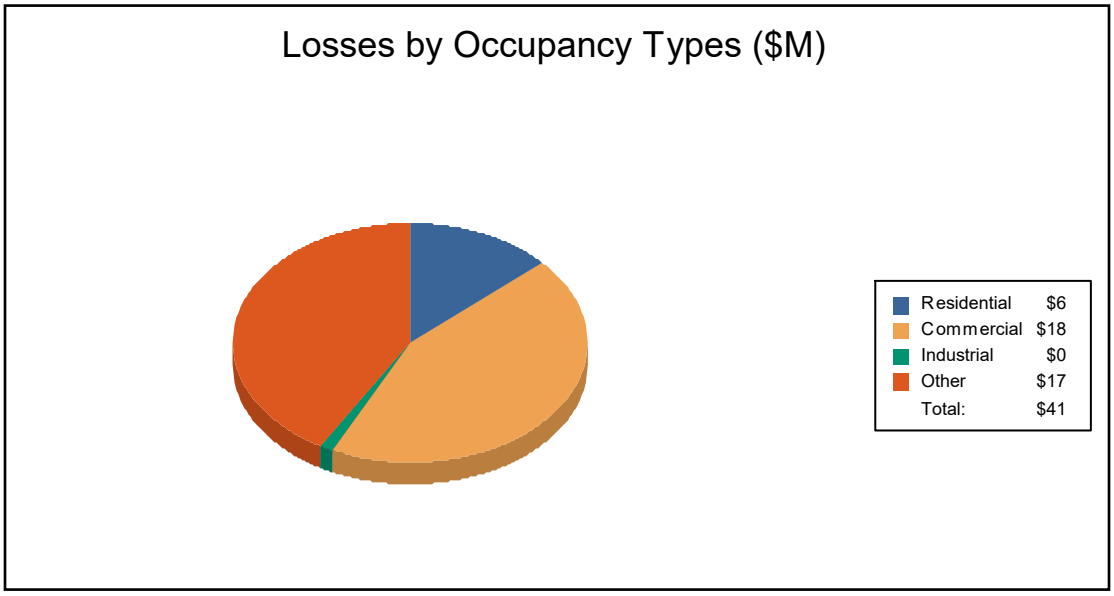
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 18.31 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.33% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.81	1.23	0.18	0.98	5.20
	Content	1.22	4.71	0.24	4.02	10.18
	Inventory	0.00	1.69	0.03	1.22	2.94
	Subtotal	**4.03**	**7.62**	**0.44**	**6.22**	**18.31**
Business Interruption						
	Income	0.00	2.62	0.01	0.98	3.61
	Relocation	1.11	1.49	0.00	0.68	3.29
	Rental Income	0.38	1.03	0.00	0.16	1.58
	Wage	0.00	5.33	0.02	9.21	14.56
	Subtotal	**1.48**	**10.48**	**0.03**	**11.04**	**23.03**
ALL	**Total**	**5.51**	**18.10**	**0.47**	**17.25**	**41.34**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,858	705,742	2,303,600
Total	**10,255**	**1,597,858**	**705,742**	**2,303,600**
Total Study Region	**10,255**	**1,597,858**	**705,742**	**2,303,600**

Hazus: Flood Global Risk Report

Region Name: Somers_FL

Flood Scenario: Somers_Flood

Print Date: Friday, April 14, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 172 census blocks. The region contains over 3 thousand households and has a total population of 10,255 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,732 buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88.32% of the buildings (and 69.36% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of 2,304 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,597,858	69.4%
Commercial	459,167	19.9%
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Agricultural	9,496	0.4%
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Government	77,221	3.4%
Education	93,901	4.1%
Total	**2,303,600**	**100%**

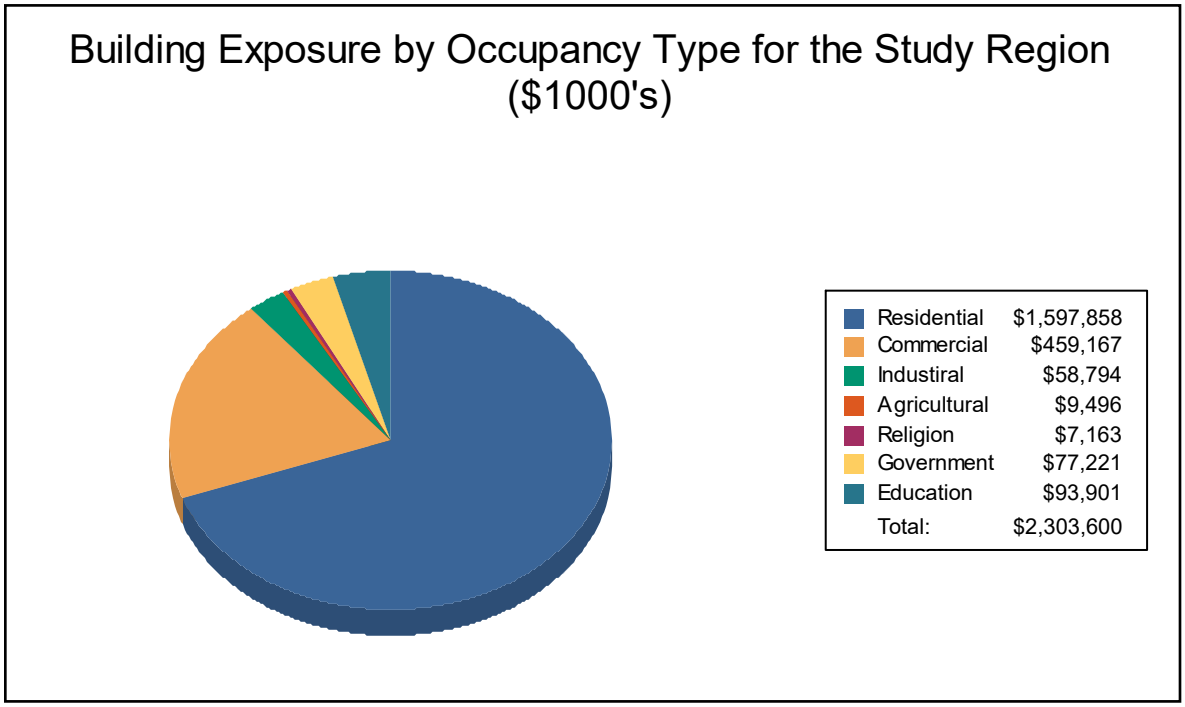
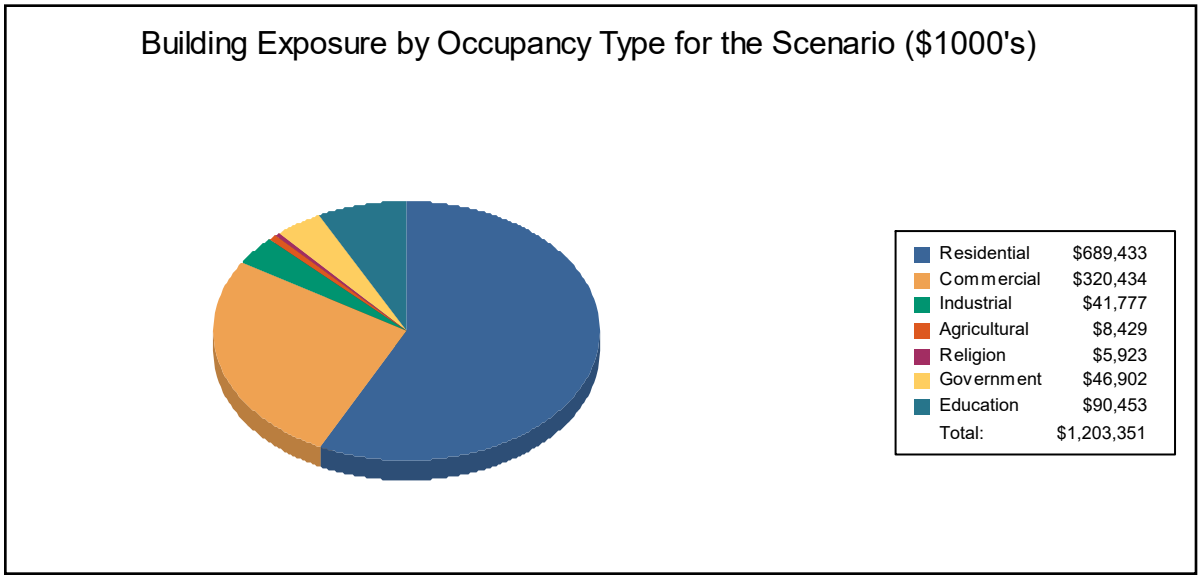


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	689,433	57.3%
Commercial	320,434	26.6%
Industrial	41,777	3.5%
Agricultural	8,429	0.7%
Religion	5,923	0.5%
Government	46,902	3.9%
Education	90,453	7.5%
Total	**1,203,351**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 1 fire station, 1 police station and 1 emergency operation center.

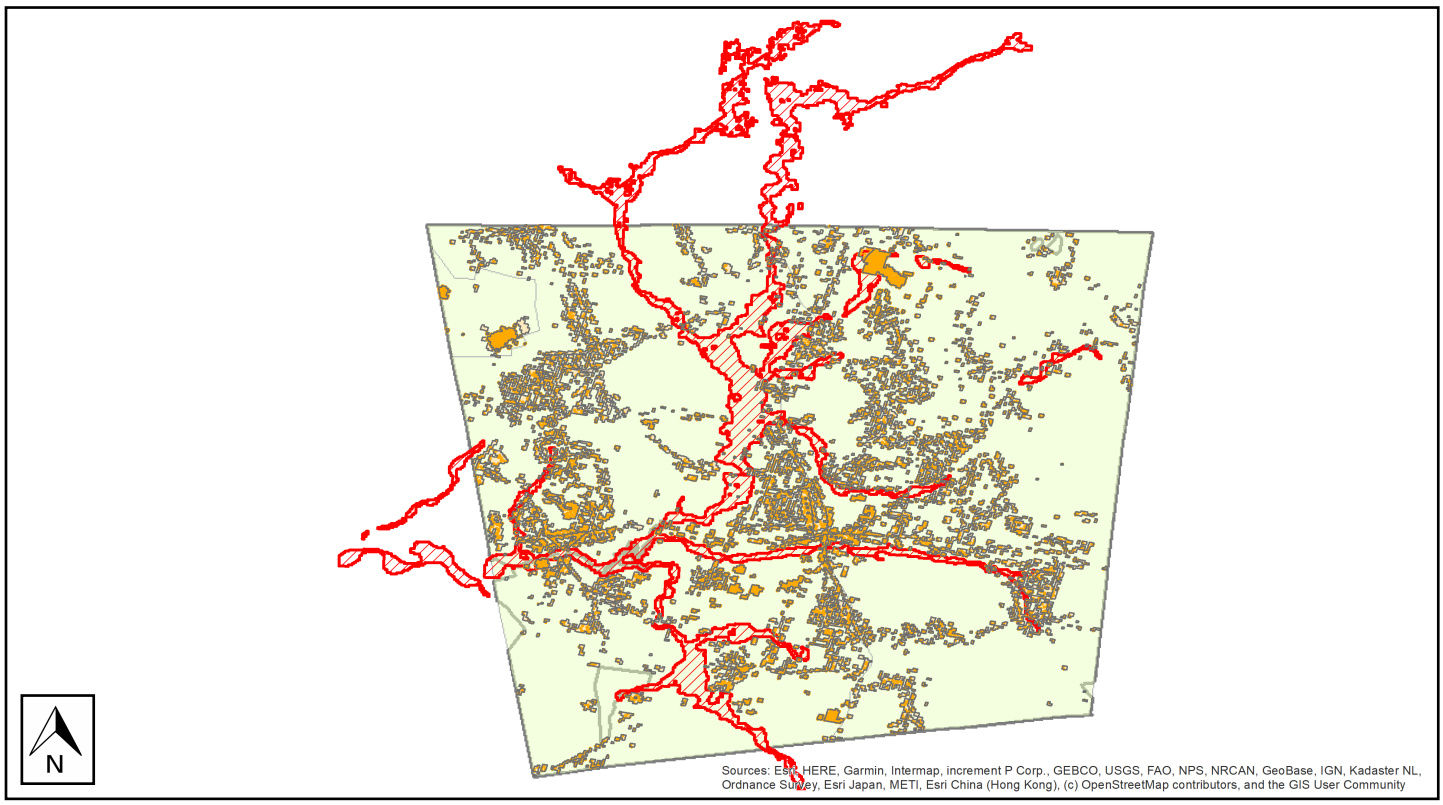
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Somers_FL
Scenario Name:	Somers_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

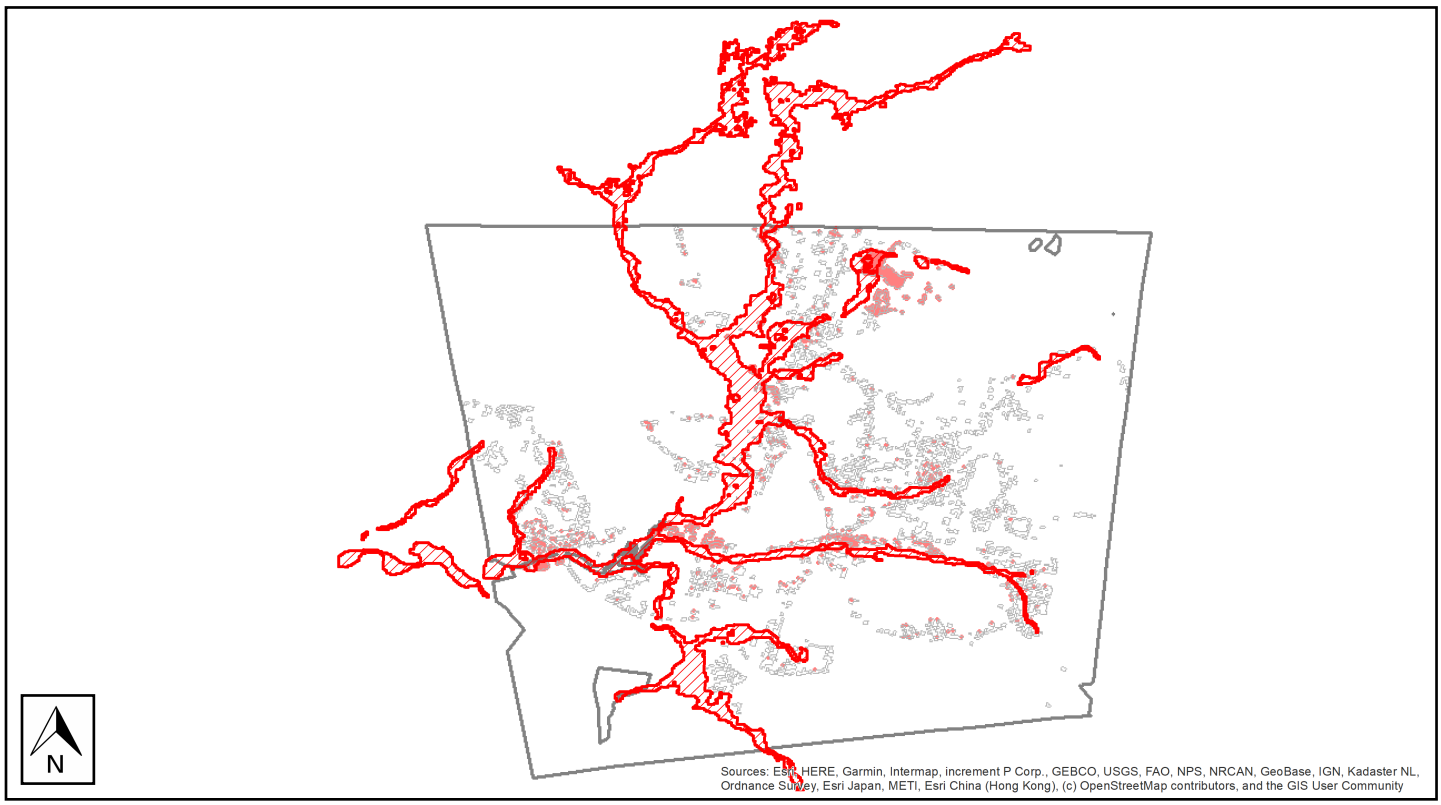


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	6	50	6	50	0	0	0	0	0	0	0	0
Total	**6**		**6**		**0**		**0**		**0**		**0**	

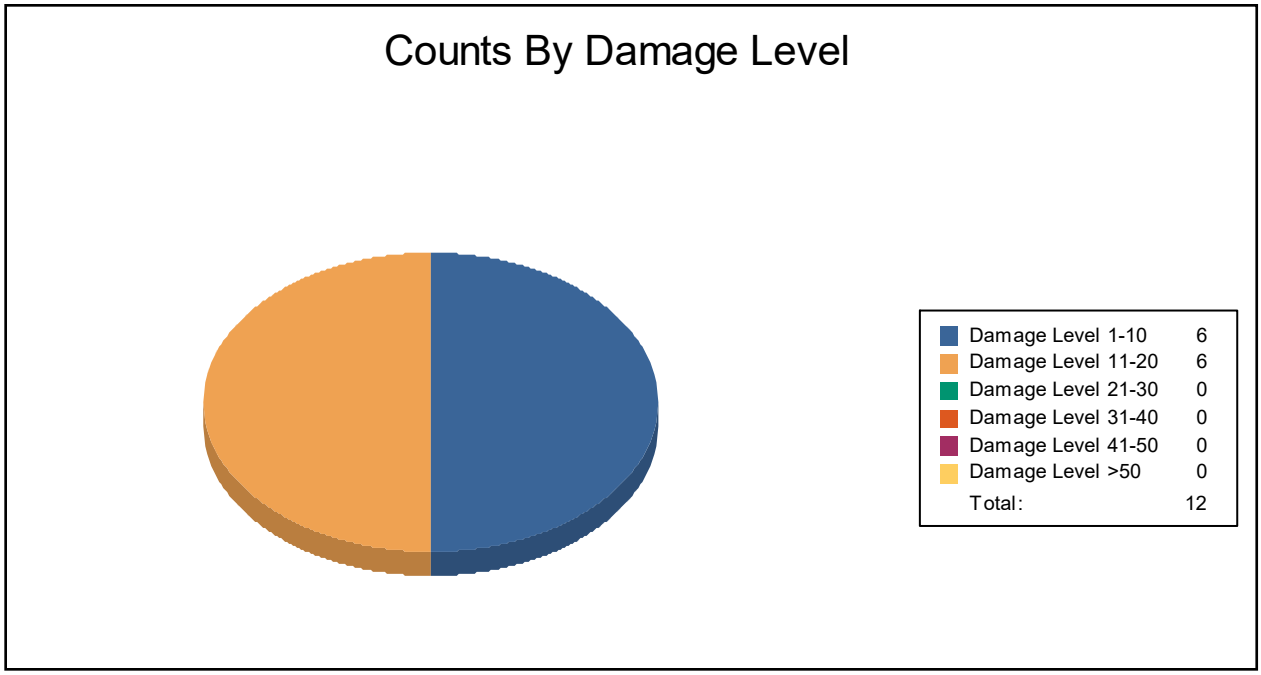


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	6	50	6	50	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

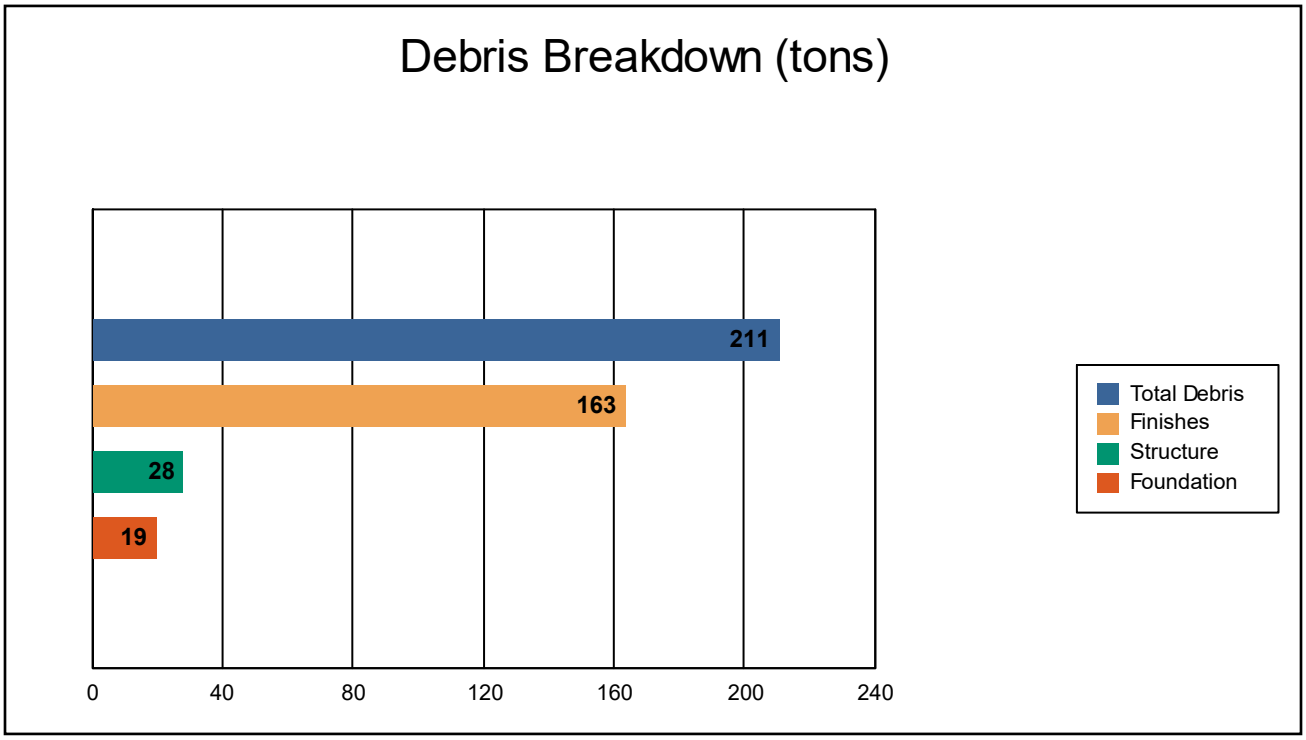
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

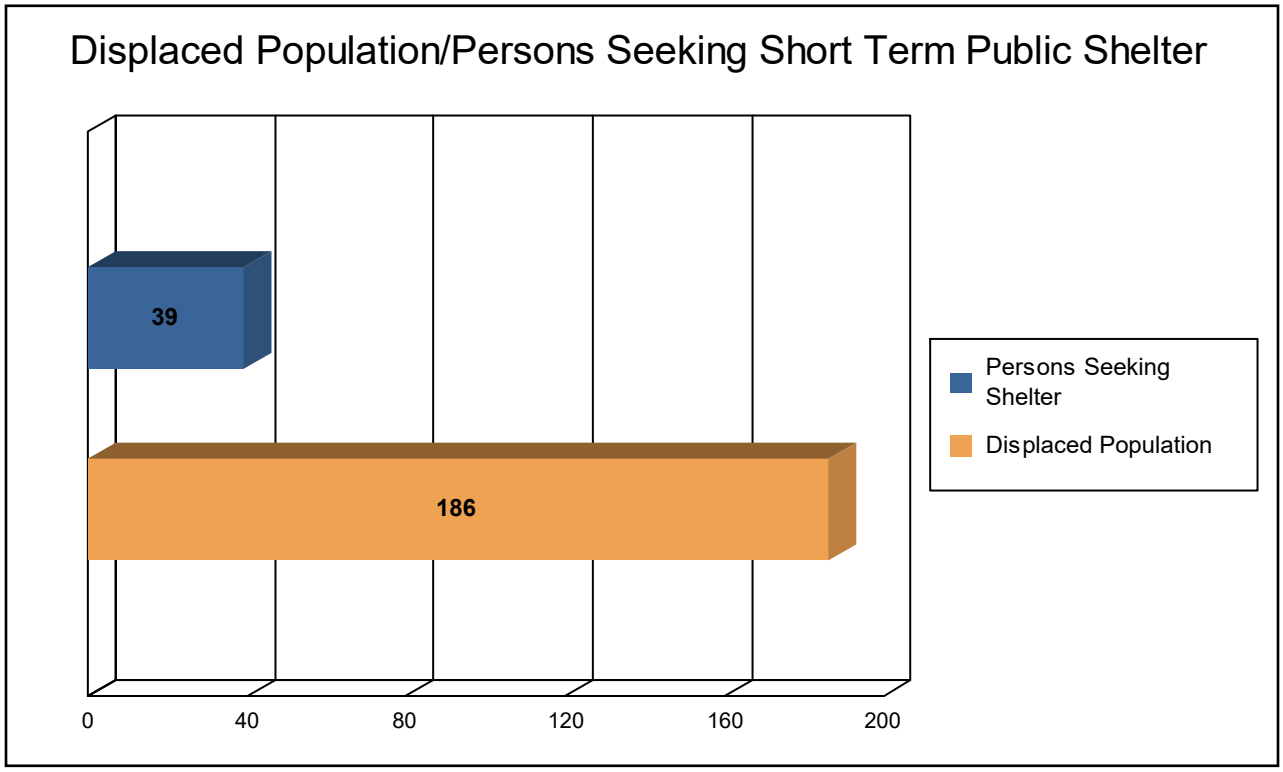


The model estimates that a total of 211 tons of debris will be generated. Of the total amount, Finishes comprises 77% of the total, Structure comprises 13% of the total, and Foundation comprises 9%. If the debris tonnage is converted into an estimated number of truckloads, it will require 9 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 62 households (or 186 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 39 people (out of a total population of 10,255) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 49.19 million dollars, which represents 4.09 % of the total replacement value of the scenario buildings.

Building-Related Losses

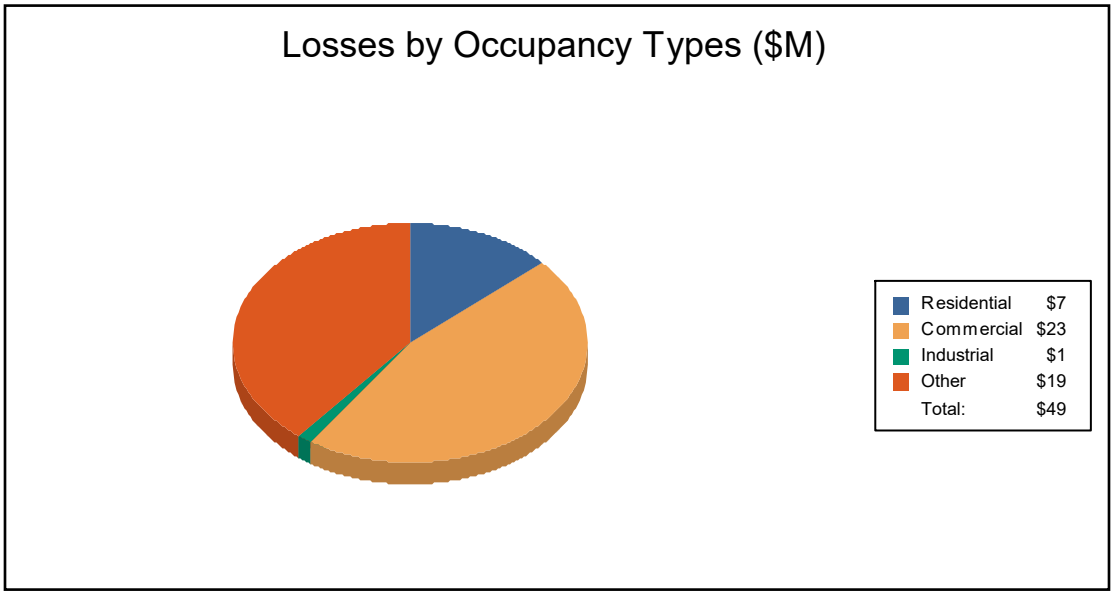
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 22.22 million dollars. 55% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.23% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.37	1.57	0.21	1.22	6.37
	Content	1.45	5.96	0.29	4.64	12.35
	Inventory	0.00	2.07	0.04	1.39	3.50
	Subtotal	**4.83**	**9.61**	**0.53**	**7.25**	**22.22**
Business Interruption						
	Income	0.00	3.40	0.01	1.11	4.51
	Relocation	1.25	1.84	0.01	0.78	3.87
	Rental Income	0.43	1.28	0.00	0.18	1.89
	Wage	0.00	6.67	0.02	10.02	16.71
	Subtotal	**1.68**	**13.18**	**0.03**	**12.08**	**26.98**
ALL	**Total**	**6.51**	**22.79**	**0.57**	**19.33**	**49.19**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,858	705,742	2,303,600
Total	**10,255**	**1,597,858**	**705,742**	**2,303,600**
Total Study Region	**10,255**	**1,597,858**	**705,742**	**2,303,600**

Hazus: Flood Global Risk Report

Region Name: Somers_FL

Flood Scenario: Somers_Flood

Print Date: Friday, April 14, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 172 census blocks. The region contains over 3 thousand households and has a total population of 10,255 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 3,732 buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88.32% of the buildings (and 69.36% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of 2,304 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,597,858	69.4%
Commercial	459,167	19.9%
Industrial	58,794	2.6%
Agricultural	9,496	0.4%
Religion	7,163	0.3%
Government	77,221	3.4%
Education	93,901	4.1%
Total	**2,303,600**	**100%**

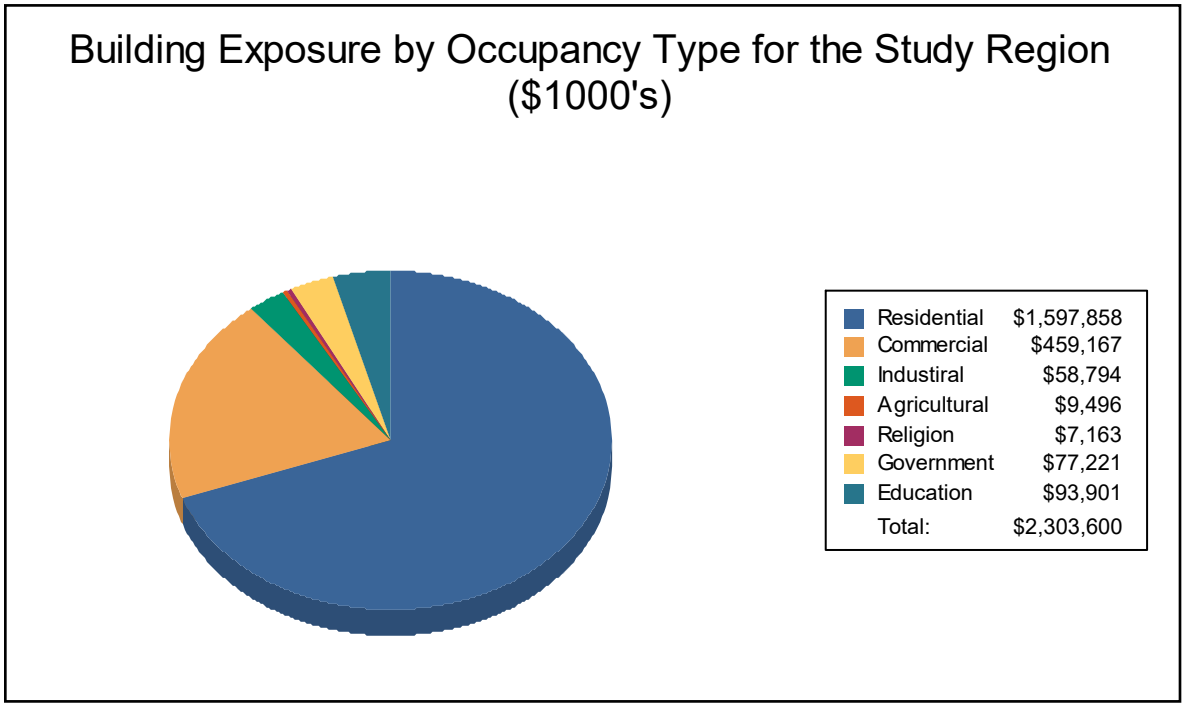
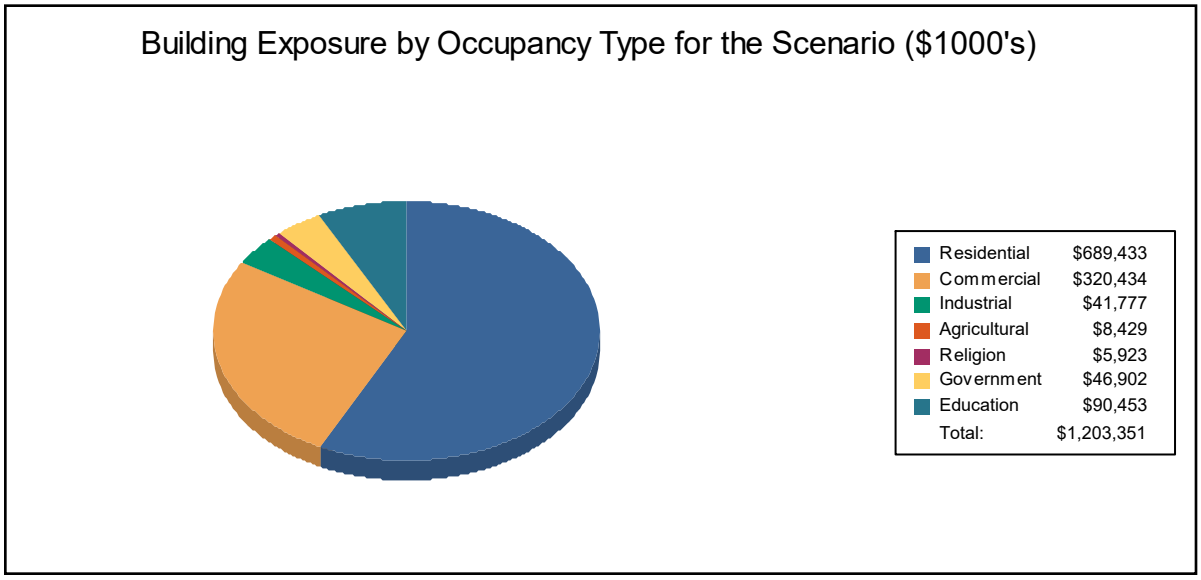


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	689,433	57.3%
Commercial	320,434	26.6%
Industrial	41,777	3.5%
Agricultural	8,429	0.7%
Religion	5,923	0.5%
Government	46,902	3.9%
Education	90,453	7.5%
Total	**1,203,351**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 1 fire station, 1 police station and 1 emergency operation center.

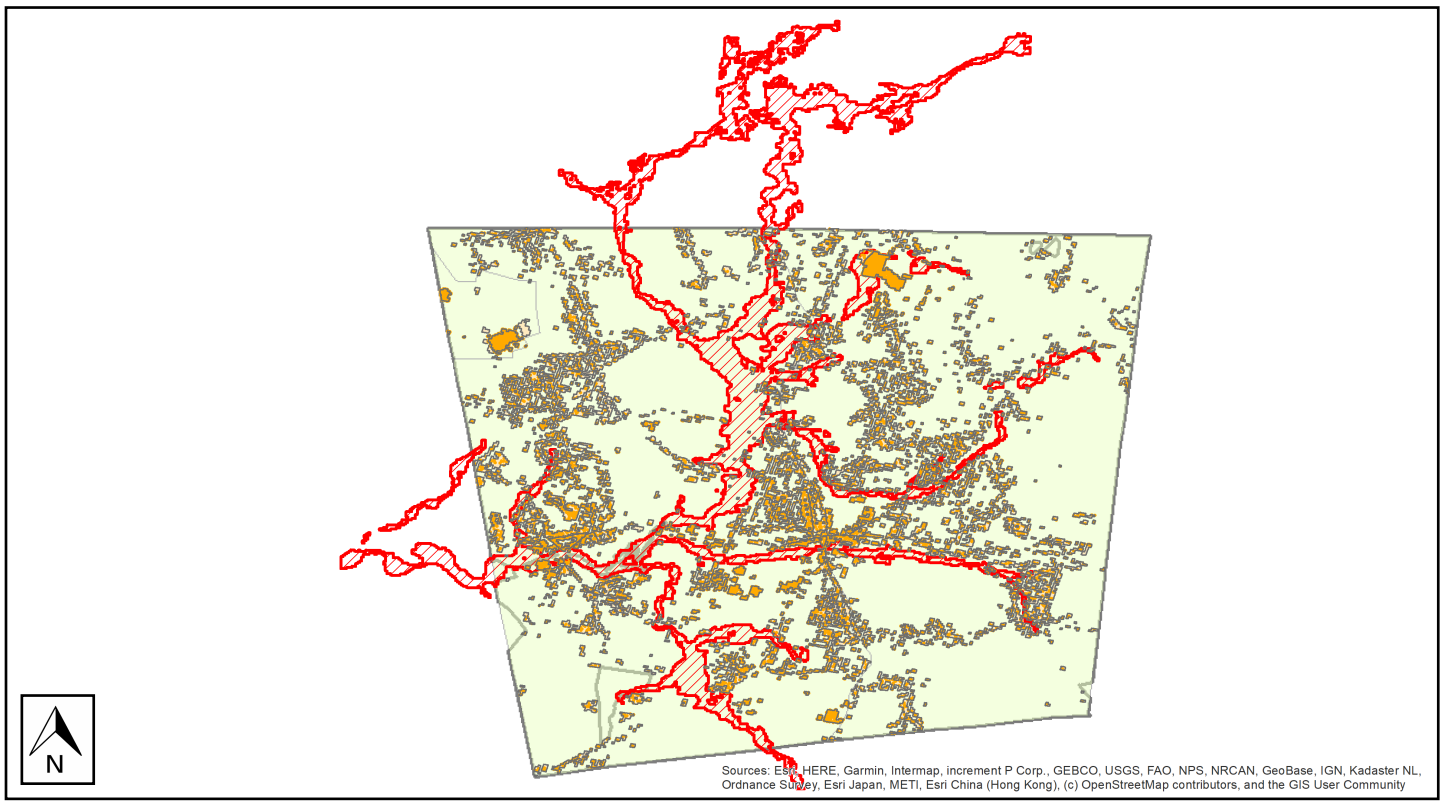
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Somers_FL
Scenario Name:	Somers_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 5 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

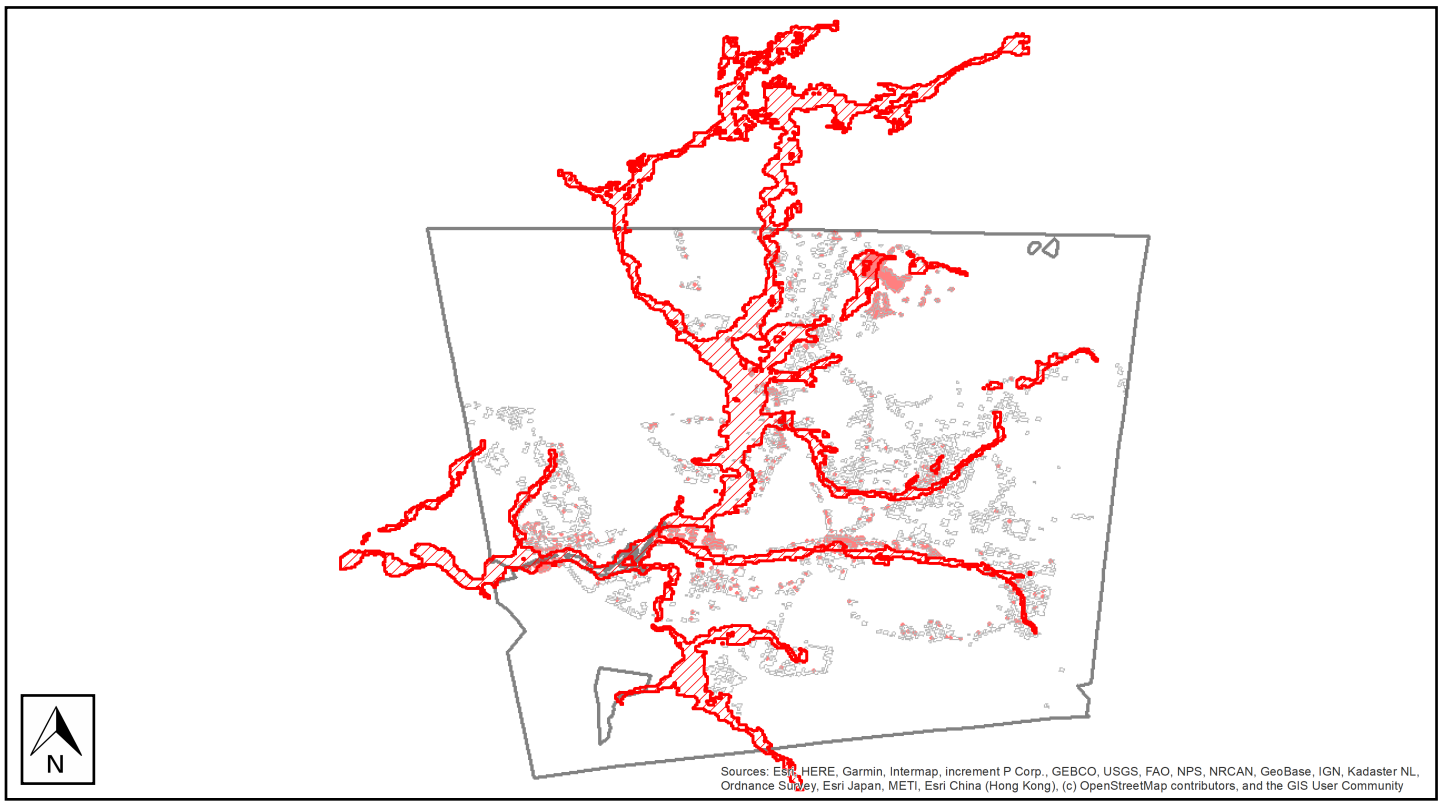


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	38	4	50	1	13	0	0	0	0	0	0
Total	**3**		**4**		**1**		**0**		**0**		**0**	

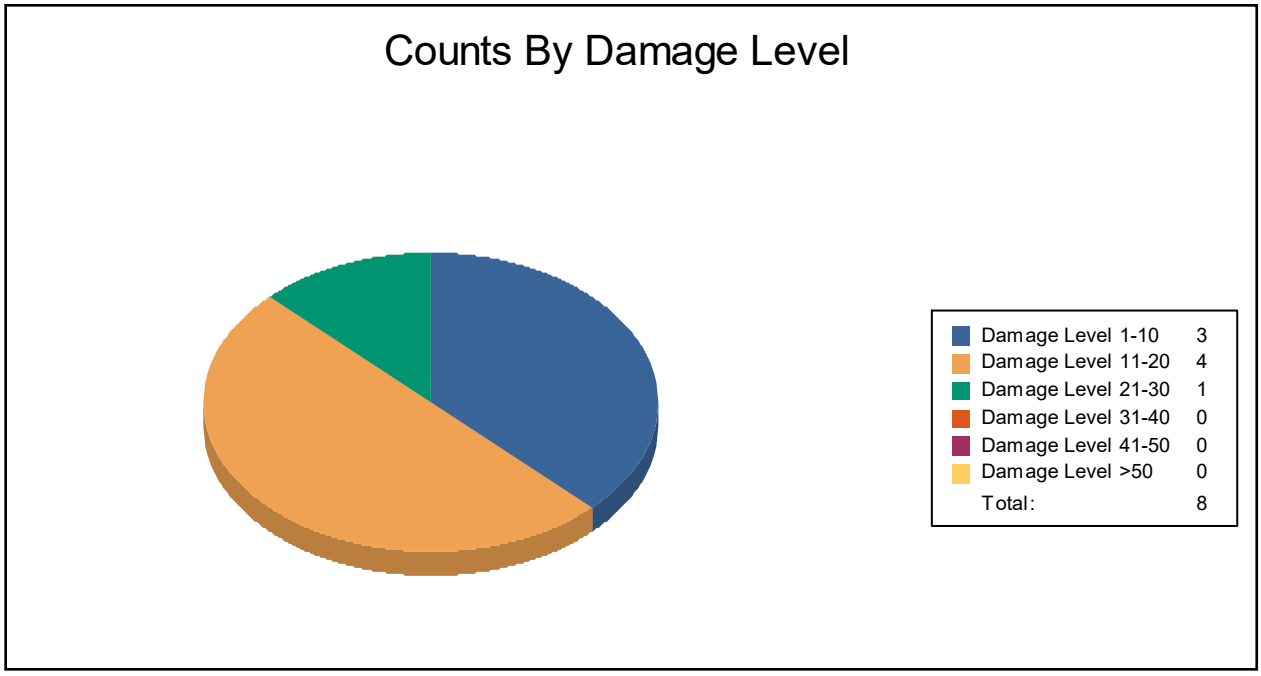


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	3	38	4	50	1	13	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

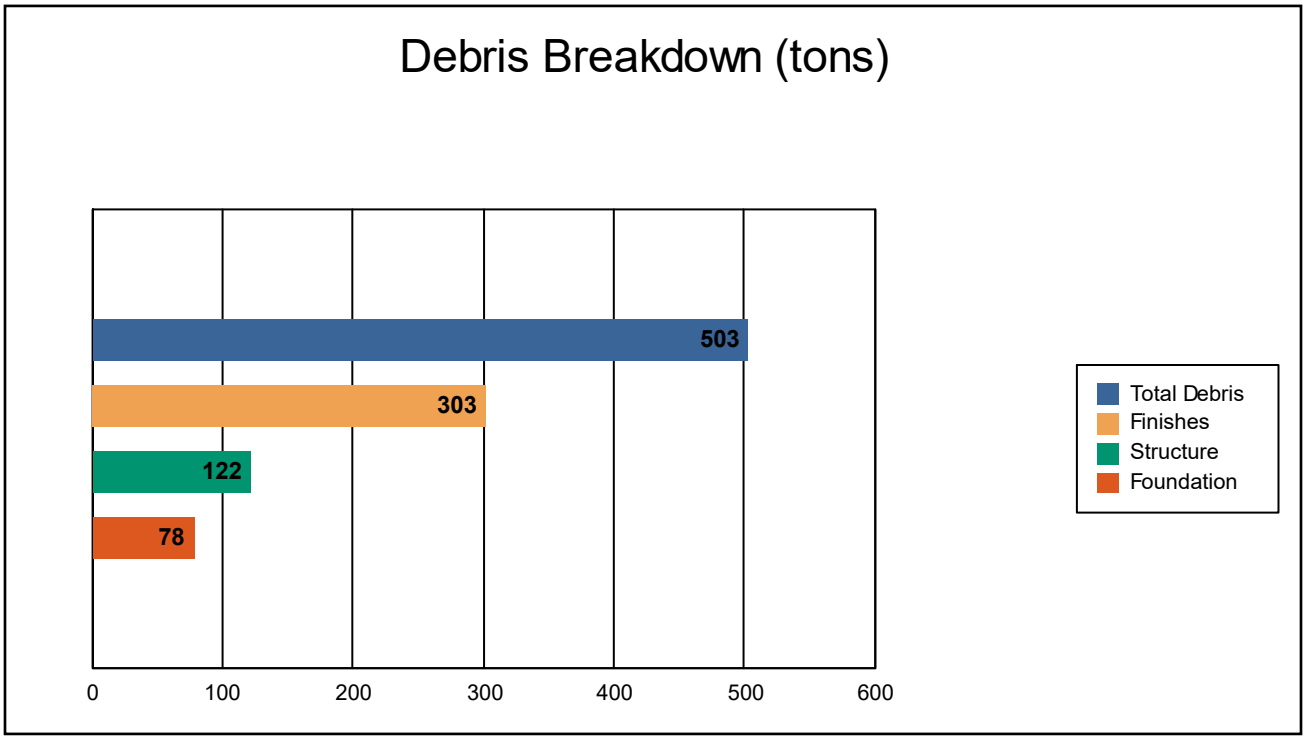
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

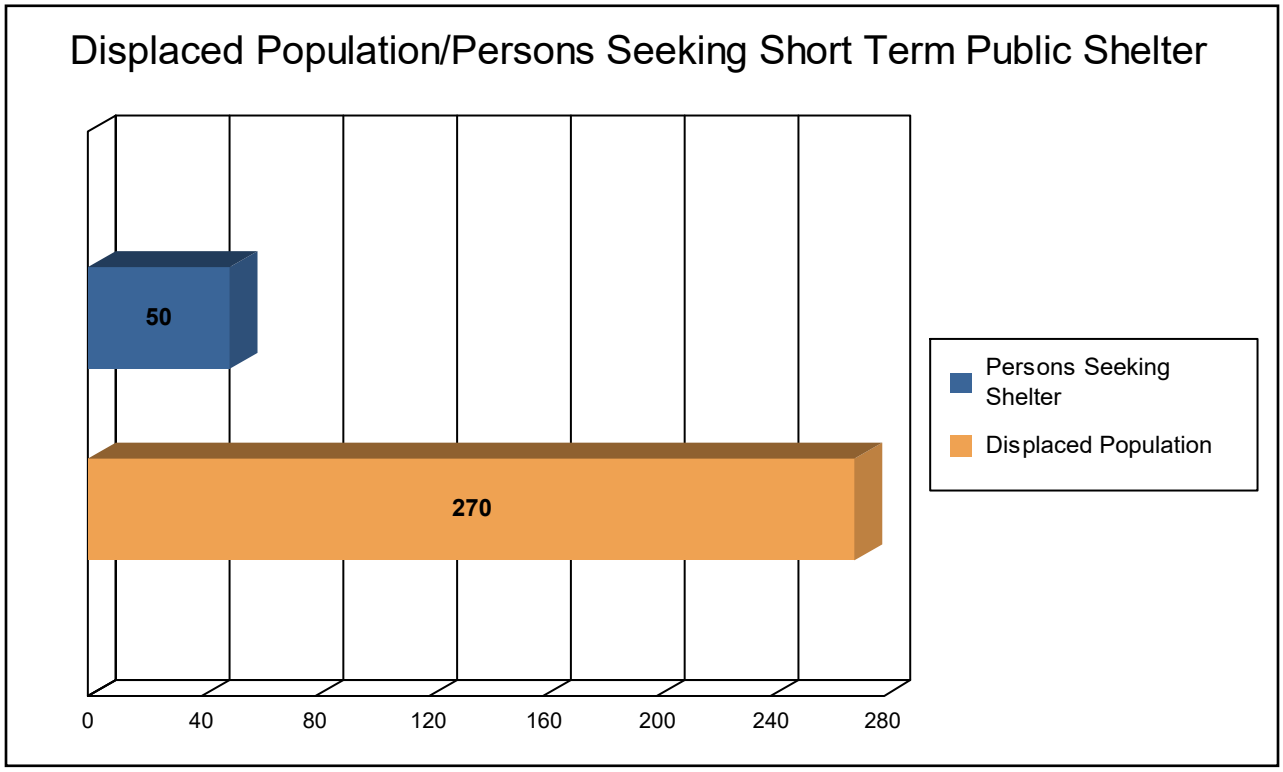


The model estimates that a total of 503 tons of debris will be generated. Of the total amount, Finishes comprises 60% of the total, Structure comprises 24% of the total, and Foundation comprises 16%. If the debris tonnage is converted into an estimated number of truckloads, it will require 21 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 90 households (or 270 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 50 people (out of a total population of 10,255) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 69.27 million dollars, which represents 5.76 % of the total replacement value of the scenario buildings.

Building-Related Losses

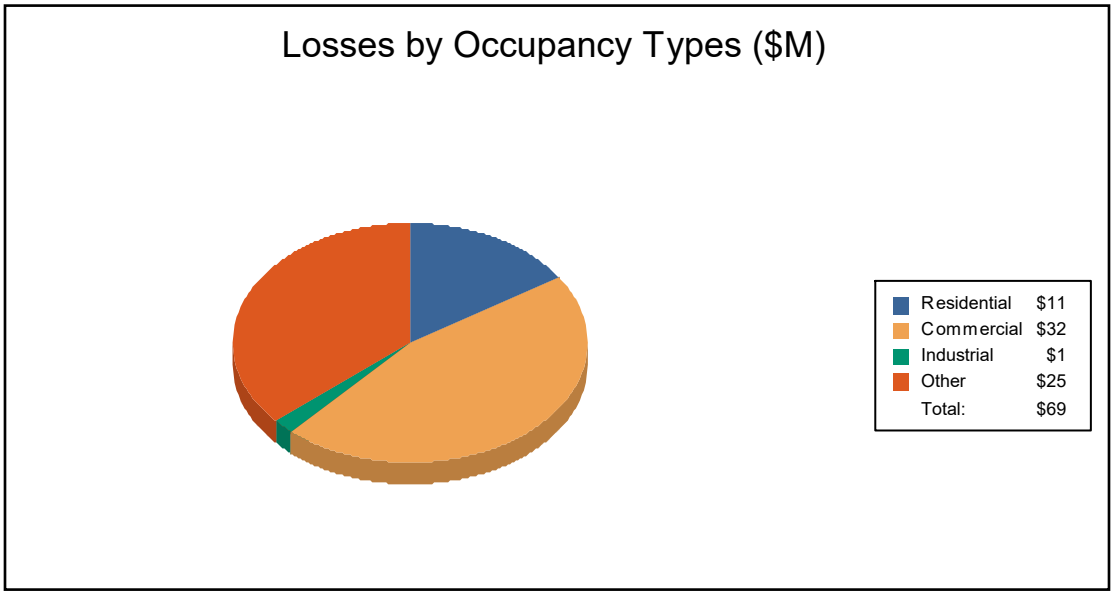
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 33.97 million dollars. 51% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 15.92% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.89	2.49	0.45	1.83	10.66
	Content	2.60	8.94	0.71	6.23	18.47
	Inventory	0.00	2.87	0.09	1.88	4.84
	Subtotal	**8.48**	**14.30**	**1.24**	**9.94**	**33.97**
Business Interruption						
	Income	0.00	4.60	0.01	1.43	6.04
	Relocation	1.87	2.34	0.01	0.97	5.19
	Rental Income	0.68	1.62	0.00	0.22	2.52
	Wage	0.00	8.89	0.03	12.63	21.56
	Subtotal	**2.55**	**17.45**	**0.06**	**15.25**	**35.30**
ALL	**Total**	**11.03**	**31.75**	**1.30**	**25.19**	**69.27**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,858	705,742	2,303,600
Total	**10,255**	**1,597,858**	**705,742**	**2,303,600**
Total Study Region	**10,255**	**1,597,858**	**705,742**	**2,303,600**

Hazus: Flood Global Risk Report

Region Name: South_Windsor_FL

Flood Scenario: South_Windsor_Flood

Print Date: Saturday, April 15, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 10 thousand households and has a total population of 26,888 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,662 buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 84.73% of the buildings (and 58.87% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,662 buildings in the region which have an aggregate total replacement value of 6,385 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,758,311	58.9%
Commercial	1,406,943	22.0%
Industrial	821,155	12.9%
Agricultural	19,527	0.3%
Religion	75,873	1.2%
Government	116,656	1.8%
Education	186,112	2.9%
Total	**6,384,577**	**100%**

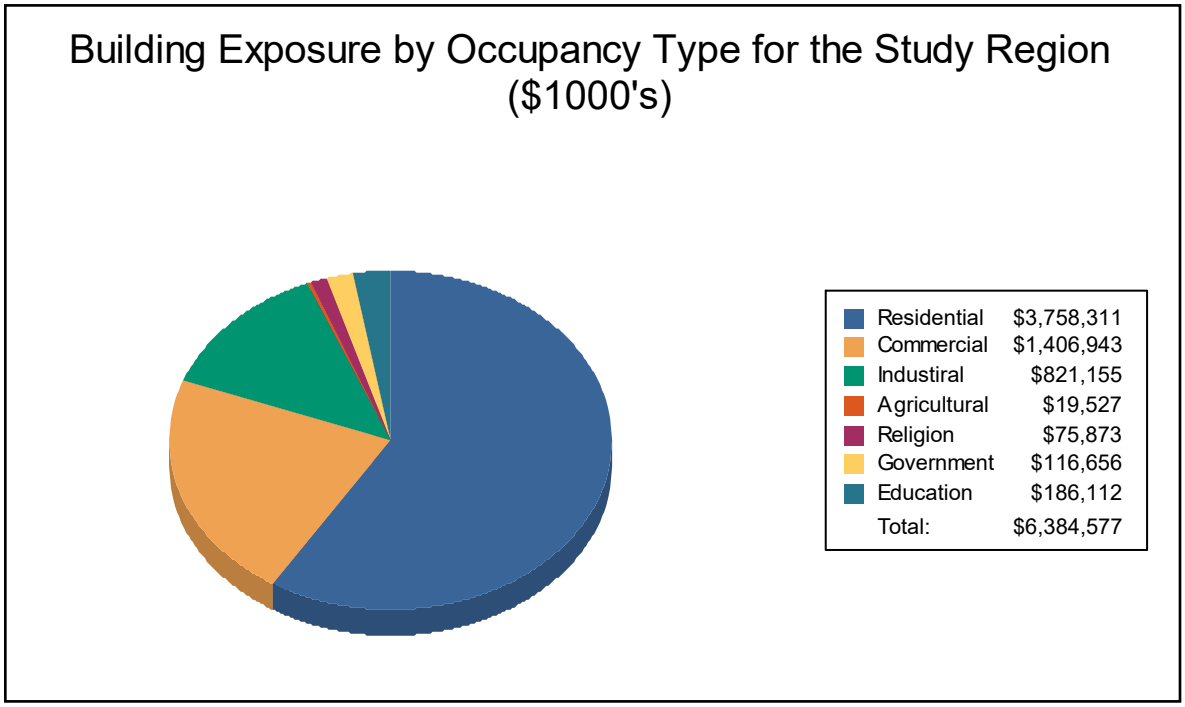
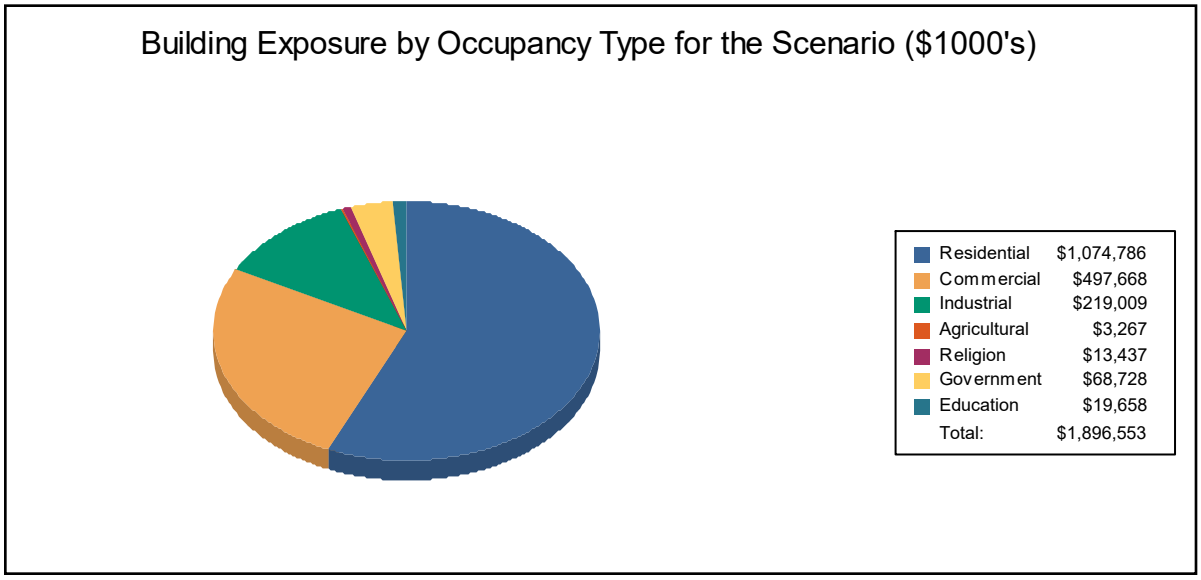


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,074,786	56.7%
Commercial	497,668	26.2%
Industrial	219,009	11.5%
Agricultural	3,267	0.2%
Religion	13,437	0.7%
Government	68,728	3.6%
Education	19,658	1.0%
Total	**1,896,553**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 2 fire stations, 1 police station and no emergency operation centers.

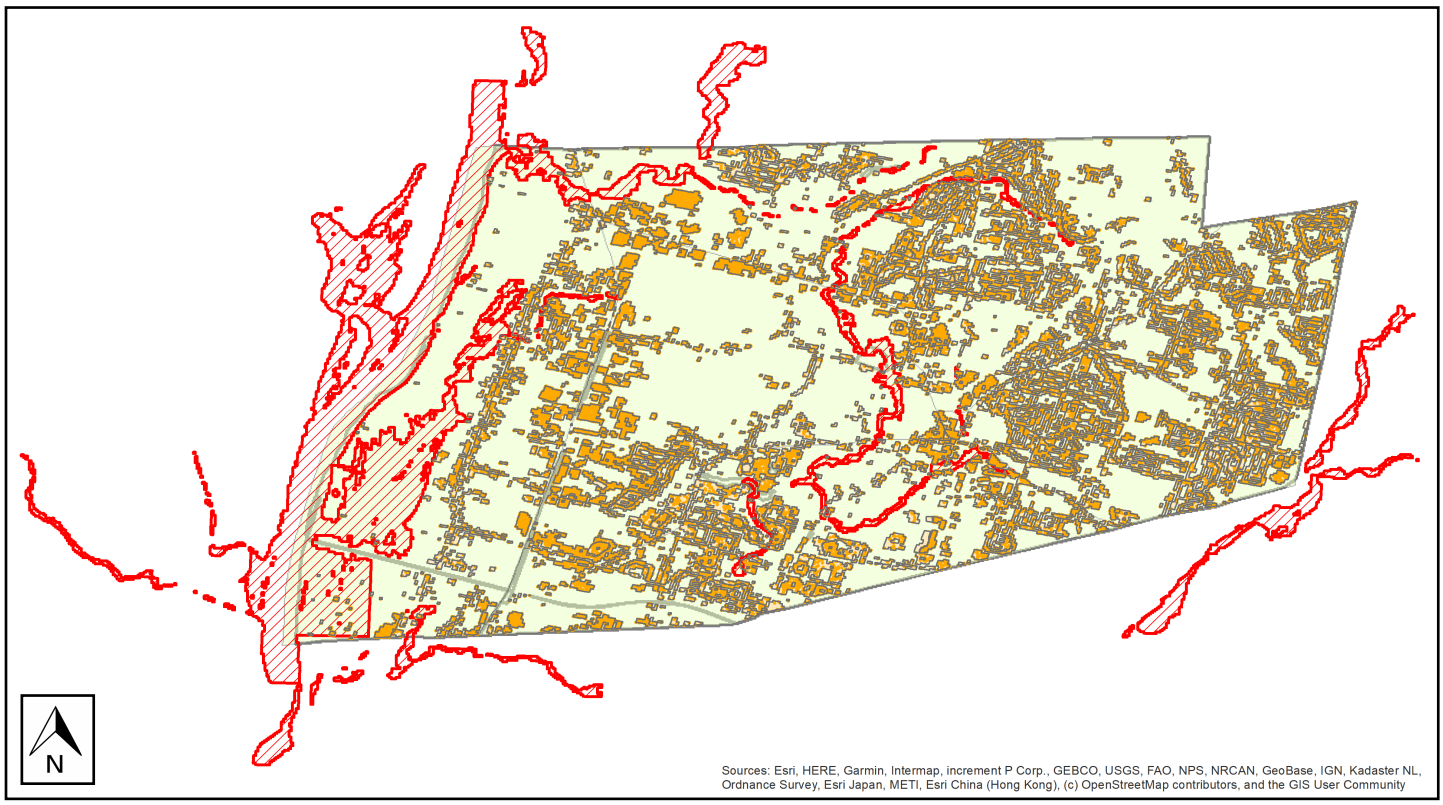
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	South_Windsor_FL
Scenario Name:	South_Windsor_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 93% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

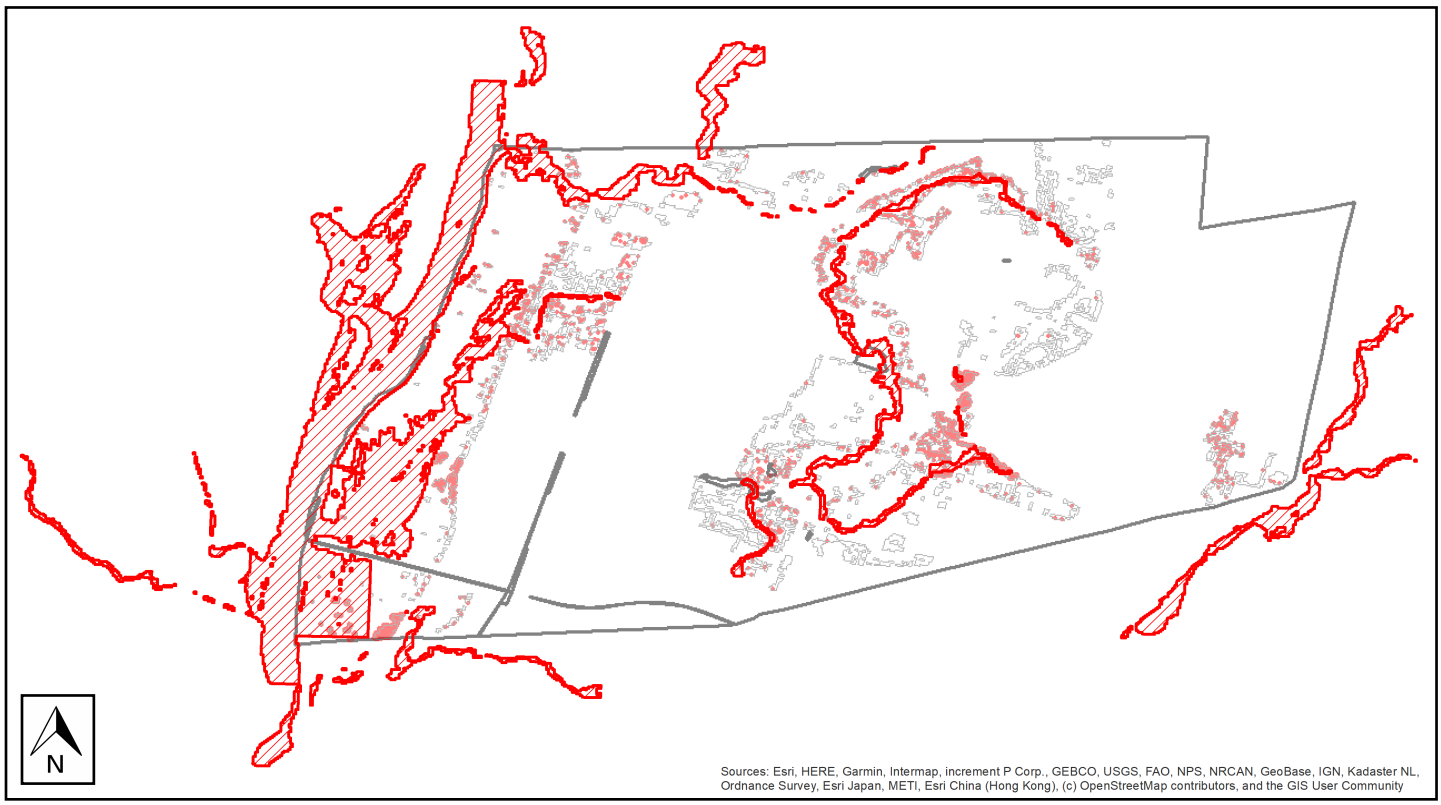


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	3	60	1	20	1	20	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	6	75	2	25	0	0	0	0	0	0	0	0
Total	**9**		**3**		**1**		**0**		**0**		**0**	

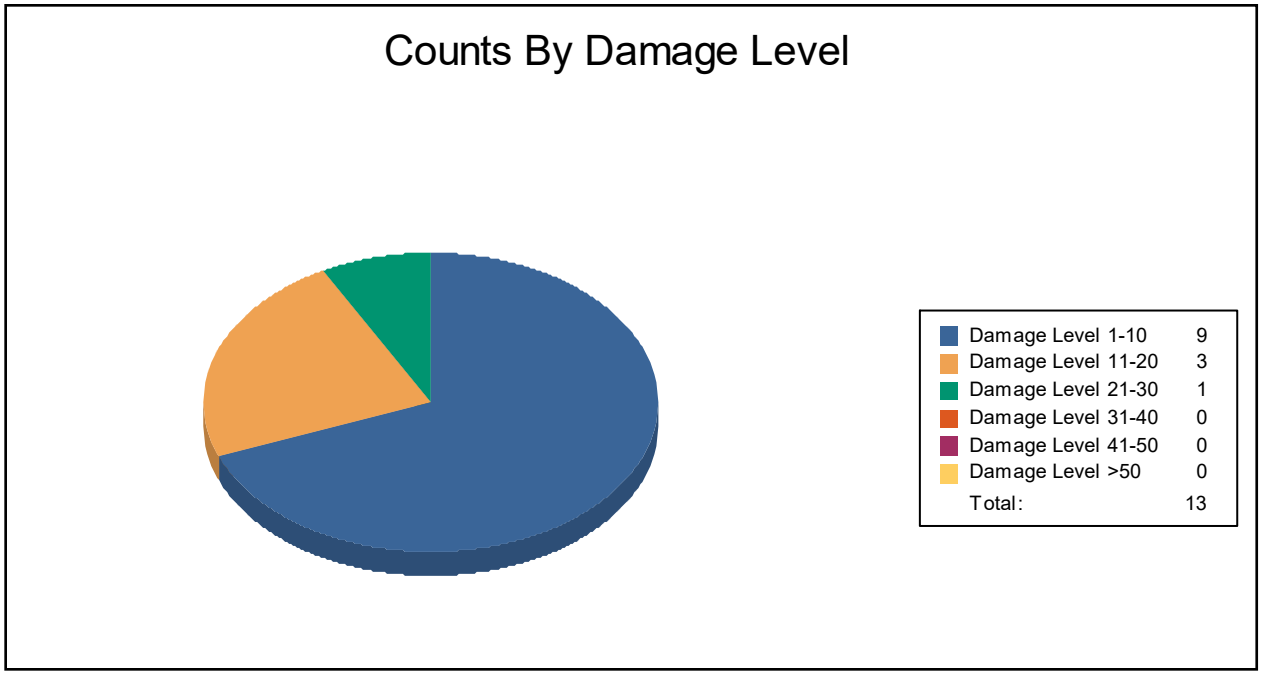


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	2	67	1	33	0	0	0	0	0	0	0	0
Steel	1	100	0	0	0	0	0	0	0	0	0	0
Wood	6	75	2	25	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	0	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

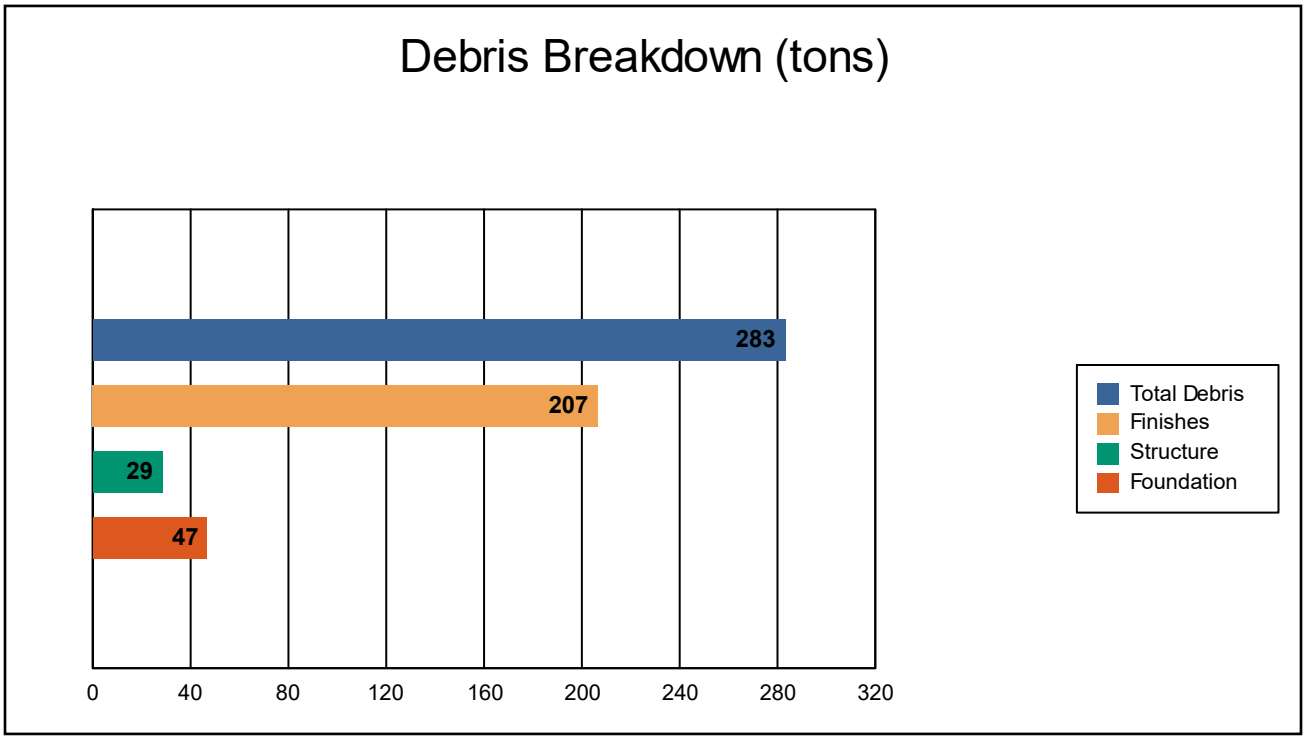
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

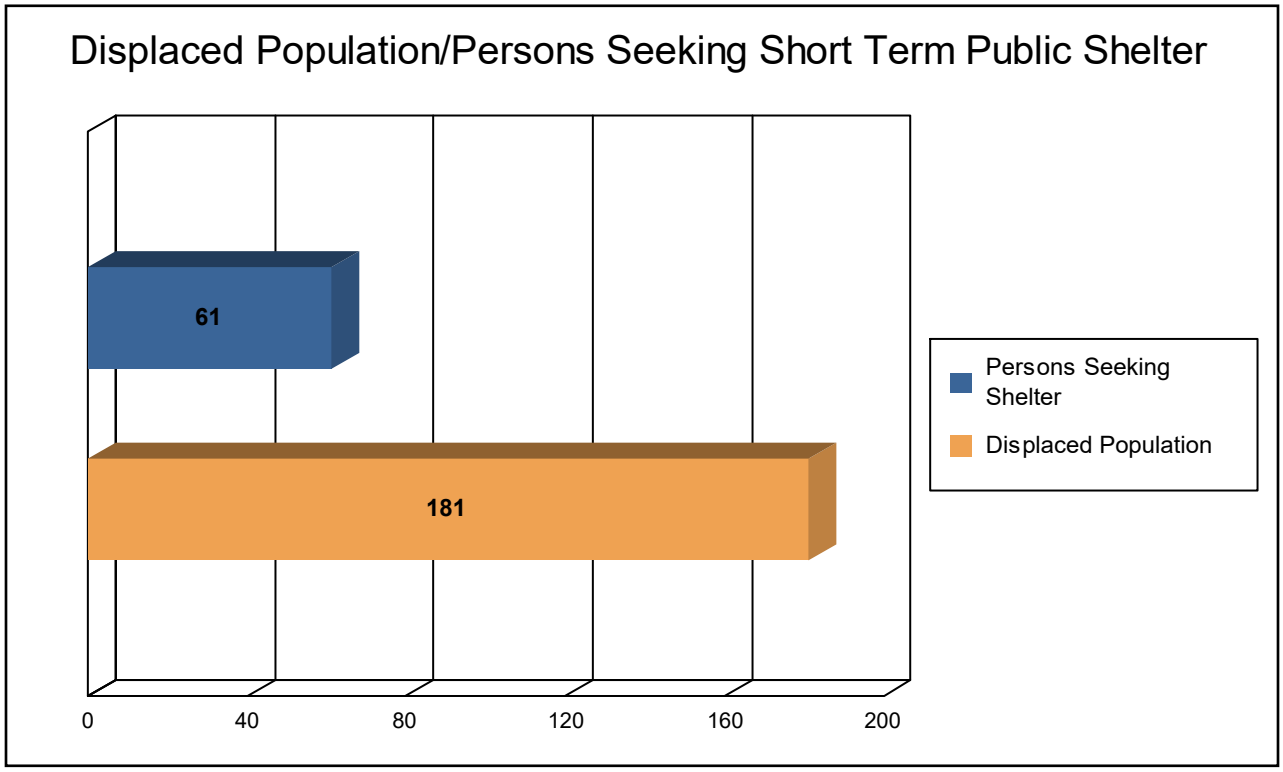


The model estimates that a total of 283 tons of debris will be generated. Of the total amount, Finishes comprises 73% of the total, Structure comprises 10% of the total, and Foundation comprises 17%. If the debris tonnage is converted into an estimated number of truckloads, it will require 12 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 60 households (or 181 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 61 people (out of a total population of 26,888) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 47.01 million dollars, which represents 2.48 % of the total replacement value of the scenario buildings.

Building-Related Losses

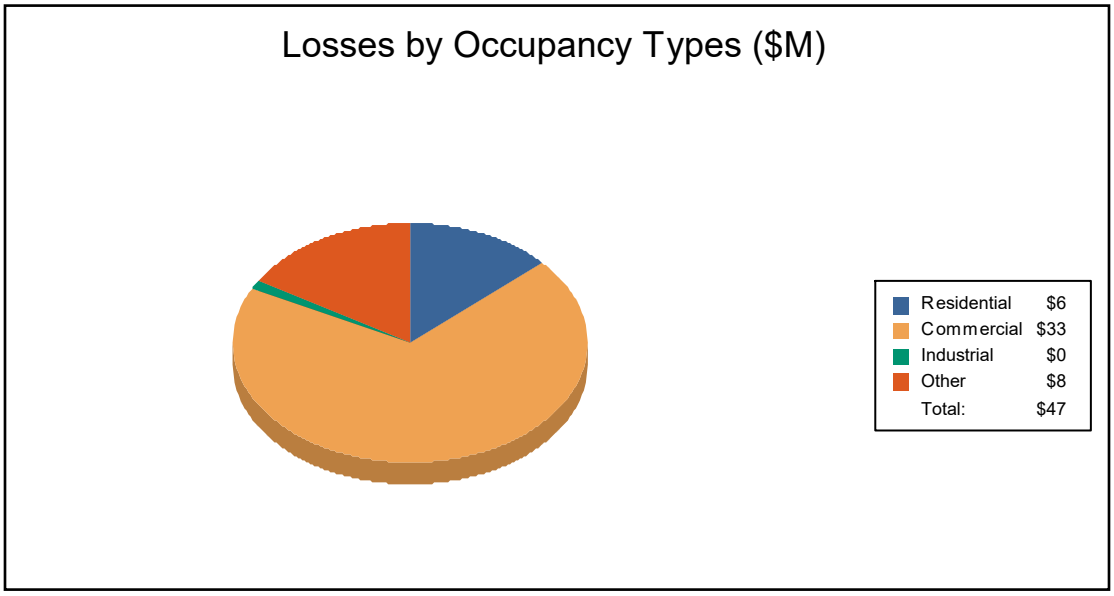
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 17.41 million dollars. 63% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.43% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.25	4.00	0.11	0.17	7.52
	Content	1.67	7.06	0.28	0.55	9.56
	Inventory	0.00	0.30	0.04	0.01	0.34
	Subtotal	**4.91**	**11.35**	**0.43**	**0.72**	**17.41**
Business Interruption						
	Income	0.01	10.72	0.01	0.13	10.86
	Relocation	0.81	2.75	0.00	0.11	3.67
	Rental Income	0.55	2.05	0.00	0.01	2.62
	Wage	0.02	5.64	0.02	6.76	12.44
	Subtotal	**1.40**	**21.16**	**0.02**	**7.01**	**29.59**
ALL	**Total**	**6.31**	**32.51**	**0.45**	**7.73**	**47.01**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,888	3,758,311	2,626,266	6,384,577
Total	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**
Total Study Region	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**

Hazus: Flood Global Risk Report

Region Name: South_Windsor_FL

Flood Scenario: South_Windsor_Flood

Print Date: Saturday, April 15, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 10 thousand households and has a total population of 26,888 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,662 buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 84.73% of the buildings (and 58.87% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,662 buildings in the region which have an aggregate total replacement value of 6,385 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,758,311	58.9%
Commercial	1,406,943	22.0%
Industrial	821,155	12.9%
Agricultural	19,527	0.3%
Religion	75,873	1.2%
Government	116,656	1.8%
Education	186,112	2.9%
Total	**6,384,577**	**100%**

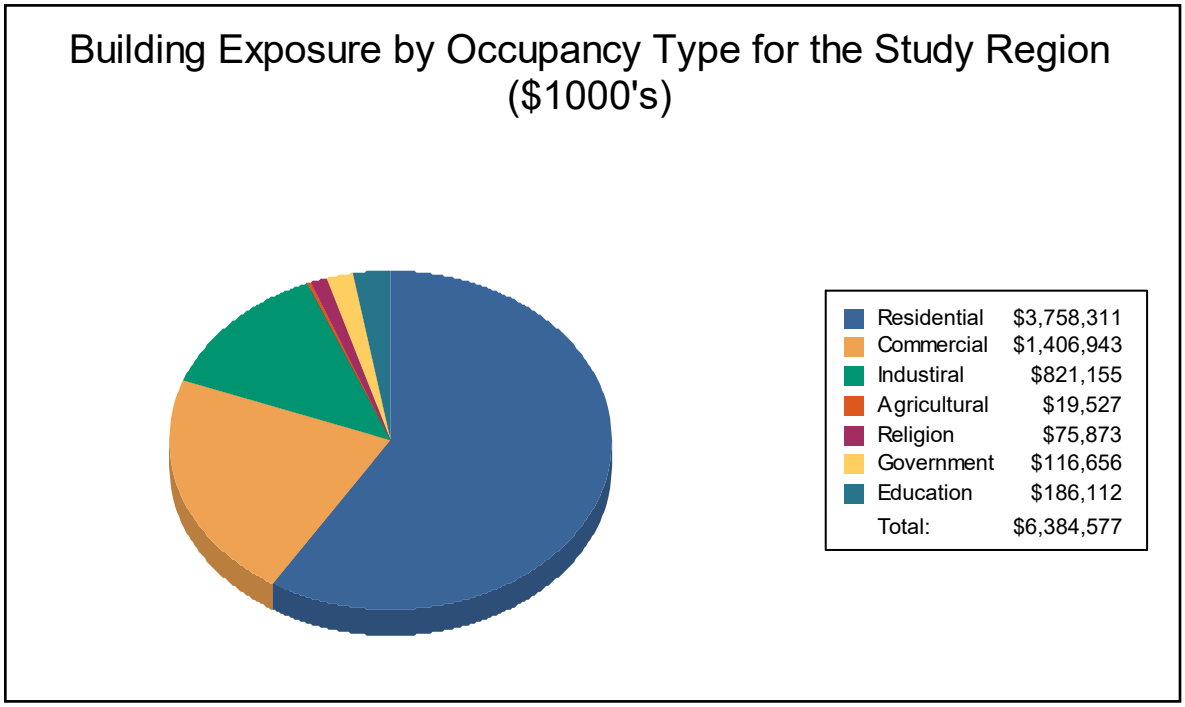
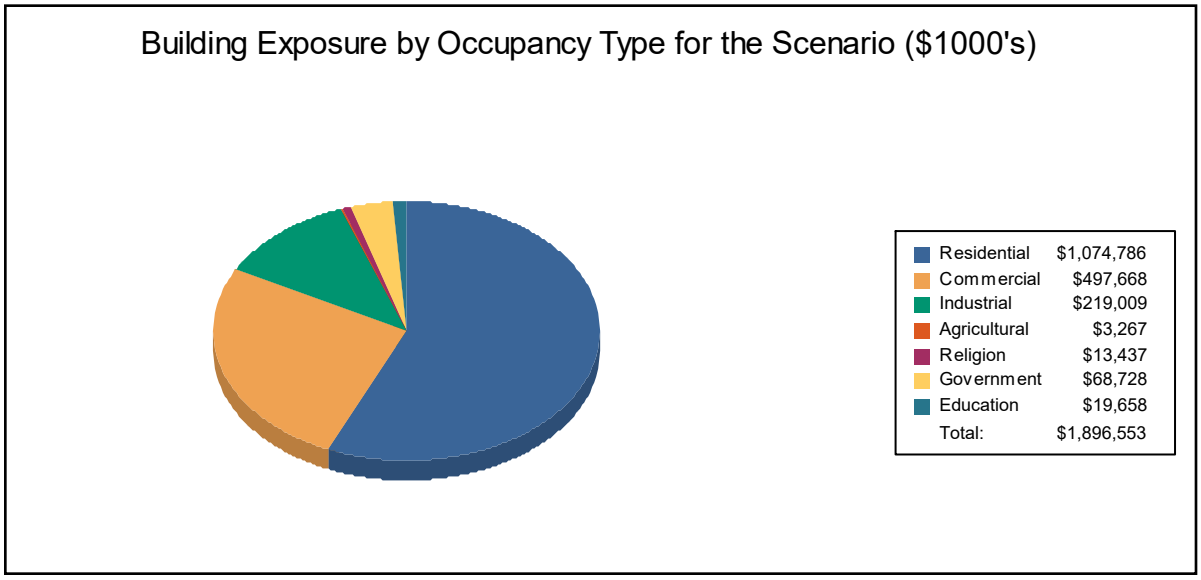


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,074,786	56.7%
Commercial	497,668	26.2%
Industrial	219,009	11.5%
Agricultural	3,267	0.2%
Religion	13,437	0.7%
Government	68,728	3.6%
Education	19,658	1.0%
Total	**1,896,553**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 2 fire stations, 1 police station and no emergency operation centers.

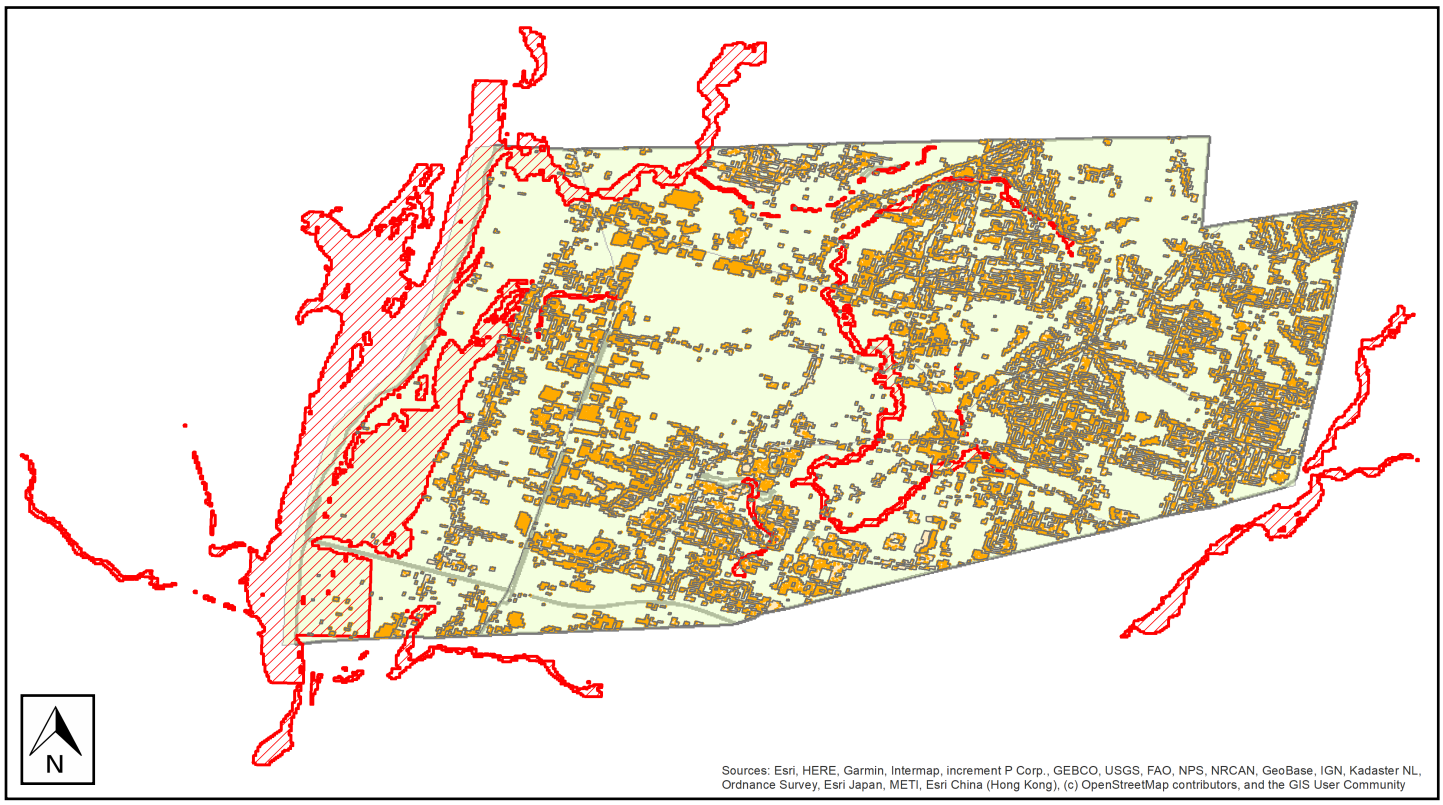
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	South_Windsor_FL
Scenario Name:	South_Windsor_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

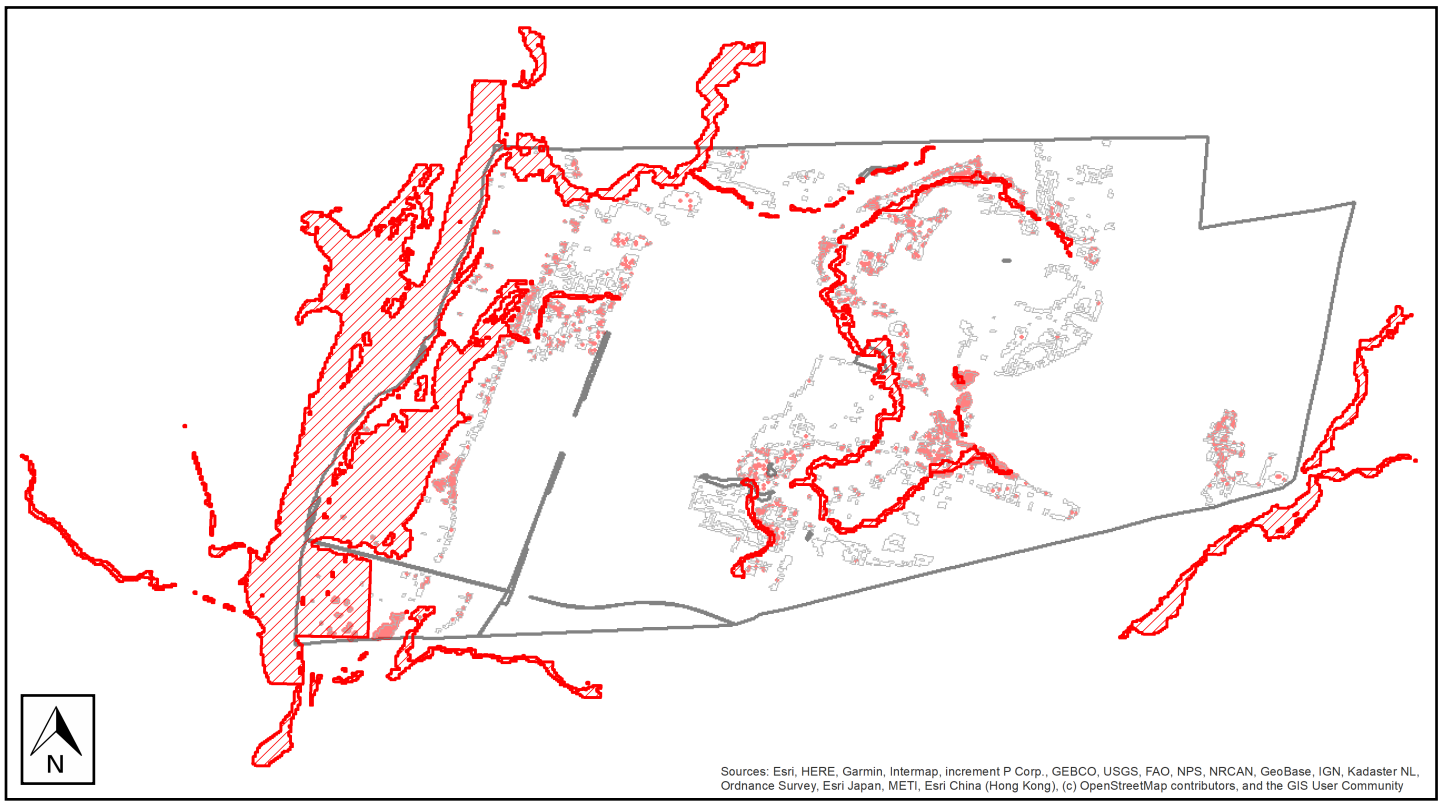


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	20	3	60	1	20	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	7	78	2	22	0	0	0	0	0	0	0	0
Total	**8**		**5**		**1**		**0**		**0**		**0**	

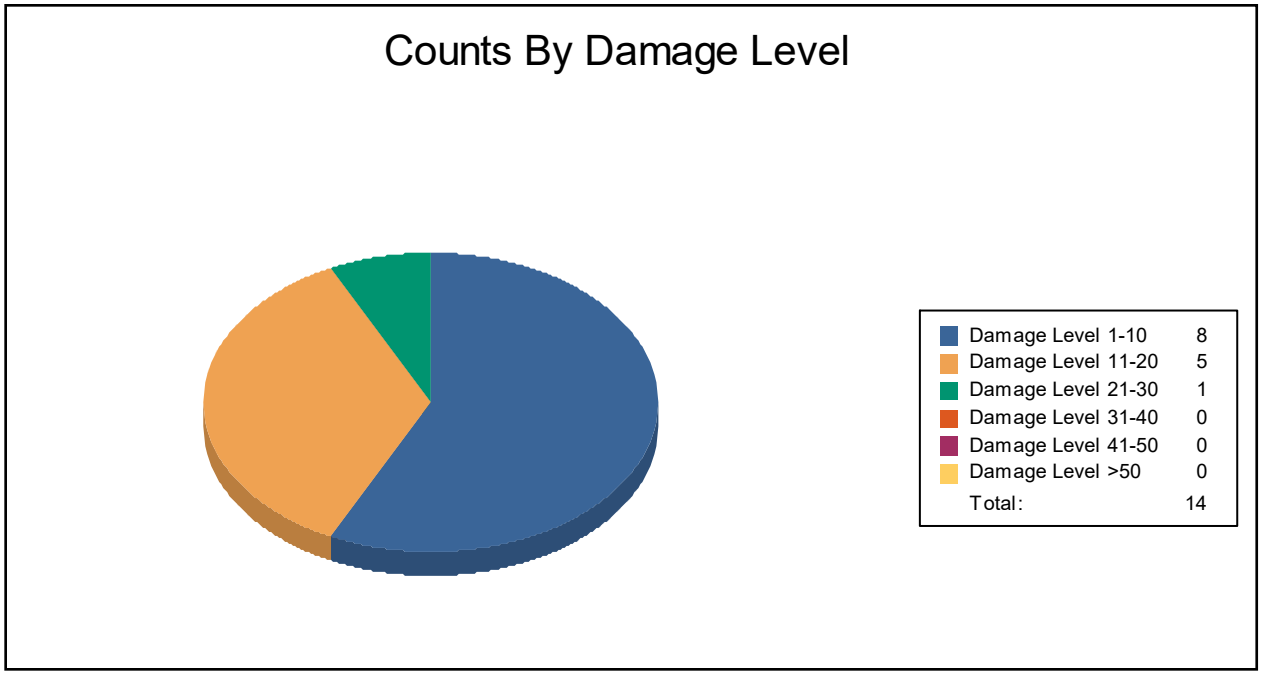


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	50	1	50	0	0	0	0	0	0	0	0
Steel	0	0	1	100	0	0	0	0	0	0	0	0
Wood	7	78	2	22	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	0	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

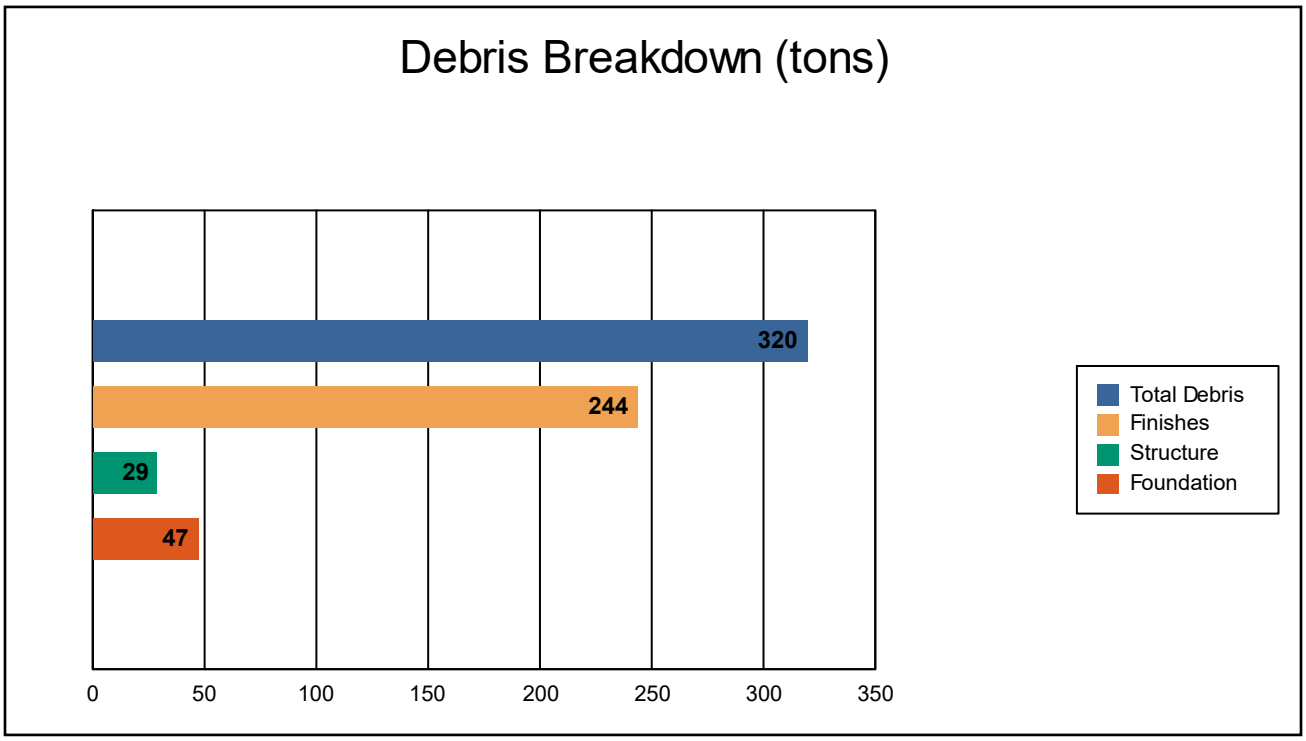
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

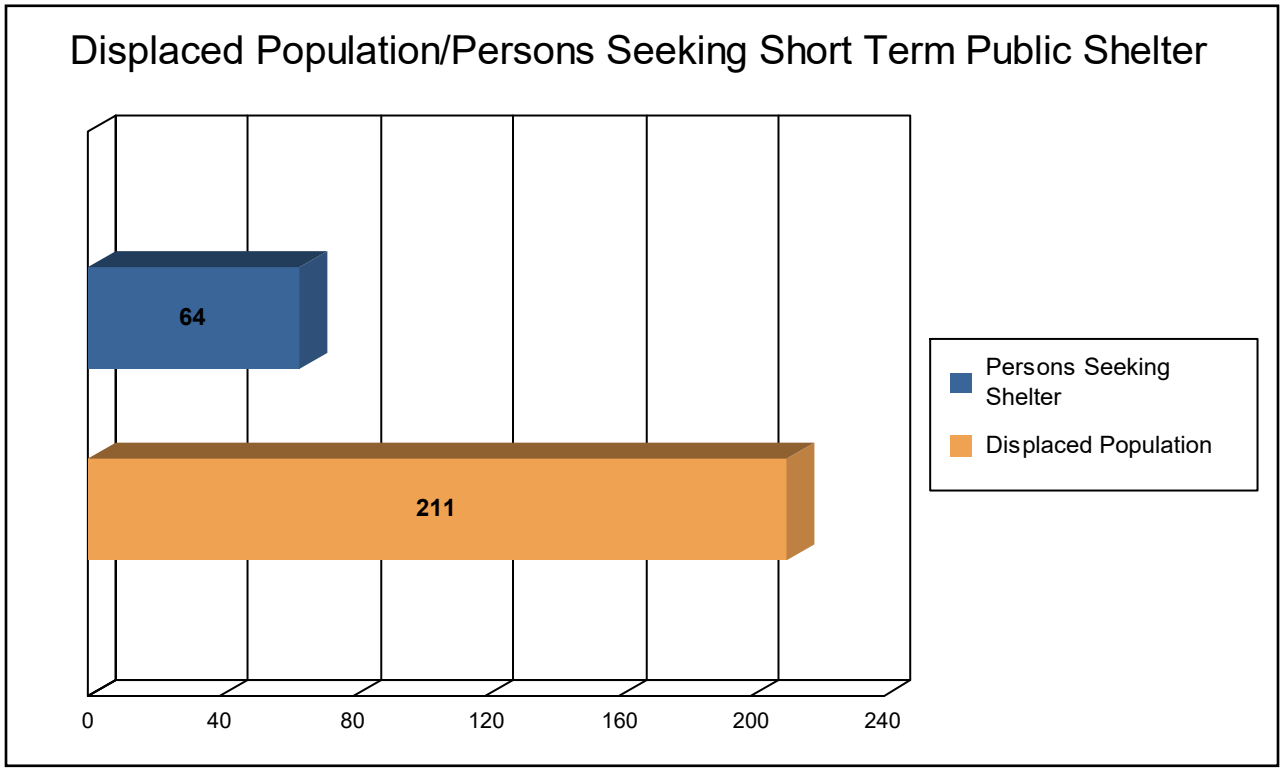


The model estimates that a total of 320 tons of debris will be generated. Of the total amount, Finishes comprises 76% of the total, Structure comprises 9% of the total, and Foundation comprises 15%. If the debris tonnage is converted into an estimated number of truckloads, it will require 13 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 70 households (or 211 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 64 people (out of a total population of 26,888) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 54.12 million dollars, which represents 2.85 % of the total replacement value of the scenario buildings.

Building-Related Losses

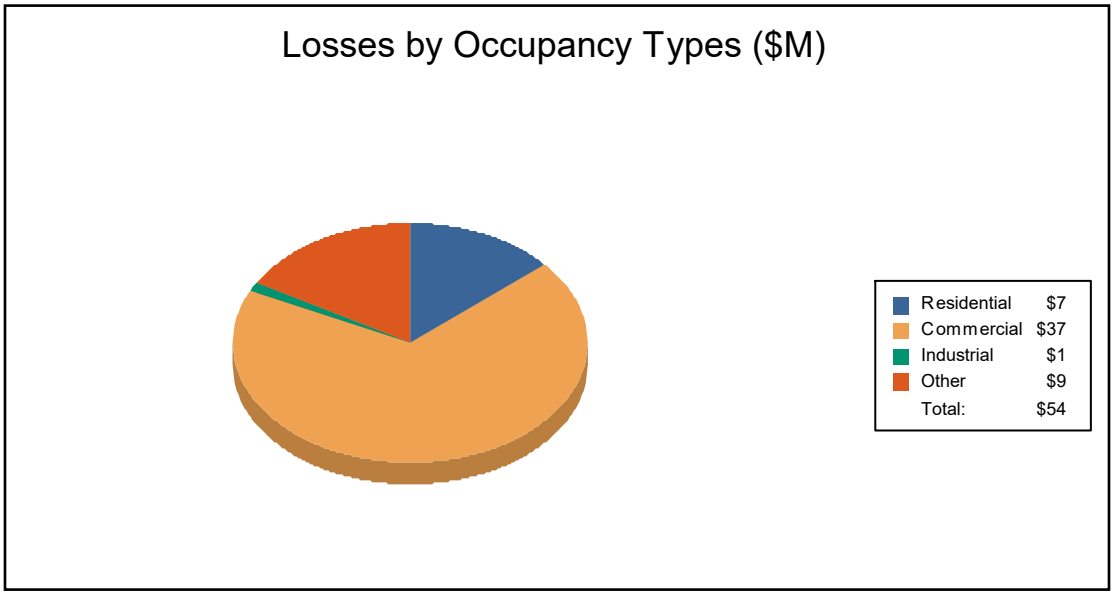
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 21.71 million dollars. 60% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.69% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.84	4.98	0.17	0.19	9.19
	Content	1.96	8.98	0.42	0.71	12.08
	Inventory	0.00	0.38	0.05	0.01	0.44
	Subtotal	**5.81**	**14.34**	**0.65**	**0.91**	**21.71**
Business Interruption						
	Income	0.02	11.38	0.01	0.18	11.59
	Relocation	0.93	2.91	0.01	0.15	3.99
	Rental Income	0.62	2.17	0.00	0.02	2.81
	Wage	0.04	6.27	0.02	7.69	14.02
	Subtotal	**1.61**	**22.73**	**0.04**	**8.04**	**32.41**
ALL	**Total**	**7.41**	**37.07**	**0.69**	**8.96**	**54.12**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,888	3,758,311	2,626,266	6,384,577
Total	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**
Total Study Region	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**

Hazus: Flood Global Risk Report

Region Name: South_Windsor_FL

Flood Scenario: South_Windsor_Flood

Print Date: Saturday, April 15, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 10 thousand households and has a total population of 26,888 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,662 buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 84.73% of the buildings (and 58.87% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,662 buildings in the region which have an aggregate total replacement value of 6,385 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
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Occupancy	Exposure ($1000)	Percent of Total
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Religion	75,873	1.2%
Government	116,656	1.8%
Education	186,112	2.9%
Total	**6,384,577**	**100%**

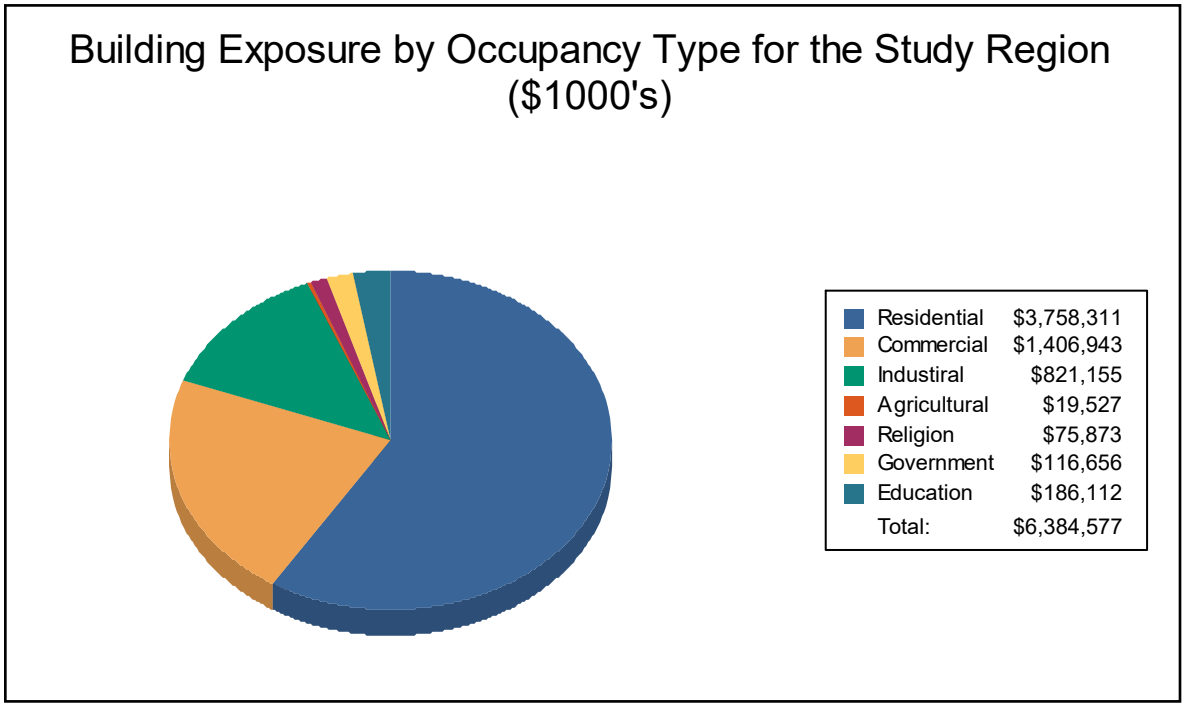
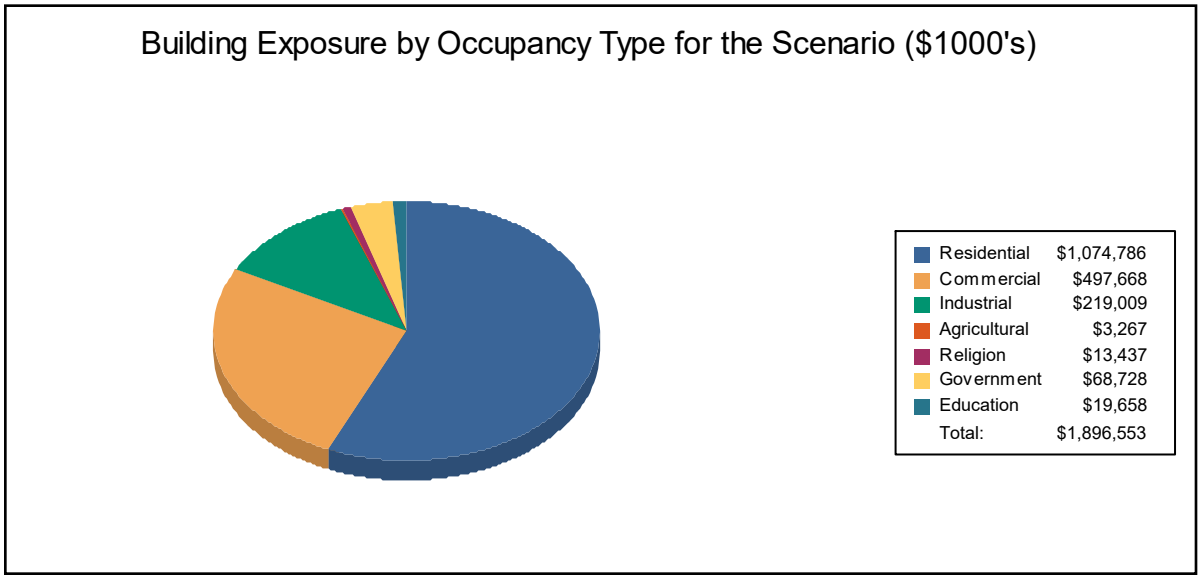


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,074,786	56.7%
Commercial	497,668	26.2%
Industrial	219,009	11.5%
Agricultural	3,267	0.2%
Religion	13,437	0.7%
Government	68,728	3.6%
Education	19,658	1.0%
Total	**1,896,553**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 2 fire stations, 1 police station and no emergency operation centers.

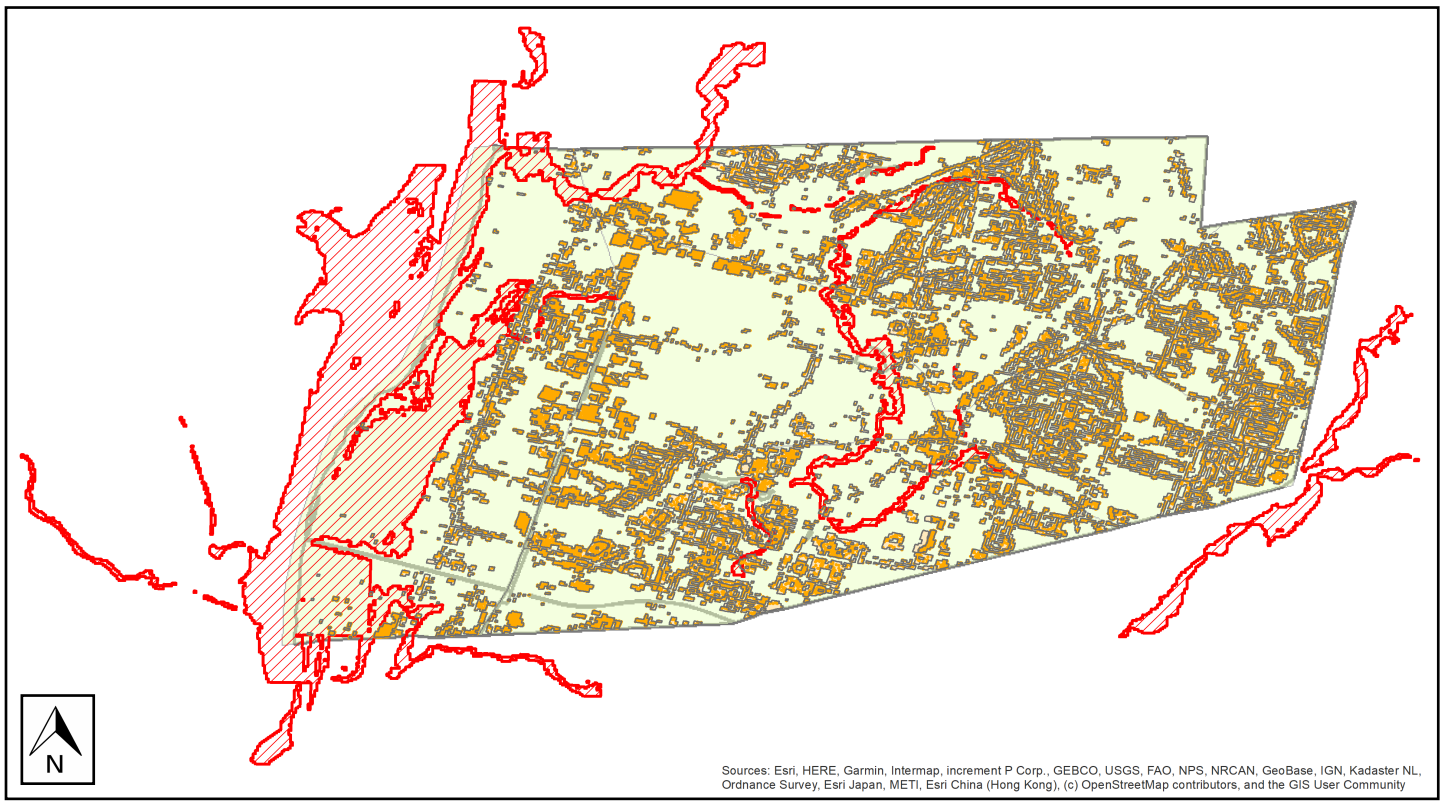
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	South_Windsor_FL
Scenario Name:	South_Windsor_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 8 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

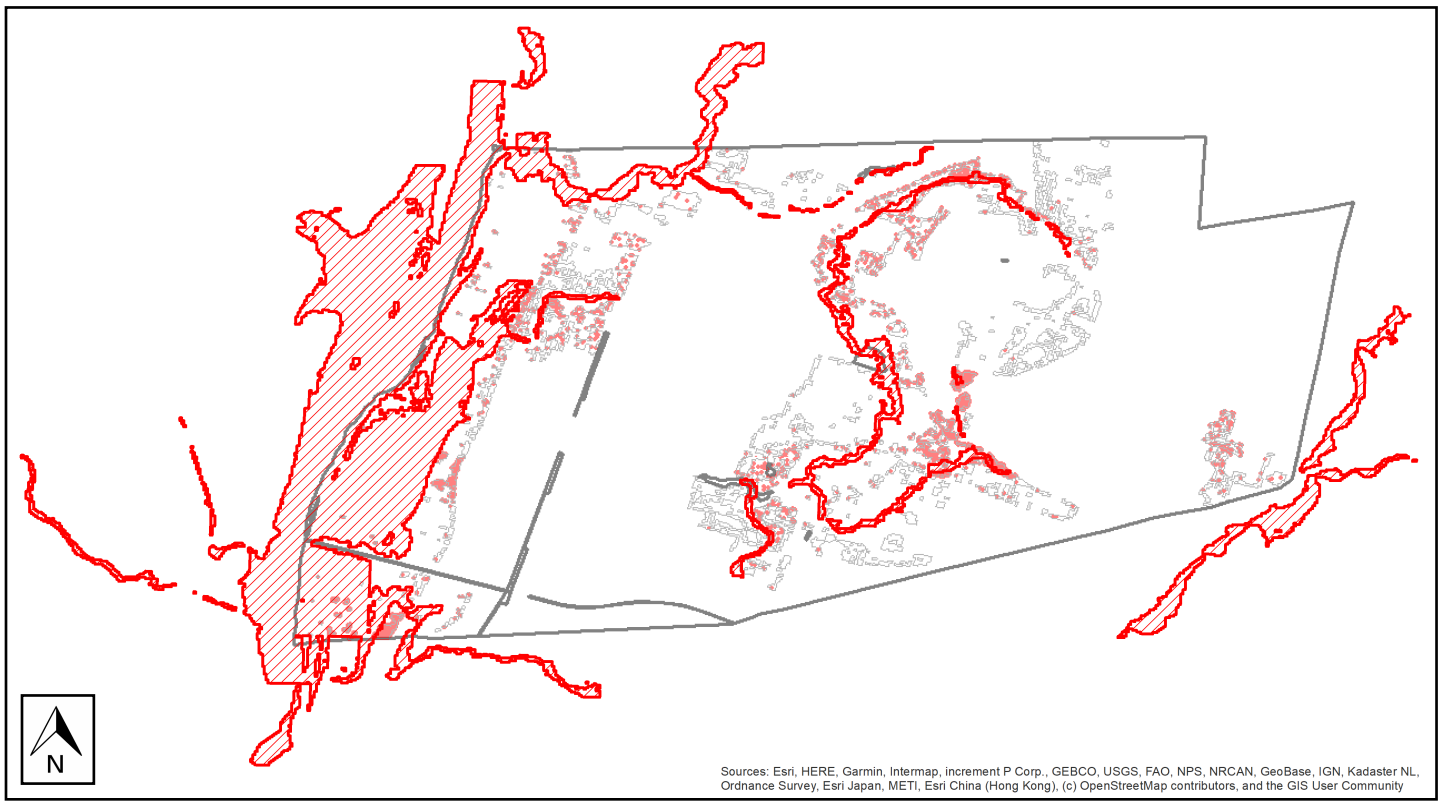


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	3	38	4	50	1	13	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	9	75	3	25	0	0	0	0	0	0	0	0
Total	**12**		**7**		**1**		**0**		**0**		**0**	

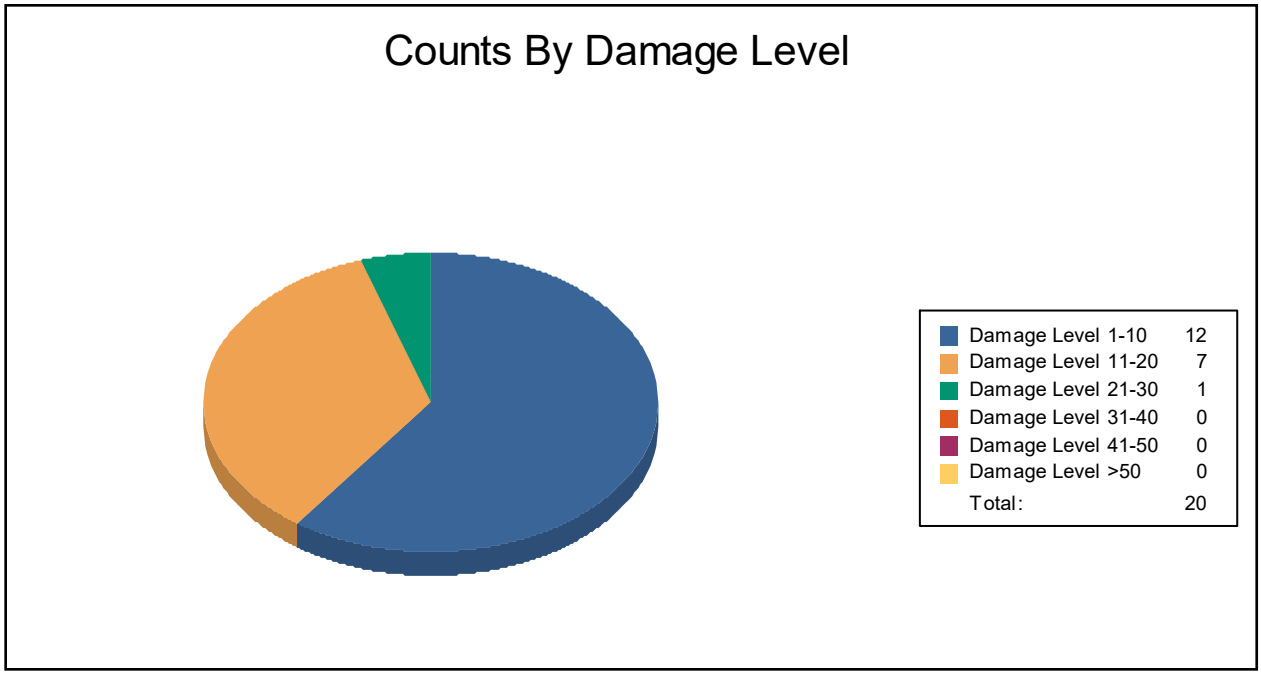


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	3	60	2	40	0	0	0	0	0	0	0	0
Steel	1	50	1	50	0	0	0	0	0	0	0	0
Wood	8	73	3	27	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	0	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

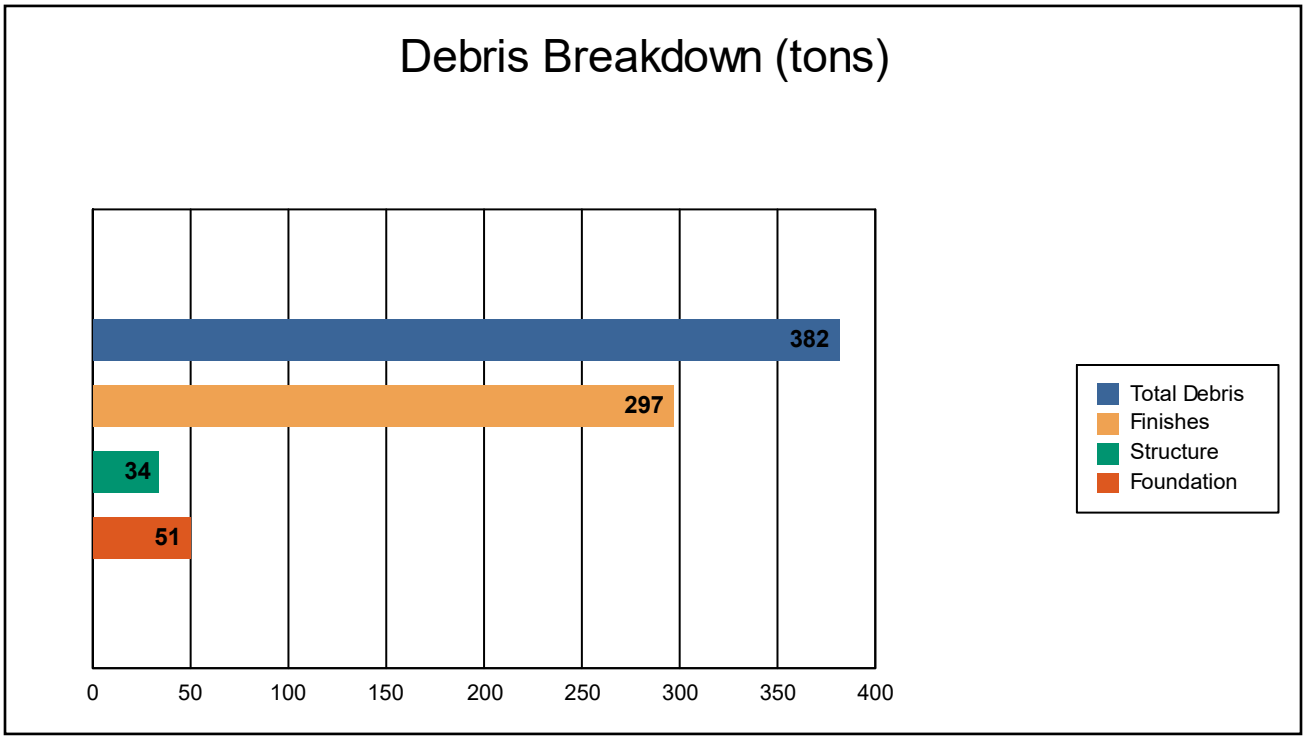
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

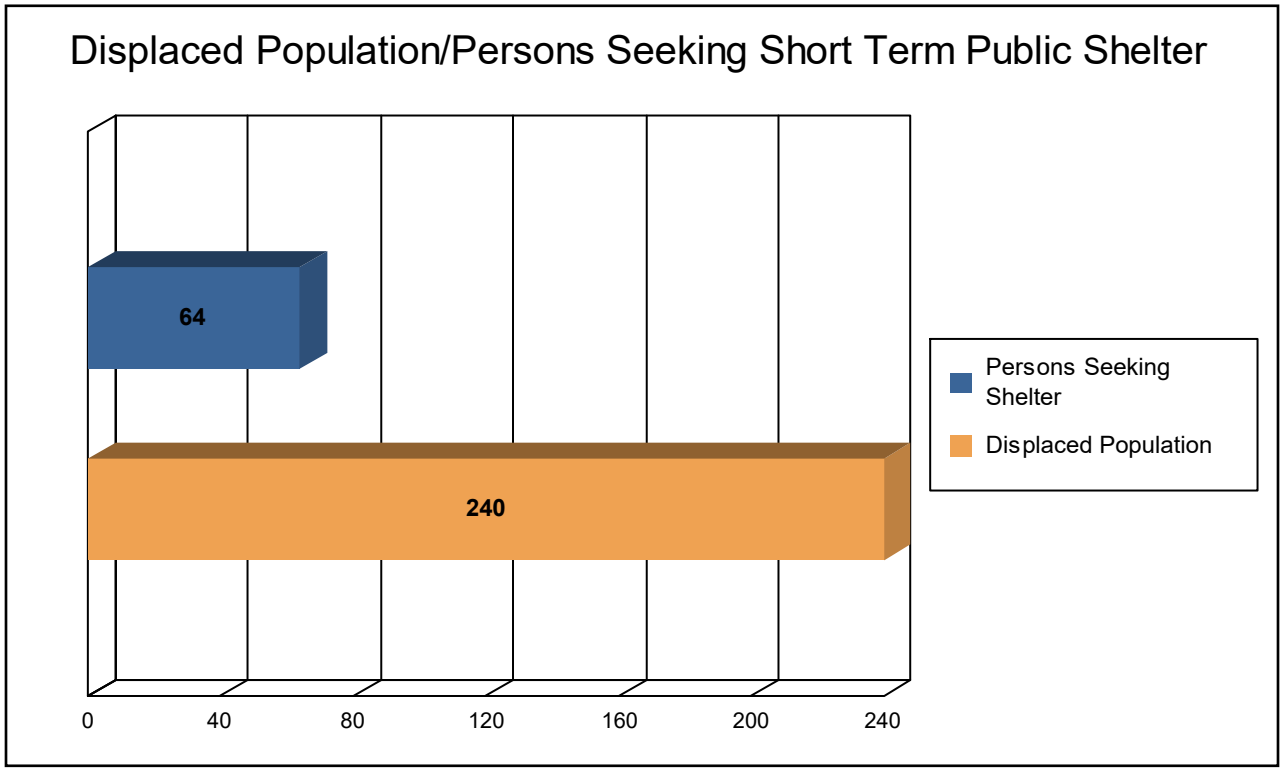


The model estimates that a total of 382 tons of debris will be generated. Of the total amount, Finishes comprises 78% of the total, Structure comprises 9% of the total, and Foundation comprises 13%. If the debris tonnage is converted into an estimated number of truckloads, it will require 16 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 80 households (or 240 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 64 people (out of a total population of 26,888) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 64.62 million dollars, which represents 3.41 % of the total replacement value of the scenario buildings.

Building-Related Losses

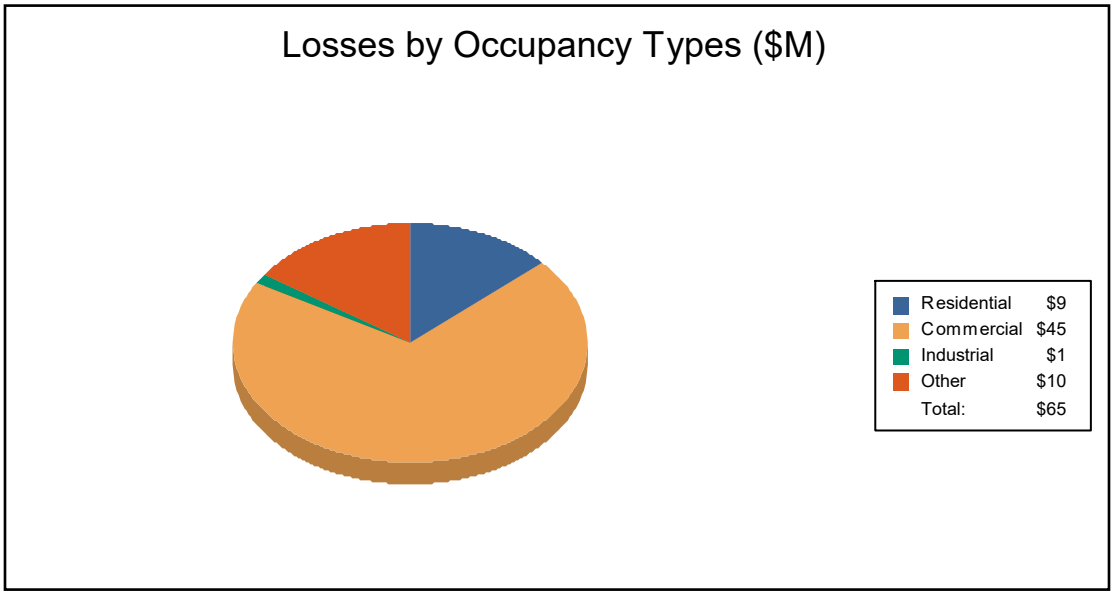
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 26.81 million dollars. 59% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.25% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.46	6.31	0.22	0.24	11.23
	Content	2.25	11.25	0.56	0.97	15.03
	Inventory	0.00	0.47	0.07	0.01	0.55
	Subtotal	**6.71**	**18.03**	**0.85**	**1.22**	**26.81**
Business Interruption						
	Income	0.02	13.77	0.01	0.21	14.01
	Relocation	1.08	3.53	0.01	0.16	4.78
	Rental Income	0.71	2.64	0.00	0.03	3.37
	Wage	0.04	7.31	0.02	8.28	15.65
	Subtotal	**1.85**	**27.24**	**0.04**	**8.67**	**37.81**
ALL	**Total**	**8.57**	**45.28**	**0.89**	**9.89**	**64.62**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,888	3,758,311	2,626,266	6,384,577
Total	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**
Total Study Region	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**

Hazus: Flood Global Risk Report

Region Name: South_Windsor_FL

Flood Scenario: South_Windsor_Flood

Print Date: Saturday, April 15, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 10 thousand households and has a total population of 26,888 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,662 buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 84.73% of the buildings (and 58.87% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,662 buildings in the region which have an aggregate total replacement value of 6,385 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,758,311	58.9%
Commercial	1,406,943	22.0%
Industrial	821,155	12.9%
Agricultural	19,527	0.3%
Religion	75,873	1.2%
Government	116,656	1.8%
Education	186,112	2.9%
Total	**6,384,577**	**100%**

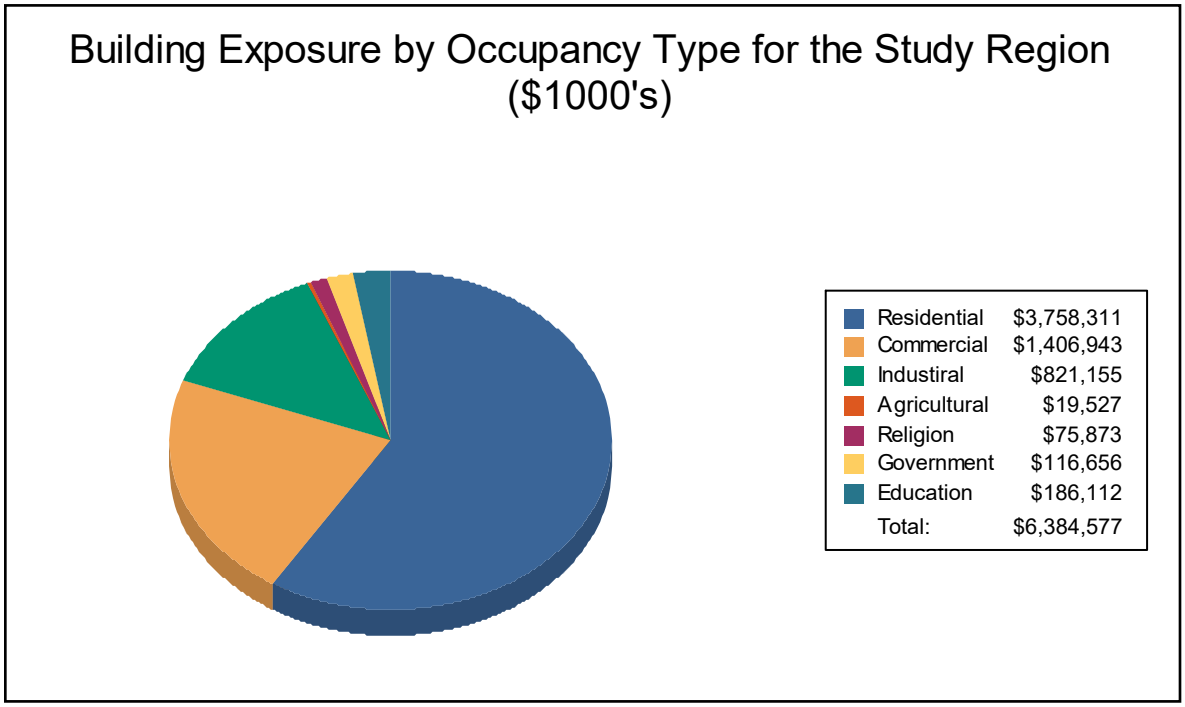
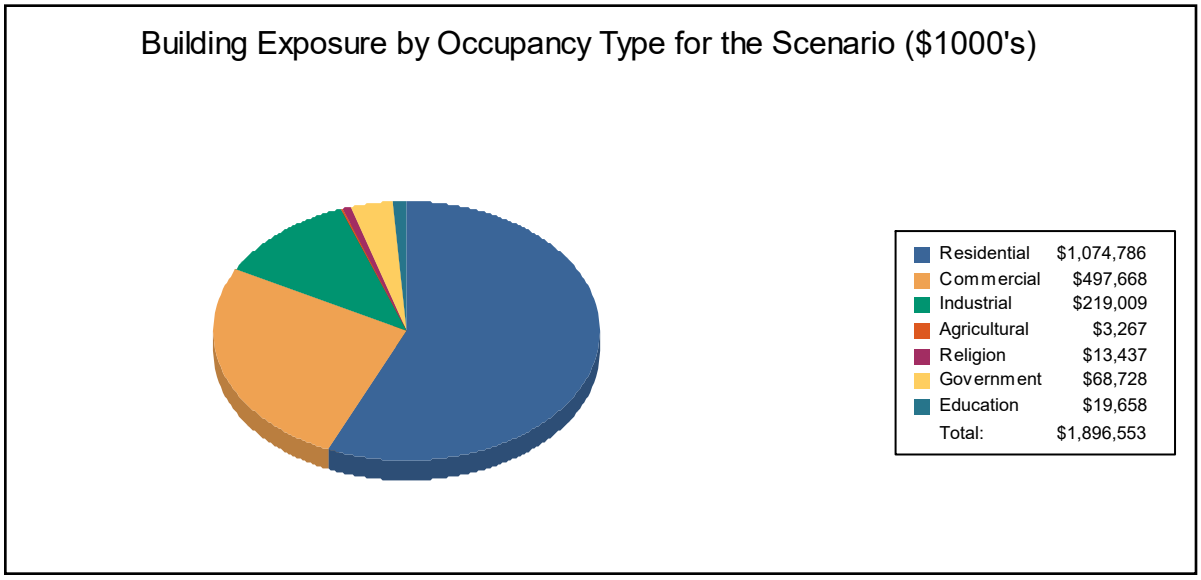


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,074,786	56.7%
Commercial	497,668	26.2%
Industrial	219,009	11.5%
Agricultural	3,267	0.2%
Religion	13,437	0.7%
Government	68,728	3.6%
Education	19,658	1.0%
Total	**1,896,553**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 2 fire stations, 1 police station and no emergency operation centers.

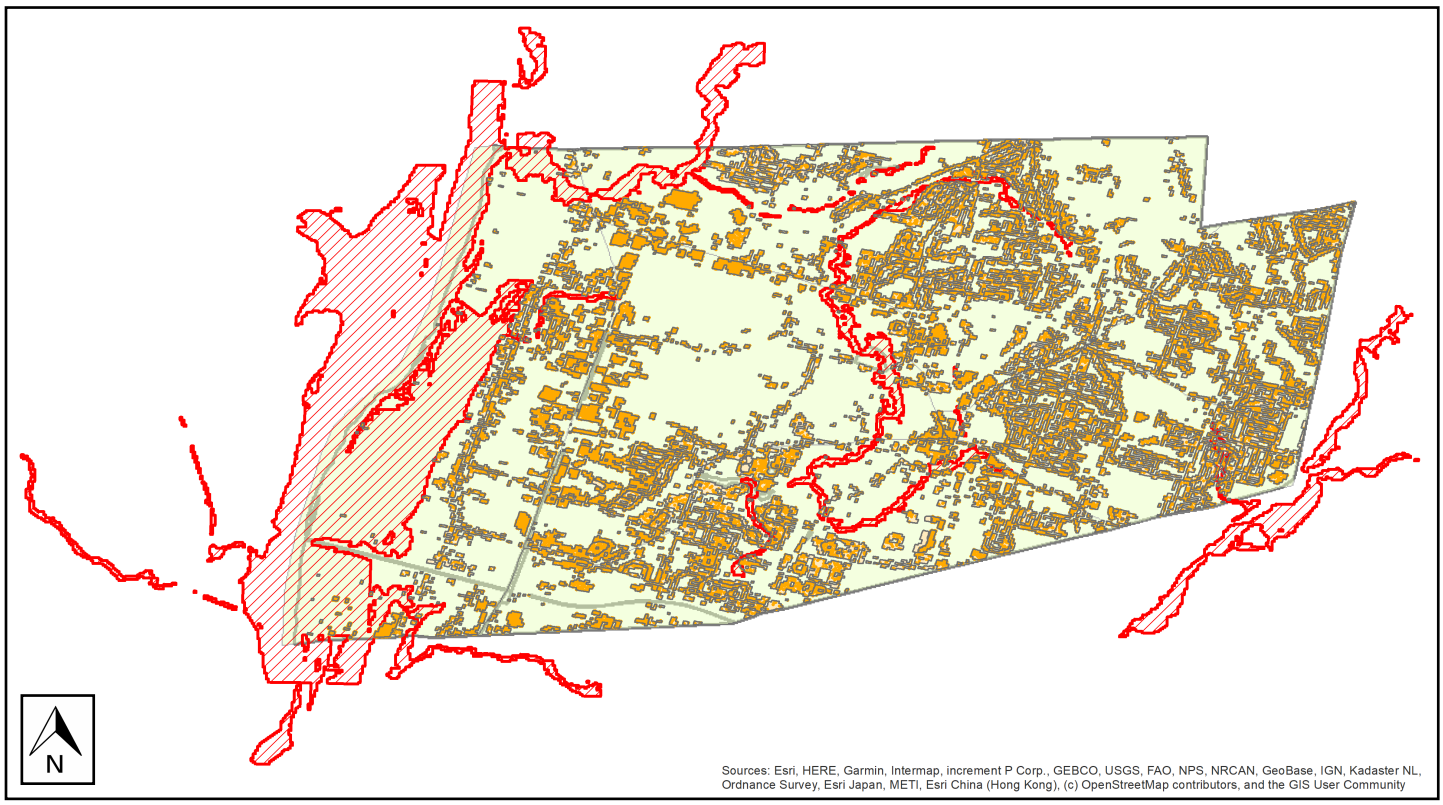
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	South_Windsor_FL
Scenario Name:	South_Windsor_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 12 buildings will be at least moderately damaged. This is over 91% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

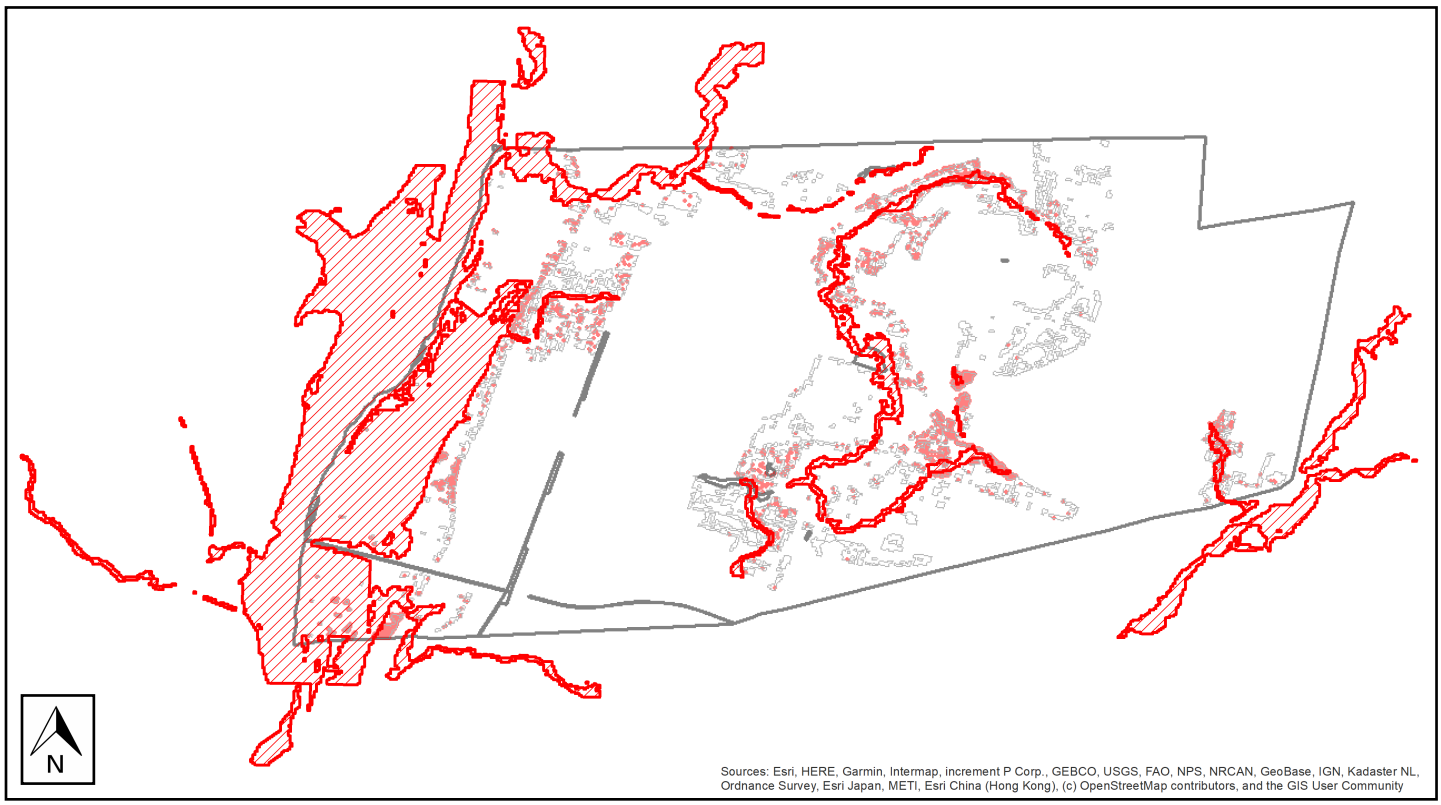


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	17	4	67	0	0	1	17	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	18	72	7	28	0	0	0	0	0	0	0	0
Total	**19**		**11**		**0**		**1**		**0**		**0**	

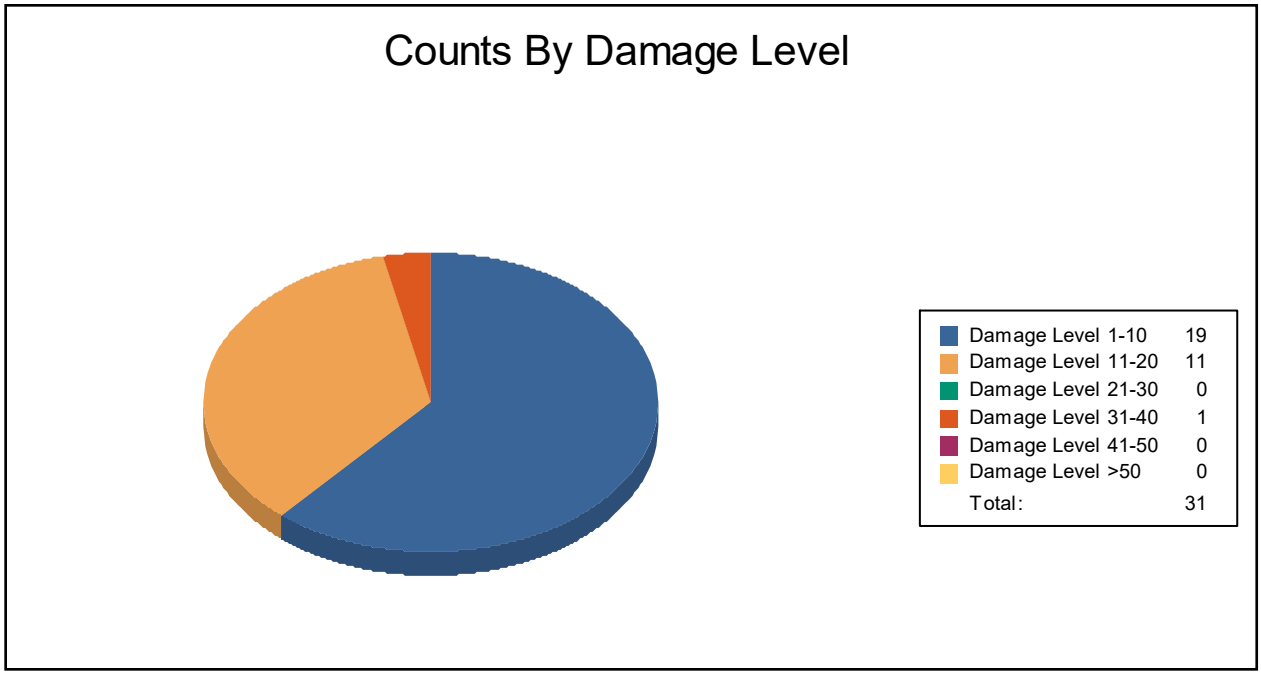


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	50	1	50	0	0	0	0	0	0	0	0
Steel	0	0	1	100	0	0	0	0	0	0	0	0
Wood	17	71	7	29	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	0	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

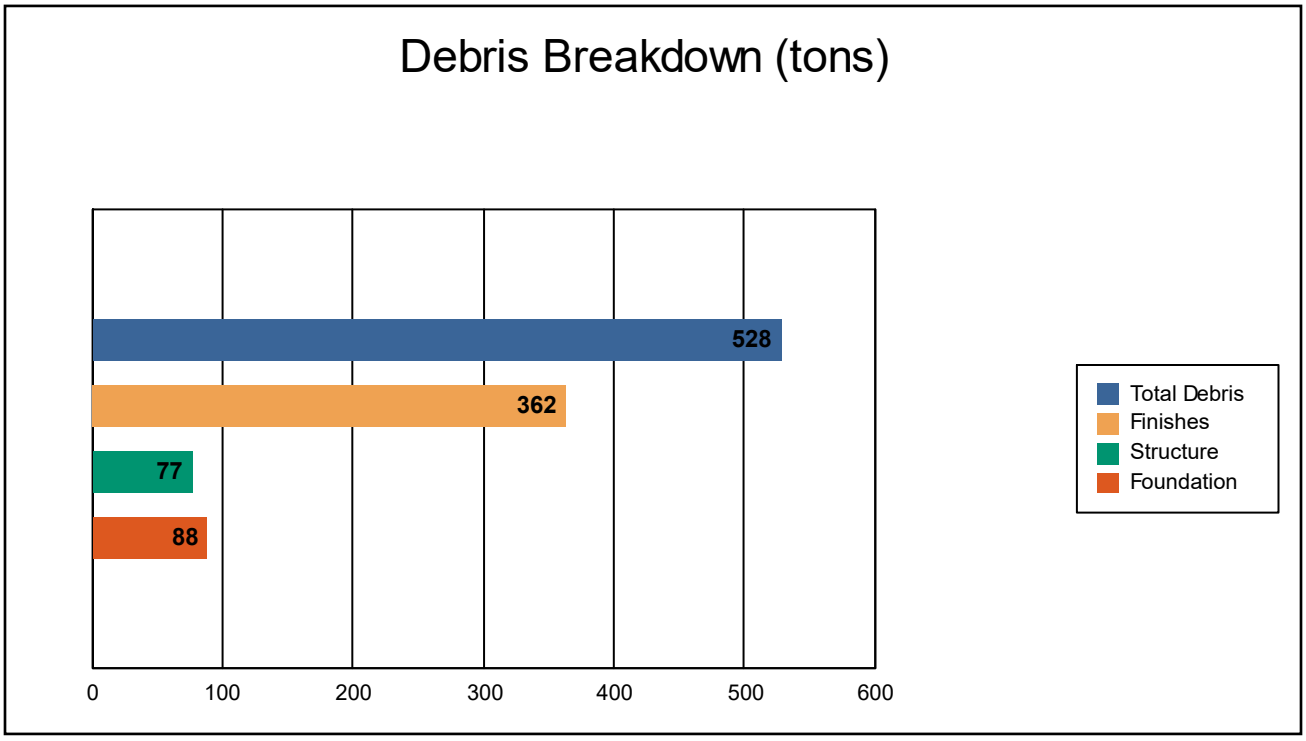
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

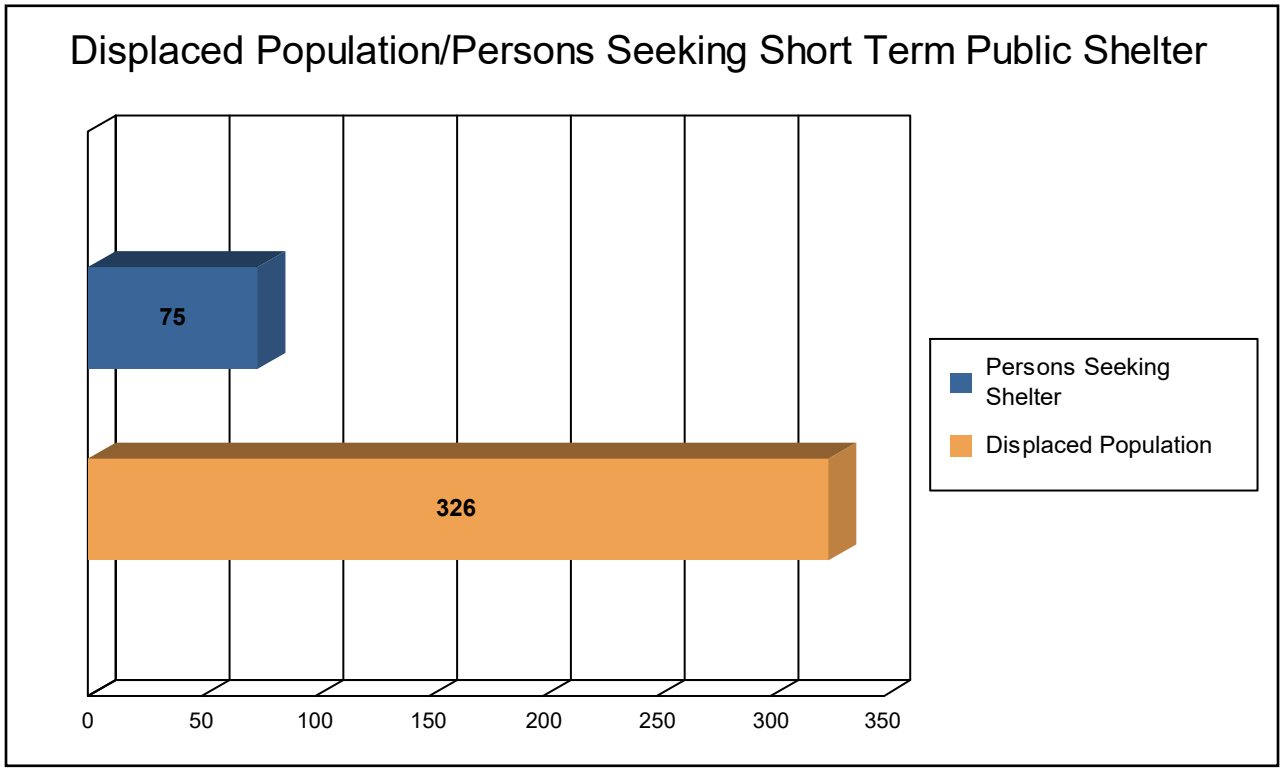


The model estimates that a total of 528 tons of debris will be generated. Of the total amount, Finishes comprises 69% of the total, Structure comprises 15% of the total, and Foundation comprises 17%. If the debris tonnage is converted into an estimated number of truckloads, it will require 22 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 109 households (or 326 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 75 people (out of a total population of 26,888) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 70.82 million dollars, which represents 3.73 % of the total replacement value of the scenario buildings.

Building-Related Losses

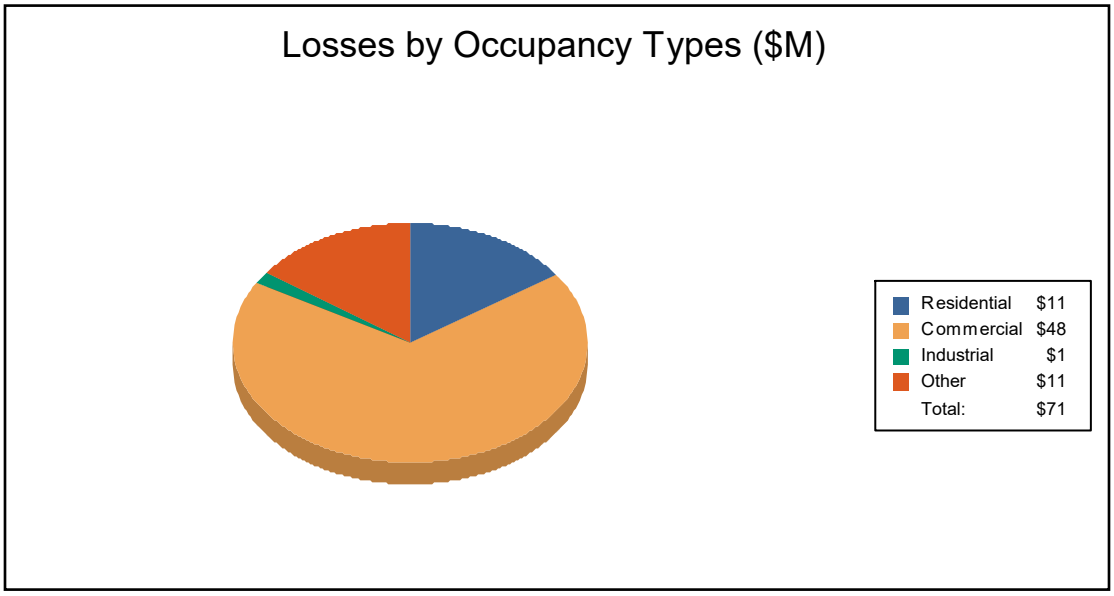
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 31.05 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 15.25% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.64	7.20	0.26	0.26	13.36
	Content	2.75	12.61	0.64	1.10	17.10
	Inventory	0.00	0.51	0.08	0.01	0.60
	Subtotal	**8.39**	**20.32**	**0.98**	**1.36**	**31.05**
Business Interruption						
	Income	0.02	14.16	0.01	0.26	14.44
	Relocation	1.50	3.62	0.01	0.19	5.31
	Rental Income	0.85	2.70	0.00	0.03	3.59
	Wage	0.04	7.50	0.03	8.86	16.43
	Subtotal	**2.41**	**27.98**	**0.05**	**9.34**	**39.77**
ALL	**Total**	**10.80**	**48.30**	**1.02**	**10.70**	**70.82**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,888	3,758,311	2,626,266	6,384,577
Total	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**
Total Study Region	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**

Hazus: Flood Global Risk Report

Region Name: South_Windsor_FL

Flood Scenario: South_Windsor_Flood

Print Date: Saturday, April 15, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 10 thousand households and has a total population of 26,888 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,662 buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 84.73% of the buildings (and 58.87% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,662 buildings in the region which have an aggregate total replacement value of 6,385 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,758,311	58.9%
Commercial	1,406,943	22.0%
Industrial	821,155	12.9%
Agricultural	19,527	0.3%
Religion	75,873	1.2%
Government	116,656	1.8%
Education	186,112	2.9%
Total	**6,384,577**	**100%**

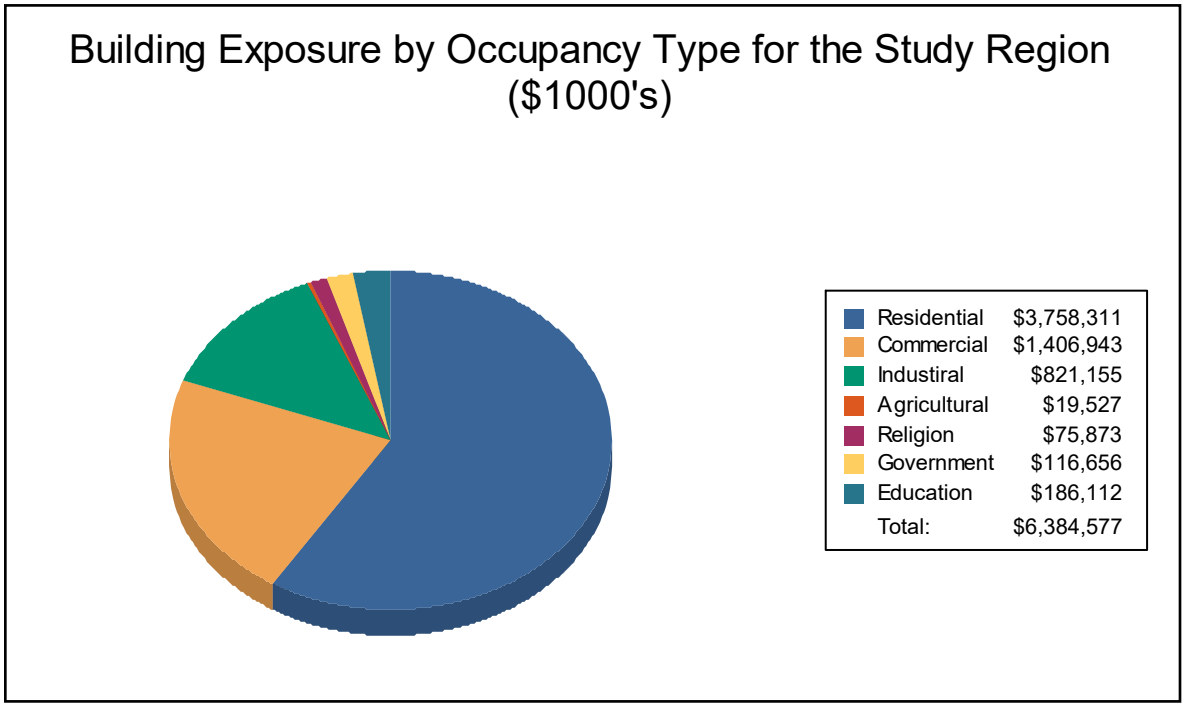
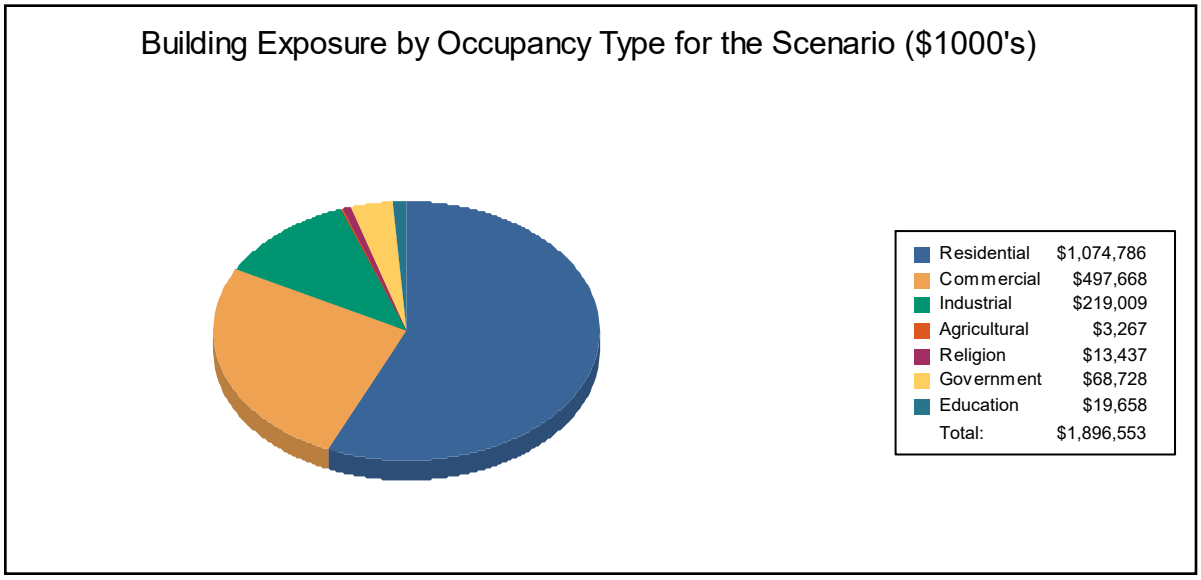


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,074,786	56.7%
Commercial	497,668	26.2%
Industrial	219,009	11.5%
Agricultural	3,267	0.2%
Religion	13,437	0.7%
Government	68,728	3.6%
Education	19,658	1.0%
Total	**1,896,553**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 8 schools, 2 fire stations, 1 police station and no emergency operation centers.

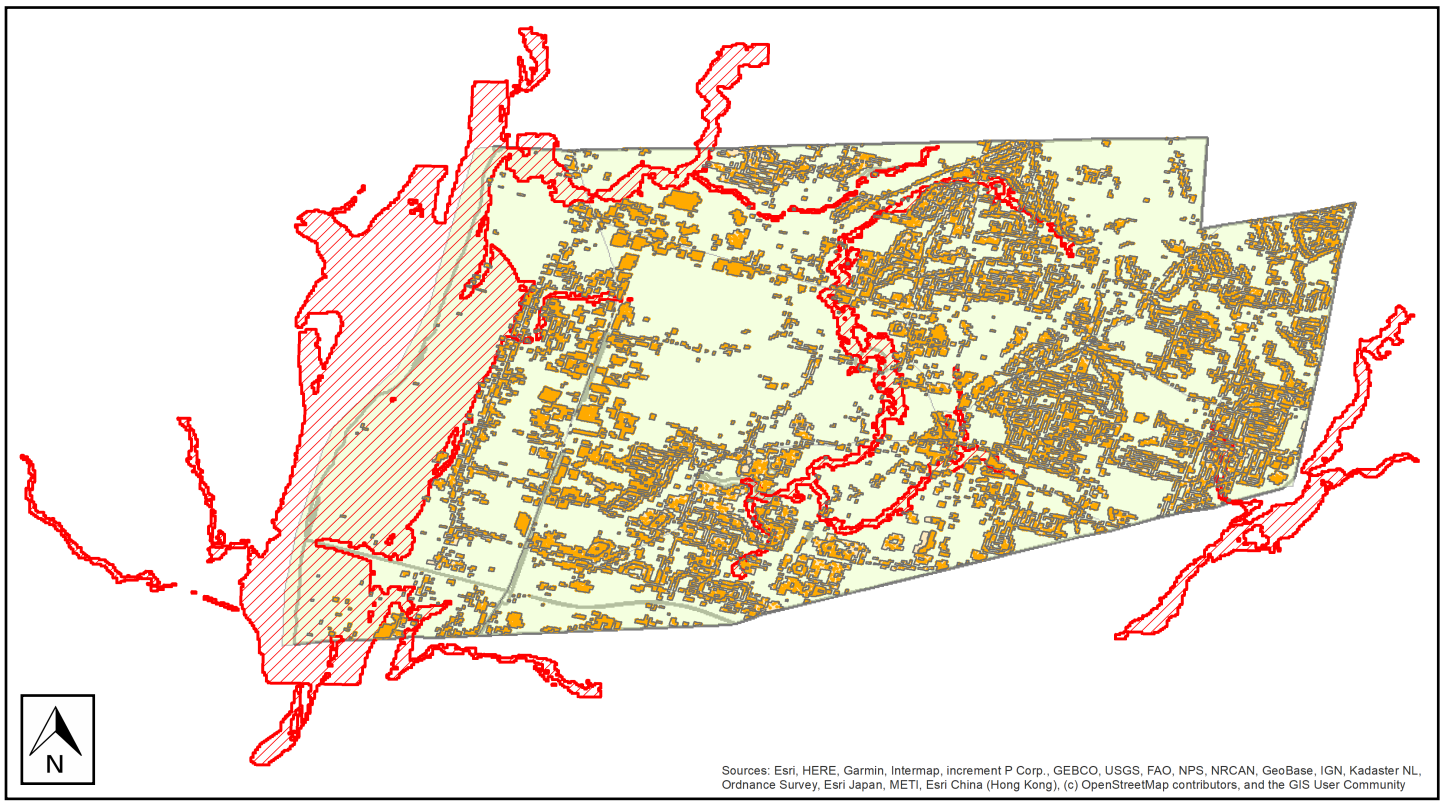
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	South_Windsor_FL
Scenario Name:	South_Windsor_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 36 buildings will be at least moderately damaged. This is over 88% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

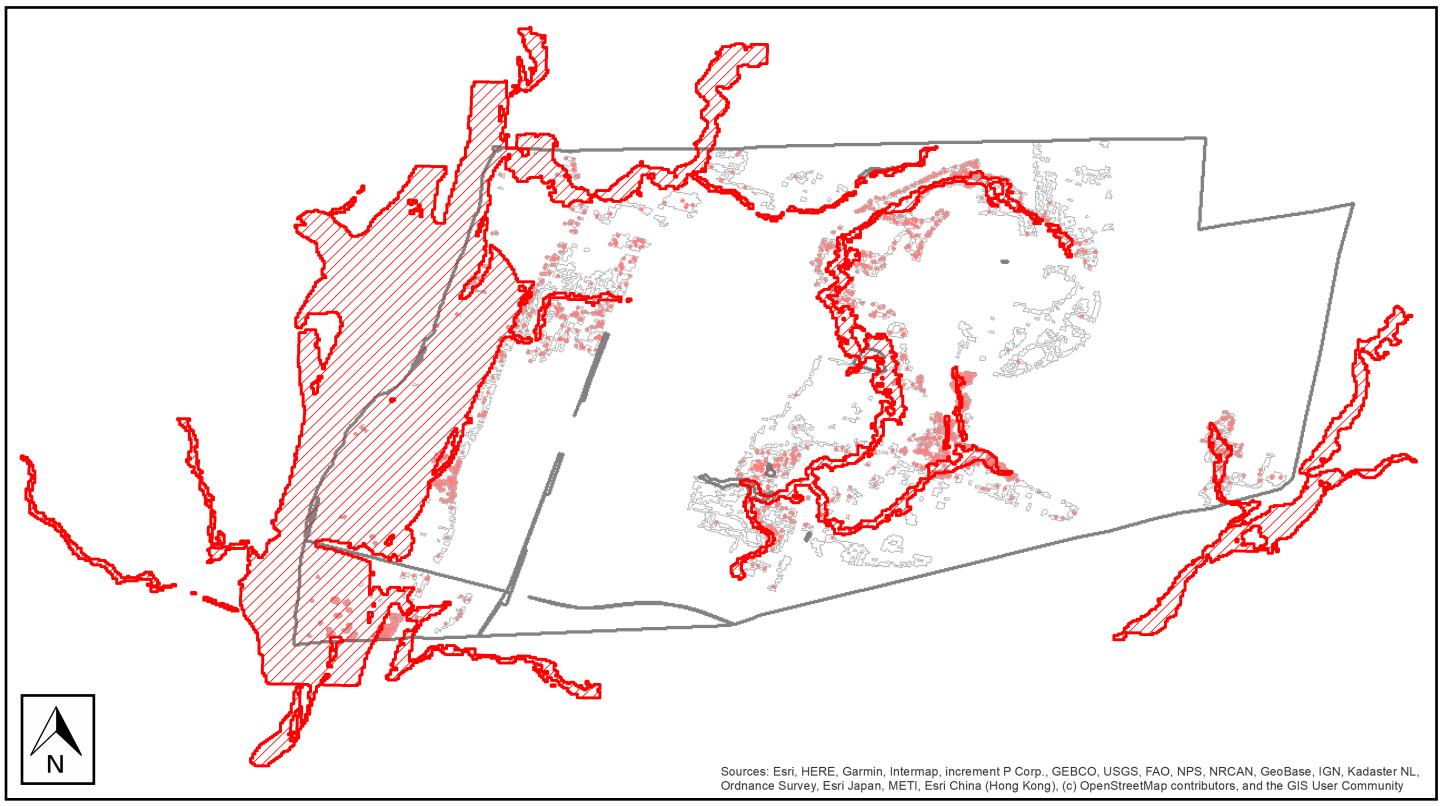


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	5	56	1	11	3	33	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	21	44	23	48	3	6	0	0	0	0	1	2
Total	**21**		**28**		**4**		**3**		**0**		**1**	

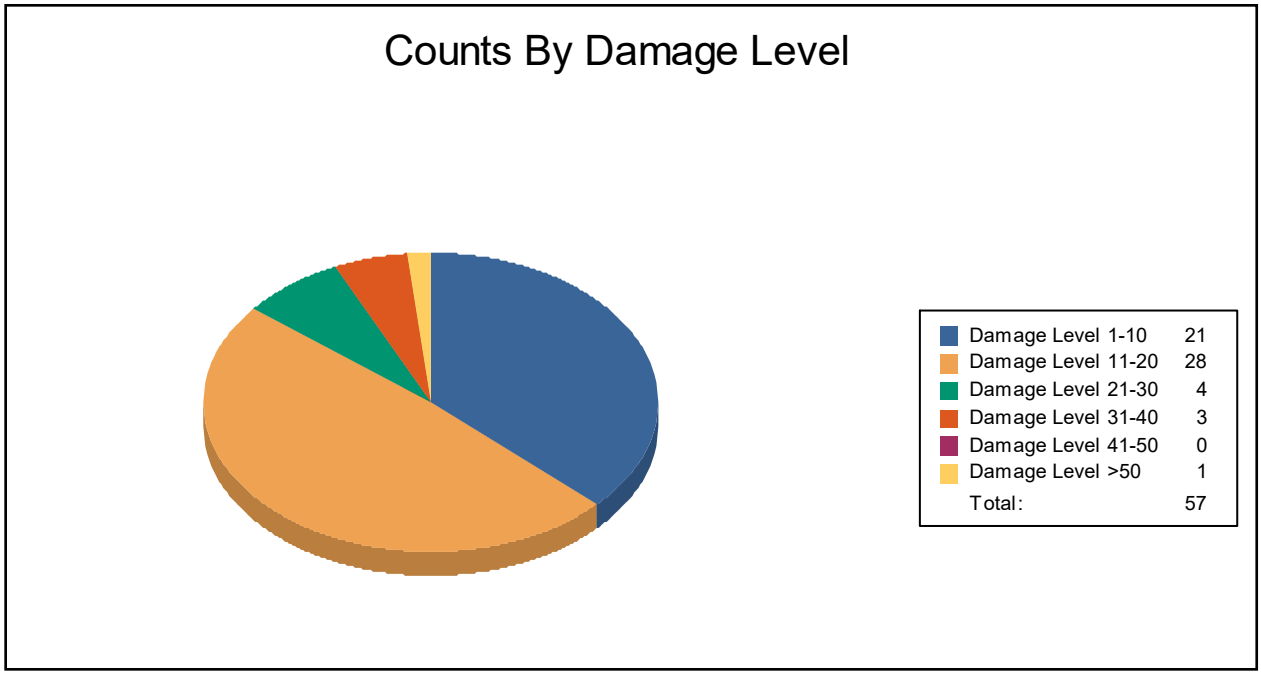


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	17	3	50	1	17	1	17	0	0	0	0
Steel	0	0	1	50	0	0	1	50	0	0	0	0
Wood	20	42	23	48	3	6	1	2	0	0	1	2

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	0	0	0	0
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	8	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

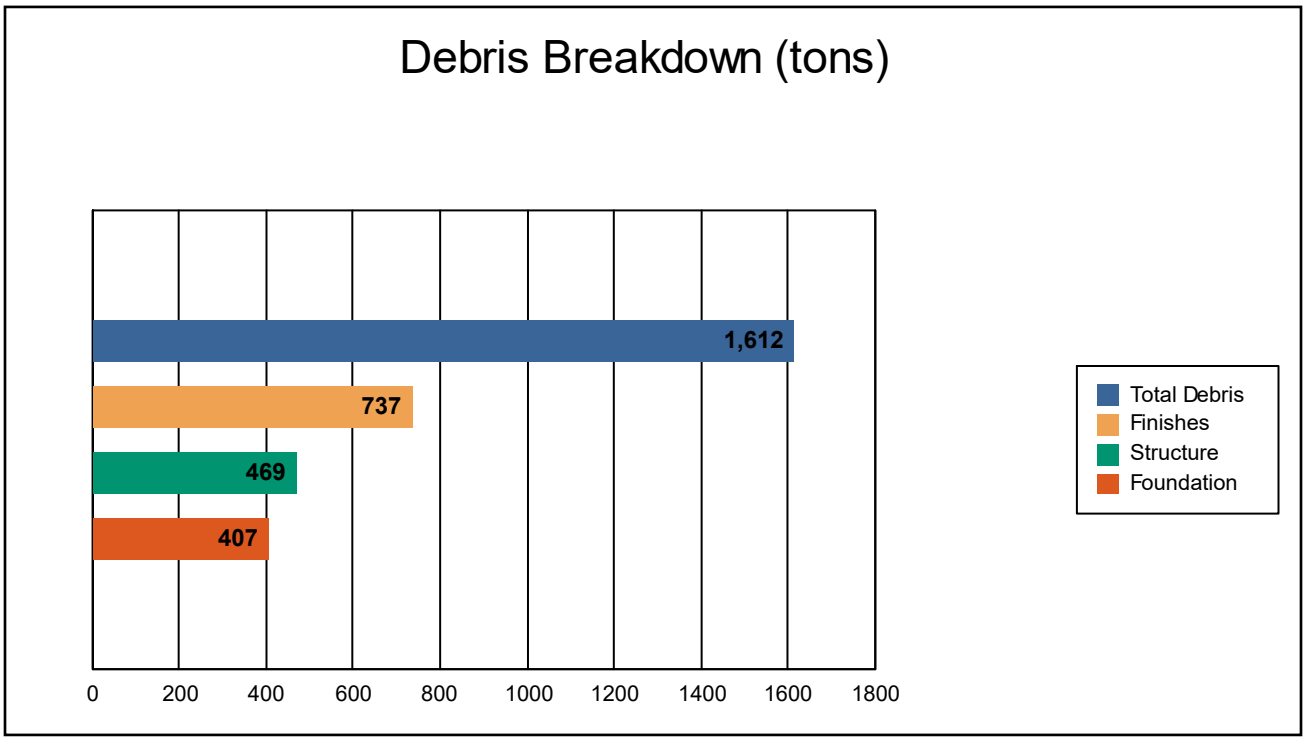
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

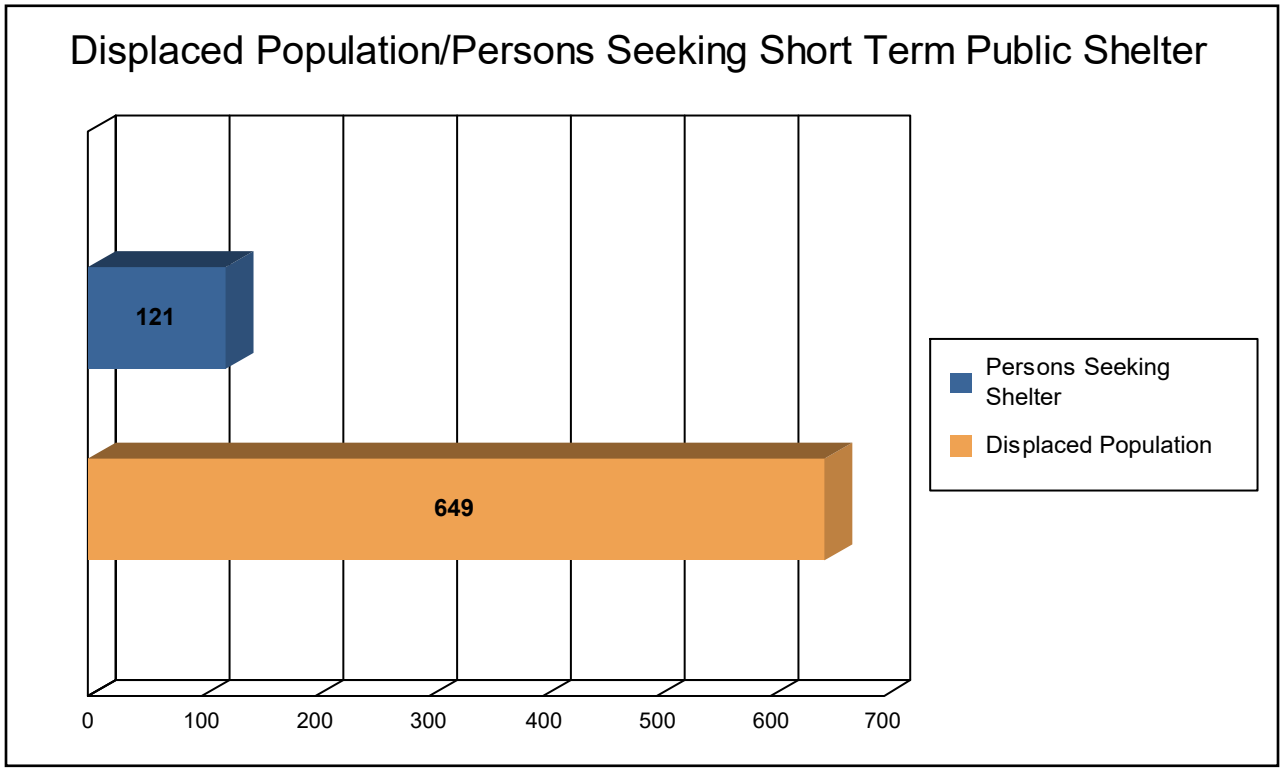


The model estimates that a total of 1,612 tons of debris will be generated. Of the total amount, Finishes comprises 46% of the total, Structure comprises 29% of the total, and Foundation comprises 25%. If the debris tonnage is converted into an estimated number of truckloads, it will require 65 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 216 households (or 649 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 121 people (out of a total population of 26,888) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 148.41 million dollars, which represents 7.83 % of the total replacement value of the scenario buildings.

Building-Related Losses

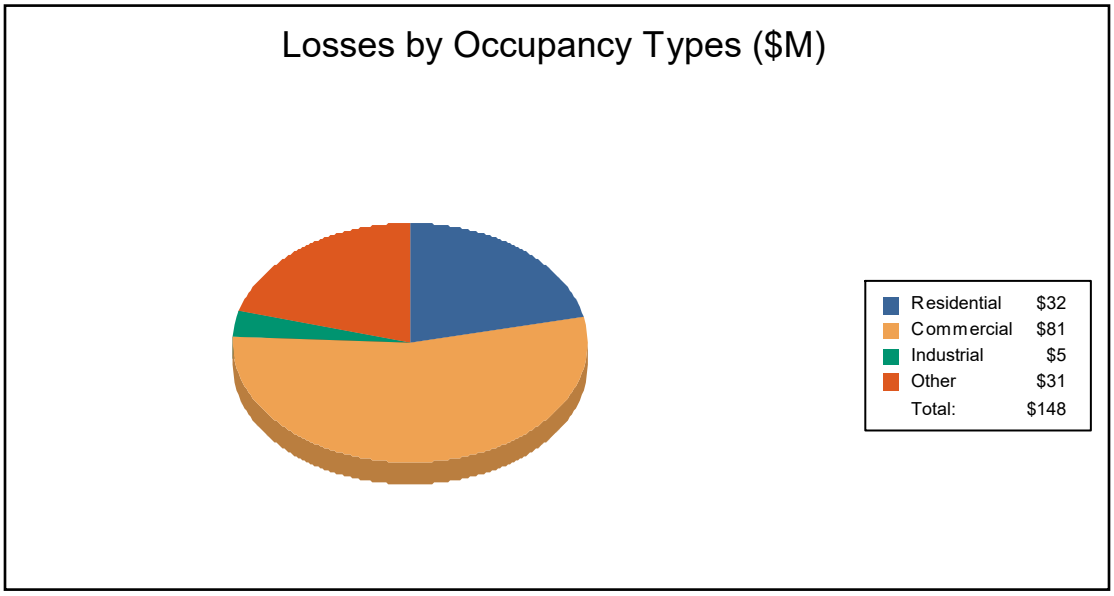
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 74.07 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 21.49% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	18.00	12.96	1.36	0.89	33.20
	Content	8.58	23.91	3.08	3.14	38.71
	Inventory	0.00	1.72	0.40	0.03	2.15
	Subtotal	**26.58**	**38.59**	**4.85**	**4.06**	**74.07**
Business Interruption						
	Income	0.05	19.93	0.05	0.56	20.59
	Relocation	3.24	5.00	0.04	0.50	8.78
	Rental Income	1.91	3.69	0.01	0.12	5.72
	Wage	0.12	13.46	0.09	25.59	39.25
	Subtotal	**5.31**	**42.08**	**0.19**	**26.77**	**74.34**
ALL	**Total**	**31.89**	**80.66**	**5.03**	**30.82**	**148.41**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	26,888	3,758,311	2,626,266	6,384,577
Total	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**
Total Study Region	**26,888**	**3,758,311**	**2,626,266**	**6,384,577**

Hazus: Flood Global Risk Report

Region Name: Southington_FL

Flood Scenario: Southington_Flood

Print Date: Sunday, April 16, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

RiskMAP
Increasing Resilience Together

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 12 square miles and contains 500 census blocks. The region contains over 17 thousand households and has a total population of 43,501 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 15,820 buildings in the region with a total building replacement value (excluding contents) of 8,843 million dollars. Approximately 88.08% of the buildings (and 68.74% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 15,820 buildings in the region which have an aggregate total replacement value of 8,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	6,078,826	68.7%
Commercial	1,571,725	17.8%
Industrial	587,282	6.6%
Agricultural	16,290	0.2%
Religion	73,670	0.8%
Government	263,619	3.0%
Education	251,898	2.8%
Total	**8,843,310**	**100%**

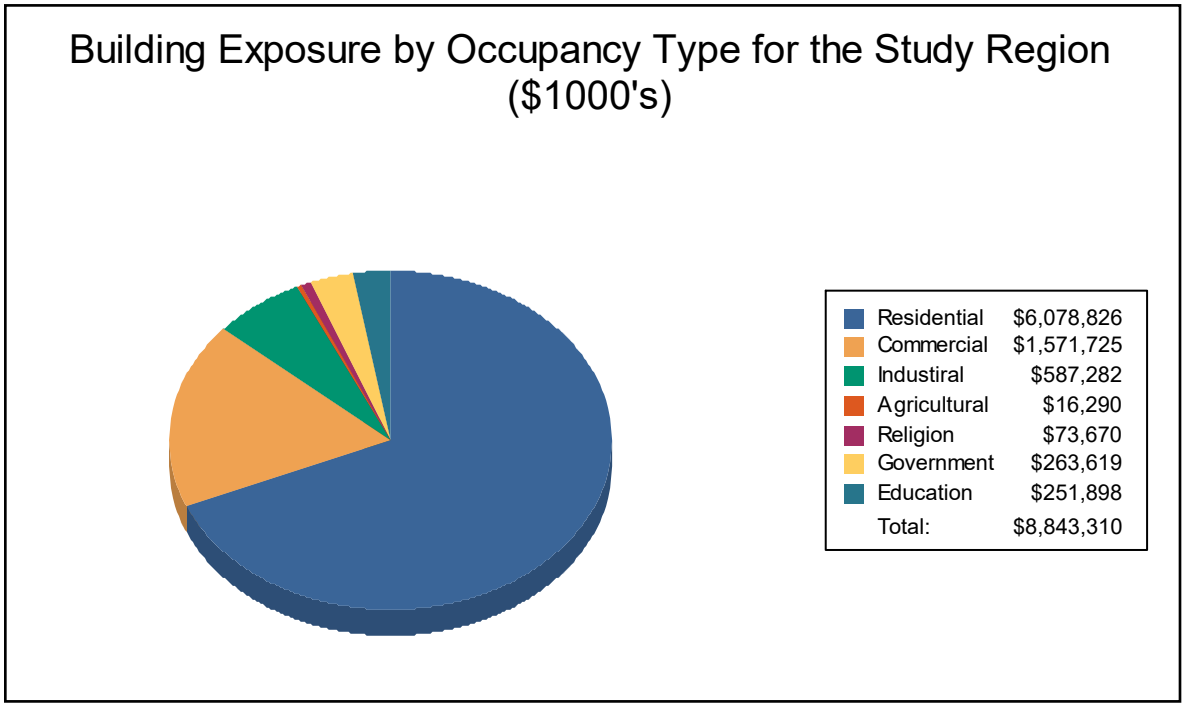
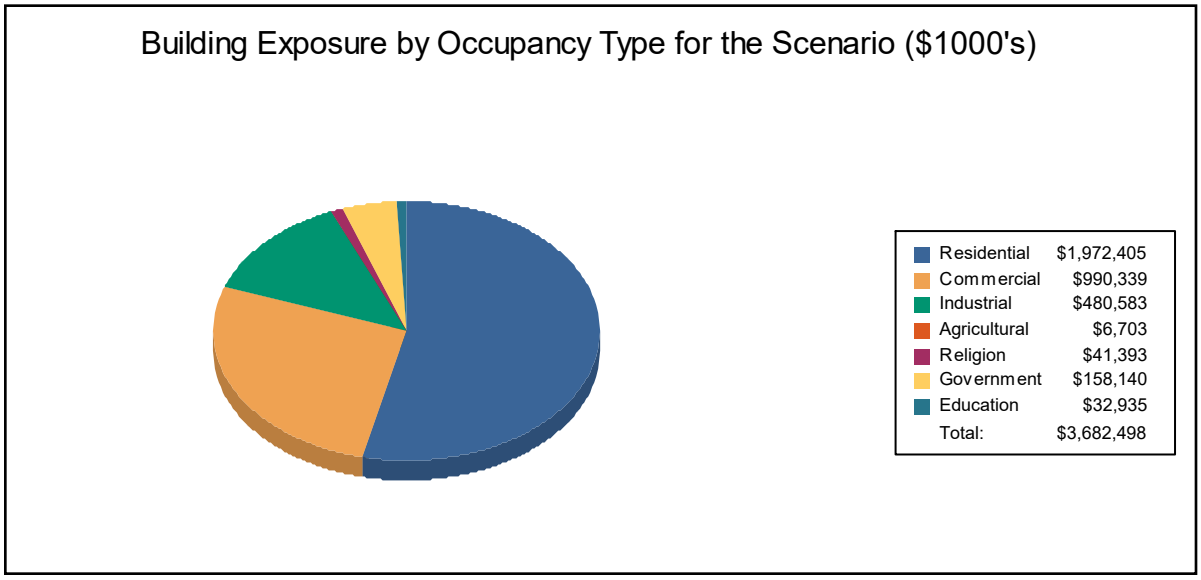


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,972,405	53.6%
Commercial	990,339	26.9%
Industrial	480,583	13.1%
Agricultural	6,703	0.2%
Religion	41,393	1.1%
Government	158,140	4.3%
Education	32,935	0.9%
Total	**3,682,498**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 15 schools, 3 fire stations, 1 police station and 1 emergency operation center.

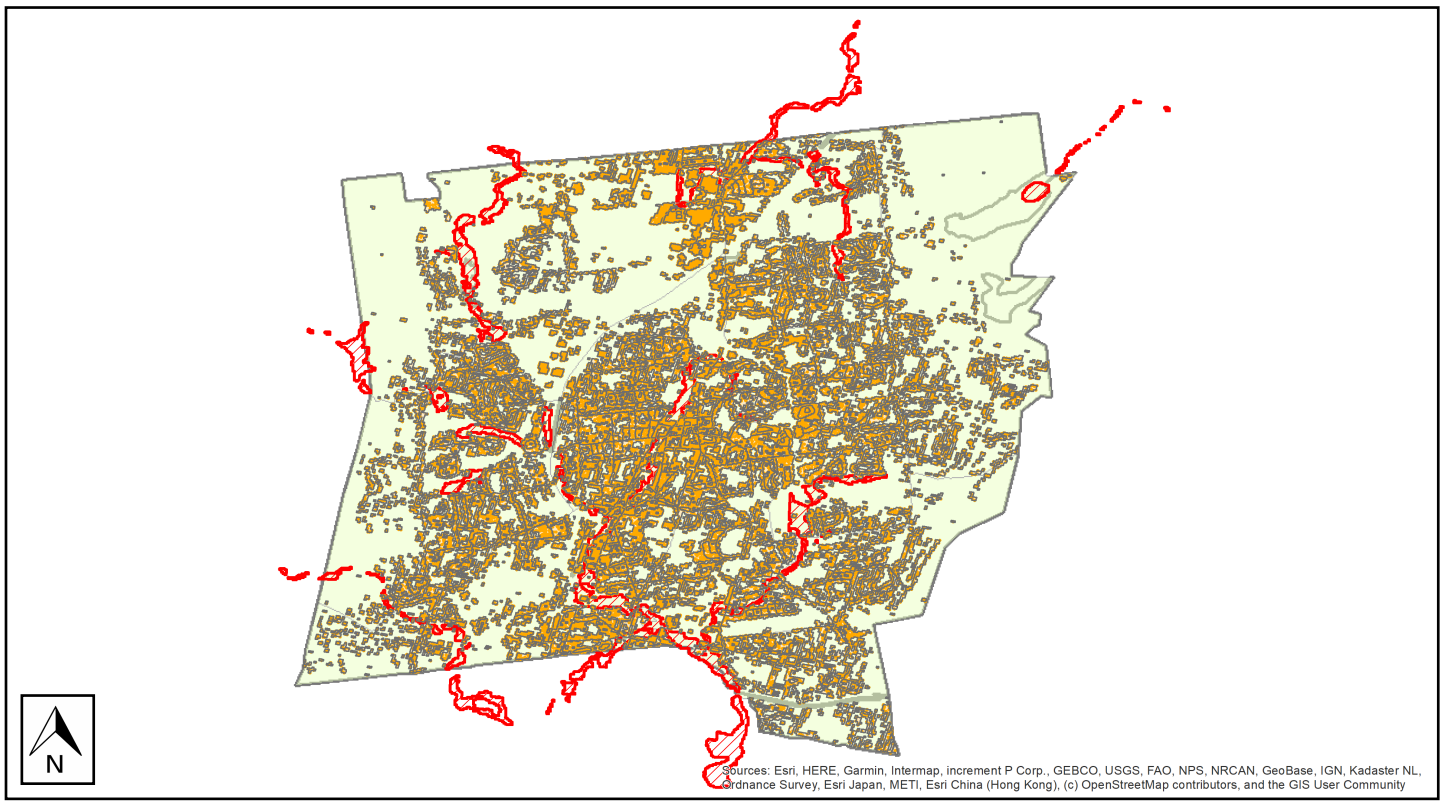
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Southington_FL
Scenario Name:	Southington_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 17 buildings will be at least moderately damaged. This is over 93% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

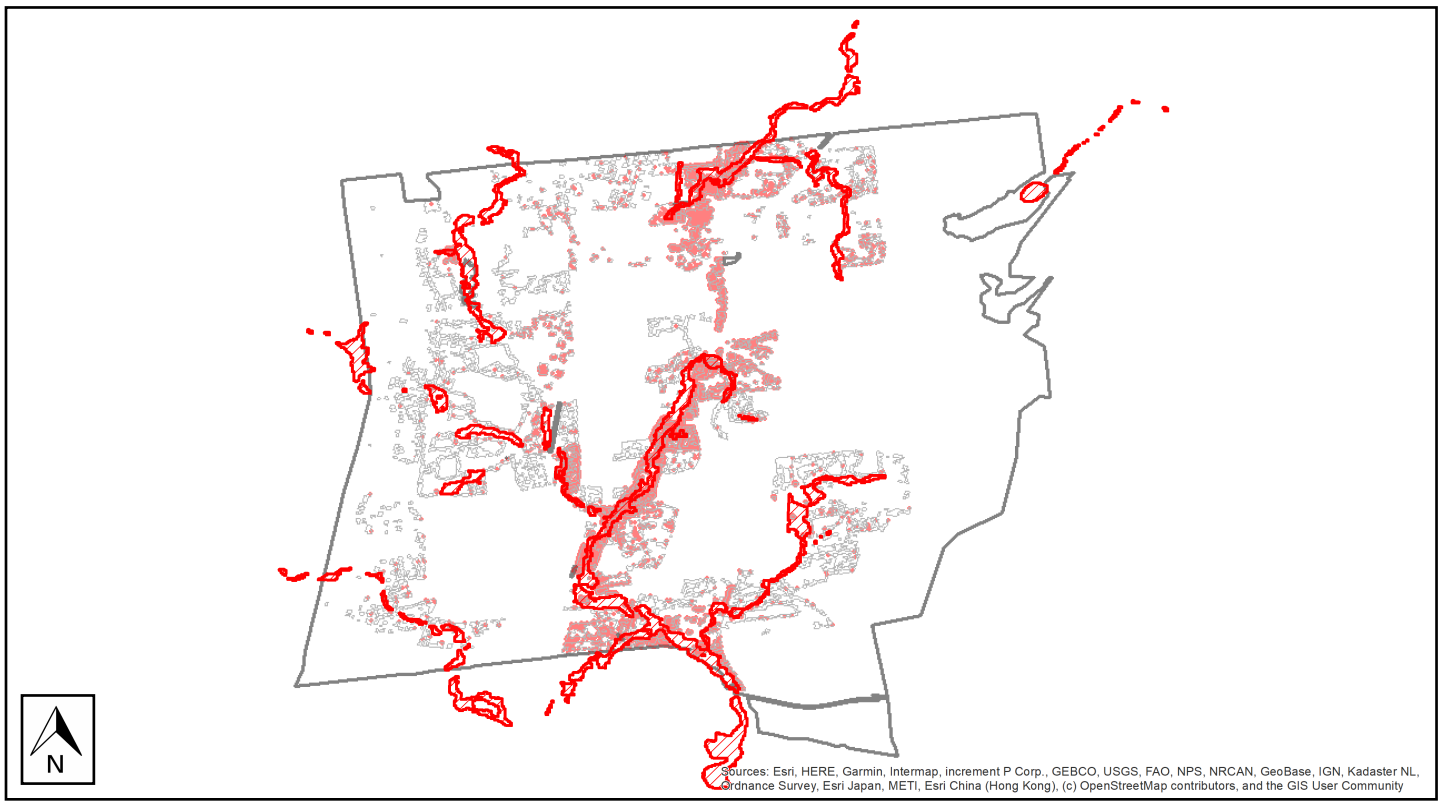


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	4	57	3	43	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	1	50	1	50	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	18	58	11	35	2	6	0	0	0	0	0	0
Total	**23**		**15**		**2**		**0**		**0**		**0**	

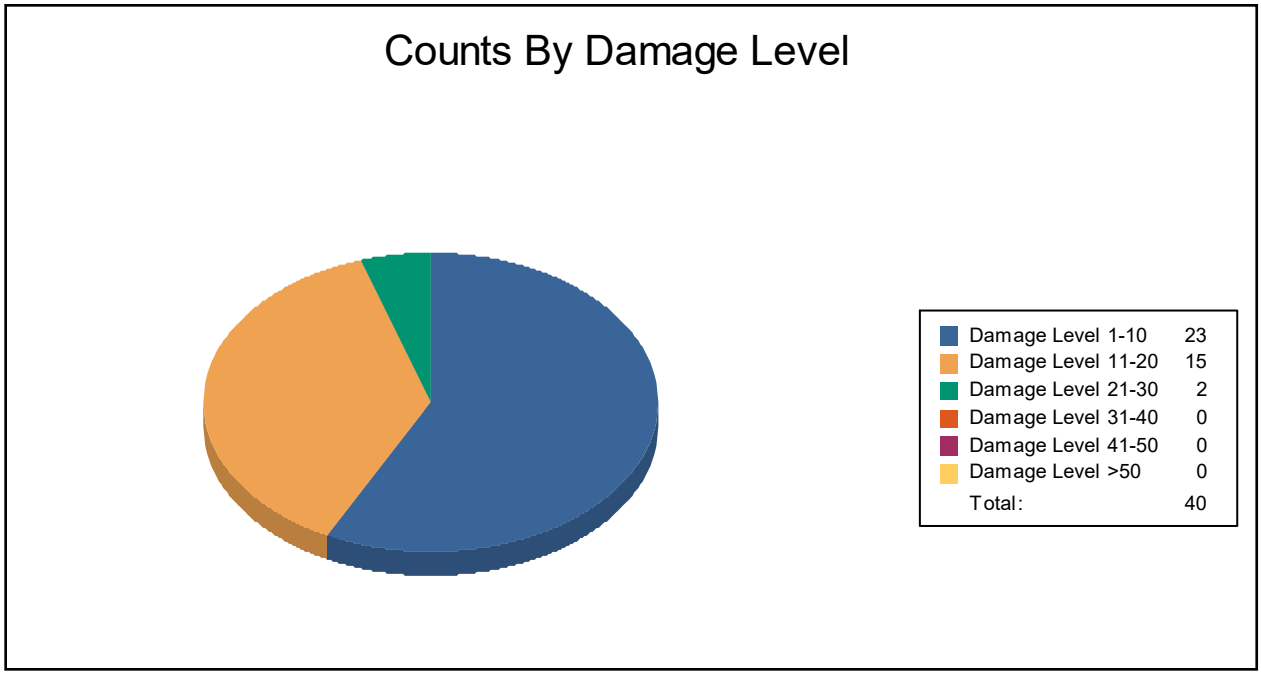


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	3	75	1	25	0	0	0	0	0	0	0	0
Steel	3	60	2	40	0	0	0	0	0	0	0	0
Wood	17	57	11	37	2	7	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	15	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

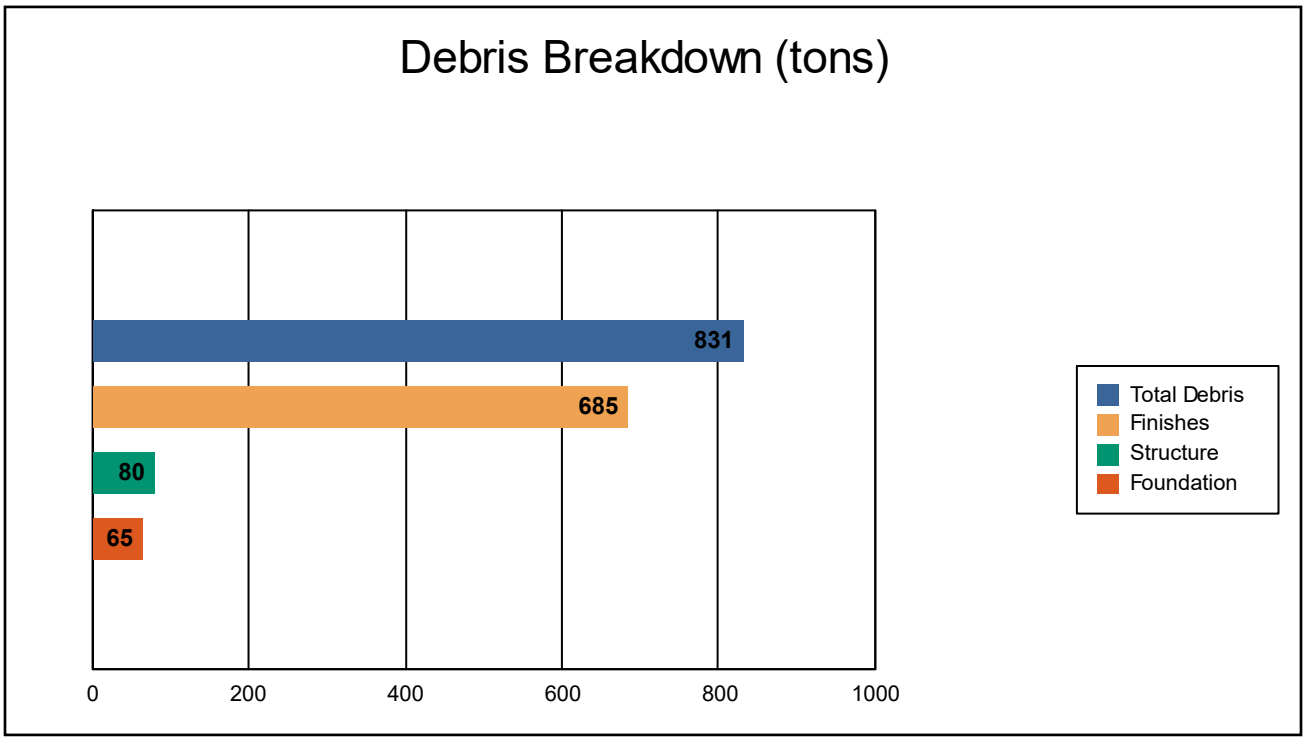
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

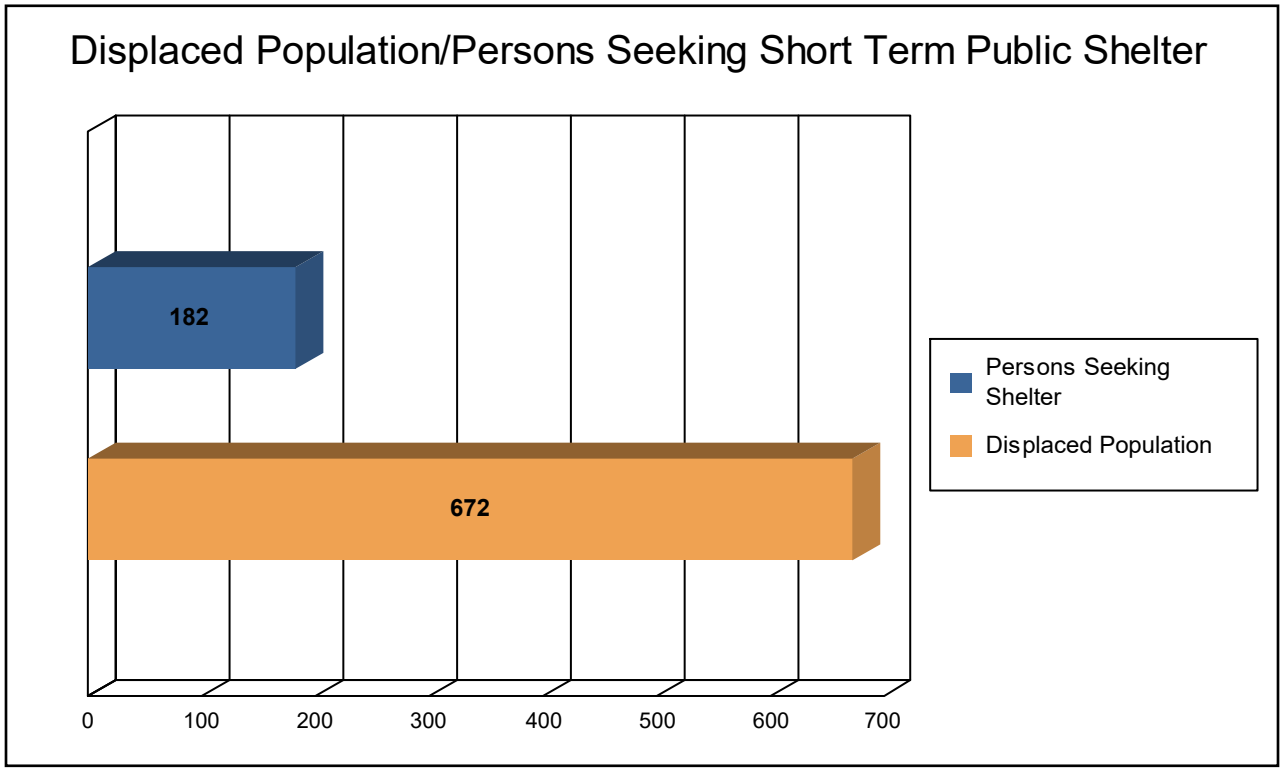


The model estimates that a total of 831 tons of debris will be generated. Of the total amount, Finishes comprises 82% of the total, Structure comprises 10% of the total, and Foundation comprises 8%. If the debris tonnage is converted into an estimated number of truckloads, it will require 34 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 224 households (or 672 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 182 people (out of a total population of 43,501) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 211.57 million dollars, which represents 5.75 % of the total replacement value of the scenario buildings.

Building-Related Losses

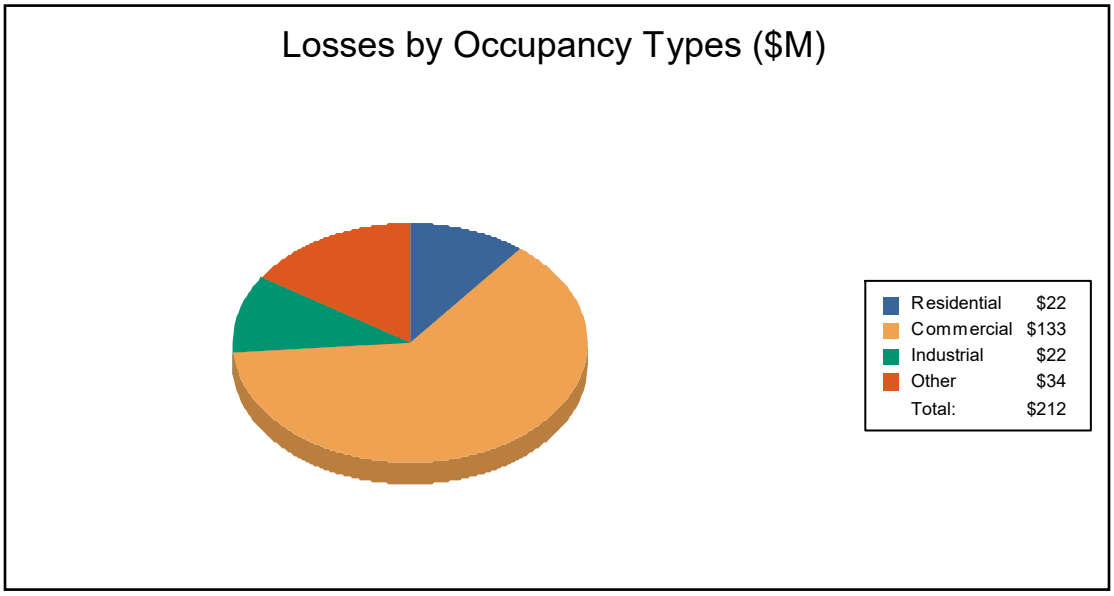
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 95.69 million dollars. 55% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 10.52% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	8.77	10.06	5.60	0.80	25.23
	Content	5.78	37.77	13.45	5.04	62.04
	Inventory	0.00	6.23	2.01	0.18	8.42
	Subtotal	**14.55**	**54.06**	**21.06**	**6.02**	**95.69**
Business Interruption						
	Income	0.92	29.62	0.31	1.46	32.31
	Relocation	2.55	7.69	0.41	1.23	11.88
	Rental Income	2.09	5.53	0.07	0.35	8.05
	Wage	2.16	36.46	0.55	24.48	63.65
	Subtotal	**7.71**	**79.30**	**1.35**	**27.52**	**115.88**
ALL	**Total**	**22.26**	**133.36**	**22.41**	**33.54**	**211.57**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,078,826	2,764,484	8,843,310
Total	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**
Total Study Region	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**

Hazus: Flood Global Risk Report

Region Name: Southington_FL

Flood Scenario: Southington_Flood

Print Date: Sunday, April 16, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 12 square miles and contains 500 census blocks. The region contains over 17 thousand households and has a total population of 43,501 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 15,820 buildings in the region with a total building replacement value (excluding contents) of 8,843 million dollars. Approximately 88.08% of the buildings (and 68.74% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 15,820 buildings in the region which have an aggregate total replacement value of 8,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	6,078,826	68.7%
Commercial	1,571,725	17.8%
Industrial	587,282	6.6%
Agricultural	16,290	0.2%
Religion	73,670	0.8%
Government	263,619	3.0%
Education	251,898	2.8%
Total	**8,843,310**	**100%**

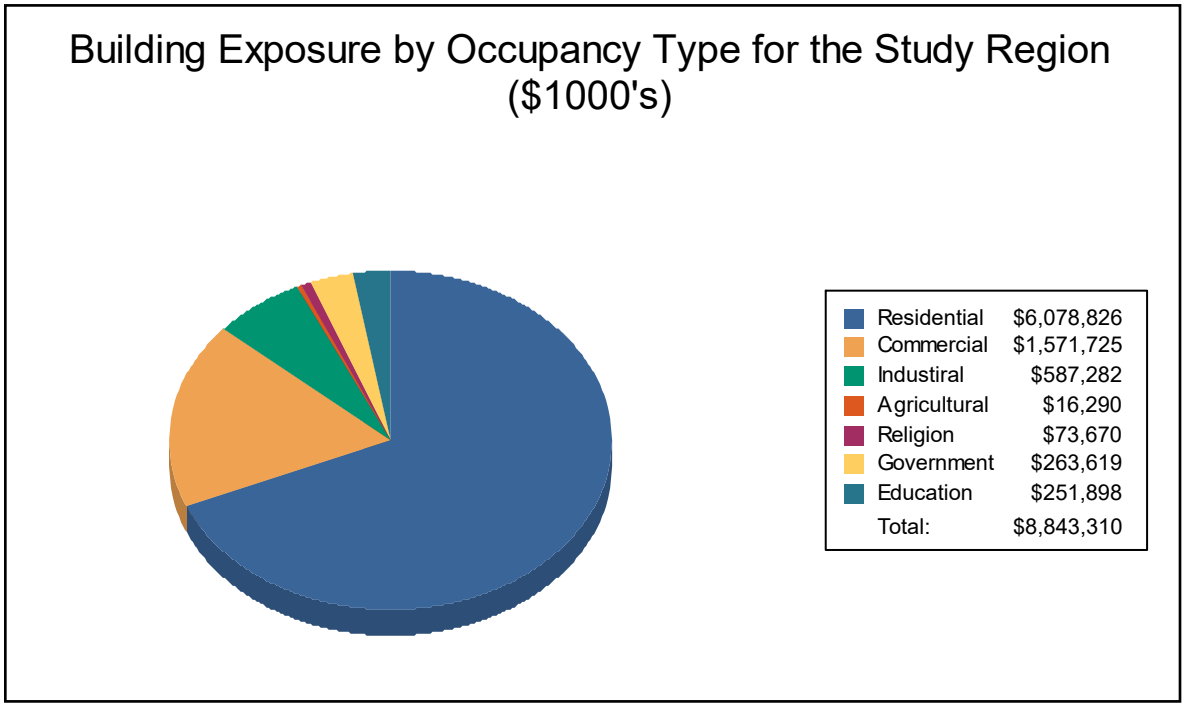
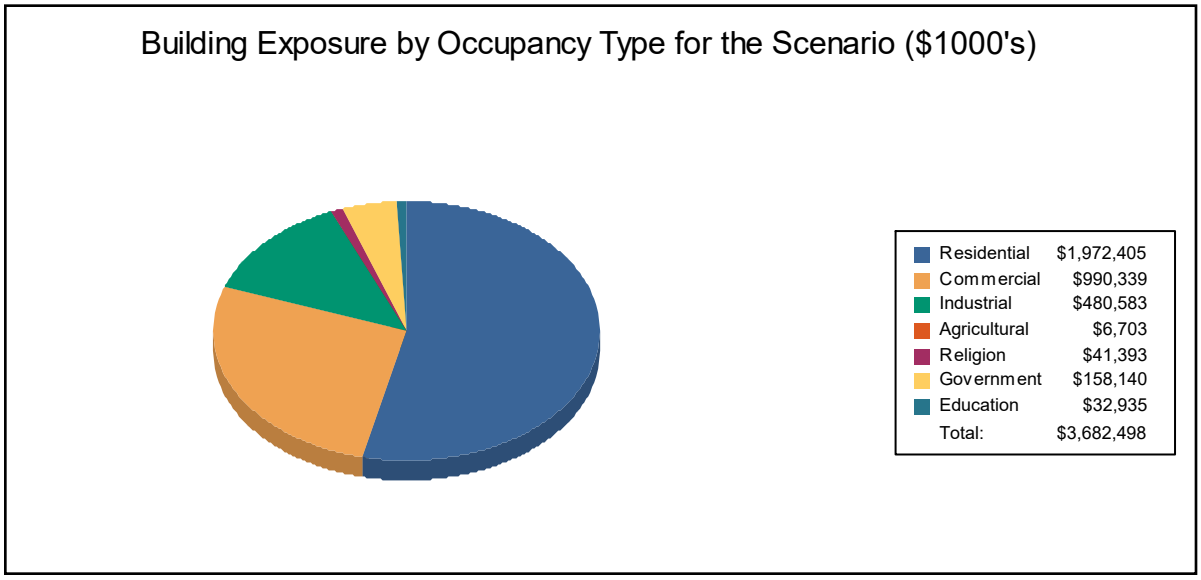


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,972,405	53.6%
Commercial	990,339	26.9%
Industrial	480,583	13.1%
Agricultural	6,703	0.2%
Religion	41,393	1.1%
Government	158,140	4.3%
Education	32,935	0.9%
Total	**3,682,498**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 15 schools, 3 fire stations, 1 police station and 1 emergency operation center.

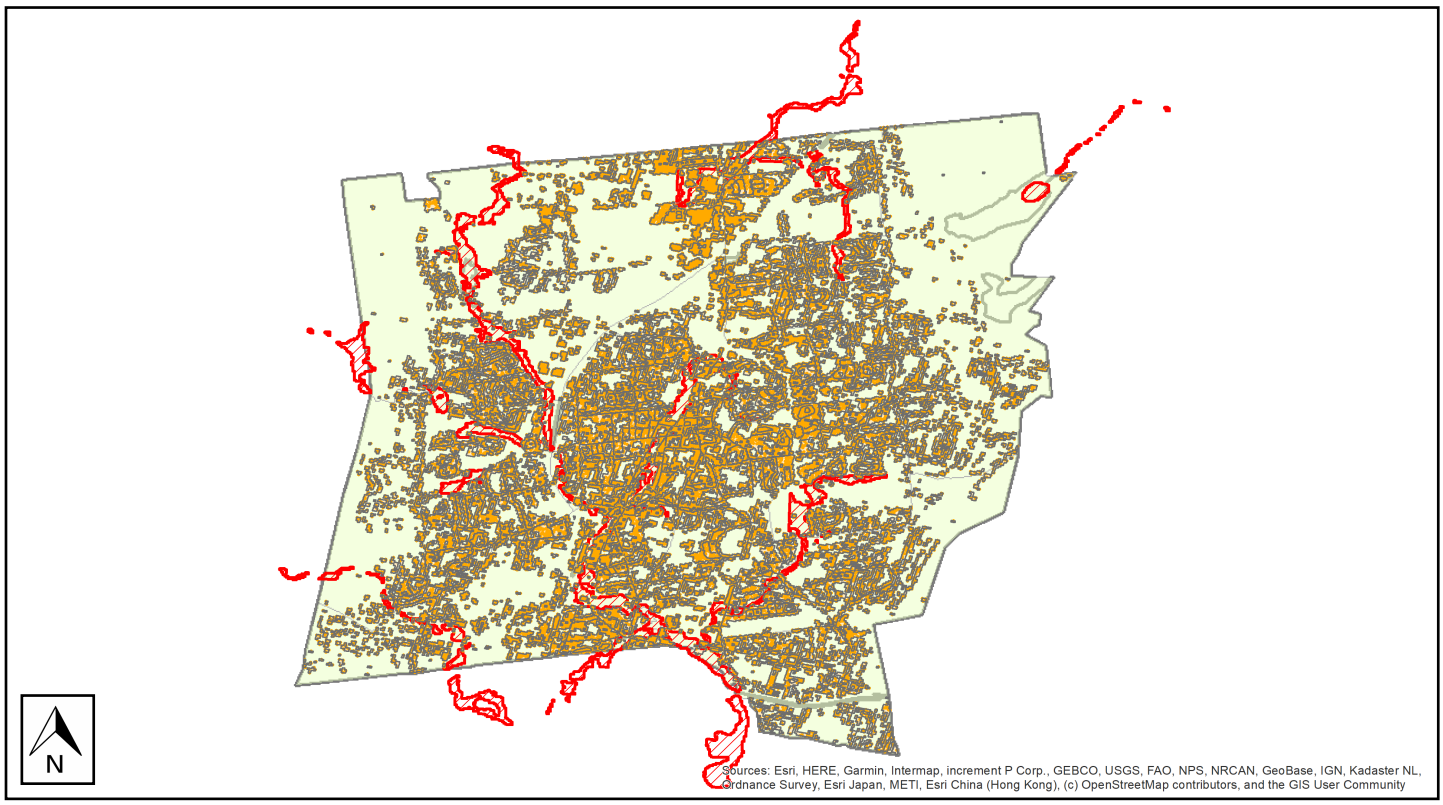
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Southington_FL
Scenario Name:	Southington_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 29 buildings will be at least moderately damaged. This is over 86% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

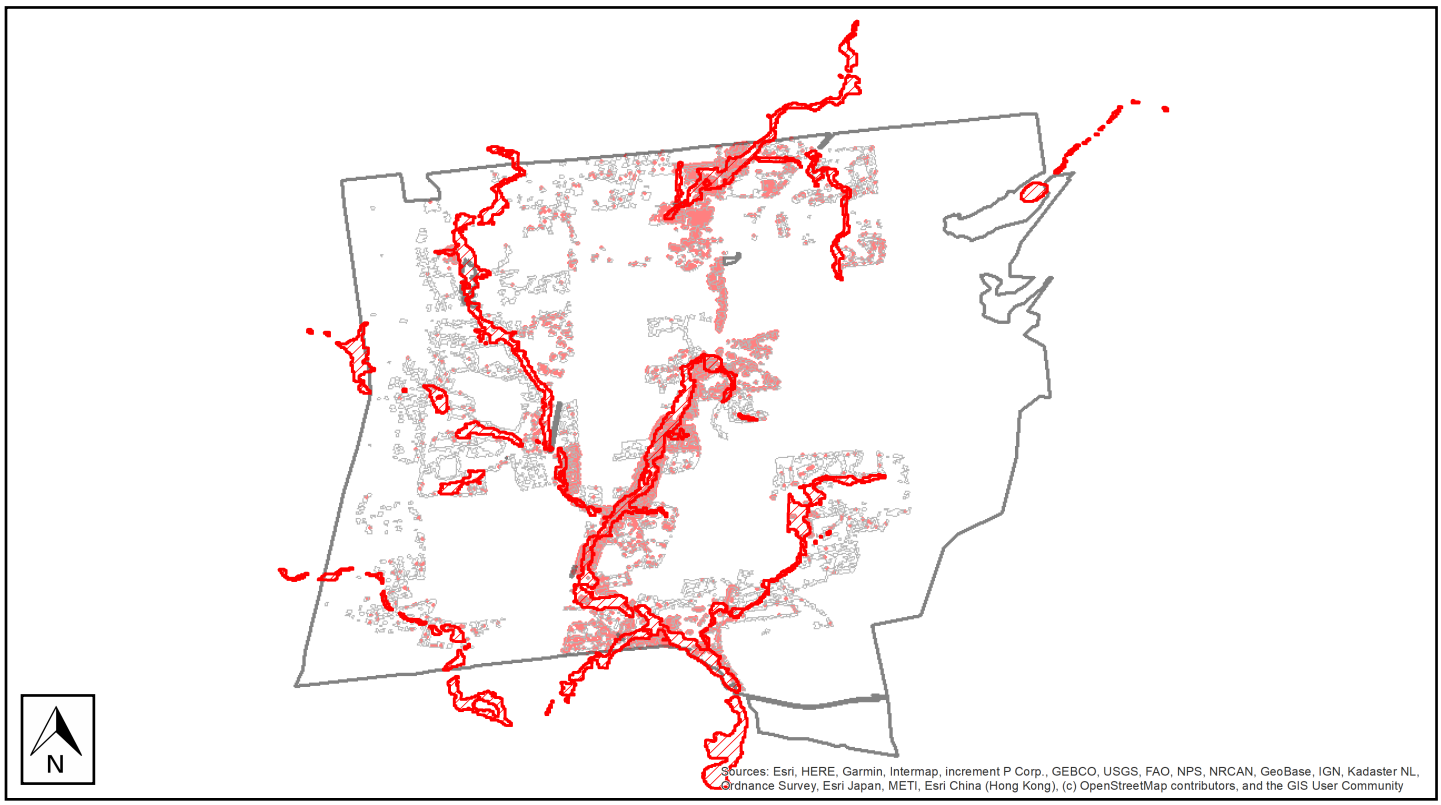


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	5	45	6	55	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	2	50	2	50	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	24	53	19	42	2	4	0	0	0	0	0	0
Total	**31**		**27**		**2**		**0**		**0**		**0**	

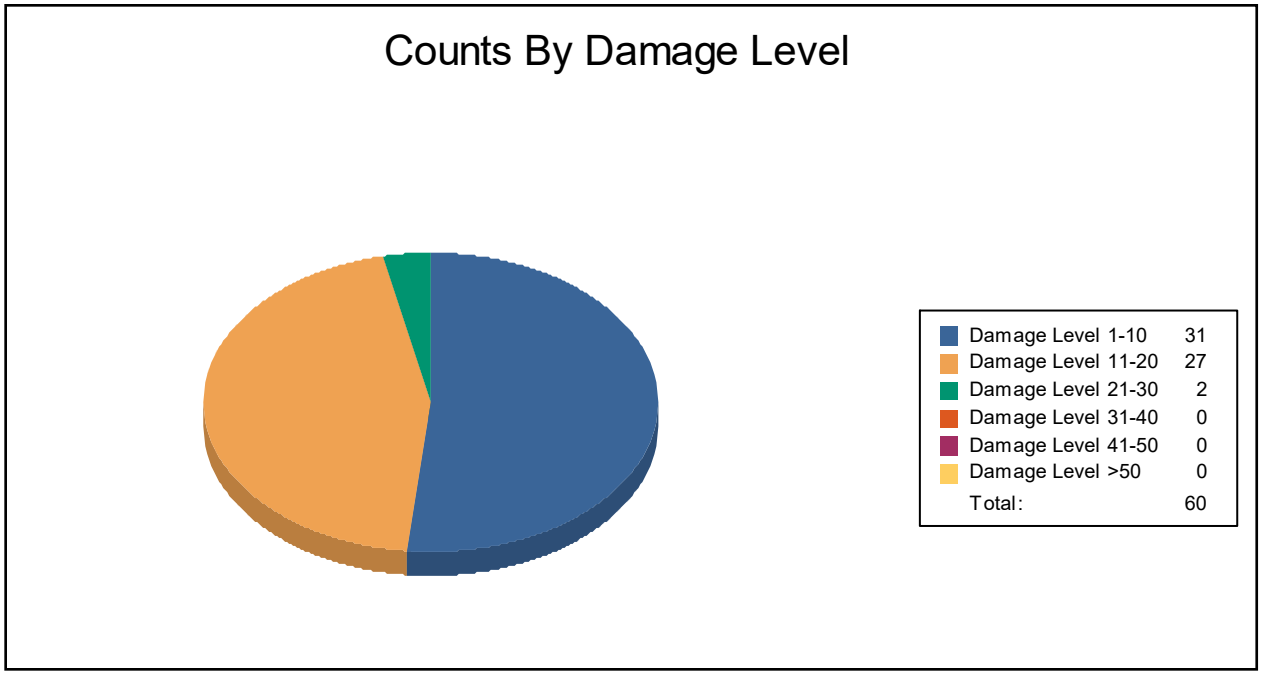


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	5	56	4	44	0	0	0	0	0	0	0	0
Steel	4	44	5	56	0	0	0	0	0	0	0	0
Wood	22	54	17	41	2	5	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	15	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

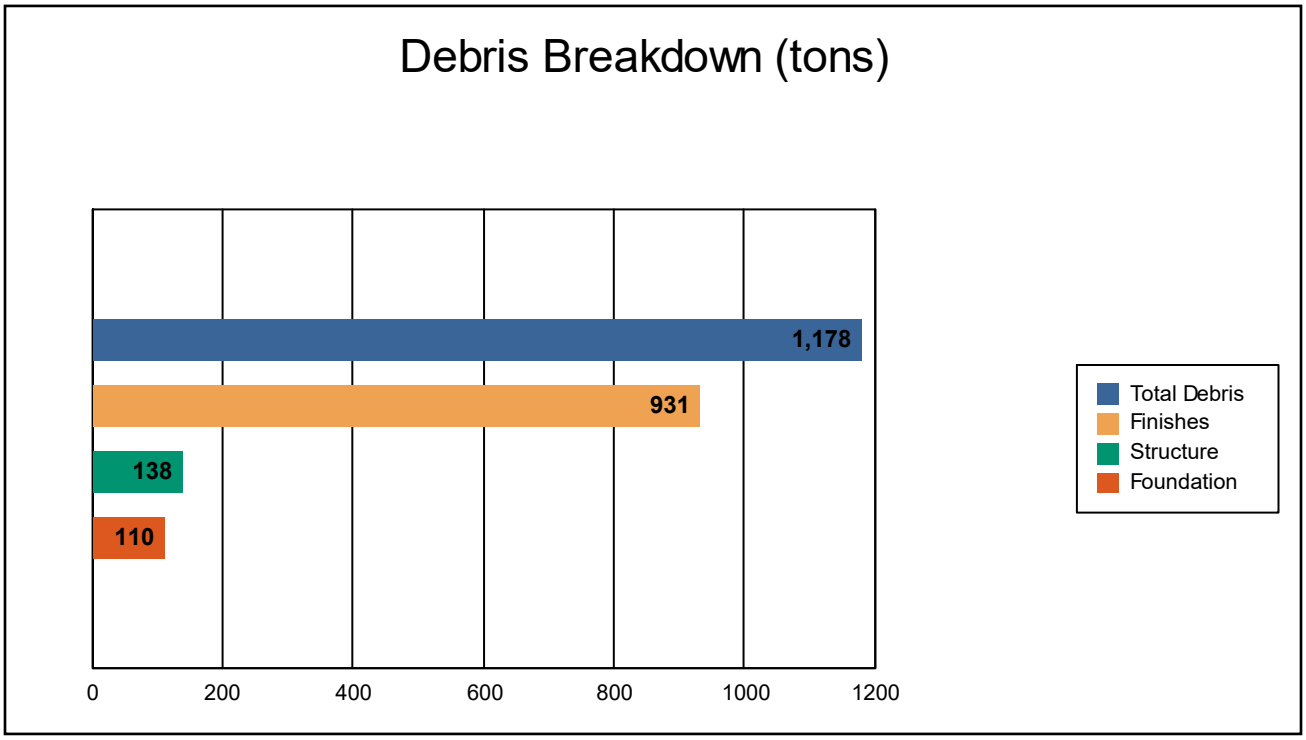
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

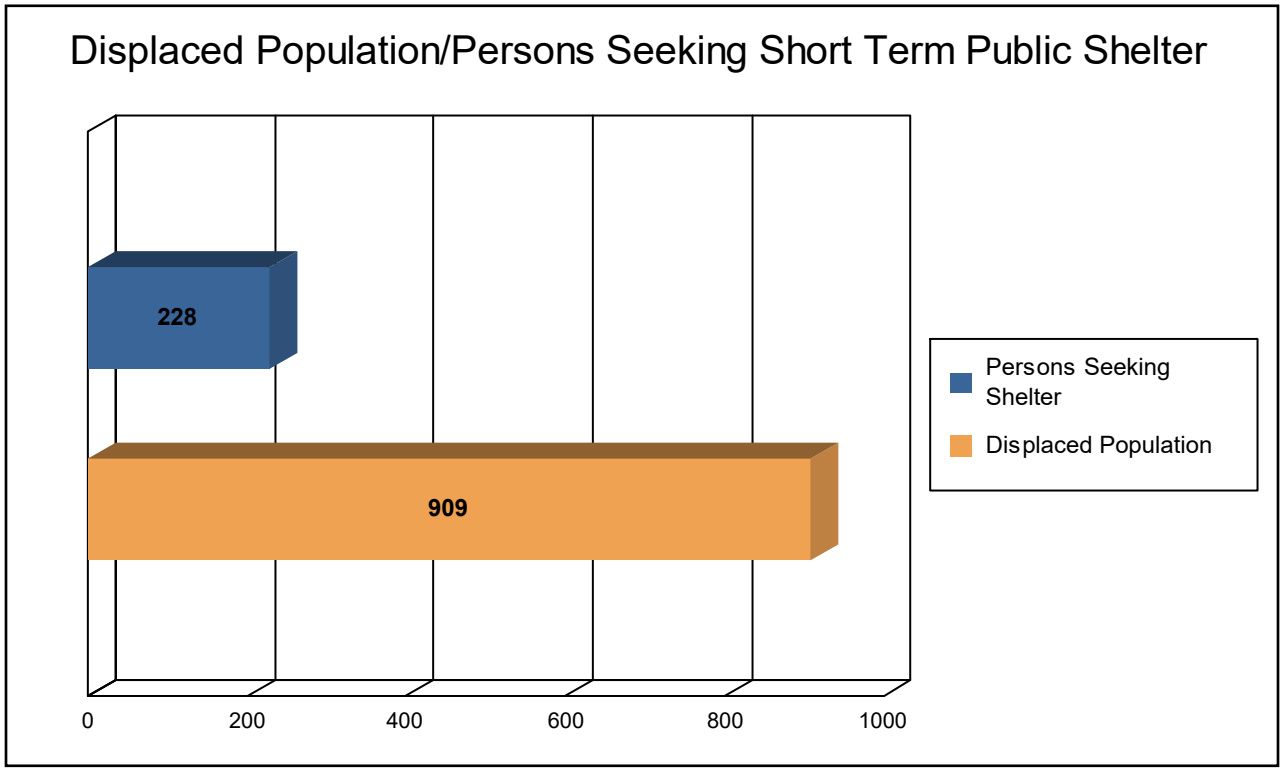


The model estimates that a total of 1,178 tons of debris will be generated. Of the total amount, Finishes comprises 79% of the total, Structure comprises 12% of the total, and Foundation comprises 9%. If the debris tonnage is converted into an estimated number of truckloads, it will require 48 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 303 households (or 909 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 228 people (out of a total population of 43,501) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 284.98 million dollars, which represents 7.74 % of the total replacement value of the scenario buildings.

Building-Related Losses

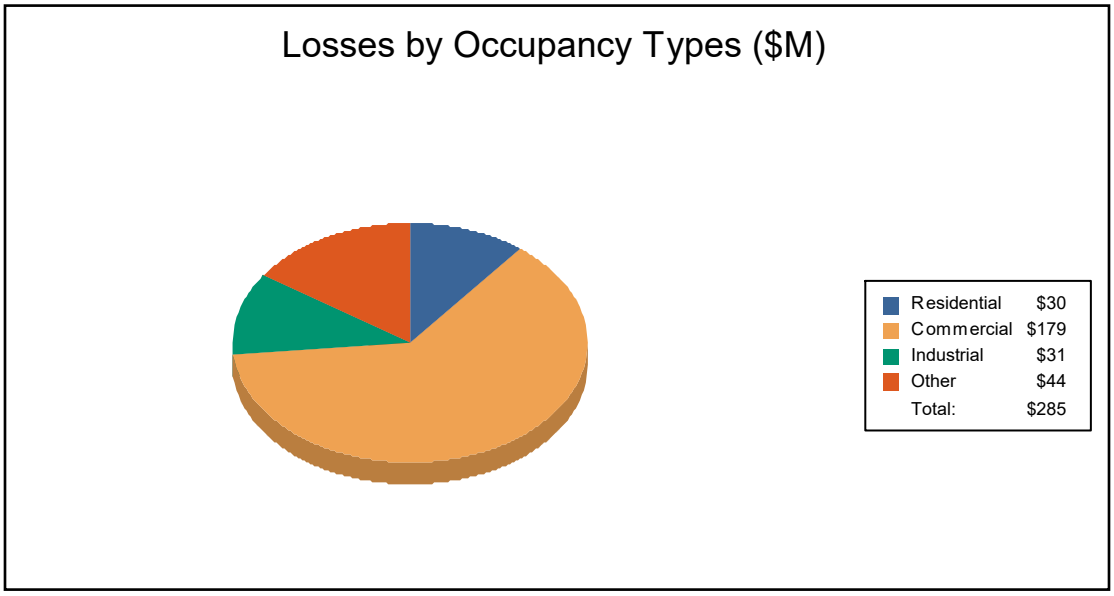
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 132.09 million dollars. 54% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 10.49% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	12.01	14.11	7.79	1.16	35.07
	Content	7.66	51.79	18.74	7.06	85.24
	Inventory	0.00	8.72	2.76	0.30	11.78
	Subtotal	**19.67**	**74.62**	**29.28**	**8.52**	**132.09**
Business Interruption						
	Income	1.17	38.59	0.44	1.92	42.11
	Relocation	3.49	10.47	0.58	1.56	16.09
	Rental Income	2.83	7.54	0.11	0.44	10.91
	Wage	2.74	48.28	0.77	32.00	83.78
	Subtotal	**10.23**	**104.87**	**1.89**	**35.92**	**152.90**
ALL	**Total**	**29.89**	**179.48**	**31.17**	**44.44**	**284.98**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,078,826	2,764,484	8,843,310
Total	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**
Total Study Region	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**

Hazus: Flood Global Risk Report

Region Name: Southington_FL

Flood Scenario: Southington_Flood

Print Date: Sunday, April 16, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 12 square miles and contains 500 census blocks. The region contains over 17 thousand households and has a total population of 43,501 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 15,820 buildings in the region with a total building replacement value (excluding contents) of 8,843 million dollars. Approximately 88.08% of the buildings (and 68.74% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 15,820 buildings in the region which have an aggregate total replacement value of 8,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	6,078,826	68.7%
Commercial	1,571,725	17.8%
Industrial	587,282	6.6%
Agricultural	16,290	0.2%
Religion	73,670	0.8%
Government	263,619	3.0%
Education	251,898	2.8%
Total	**8,843,310**	**100%**

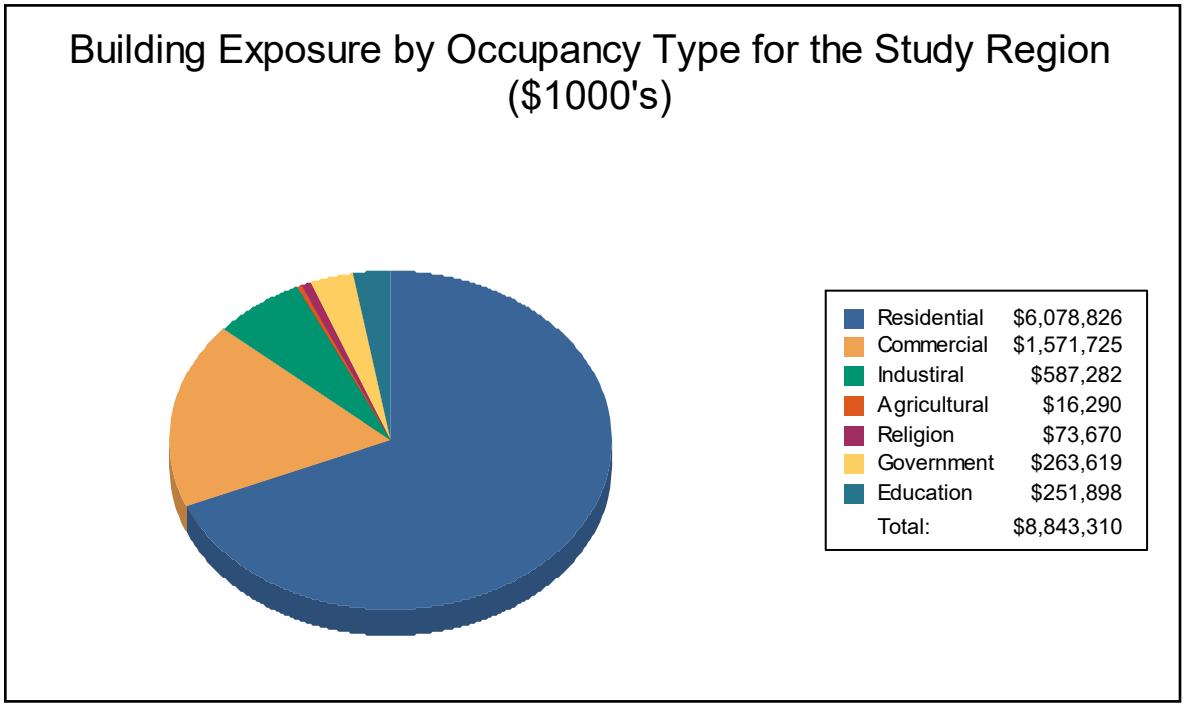
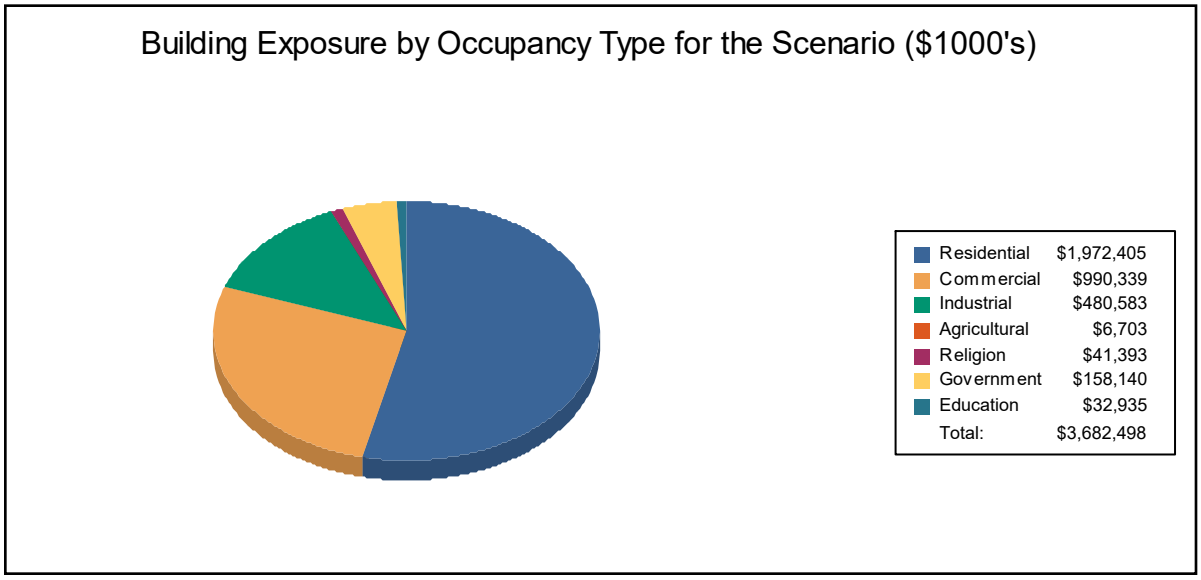


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,972,405	53.6%
Commercial	990,339	26.9%
Industrial	480,583	13.1%
Agricultural	6,703	0.2%
Religion	41,393	1.1%
Government	158,140	4.3%
Education	32,935	0.9%
Total	**3,682,498**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 15 schools, 3 fire stations, 1 police station and 1 emergency operation center.

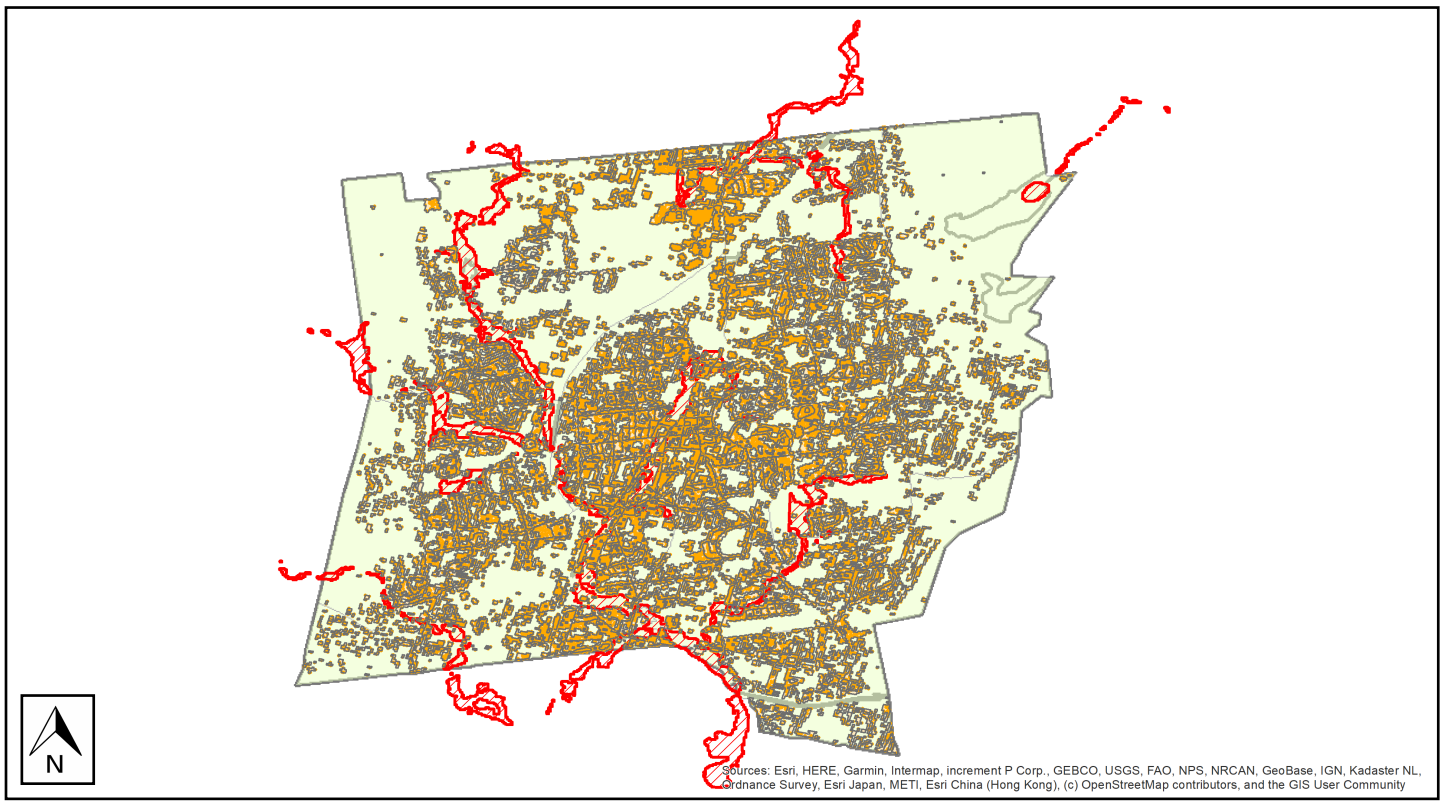
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Southington_FL
Scenario Name:	Southington_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 51 buildings will be at least moderately damaged. This is over 92% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

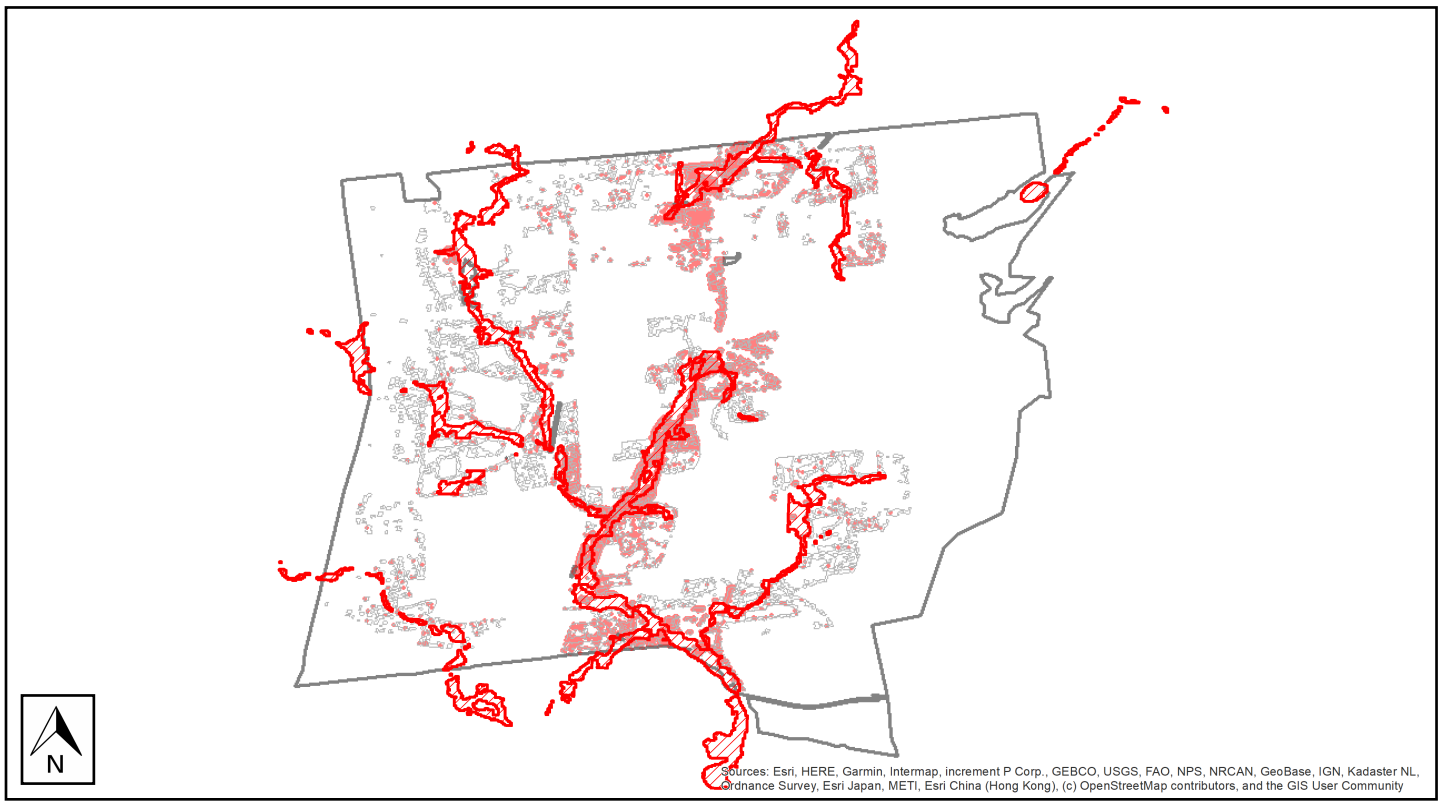


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	4	24	12	71	1	6	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	1	33	2	67	0	0	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	34	49	26	38	8	12	1	1	0	0	0	0
Total	**39**		**41**		**9**		**1**		**0**		**0**	

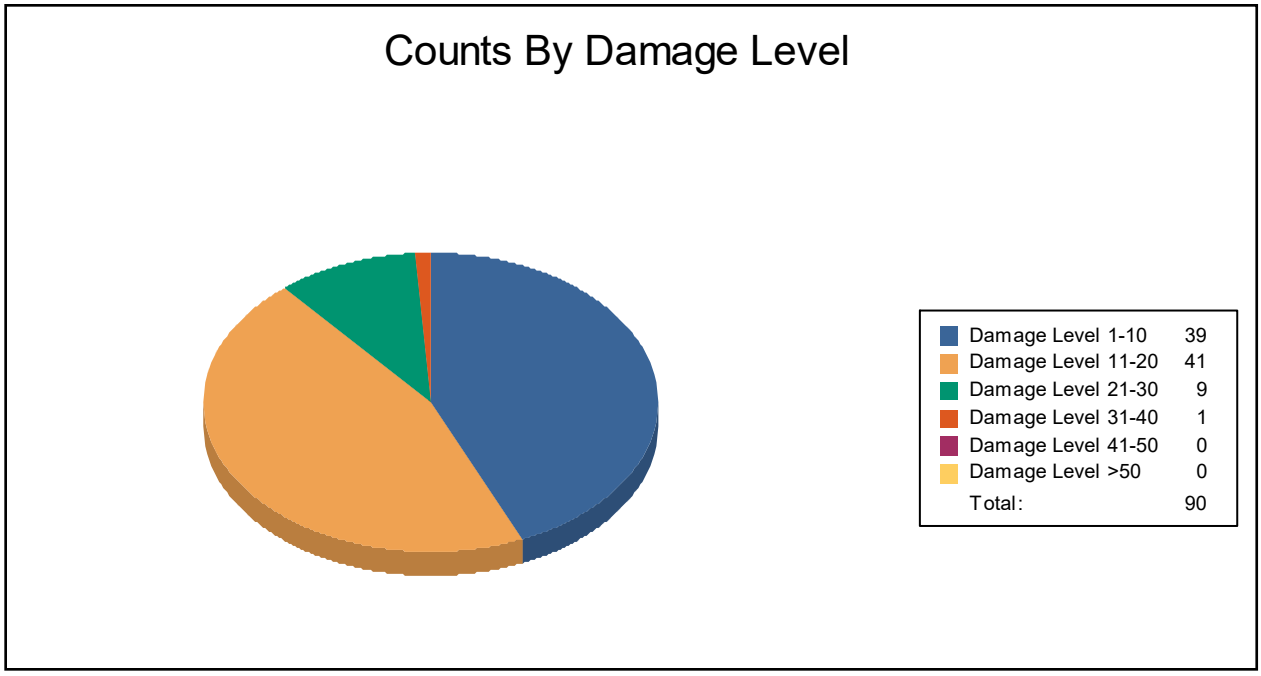


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	1	100	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	4	36	6	55	1	9	0	0	0	0	0	0
Steel	4	31	8	62	1	8	0	0	0	0	0	0
Wood	30	47	26	41	7	11	1	2	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	15	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

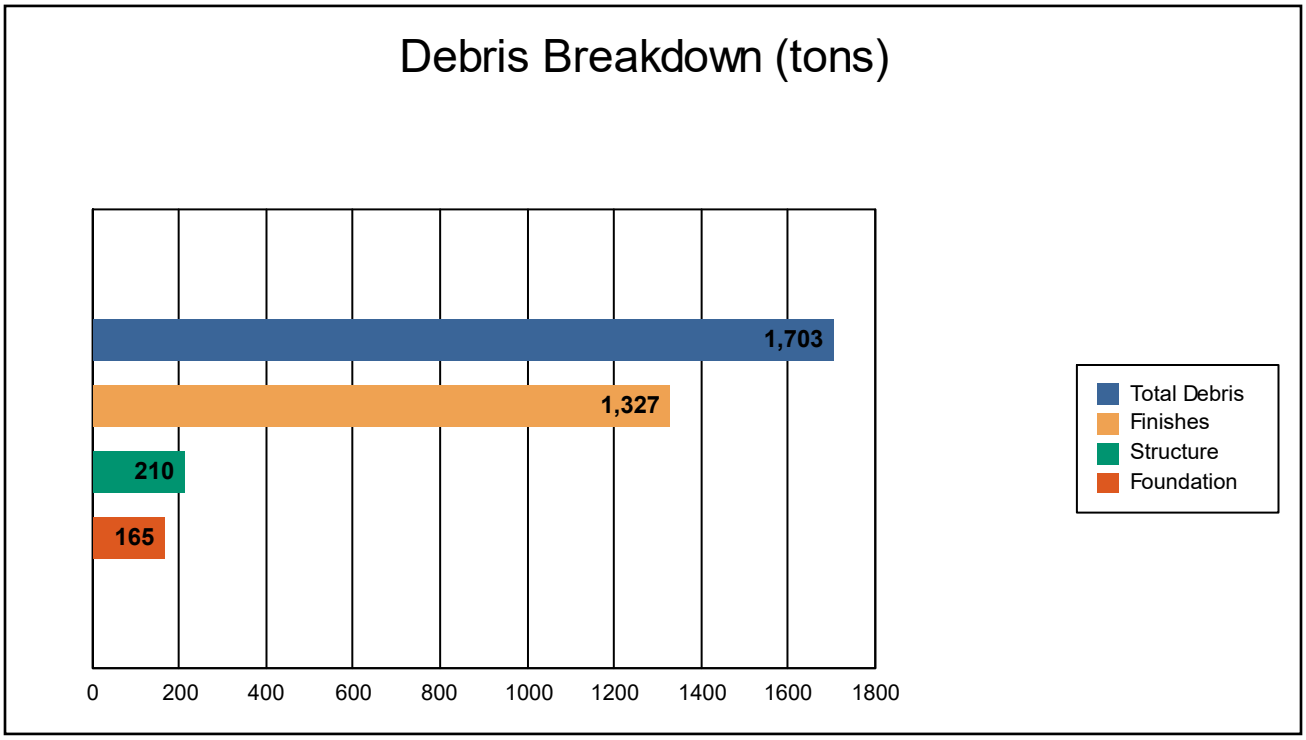
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

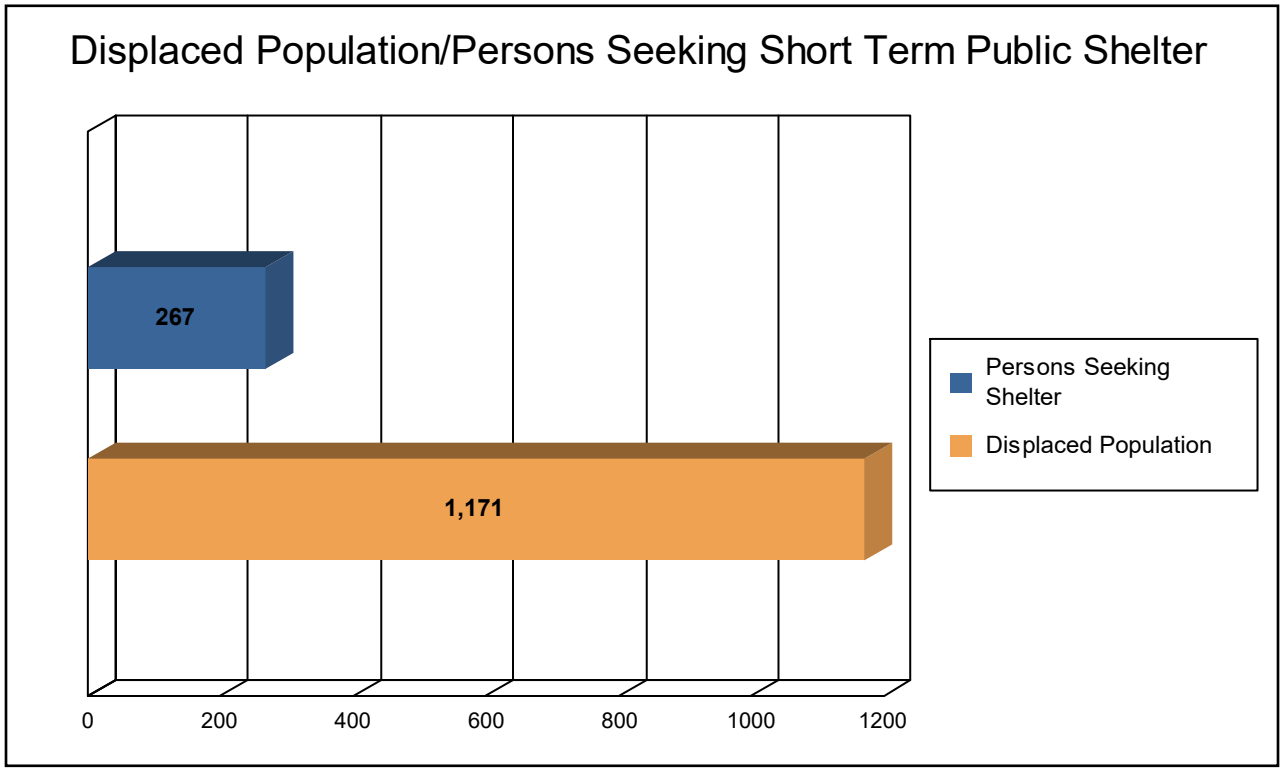


The model estimates that a total of 1,703 tons of debris will be generated. Of the total amount, Finishes comprises 78% of the total, Structure comprises 12% of the total, and Foundation comprises 10%. If the debris tonnage is converted into an estimated number of truckloads, it will require 69 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 390 households (or 1,171 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 267 people (out of a total population of 43,501) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 393.01 million dollars, which represents 10.67 % of the total replacement value of the scenario buildings.

Building-Related Losses

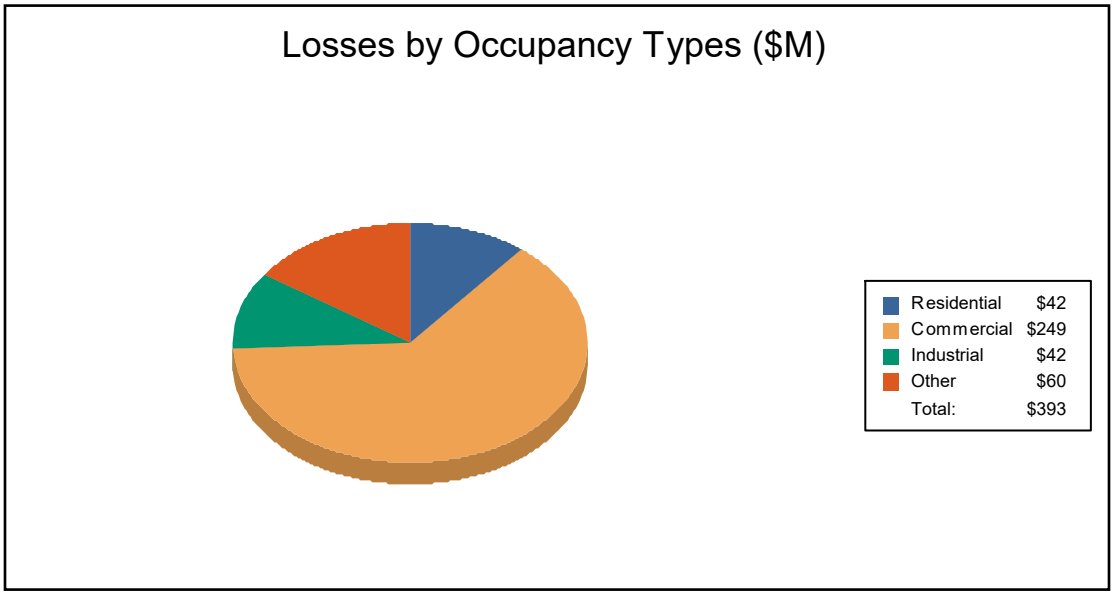
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 189.27 million dollars. 52% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 10.76% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	17.59	21.01	10.61	1.82	51.02
	Content	10.99	74.75	25.40	10.63	121.77
	Inventory	0.00	12.22	3.68	0.58	16.48
	Subtotal	**28.58**	**107.98**	**39.69**	**13.02**	**189.27**
Business Interruption						
	Income	1.57	50.90	0.51	2.55	55.53
	Relocation	4.64	14.29	0.66	2.10	21.69
	Rental Income	3.80	10.26	0.13	0.59	14.77
	Wage	3.69	65.25	0.91	41.91	111.75
	Subtotal	**13.69**	**140.70**	**2.20**	**47.15**	**203.74**
ALL	**Total**	**42.27**	**248.67**	**41.89**	**60.17**	**393.01**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,078,826	2,764,484	8,843,310
Total	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**
Total Study Region	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**

Hazus: Flood Global Risk Report

Region Name: Southington_FL

Flood Scenario: Southington_Flood

Print Date: Sunday, April 16, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 12 square miles and contains 500 census blocks. The region contains over 17 thousand households and has a total population of 43,501 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 15,820 buildings in the region with a total building replacement value (excluding contents) of 8,843 million dollars. Approximately 88.08% of the buildings (and 68.74% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 15,820 buildings in the region which have an aggregate total replacement value of 8,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	6,078,826	68.7%
Commercial	1,571,725	17.8%
Industrial	587,282	6.6%
Agricultural	16,290	0.2%
Religion	73,670	0.8%
Government	263,619	3.0%
Education	251,898	2.8%
Total	**8,843,310**	**100%**

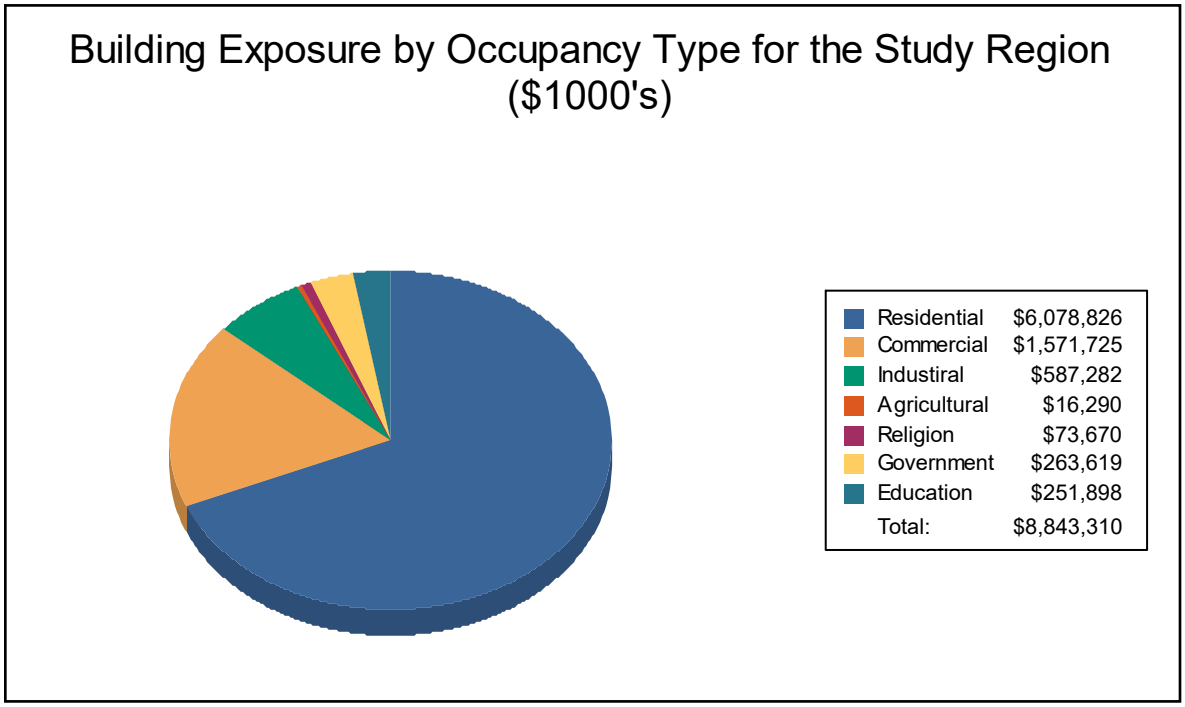
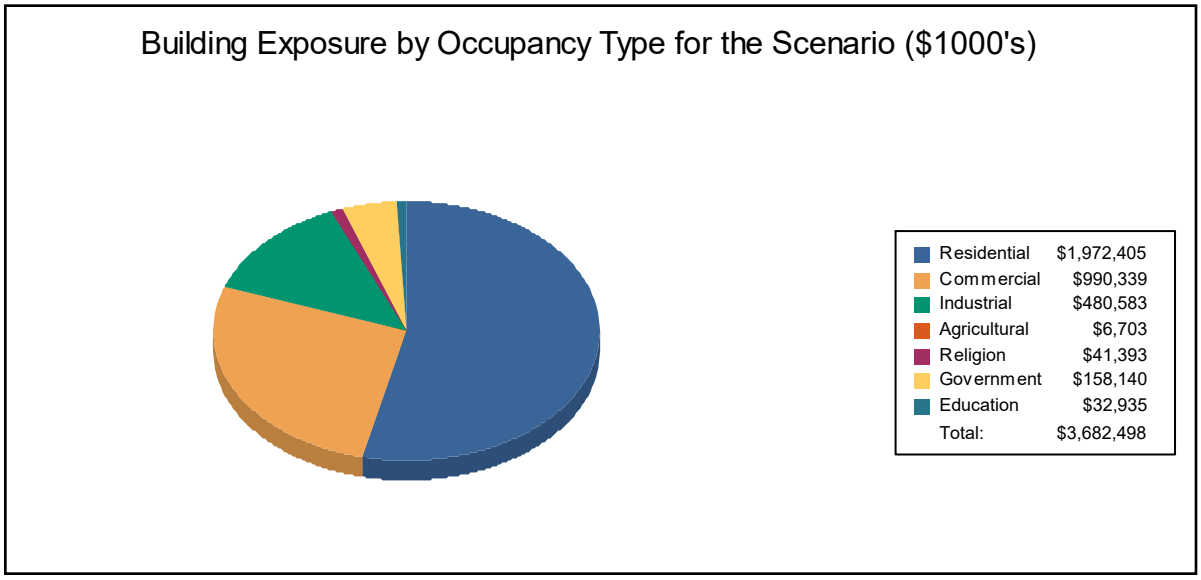


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,972,405	53.6%
Commercial	990,339	26.9%
Industrial	480,583	13.1%
Agricultural	6,703	0.2%
Religion	41,393	1.1%
Government	158,140	4.3%
Education	32,935	0.9%
Total	**3,682,498**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 15 schools, 3 fire stations, 1 police station and 1 emergency operation center.

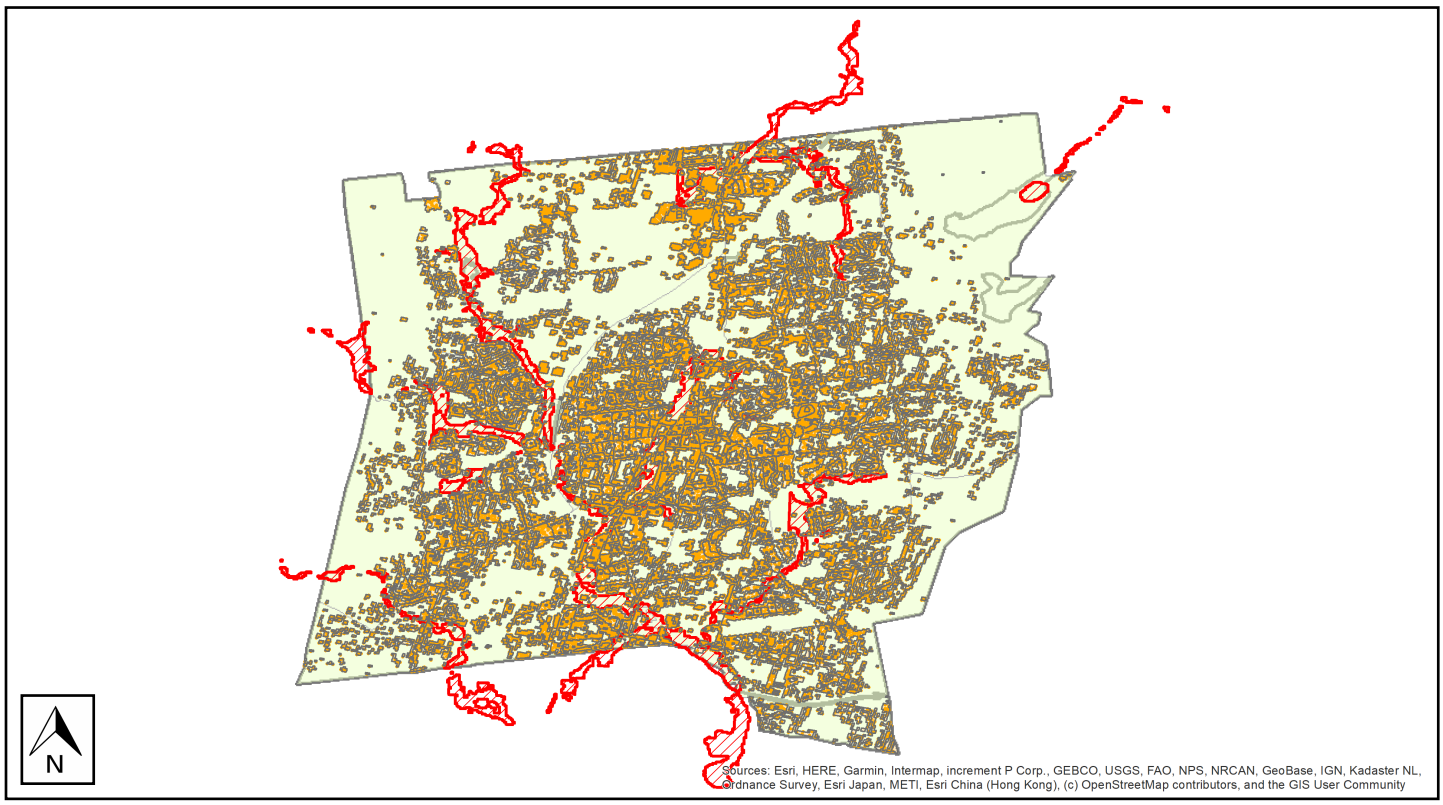
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Southington_FL
Scenario Name:	Southington_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 61 buildings will be at least moderately damaged. This is over 92% of the total number of buildings in the scenario. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

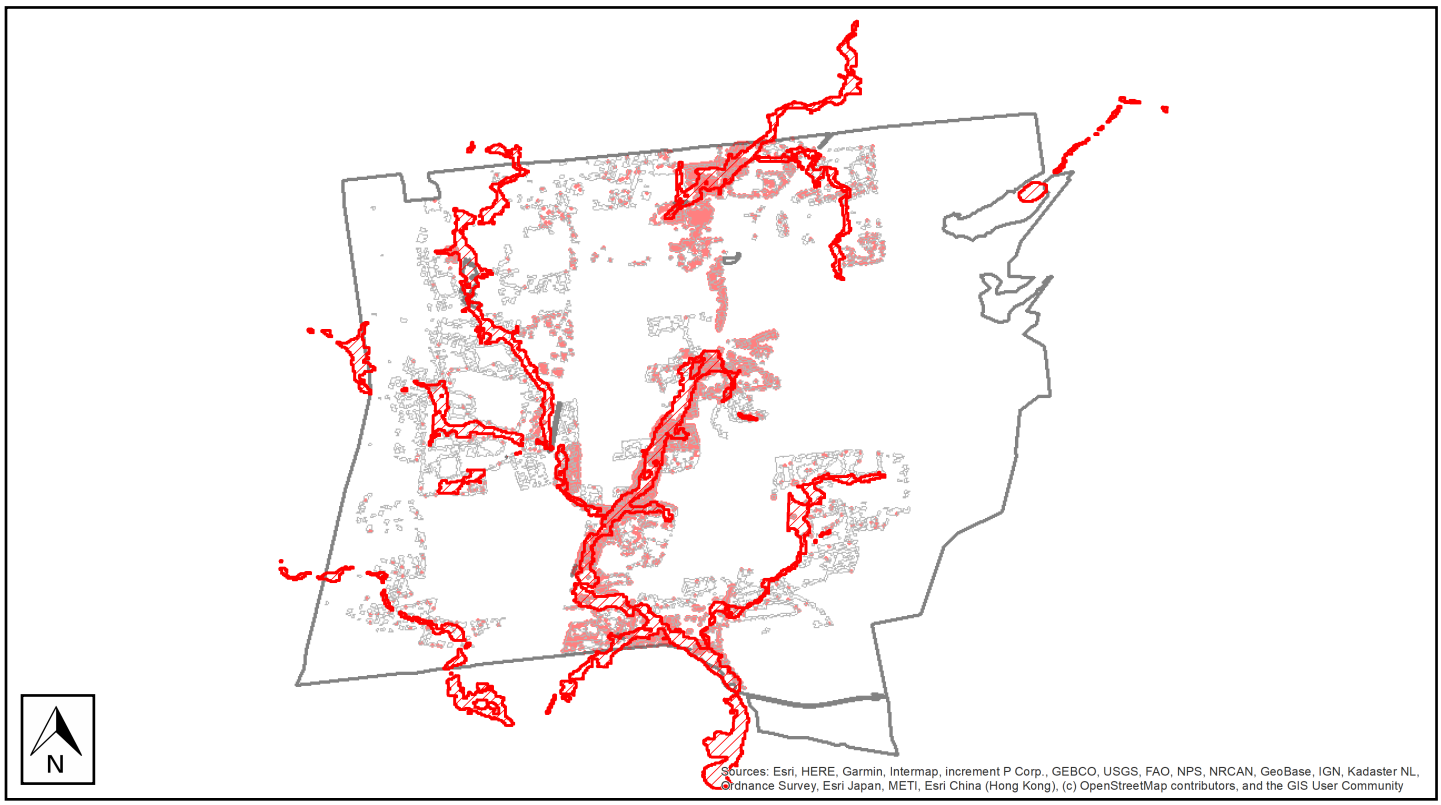


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	4	25	12	75	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	2	100	0	0	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	37	45	34	41	10	12	0	0	0	0	2	2
Total	**41**		**49**		**10**		**0**		**0**		**2**	

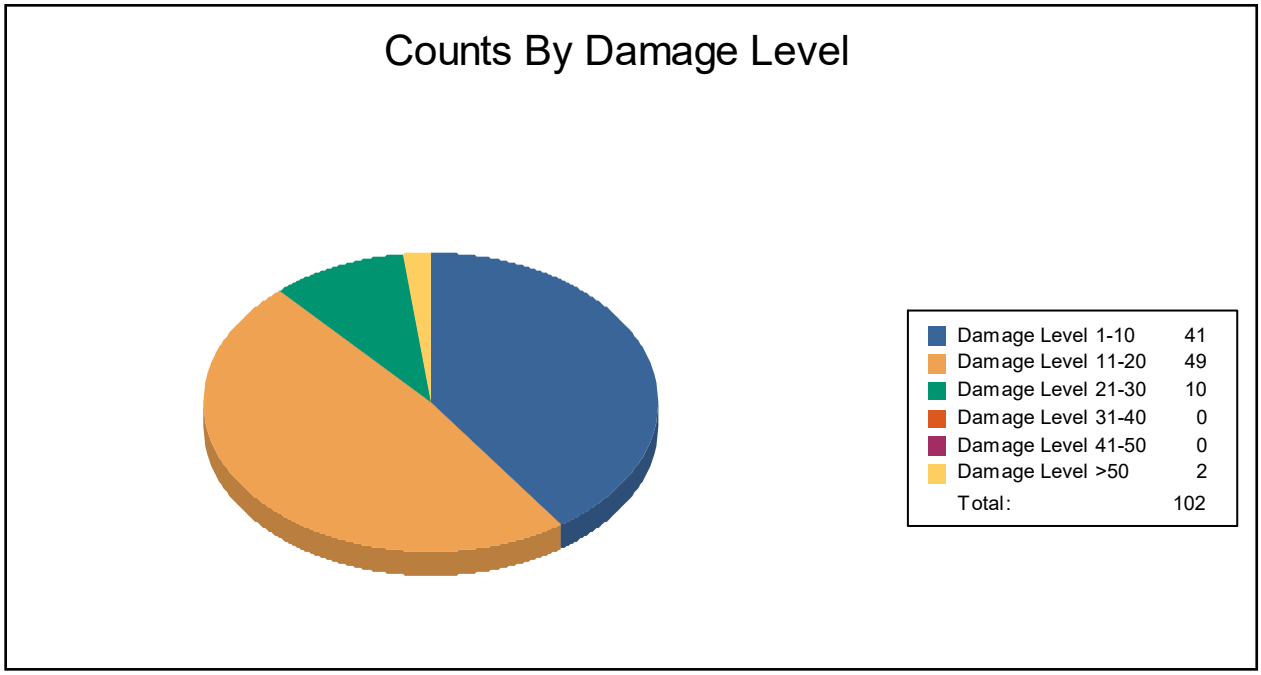


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	1	100	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	2	100
Masonry	5	36	8	57	1	7	0	0	0	0	0	0
Steel	3	30	7	70	0	0	0	0	0	0	0	0
Wood	32	43	34	45	9	12	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	15	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

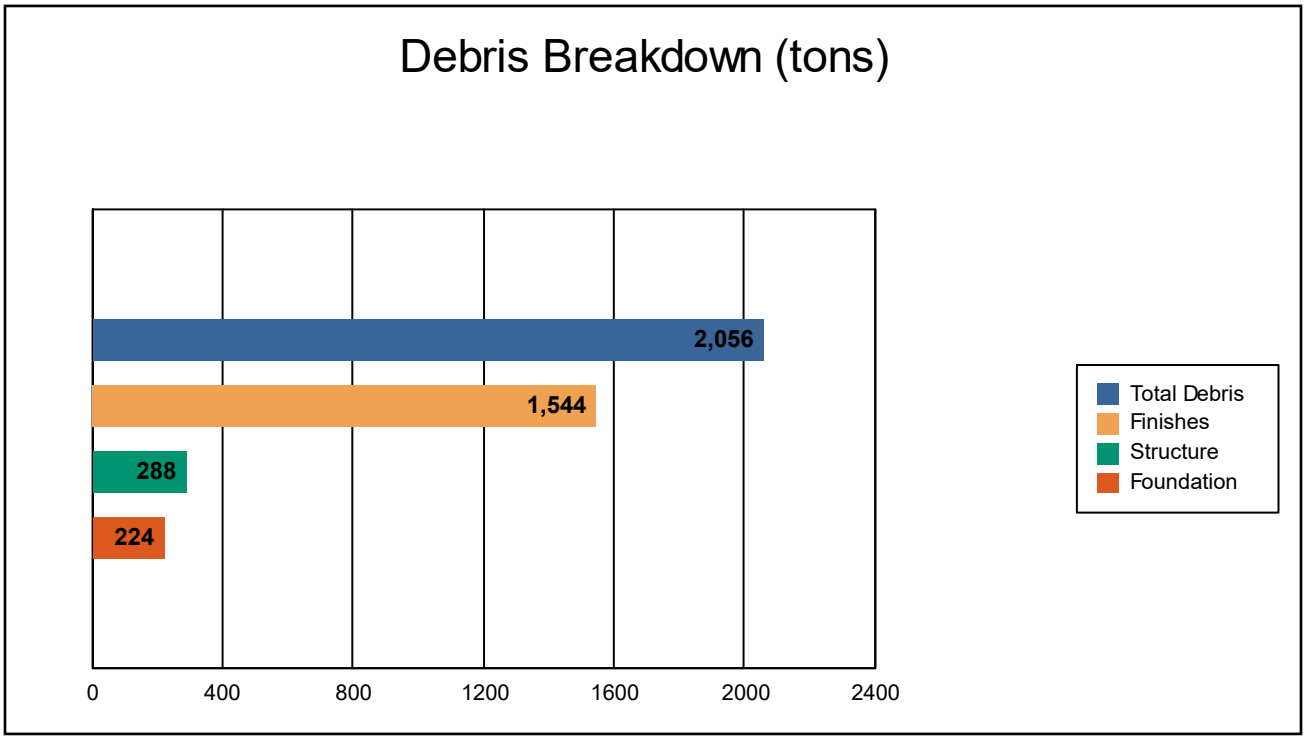
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

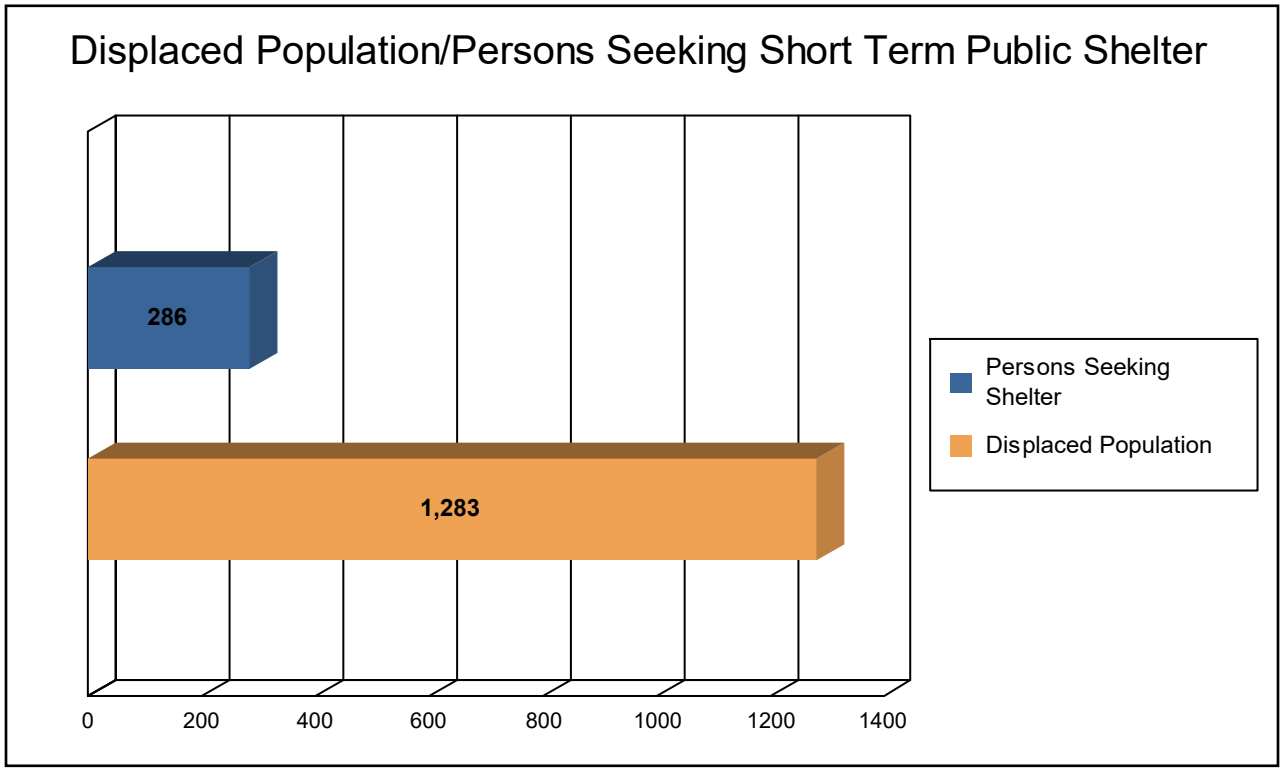


The model estimates that a total of 2,056 tons of debris will be generated. Of the total amount, Finishes comprises 75% of the total, Structure comprises 14% of the total, and Foundation comprises 11%. If the debris tonnage is converted into an estimated number of truckloads, it will require 83 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 428 households (or 1,283 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 286 people (out of a total population of 43,501) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 438.88 million dollars, which represents 11.92 % of the total replacement value of the scenario buildings.

Building-Related Losses

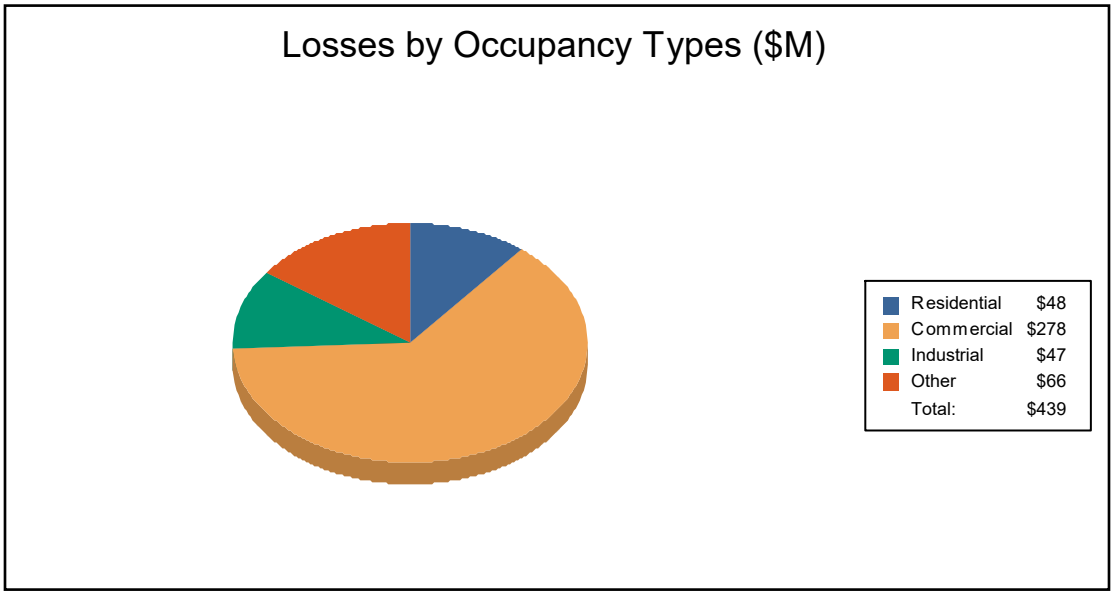
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 217.35 million dollars. 50% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 10.89% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	20.39	24.47	11.99	2.15	59.00
	Content	12.45	85.95	28.80	12.27	139.46
	Inventory	0.00	14.01	4.15	0.73	18.89
	Subtotal	**32.84**	**124.43**	**44.94**	**15.15**	**217.35**
Business Interruption						
	Income	1.67	55.32	0.56	2.79	60.34
	Relocation	5.15	15.63	0.71	2.26	23.74
	Rental Income	4.21	11.23	0.13	0.63	16.19
	Wage	3.93	71.49	0.98	44.86	121.26
	Subtotal	**14.96**	**153.66**	**2.37**	**50.54**	**221.53**
ALL	**Total**	**47.80**	**278.09**	**47.31**	**65.69**	**438.88**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,078,826	2,764,484	8,843,310
Total	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**
Total Study Region	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**

Hazus: Flood Global Risk Report

Region Name: Southington_FL

Flood Scenario: Southington_Flood

Print Date: Sunday, April 16, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 12 square miles and contains 500 census blocks. The region contains over 17 thousand households and has a total population of 43,501 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 15,820 buildings in the region with a total building replacement value (excluding contents) of 8,843 million dollars. Approximately 88.08% of the buildings (and 68.74% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 15,820 buildings in the region which have an aggregate total replacement value of 8,843 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	6,078,826	68.7%
Commercial	1,571,725	17.8%
Industrial	587,282	6.6%
Agricultural	16,290	0.2%
Religion	73,670	0.8%
Government	263,619	3.0%
Education	251,898	2.8%
Total	**8,843,310**	**100%**

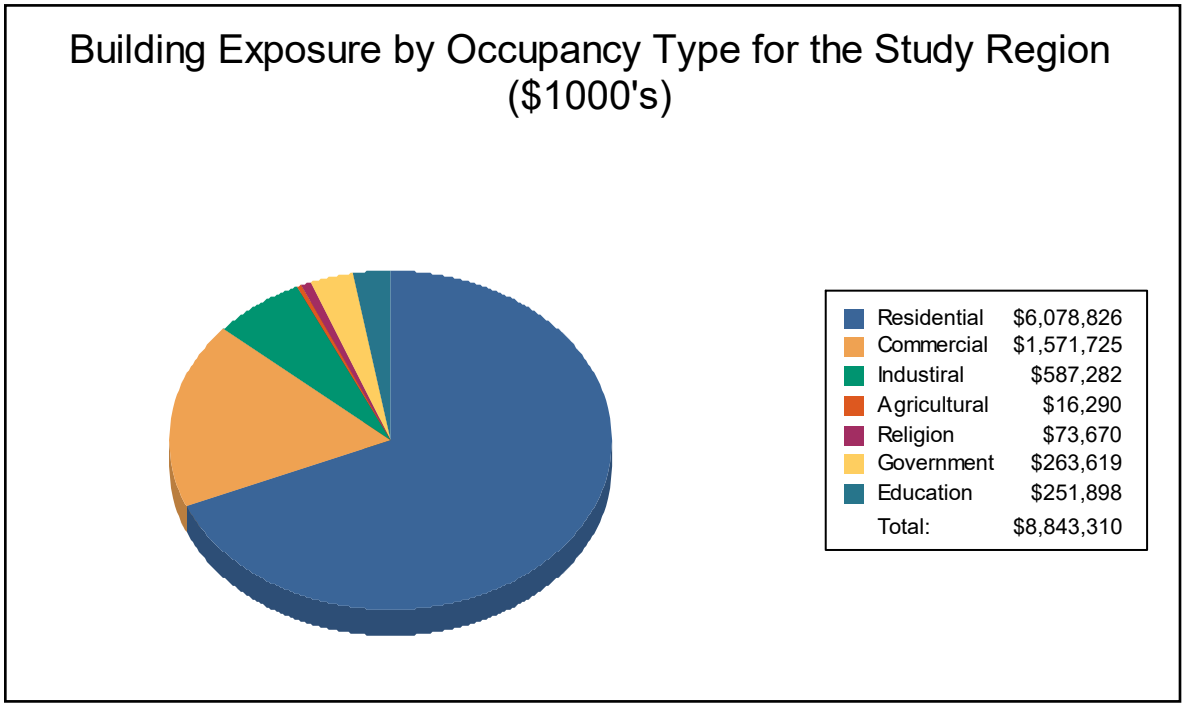
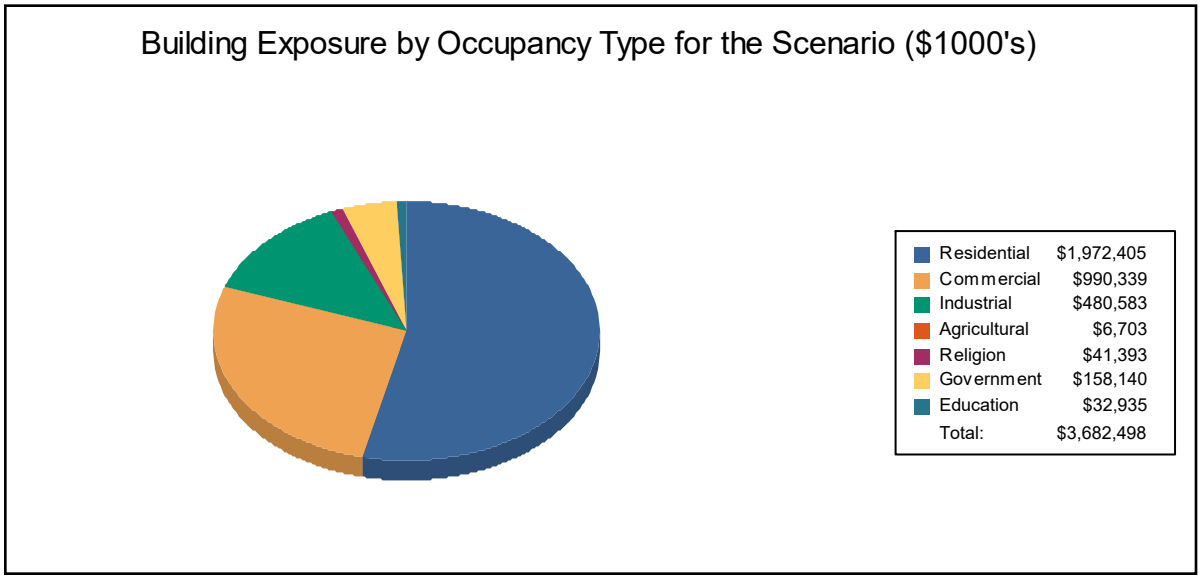


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,972,405	53.6%
Commercial	990,339	26.9%
Industrial	480,583	13.1%
Agricultural	6,703	0.2%
Religion	41,393	1.1%
Government	158,140	4.3%
Education	32,935	0.9%
Total	**3,682,498**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 15 schools, 3 fire stations, 1 police station and 1 emergency operation center.

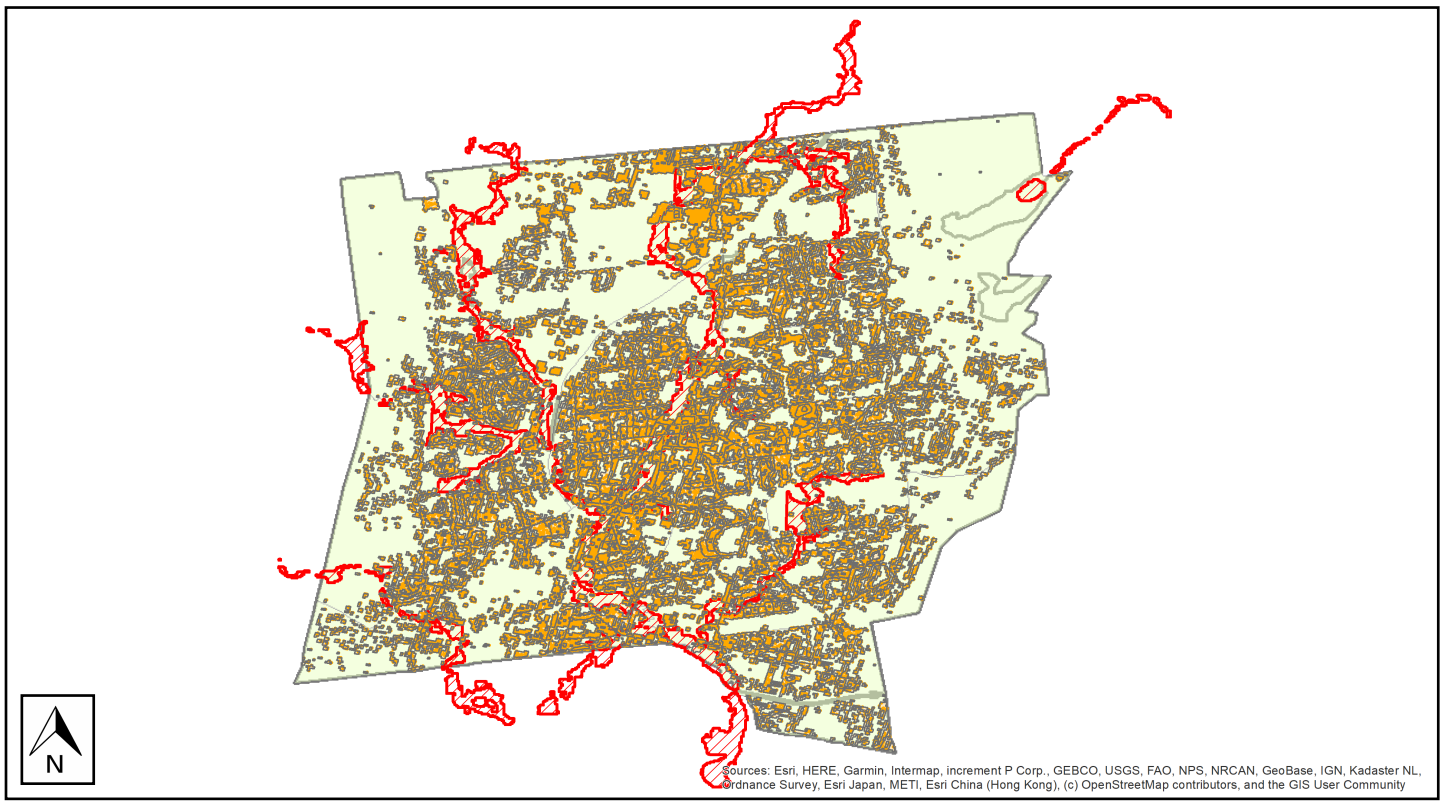
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Southington_FL
Scenario Name:	Southington_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 103 buildings will be at least moderately damaged. This is over 91% of the total number of buildings in the scenario. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

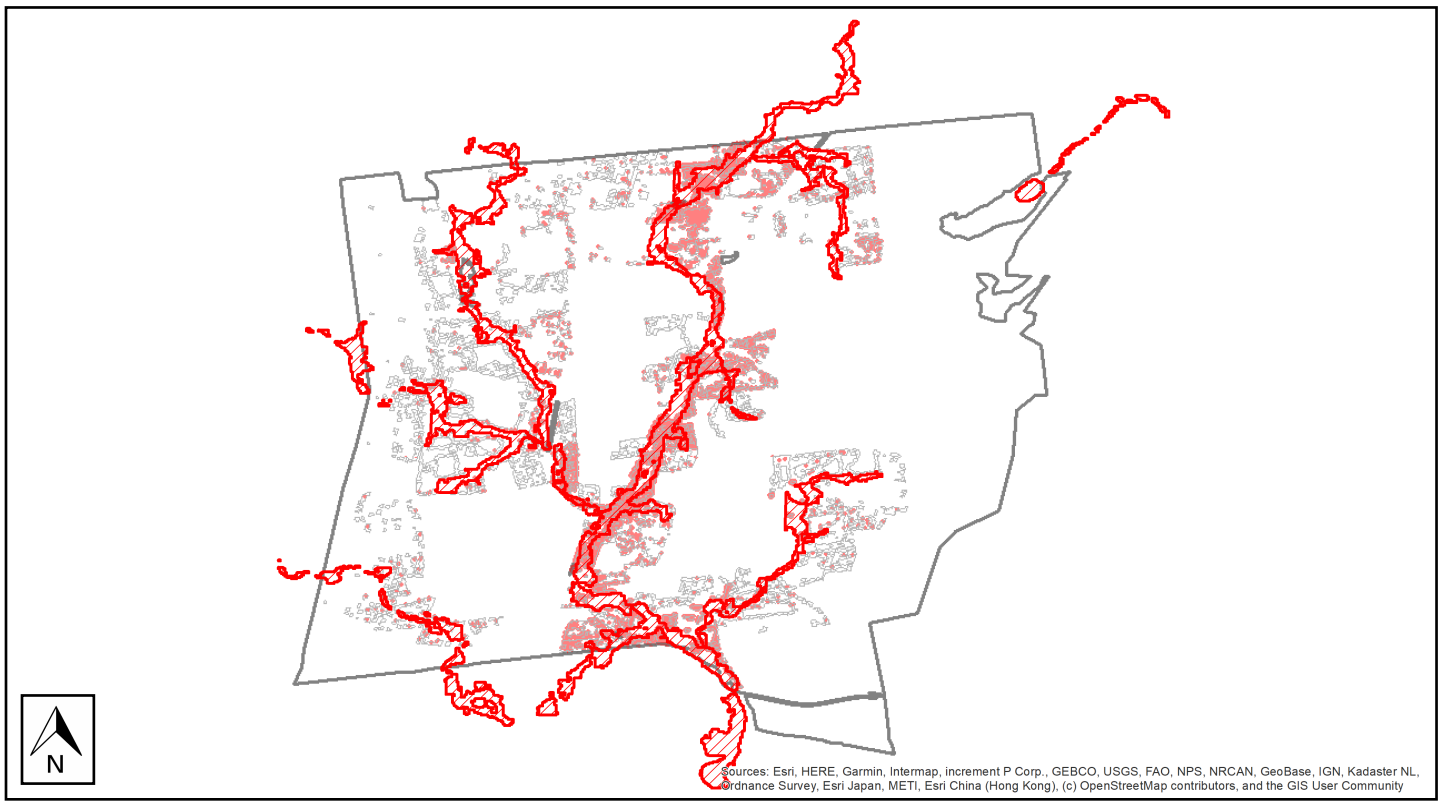


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	3	11	22	81	1	4	1	4	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	1	100	0	0	0	0	0	0	0	0
Industrial	0	0	2	67	1	33	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	52	41	56	44	14	11	2	2	0	0	2	2
Total	**55**		**82**		**16**		**3**		**0**		**2**	

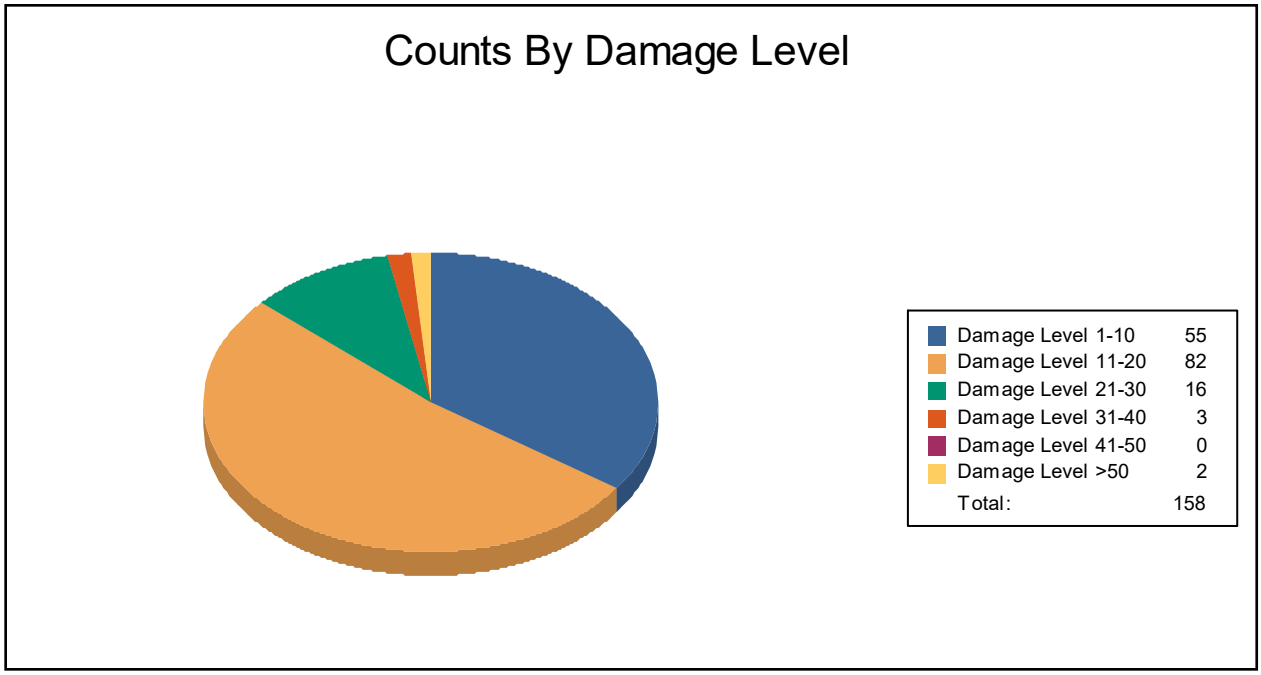


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	1	100	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	2	100
Masonry	6	32	10	53	3	16	0	0	0	0	0	0
Steel	2	14	10	71	2	14	0	0	0	0	0	0
Wood	48	40	58	49	11	9	2	2	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	15	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

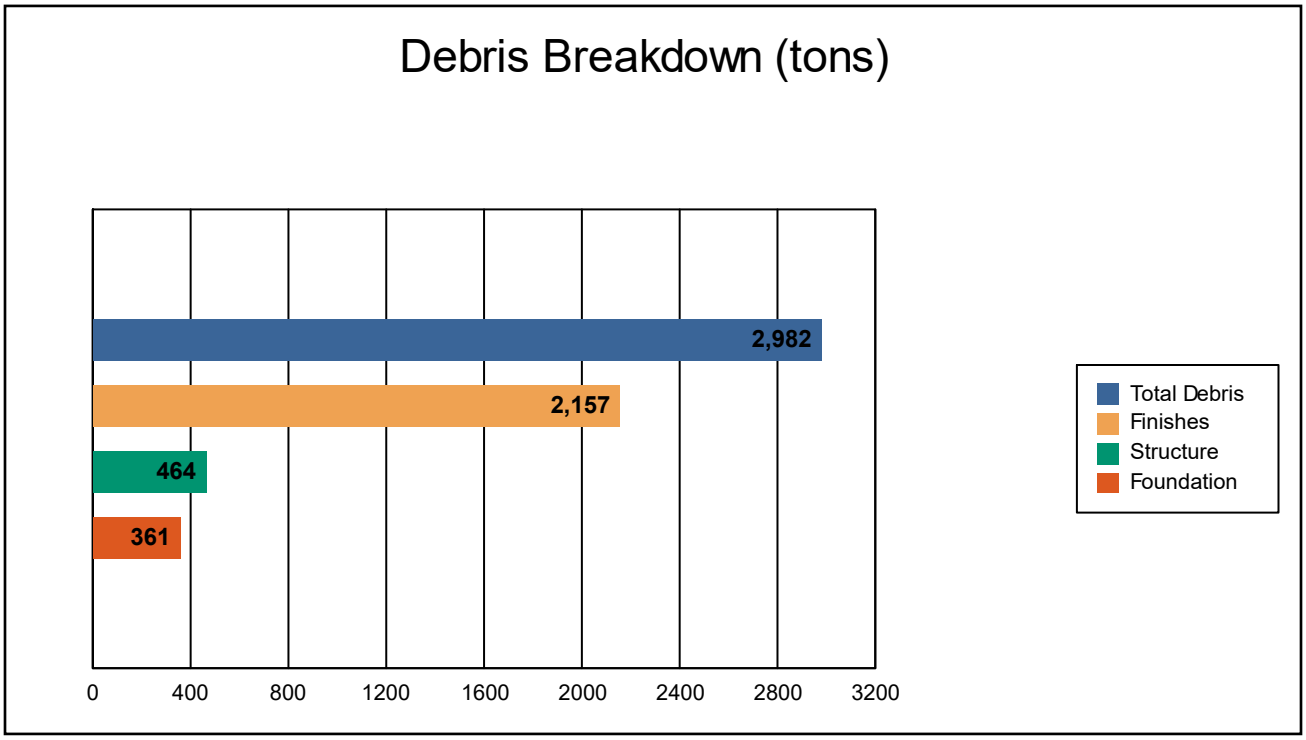
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

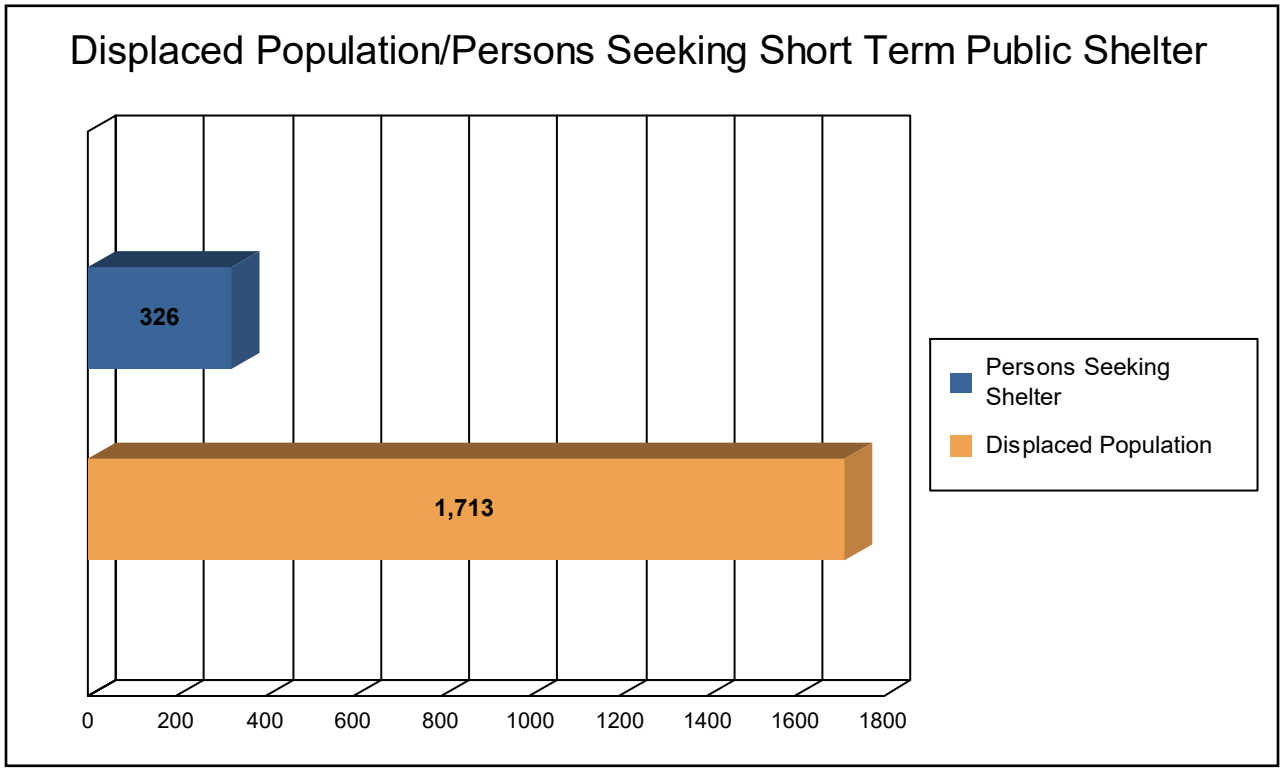


The model estimates that a total of 2,982 tons of debris will be generated. Of the total amount, Finishes comprises 72% of the total, Structure comprises 16% of the total, and Foundation comprises 12%. If the debris tonnage is converted into an estimated number of truckloads, it will require 120 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 571 households (or 1,713 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 326 people (out of a total population of 43,501) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 599.44 million dollars, which represents 16.28 % of the total replacement value of the scenario buildings.

Building-Related Losses

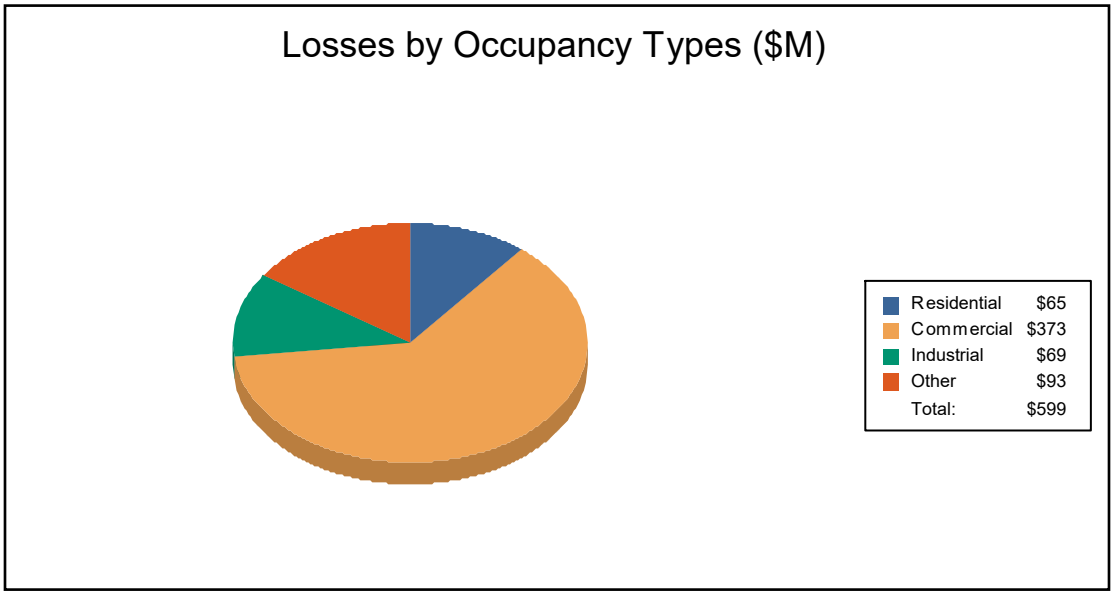
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 307.12 million dollars. 49% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 10.92% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	28.64	34.41	17.40	3.14	83.59
	Content	16.80	119.10	42.04	17.91	195.85
	Inventory	0.00	20.49	6.05	1.14	27.69
	Subtotal	**45.44**	**174.00**	**65.49**	**22.19**	**307.12**
Business Interruption						
	Income	2.07	71.29	0.76	4.07	78.20
	Relocation	7.20	20.52	0.91	3.32	31.95
	Rental Income	5.87	14.80	0.18	0.93	21.77
	Wage	4.87	92.14	1.32	62.07	160.40
	Subtotal	**20.01**	**198.75**	**3.17**	**70.39**	**292.31**
ALL	**Total**	**65.45**	**372.75**	**68.66**	**92.58**	**599.44**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,078,826	2,764,484	8,843,310
Total	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**
Total Study Region	**43,501**	**6,078,826**	**2,764,484**	**8,843,310**

Hazus: Flood Global Risk Report

Region Name: Stafford_FL

Flood Scenario: Stafford_Flood

Print Date: Monday, April 17, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 250 census blocks. The region contains over 5 thousand households and has a total population of 11,472 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,738 buildings in the region with a total building replacement value (excluding contents) of 2,217 million dollars. Approximately 89.15% of the buildings (and 65.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of 2,217 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,443,955	65.1%
Commercial	386,253	17.4%
Industrial	181,608	8.2%
Agricultural	897	0.0%
Religion	26,586	1.2%
Government	80,516	3.6%
Education	97,482	4.4%
Total	**2,217,297**	**100%**

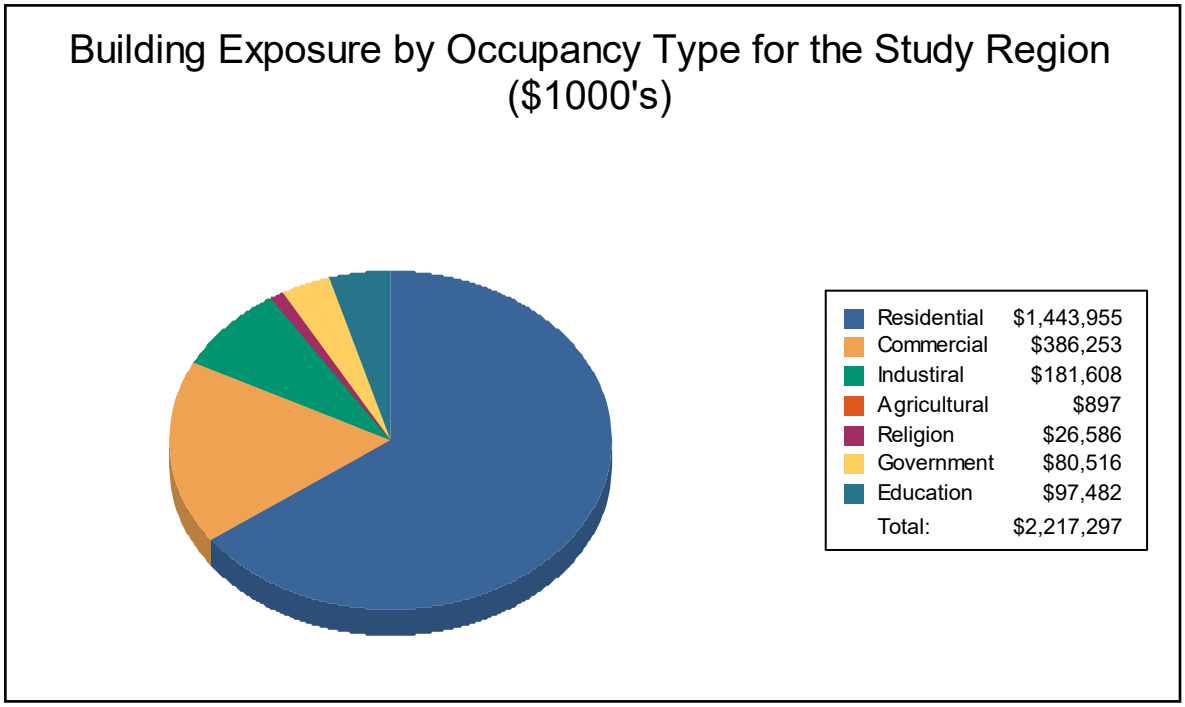
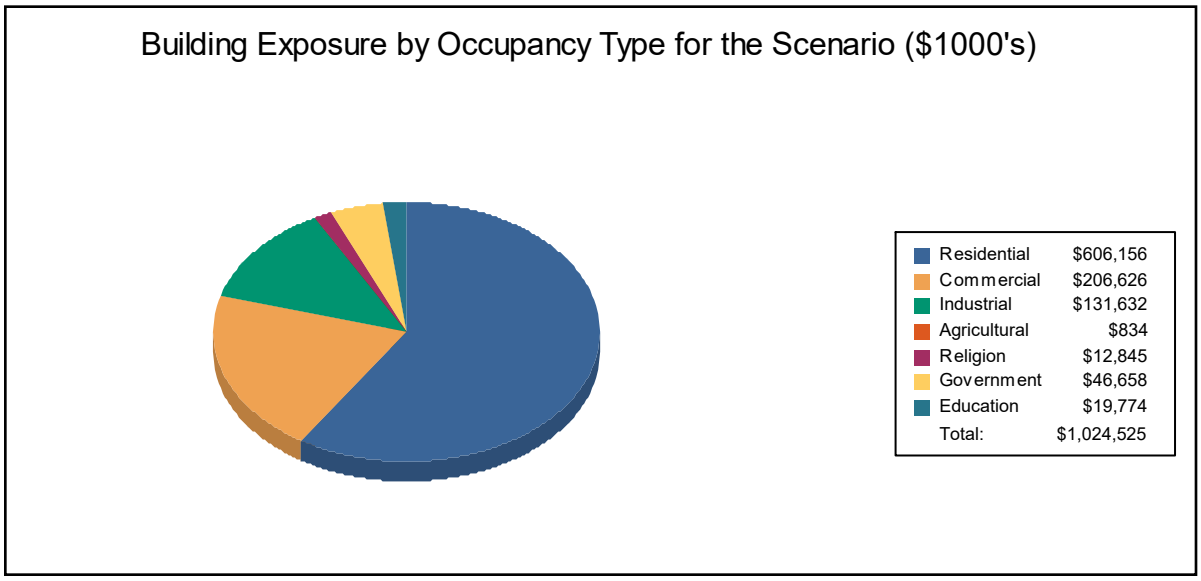


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	606,156	59.2%
Commercial	206,626	20.2%
Industrial	131,632	12.8%
Agricultural	834	0.1%
Religion	12,845	1.3%
Government	46,658	4.6%
Education	19,774	1.9%
Total	**1,024,525**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

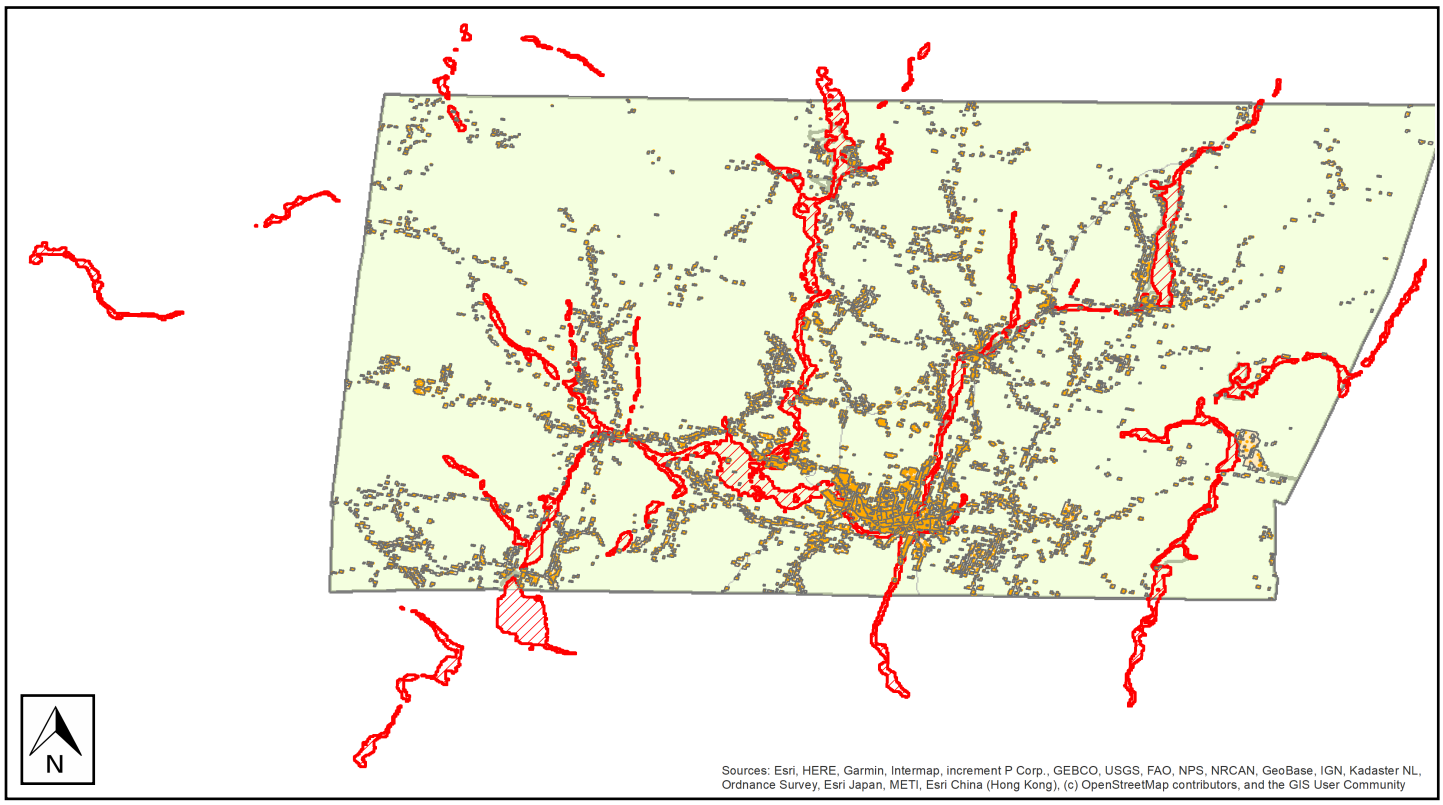
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Stafford_FL
Scenario Name:	Stafford_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 91% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

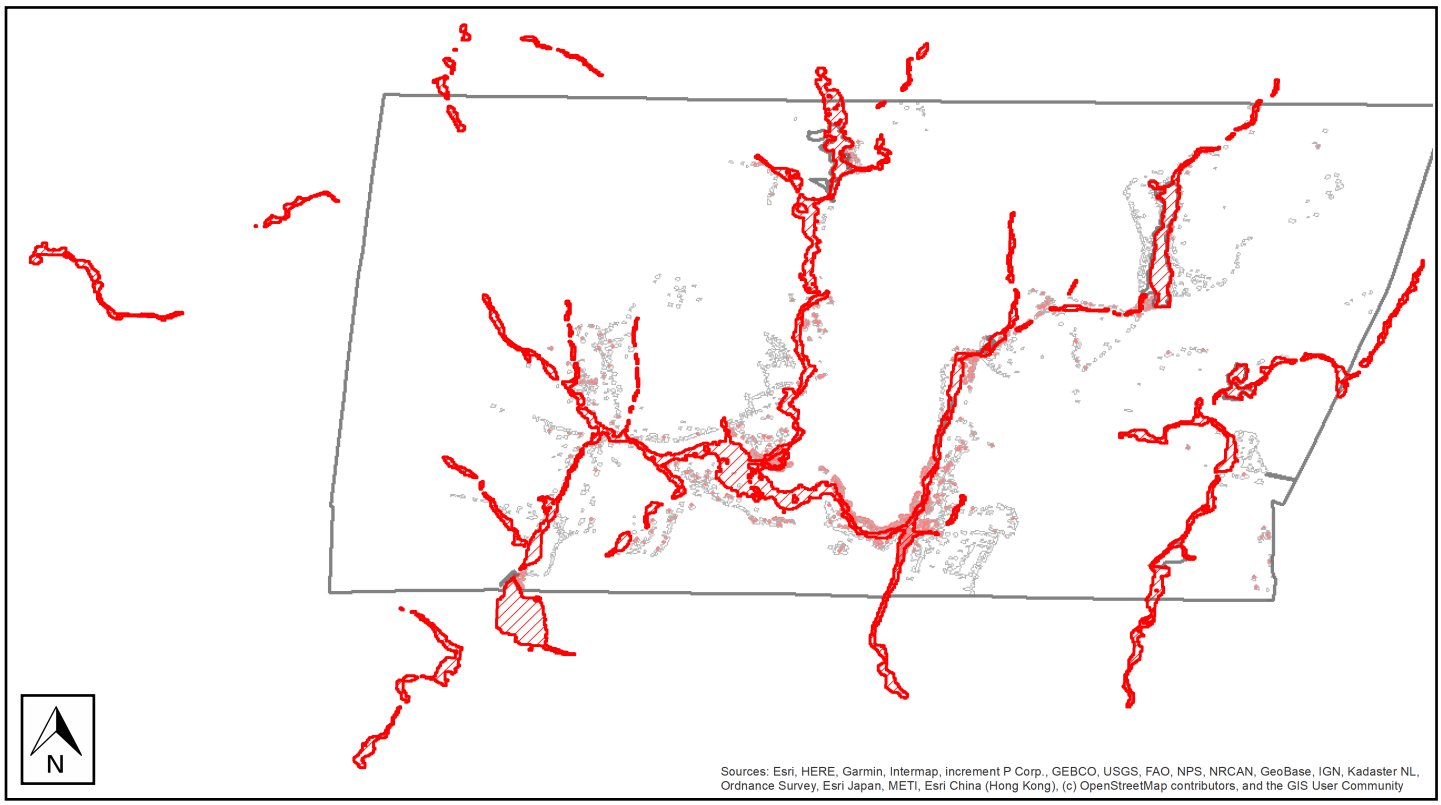


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	50	1	50	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	10	59	6	35	1	6	0	0	0	0	0	0
Total	**11**		**8**		**1**		**0**		**0**		**0**	

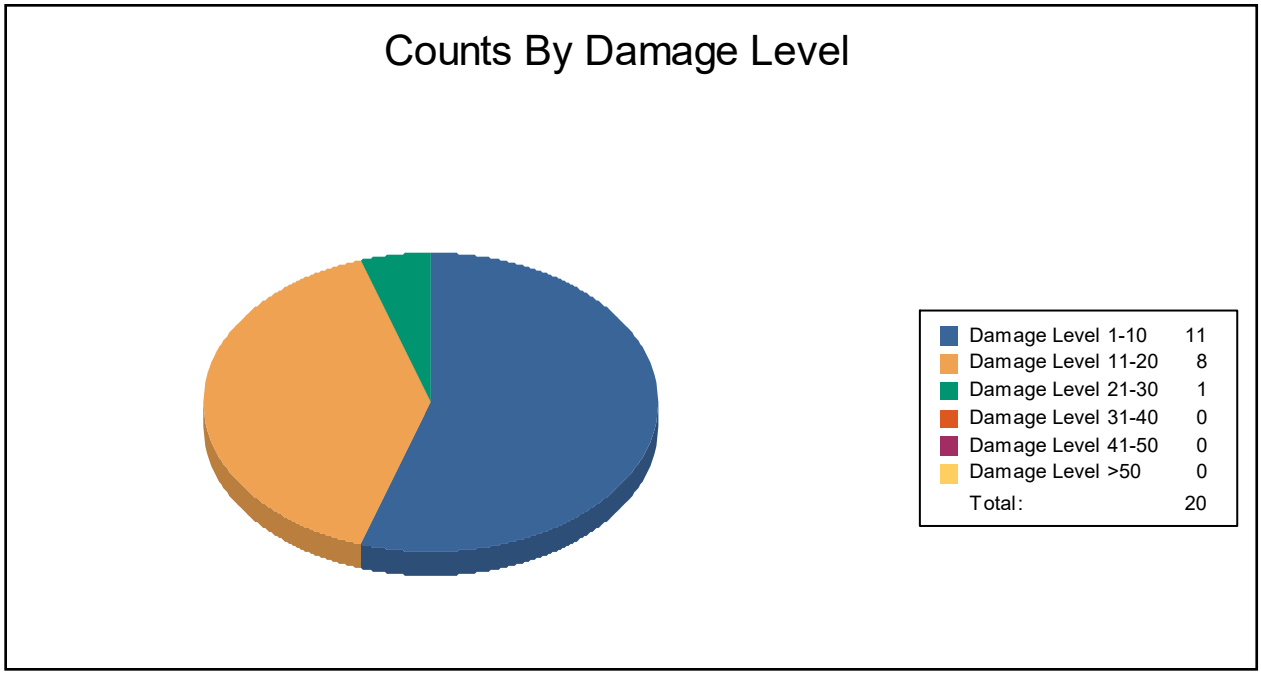


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	1	50	1	50	0	0	0	0	0	0	0	0
Wood	10	59	6	35	1	6	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 72 hospital beds available for use. On the day of the scenario flood event, the model estimates that 72 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

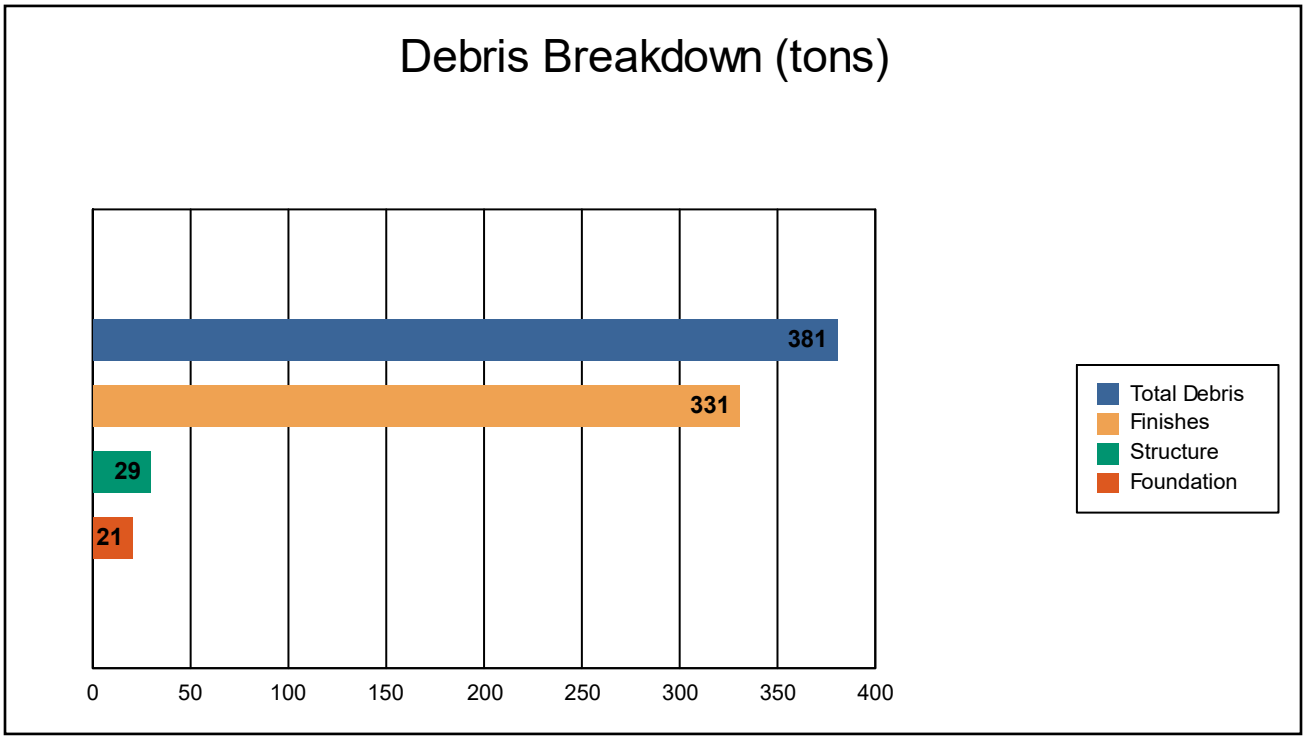
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

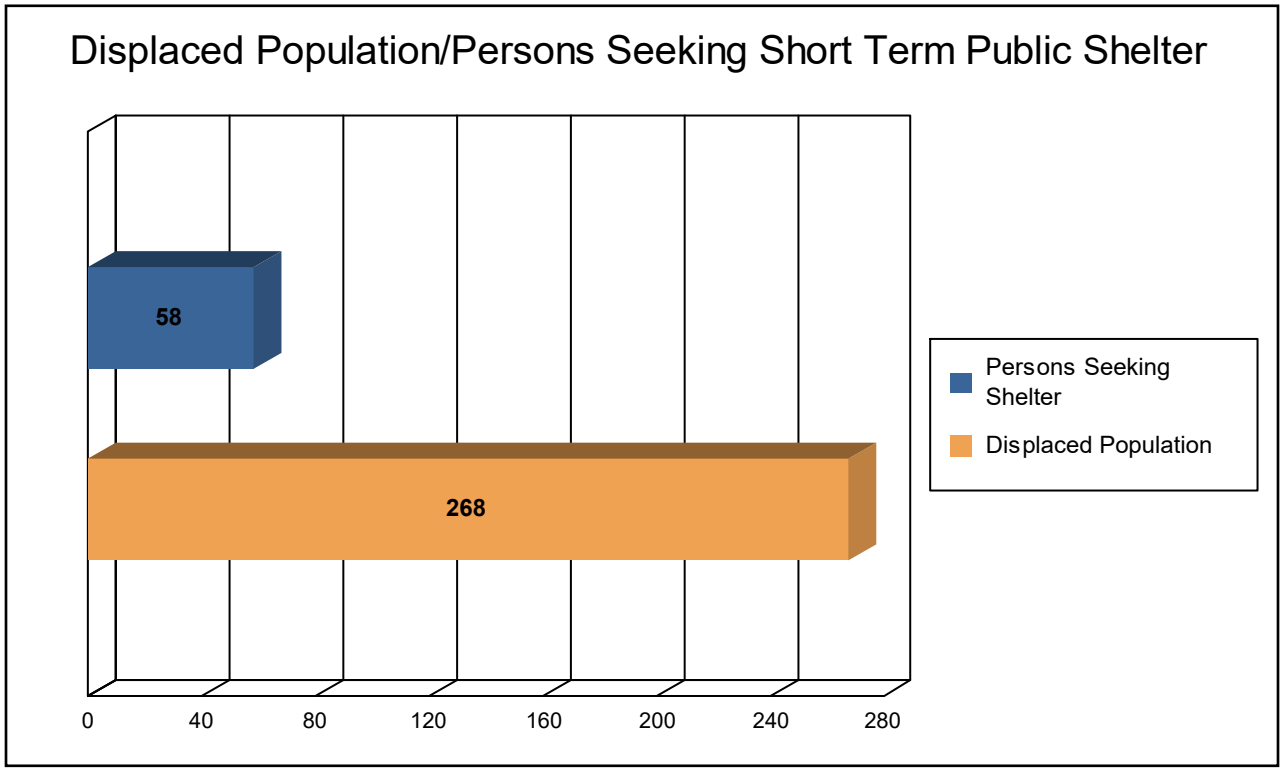


The model estimates that a total of 381 tons of debris will be generated. Of the total amount, Finishes comprises 87% of the total, Structure comprises 8% of the total, and Foundation comprises 5%. If the debris tonnage is converted into an estimated number of truckloads, it will require 16 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 89 households (or 268 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 58 people (out of a total population of 11,472) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 98.76 million dollars, which represents 9.64 % of the total replacement value of the scenario buildings.

Building-Related Losses

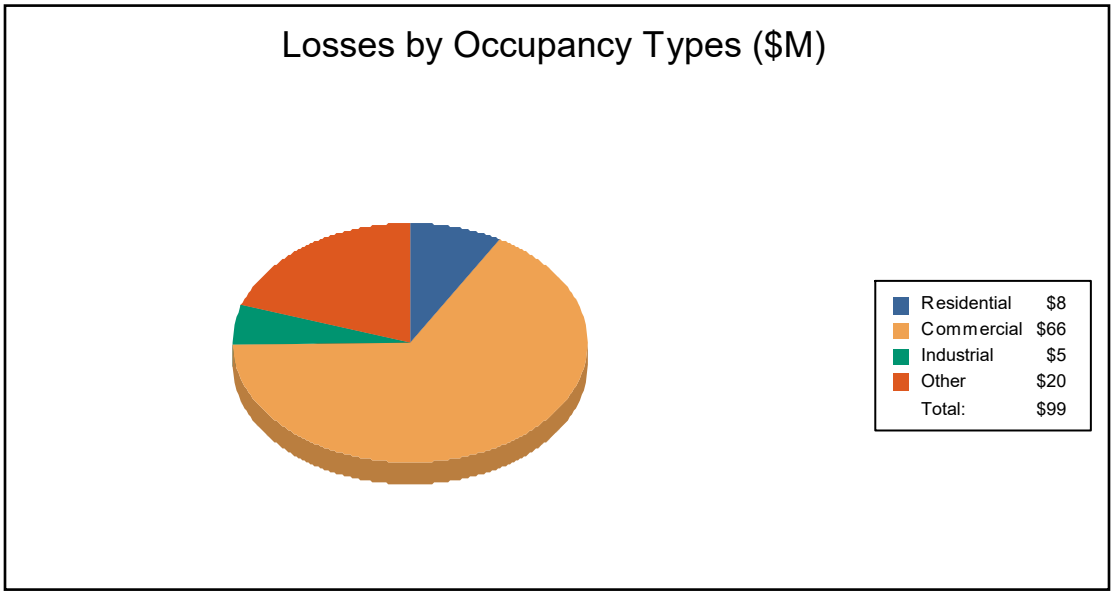
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 58.30 million dollars. 41% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.40% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.43	6.89	1.45	0.67	13.44
	Content	2.12	22.49	3.10	4.42	32.14
	Inventory	0.00	12.31	0.41	0.00	12.72
	Subtotal	**6.56**	**41.68**	**4.97**	**5.10**	**58.30**
Business Interruption						
	Income	0.00	5.71	0.07	1.02	6.80
	Relocation	1.23	4.54	0.09	0.79	6.65
	Rental Income	0.50	3.28	0.01	0.19	3.98
	Wage	0.01	10.34	0.13	12.57	23.04
	Subtotal	**1.74**	**23.86**	**0.30**	**14.57**	**40.46**
ALL	**Total**	**8.30**	**65.54**	**5.26**	**19.66**	**98.76**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,443,955	773,342	2,217,297
Total	**11,472**	**1,443,955**	**773,342**	**2,217,297**
Total Study Region	**11,472**	**1,443,955**	**773,342**	**2,217,297**

Hazus: Flood Global Risk Report

Region Name: Stafford_FL

Flood Scenario: Stafford_Flood

Print Date: Monday, April 17, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 250 census blocks. The region contains over 5 thousand households and has a total population of 11,472 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,738 buildings in the region with a total building replacement value (excluding contents) of 2,217 million dollars. Approximately 89.15% of the buildings (and 65.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of 2,217 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,443,955	65.1%
Commercial	386,253	17.4%
Industrial	181,608	8.2%
Agricultural	897	0.0%
Religion	26,586	1.2%
Government	80,516	3.6%
Education	97,482	4.4%
Total	**2,217,297**	**100%**

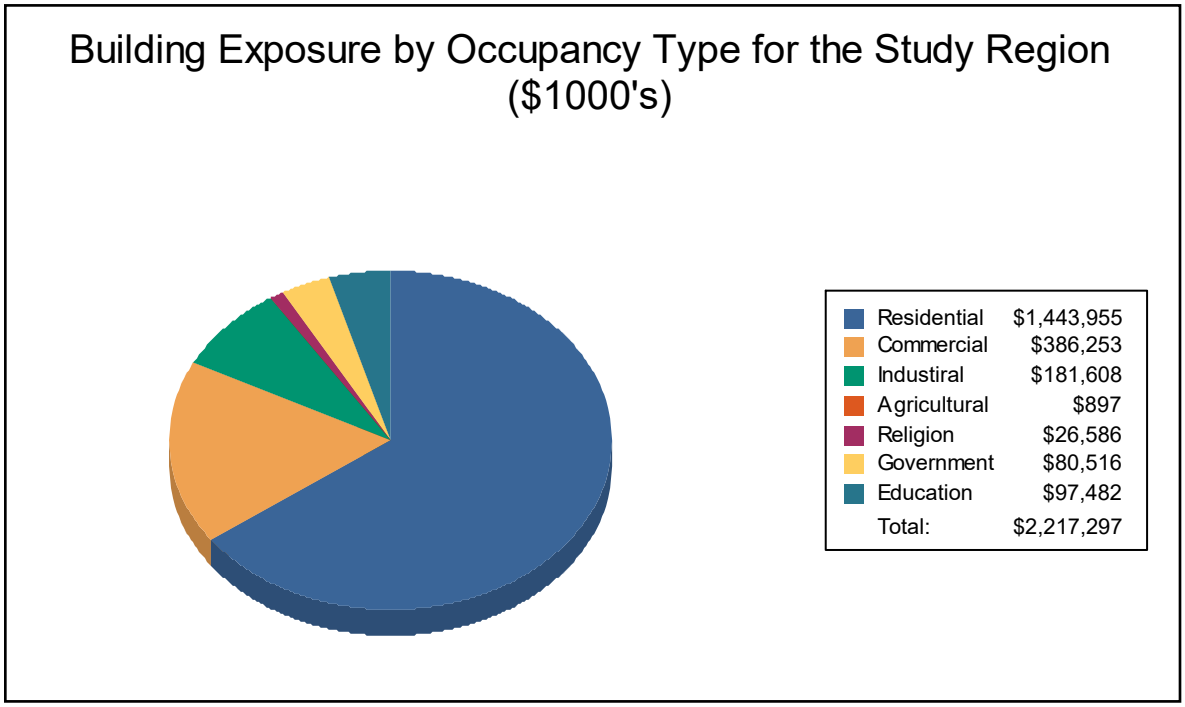
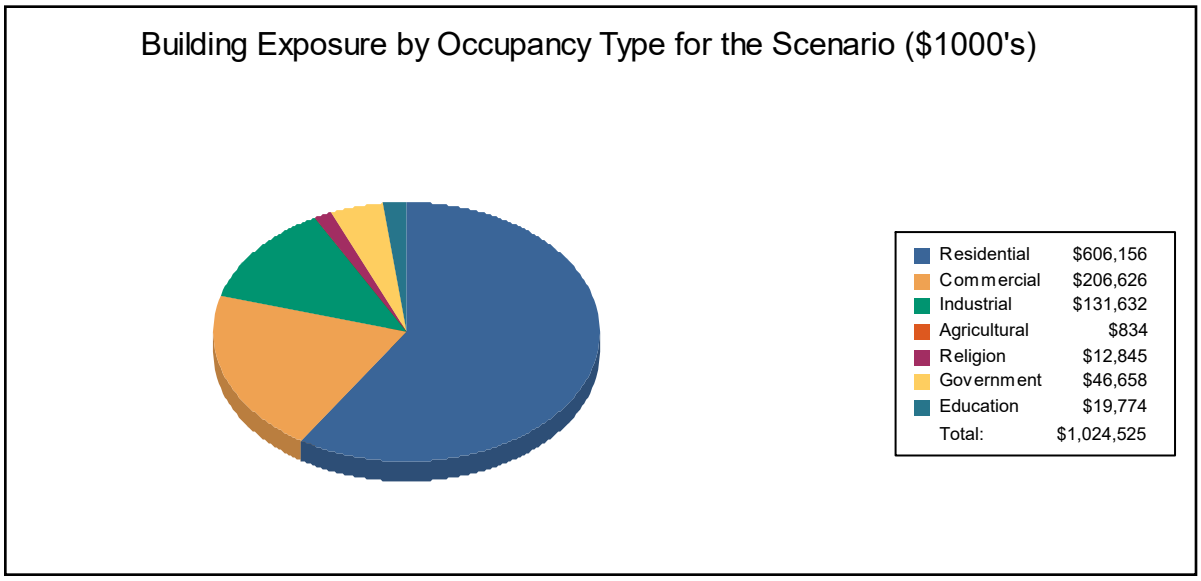


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	606,156	59.2%
Commercial	206,626	20.2%
Industrial	131,632	12.8%
Agricultural	834	0.1%
Religion	12,845	1.3%
Government	46,658	4.6%
Education	19,774	1.9%
Total	**1,024,525**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

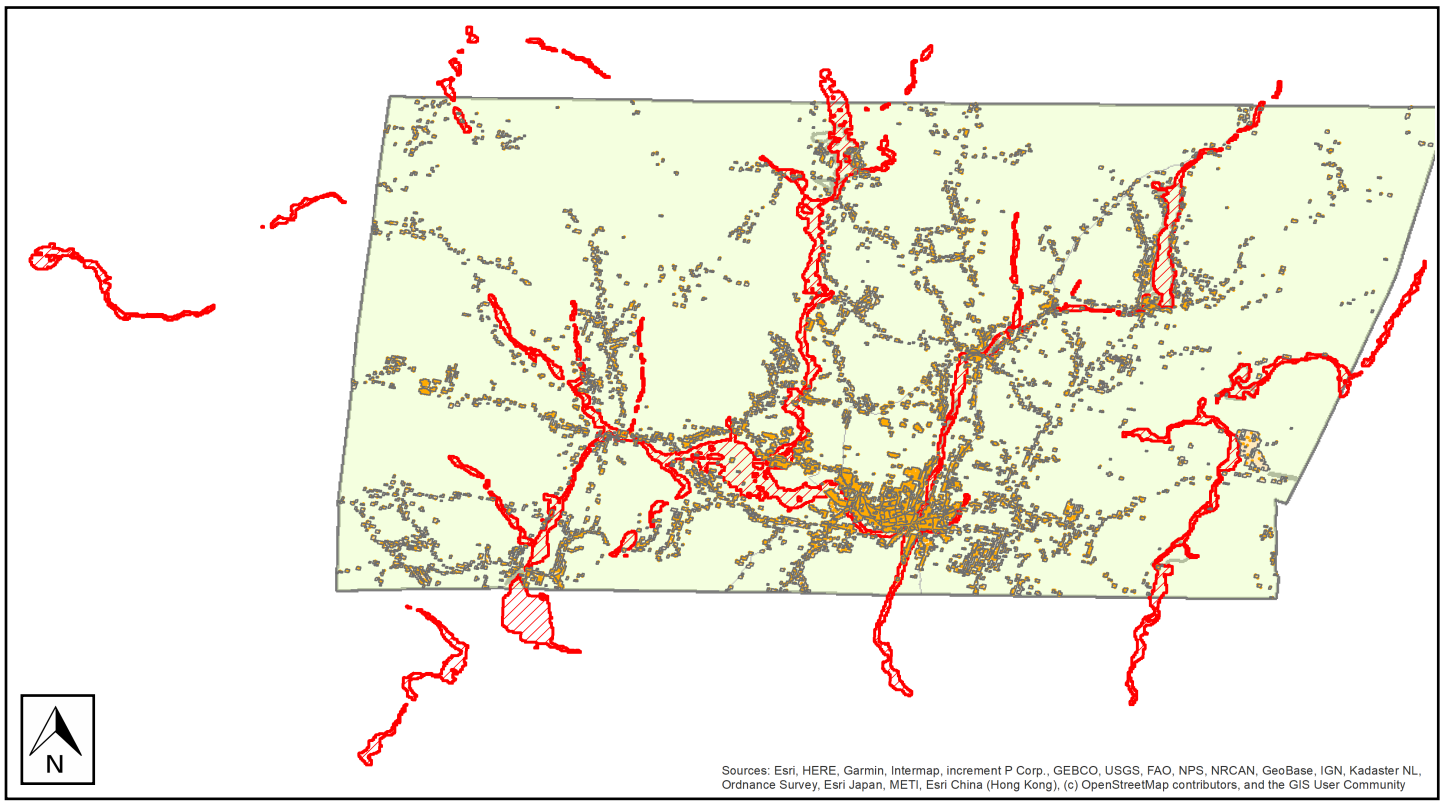
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Stafford_FL
Scenario Name:	Stafford_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 92% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

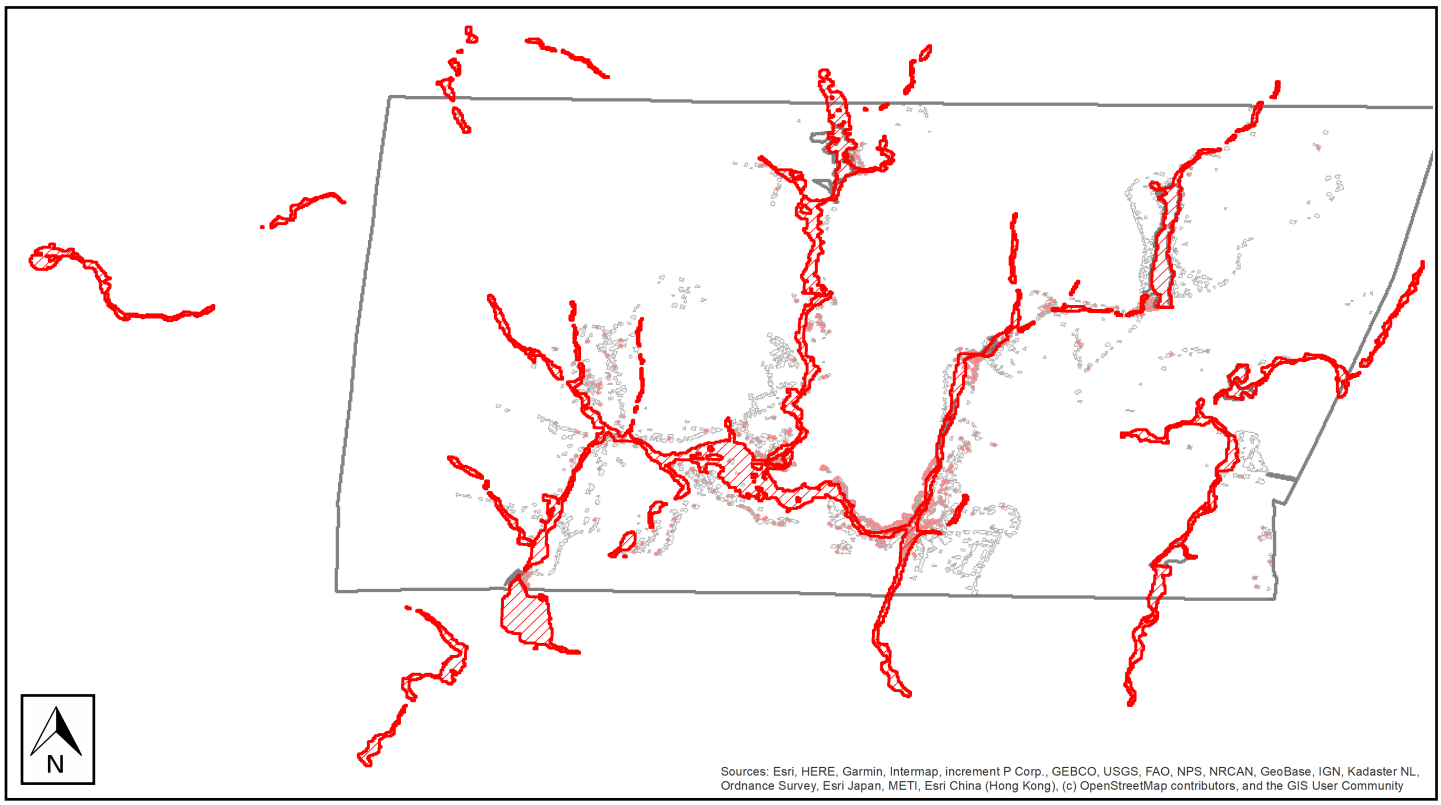


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	25	3	75	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	11	61	6	33	0	0	1	6	0	0	0	0
Total	**12**		**10**		**0**		**1**		**0**		**0**	

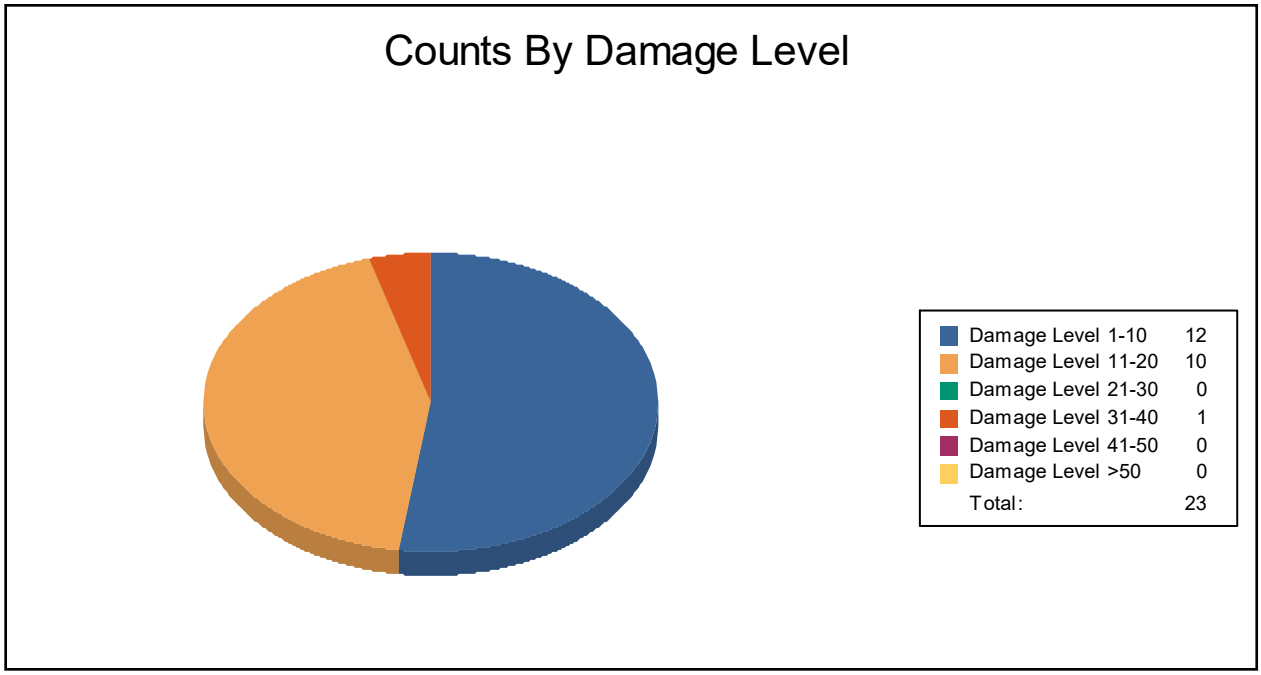


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	3	100	0	0	0	0	0	0	0	0
Wood	11	61	6	33	0	0	1	6	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 72 hospital beds available for use. On the day of the scenario flood event, the model estimates that 72 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

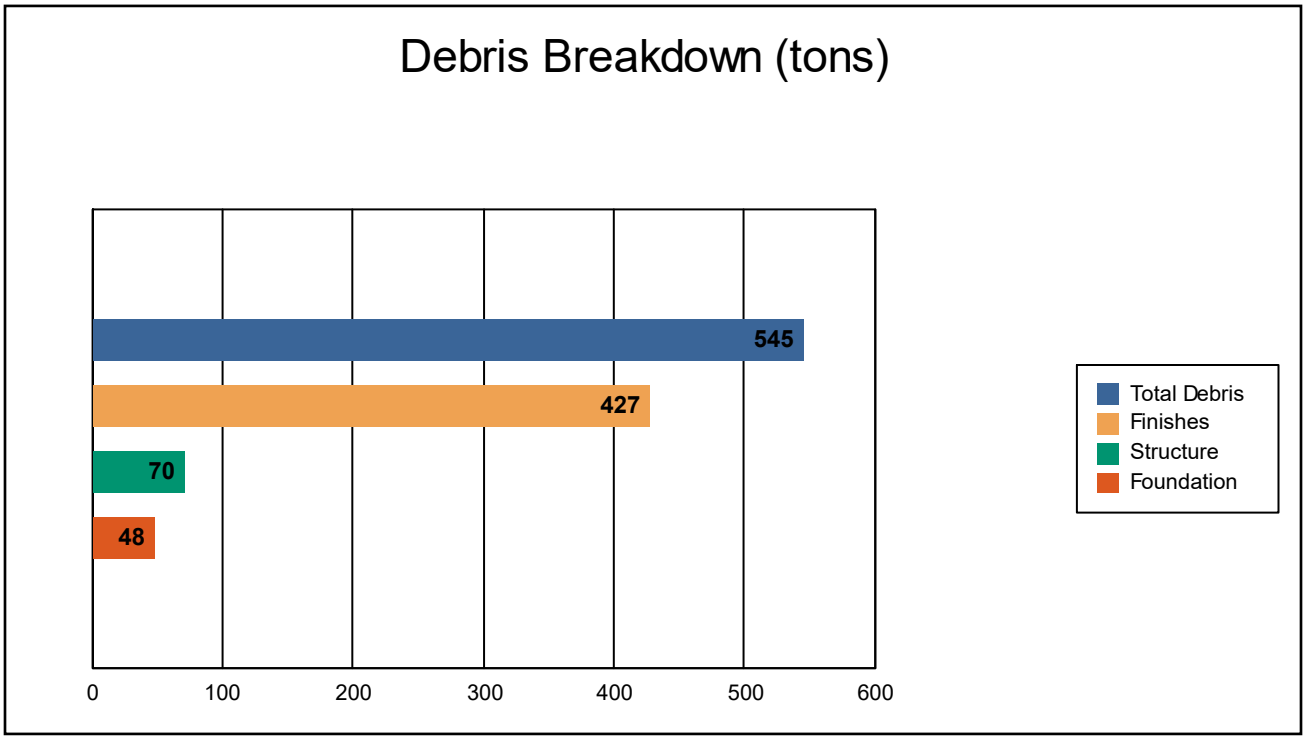
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

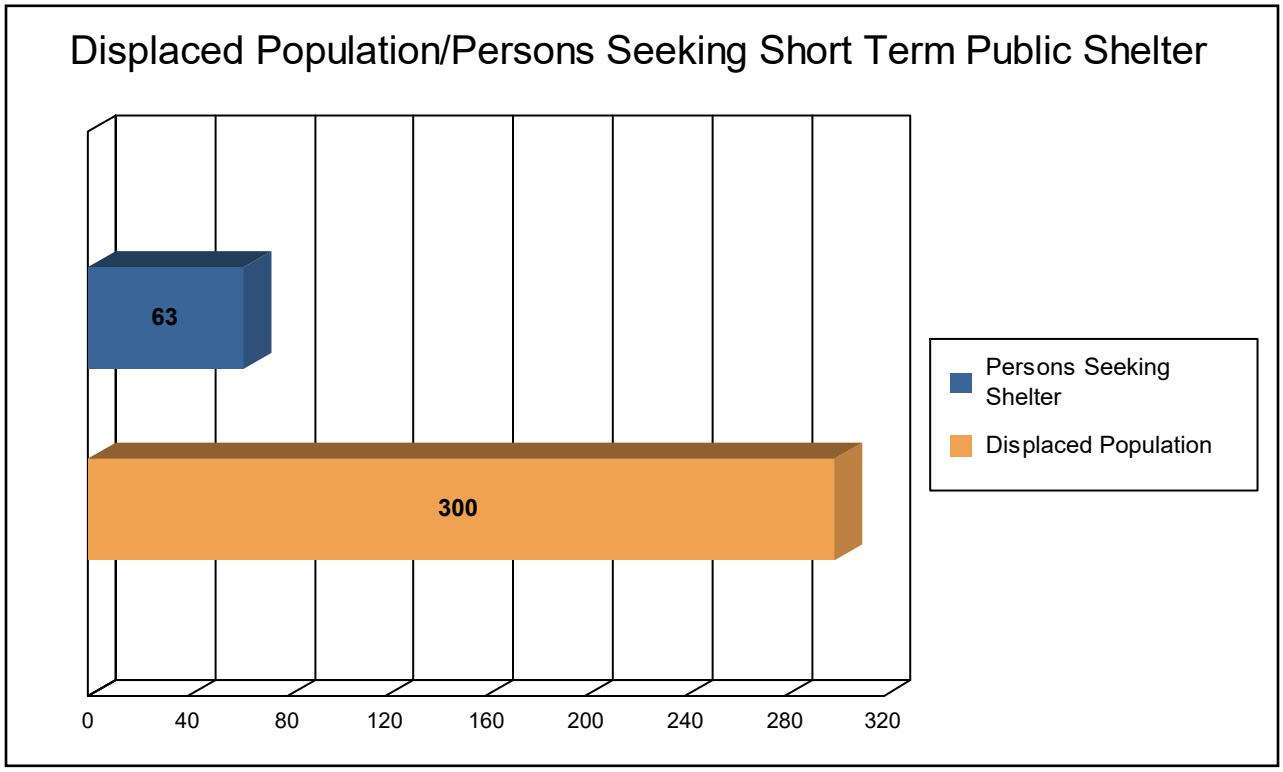


The model estimates that a total of 545 tons of debris will be generated. Of the total amount, Finishes comprises 78% of the total, Structure comprises 13% of the total, and Foundation comprises 9%. If the debris tonnage is converted into an estimated number of truckloads, it will require 22 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 100 households (or 300 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 63 people (out of a total population of 11,472) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 120.91 million dollars, which represents 11.80 % of the total replacement value of the scenario buildings.

Building-Related Losses

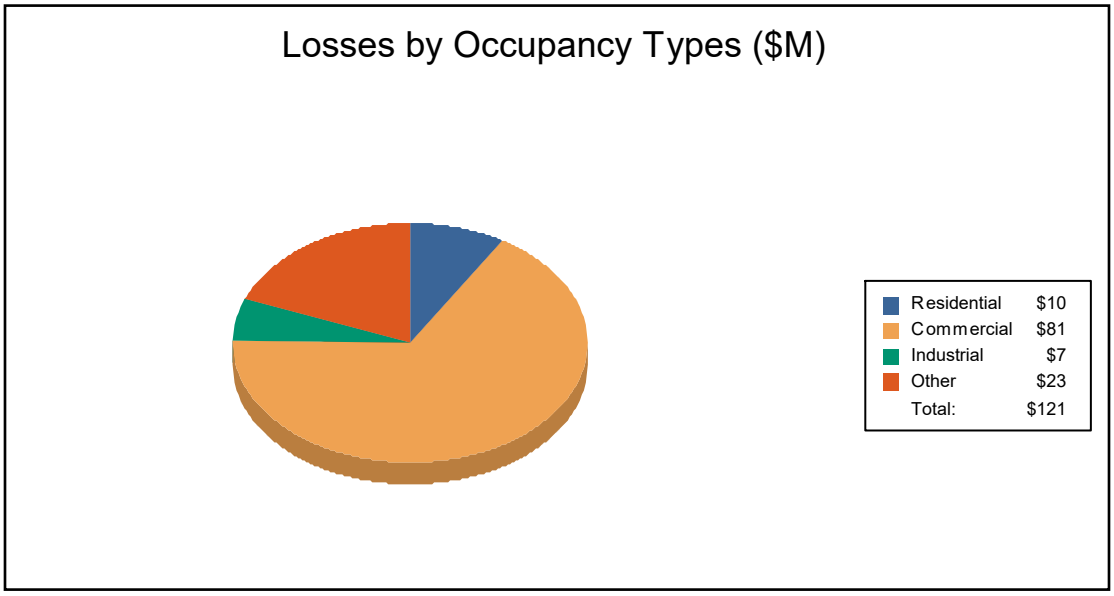
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 72.85 million dollars. 40% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.64% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.69	9.01	1.82	0.84	17.37
	Content	2.72	28.22	3.94	5.27	40.14
	Inventory	0.00	14.81	0.52	0.01	15.34
	Subtotal	**8.41**	**52.04**	**6.27**	**6.12**	**72.85**
Business Interruption						
	Income	0.00	6.99	0.08	1.12	8.19
	Relocation	1.44	5.25	0.11	0.89	7.68
	Rental Income	0.59	3.76	0.02	0.23	4.60
	Wage	0.01	12.46	0.15	14.97	27.59
	Subtotal	**2.04**	**28.46**	**0.35**	**17.21**	**48.06**
ALL	**Total**	**10.45**	**80.50**	**6.62**	**23.33**	**120.91**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,443,955	773,342	2,217,297
Total	**11,472**	**1,443,955**	**773,342**	**2,217,297**
Total Study Region	**11,472**	**1,443,955**	**773,342**	**2,217,297**

Hazus: Flood Global Risk Report

Region Name: Stafford_FL

Flood Scenario: Stafford_Flood

Print Date: Monday, April 17, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 250 census blocks. The region contains over 5 thousand households and has a total population of 11,472 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,738 buildings in the region with a total building replacement value (excluding contents) of 2,217 million dollars. Approximately 89.15% of the buildings (and 65.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of 2,217 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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Total	**2,217,297**	**100%**

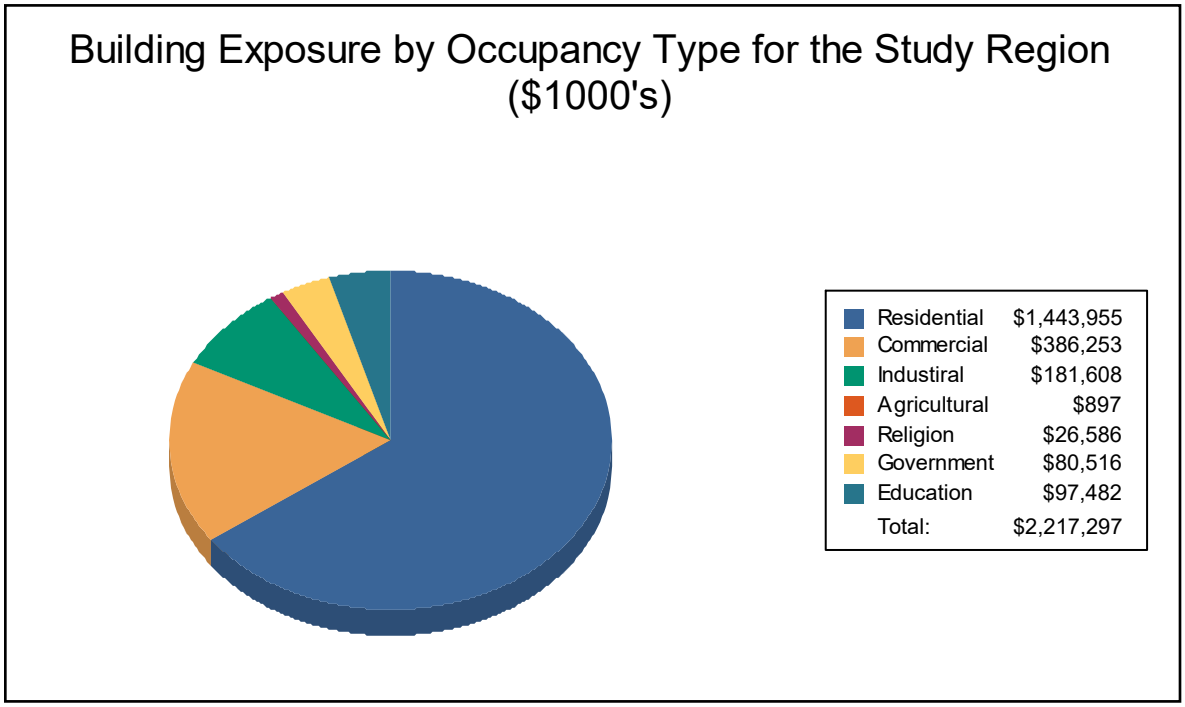

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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Industrial	131,632	12.8%
Agricultural	834	0.1%
Religion	12,845	1.3%
Government	46,658	4.6%
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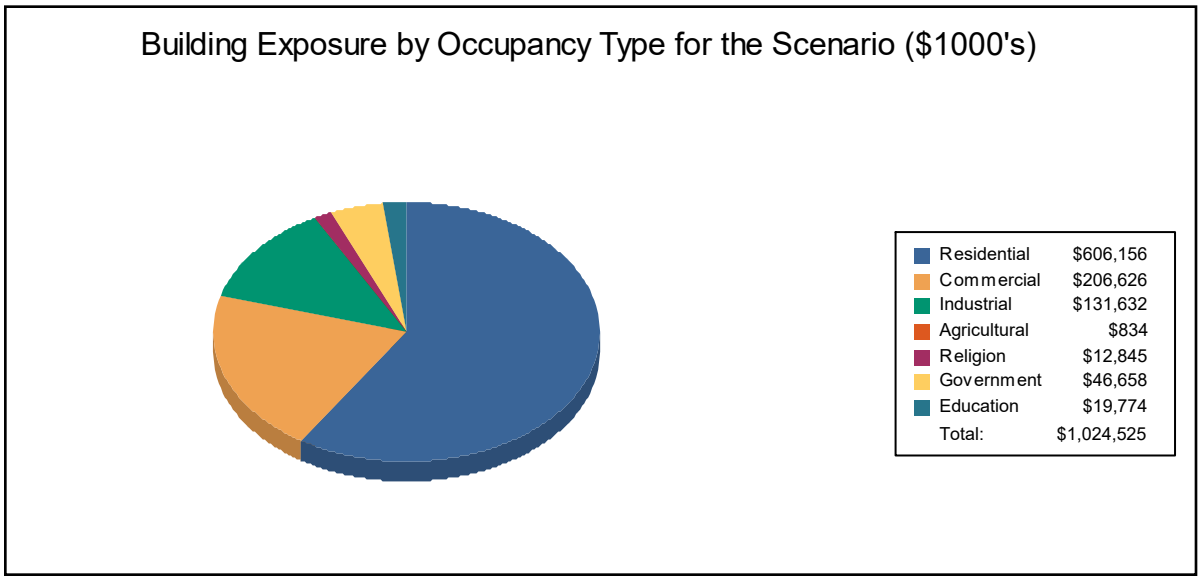
Total	**1,024,525**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

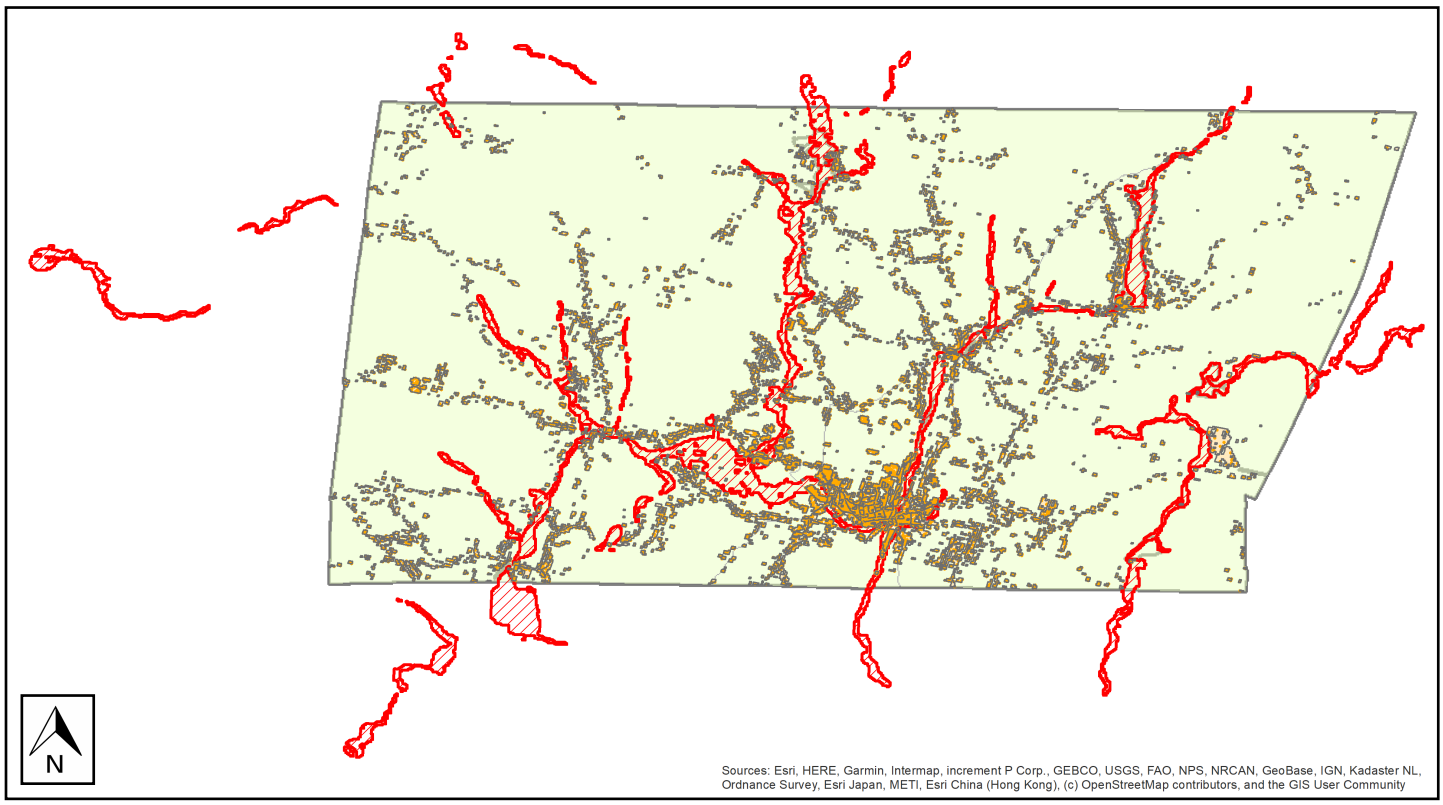
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Stafford_FL
Scenario Name:	Stafford_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 20 buildings will be at least moderately damaged. This is over 91% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

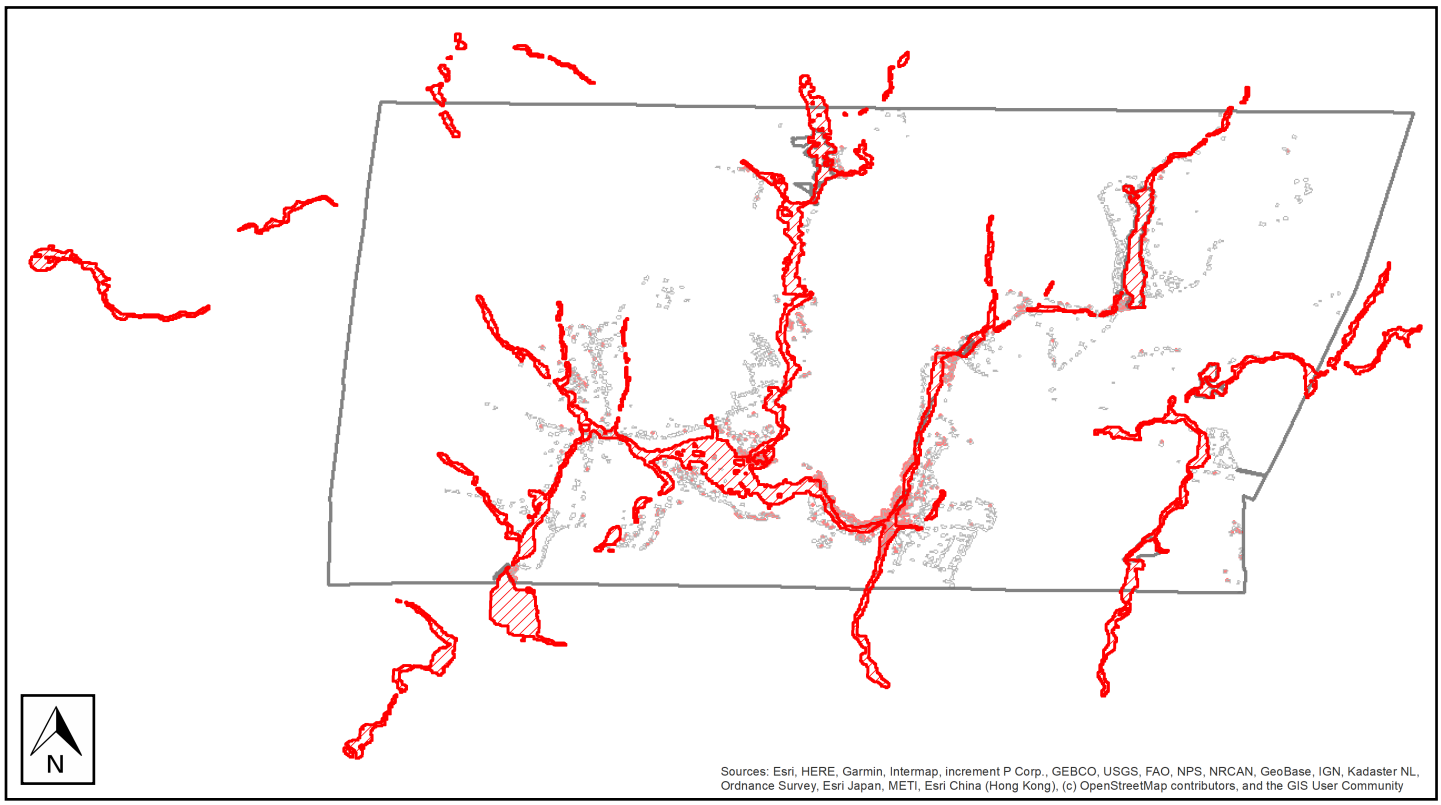


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	3	100	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	12	43	13	46	1	4	2	7	0	0	0	0
Total	**12**		**17**		**1**		**2**		**0**		**0**	

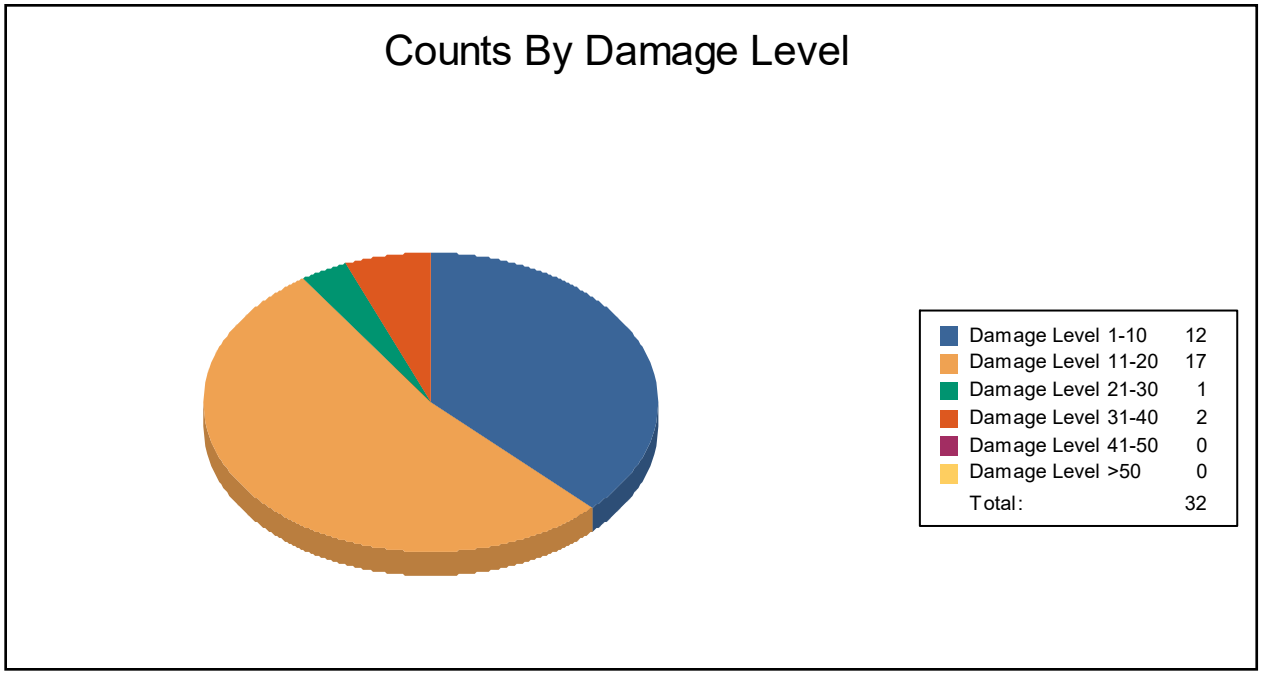


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	3	100	0	0	0	0	0	0	0	0
Wood	12	43	13	46	1	4	2	7	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 72 hospital beds available for use. On the day of the scenario flood event, the model estimates that 72 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

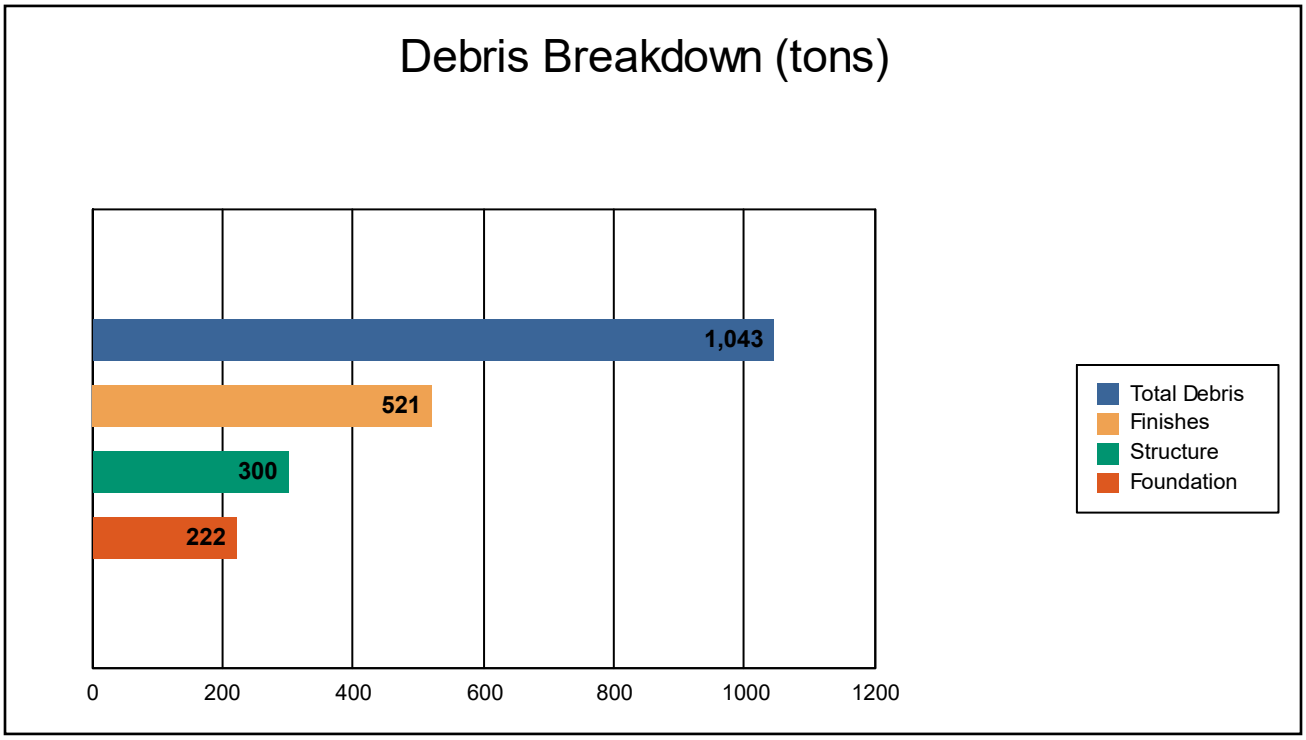
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

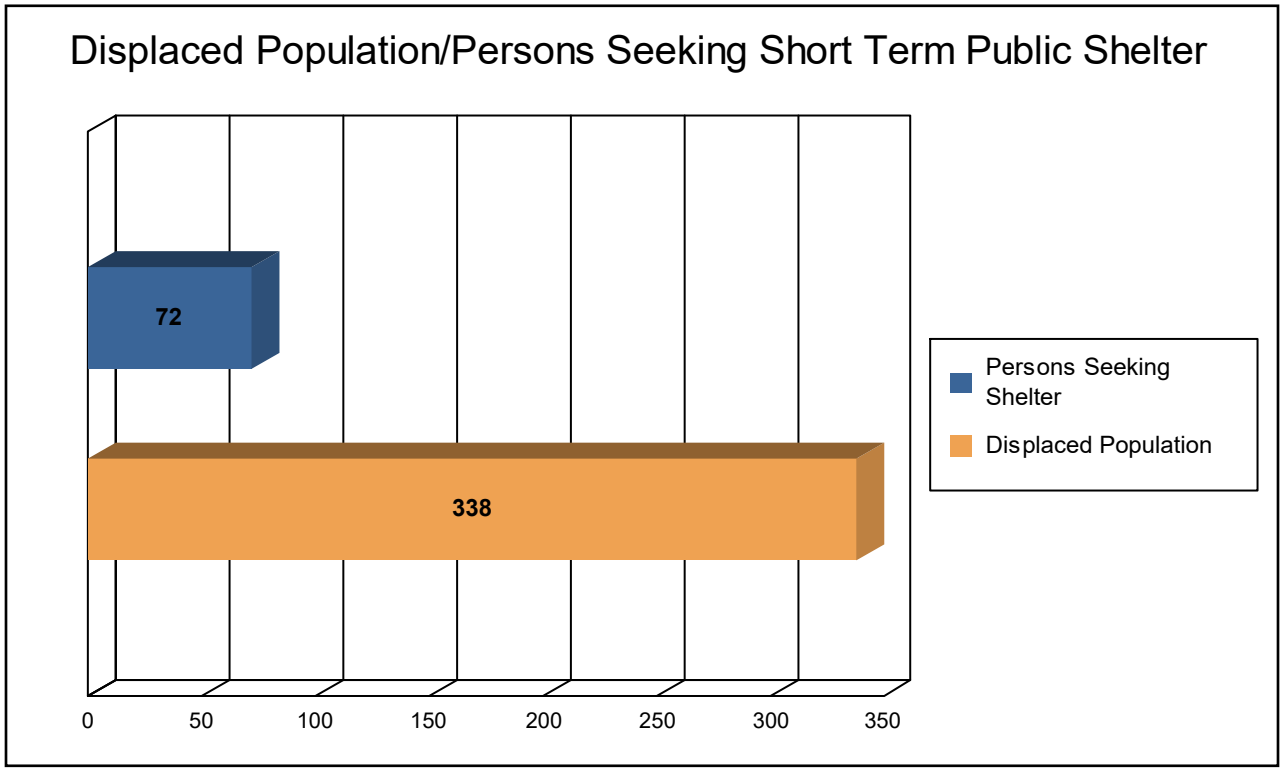


The model estimates that a total of 1,043 tons of debris will be generated. Of the total amount, Finishes comprises 50% of the total, Structure comprises 29% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 42 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 113 households (or 338 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 72 people (out of a total population of 11,472) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 137.86 million dollars, which represents 13.46 % of the total replacement value of the scenario buildings.

Building-Related Losses

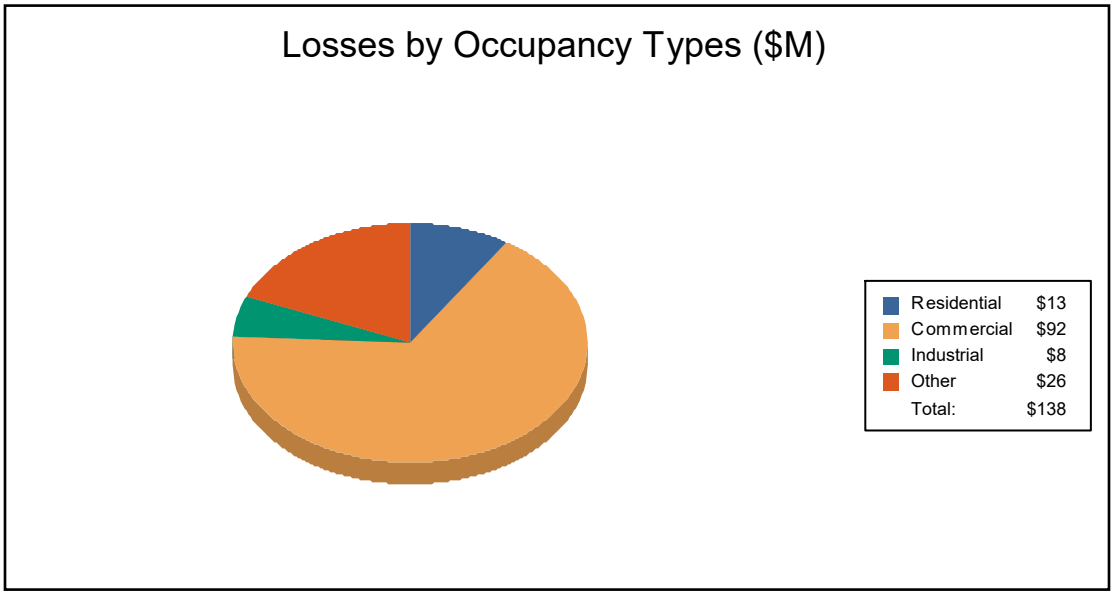
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 84.46 million dollars. 39% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 9.12% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6.92	10.97	2.12	1.00	21.00
	Content	3.28	32.71	4.63	5.81	46.42
	Inventory	0.00	16.42	0.61	0.01	17.03
	Subtotal	**10.20**	**60.09**	**7.35**	**6.82**	**84.46**
Business Interruption						
	Income	0.00	7.93	0.09	1.21	9.23
	Relocation	1.67	5.78	0.12	0.98	8.55
	Rental Income	0.69	4.14	0.02	0.26	5.11
	Wage	0.01	14.10	0.17	16.25	30.52
	Subtotal	**2.37**	**31.94**	**0.40**	**18.70**	**53.40**
ALL	**Total**	**12.57**	**92.03**	**7.74**	**25.52**	**137.86**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,443,955	773,342	2,217,297
Total	**11,472**	**1,443,955**	**773,342**	**2,217,297**
Total Study Region	**11,472**	**1,443,955**	**773,342**	**2,217,297**

Hazus: Flood Global Risk Report

Region Name: Stafford_FL

Flood Scenario: Stafford_Flood

Print Date: Monday, April 17, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 250 census blocks. The region contains over 5 thousand households and has a total population of 11,472 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,738 buildings in the region with a total building replacement value (excluding contents) of 2,217 million dollars. Approximately 89.15% of the buildings (and 65.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of 2,217 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,443,955	65.1%
Commercial	386,253	17.4%
Industrial	181,608	8.2%
Agricultural	897	0.0%
Religion	26,586	1.2%
Government	80,516	3.6%
Education	97,482	4.4%
Total	**2,217,297**	**100%**

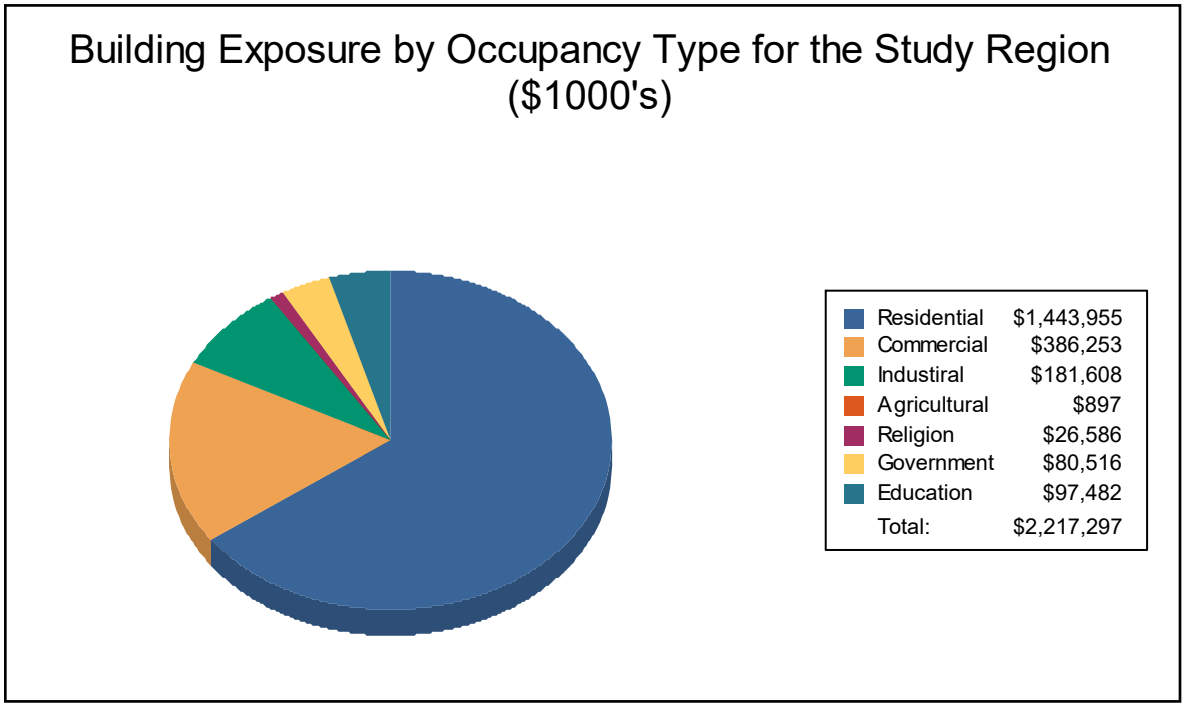
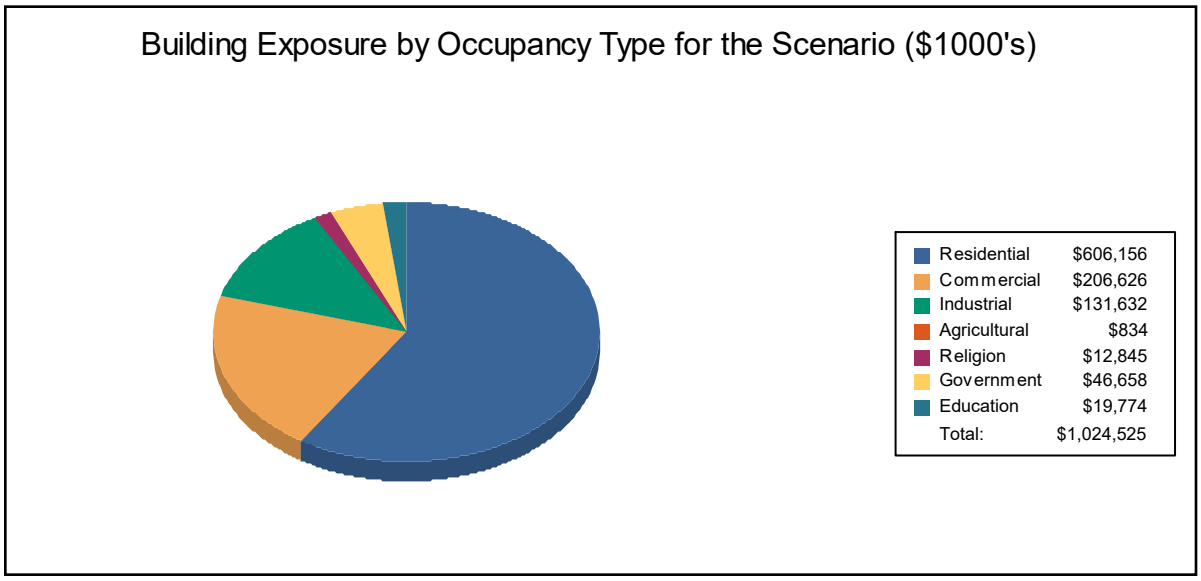


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	606,156	59.2%
Commercial	206,626	20.2%
Industrial	131,632	12.8%
Agricultural	834	0.1%
Religion	12,845	1.3%
Government	46,658	4.6%
Education	19,774	1.9%
Total	**1,024,525**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

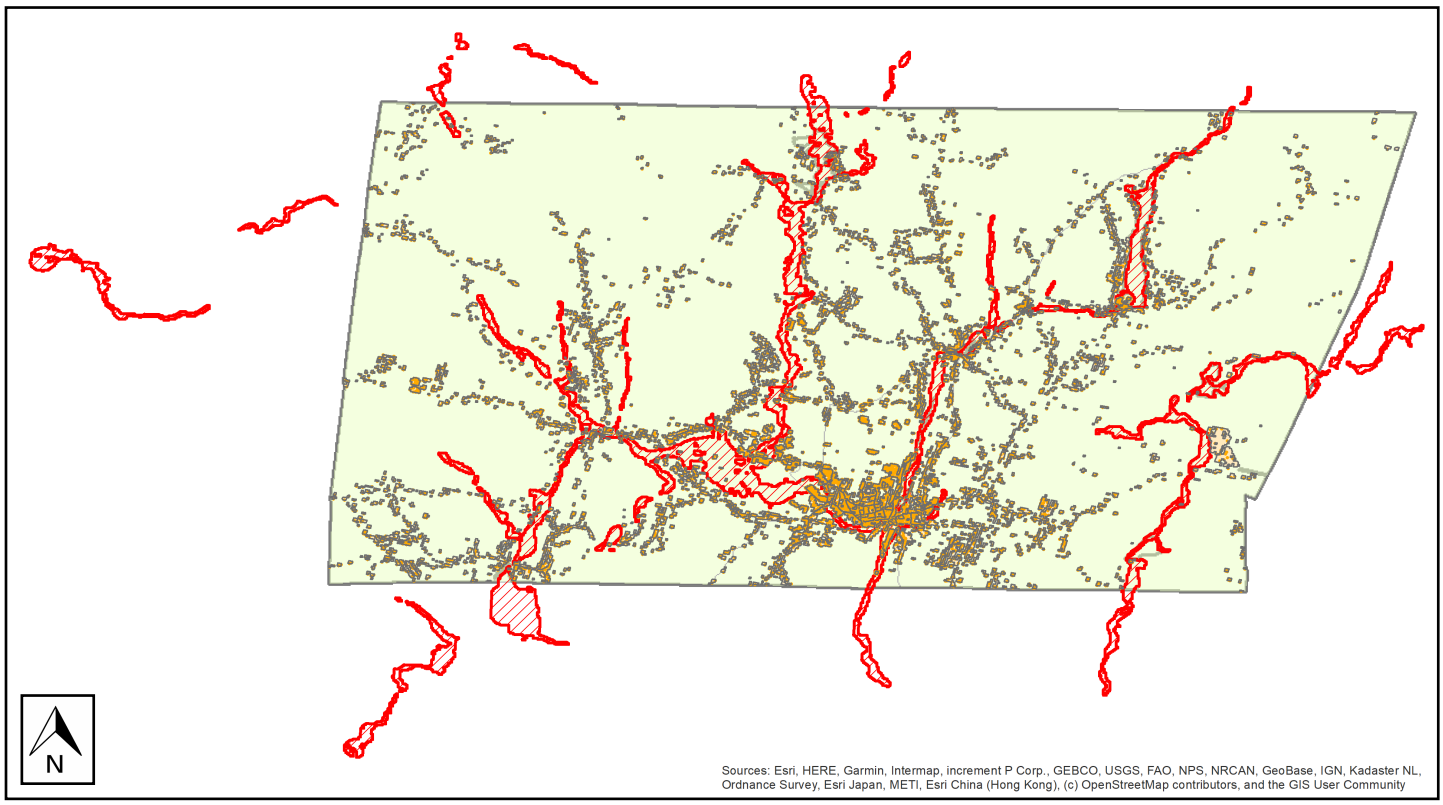
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Stafford_FL
Scenario Name:	Stafford_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 22 buildings will be at least moderately damaged. This is over 94% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

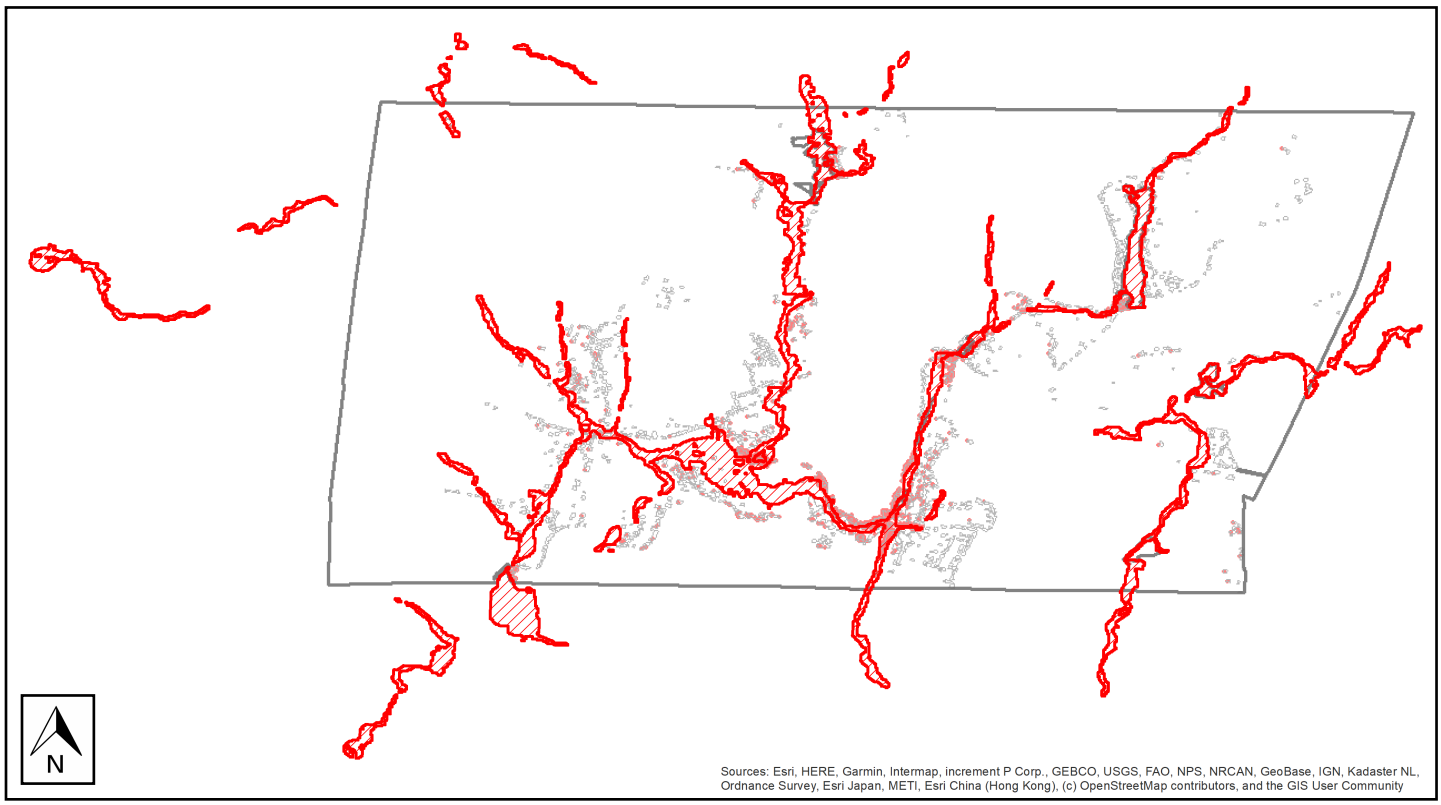


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	3	75	1	25	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	12	41	15	52	1	3	0	0	1	3	0	0
Total	**12**		**19**		**2**		**0**		**1**		**0**	

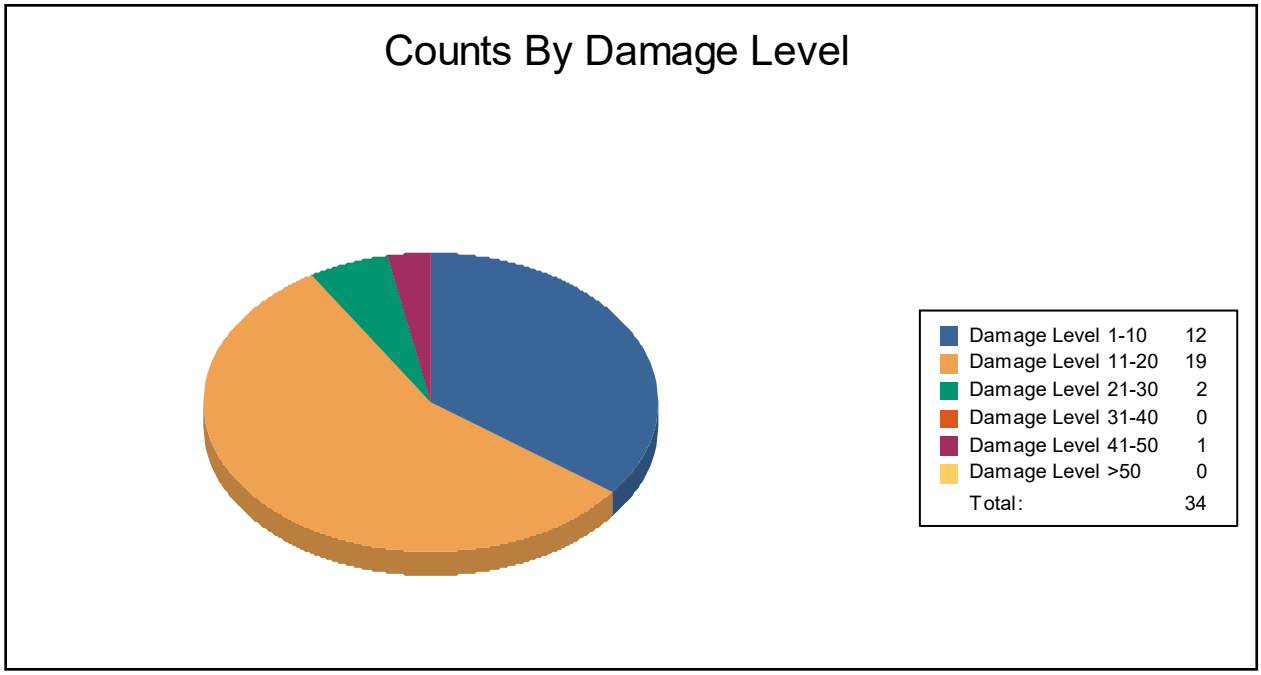


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	2	67	1	33	0	0	0	0	0	0
Wood	12	41	15	52	1	3	0	0	1	3	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 72 hospital beds available for use. On the day of the scenario flood event, the model estimates that 72 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

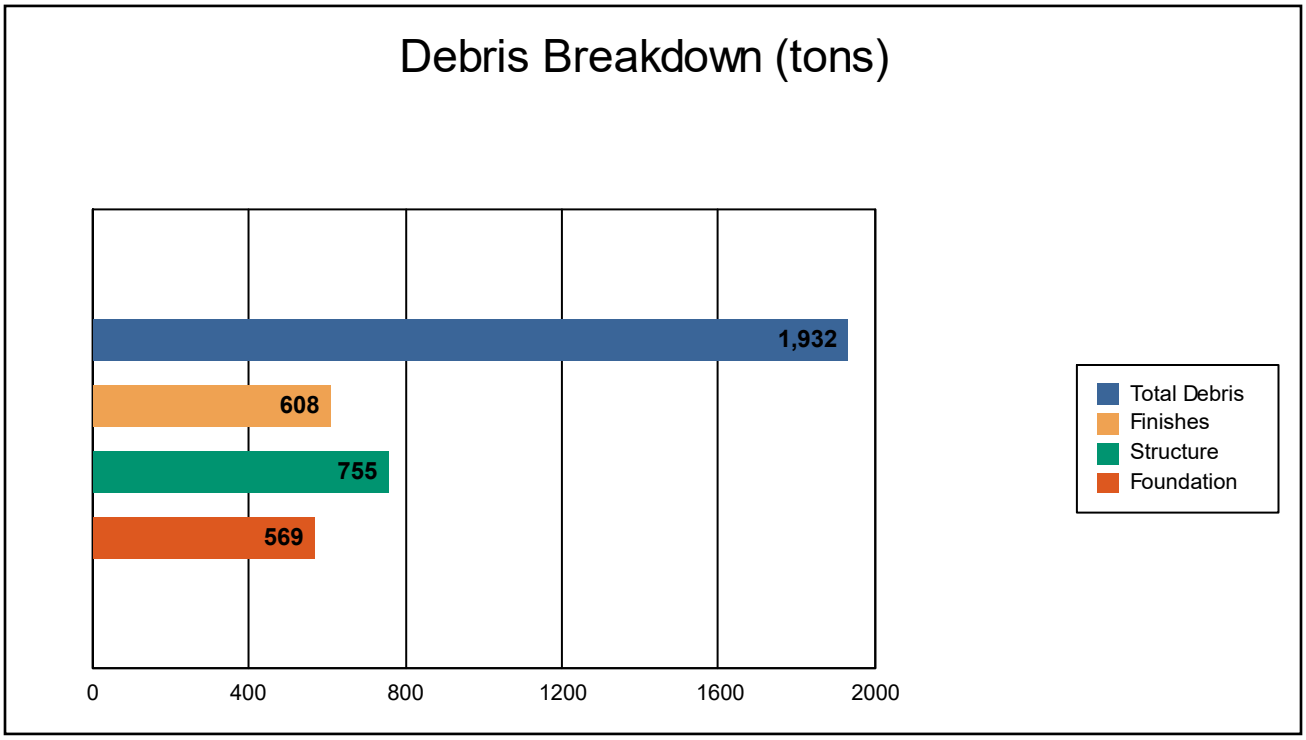
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

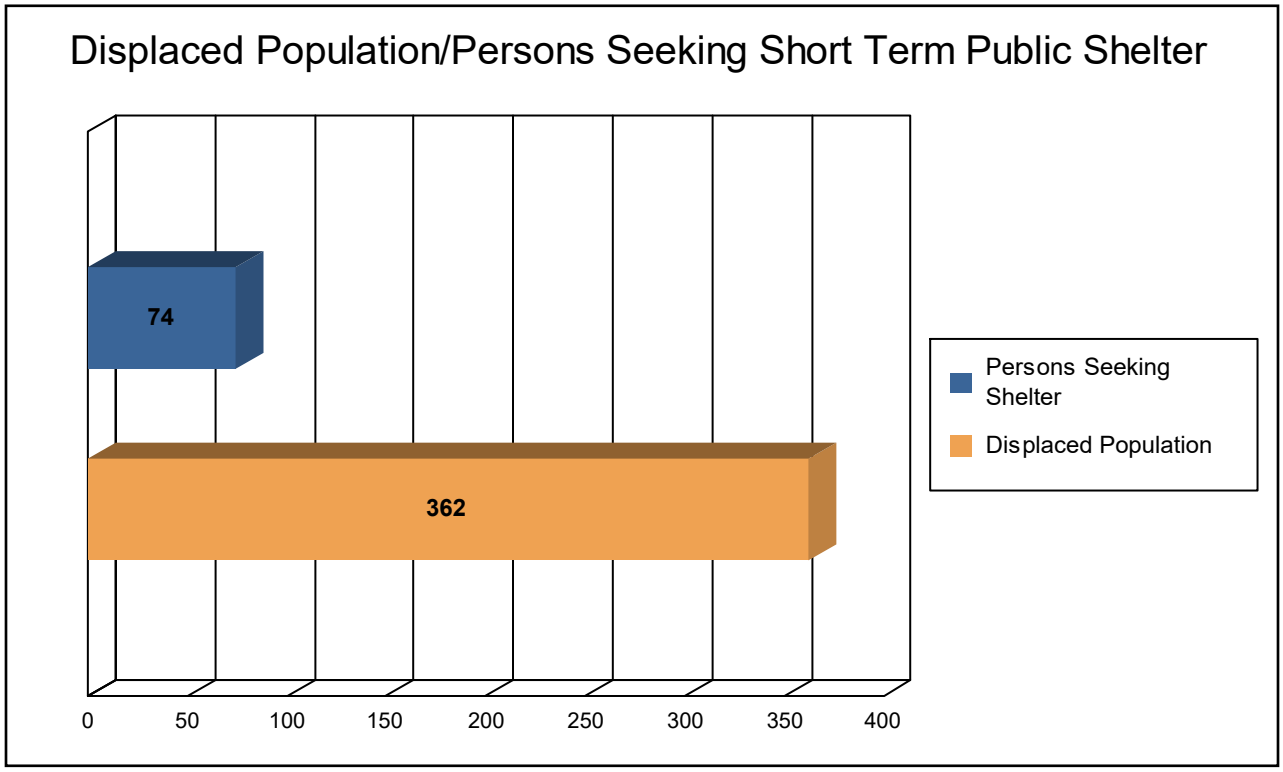


The model estimates that a total of 1,932 tons of debris will be generated. Of the total amount, Finishes comprises 31% of the total, Structure comprises 39% of the total, and Foundation comprises 29%. If the debris tonnage is converted into an estimated number of truckloads, it will require 78 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 121 households (or 362 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 74 people (out of a total population of 11,472) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 158.92 million dollars, which represents 15.51 % of the total replacement value of the scenario buildings.

Building-Related Losses

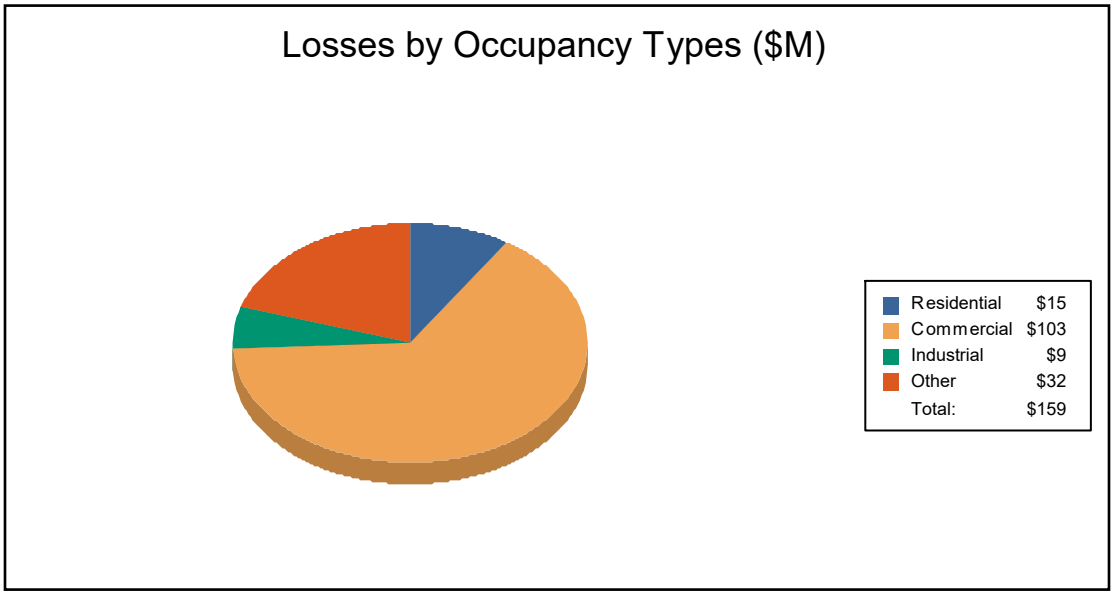
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 96.22 million dollars. 39% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 9.17% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	8.12	12.86	2.43	1.25	24.66
	Content	3.86	37.25	5.29	6.81	53.21
	Inventory	0.00	17.64	0.69	0.01	18.34
	Subtotal	**11.99**	**67.75**	**8.41**	**8.07**	**96.22**
Business Interruption						
	Income	0.00	9.13	0.10	1.31	10.53
	Relocation	1.82	6.22	0.13	1.11	9.27
	Rental Income	0.76	4.43	0.02	0.29	5.50
	Wage	0.01	15.81	0.18	21.41	37.40
	Subtotal	**2.59**	**35.58**	**0.43**	**24.11**	**62.71**
ALL	**Total**	**14.57**	**103.33**	**8.84**	**32.18**	**158.92**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,443,955	773,342	2,217,297
Total	**11,472**	**1,443,955**	**773,342**	**2,217,297**
Total Study Region	**11,472**	**1,443,955**	**773,342**	**2,217,297**

Hazus: Flood Global Risk Report

Region Name: Stafford_FL

Flood Scenario: Stafford_Flood

Print Date: Monday, April 17, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 4 square miles and contains 250 census blocks. The region contains over 5 thousand households and has a total population of 11,472 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,738 buildings in the region with a total building replacement value (excluding contents) of 2,217 million dollars. Approximately 89.15% of the buildings (and 65.12% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of 2,217 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
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Government	80,516	3.6%
Education	97,482	4.4%
Total	**2,217,297**	**100%**

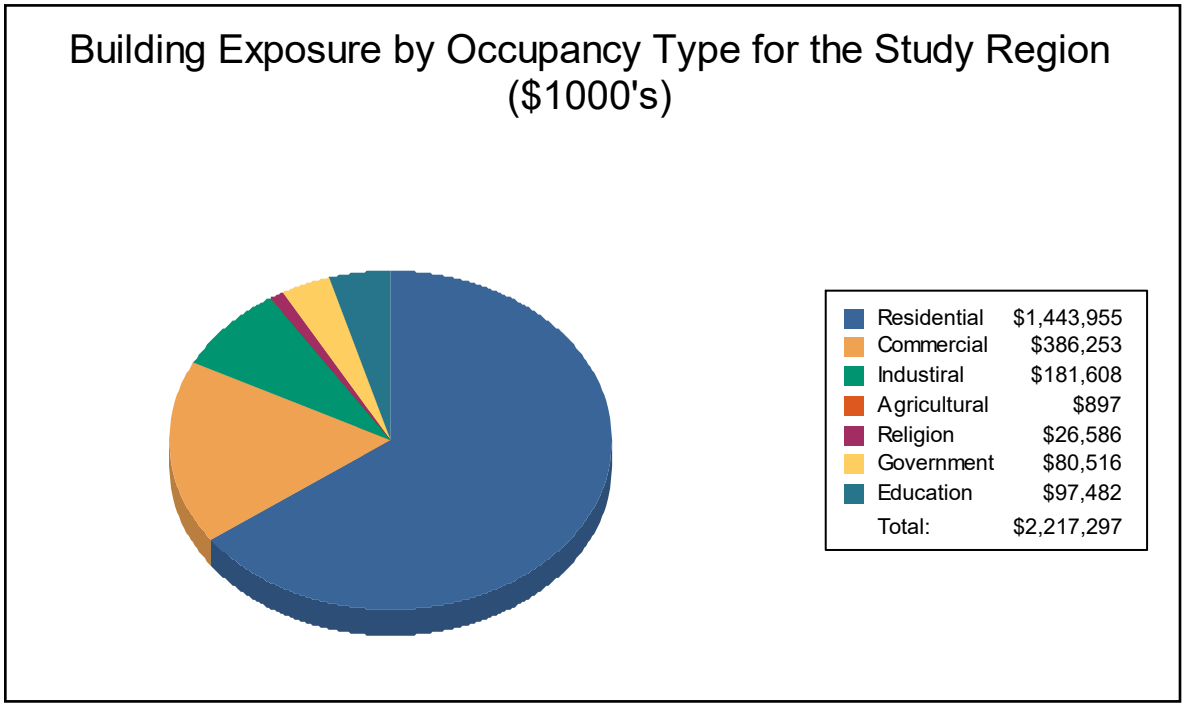

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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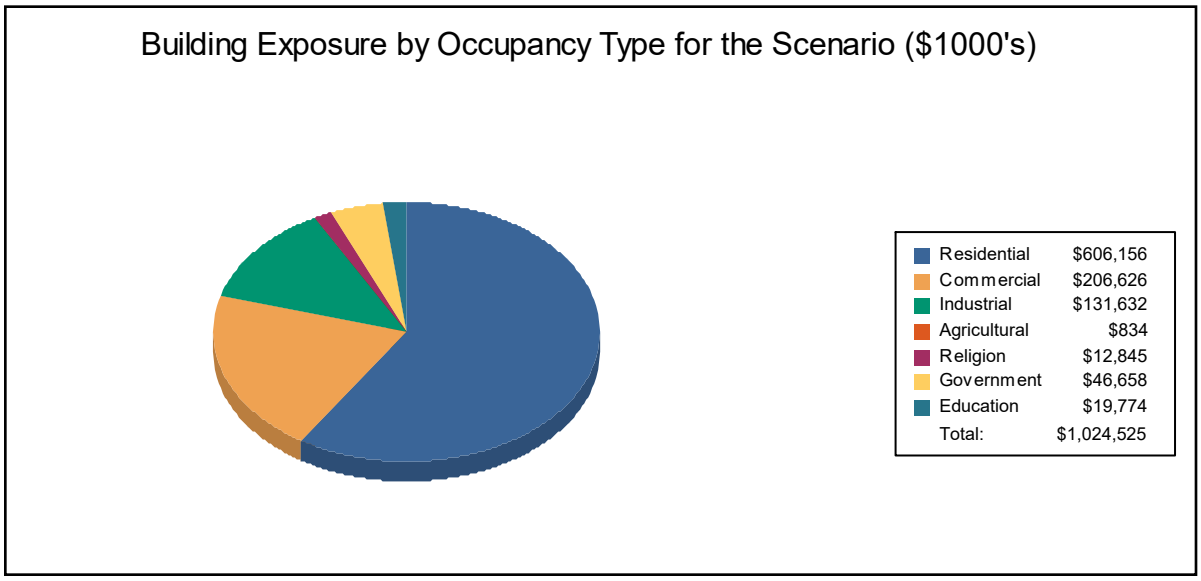
Commercial	206,626	20.2%
Industrial	131,632	12.8%
Agricultural	834	0.1%
Religion	12,845	1.3%
Government	46,658	4.6%
Education	19,774	1.9%
Total	**1,024,525**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds.
There are 5 schools, 3 fire stations, 1 police station and 1 emergency operation center.

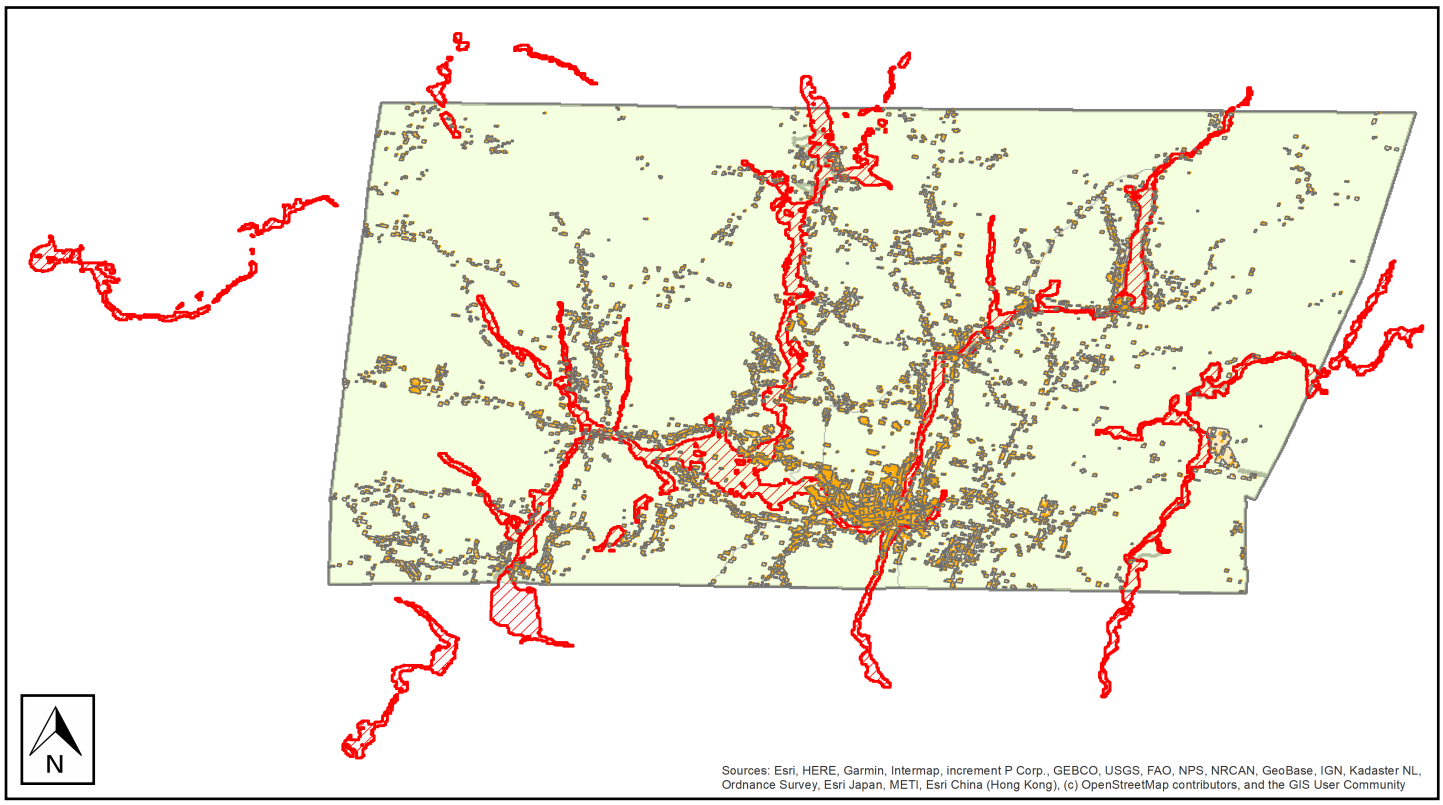
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Stafford_FL
Scenario Name:	Stafford_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 14 buildings will be at least moderately damaged. This is over 96% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

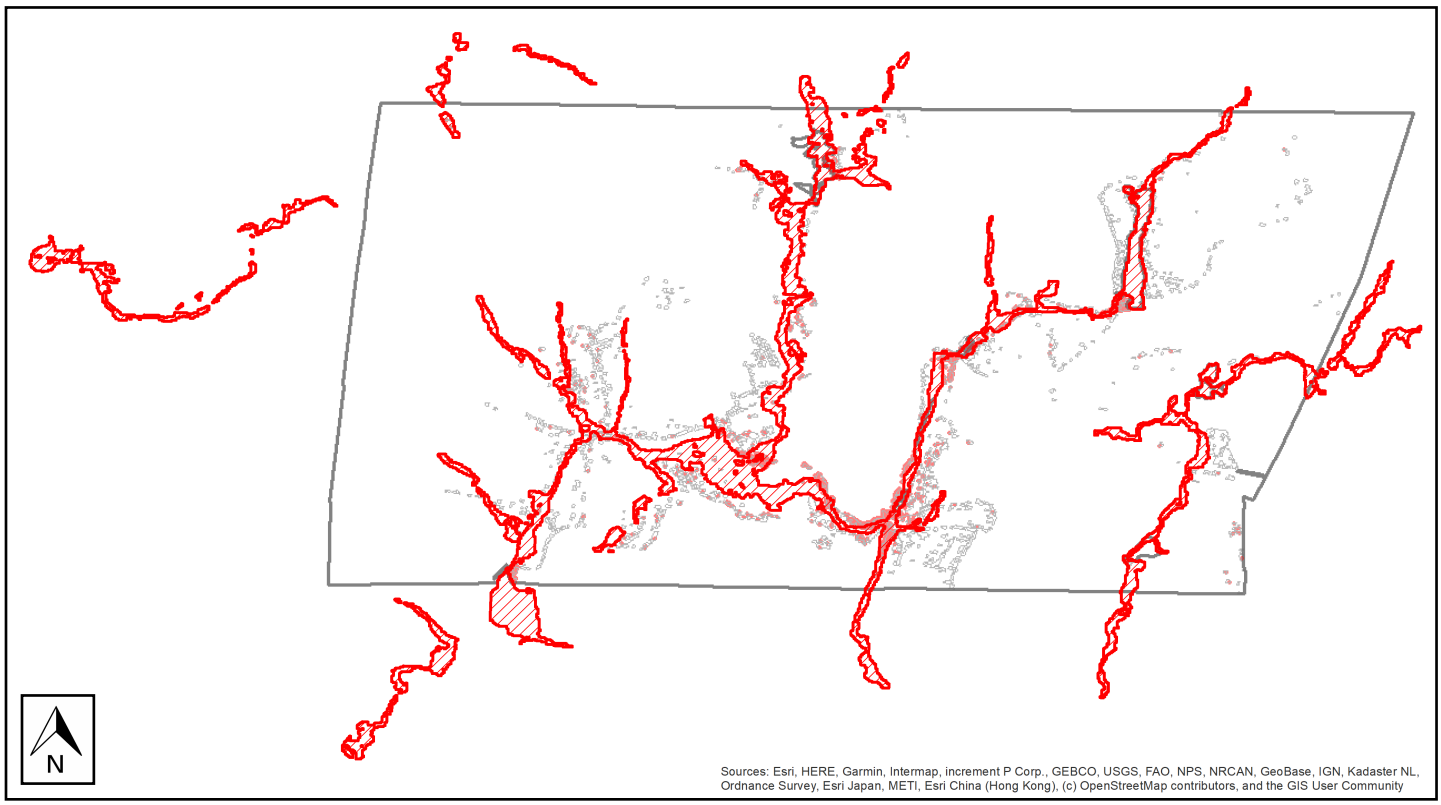


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	3	50	3	50	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	1	100	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	10	63	6	38	0	0	0	0	0	0	0	0
Total	**10**		**11**		**3**		**0**		**0**		**0**	

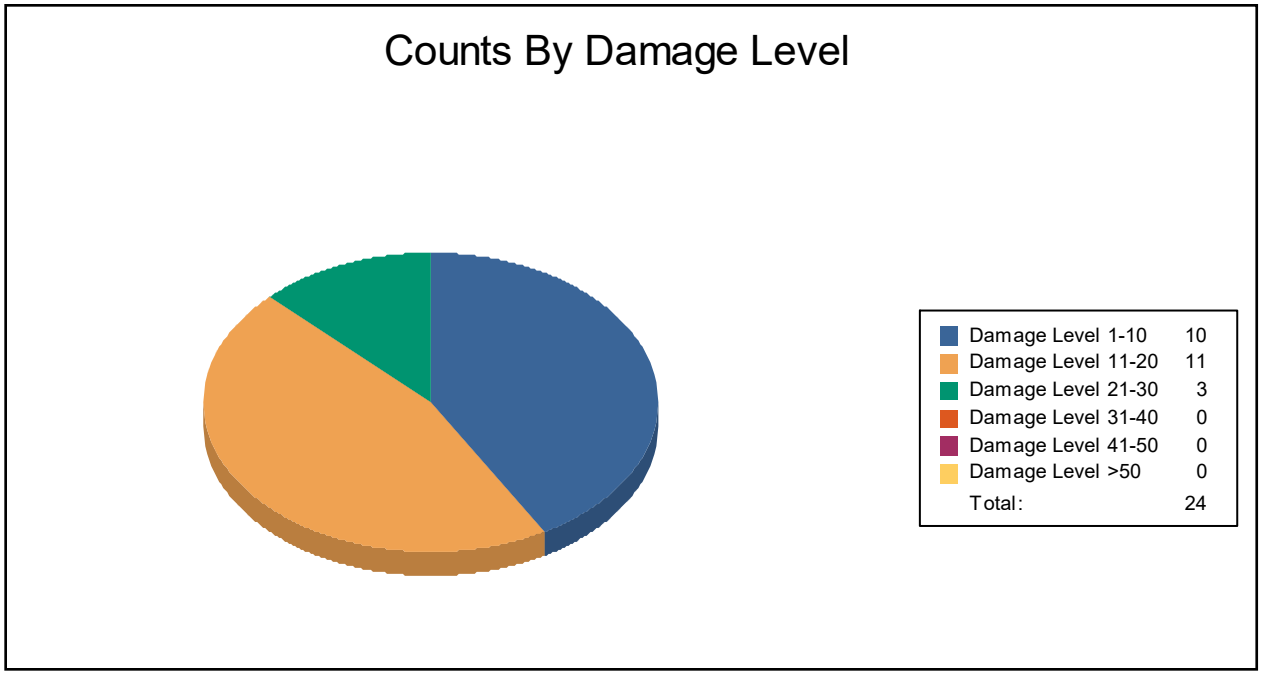


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	1	50	1	50	0	0	0	0	0	0
Steel	0	0	3	60	2	40	0	0	0	0	0	0
Wood	10	63	6	38	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 72 hospital beds available for use. On the day of the scenario flood event, the model estimates that 72 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

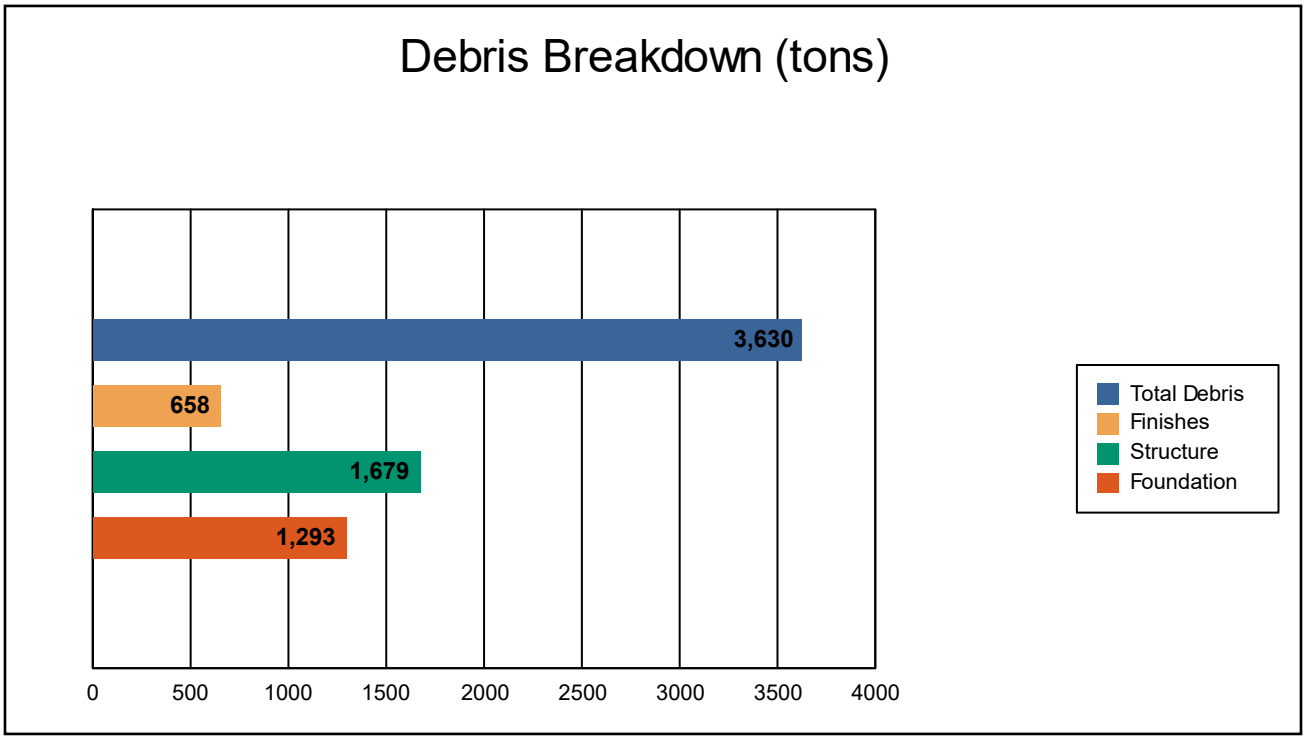
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

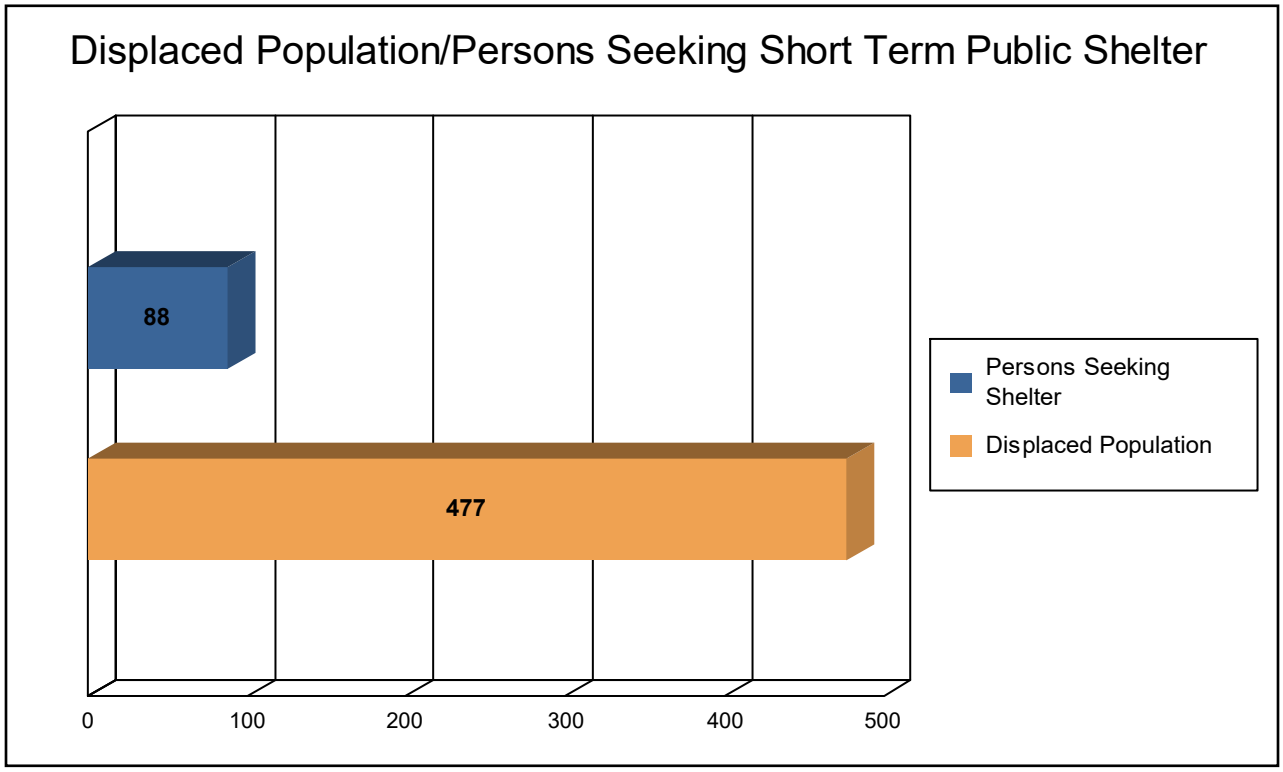


The model estimates that a total of 3,630 tons of debris will be generated. Of the total amount, Finishes comprises 18% of the total, Structure comprises 46% of the total, and Foundation comprises 36%. If the debris tonnage is converted into an estimated number of truckloads, it will require 146 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 159 households (or 477 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 88 people (out of a total population of 11,472) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 205.12 million dollars, which represents 20.02 % of the total replacement value of the scenario buildings.

Building-Related Losses

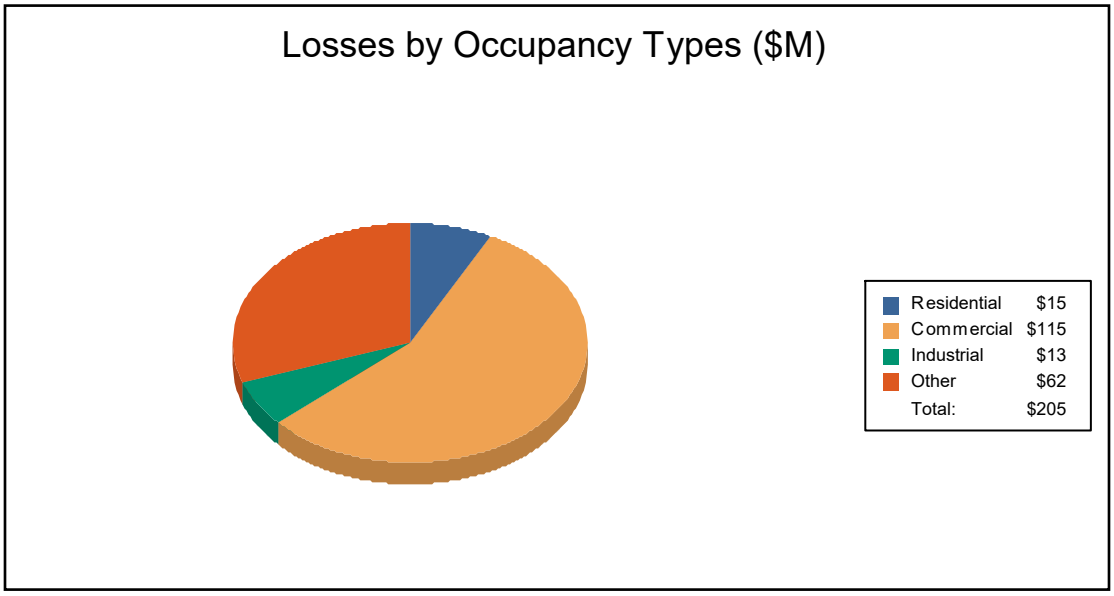
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 109.69 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 7.36% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	8.30	14.36	3.55	1.89	28.10
	Content	4.08	41.82	7.96	8.79	62.65
	Inventory	0.00	17.94	0.99	0.01	18.94
	Subtotal	**12.39**	**74.11**	**12.50**	**10.69**	**109.69**
Business Interruption						
	Income	0.00	10.77	0.12	1.26	12.14
	Relocation	1.89	6.78	0.19	1.39	10.25
	Rental Income	0.83	4.78	0.03	0.36	6.00
	Wage	0.00	18.33	0.21	48.50	67.04
	Subtotal	**2.72**	**40.66**	**0.55**	**51.50**	**95.43**
ALL	**Total**	**15.11**	**114.77**	**13.05**	**62.20**	**205.12**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,443,955	773,342	2,217,297
Total	**11,472**	**1,443,955**	**773,342**	**2,217,297**
Total Study Region	**11,472**	**1,443,955**	**773,342**	**2,217,297**

Hazus: Flood Global Risk Report

Region Name: Suffield_FL

Flood Scenario: Suffield_Flood

Print Date: Wednesday, April 19, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

RiskMAP
Increasing Resilience Together

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 181 census blocks. The region contains over 6 thousand households and has a total population of 15,746 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,971 buildings in the region with a total building replacement value (excluding contents) of 3,183 million dollars. Approximately 89.76% of the buildings (and 70.14% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,971 buildings in the region which have an aggregate total replacement value of 3,183 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,232,305	70.1%
Commercial	469,142	14.7%
Industrial	130,522	4.1%
Agricultural	16,812	0.5%
Religion	25,024	0.8%
Government	108,212	3.4%
Education	200,759	6.3%
Total	**3,182,776**	**100%**

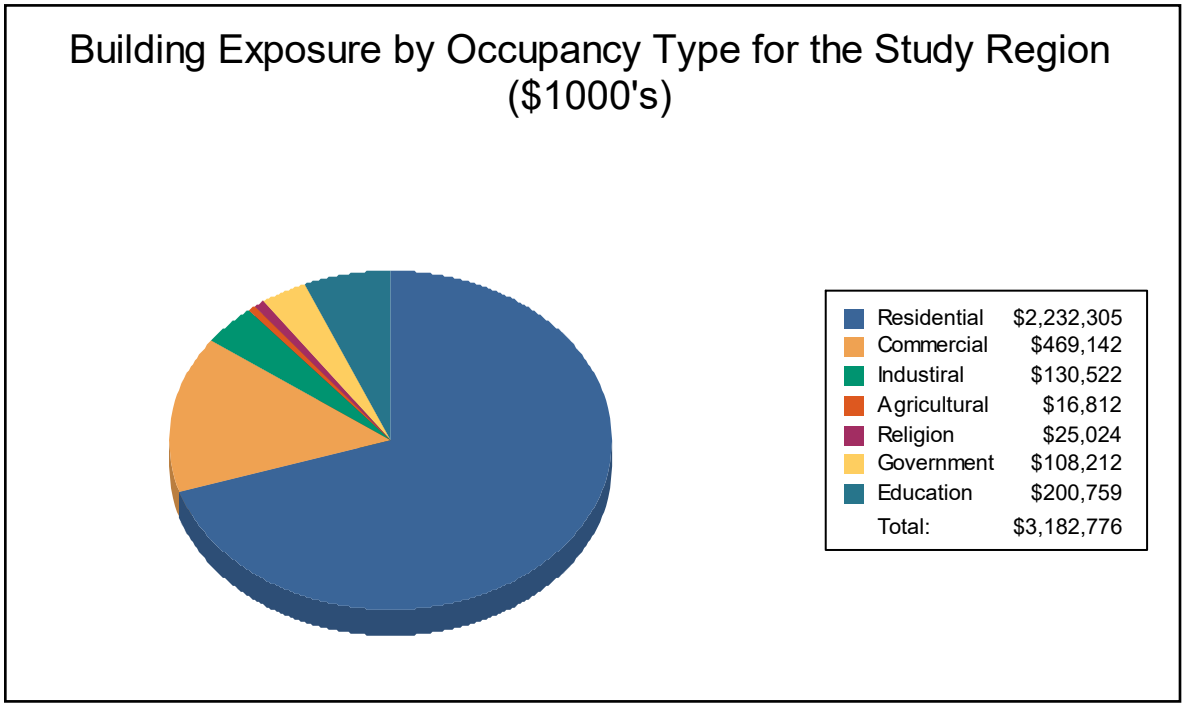
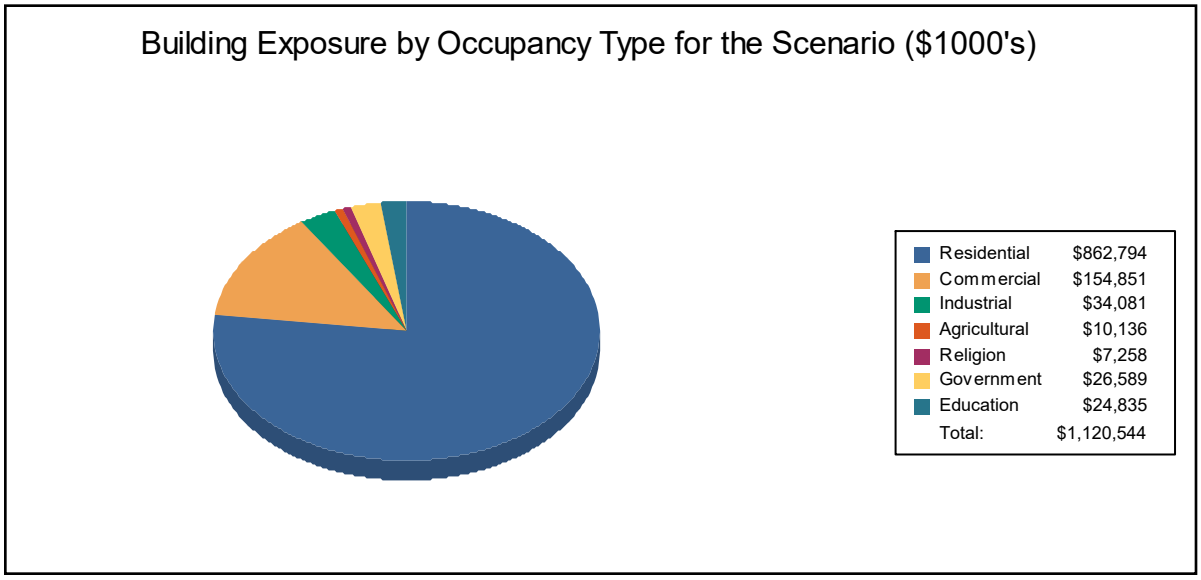


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	862,794	77.0%
Commercial	154,851	13.8%
Industrial	34,081	3.0%
Agricultural	10,136	0.9%
Religion	7,258	0.6%
Government	26,589	2.4%
Education	24,835	2.2%
Total	**1,120,544**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

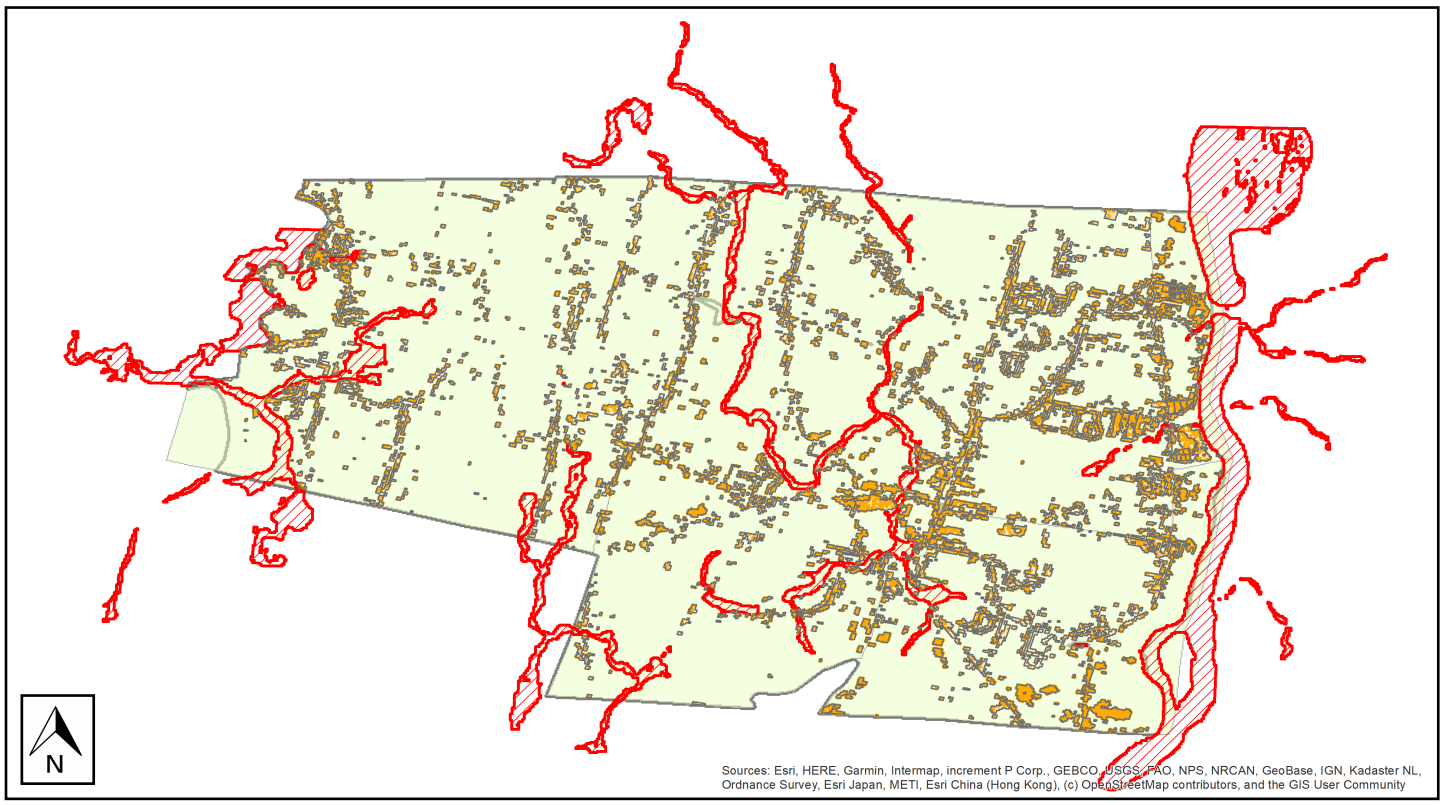
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Suffield_FL
Scenario Name:	Suffield_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 5 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

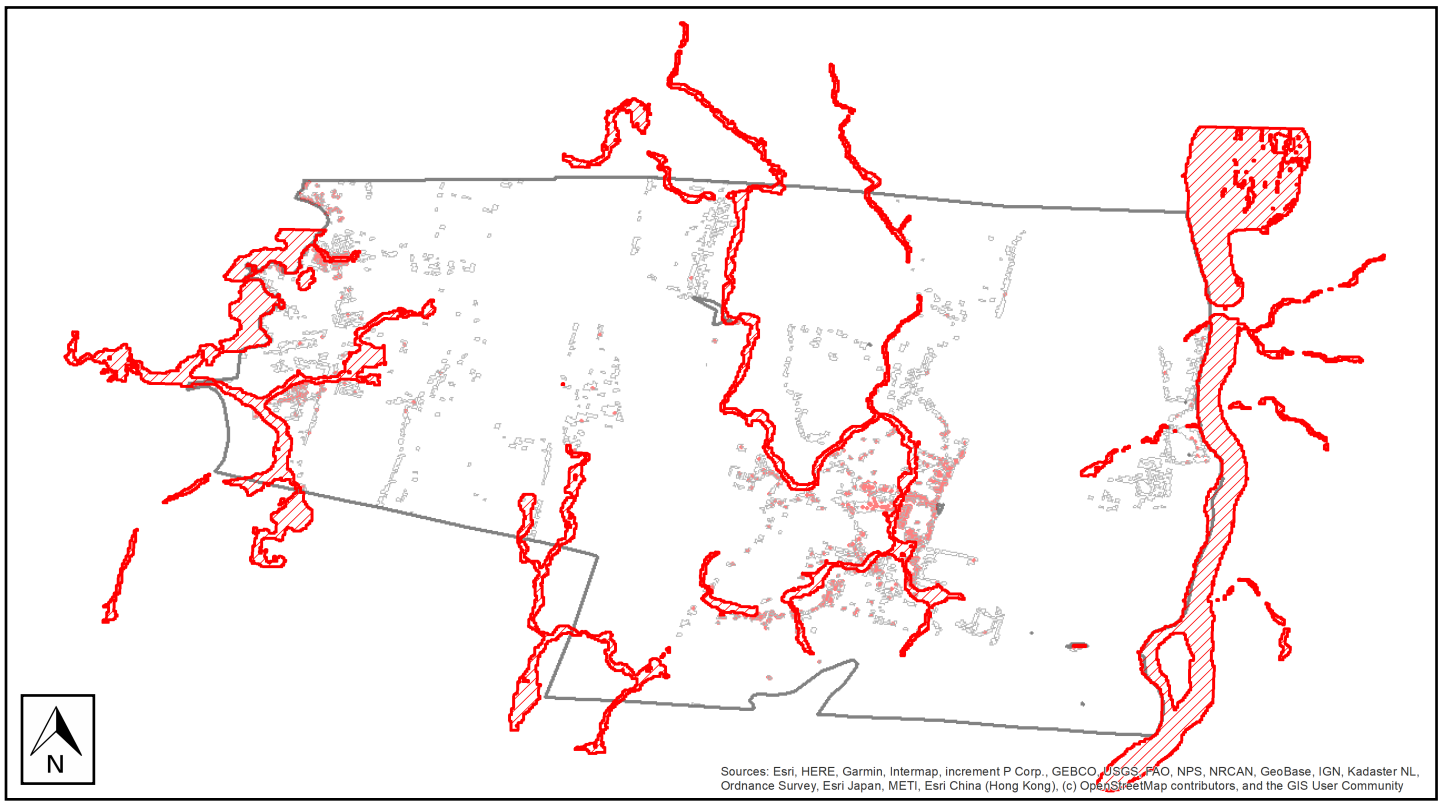


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	29	4	57	1	14	0	0	0	0	0	0
Total	**2**		**4**		**1**		**0**		**0**		**0**	

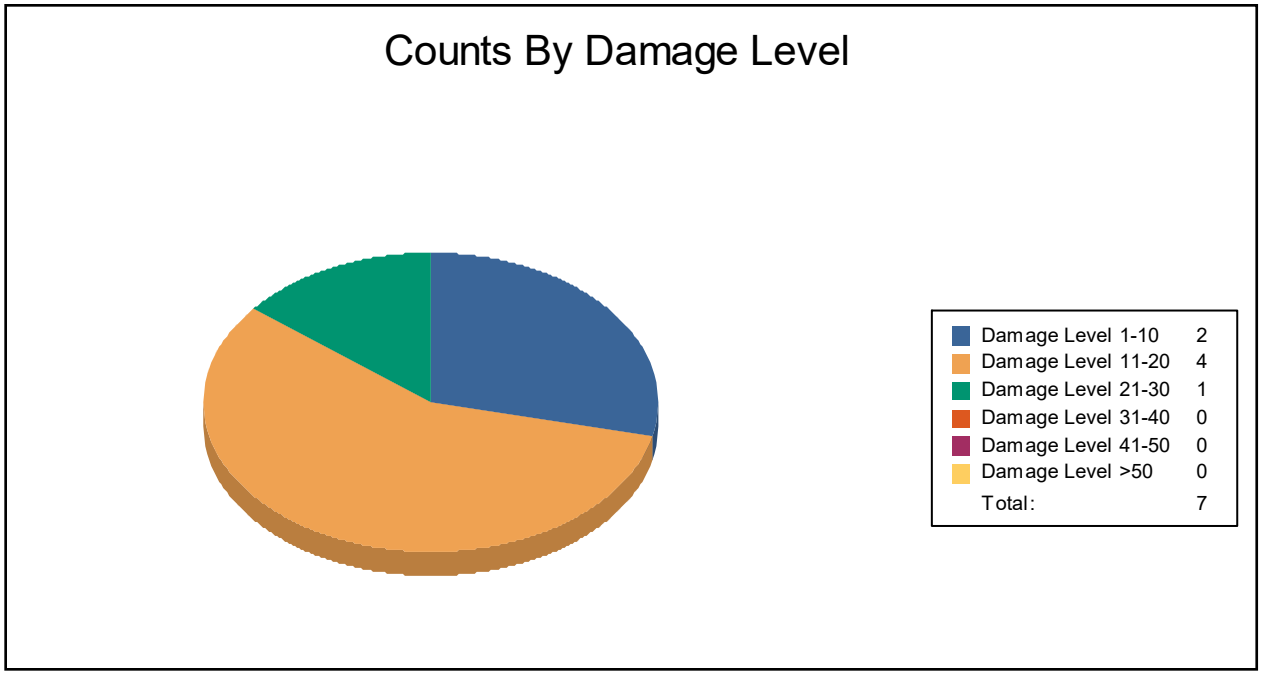


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	29	4	57	1	14	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

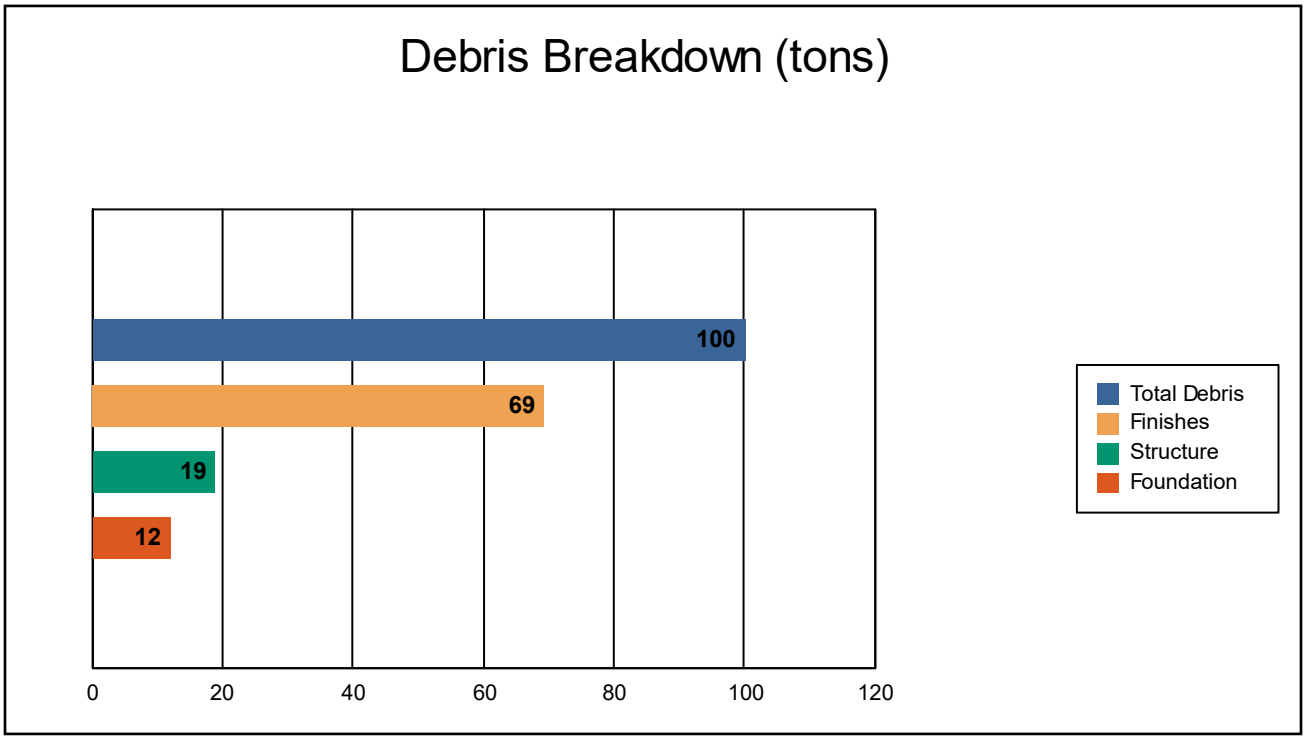
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

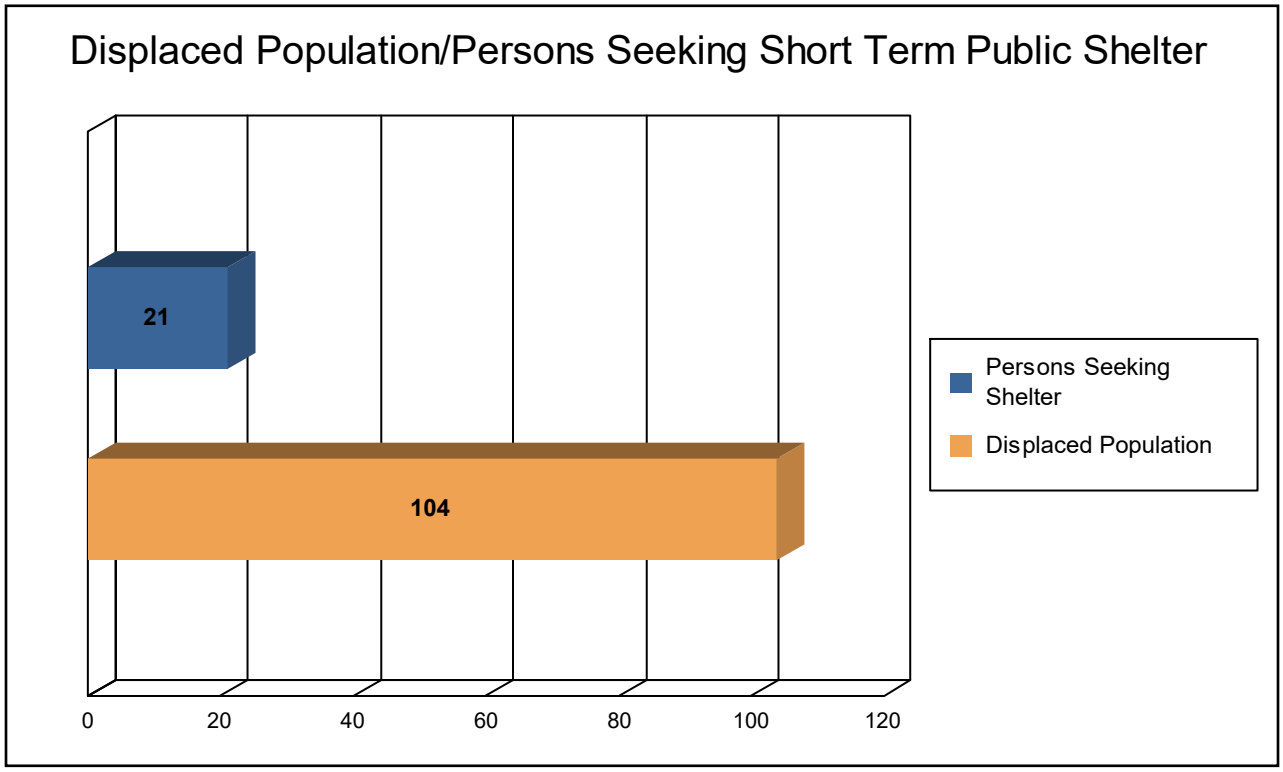


The model estimates that a total of 100 tons of debris will be generated. Of the total amount, Finishes comprises 69% of the total, Structure comprises 19% of the total, and Foundation comprises 12%. If the debris tonnage is converted into an estimated number of truckloads, it will require 5 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 35 households (or 104 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 21 people (out of a total population of 15,746) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 8.79 million dollars, which represents 0.78 % of the total replacement value of the scenario buildings.

Building-Related Losses

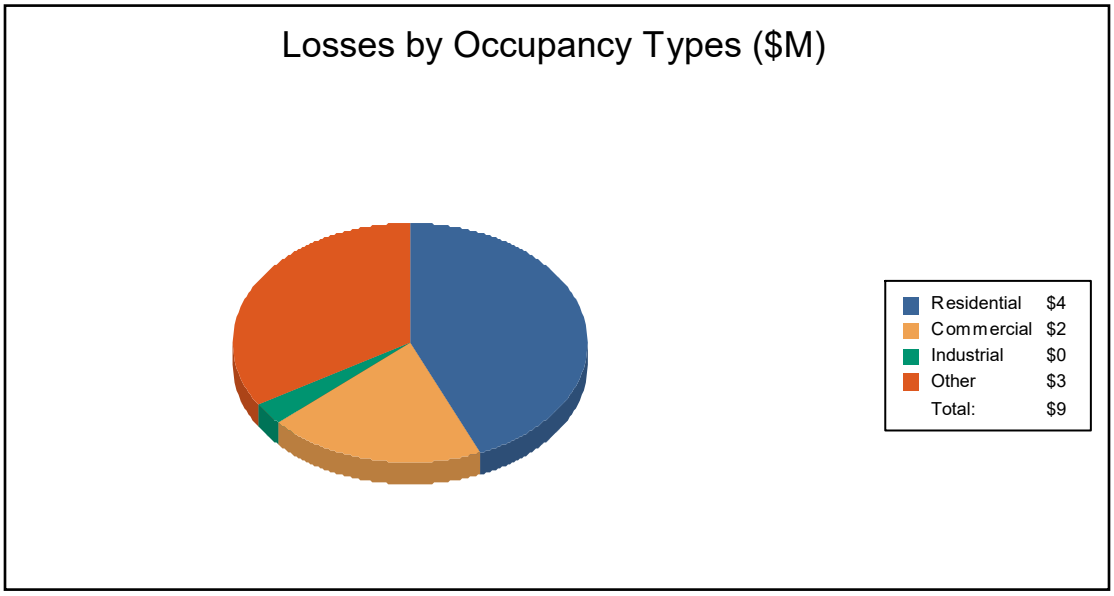
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 4.35 million dollars. 51% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 43.73% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.12	0.18	0.10	0.05	2.45
	Content	0.89	0.46	0.15	0.32	1.81
	Inventory	0.00	0.05	0.02	0.03	0.09
	Subtotal	**3.01**	**0.69**	**0.26**	**0.39**	**4.35**
Business Interruption						
	Income	0.00	0.43	0.00	0.07	0.50
	Relocation	0.65	0.08	0.00	0.02	0.75
	Rental Income	0.18	0.03	0.00	0.00	0.21
	Wage	0.00	0.49	0.01	2.49	2.98
	Subtotal	**0.83**	**1.03**	**0.01**	**2.57**	**4.44**
ALL	**Total**	**3.85**	**1.71**	**0.27**	**2.97**	**8.79**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	15,746	2,232,305	950,471	3,182,776
Total	**15,746**	**2,232,305**	**950,471**	**3,182,776**
Total Study Region	**15,746**	**2,232,305**	**950,471**	**3,182,776**

Hazus: Flood Global Risk Report

Region Name: Suffield_FL

Flood Scenario: Suffield_Flood

Print Date: Wednesday, April 19, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
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There are an estimated 4,971 buildings in the region with a total building replacement value (excluding contents) of 3,183 million dollars. Approximately 89.76% of the buildings (and 70.14% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,971 buildings in the region which have an aggregate total replacement value of 3,183 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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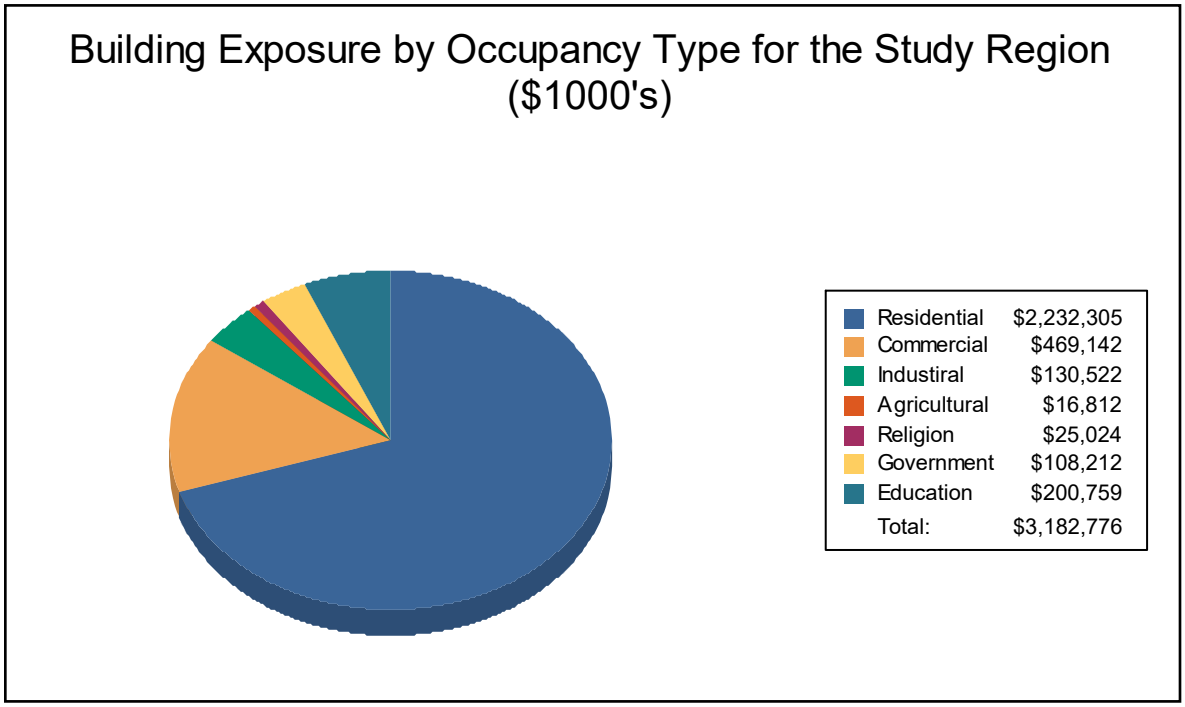

Table 2
Building Exposure by Occupancy Type for the Scenario

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Industrial	34,081	3.0%
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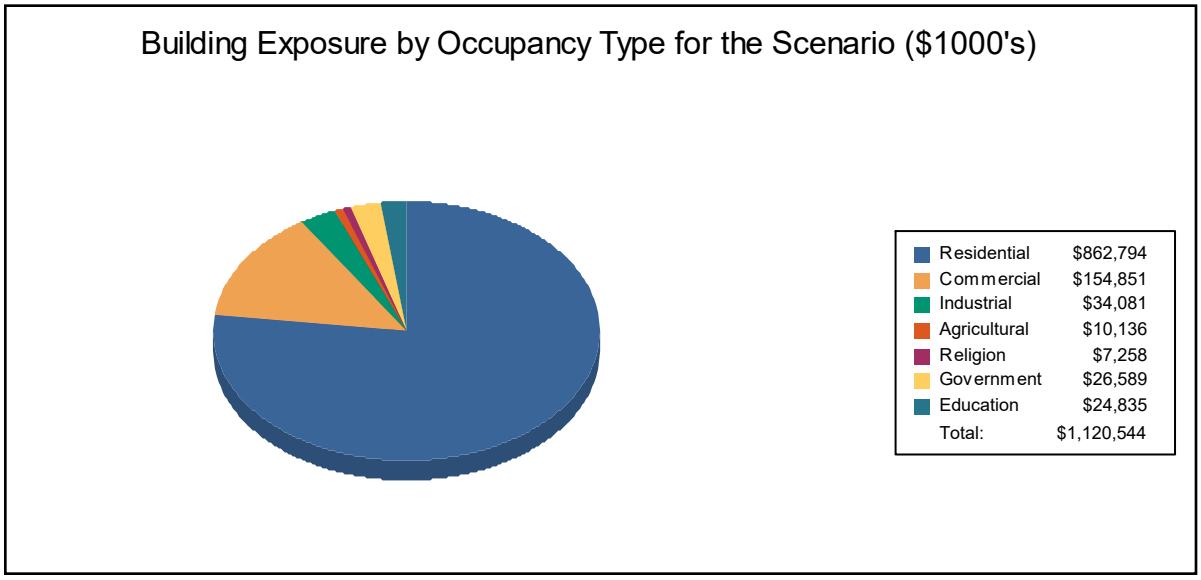
Education	24,835	2.2%
Total	**1,120,544**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

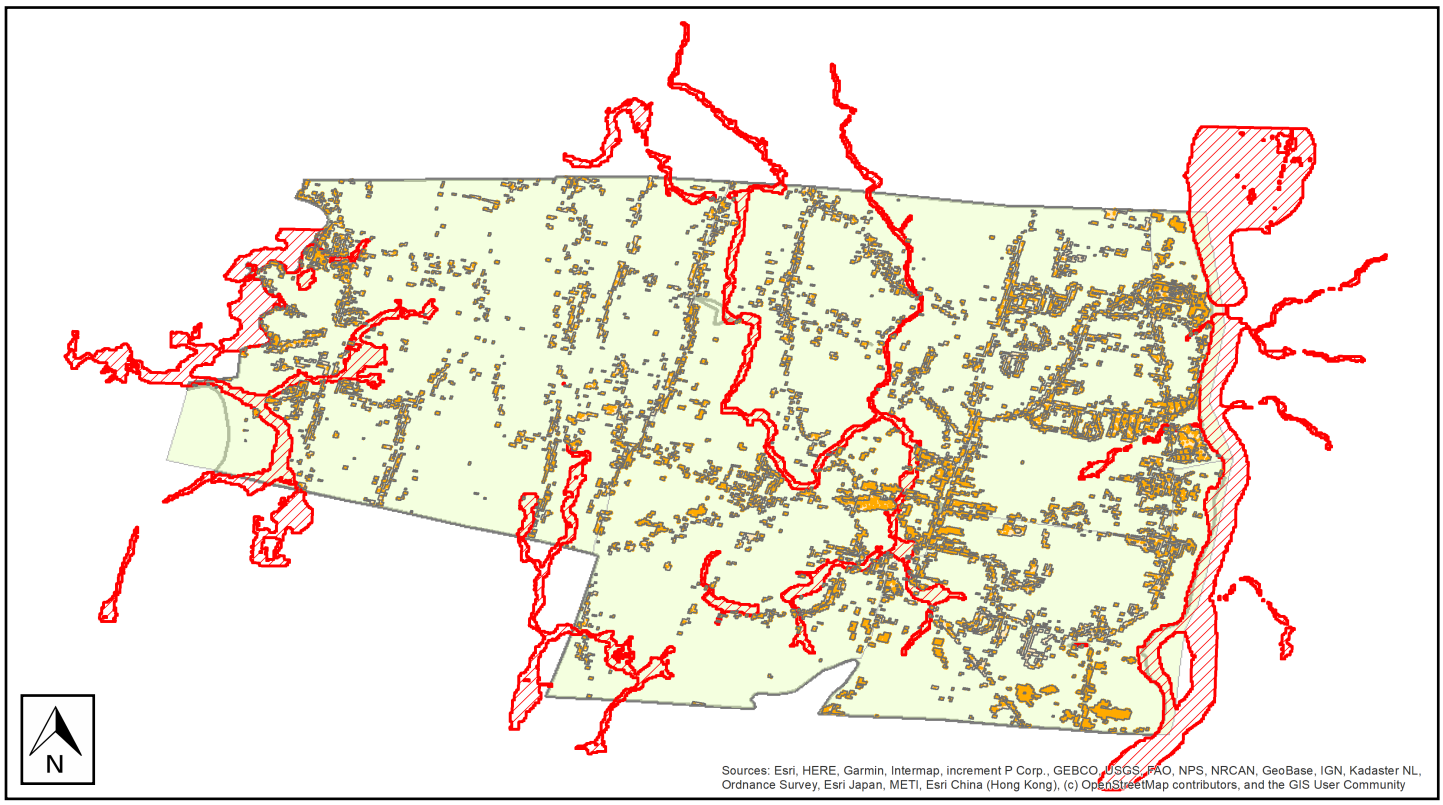
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Suffield_FL
Scenario Name:	Suffield_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

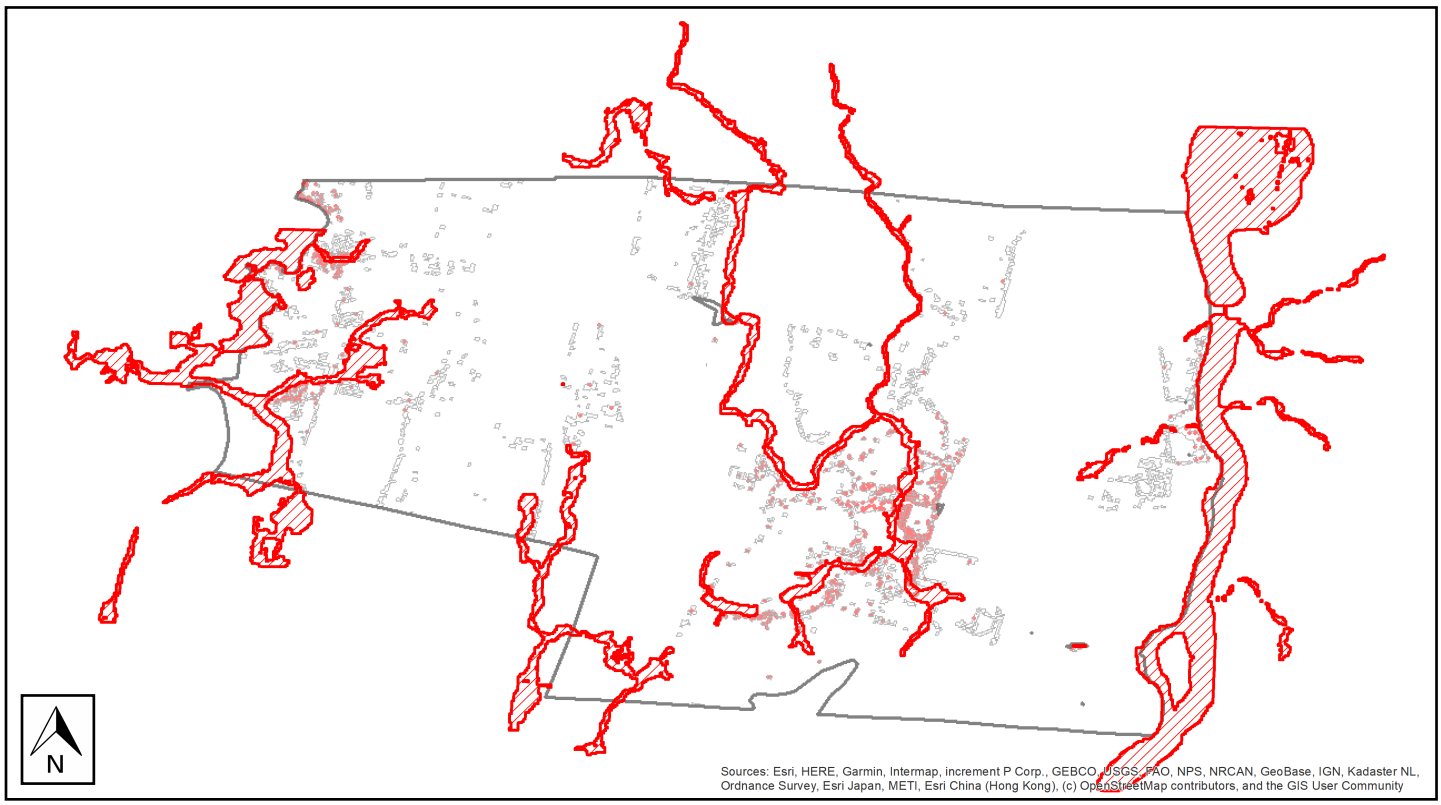


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	25	3	38	3	38	0	0	0	0	0	0
Total	**2**		**3**		**3**		**0**		**0**		**0**	

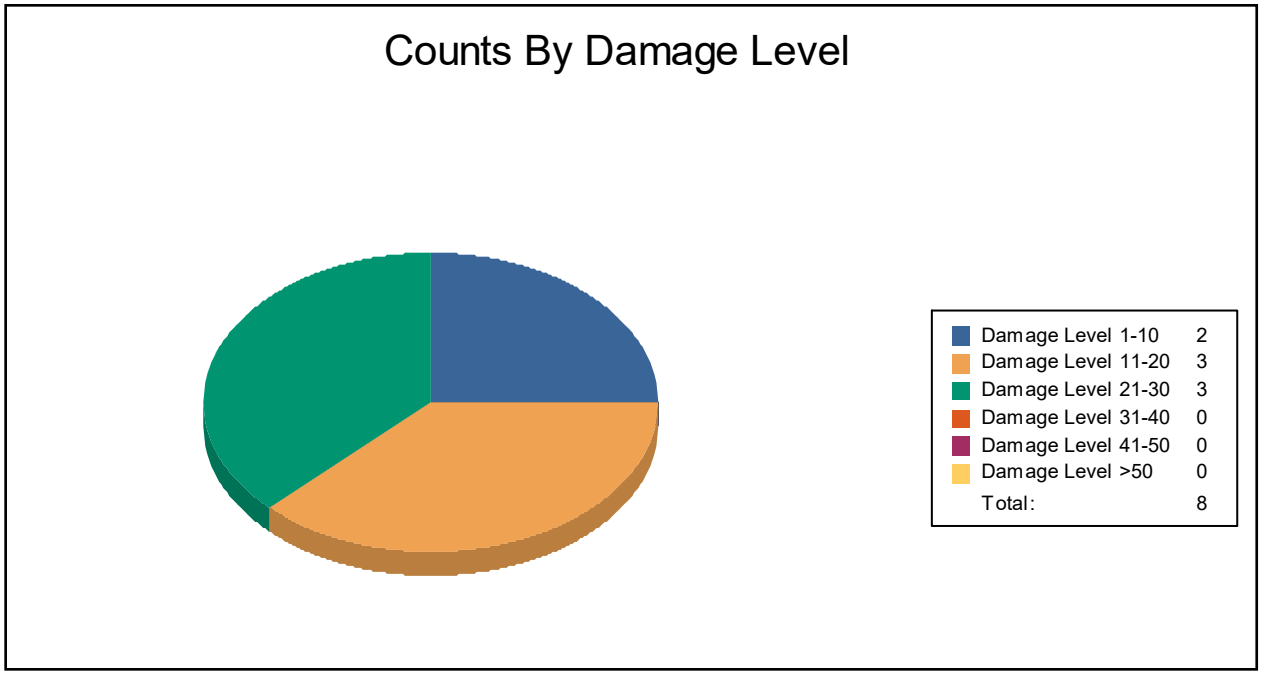


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	25	3	38	3	38	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

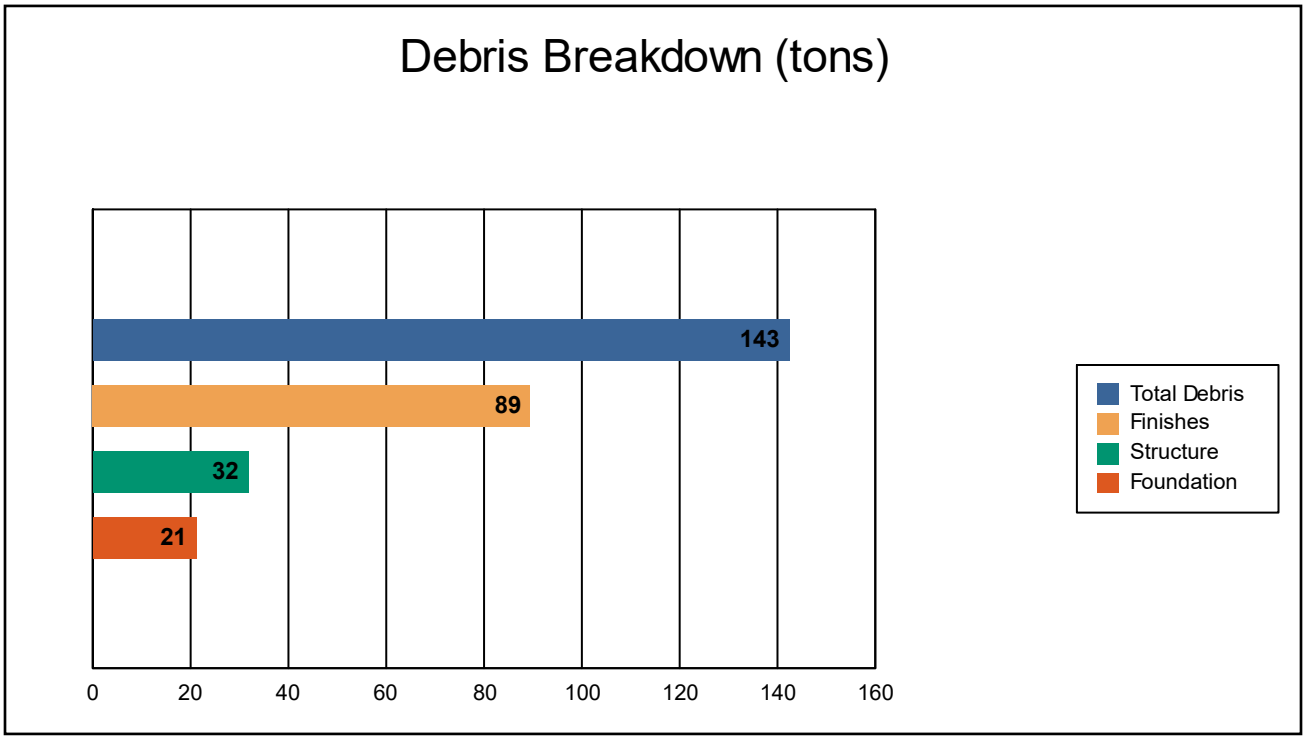
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

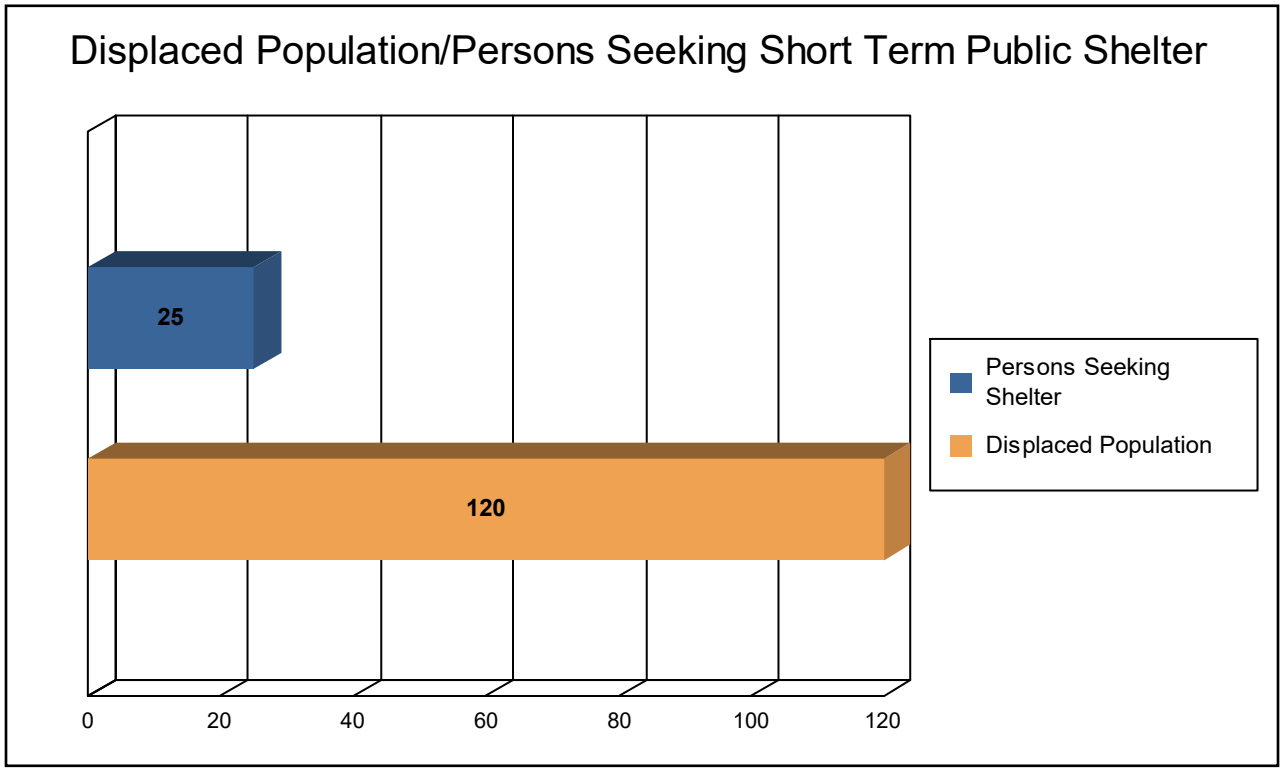


The model estimates that a total of 143 tons of debris will be generated. Of the total amount, Finishes comprises 63% of the total, Structure comprises 22% of the total, and Foundation comprises 15%. If the debris tonnage is converted into an estimated number of truckloads, it will require 6 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 40 households (or 120 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 25 people (out of a total population of 15,746) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 12.05 million dollars, which represents 1.08 % of the total replacement value of the scenario buildings.

Building-Related Losses

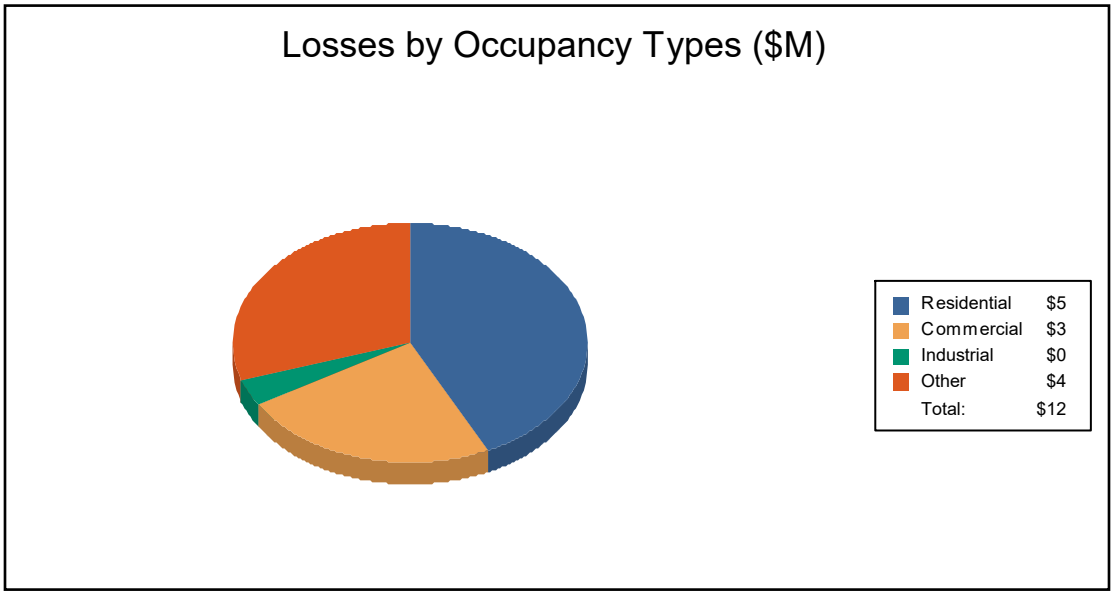
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 6.43 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 42.78% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.90	0.36	0.15	0.08	3.49
	Content	1.24	0.84	0.22	0.49	2.79
	Inventory	0.00	0.07	0.03	0.05	0.15
	Subtotal	**4.14**	**1.26**	**0.40**	**0.62**	**6.43**
Business Interruption						
	Income	0.00	0.61	0.00	0.10	0.71
	Relocation	0.80	0.11	0.00	0.02	0.93
	Rental Income	0.22	0.04	0.00	0.00	0.26
	Wage	0.00	0.84	0.01	2.87	3.72
	Subtotal	**1.02**	**1.60**	**0.01**	**3.00**	**5.62**
ALL	**Total**	**5.15**	**2.86**	**0.42**	**3.62**	**12.05**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	15,746	2,232,305	950,471	3,182,776
Total	**15,746**	**2,232,305**	**950,471**	**3,182,776**
Total Study Region	**15,746**	**2,232,305**	**950,471**	**3,182,776**

Hazus: Flood Global Risk Report

Region Name: Suffield_FL

Flood Scenario: Suffield_Flood

Print Date: Wednesday, April 19, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 181 census blocks. The region contains over 6 thousand households and has a total population of 15,746 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,971 buildings in the region with a total building replacement value (excluding contents) of 3,183 million dollars. Approximately 89.76% of the buildings (and 70.14% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,971 buildings in the region which have an aggregate total replacement value of 3,183 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,232,305	70.1%
Commercial	469,142	14.7%
Industrial	130,522	4.1%
Agricultural	16,812	0.5%
Religion	25,024	0.8%
Government	108,212	3.4%
Education	200,759	6.3%
Total	**3,182,776**	**100%**

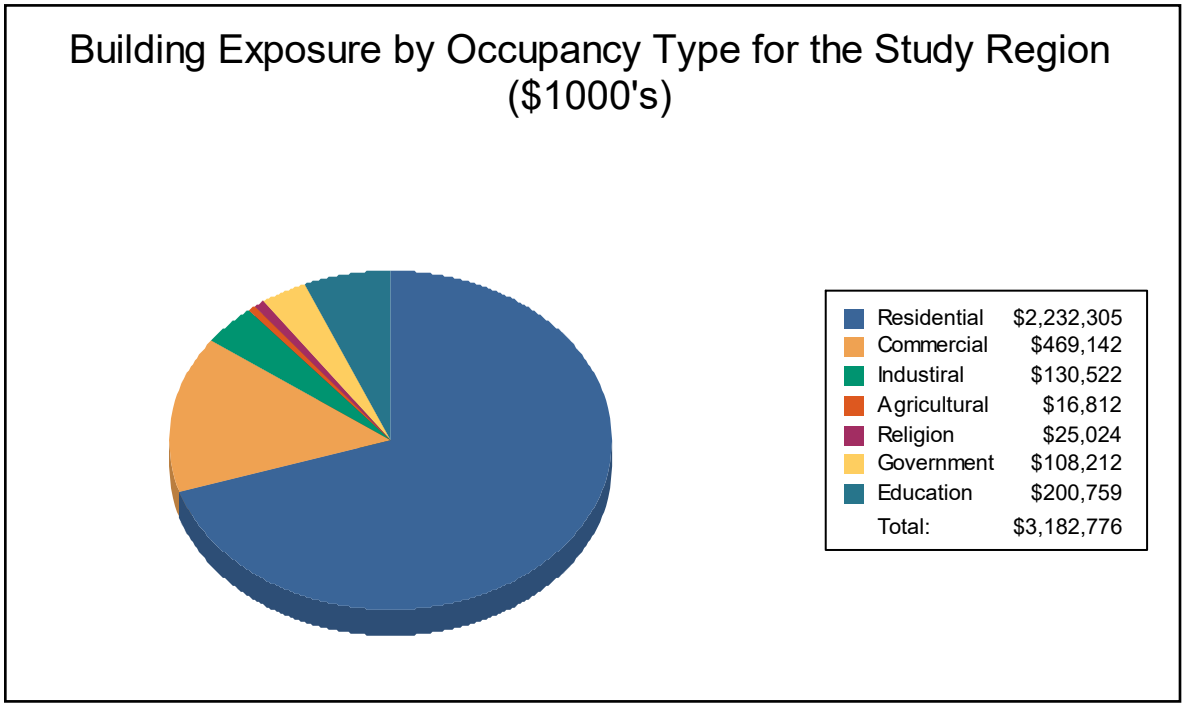
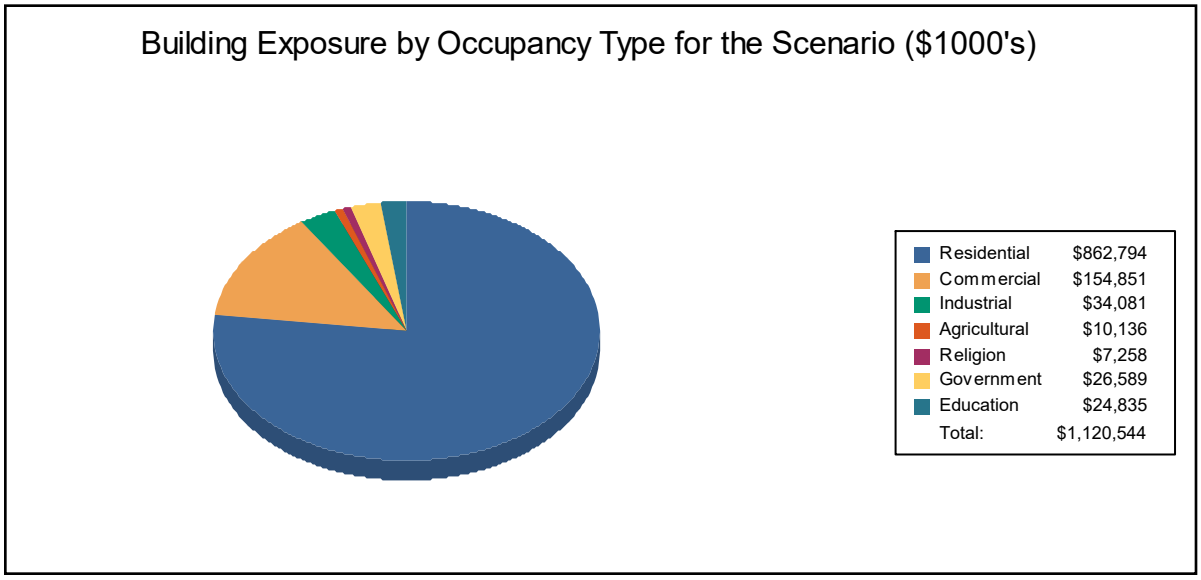


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	862,794	77.0%
Commercial	154,851	13.8%
Industrial	34,081	3.0%
Agricultural	10,136	0.9%
Religion	7,258	0.6%
Government	26,589	2.4%
Education	24,835	2.2%
Total	**1,120,544**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

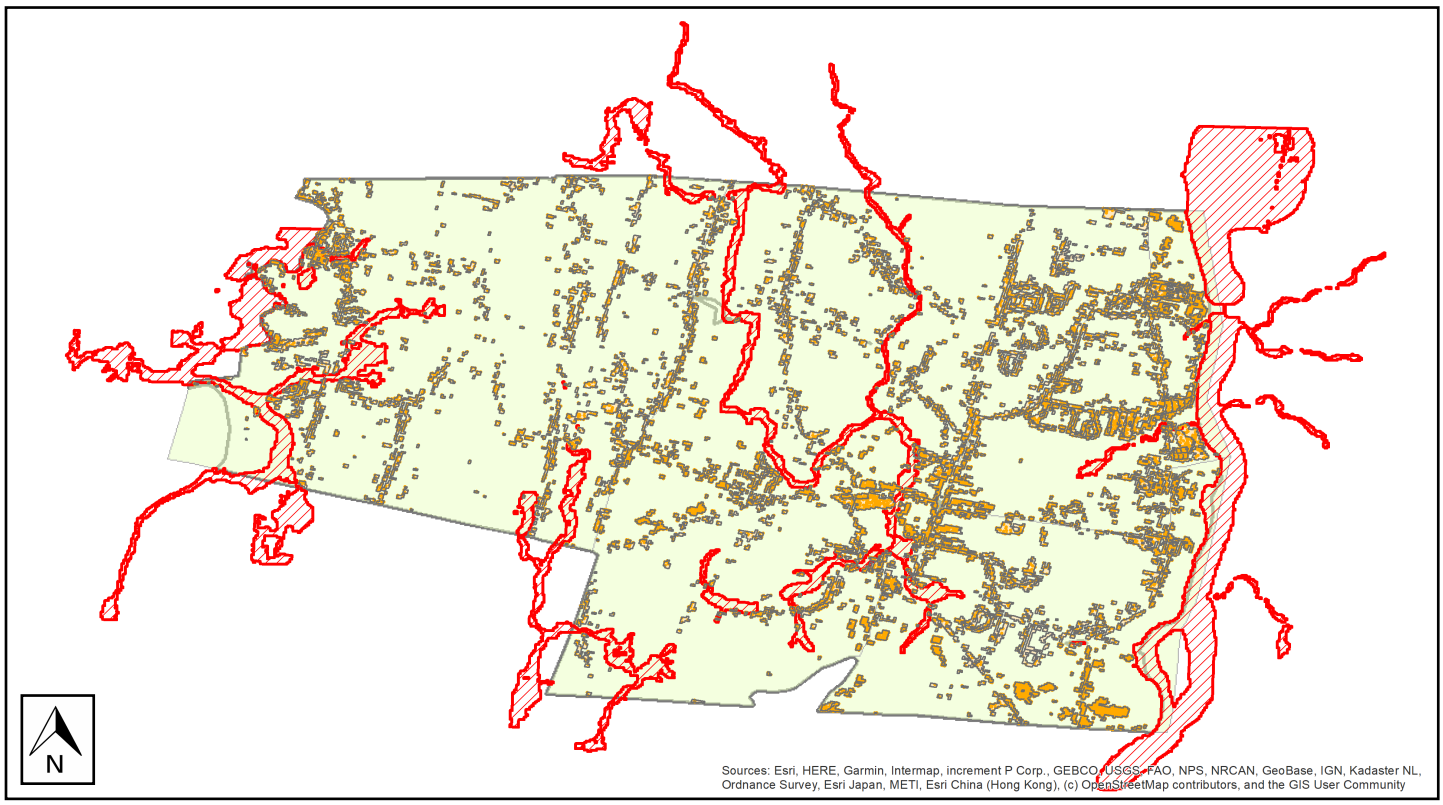
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Suffield_FL
Scenario Name:	Suffield_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

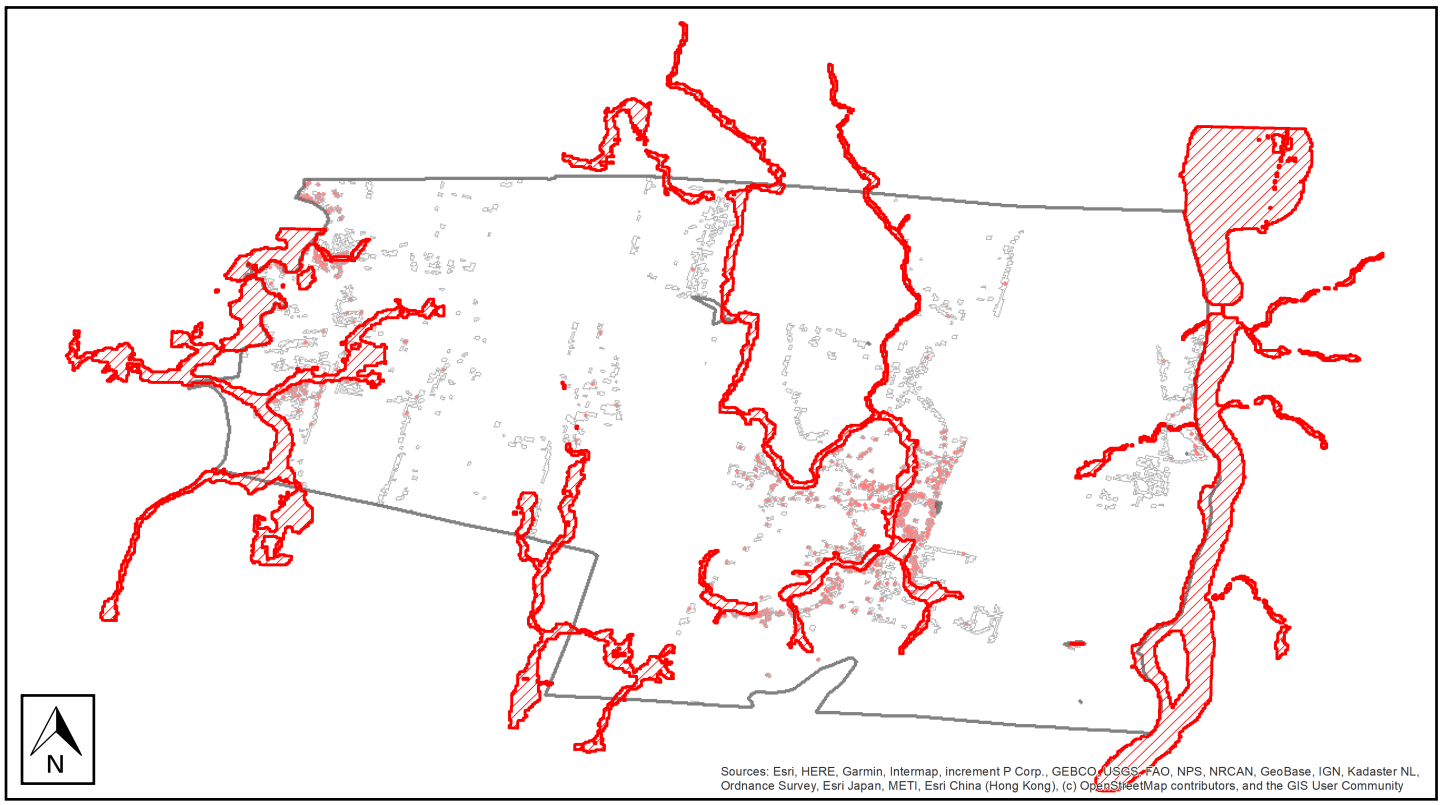


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	33	2	33	2	33	0	0	0	0	0	0
Total	**2**		**2**		**2**		**0**		**0**		**0**	

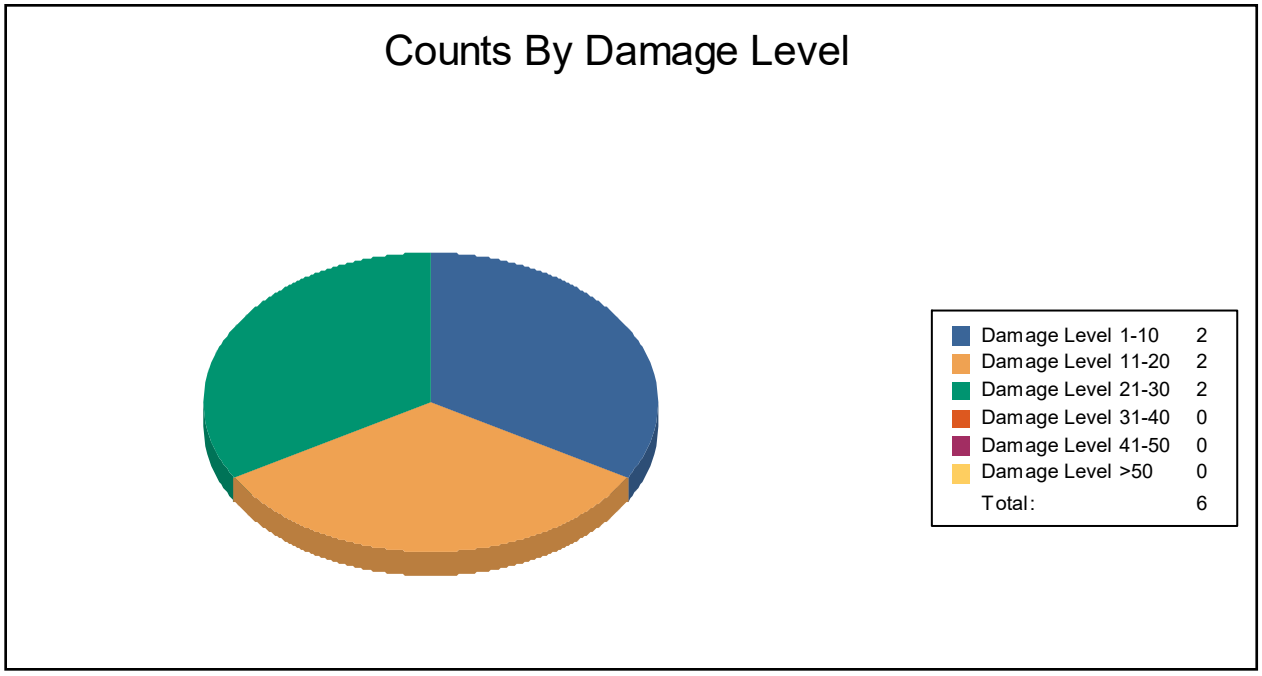


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	33	2	33	2	33	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

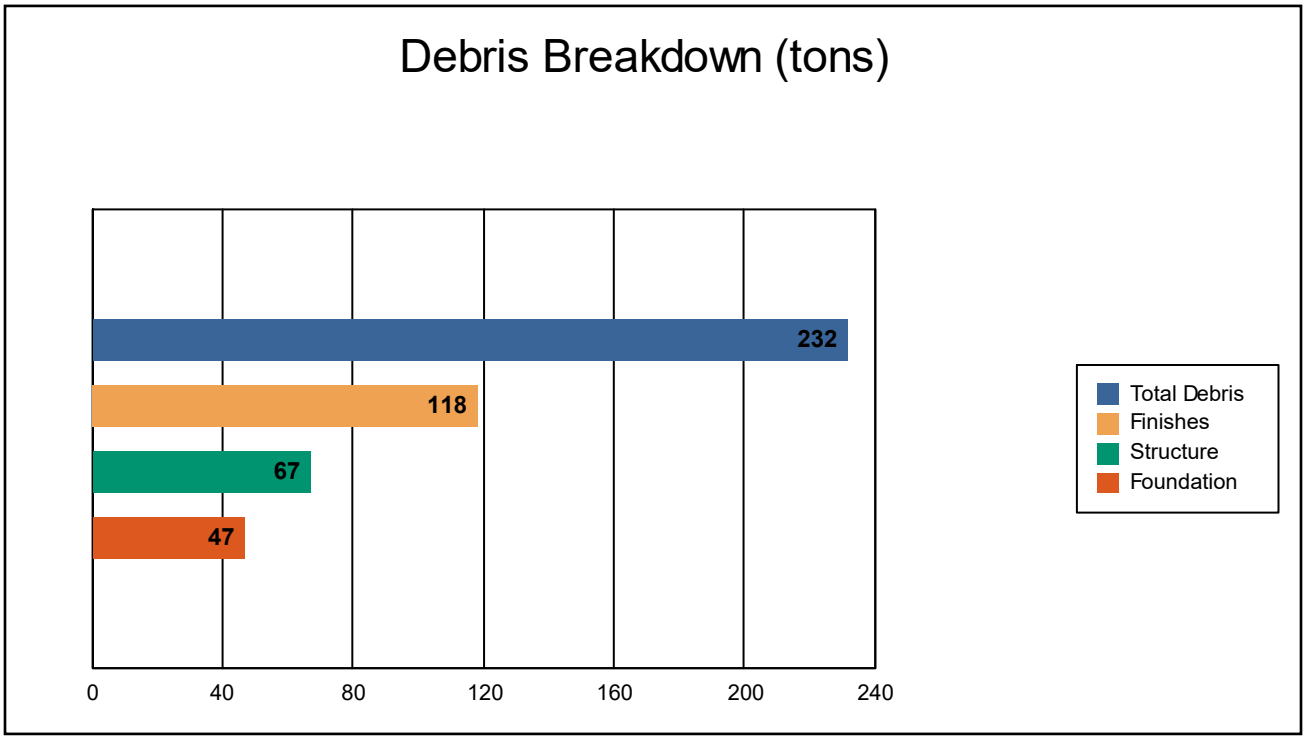
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

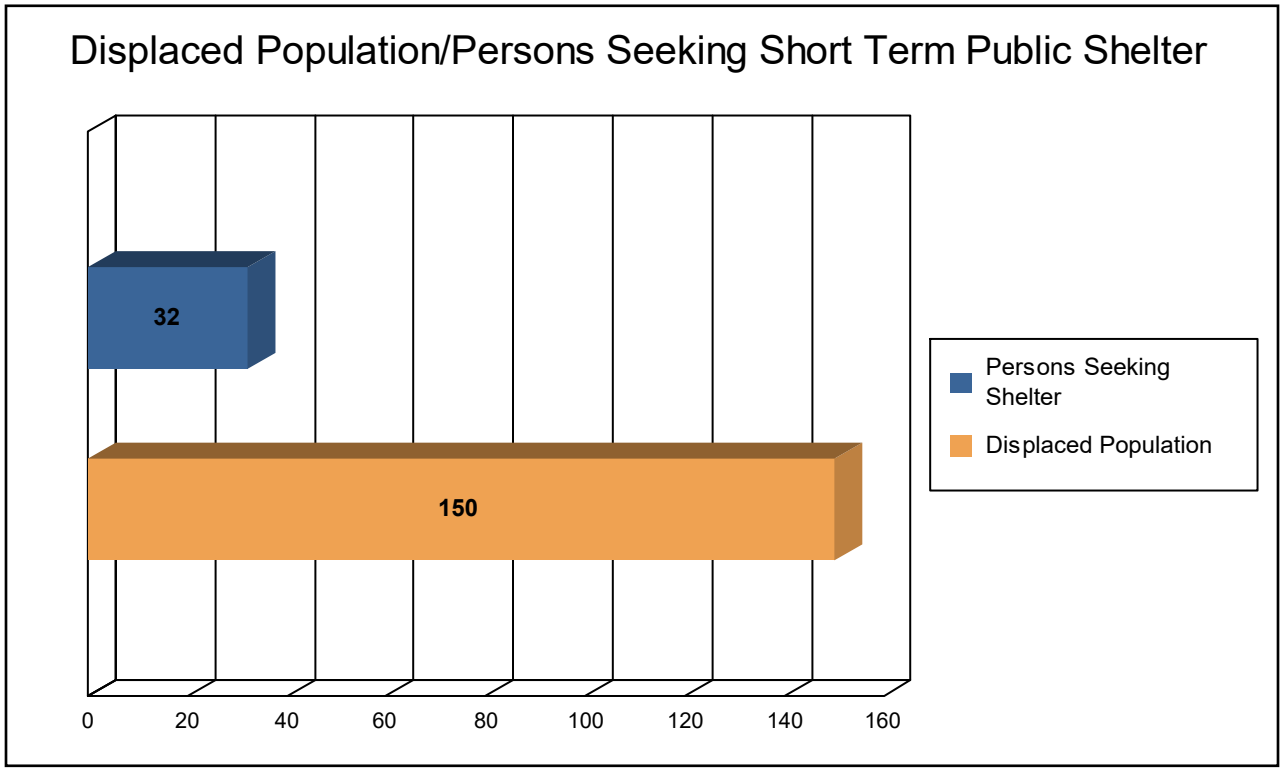


The model estimates that a total of 232 tons of debris will be generated. Of the total amount, Finishes comprises 51% of the total, Structure comprises 29% of the total, and Foundation comprises 20%. If the debris tonnage is converted into an estimated number of truckloads, it will require 10 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 50 households (or 150 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 32 people (out of a total population of 15,746) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 15.81 million dollars, which represents 1.41 % of the total replacement value of the scenario buildings.

Building-Related Losses

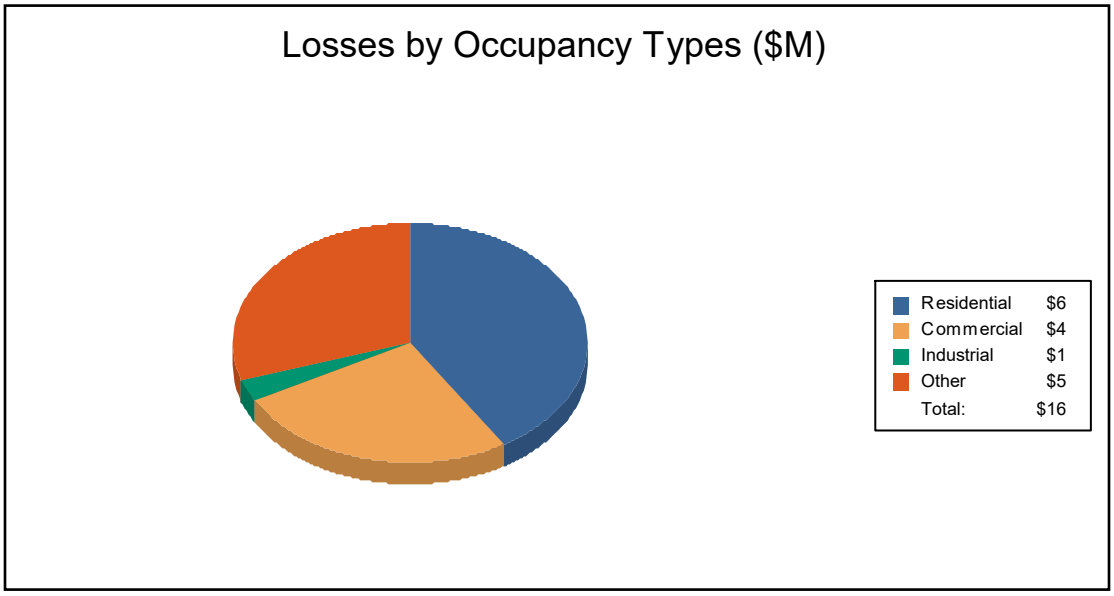
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 8.39 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 41.00% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.68	0.53	0.18	0.11	4.51
	Content	1.57	1.17	0.27	0.68	3.68
	Inventory	0.00	0.09	0.04	0.08	0.20
	Subtotal	**5.26**	**1.78**	**0.49**	**0.87**	**8.39**
Business Interruption						
	Income	0.00	0.87	0.00	0.13	1.01
	Relocation	0.96	0.17	0.00	0.03	1.16
	Rental Income	0.27	0.07	0.00	0.00	0.34
	Wage	0.00	1.21	0.01	3.70	4.92
	Subtotal	**1.23**	**2.32**	**0.02**	**3.86**	**7.42**
ALL	**Total**	**6.48**	**4.10**	**0.50**	**4.73**	**15.81**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	15,746	2,232,305	950,471	3,182,776
Total	**15,746**	**2,232,305**	**950,471**	**3,182,776**
Total Study Region	**15,746**	**2,232,305**	**950,471**	**3,182,776**

Hazus: Flood Global Risk Report

Region Name: Suffield_FL

Flood Scenario: Suffield_Flood

Print Date: Wednesday, April 19, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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Note:
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There are an estimated 4,971 buildings in the region with a total building replacement value (excluding contents) of 3,183 million dollars. Approximately 89.76% of the buildings (and 70.14% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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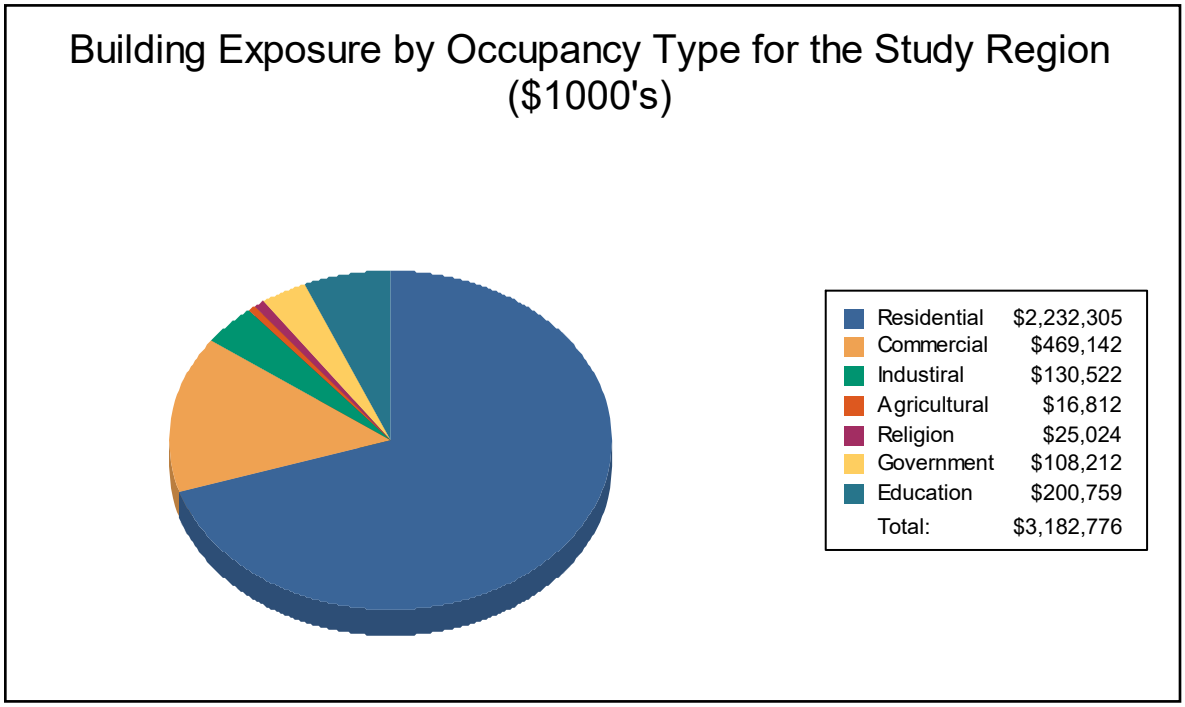

Table 2
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Occupancy	Exposure ($1000)	Percent of Total
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Commercial	154,851	13.8%
Industrial	34,081	3.0%
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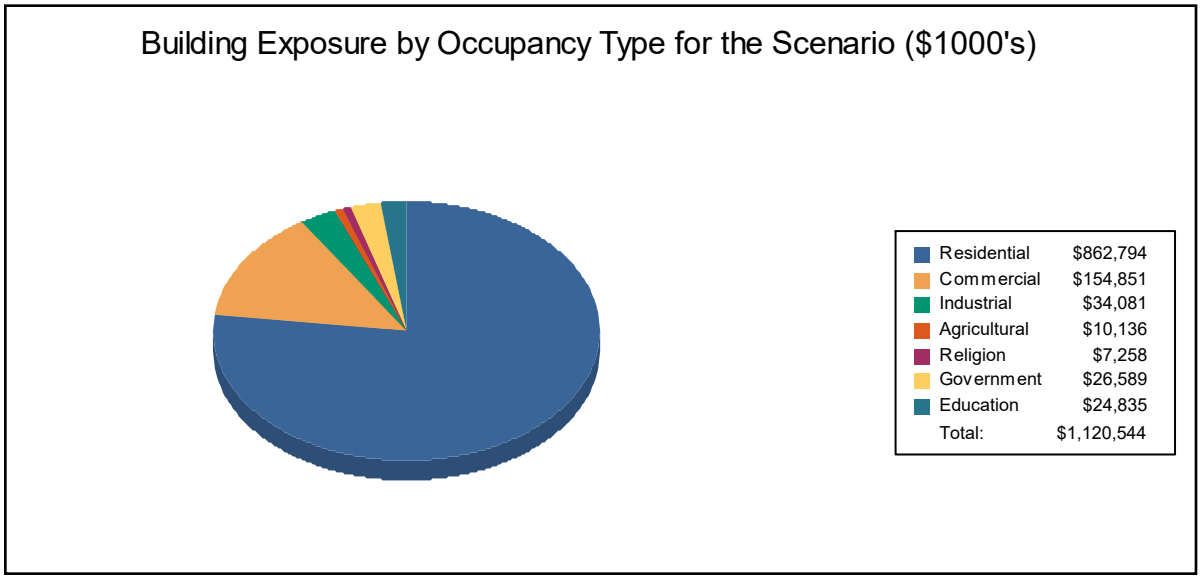
Education	24,835	2.2%
Total	**1,120,544**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

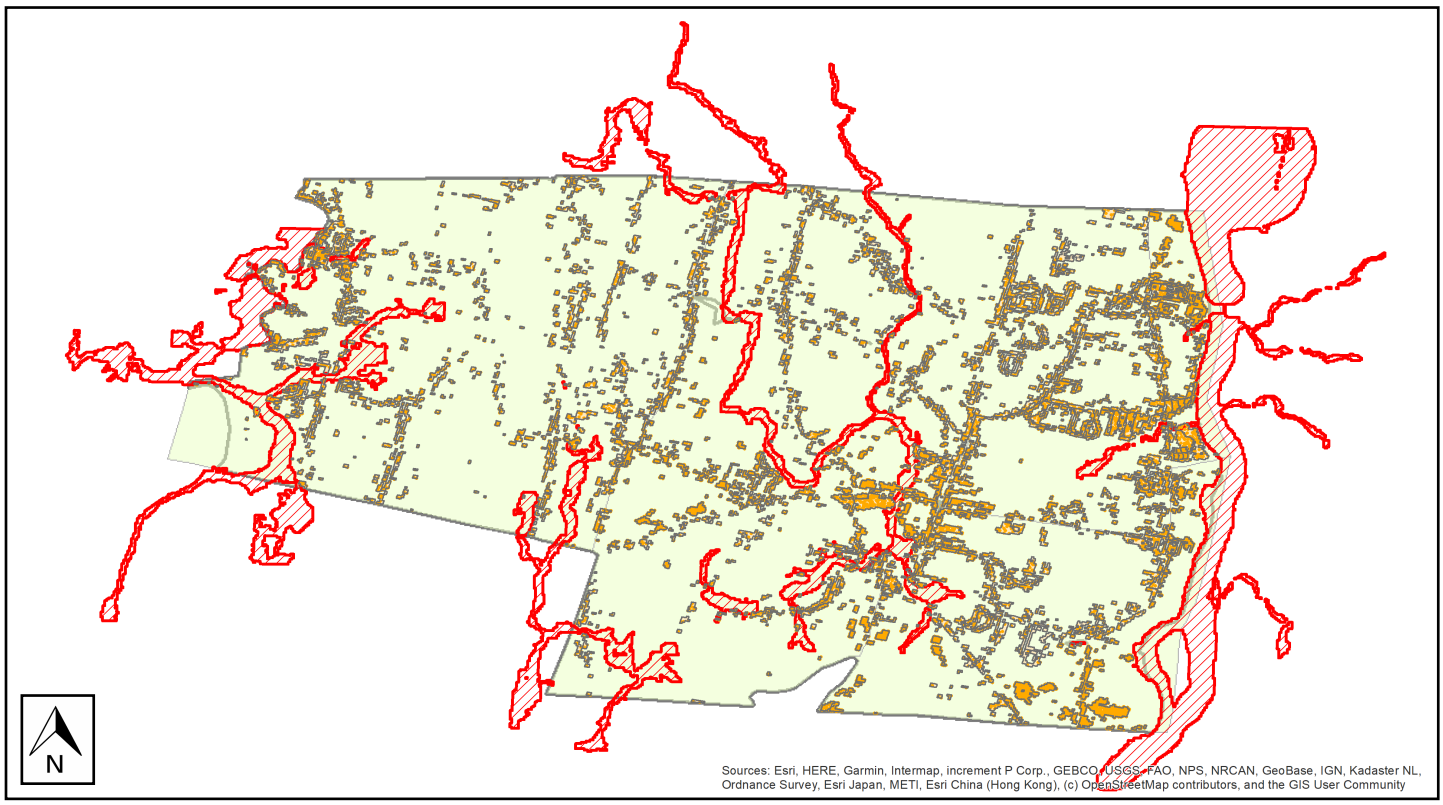
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Suffield_FL
Scenario Name:	Suffield_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

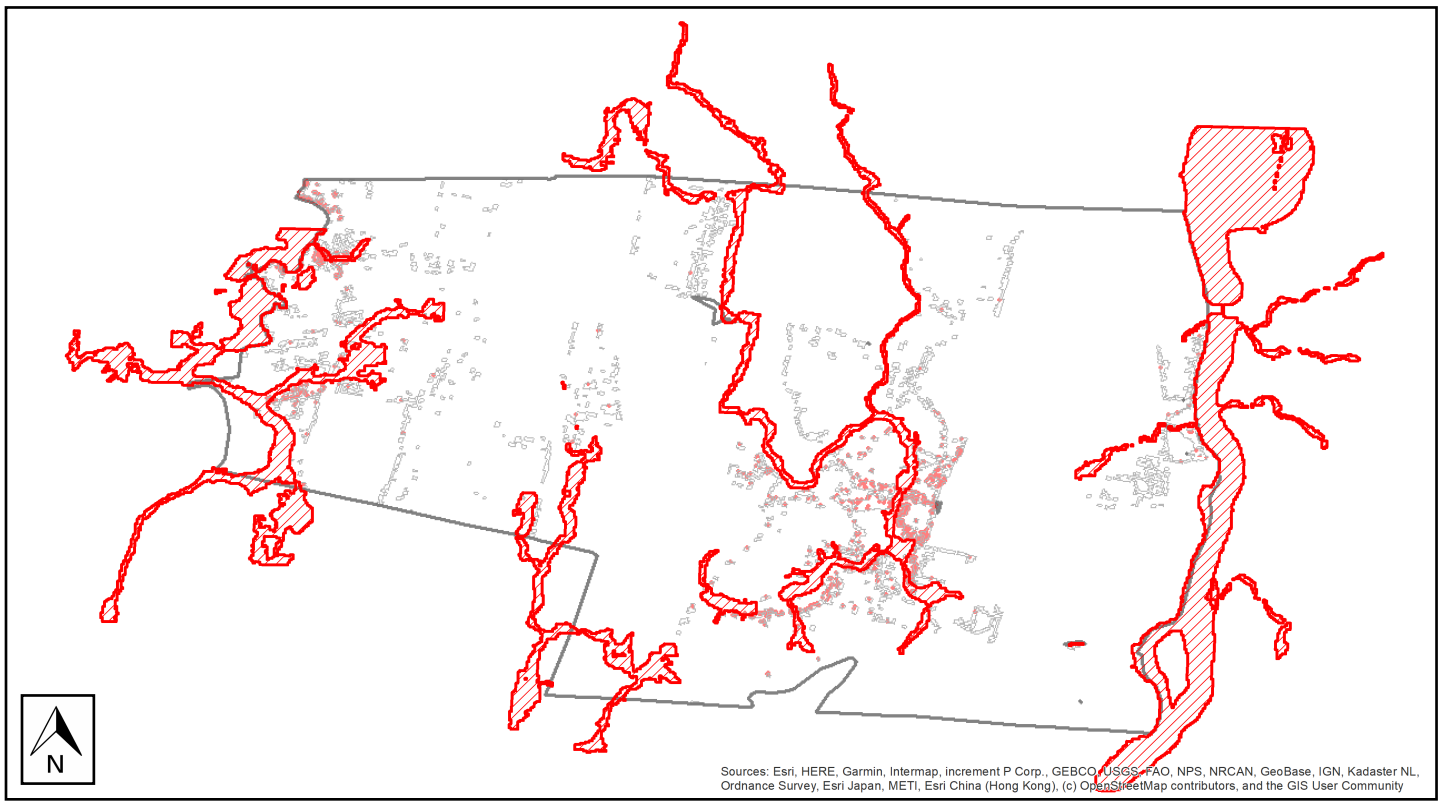


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	2	33	2	33	2	33	0	0	0	0	0	0
Total	**2**		**2**		**2**		**0**		**0**		**0**	

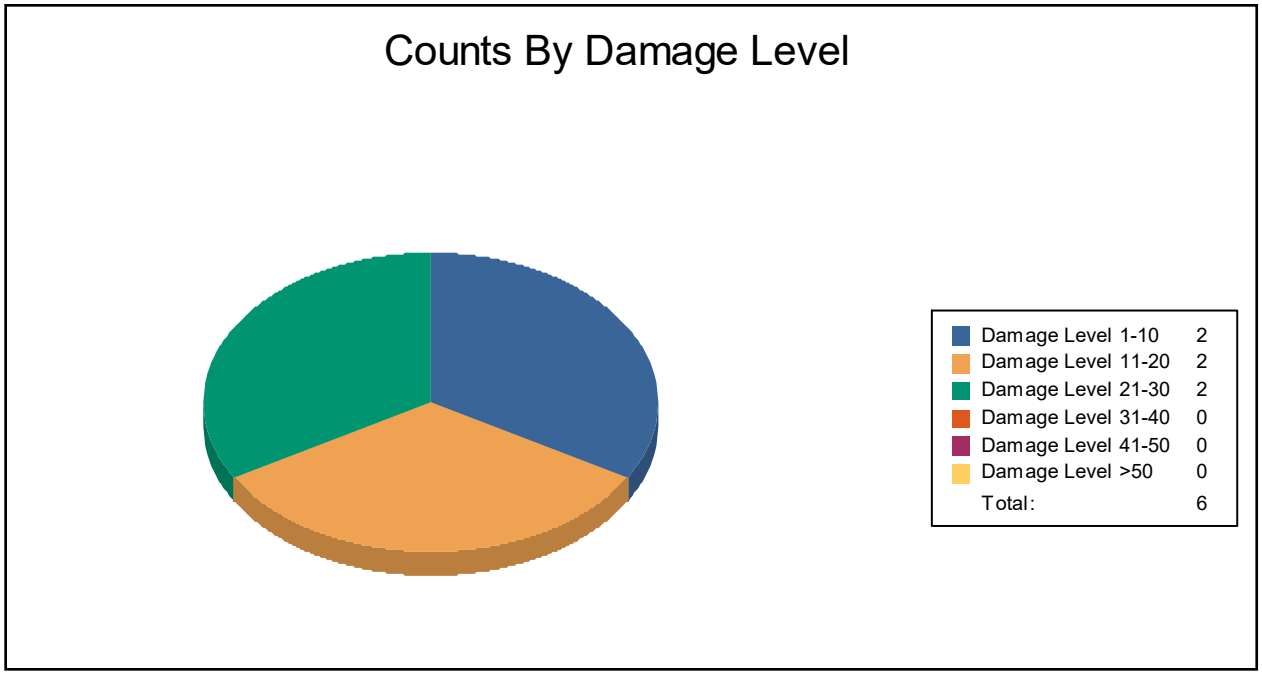


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	2	33	2	33	2	33	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

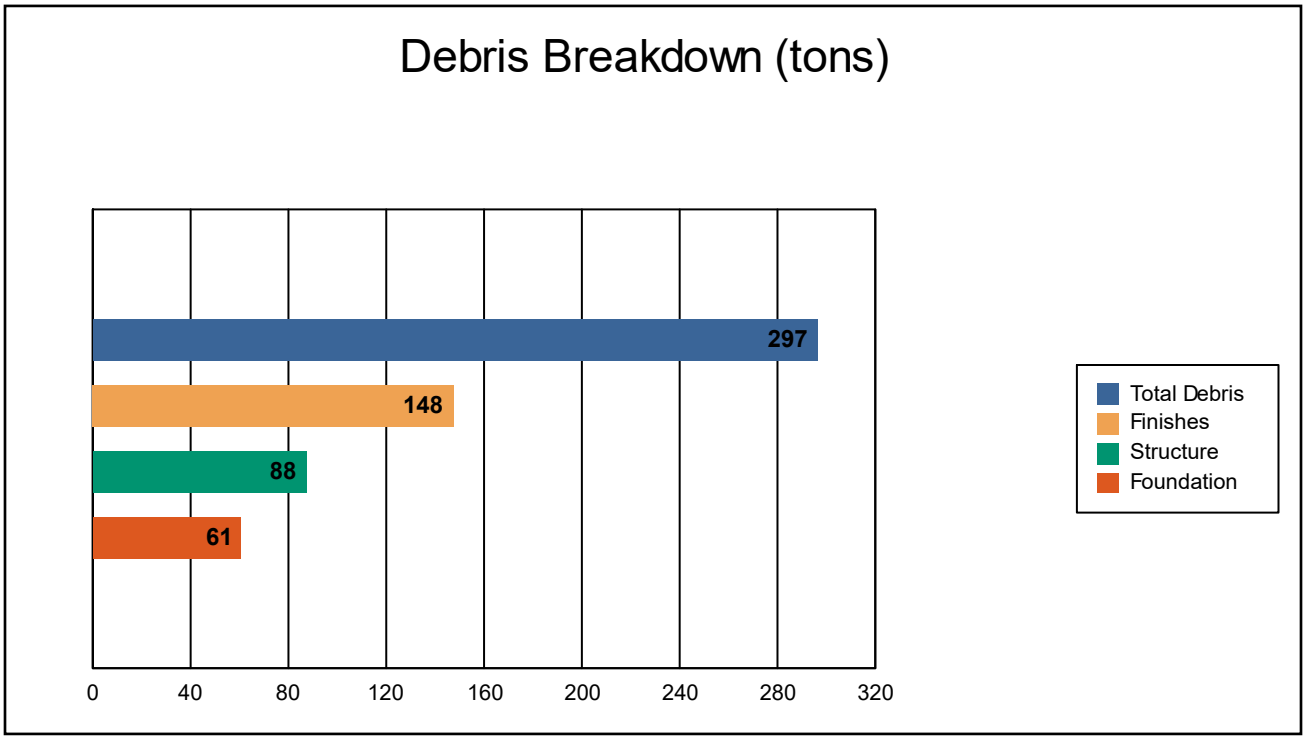
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

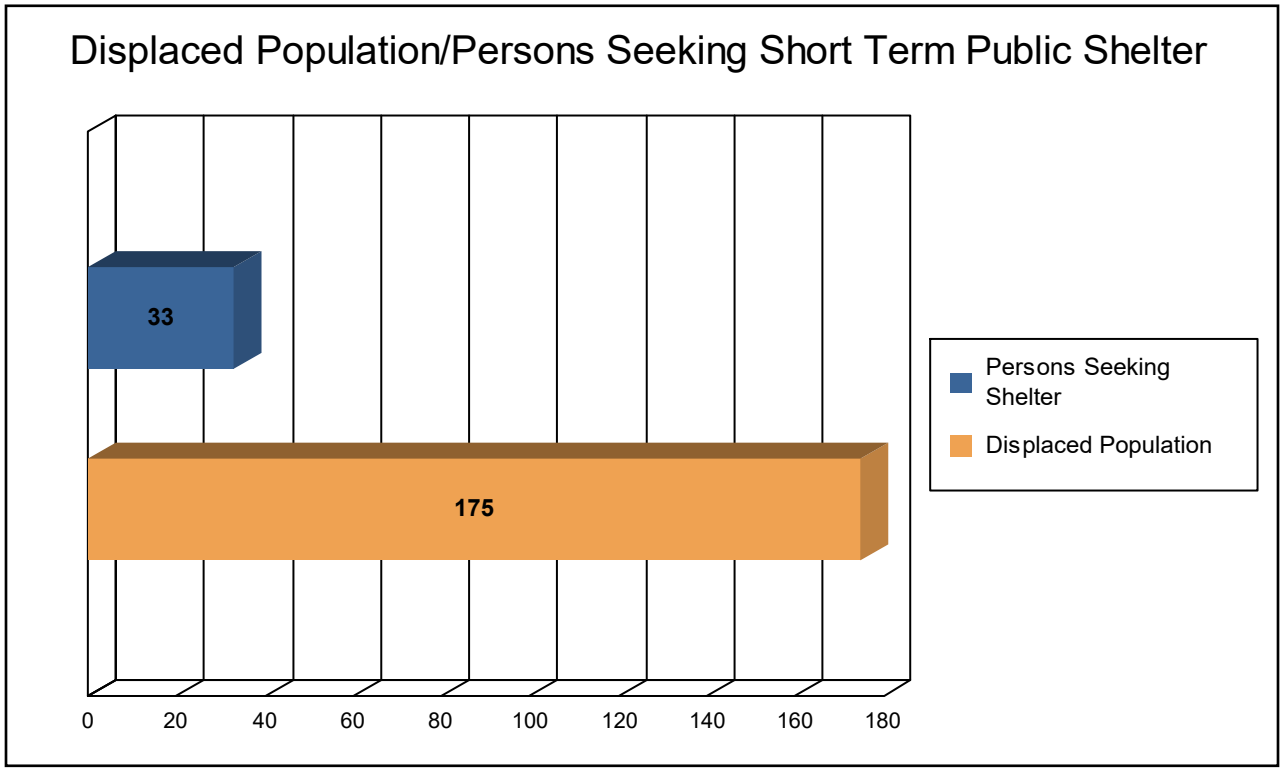


The model estimates that a total of 297 tons of debris will be generated. Of the total amount, Finishes comprises 50% of the total, Structure comprises 30% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 12 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 58 households (or 175 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 33 people (out of a total population of 15,746) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 19.57 million dollars, which represents 1.75 % of the total replacement value of the scenario buildings.

Building-Related Losses

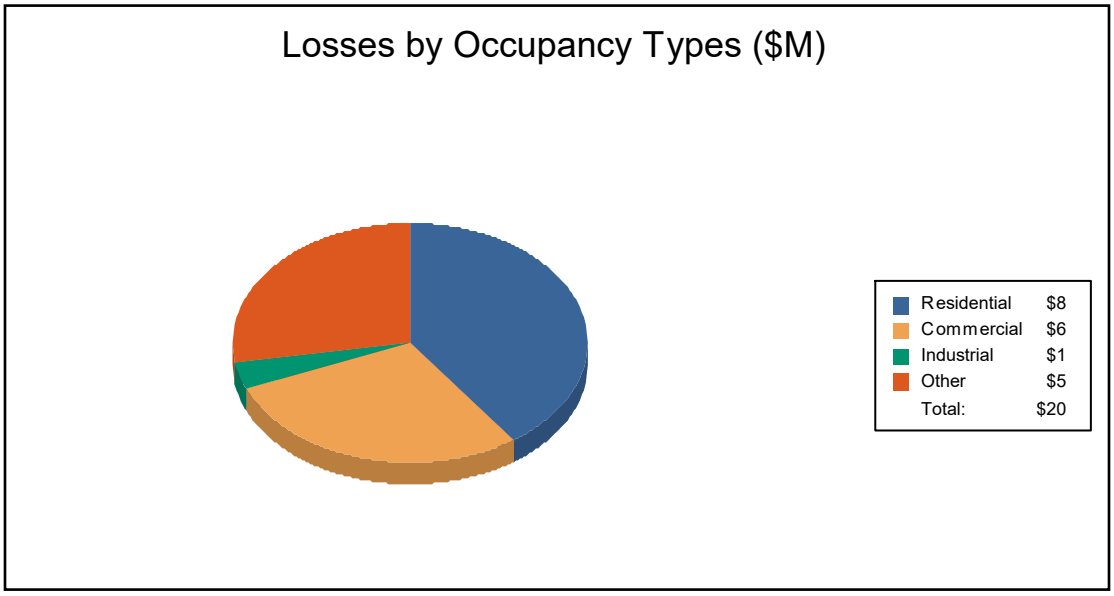
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 10.70 million dollars. 45% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 39.95% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.44	0.71	0.24	0.15	5.54
	Content	1.91	1.79	0.38	0.82	4.90
	Inventory	0.00	0.13	0.04	0.10	0.26
	Subtotal	**6.35**	**2.62**	**0.66**	**1.07**	**10.70**
Business Interruption						
	Income	0.00	1.10	0.00	0.15	1.26
	Relocation	1.14	0.21	0.00	0.04	1.38
	Rental Income	0.33	0.09	0.00	0.00	0.42
	Wage	0.00	1.62	0.01	4.18	5.82
	Subtotal	**1.47**	**3.02**	**0.02**	**4.37**	**8.87**
ALL	**Total**	**7.82**	**5.64**	**0.68**	**5.44**	**19.57**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	15,746	2,232,305	950,471	3,182,776
Total	**15,746**	**2,232,305**	**950,471**	**3,182,776**
Total Study Region	**15,746**	**2,232,305**	**950,471**	**3,182,776**

Hazus: Flood Global Risk Report

Region Name: Suffield_FL

Flood Scenario: Suffield_Flood

Print Date: Wednesday, April 19, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 181 census blocks. The region contains over 6 thousand households and has a total population of 15,746 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,971 buildings in the region with a total building replacement value (excluding contents) of 3,183 million dollars. Approximately 89.76% of the buildings (and 70.14% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,971 buildings in the region which have an aggregate total replacement value of 3,183 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,232,305	70.1%
Commercial	469,142	14.7%
Industrial	130,522	4.1%
Agricultural	16,812	0.5%
Religion	25,024	0.8%
Government	108,212	3.4%
Education	200,759	6.3%
Total	**3,182,776**	**100%**

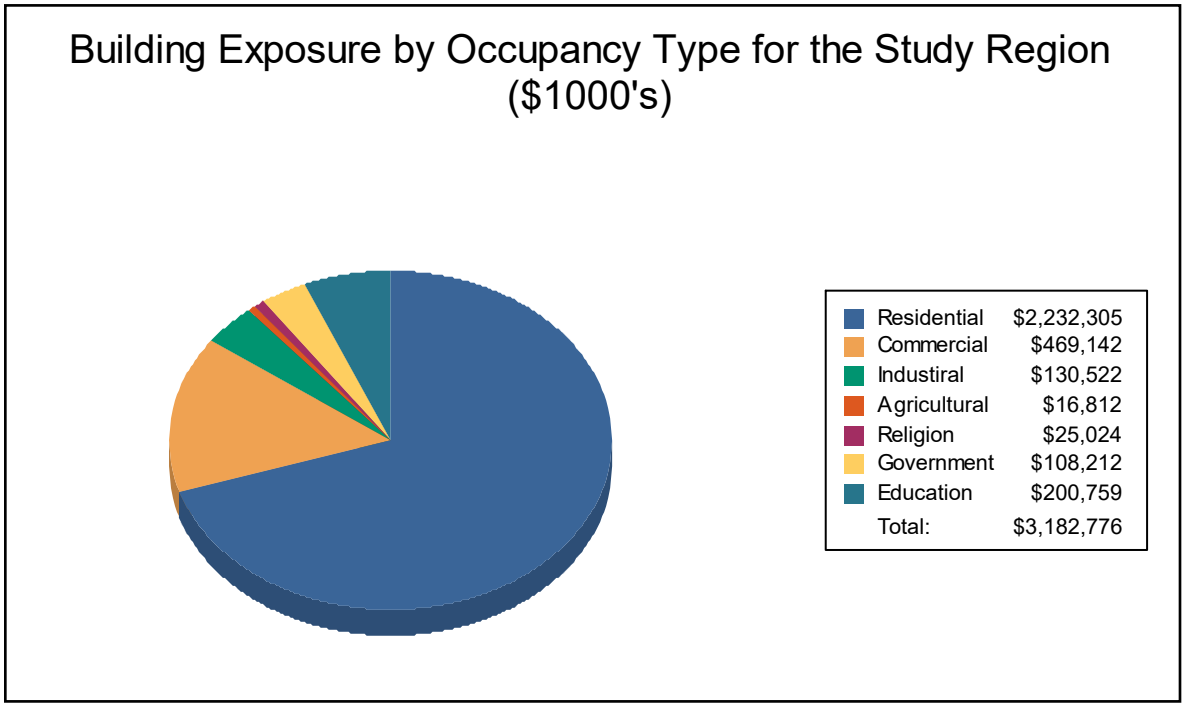
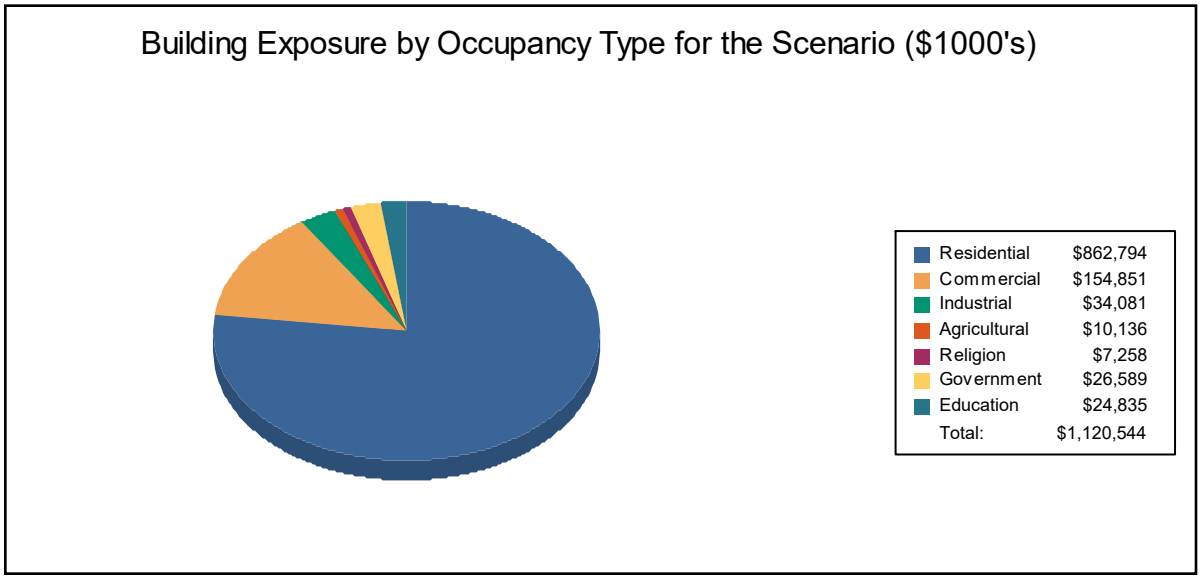


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	862,794	77.0%
Commercial	154,851	13.8%
Industrial	34,081	3.0%
Agricultural	10,136	0.9%
Religion	7,258	0.6%
Government	26,589	2.4%
Education	24,835	2.2%
Total	**1,120,544**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

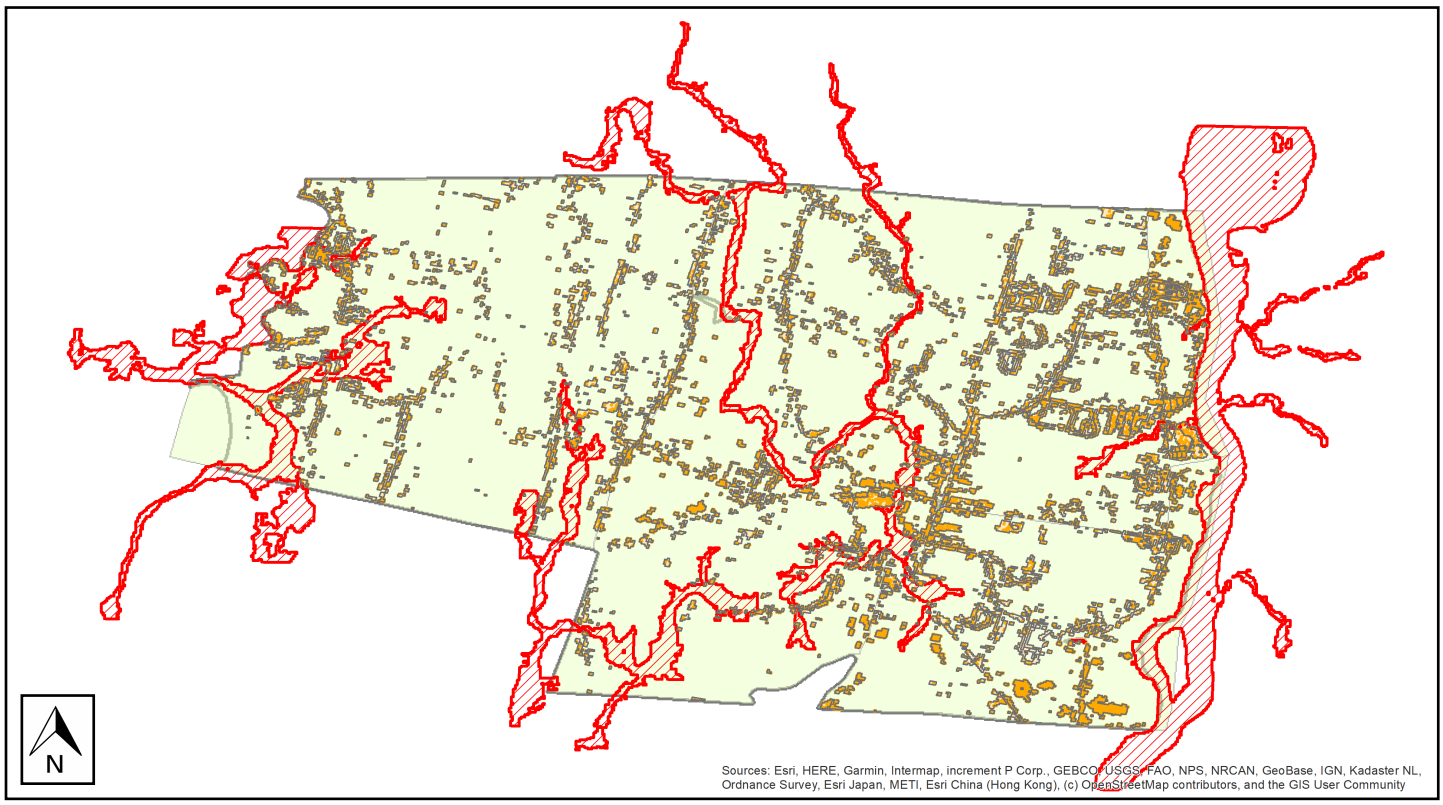
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Suffield_FL
Scenario Name:	Suffield_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 16 buildings will be at least moderately damaged. This is over 88% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

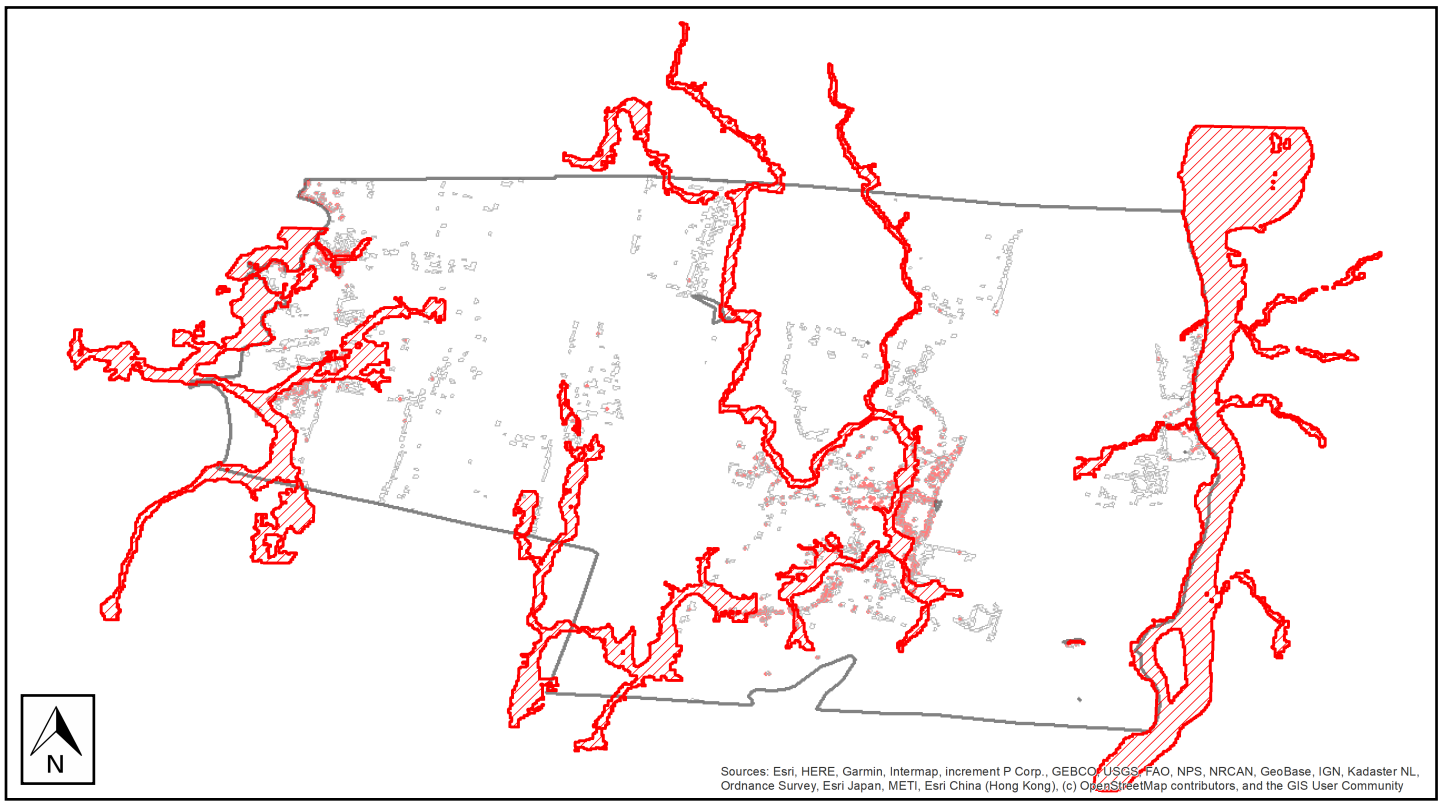


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	8	33	9	38	4	17	2	8	1	4	0	0
Total	**8**		**9**		**4**		**2**		**1**		**0**	

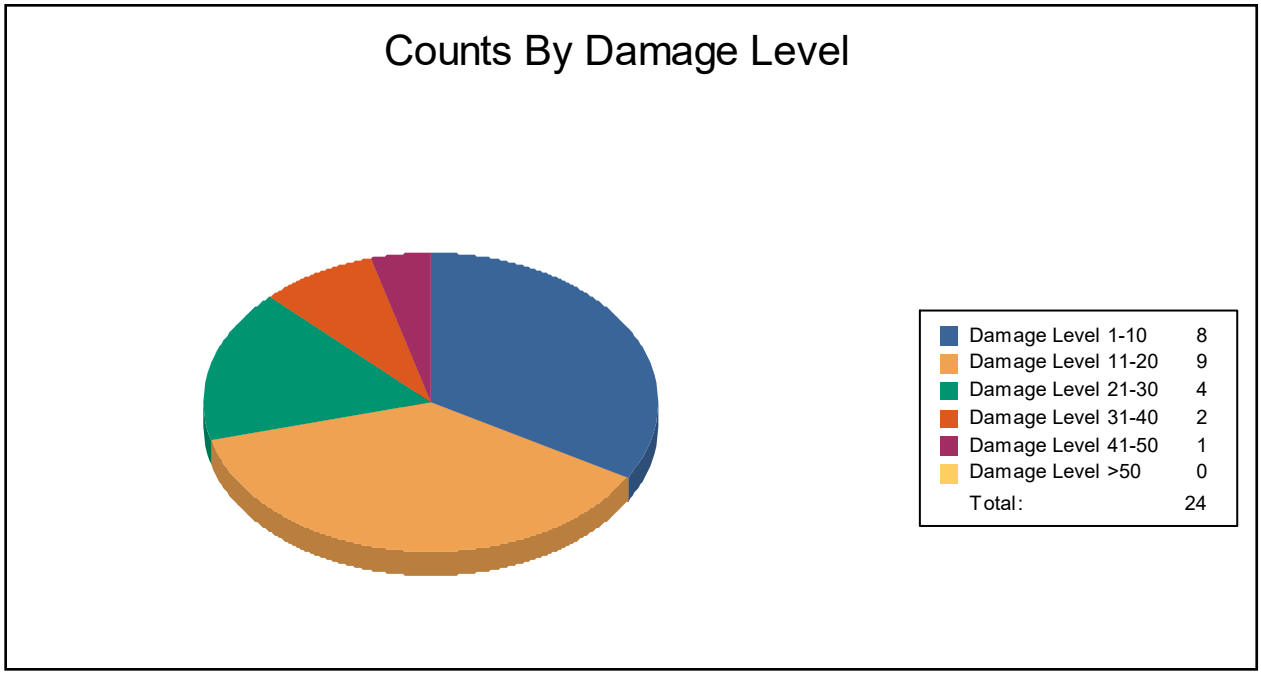


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	8	33	9	38	4	17	2	8	1	4	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

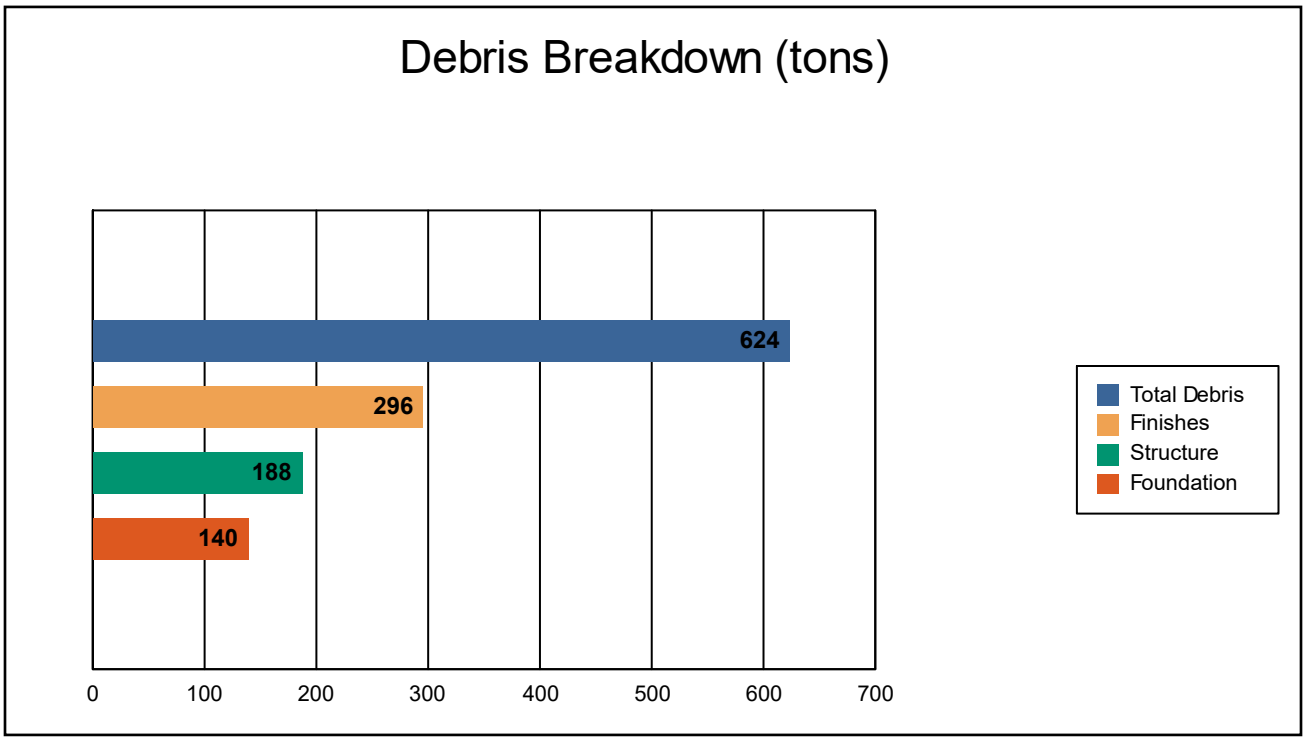
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

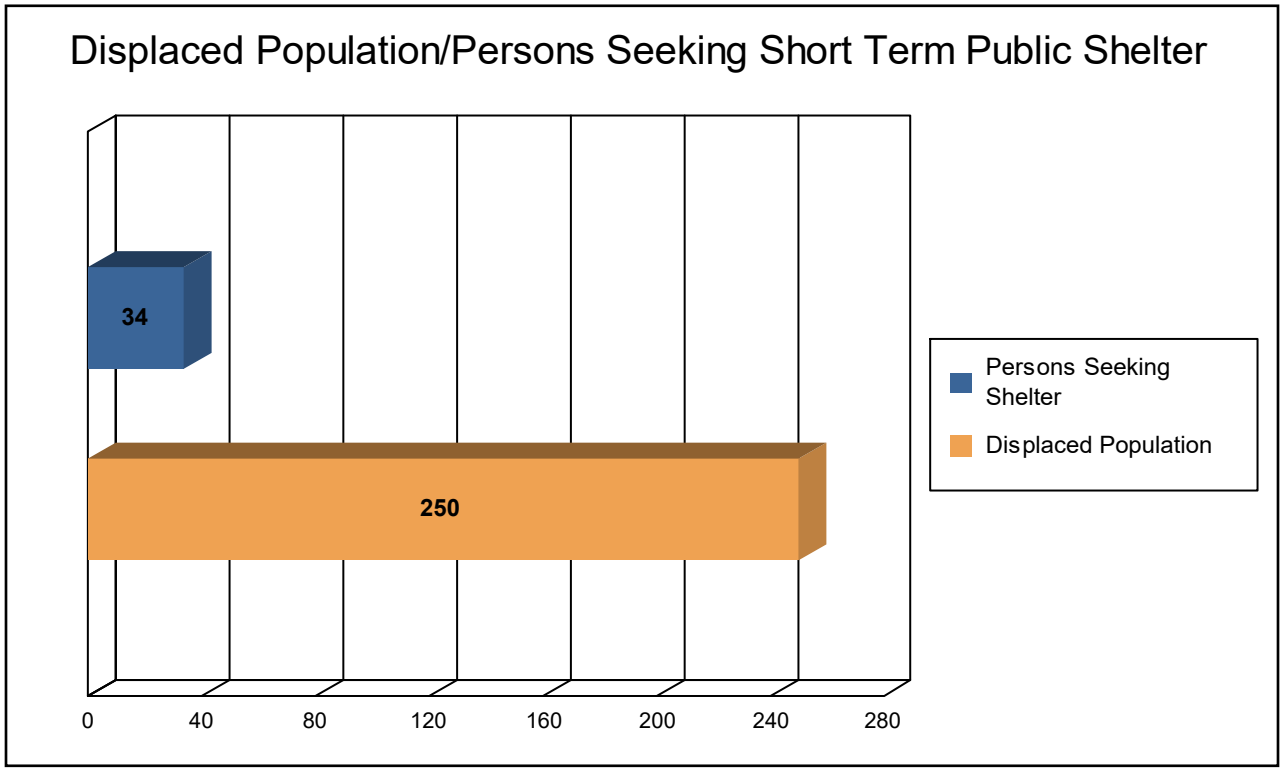


The model estimates that a total of 624 tons of debris will be generated. Of the total amount, Finishes comprises 47% of the total, Structure comprises 30% of the total, and Foundation comprises 22%. If the debris tonnage is converted into an estimated number of truckloads, it will require 25 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 83 households (or 250 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 34 people (out of a total population of 15,746) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 39.97 million dollars, which represents 3.57 % of the total replacement value of the scenario buildings.

Building-Related Losses

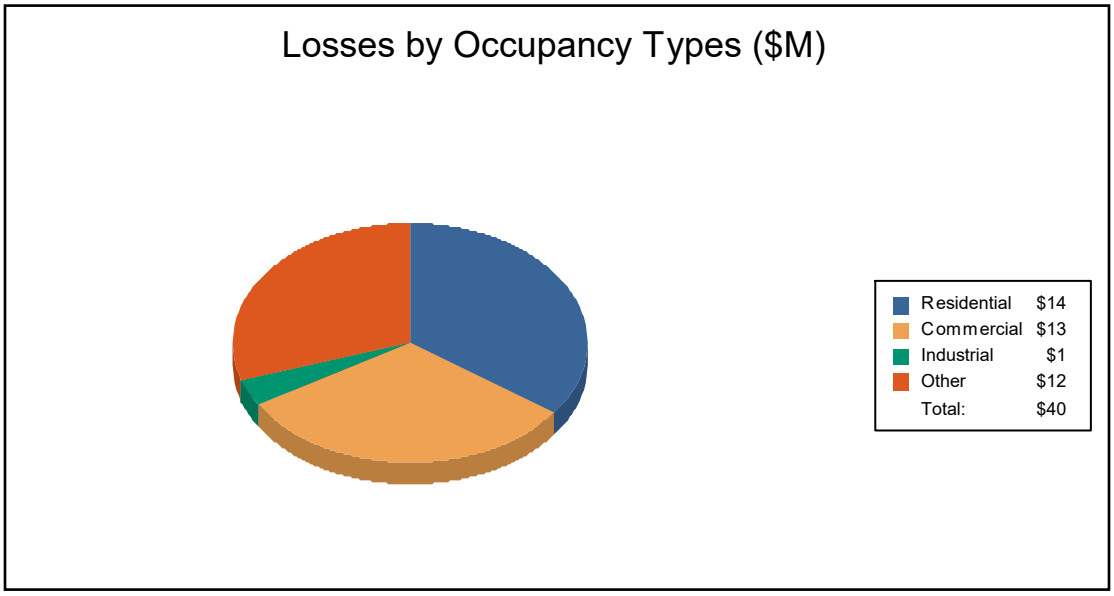
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 21.41 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 34.92% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.92	1.46	0.53	0.38	10.29
	Content	3.44	4.17	0.76	1.97	10.34
	Inventory	0.00	0.33	0.10	0.35	0.78
	Subtotal	**11.36**	**5.96**	**1.39**	**2.70**	**21.41**
Business Interruption						
	Income	0.00	2.27	0.02	0.36	2.65
	Relocation	1.98	0.46	0.01	0.14	2.59
	Rental Income	0.62	0.21	0.00	0.01	0.84
	Wage	0.00	3.64	0.03	8.81	12.48
	Subtotal	**2.60**	**6.58**	**0.06**	**9.33**	**18.56**
ALL	**Total**	**13.96**	**12.54**	**1.45**	**12.03**	**39.97**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	15,746	2,232,305	950,471	3,182,776
Total	**15,746**	**2,232,305**	**950,471**	**3,182,776**
Total Study Region	**15,746**	**2,232,305**	**950,471**	**3,182,776**

Hazus: Flood Global Risk Report

Region Name:	Tolland_FL
Flood Scenario:	Tolland_Flood
Print Date:	Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 219 census blocks. The region contains over 5 thousand households and has a total population of 14,549 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,767 buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89.20% of the buildings (and 77.44% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,767 buildings in the region which have an aggregate total replacement value of 3,056 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,366,535	77.4%
Commercial	273,160	8.9%
Industrial	133,126	4.4%
Agricultural	9,012	0.3%
Religion	19,292	0.6%
Government	112,816	3.7%
Education	141,950	4.6%
Total	**3,055,891**	**100%**

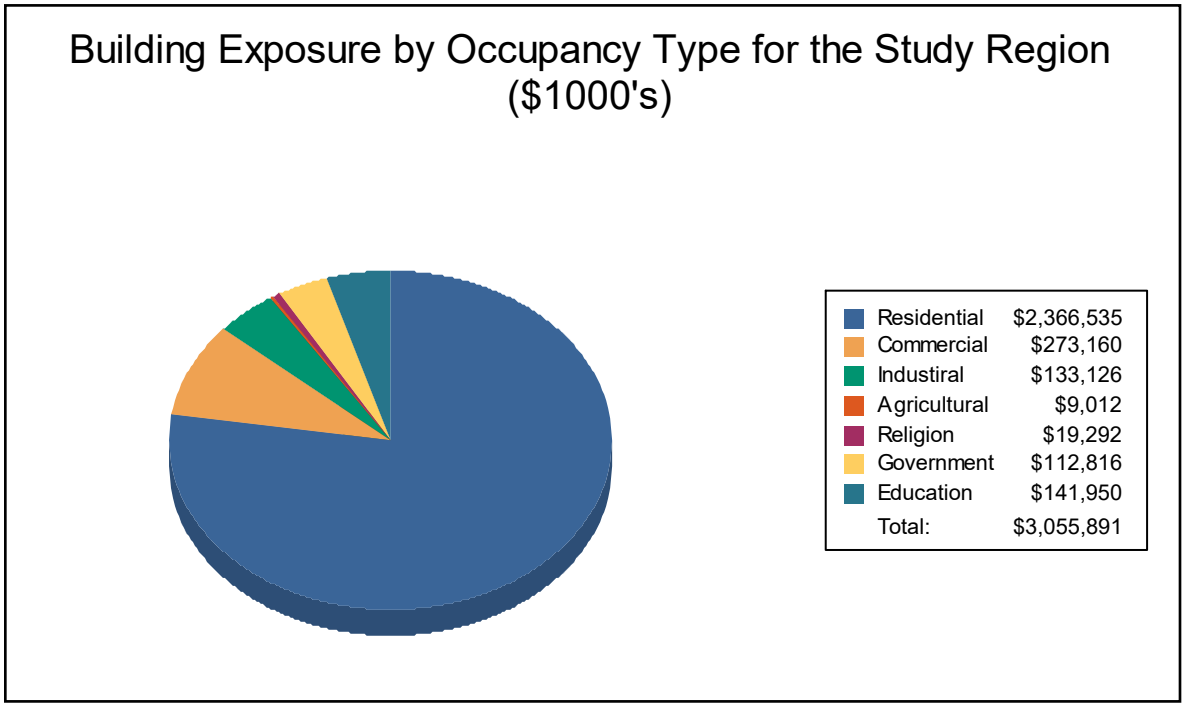
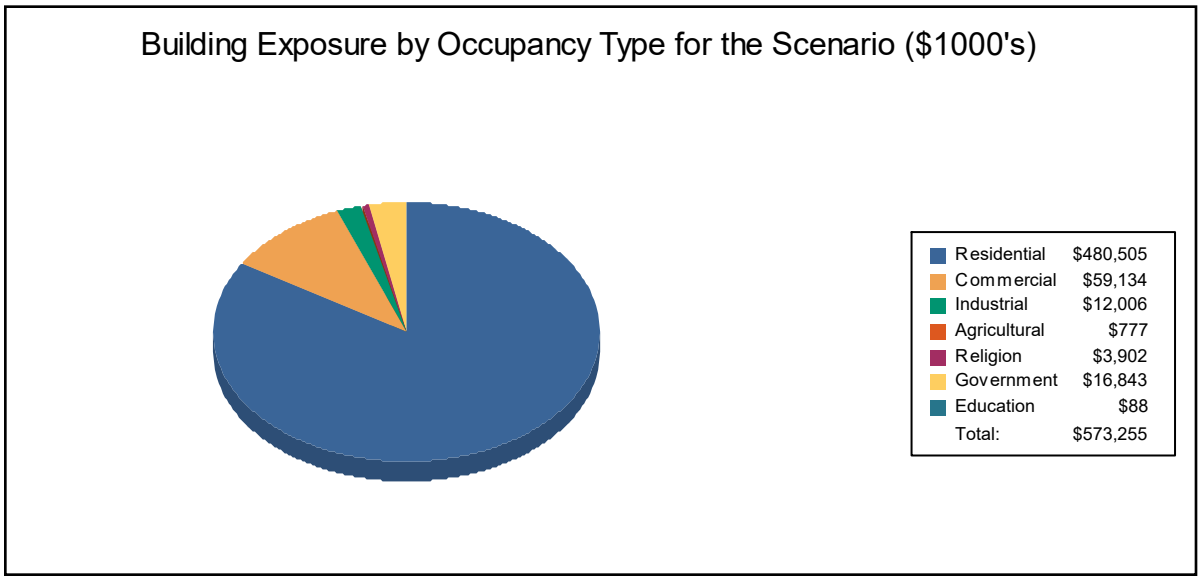


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	480,505	83.8%
Commercial	59,134	10.3%
Industrial	12,006	2.1%
Agricultural	777	0.1%
Religion	3,902	0.7%
Government	16,843	2.9%
Education	88	0.0%
Total	**573,255**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

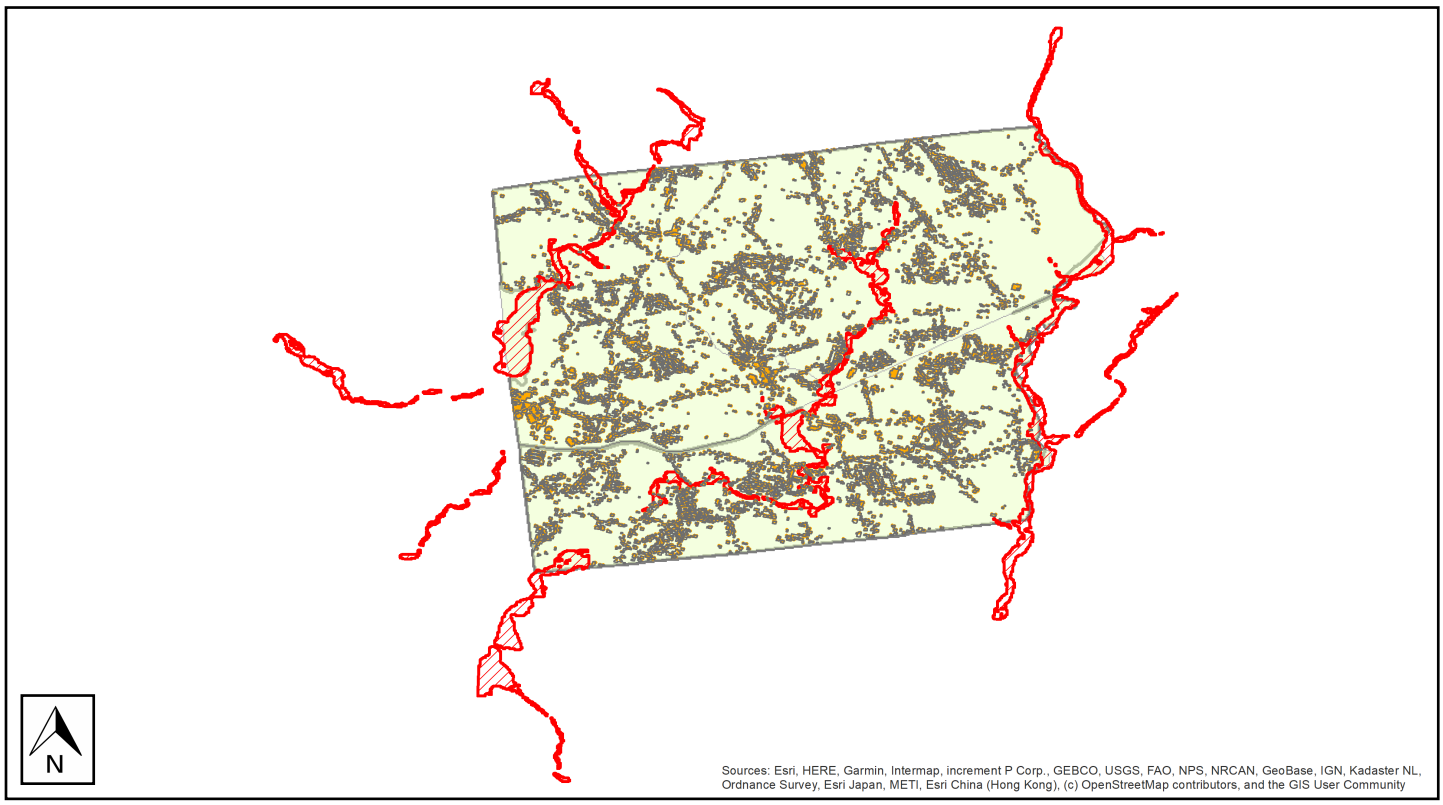
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Tolland_FL
Scenario Name:	Tolland_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

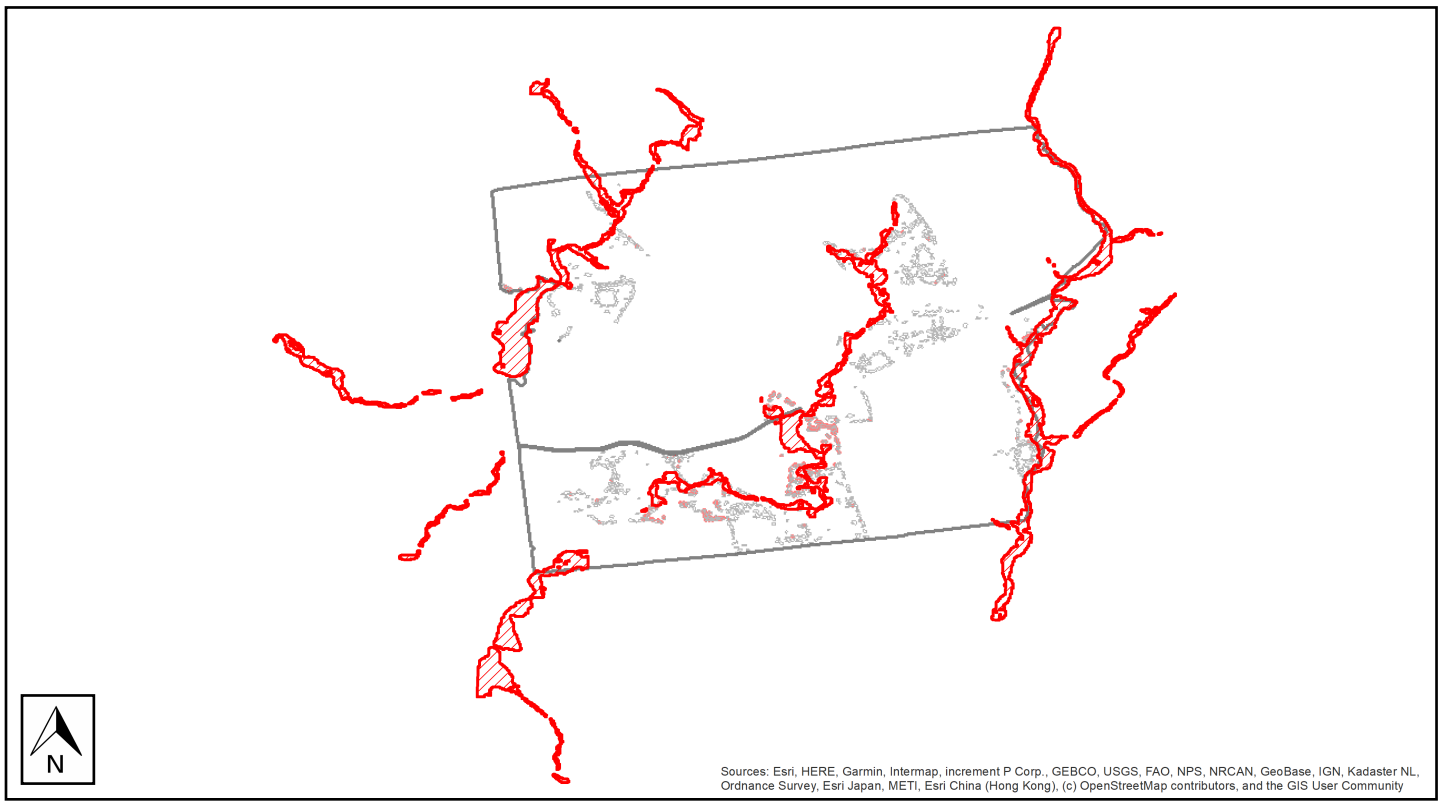


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

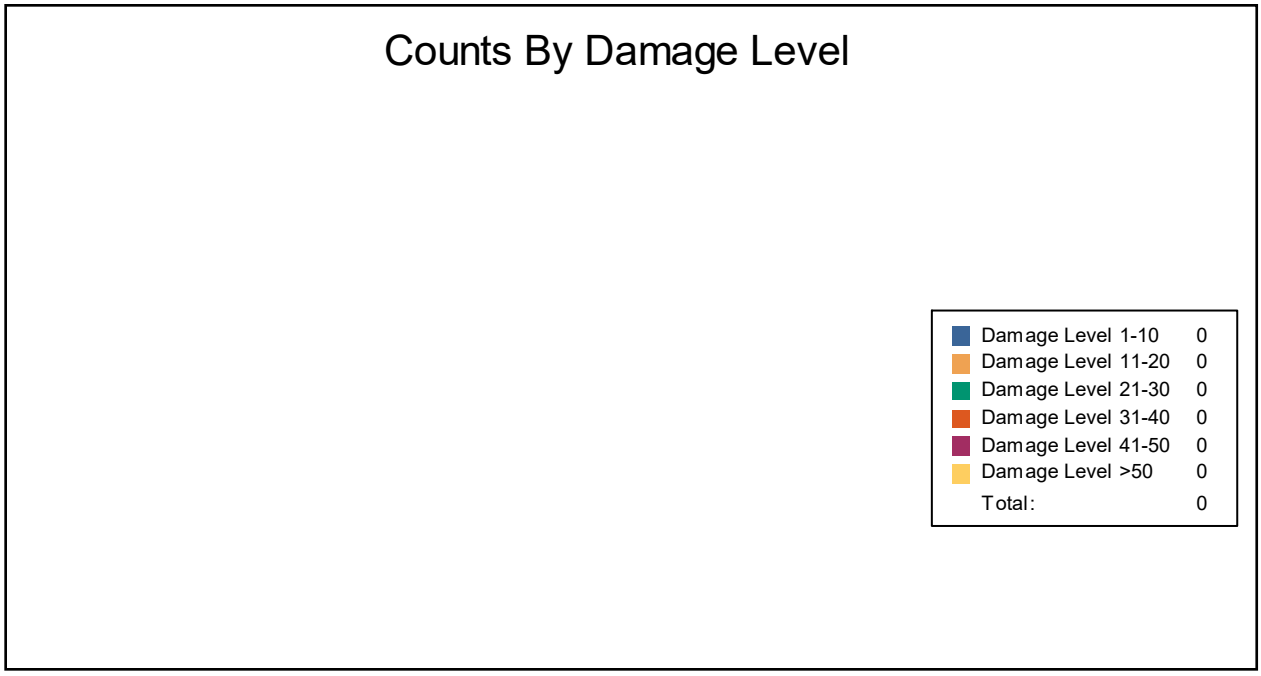


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

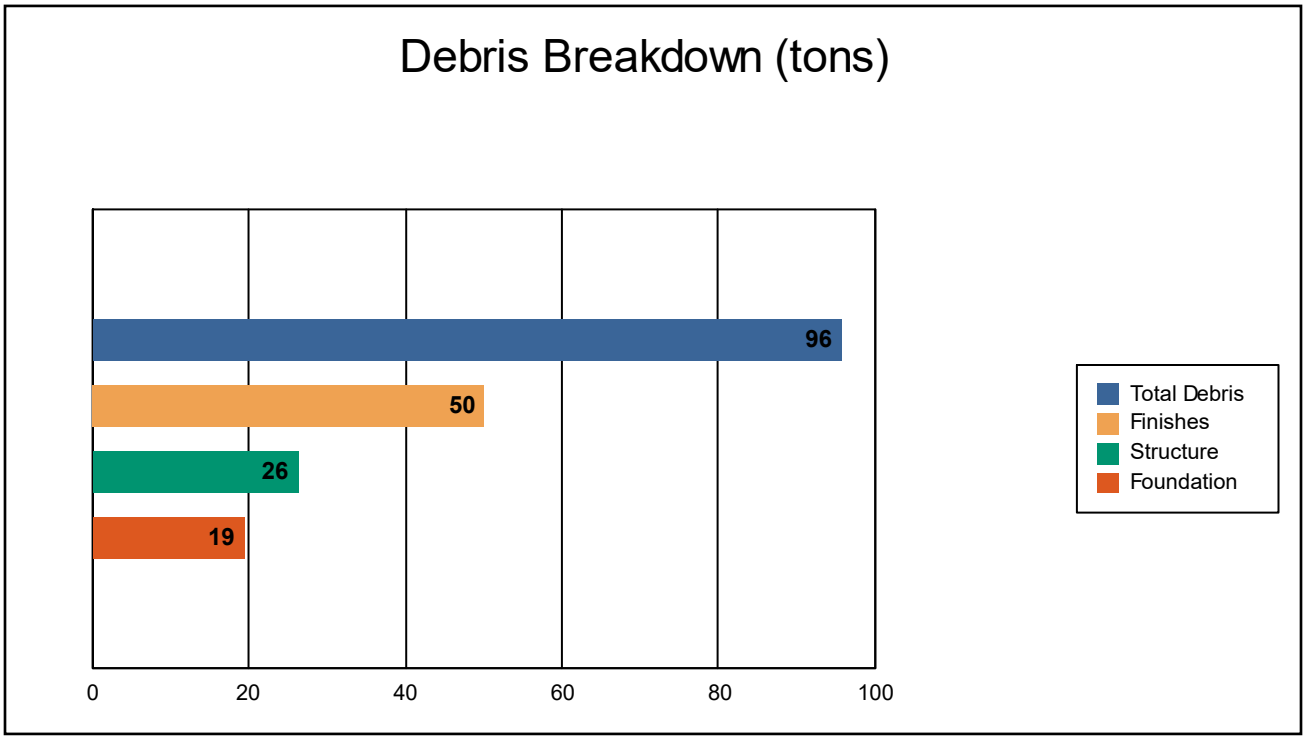
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

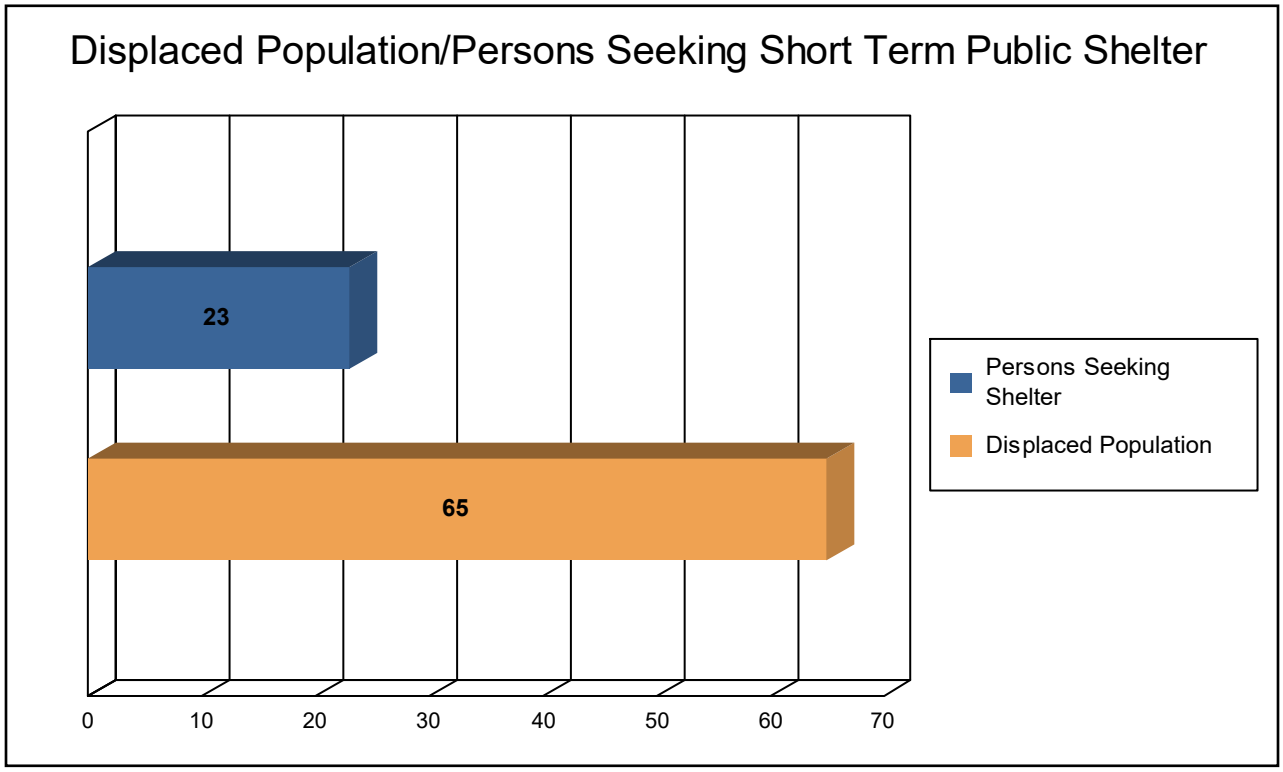


The model estimates that a total of 96 tons of debris will be generated. Of the total amount, Finishes comprises 52% of the total, Structure comprises 27% of the total, and Foundation comprises 20%. If the debris tonnage is converted into an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 22 households (or 65 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 23 people (out of a total population of 14,549) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 8.34 million dollars, which represents 1.45 % of the total replacement value of the scenario buildings.

Building-Related Losses

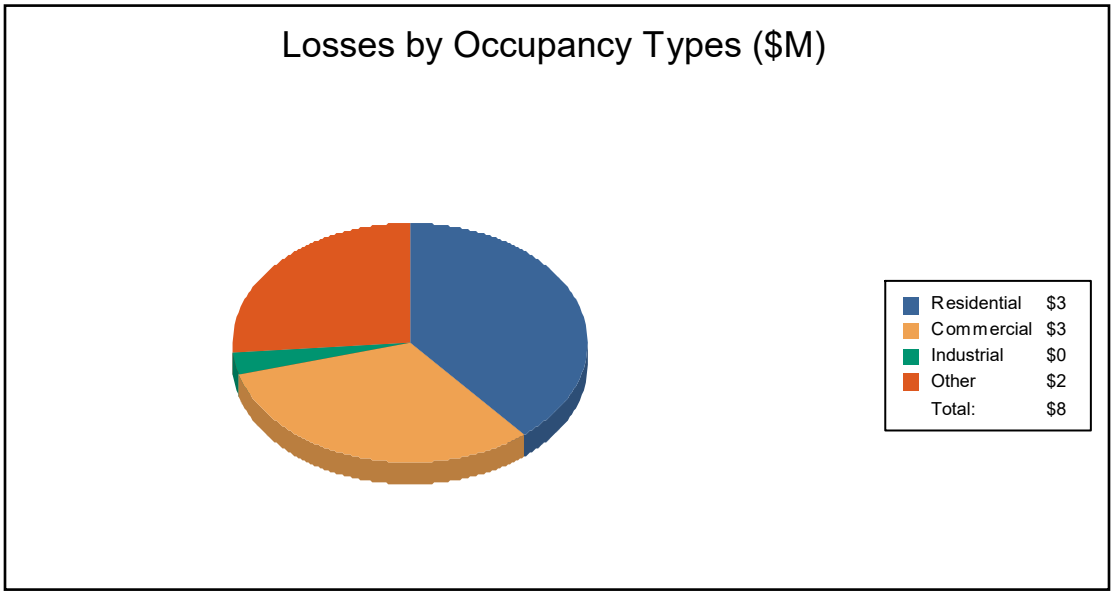
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 4.49 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 38.88% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.89	0.22	0.06	0.03	2.20
	Content	0.79	0.91	0.13	0.24	2.07
	Inventory	0.00	0.20	0.02	0.00	0.22
	Subtotal	**2.68**	**1.32**	**0.21**	**0.28**	**4.49**
Business Interruption						
	Income	0.01	0.47	0.01	0.03	0.51
	Relocation	0.42	0.12	0.00	0.01	0.55
	Rental Income	0.11	0.08	0.00	0.00	0.20
	Wage	0.02	0.67	0.01	1.89	2.60
	Subtotal	**0.56**	**1.34**	**0.02**	**1.93**	**3.85**
ALL	**Total**	**3.24**	**2.66**	**0.23**	**2.21**	**8.34**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	14,549	2,366,535	689,356	3,055,891
Total	**14,549**	**2,366,535**	**689,356**	**3,055,891**
Total Study Region	**14,549**	**2,366,535**	**689,356**	**3,055,891**

Hazus: Flood Global Risk Report

Region Name:	Tolland_FL
Flood Scenario:	Tolland_Flood
Print Date:	Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 219 census blocks. The region contains over 5 thousand households and has a total population of 14,549 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,767 buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89.20% of the buildings (and 77.44% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,767 buildings in the region which have an aggregate total replacement value of 3,056 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,366,535	77.4%
Commercial	273,160	8.9%
Industrial	133,126	4.4%
Agricultural	9,012	0.3%
Religion	19,292	0.6%
Government	112,816	3.7%
Education	141,950	4.6%
Total	**3,055,891**	**100%**

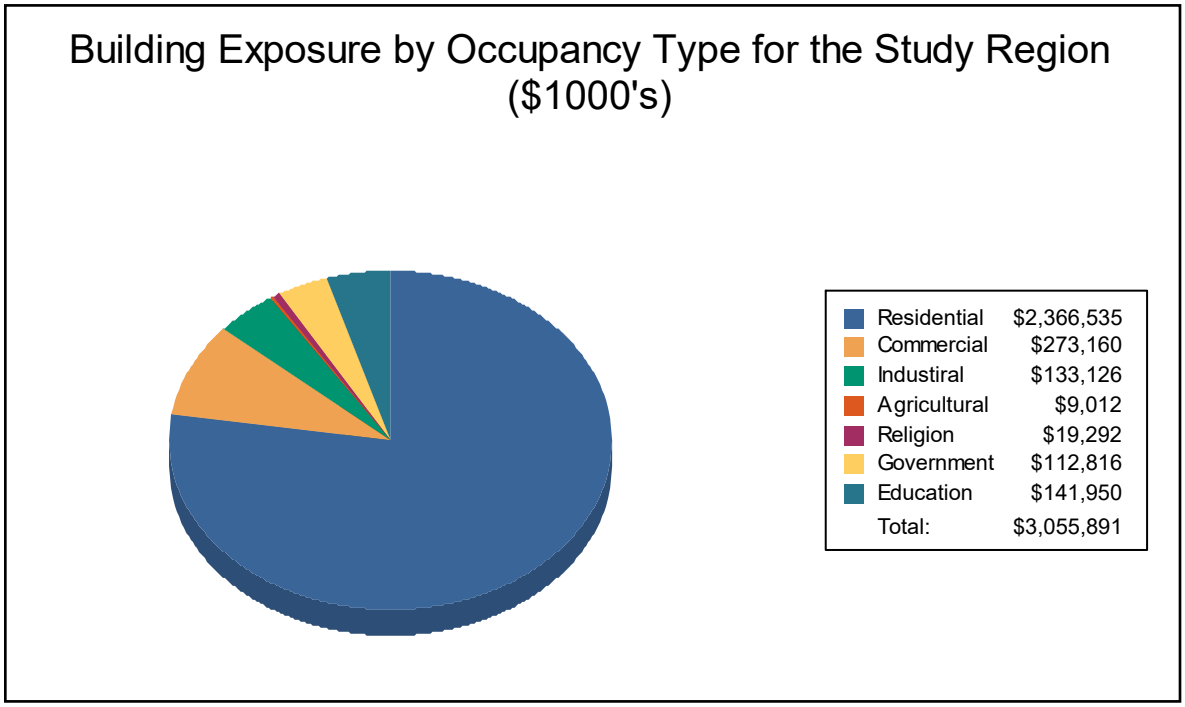
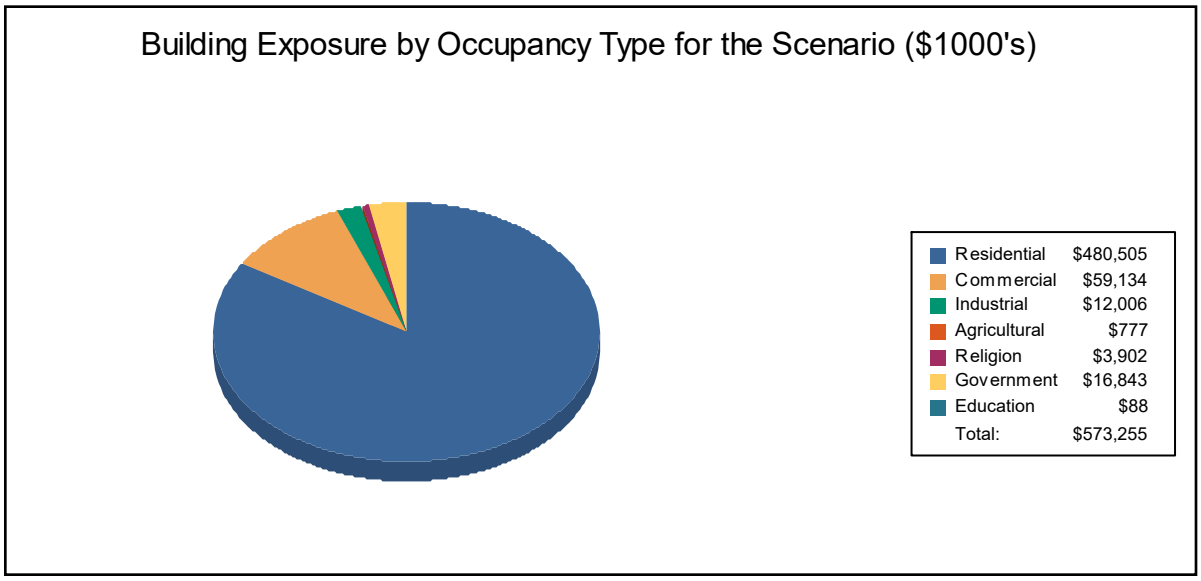


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	480,505	83.8%
Commercial	59,134	10.3%
Industrial	12,006	2.1%
Agricultural	777	0.1%
Religion	3,902	0.7%
Government	16,843	2.9%
Education	88	0.0%
Total	**573,255**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

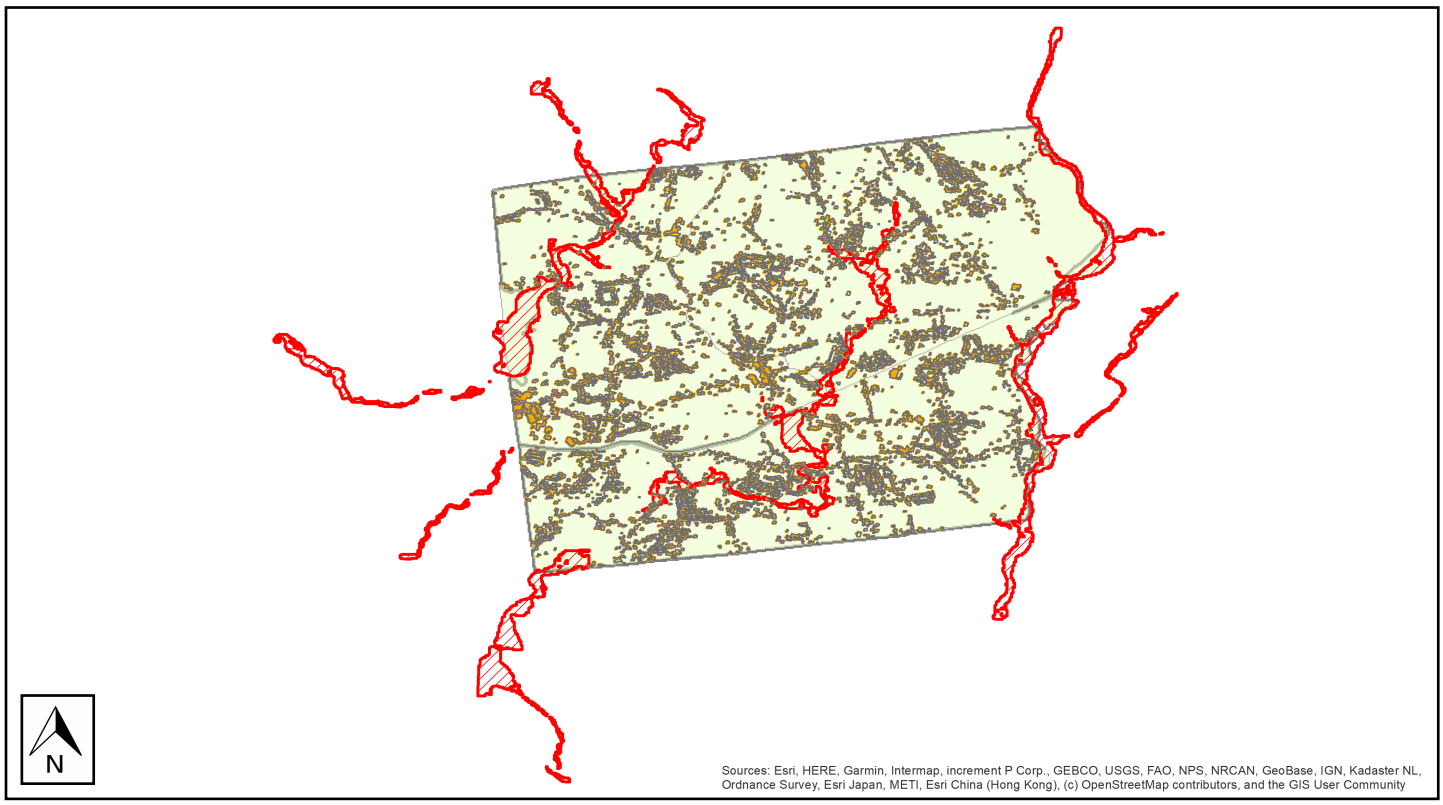
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Tolland_FL
Scenario Name:	Tolland_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

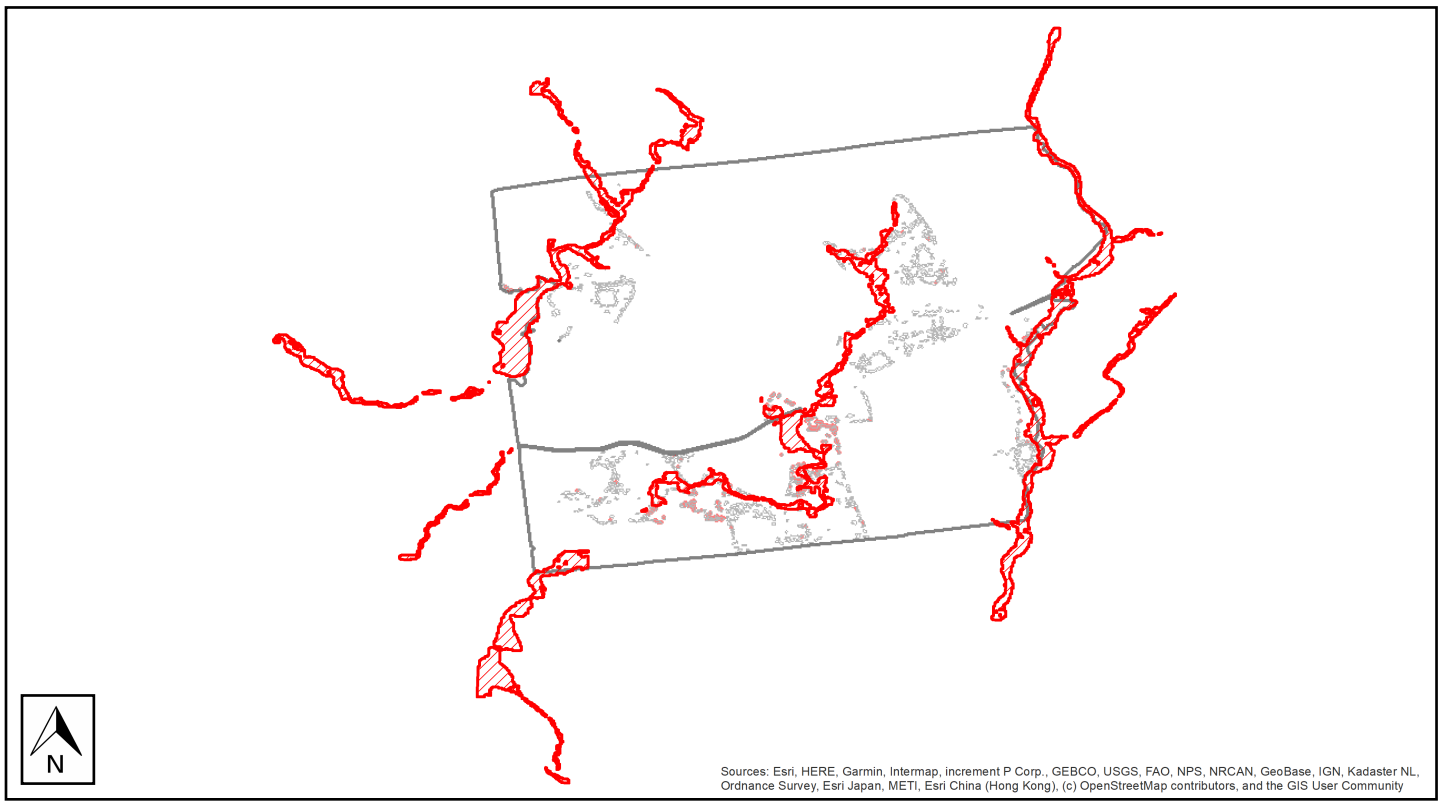


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

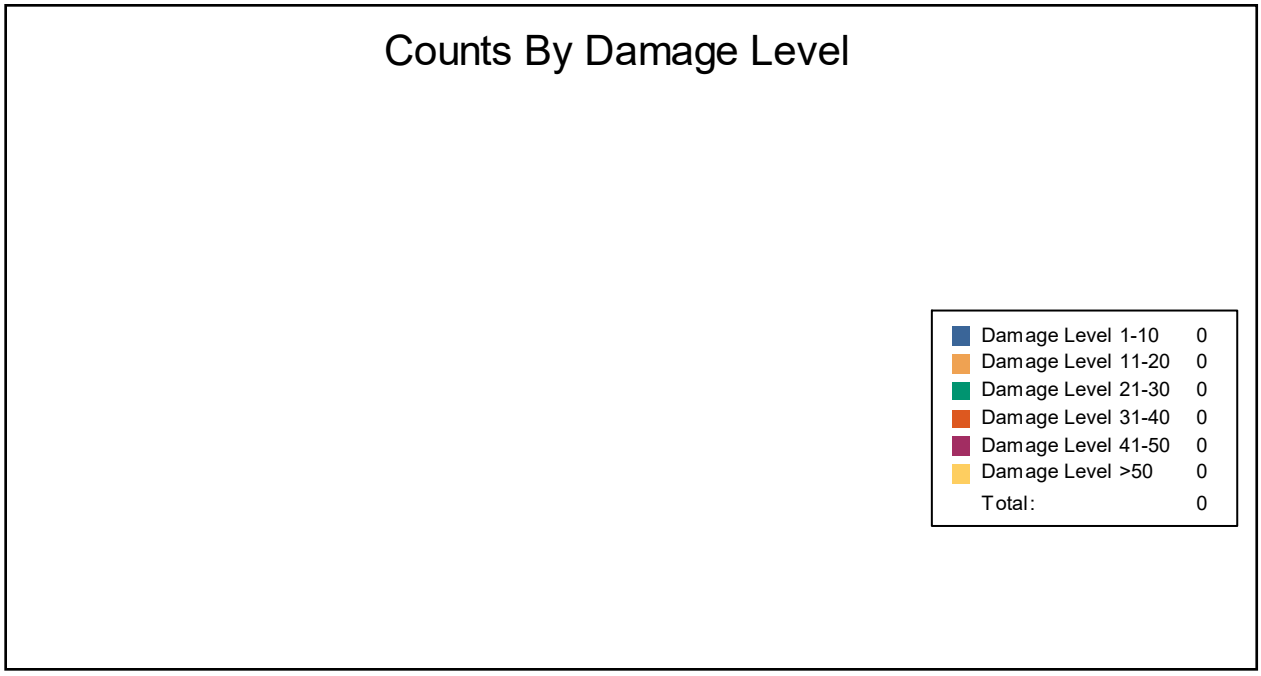


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

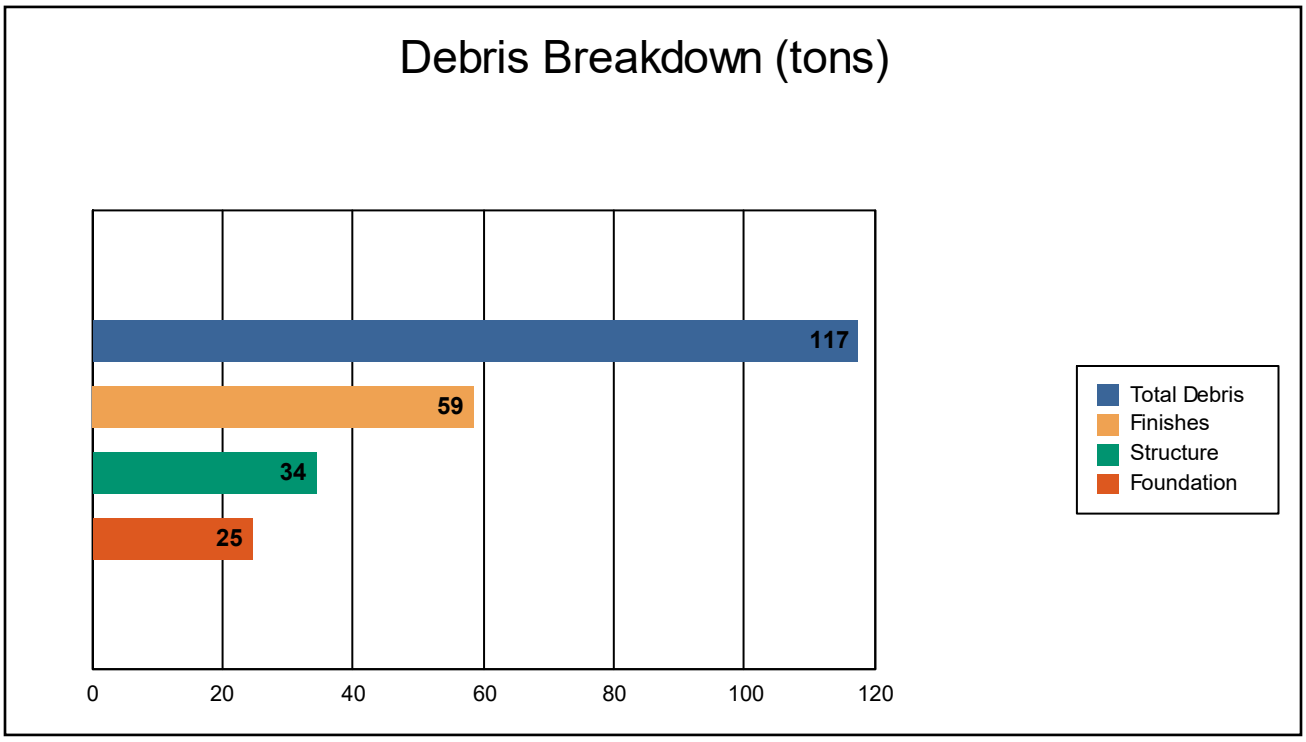
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

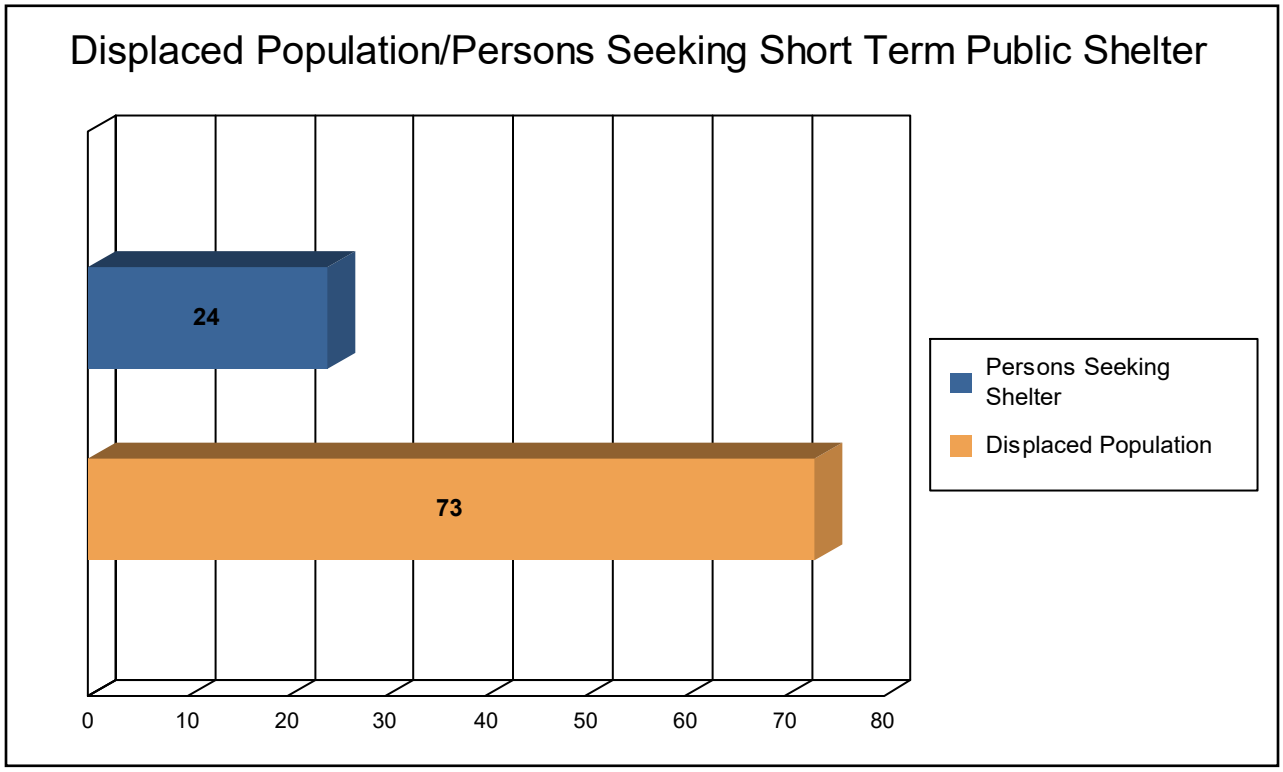


The model estimates that a total of 117 tons of debris will be generated. Of the total amount, Finishes comprises 50% of the total, Structure comprises 29% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 5 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 24 households (or 73 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 24 people (out of a total population of 14,549) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 10.17 million dollars, which represents 1.77 % of the total replacement value of the scenario buildings.

Building-Related Losses

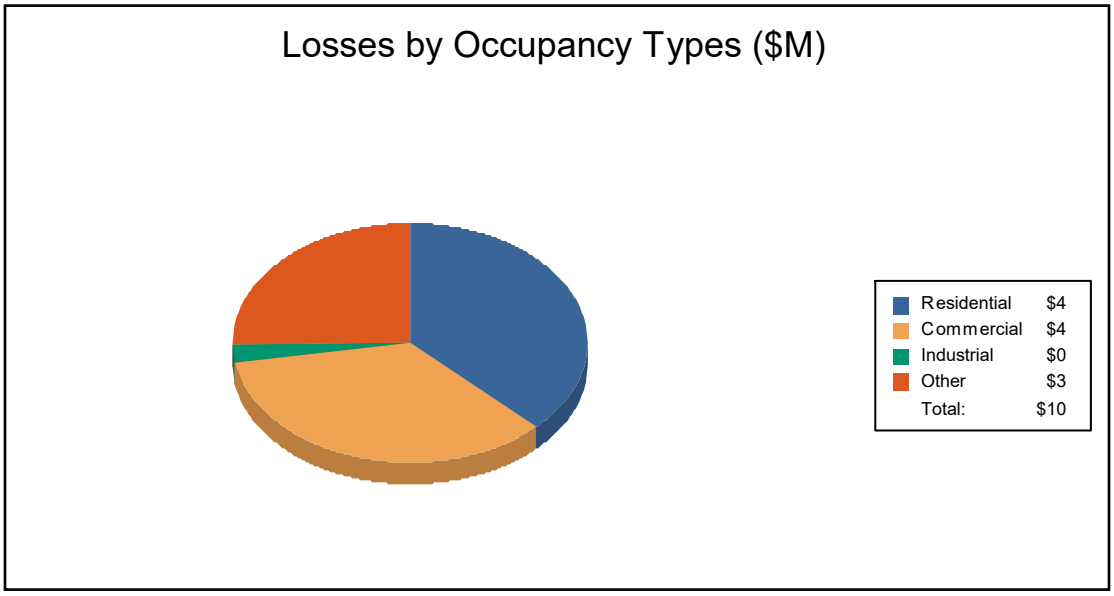
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 5.47 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 37.49% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.23	0.29	0.07	0.04	2.63
	Content	0.94	1.17	0.16	0.28	2.56
	Inventory	0.00	0.26	0.02	0.00	0.28
	Subtotal	**3.17**	**1.72**	**0.25**	**0.32**	**5.47**
Business Interruption						
	Income	0.01	0.63	0.01	0.03	0.68
	Relocation	0.49	0.15	0.00	0.01	0.65
	Rental Income	0.13	0.10	0.00	0.00	0.24
	Wage	0.02	0.92	0.01	2.20	3.15
	Subtotal	**0.64**	**1.81**	**0.02**	**2.24**	**4.71**
ALL	**Total**	**3.81**	**3.52**	**0.28**	**2.56**	**10.17**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	14,549	2,366,535	689,356	3,055,891
Total	**14,549**	**2,366,535**	**689,356**	**3,055,891**
Total Study Region	**14,549**	**2,366,535**	**689,356**	**3,055,891**

Hazus: Flood Global Risk Report

Region Name:	Tolland_FL
Flood Scenario:	Tolland_Flood
Print Date:	Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 219 census blocks. The region contains over 5 thousand households and has a total population of 14,549 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,767 buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89.20% of the buildings (and 77.44% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,767 buildings in the region which have an aggregate total replacement value of 3,056 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
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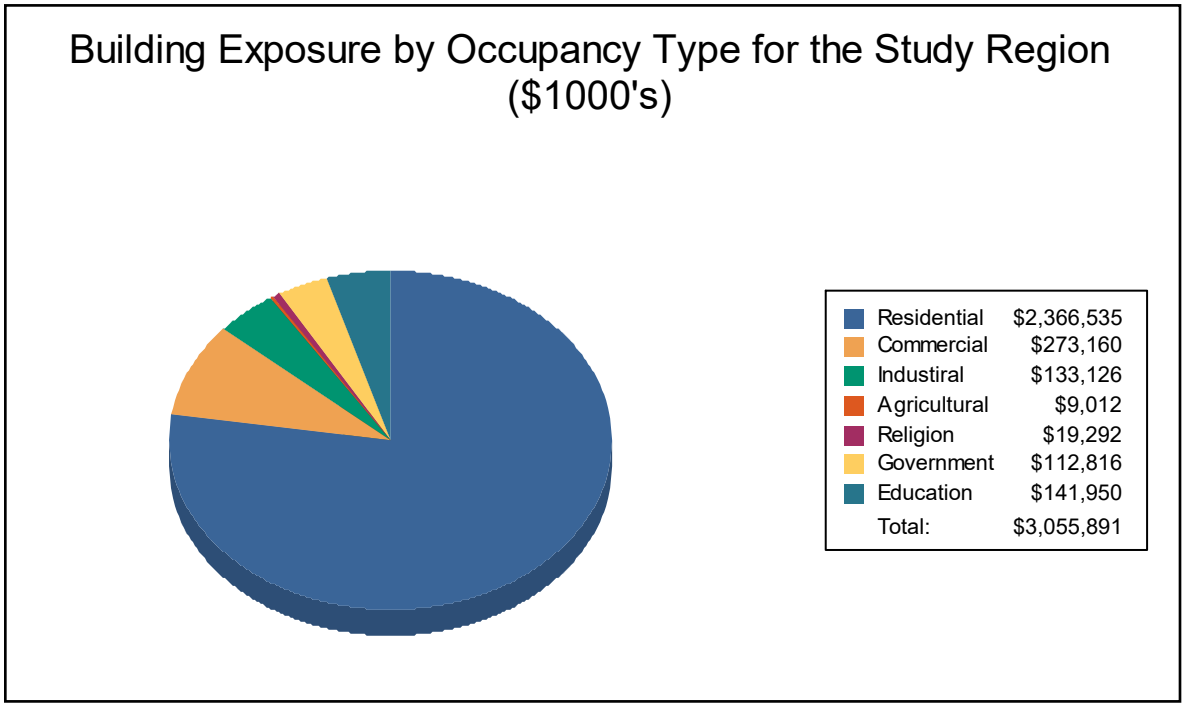

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Building Exposure by Occupancy Type for the Scenario

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Agricultural	777	0.1%
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Government	16,843	2.9%
Education	88	0.0%
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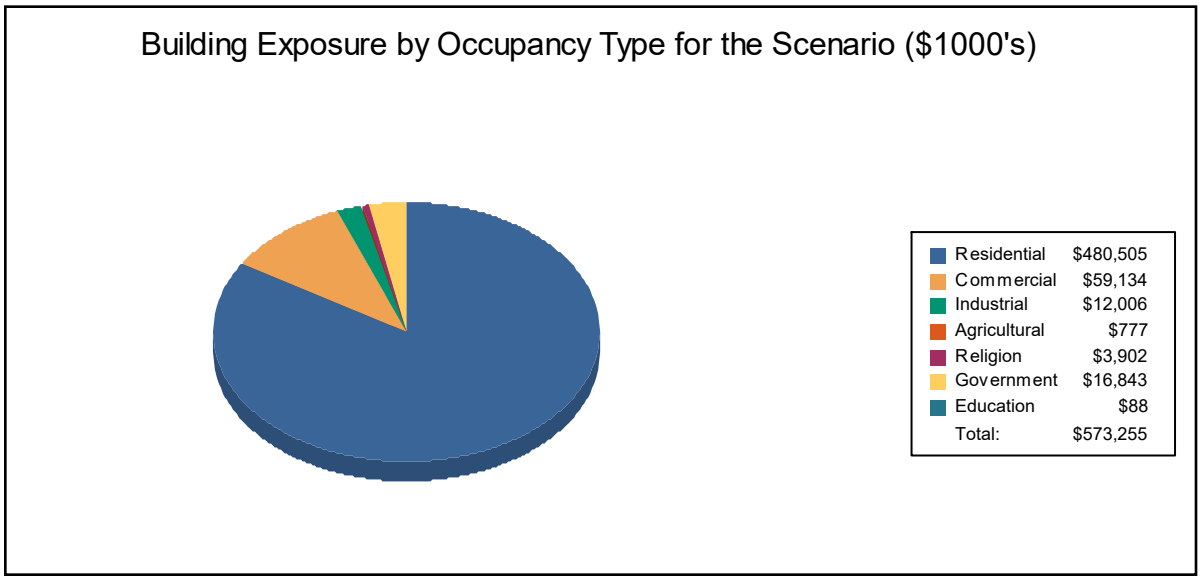


Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

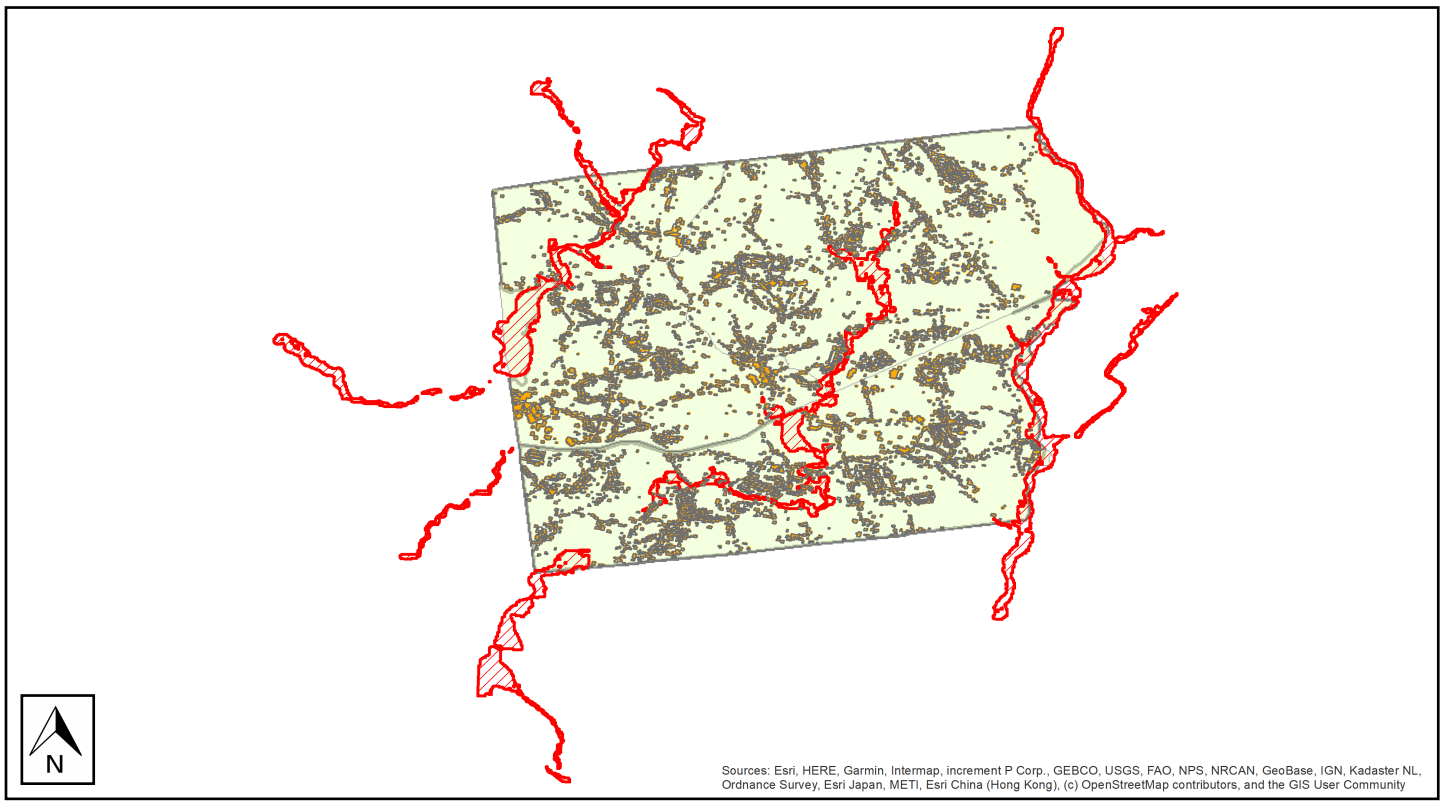
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Tolland_FL
Scenario Name:	Tolland_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

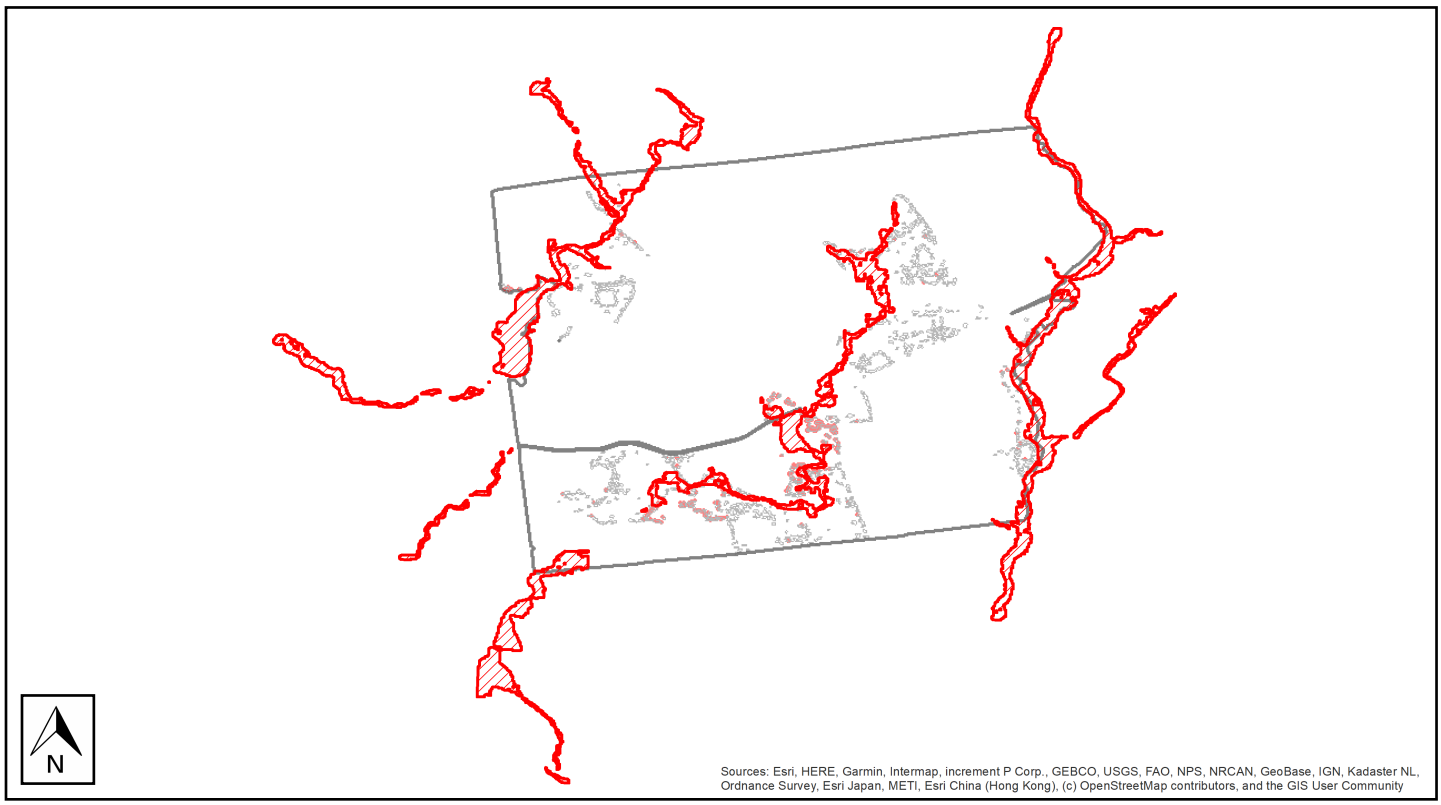


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

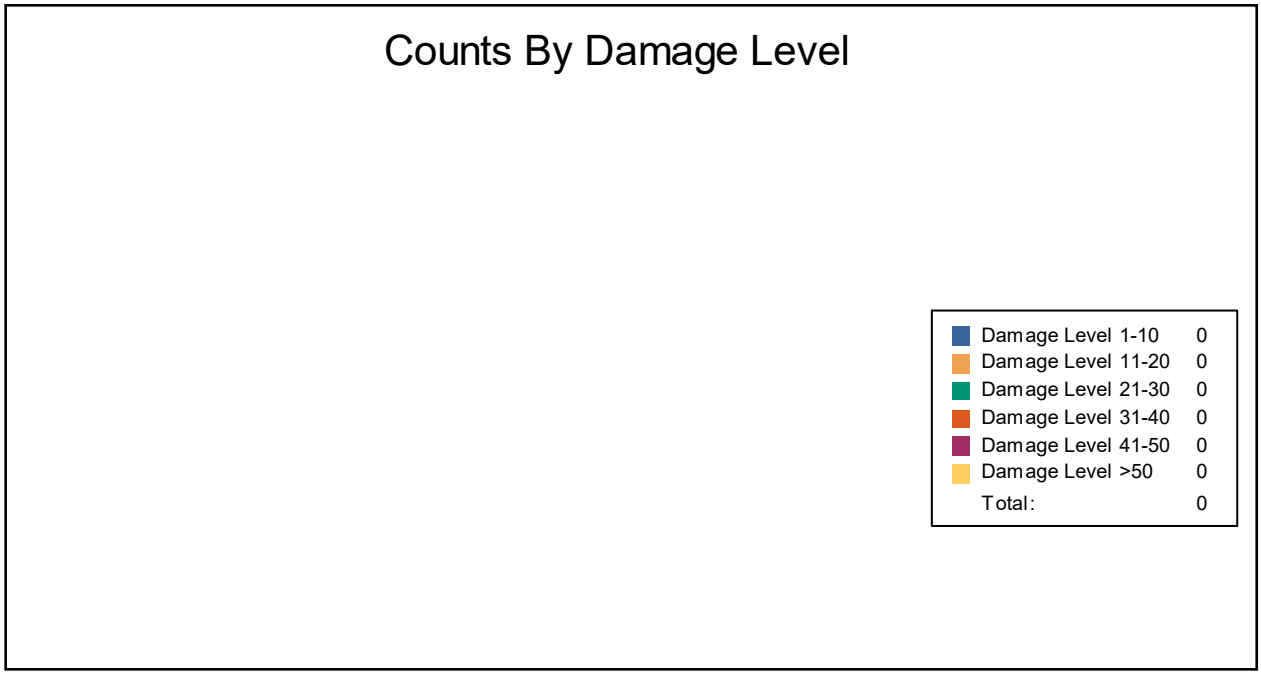


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

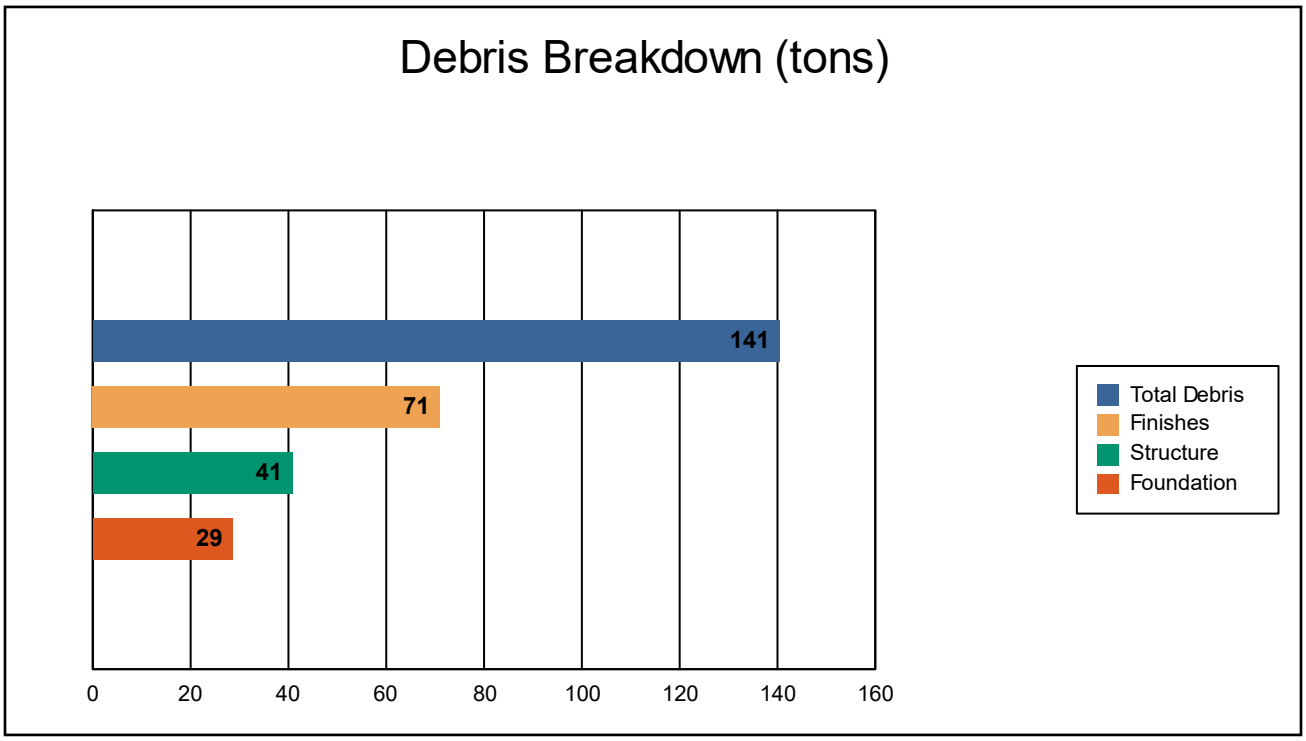
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

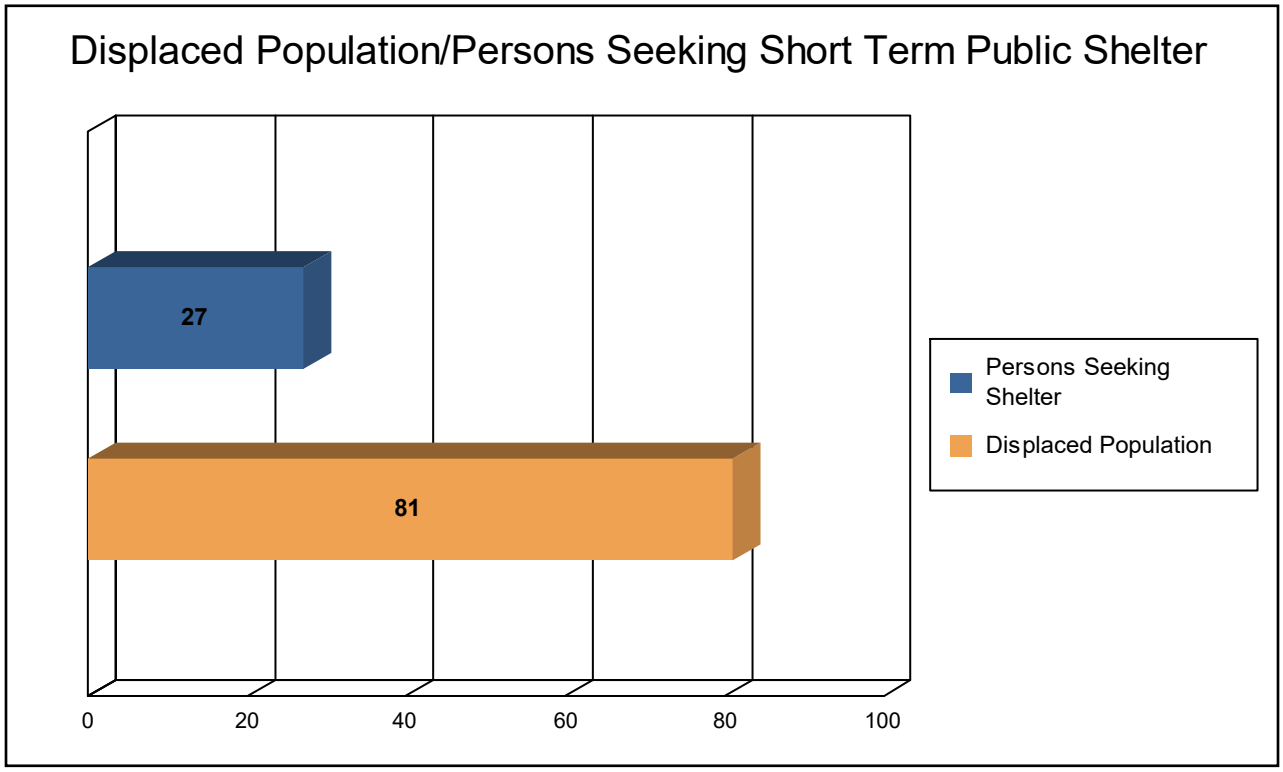


The model estimates that a total of 141 tons of debris will be generated. Of the total amount, Finishes comprises 50% of the total, Structure comprises 29% of the total, and Foundation comprises 20%. If the debris tonnage is converted into an estimated number of truckloads, it will require 6 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 27 households (or 81 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 27 people (out of a total population of 14,549) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 12.27 million dollars, which represents 2.14 % of the total replacement value of the scenario buildings.

Building-Related Losses

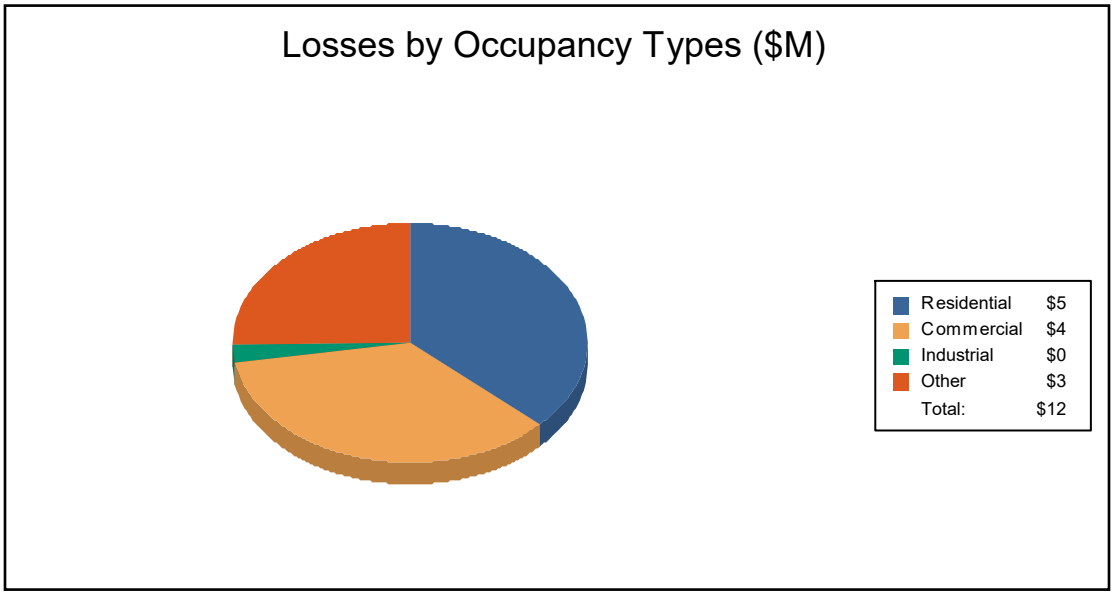
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 6.59 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 37.06% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.66	0.36	0.08	0.04	3.15
	Content	1.13	1.43	0.20	0.34	3.09
	Inventory	0.00	0.31	0.03	0.00	0.34
	Subtotal	**3.79**	**2.10**	**0.31**	**0.39**	**6.59**
Business Interruption						
	Income	0.01	0.79	0.01	0.06	0.87
	Relocation	0.57	0.17	0.00	0.03	0.77
	Rental Income	0.15	0.12	0.00	0.00	0.28
	Wage	0.03	1.12	0.01	2.61	3.76
	Subtotal	**0.76**	**2.20**	**0.02**	**2.71**	**5.68**
ALL	**Total**	**4.55**	**4.30**	**0.33**	**3.09**	**12.27**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	14,549	2,366,535	689,356	3,055,891
Total	**14,549**	**2,366,535**	**689,356**	**3,055,891**
Total Study Region	**14,549**	**2,366,535**	**689,356**	**3,055,891**

Hazus: Flood Global Risk Report

Region Name:	Tolland_FL
Flood Scenario:	Tolland_Flood
Print Date:	Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 219 census blocks. The region contains over 5 thousand households and has a total population of 14,549 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,767 buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89.20% of the buildings (and 77.44% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,767 buildings in the region which have an aggregate total replacement value of 3,056 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,366,535	77.4%
Commercial	273,160	8.9%
Industrial	133,126	4.4%
Agricultural	9,012	0.3%
Religion	19,292	0.6%
Government	112,816	3.7%
Education	141,950	4.6%
Total	**3,055,891**	**100%**

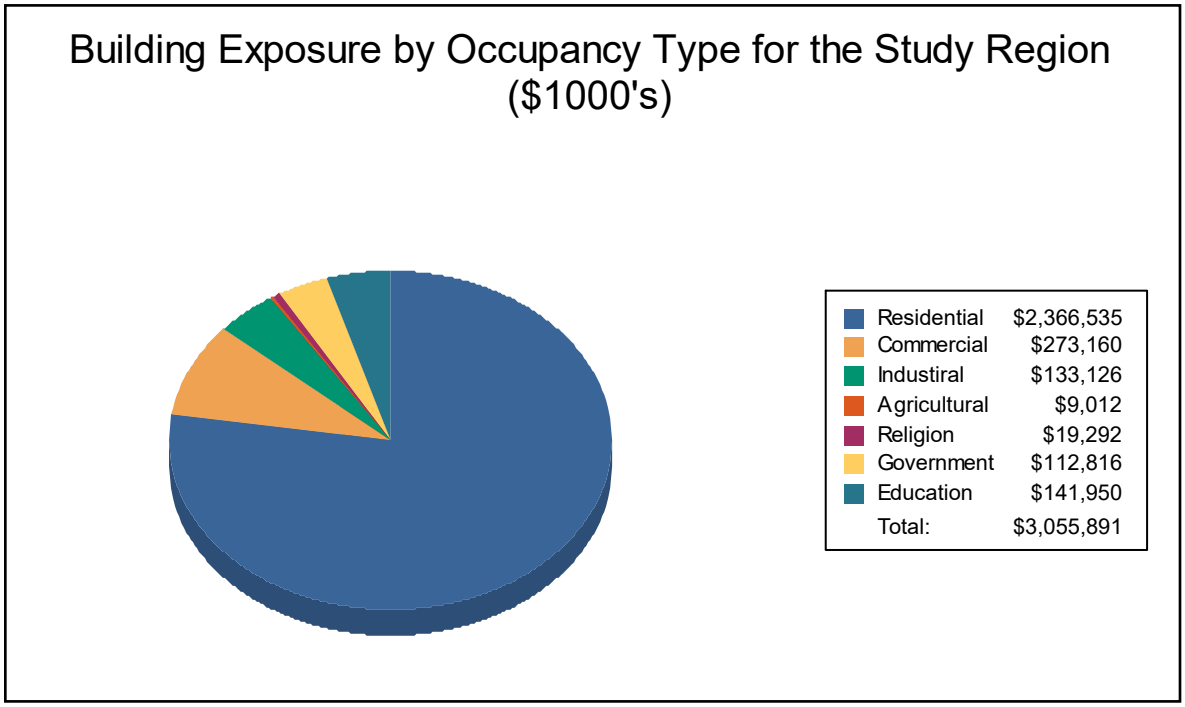
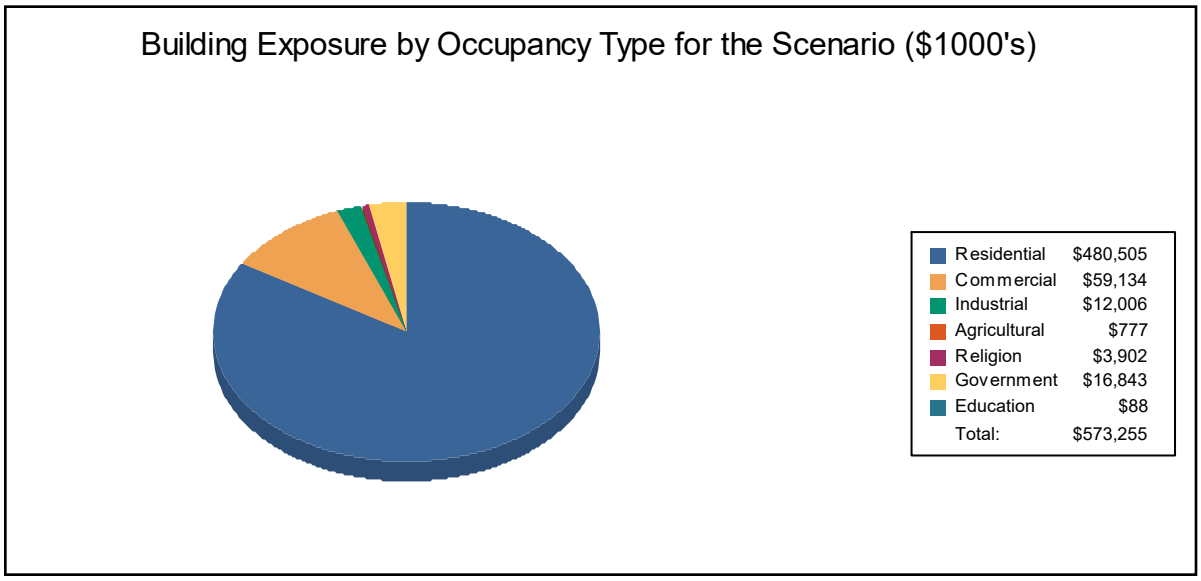


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	480,505	83.8%
Commercial	59,134	10.3%
Industrial	12,006	2.1%
Agricultural	777	0.1%
Religion	3,902	0.7%
Government	16,843	2.9%
Education	88	0.0%
Total	**573,255**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

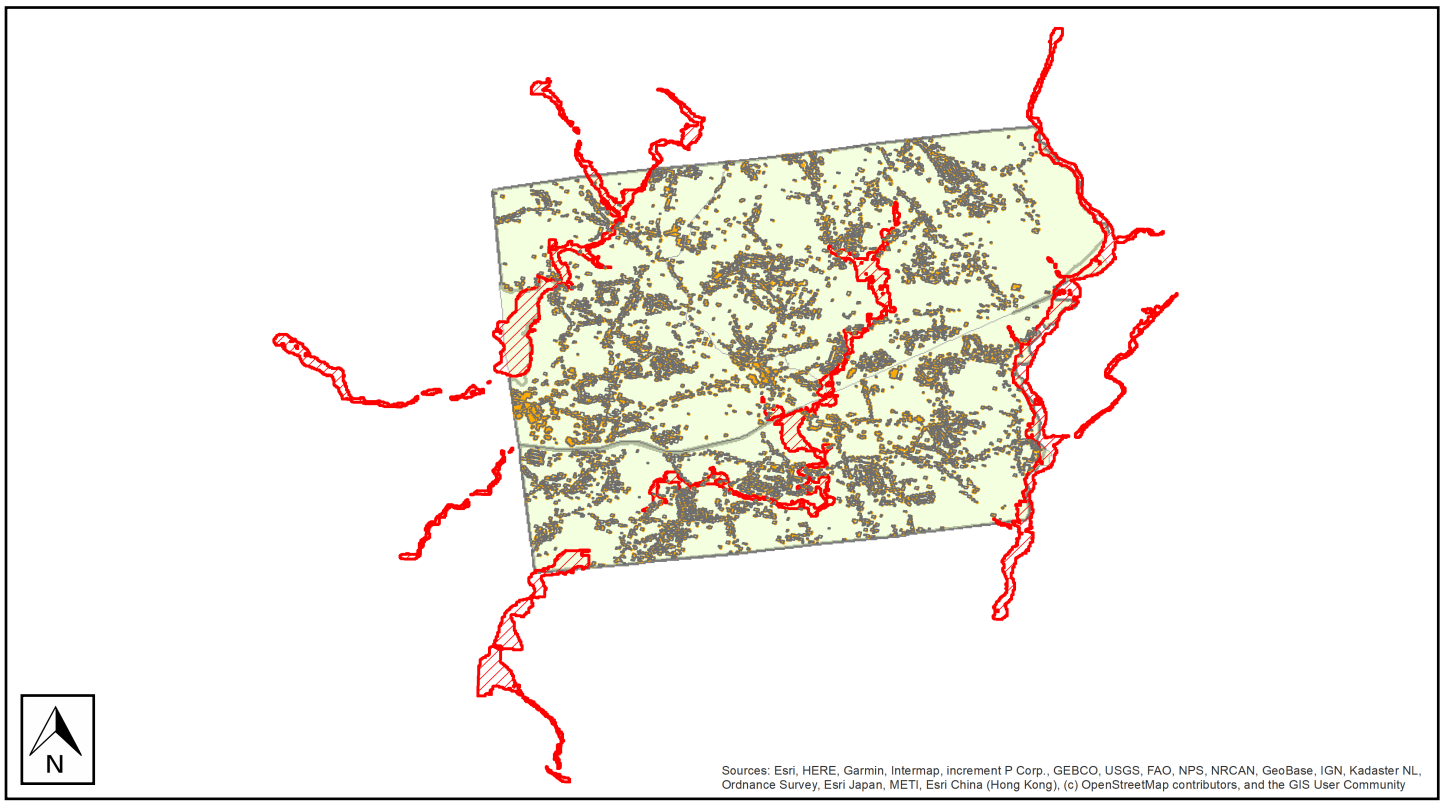
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Tolland_FL
Scenario Name:	Tolland_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

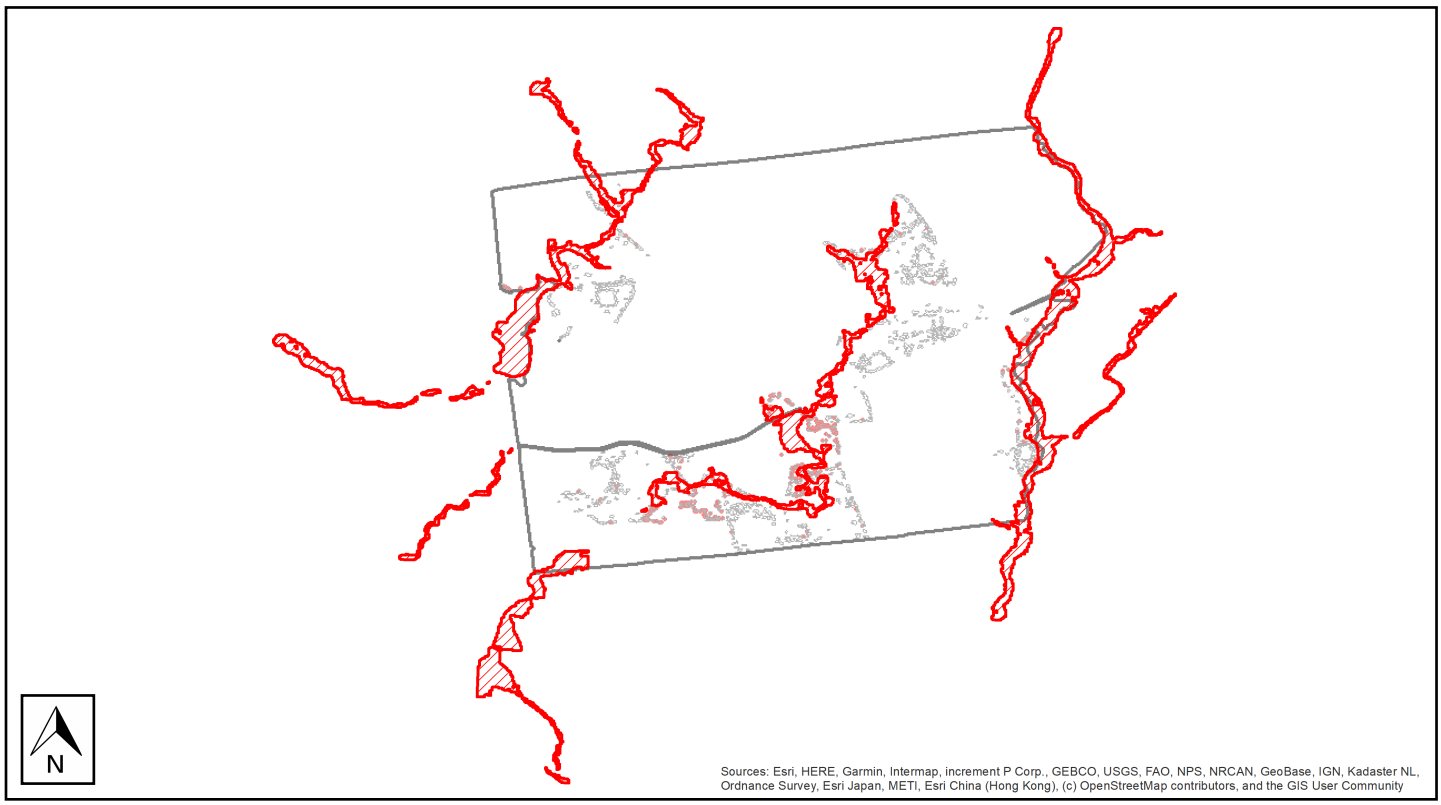


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

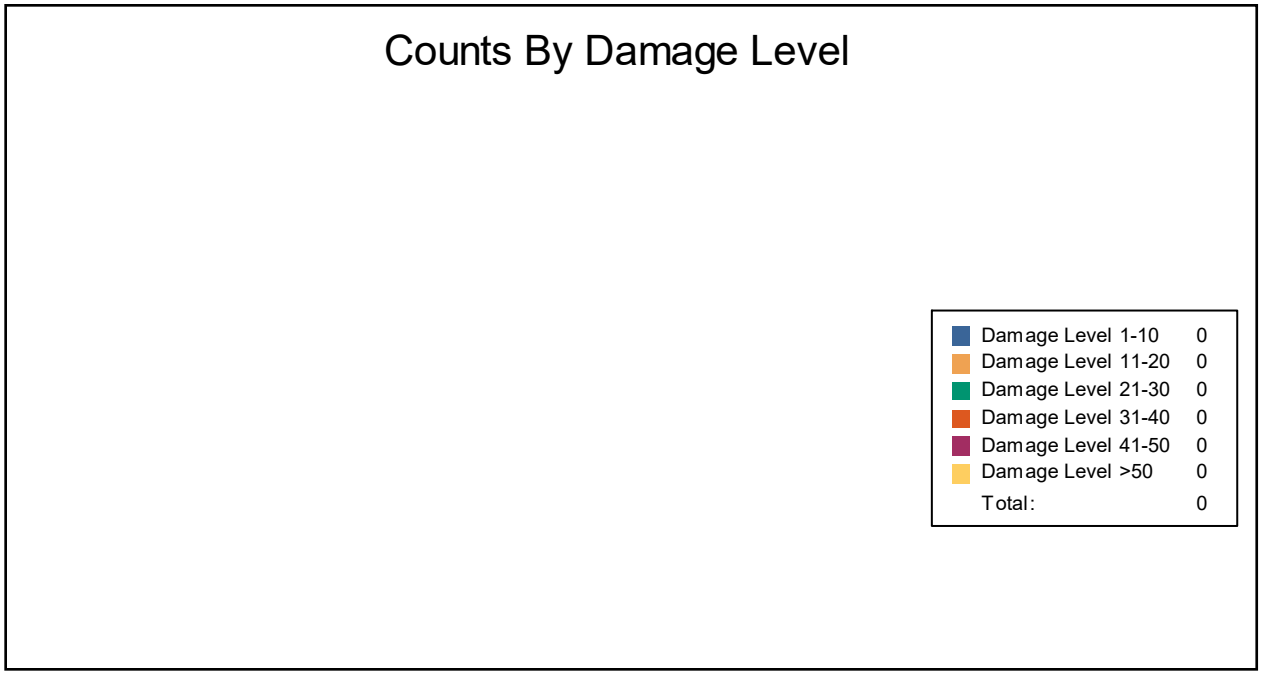


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

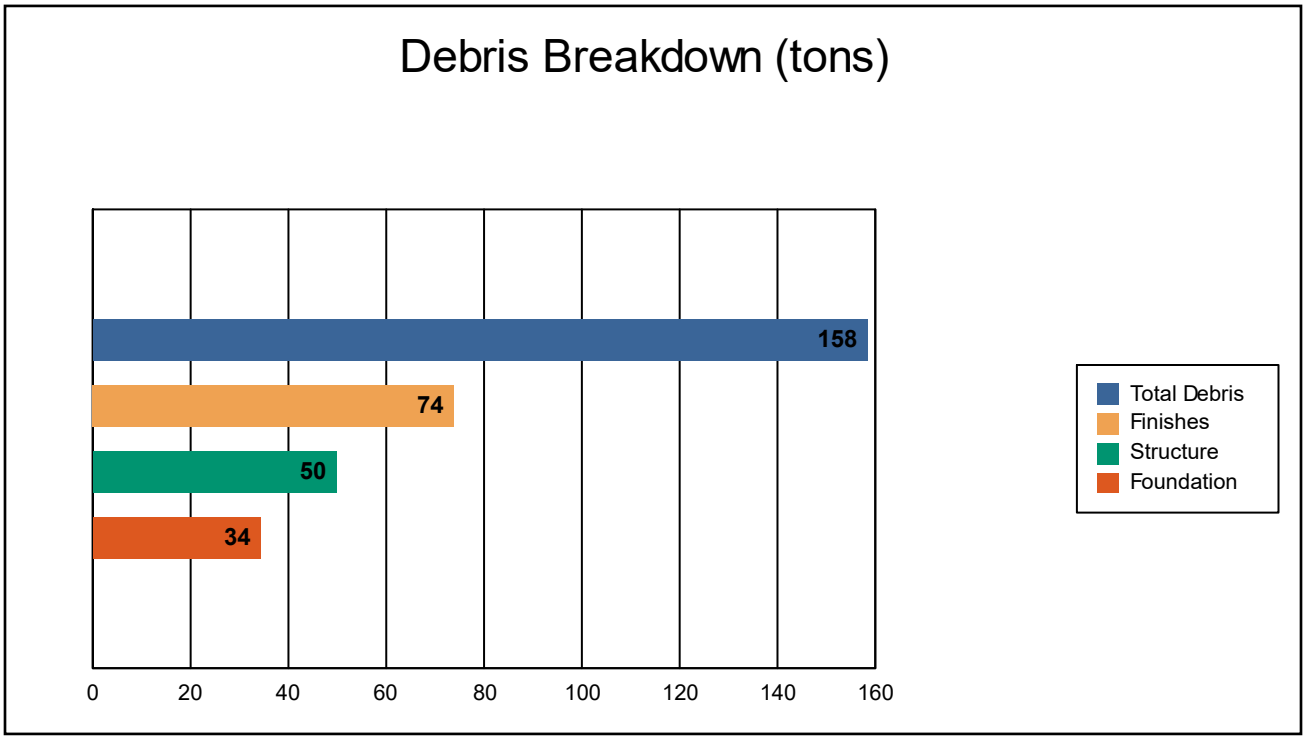
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

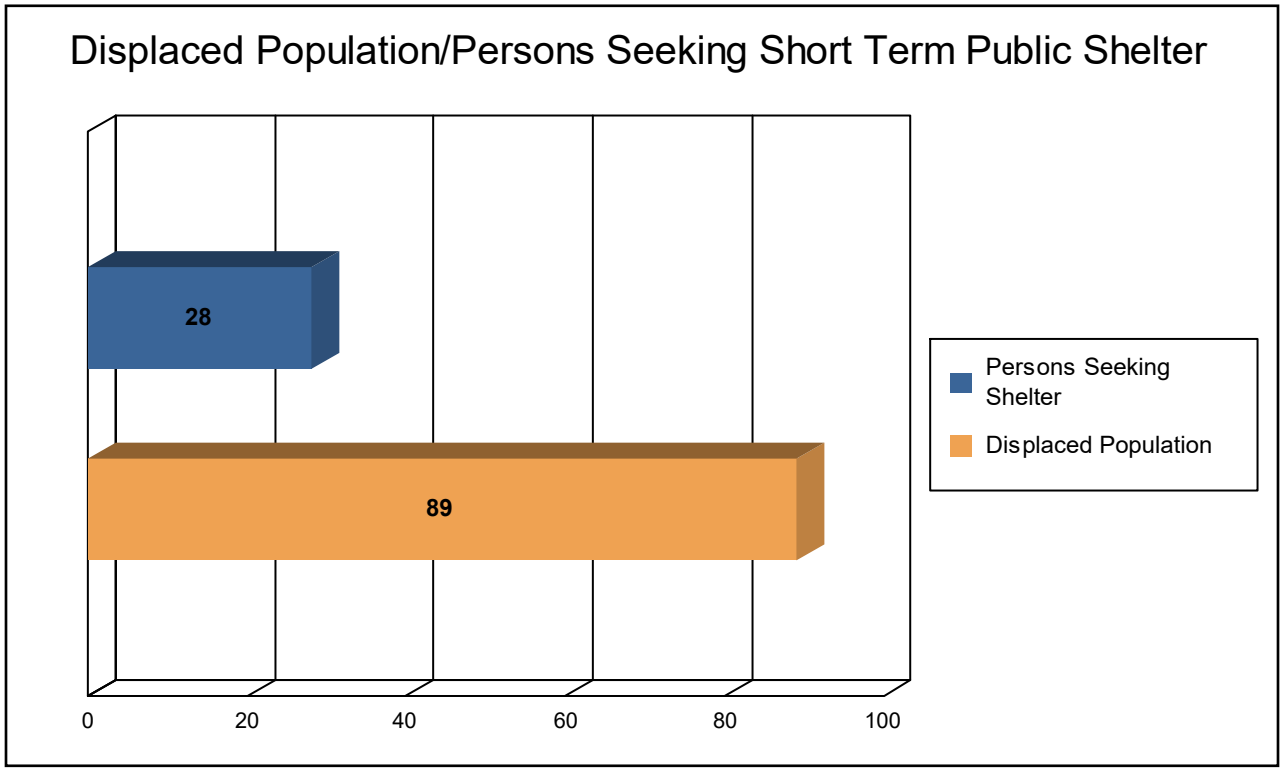


The model estimates that a total of 158 tons of debris will be generated. Of the total amount, Finishes comprises 47% of the total, Structure comprises 32% of the total, and Foundation comprises 22%. If the debris tonnage is converted into an estimated number of truckloads, it will require 7 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 30 households (or 89 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 28 people (out of a total population of 14,549) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 13.50 million dollars, which represents 2.36 % of the total replacement value of the scenario buildings.

Building-Related Losses

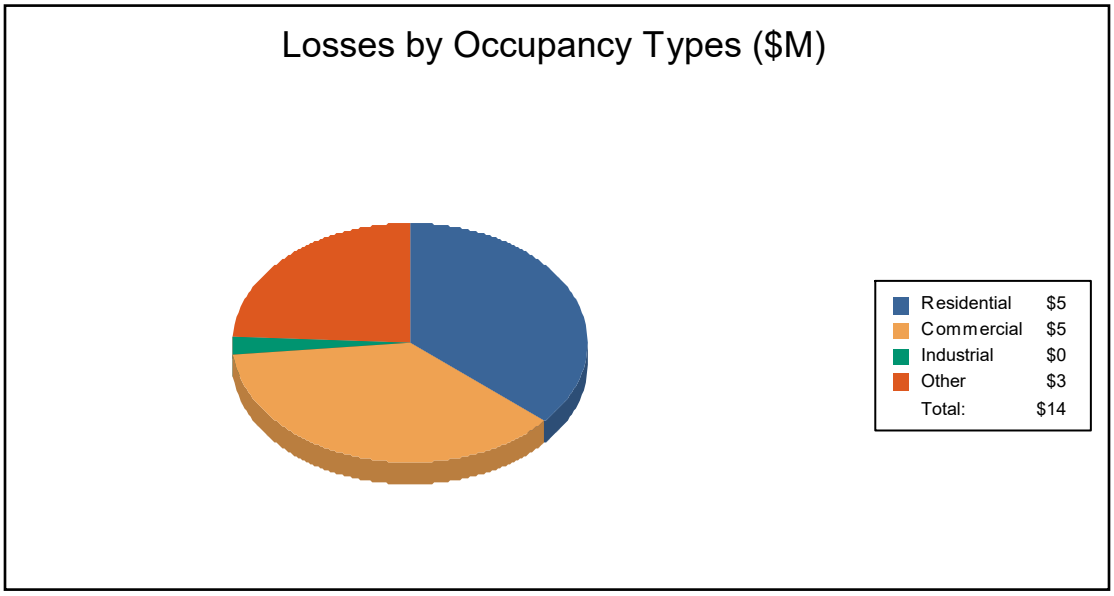
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 7.19 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 36.50% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.90	0.40	0.08	0.05	3.43
	Content	1.23	1.59	0.20	0.36	3.38
	Inventory	0.00	0.34	0.03	0.00	0.37
	Subtotal	**4.13**	**2.33**	**0.31**	**0.42**	**7.19**
Business Interruption						
	Income	0.01	0.95	0.01	0.06	1.03
	Relocation	0.60	0.21	0.00	0.03	0.85
	Rental Income	0.16	0.15	0.00	0.00	0.32
	Wage	0.03	1.34	0.01	2.75	4.12
	Subtotal	**0.80**	**2.65**	**0.02**	**2.84**	**6.32**
ALL	**Total**	**4.93**	**4.98**	**0.34**	**3.26**	**13.50**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	14,549	2,366,535	689,356	3,055,891
Total	**14,549**	**2,366,535**	**689,356**	**3,055,891**
Total Study Region	**14,549**	**2,366,535**	**689,356**	**3,055,891**

Hazus: Flood Global Risk Report

Region Name:	Tolland_FL
Flood Scenario:	Tolland_Flood
Print Date:	Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 219 census blocks. The region contains over 5 thousand households and has a total population of 14,549 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 5,767 buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89.20% of the buildings (and 77.44% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,767 buildings in the region which have an aggregate total replacement value of 3,056 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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Education	141,950	4.6%
Total	**3,055,891**	**100%**

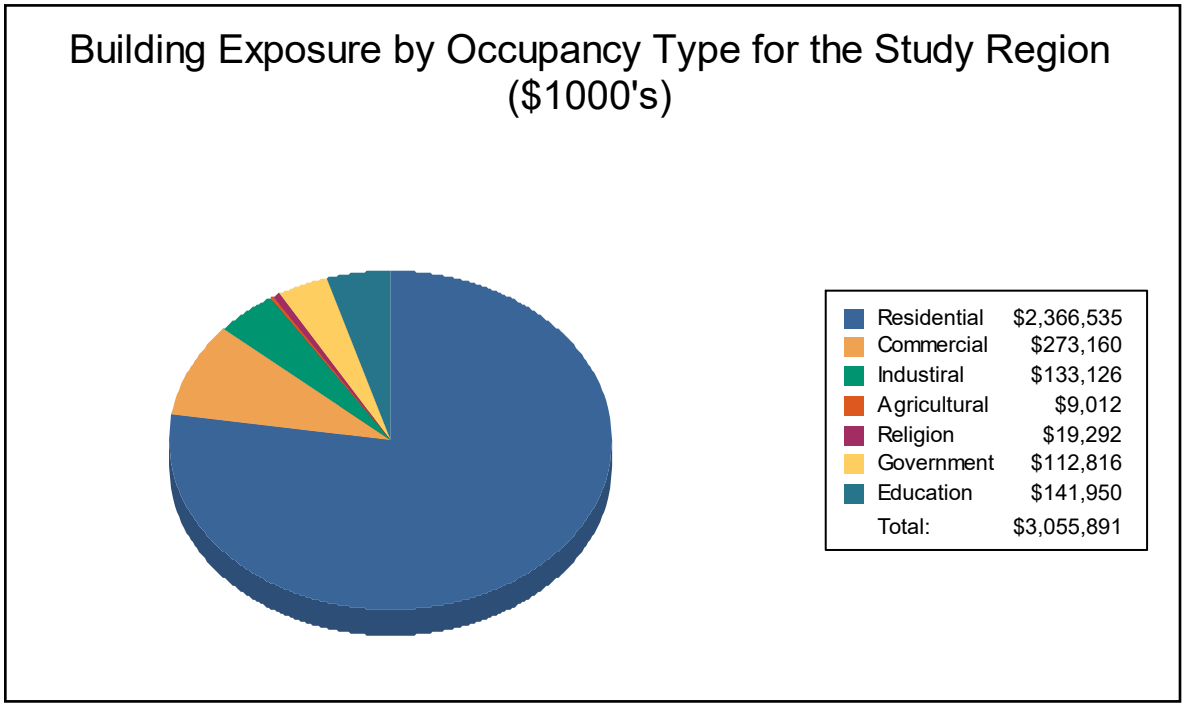

Table 2
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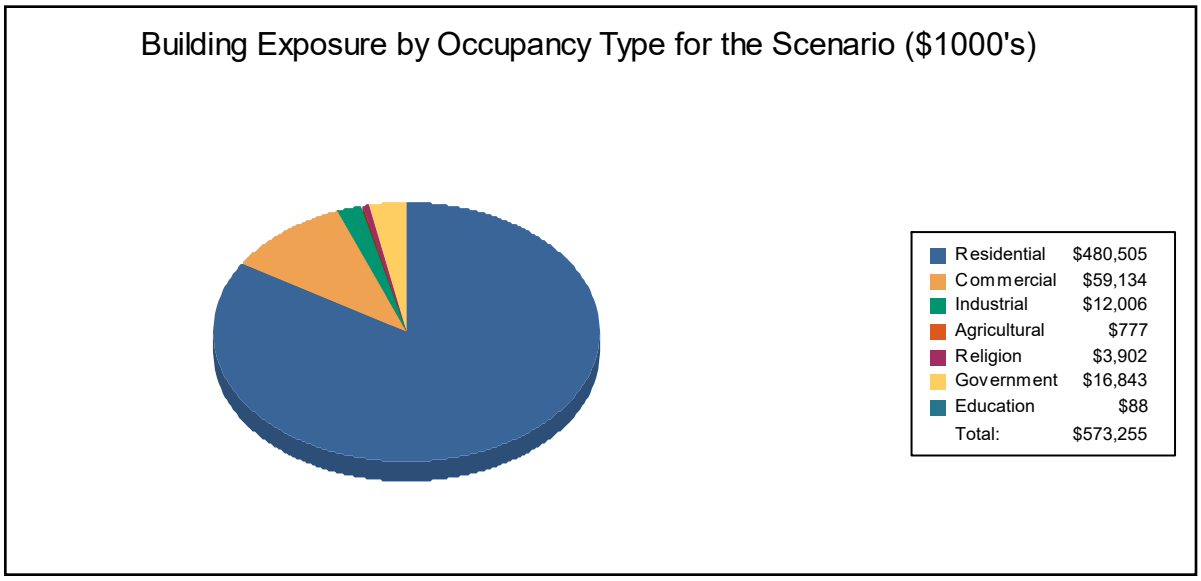
Industrial	12,006	2.1%
Agricultural	777	0.1%
Religion	3,902	0.7%
Government	16,843	2.9%
Education	88	0.0%
Total	**573,255**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 1 police station and 1 emergency operation center.

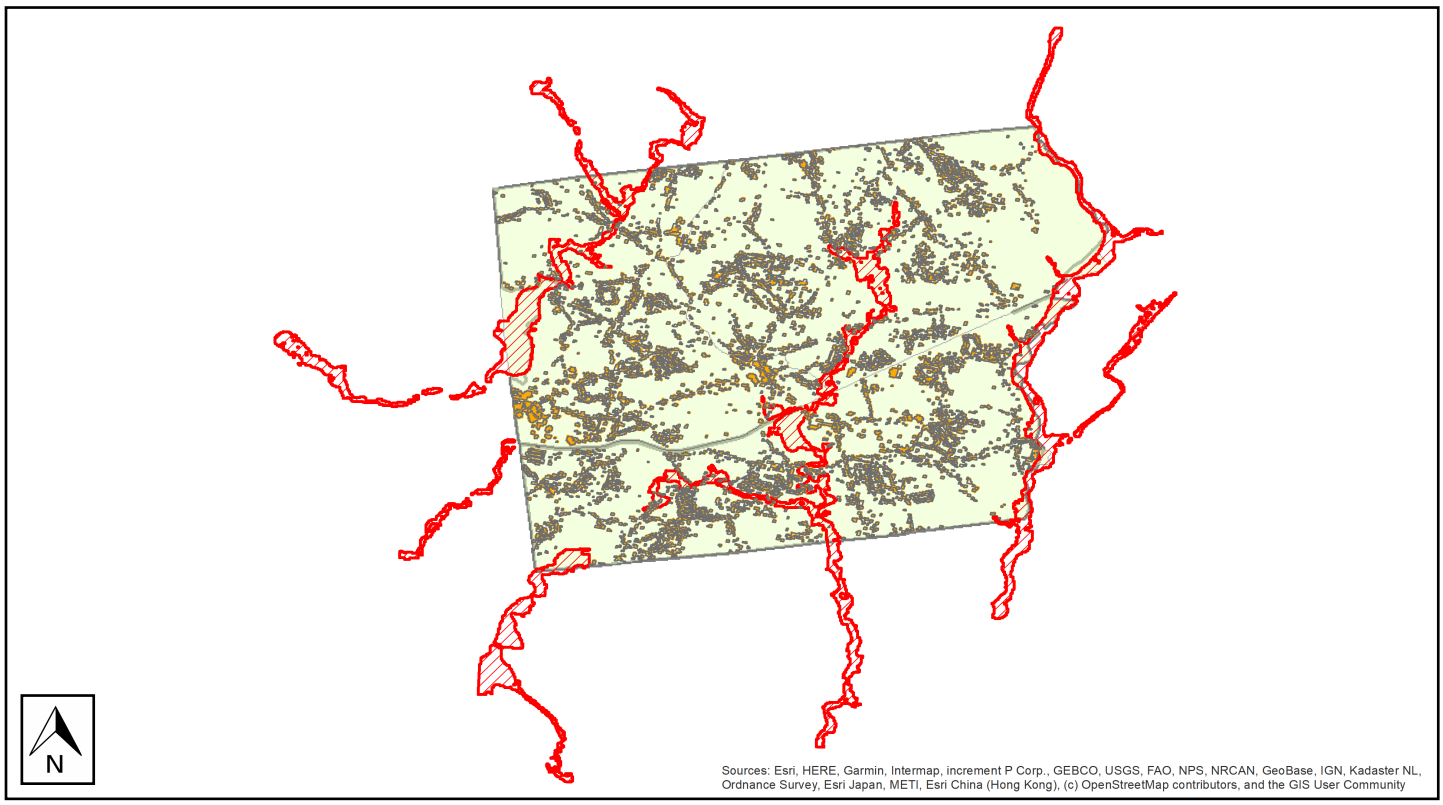
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Tolland_FL
Scenario Name:	Tolland_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

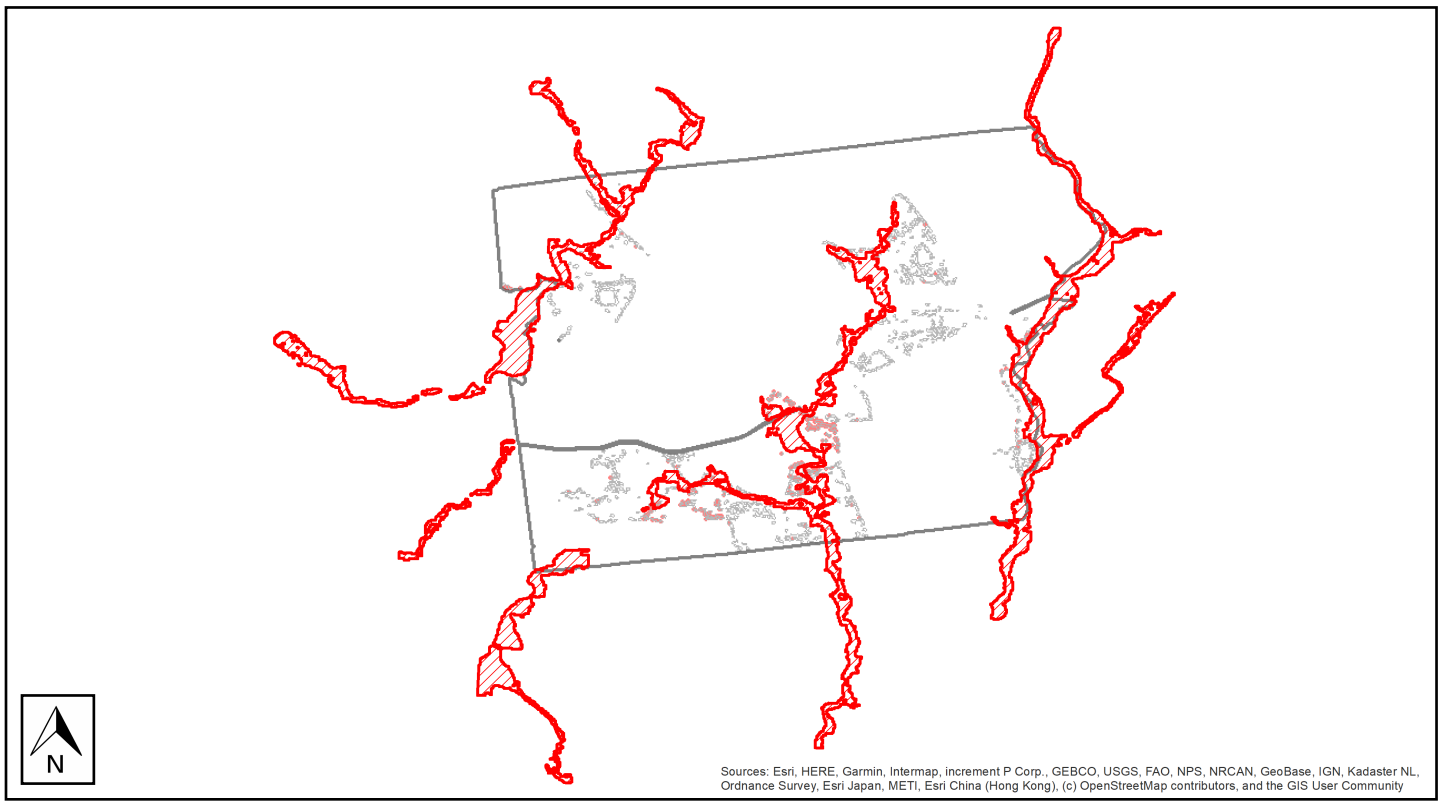


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	2	100	0	0	0	0	0	0	0	0
Total	**0**		**2**		**0**		**0**		**0**		**0**	

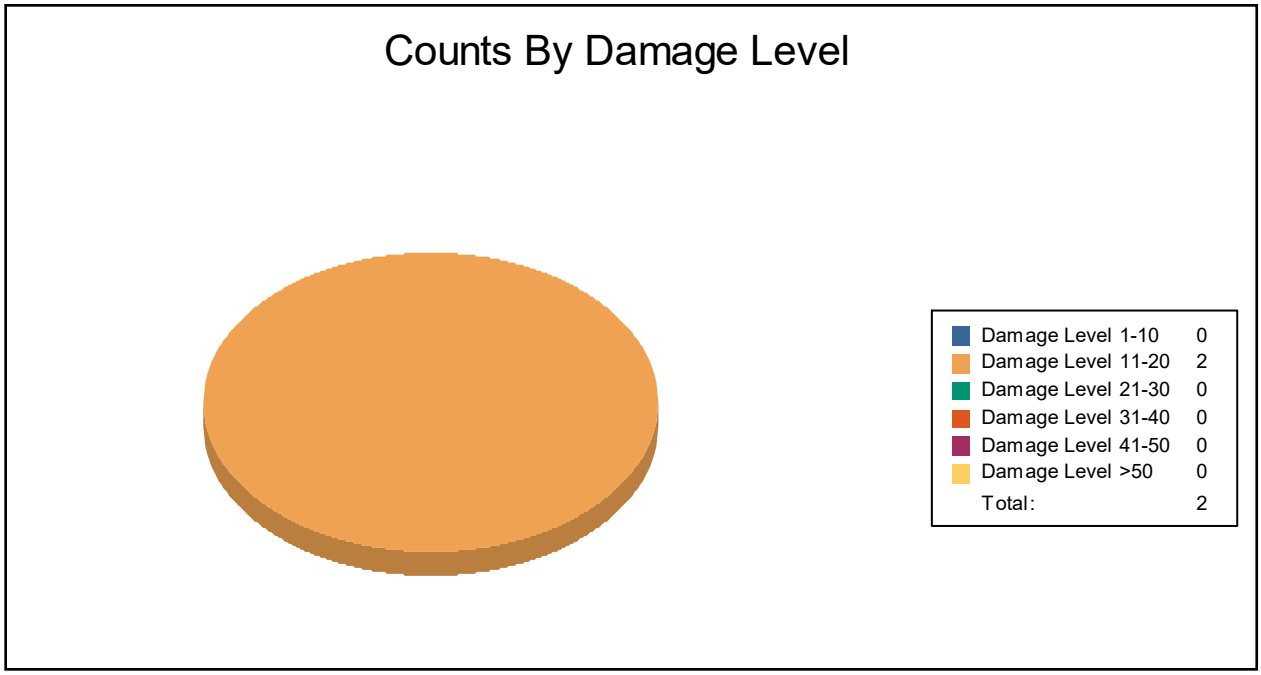


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	2	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

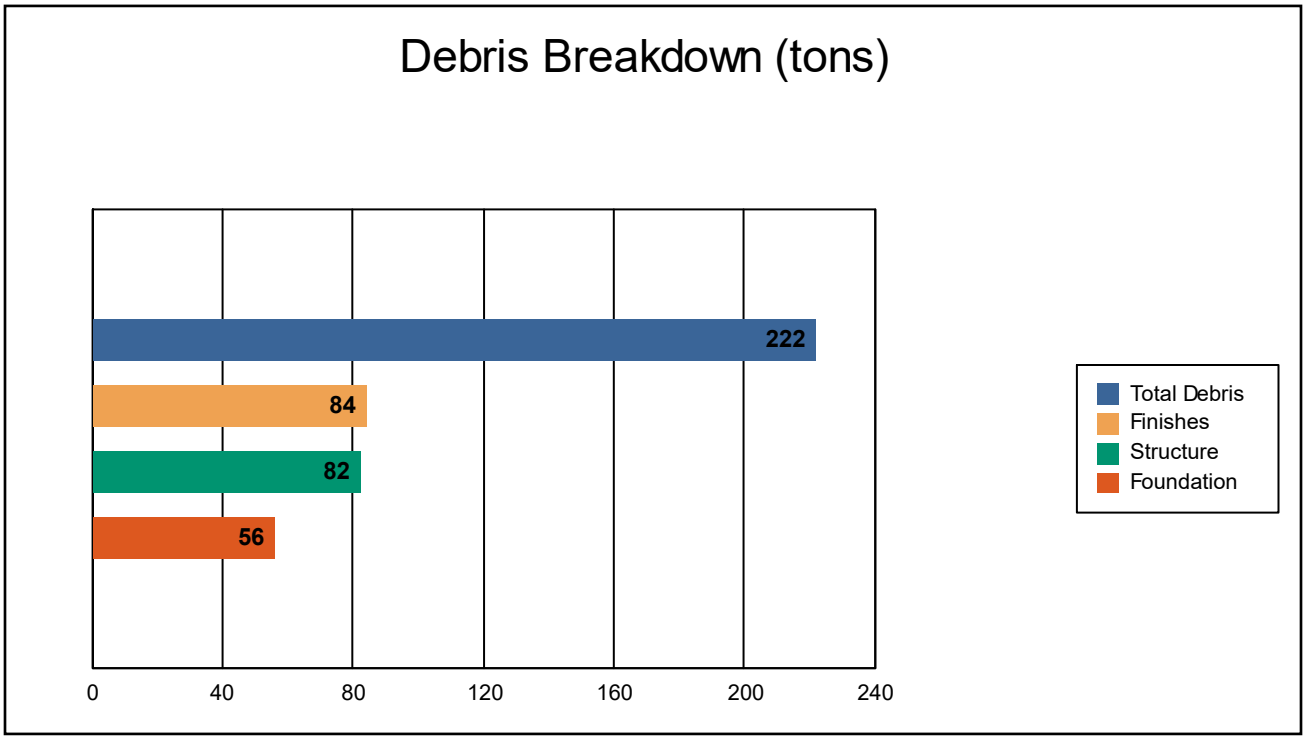
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

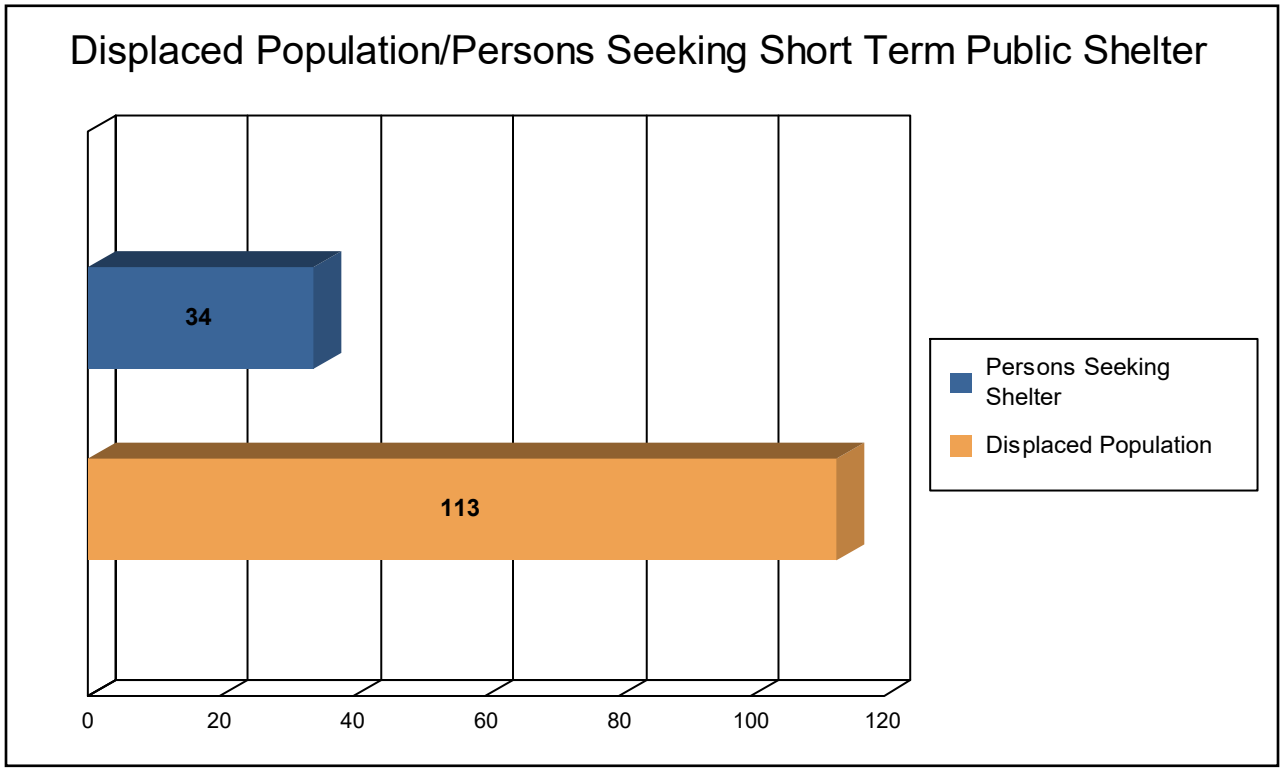


The model estimates that a total of 222 tons of debris will be generated. Of the total amount, Finishes comprises 38% of the total, Structure comprises 37% of the total, and Foundation comprises 25%. If the debris tonnage is converted into an estimated number of truckloads, it will require 9 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 38 households (or 113 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 34 people (out of a total population of 14,549) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 16.19 million dollars, which represents 2.82 % of the total replacement value of the scenario buildings.

Building-Related Losses

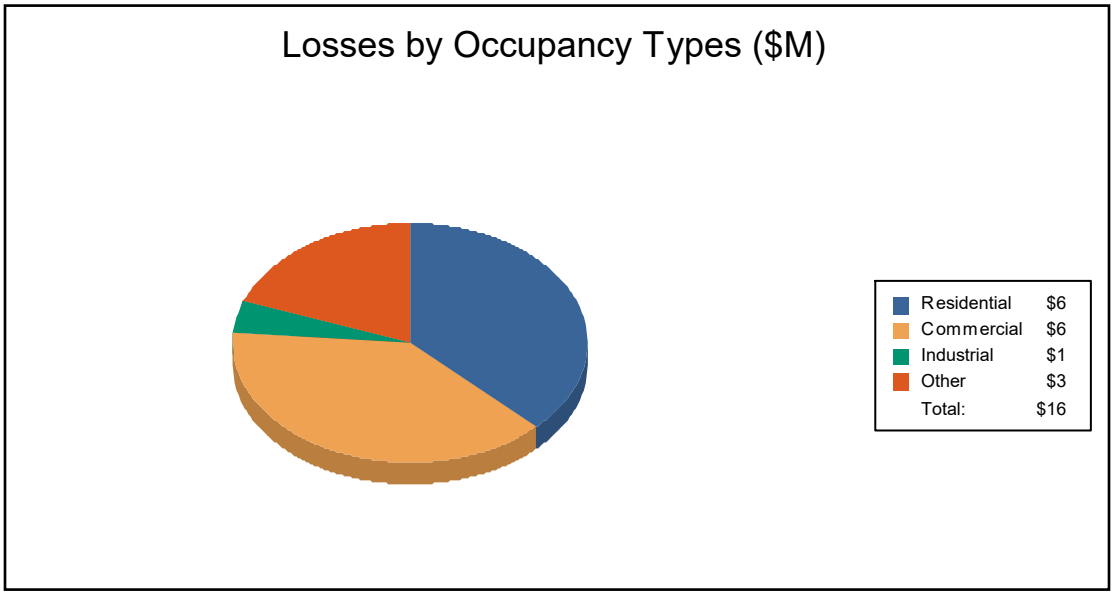
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 9.62 million dollars. 41% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 37.56% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.63	0.57	0.14	0.07	4.42
	Content	1.55	2.16	0.41	0.54	4.66
	Inventory	0.00	0.48	0.06	0.00	0.55
	Subtotal	**5.18**	**3.21**	**0.61**	**0.62**	**9.62**
Business Interruption						
	Income	0.01	1.10	0.02	0.12	1.25
	Relocation	0.68	0.26	0.01	0.06	1.02
	Rental Income	0.19	0.19	0.01	0.01	0.39
	Wage	0.03	1.52	0.03	2.33	3.91
	Subtotal	**0.91**	**3.07**	**0.07**	**2.52**	**6.57**
ALL	**Total**	**6.08**	**6.28**	**0.69**	**3.14**	**16.19**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	14,549	2,366,535	689,356	3,055,891
Total	**14,549**	**2,366,535**	**689,356**	**3,055,891**
Total Study Region	**14,549**	**2,366,535**	**689,356**	**3,055,891**

Hazus: Flood Global Risk Report

Region Name: Vernon_FL

Flood Scenario: Vernon_Flood

Print Date: Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 356 census blocks. The region contains over 14 thousand households and has a total population of 30,215 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,605 buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88.33% of the buildings (and 70.85% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,605 buildings in the region which have an aggregate total replacement value of 4,838 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,427,478	70.8%
Commercial	859,175	17.8%
Industrial	201,622	4.2%
Agricultural	3,210	0.1%
Religion	40,633	0.8%
Government	124,155	2.6%
Education	181,691	3.8%
Total	**4,837,964**	**100%**

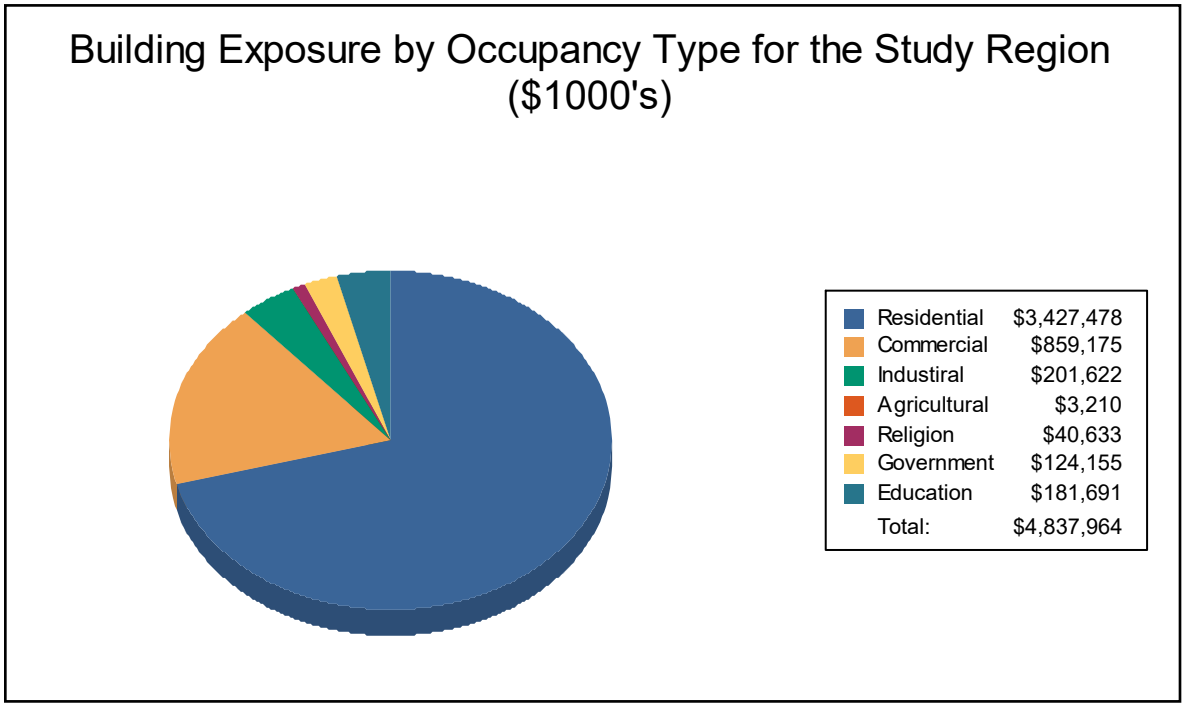
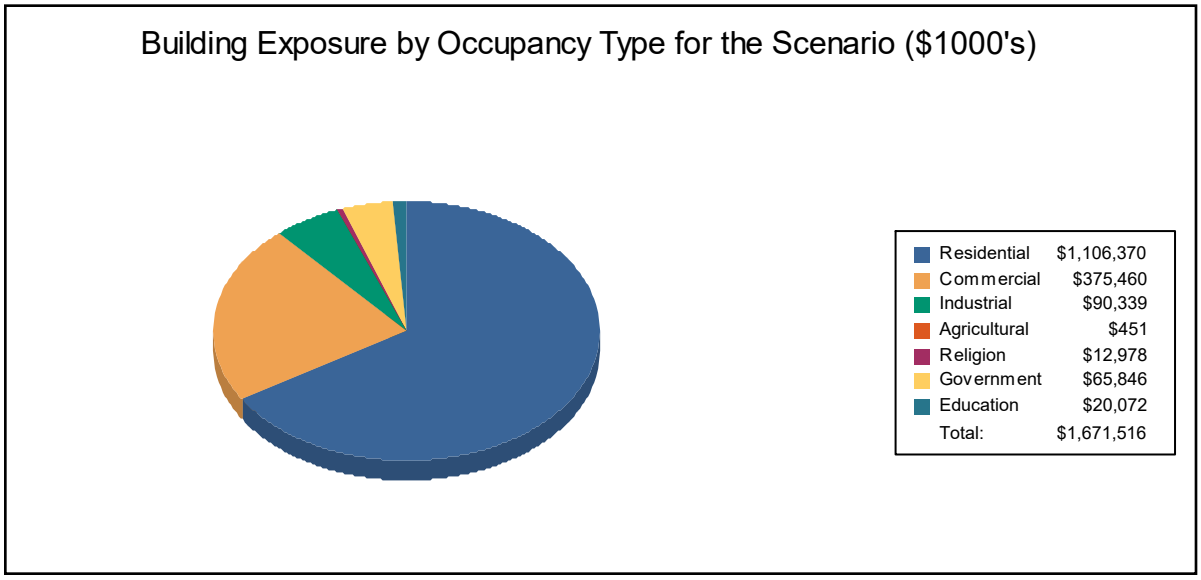


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,106,370	66.2%
Commercial	375,460	22.5%
Industrial	90,339	5.4%
Agricultural	451	0.0%
Religion	12,978	0.8%
Government	65,846	3.9%
Education	20,072	1.2%
Total	**1,671,516**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds.
There are 7 schools, 6 fire stations, 1 police station and 1 emergency operation center.

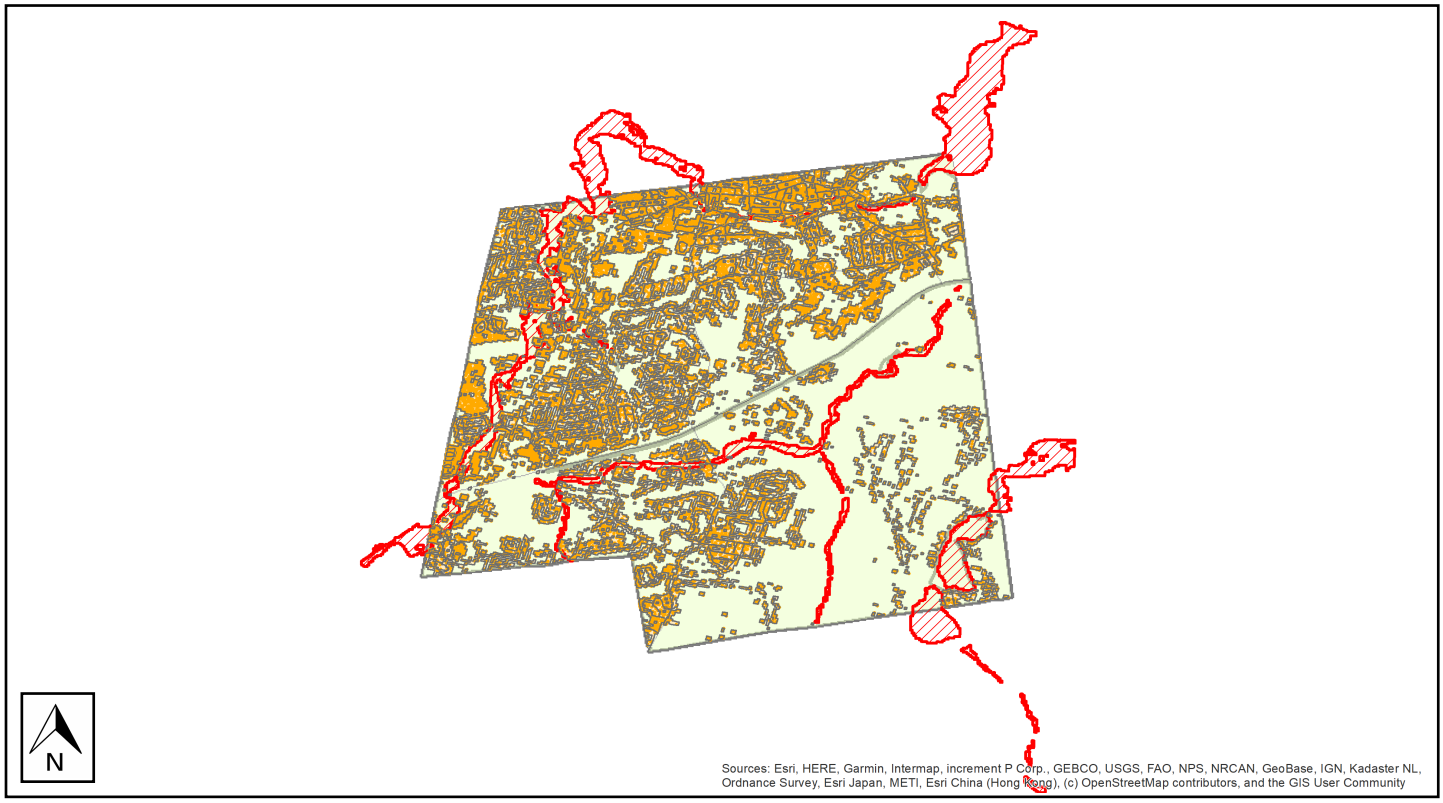
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Vernon_FL
Scenario Name:	Vernon_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 10 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

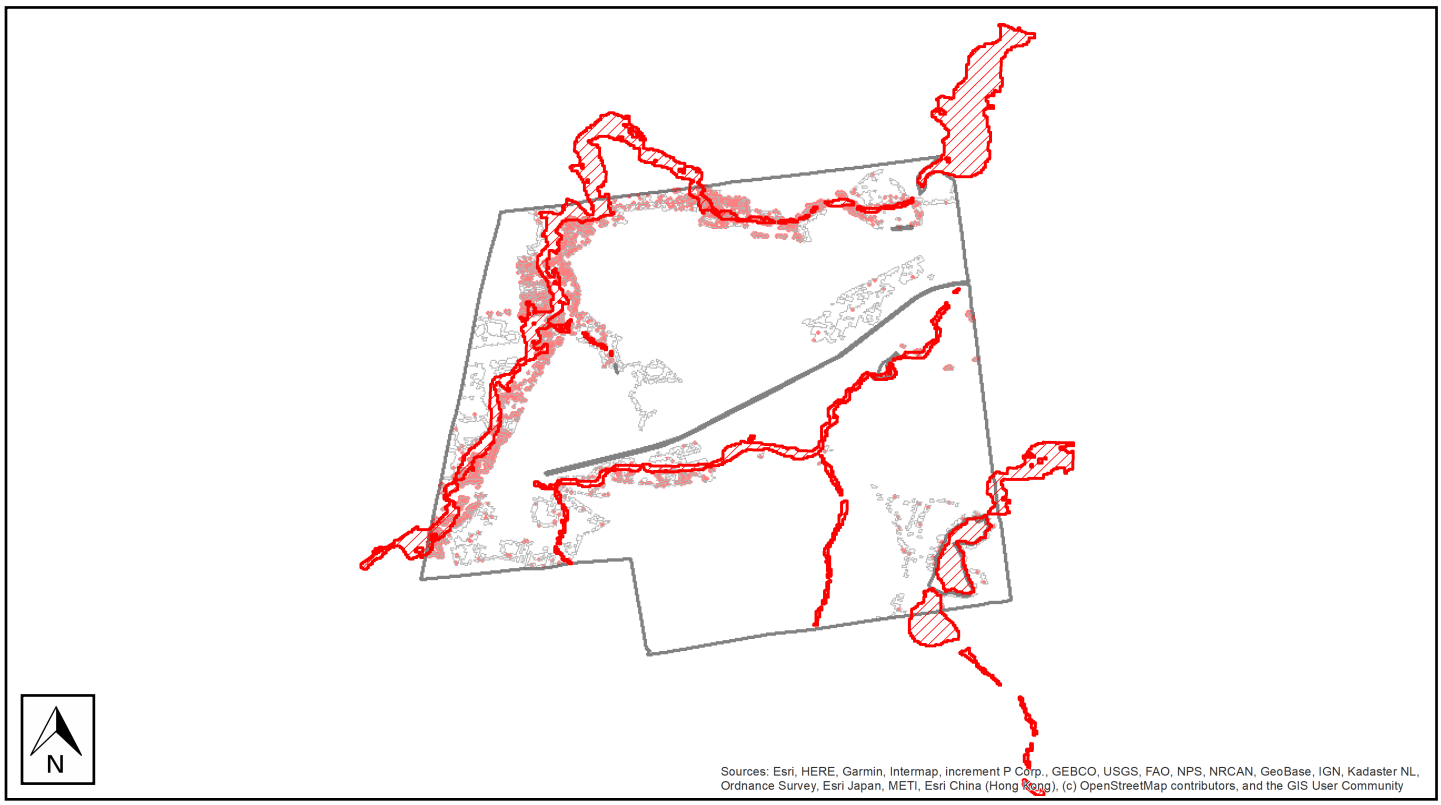


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	20	4	80	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	1	100	0	0	0	0	0	0	0	0	0	0
Residential	6	50	5	42	1	8	0	0	0	0	0	0
Total	**8**		**9**		**1**		**0**		**0**		**0**	

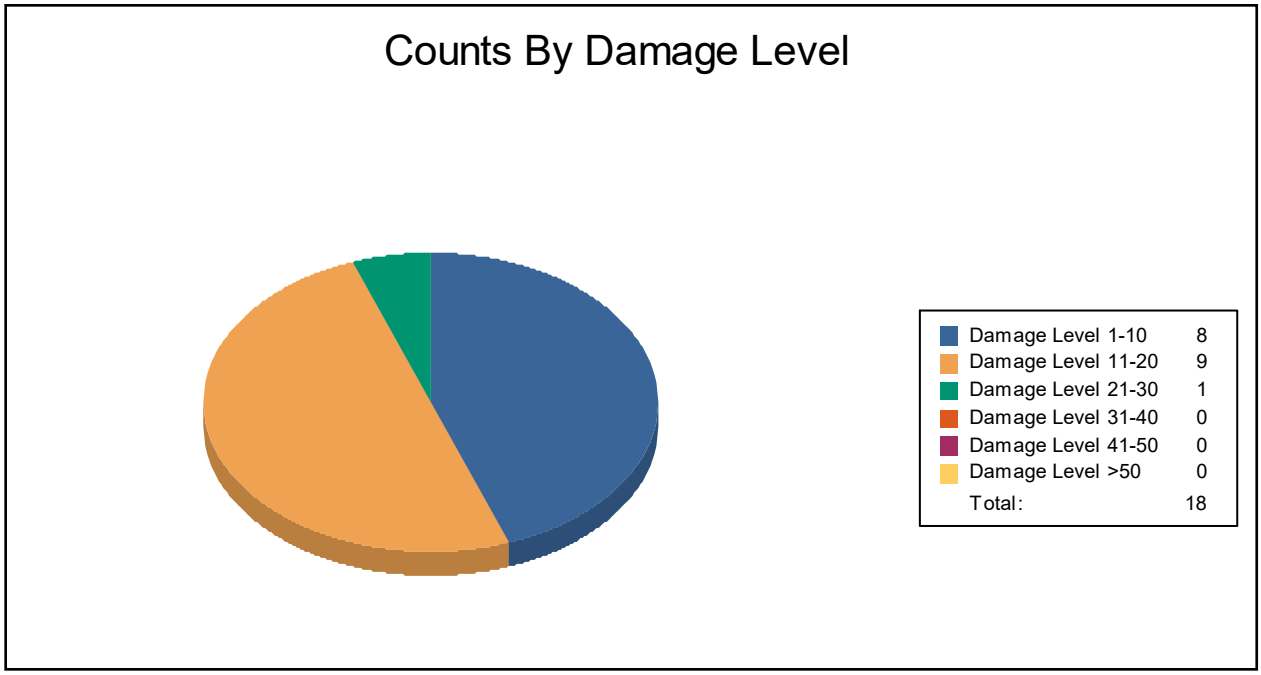


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	50	1	50	0	0	0	0	0	0	0	0
Steel	1	33	2	67	0	0	0	0	0	0	0	0
Wood	5	42	6	50	1	8	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 102 hospital beds available for use. On the day of the scenario flood event, the model estimates that 102 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

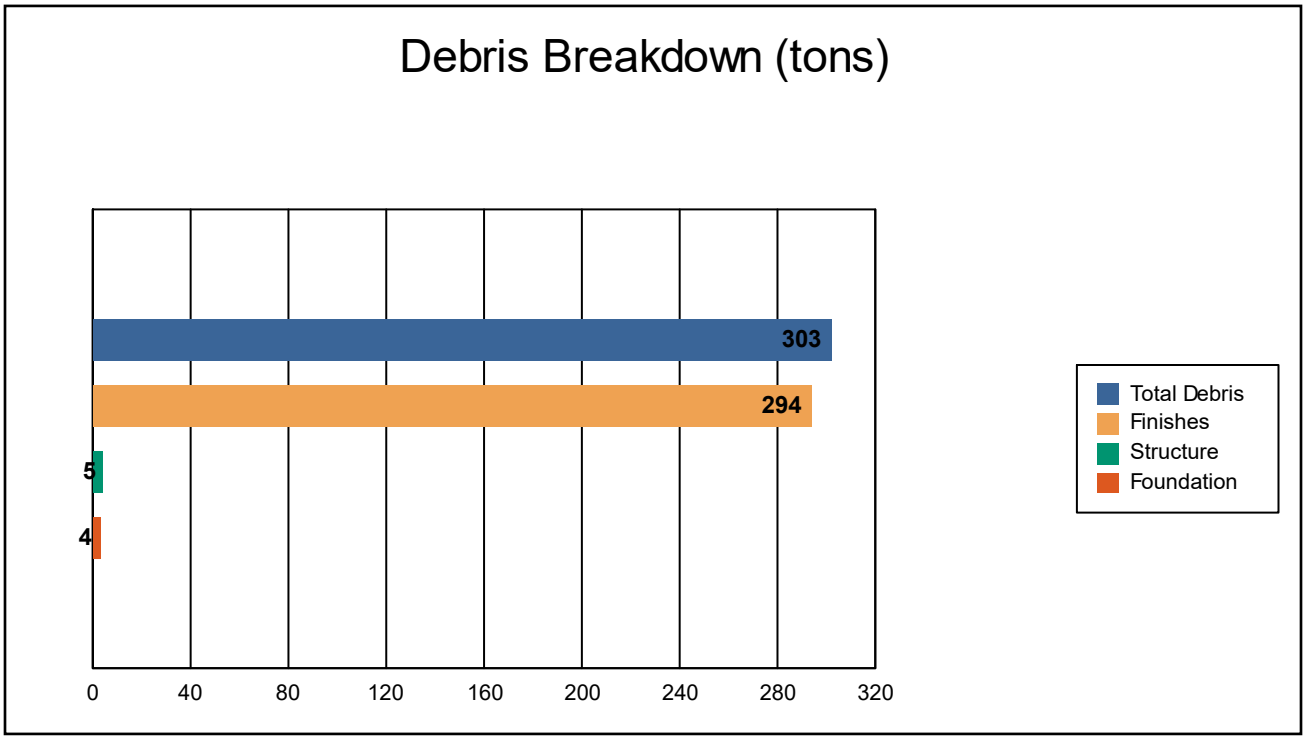
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

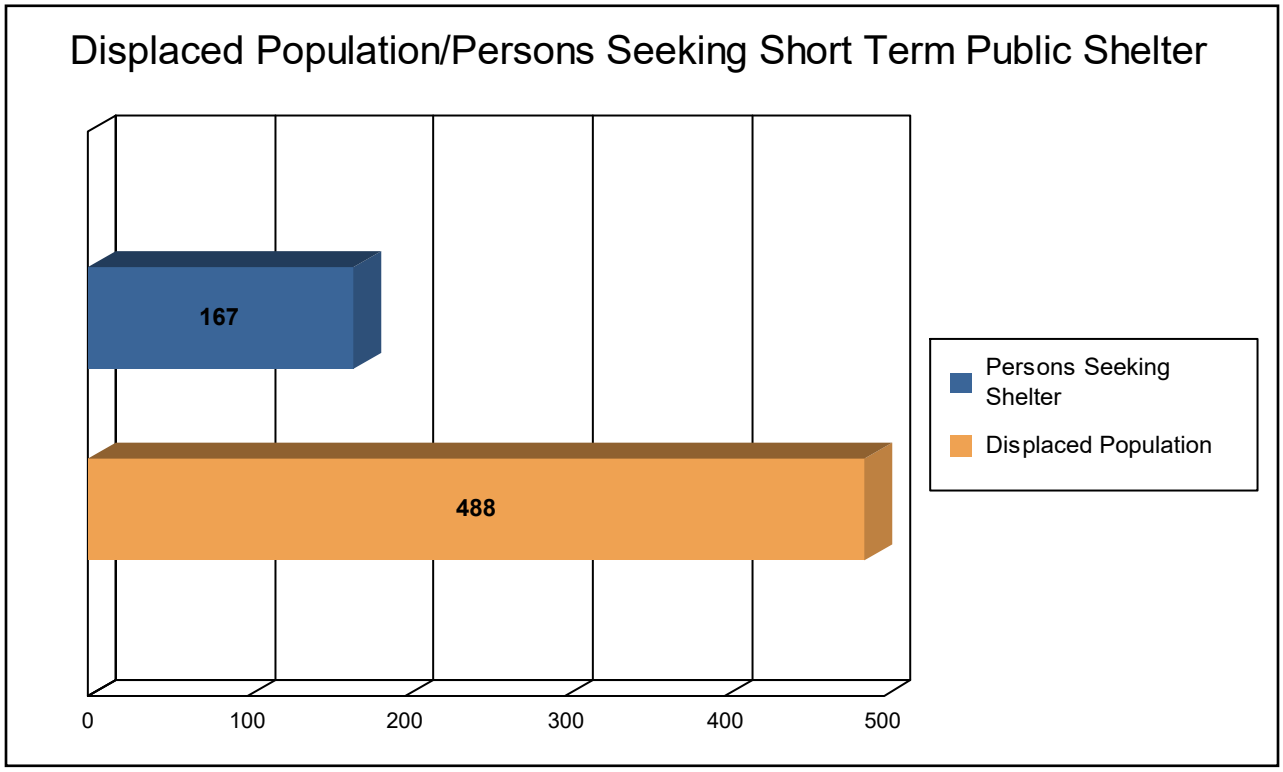


The model estimates that a total of 303 tons of debris will be generated. Of the total amount, Finishes comprises 97% of the total, Structure comprises 2% of the total, and Foundation comprises 1%. If the debris tonnage is converted into an estimated number of truckloads, it will require 13 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 163 households (or 488 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 167 people (out of a total population of 30,215) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 99.29 million dollars, which represents 5.94 % of the total replacement value of the scenario buildings.

Building-Related Losses

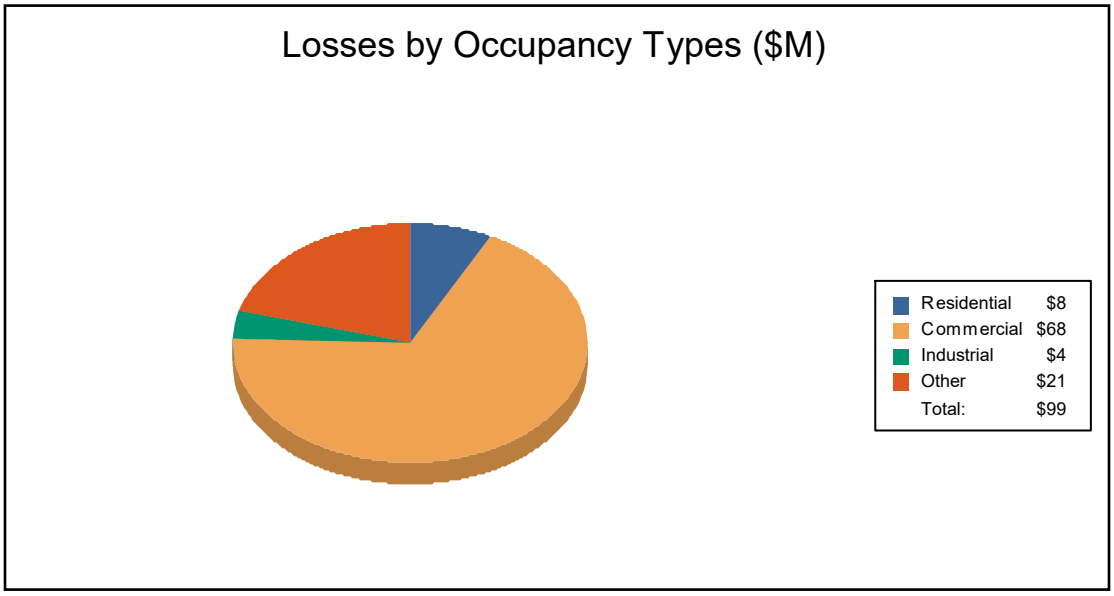
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 40.96 million dollars. 59% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 7.58% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3.13	5.38	1.03	0.54	10.07
	Content	1.75	20.19	1.87	3.36	27.16
	Inventory	0.00	3.44	0.29	0.01	3.73
	Subtotal	**4.87**	**29.01**	**3.18**	**3.90**	**40.96**
Business Interruption						
	Income	0.10	13.03	0.12	1.62	14.86
	Relocation	1.18	4.26	0.09	1.12	6.65
	Rental Income	1.13	2.99	0.02	0.20	4.35
	Wage	0.24	18.34	0.17	13.71	32.47
	Subtotal	**2.65**	**38.62**	**0.40**	**16.66**	**58.32**
ALL	**Total**	**7.53**	**67.63**	**3.58**	**20.56**	**99.29**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,478	1,410,486	4,837,964
Total	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**
Total Study Region	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**

Hazus: Flood Global Risk Report

Region Name: Vernon_FL

Flood Scenario: Vernon_Flood

Print Date: Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
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The geographical size of the region is approximately 6 square miles and contains 356 census blocks. The region contains over 14 thousand households and has a total population of 30,215 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,605 buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88.33% of the buildings (and 70.85% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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Building Exposure by Occupancy Type for the Study Region

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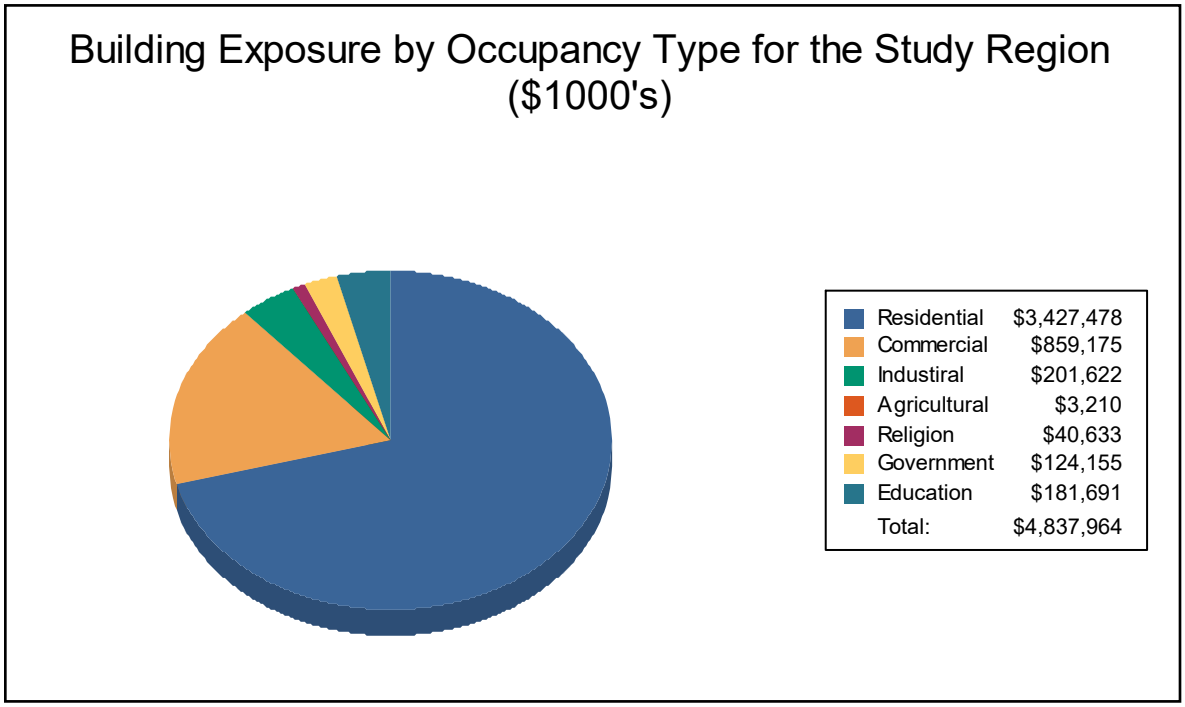
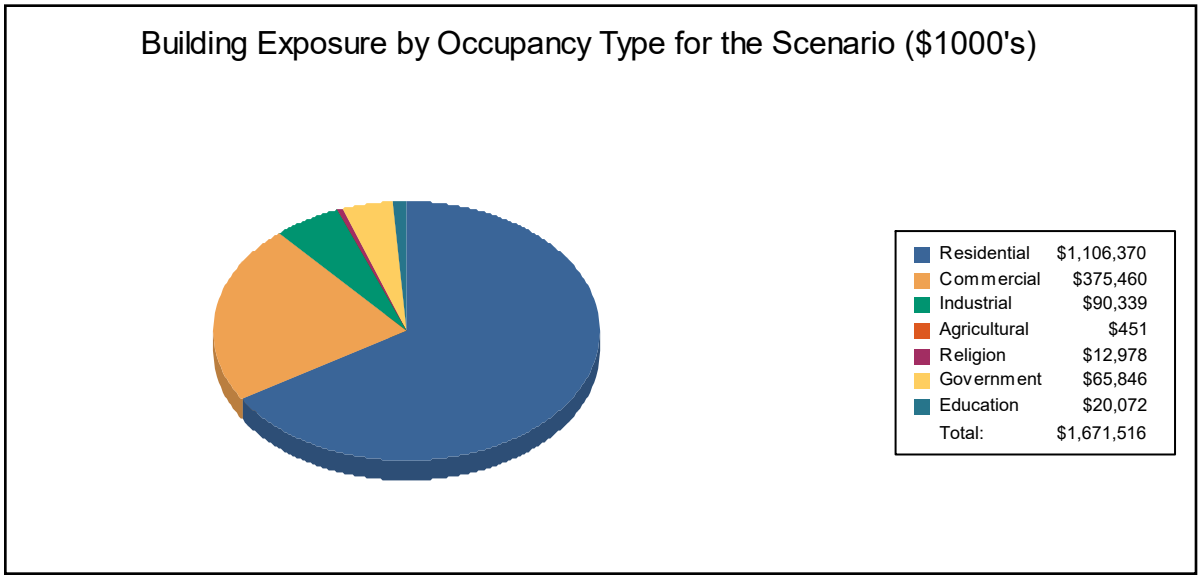


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,106,370	66.2%
Commercial	375,460	22.5%
Industrial	90,339	5.4%
Agricultural	451	0.0%
Religion	12,978	0.8%
Government	65,846	3.9%
Education	20,072	1.2%
Total	**1,671,516**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds.
There are 7 schools, 6 fire stations, 1 police station and 1 emergency operation center.

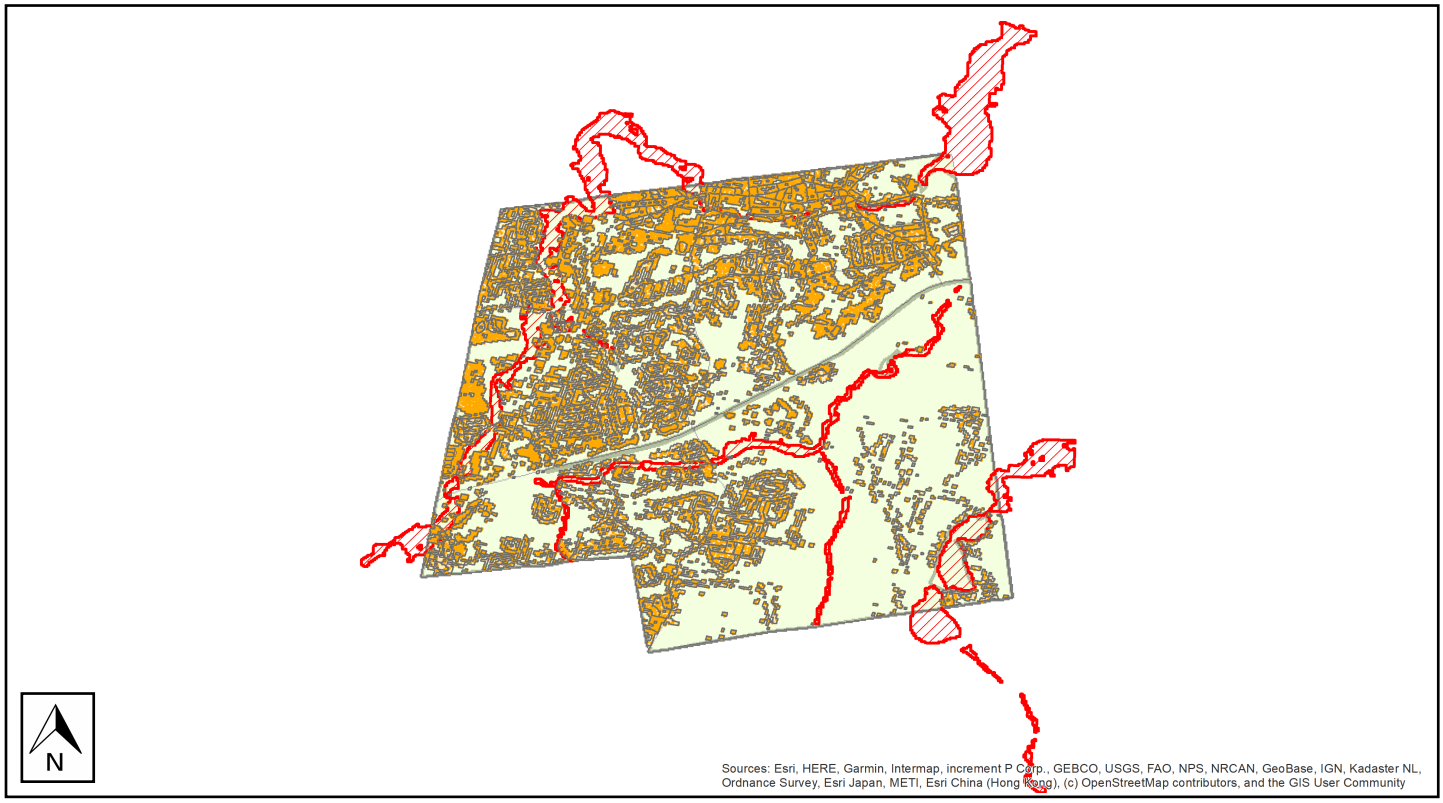
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Vernon_FL
Scenario Name:	Vernon_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

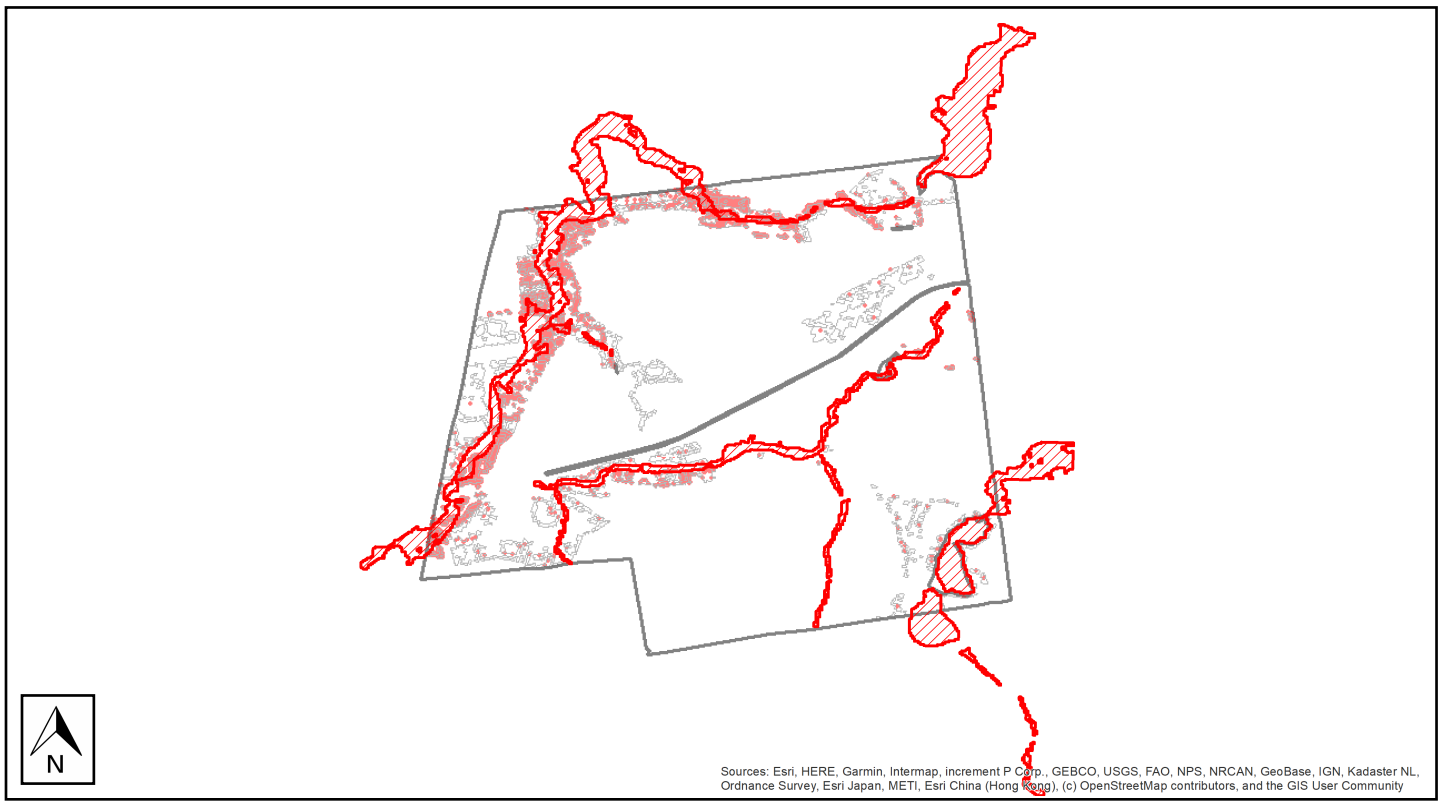


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	17	5	83	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	1	100	0	0	0	0	0	0	0	0	0	0
Residential	6	50	5	42	1	8	0	0	0	0	0	0
Total	**8**		**10**		**1**		**0**		**0**		**0**	

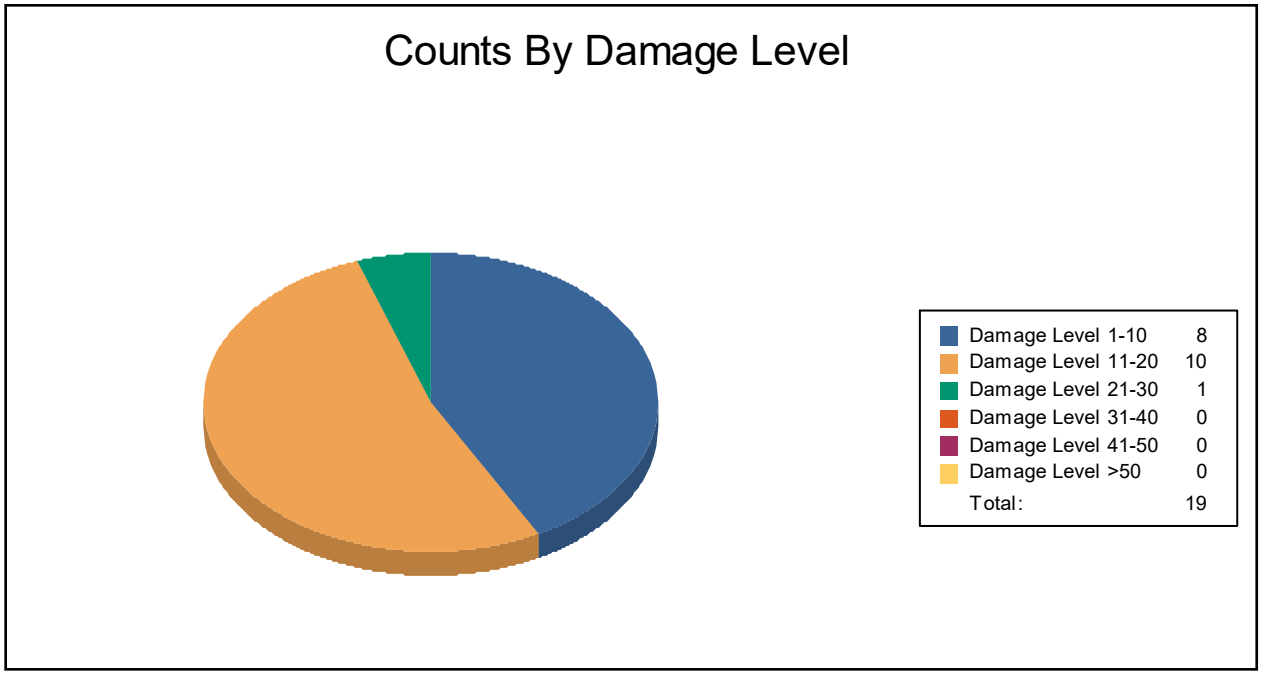


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	2	100	0	0	0	0	0	0	0	0
Steel	1	33	2	67	0	0	0	0	0	0	0	0
Wood	6	46	6	46	1	8	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 102 hospital beds available for use. On the day of the scenario flood event, the model estimates that 102 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

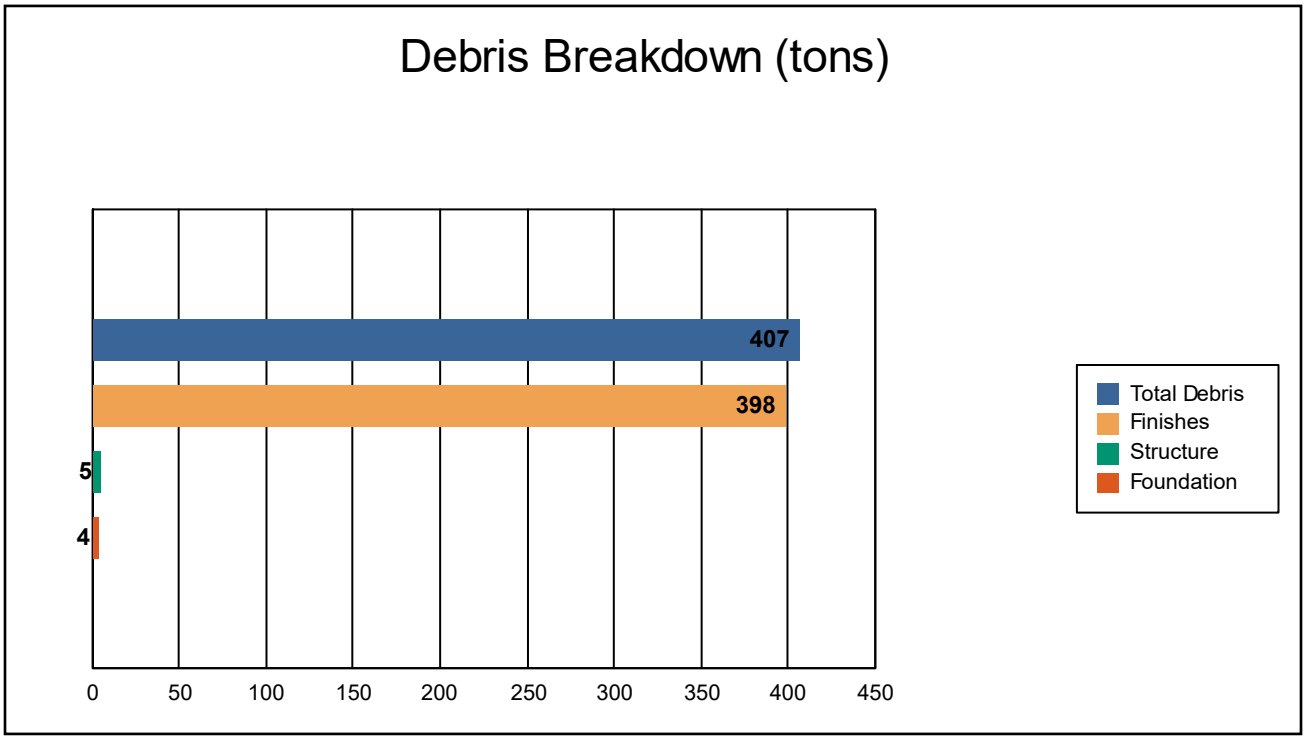
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

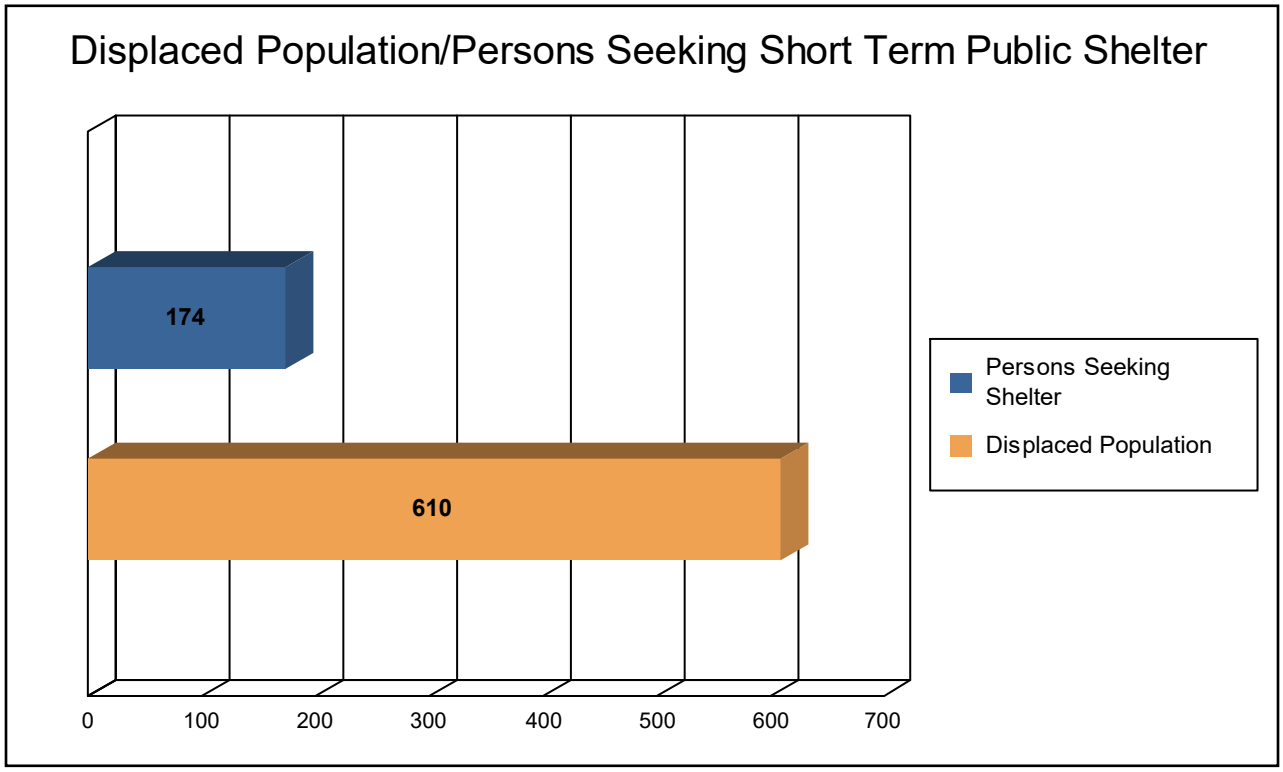


The model estimates that a total of 407 tons of debris will be generated. Of the total amount, Finishes comprises 98% of the total, Structure comprises 1% of the total, and Foundation comprises 1%. If the debris tonnage is converted into an estimated number of truckloads, it will require 17 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 203 households (or 610 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 174 people (out of a total population of 30,215) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 125.53 million dollars, which represents 7.51 % of the total replacement value of the scenario buildings.

Building-Related Losses

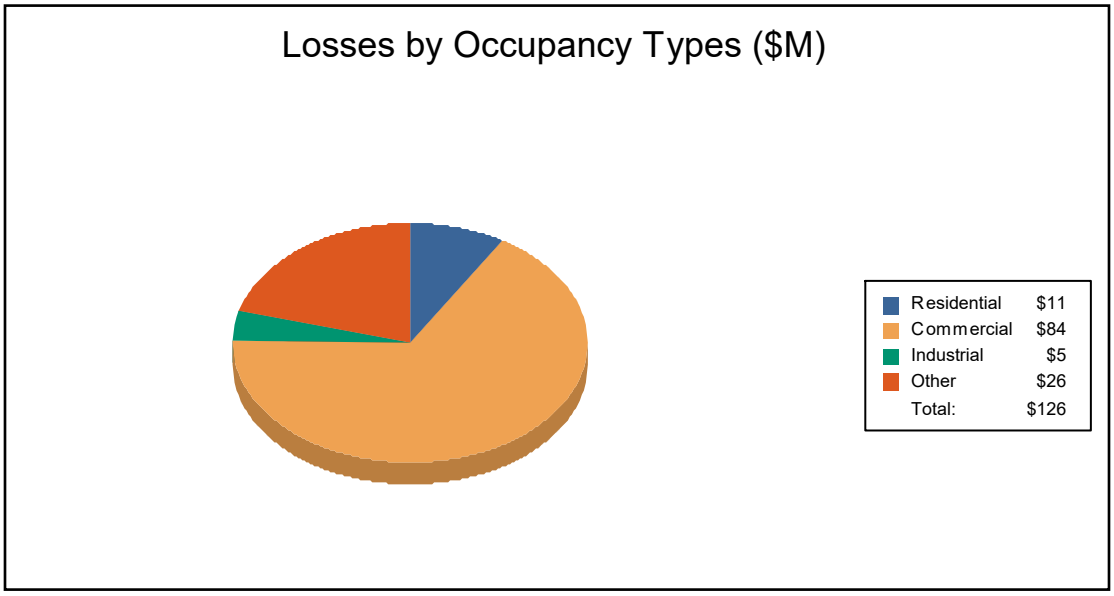
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 55.10 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 8.56% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.62	7.09	1.38	0.77	13.85
	Content	2.58	26.37	2.54	4.73	36.22
	Inventory	0.00	4.62	0.39	0.02	5.04
	Subtotal	**7.19**	**38.08**	**4.31**	**5.51**	**55.10**
Business Interruption						
	Income	0.16	15.62	0.13	1.91	17.81
	Relocation	1.50	4.98	0.10	1.32	7.90
	Rental Income	1.52	3.50	0.03	0.24	5.28
	Wage	0.38	21.69	0.19	17.17	39.43
	Subtotal	**3.55**	**45.79**	**0.45**	**20.64**	**70.43**
ALL	**Total**	**10.75**	**83.87**	**4.76**	**26.16**	**125.53**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,478	1,410,486	4,837,964
Total	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**
Total Study Region	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**

Hazus: Flood Global Risk Report

Region Name: Vernon_FL

Flood Scenario: Vernon_Flood

Print Date: Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 356 census blocks. The region contains over 14 thousand households and has a total population of 30,215 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,605 buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88.33% of the buildings (and 70.85% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,605 buildings in the region which have an aggregate total replacement value of 4,838 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,427,478	70.8%
Commercial	859,175	17.8%
Industrial	201,622	4.2%
Agricultural	3,210	0.1%
Religion	40,633	0.8%
Government	124,155	2.6%
Education	181,691	3.8%
Total	**4,837,964**	**100%**

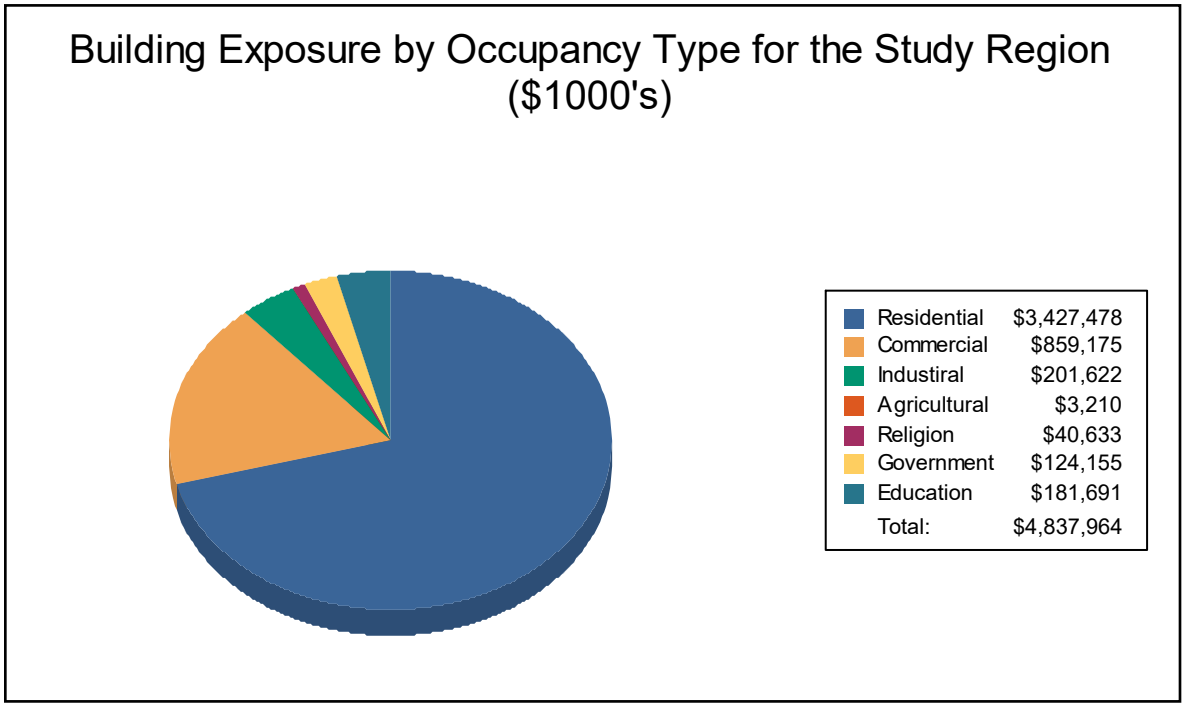
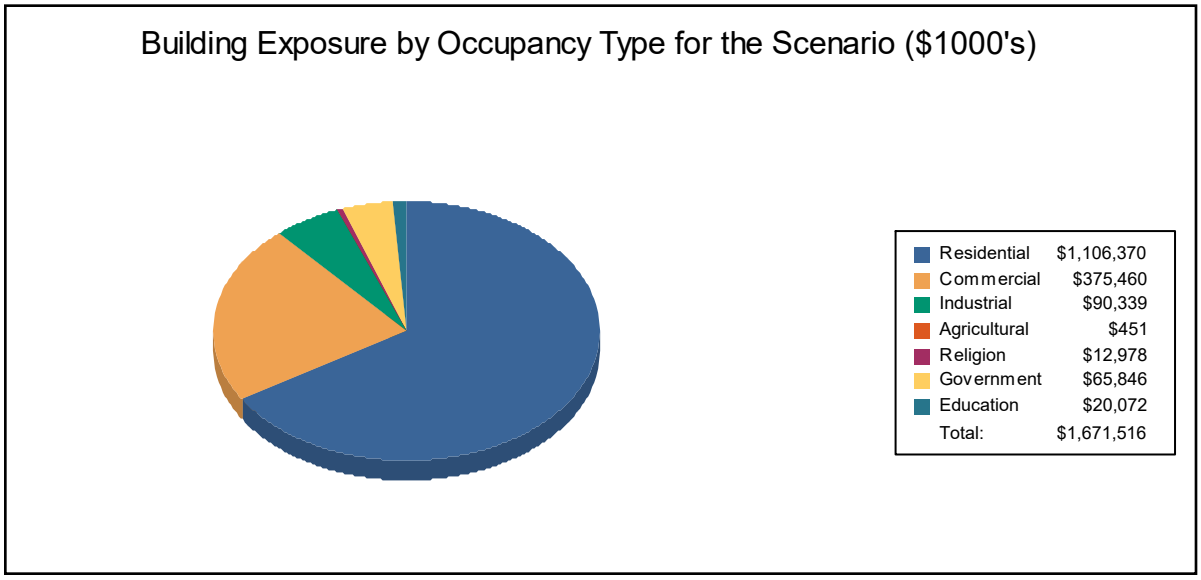


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,106,370	66.2%
Commercial	375,460	22.5%
Industrial	90,339	5.4%
Agricultural	451	0.0%
Religion	12,978	0.8%
Government	65,846	3.9%
Education	20,072	1.2%
Total	**1,671,516**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds.
There are 7 schools, 6 fire stations, 1 police station and 1 emergency operation center.

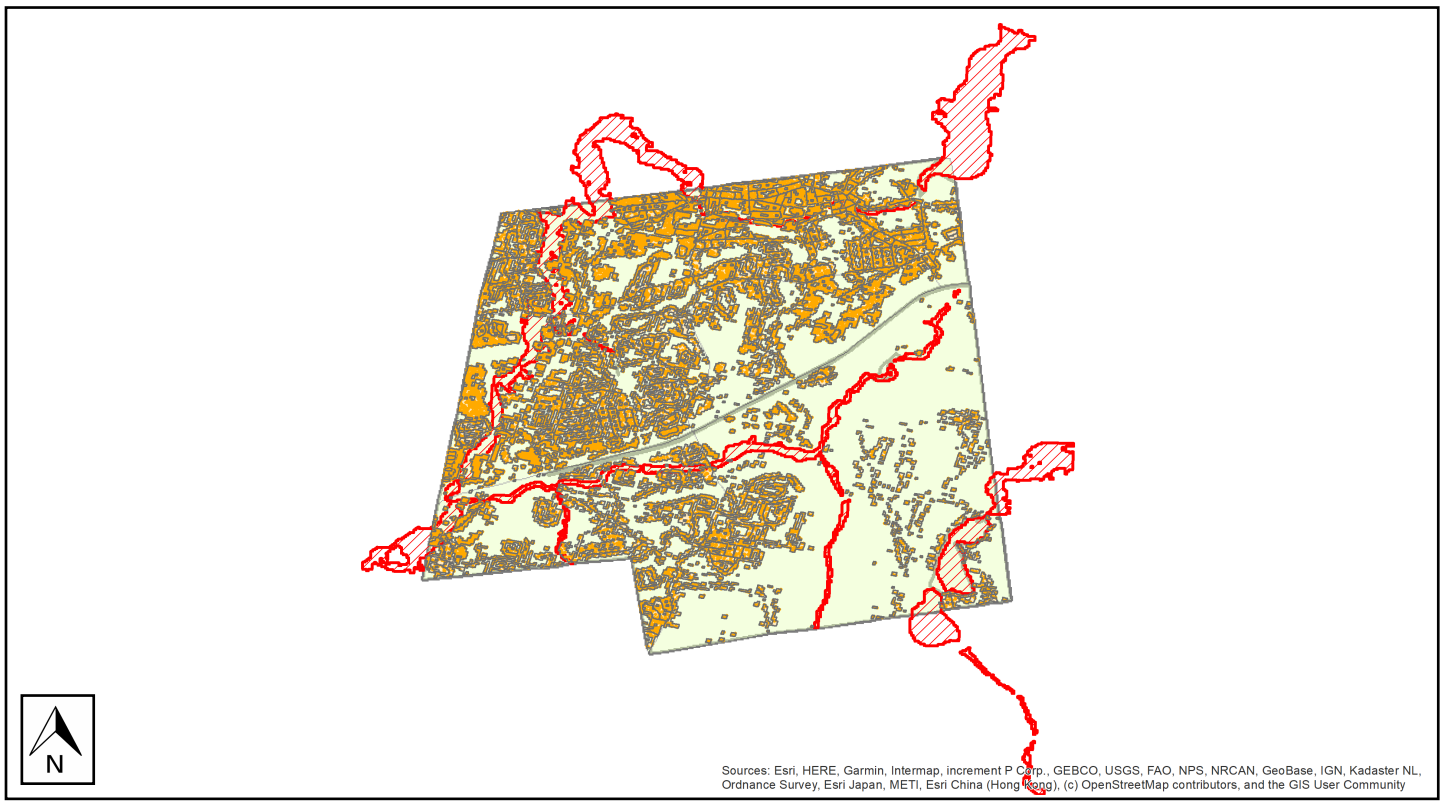
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Vernon_FL
Scenario Name:	Vernon_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 20 buildings will be at least moderately damaged. This is over 97% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

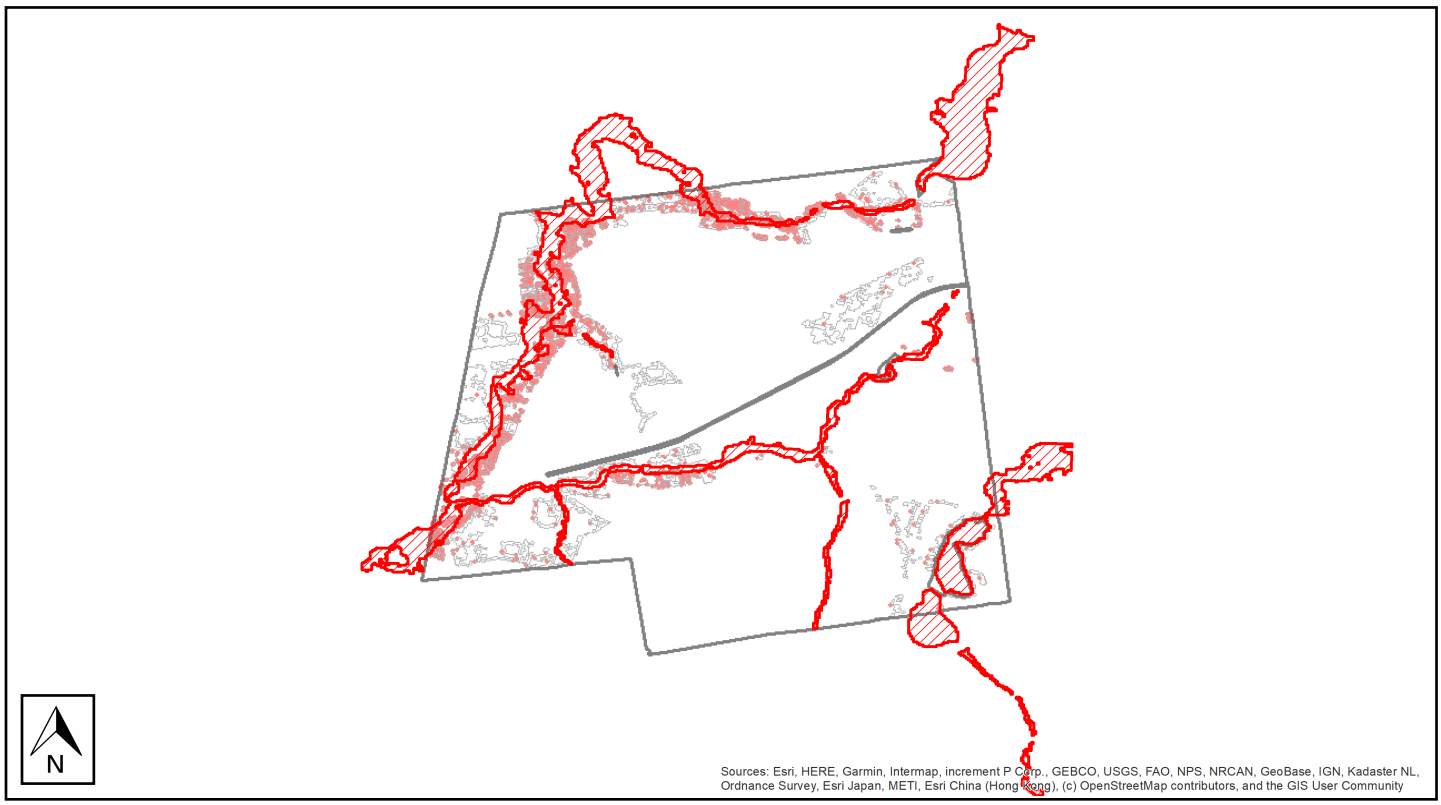


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	17	5	83	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	1	100	0	0	0	0	0	0	0	0	0	0
Residential	7	32	11	50	3	14	1	5	0	0	0	0
Total	**9**		**16**		**3**		**1**		**0**		**0**	

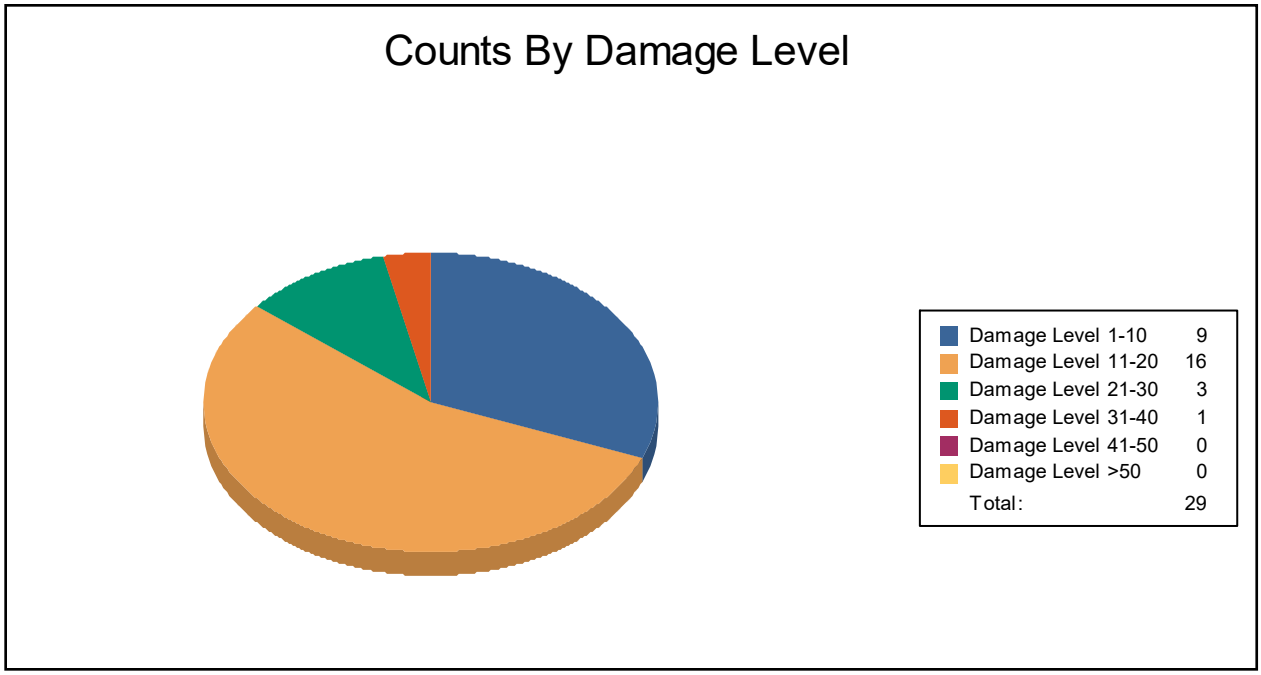


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	2	100	0	0	0	0	0	0	0	0
Steel	1	33	2	67	0	0	0	0	0	0	0	0
Wood	7	30	12	52	3	13	1	4	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 102 hospital beds available for use. On the day of the scenario flood event, the model estimates that 102 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

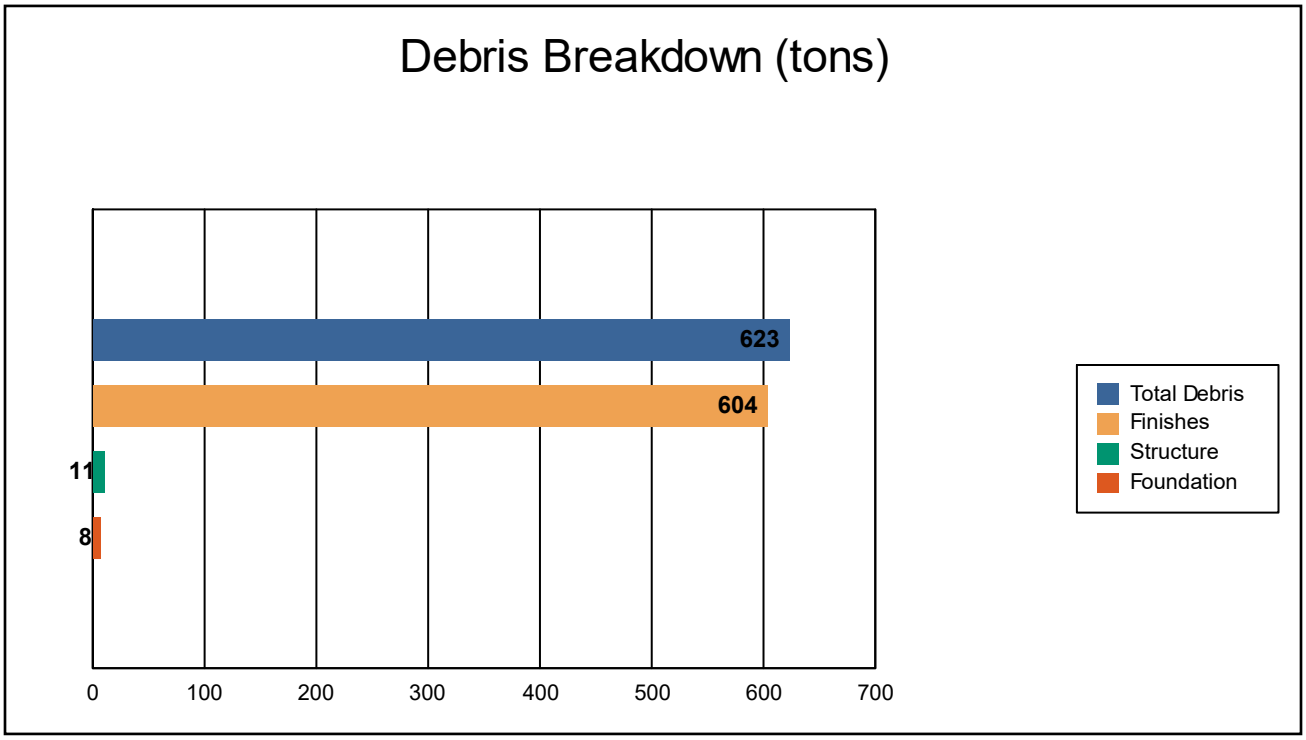
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

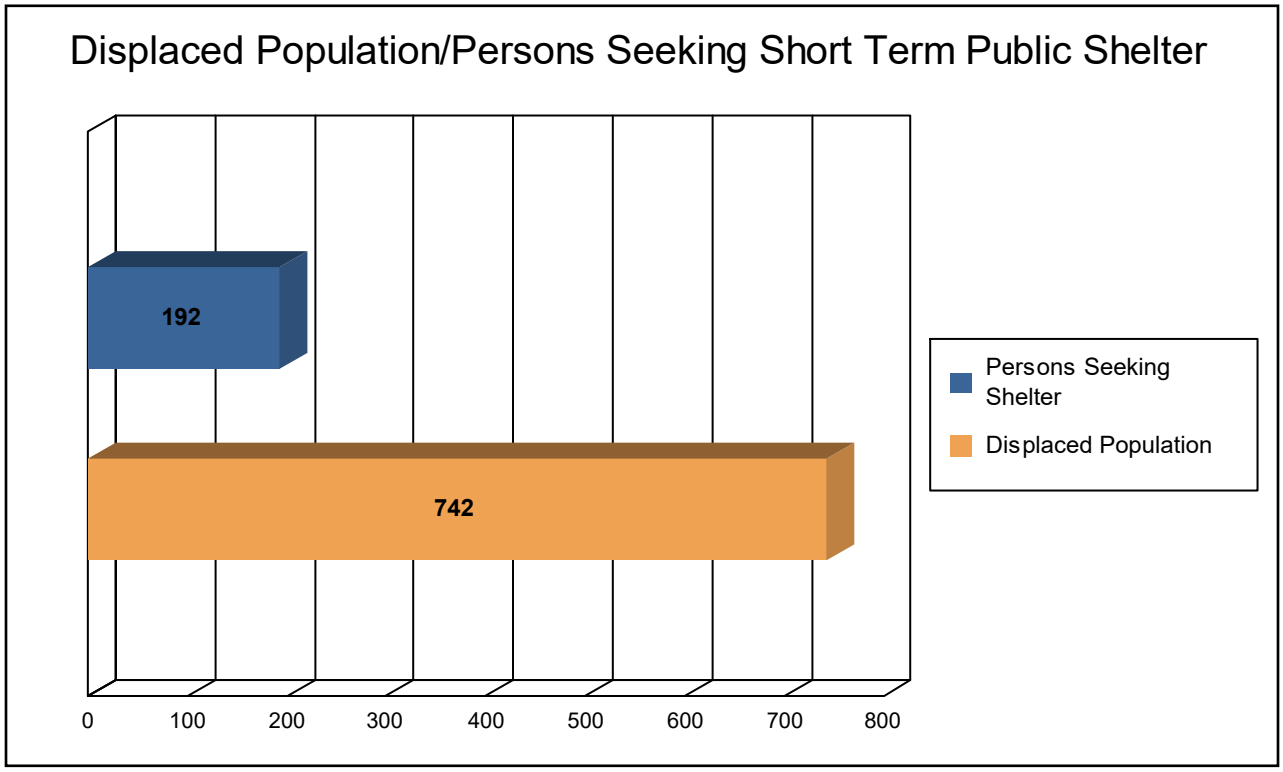


The model estimates that a total of 623 tons of debris will be generated. Of the total amount, Finishes comprises 97% of the total, Structure comprises 2% of the total, and Foundation comprises 1%. If the debris tonnage is converted into an estimated number of truckloads, it will require 25 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 247 households (or 742 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 192 people (out of a total population of 30,215) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 160.75 million dollars, which represents 9.62 % of the total replacement value of the scenario buildings.

Building-Related Losses

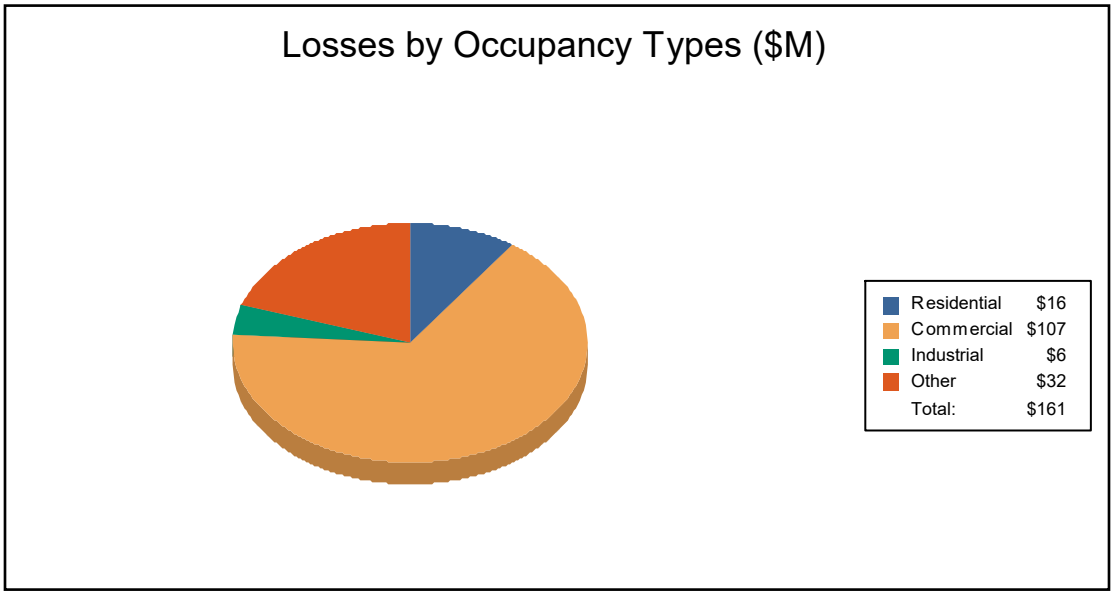
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 73.60 million dollars. 54% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 9.66% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	7.07	9.17	1.76	1.01	19.02
	Content	3.91	34.05	3.43	6.18	47.57
	Inventory	0.00	6.44	0.53	0.04	7.01
	Subtotal	**10.98**	**49.67**	**5.73**	**7.23**	**73.60**
Business Interruption						
	Income	0.19	19.60	0.16	2.05	22.01
	Relocation	1.94	6.36	0.13	1.46	9.89
	Rental Income	1.96	4.52	0.04	0.28	6.79
	Wage	0.46	26.73	0.25	21.02	48.46
	Subtotal	**4.56**	**57.21**	**0.57**	**24.80**	**87.14**
ALL	**Total**	**15.54**	**106.87**	**6.30**	**32.03**	**160.75**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,478	1,410,486	4,837,964
Total	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**
Total Study Region	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**

Hazus: Flood Global Risk Report

Region Name: Vernon_FL

Flood Scenario: Vernon_Flood

Print Date: Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
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The geographical size of the region is approximately 6 square miles and contains 356 census blocks. The region contains over 14 thousand households and has a total population of 30,215 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,605 buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88.33% of the buildings (and 70.85% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,605 buildings in the region which have an aggregate total replacement value of 4,838 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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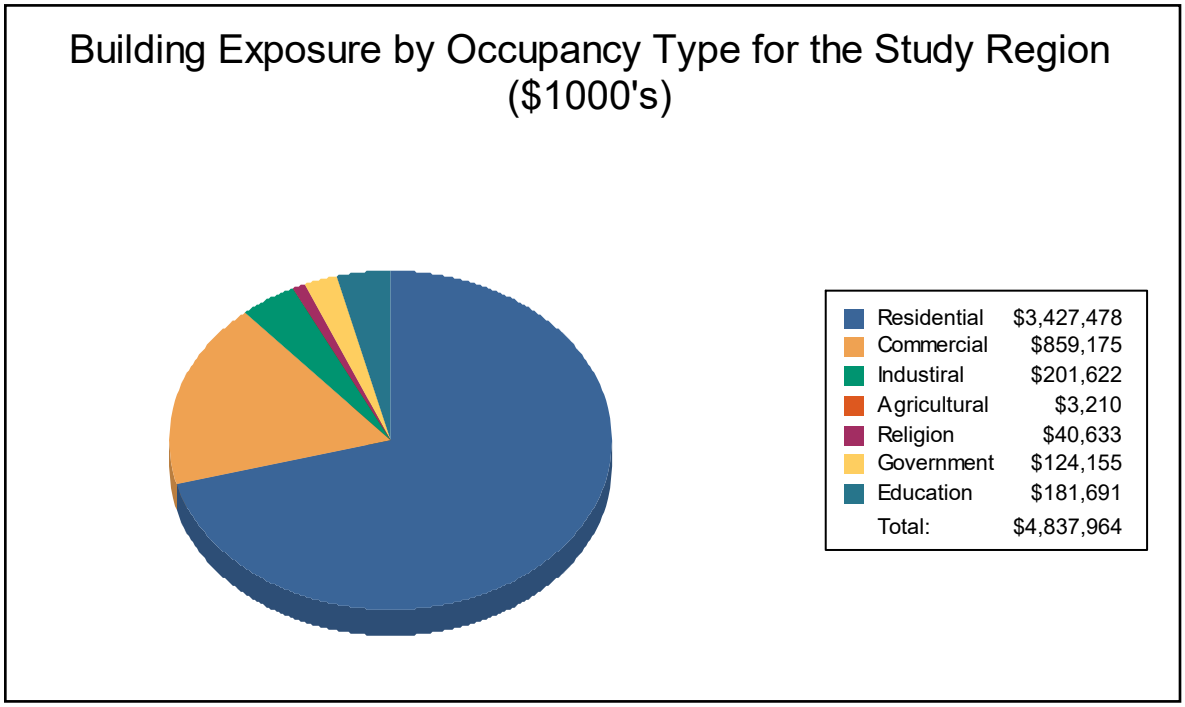

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,106,370	66.2%
Commercial	375,460	22.5%
Industrial	90,339	5.4%
Agricultural	451	0.0%
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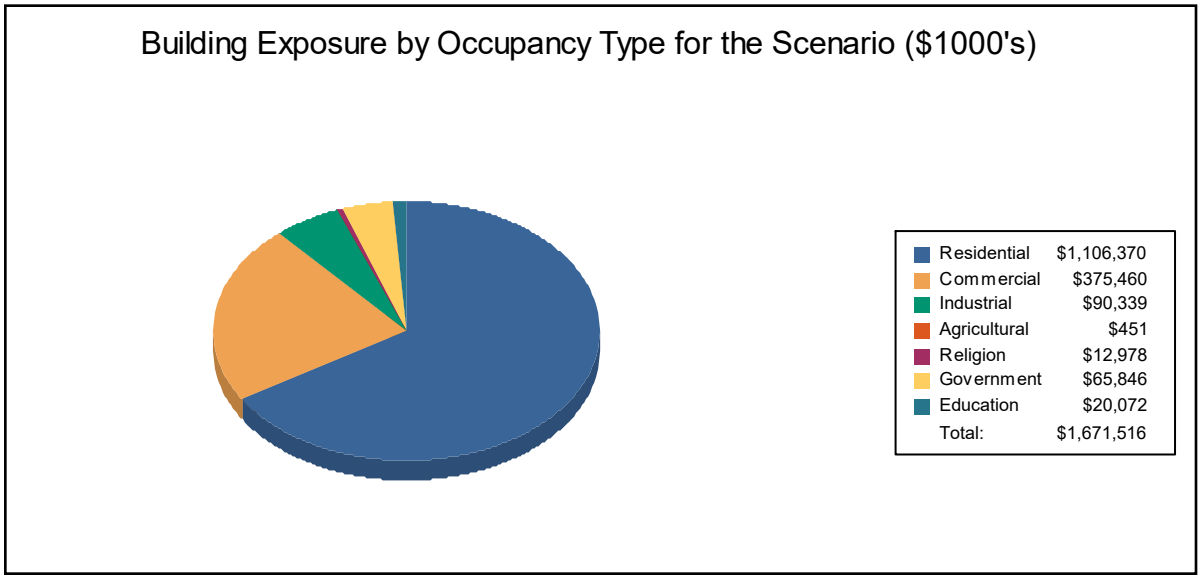
Government	65,846	3.9%
Education	20,072	1.2%
Total	**1,671,516**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds.
There are 7 schools, 6 fire stations, 1 police station and 1 emergency operation center.

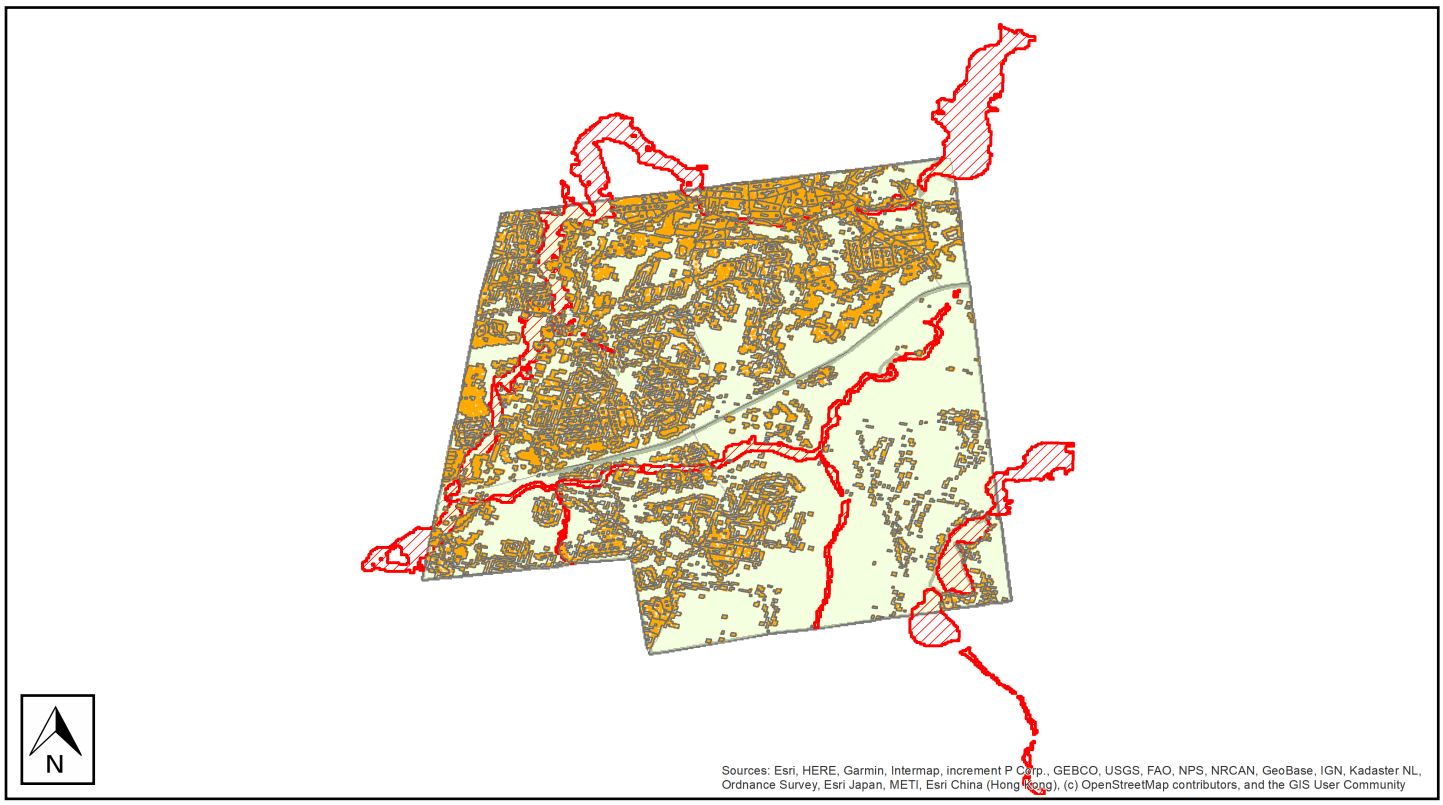
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Vernon_FL
Scenario Name:	Vernon_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 24 buildings will be at least moderately damaged. This is over 97% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

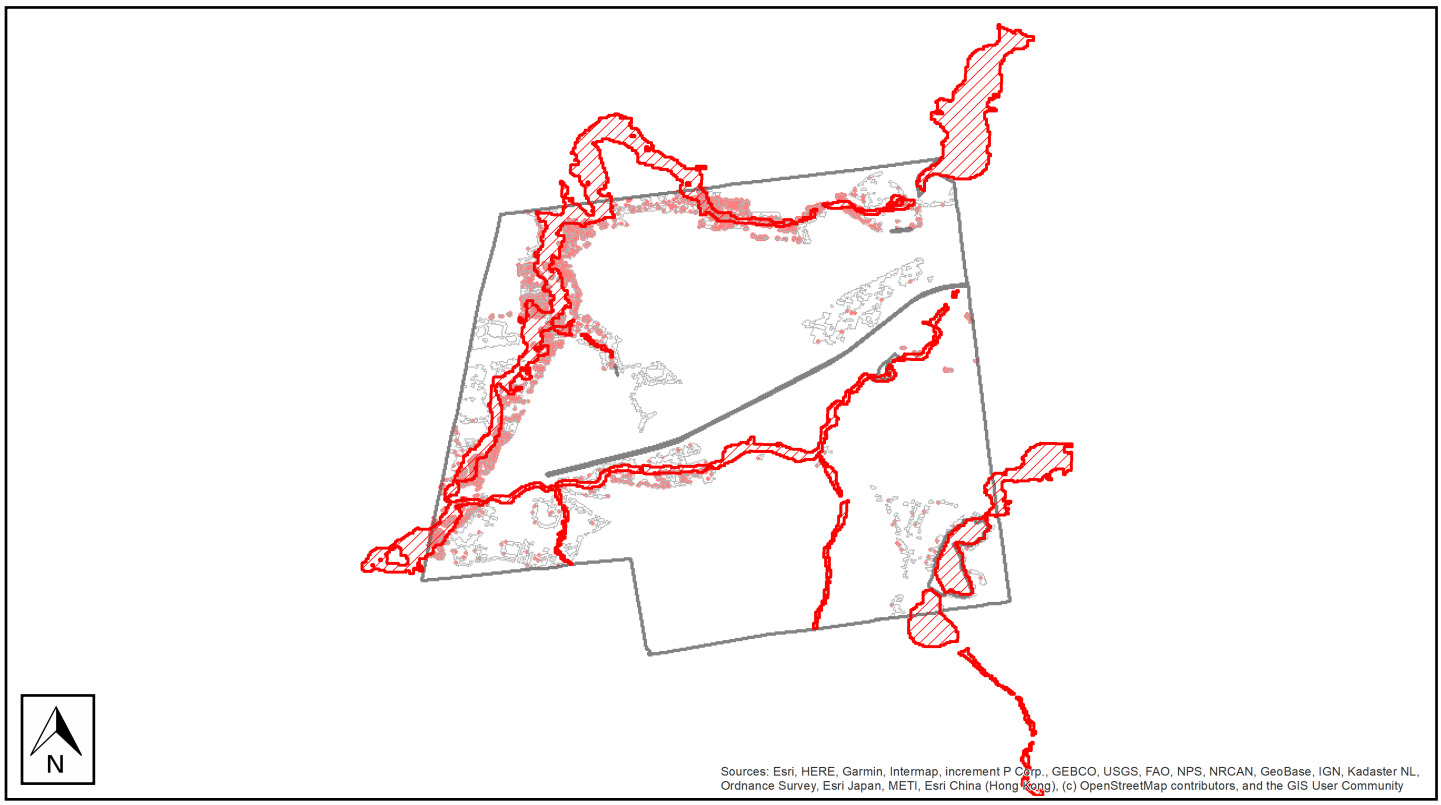


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	14	6	86	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	1	100	0	0	0	0	0	0	0	0	0	0
Residential	13	42	14	45	3	10	1	3	0	0	0	0
Total	**15**		**20**		**3**		**1**		**0**		**0**	

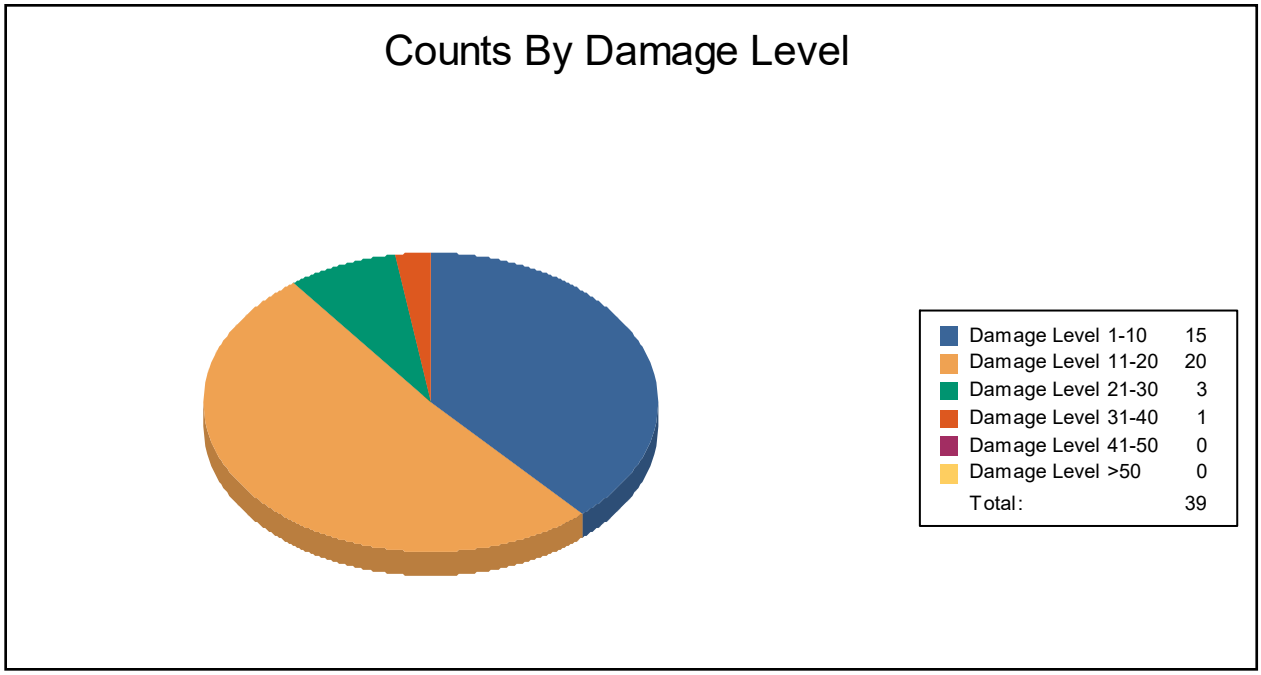


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	2	100	0	0	0	0	0	0	0	0
Steel	1	33	2	67	0	0	0	0	0	0	0	0
Wood	13	41	15	47	3	9	1	3	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 102 hospital beds available for use. On the day of the scenario flood event, the model estimates that 102 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

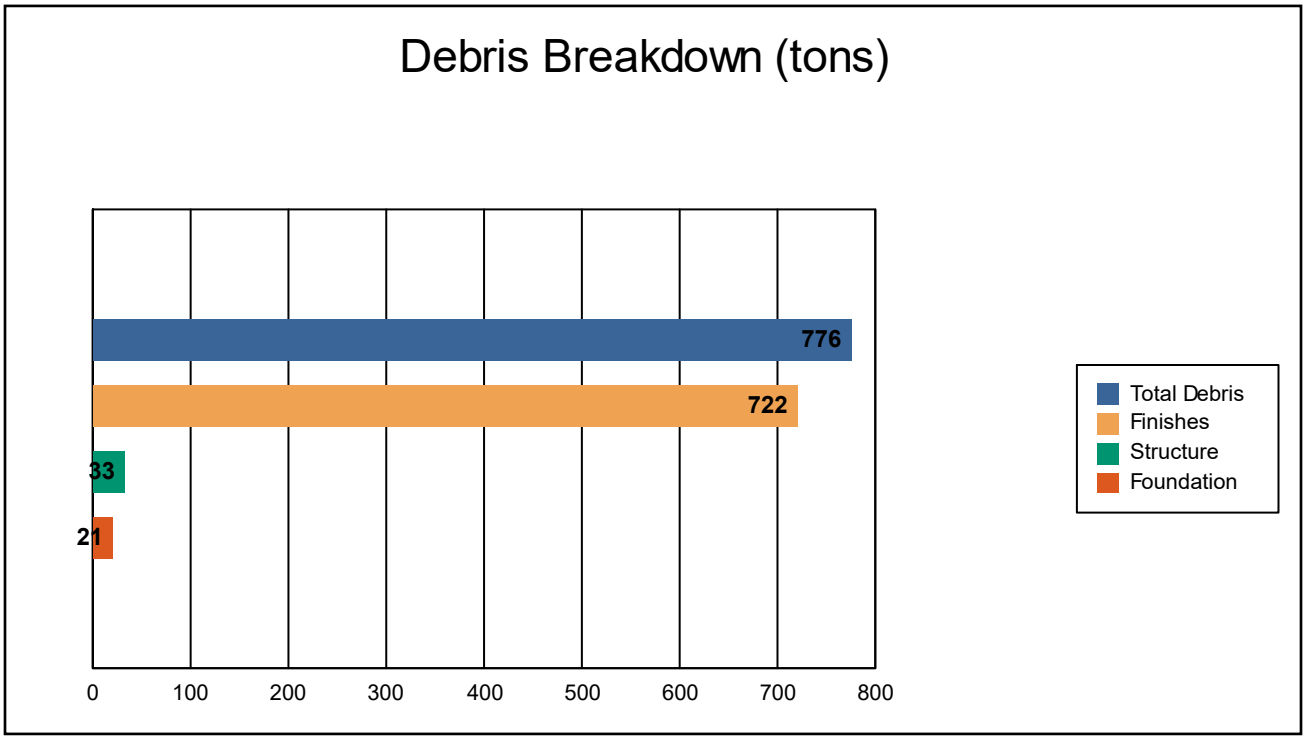
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

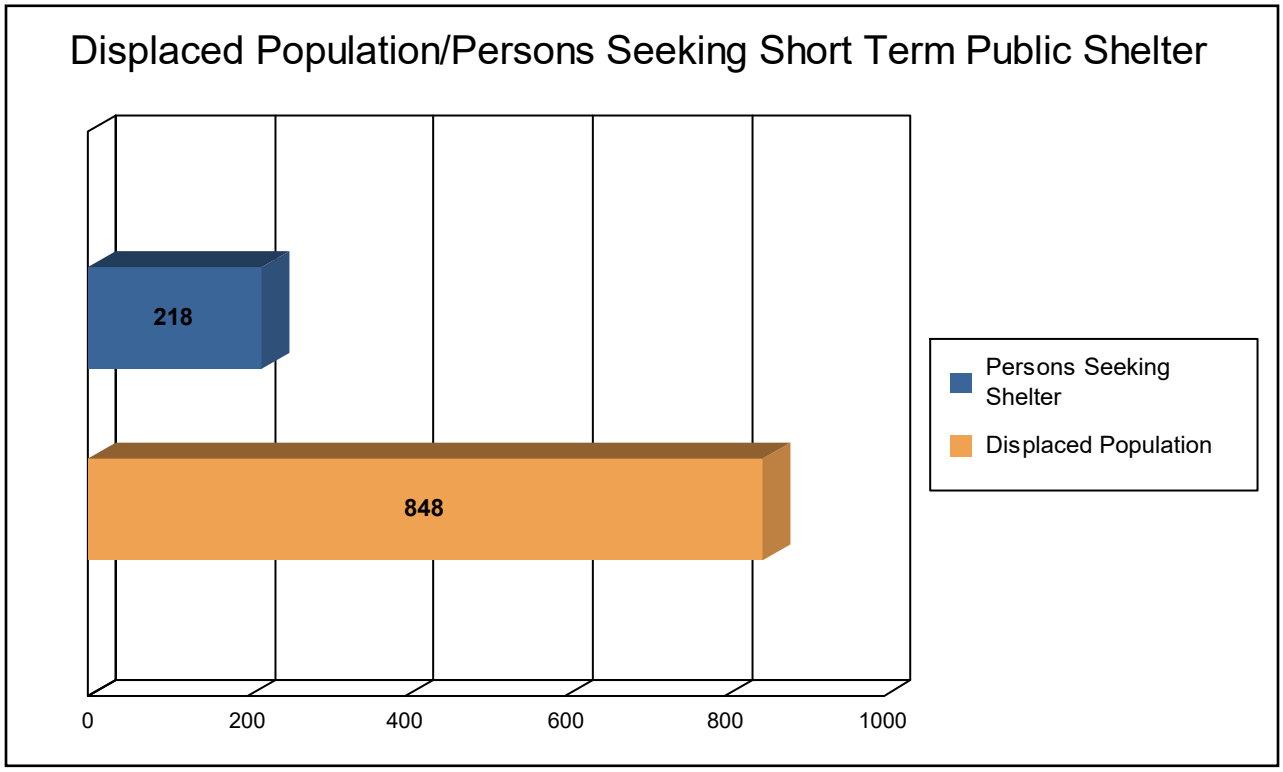


The model estimates that a total of 776 tons of debris will be generated. Of the total amount, Finishes comprises 93% of the total, Structure comprises 4% of the total, and Foundation comprises 3%. If the debris tonnage is converted into an estimated number of truckloads, it will require 32 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 283 households (or 848 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 218 people (out of a total population of 30,215) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 181.55 million dollars, which represents 10.86 % of the total replacement value of the scenario buildings.

Building-Related Losses

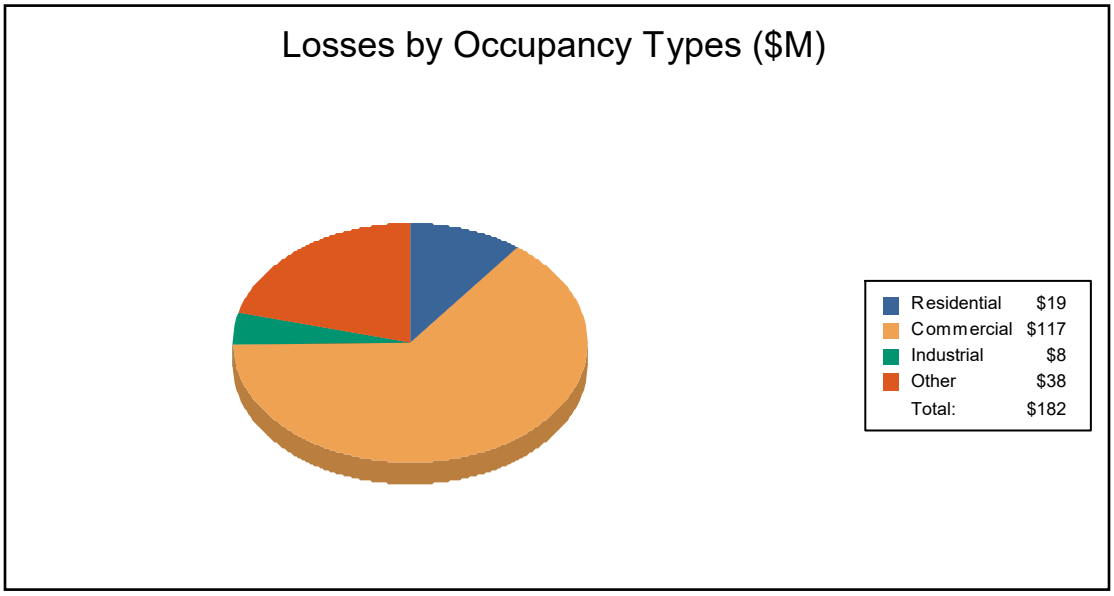
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 84.48 million dollars. 53% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 10.35% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	8.58	10.36	2.07	1.22	22.24
	Content	4.74	37.95	4.16	7.42	54.26
	Inventory	0.00	7.28	0.64	0.05	7.98
	Subtotal	**13.32**	**55.60**	**6.87**	**8.69**	**84.48**
Business Interruption						
	Income	0.25	20.89	0.18	2.32	23.64
	Relocation	2.30	6.86	0.14	1.68	10.98
	Rental Income	2.33	4.88	0.04	0.32	7.57
	Wage	0.59	28.54	0.27	25.48	54.88
	Subtotal	**5.47**	**61.17**	**0.64**	**29.80**	**97.07**
ALL	**Total**	**18.78**	**116.76**	**7.51**	**38.49**	**181.55**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,478	1,410,486	4,837,964
Total	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**
Total Study Region	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**

Hazus: Flood Global Risk Report

Region Name: Vernon_FL

Flood Scenario: Vernon_Flood

Print Date: Thursday, April 20, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 6 square miles and contains 356 census blocks. The region contains over 14 thousand households and has a total population of 30,215 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 8,605 buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88.33% of the buildings (and 70.85% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,605 buildings in the region which have an aggregate total replacement value of 4,838 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,427,478	70.8%
Commercial	859,175	17.8%
Industrial	201,622	4.2%
Agricultural	3,210	0.1%
Religion	40,633	0.8%
Government	124,155	2.6%
Education	181,691	3.8%
Total	**4,837,964**	**100%**

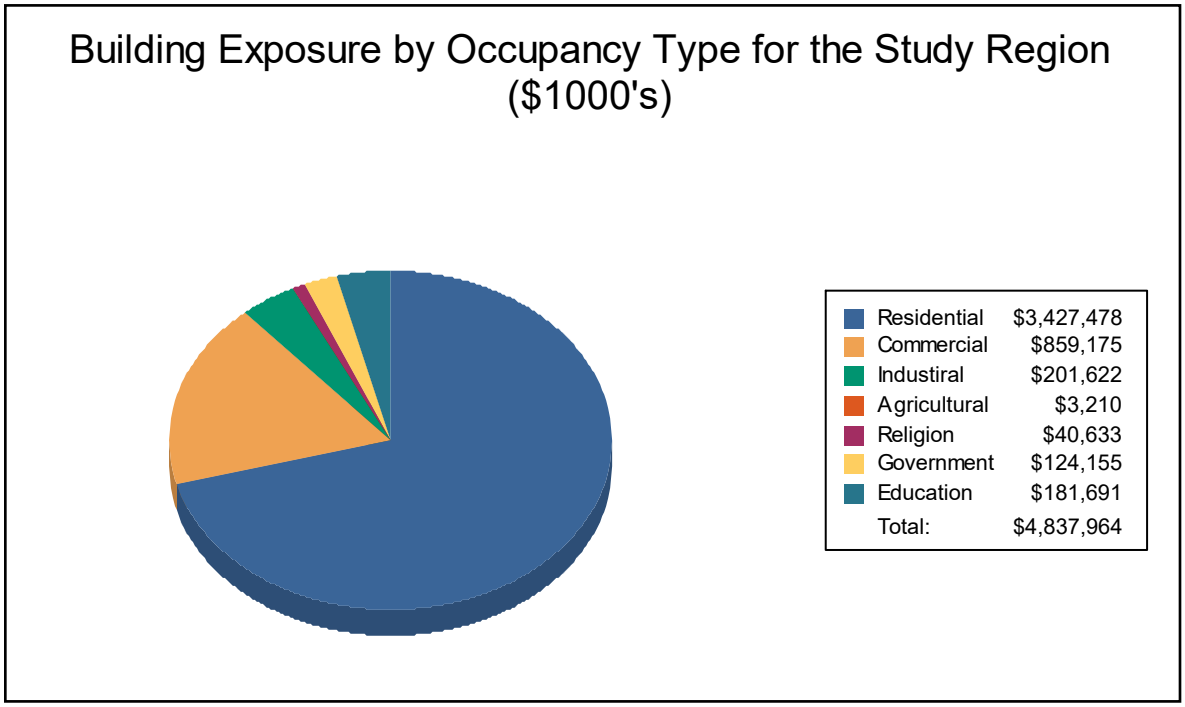
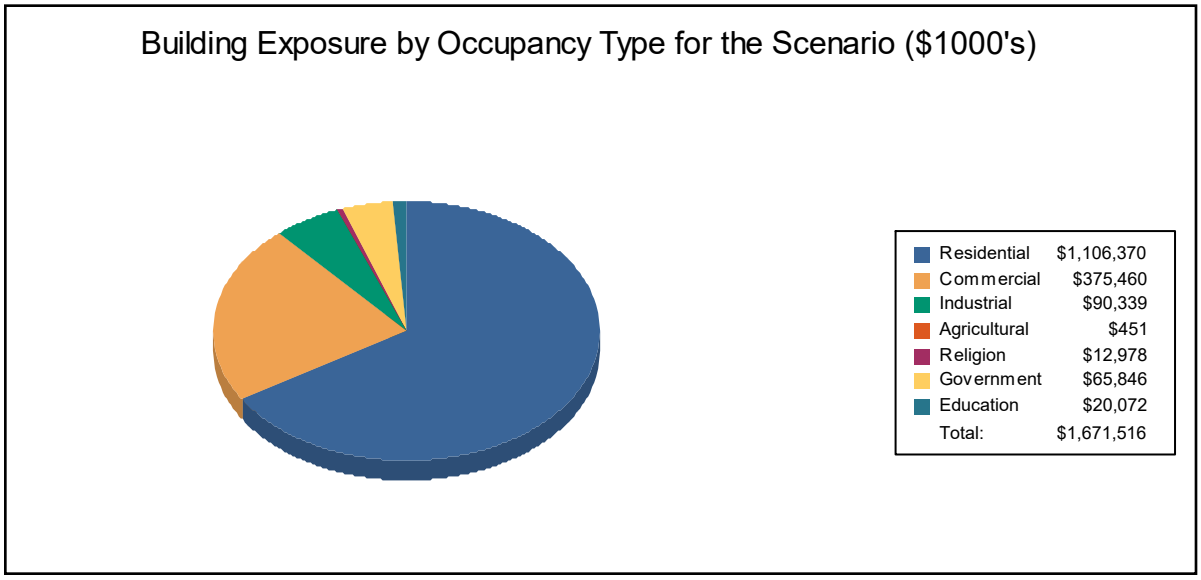


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,106,370	66.2%
Commercial	375,460	22.5%
Industrial	90,339	5.4%
Agricultural	451	0.0%
Religion	12,978	0.8%
Government	65,846	3.9%
Education	20,072	1.2%
Total	**1,671,516**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds.
There are 7 schools, 6 fire stations, 1 police station and 1 emergency operation center.

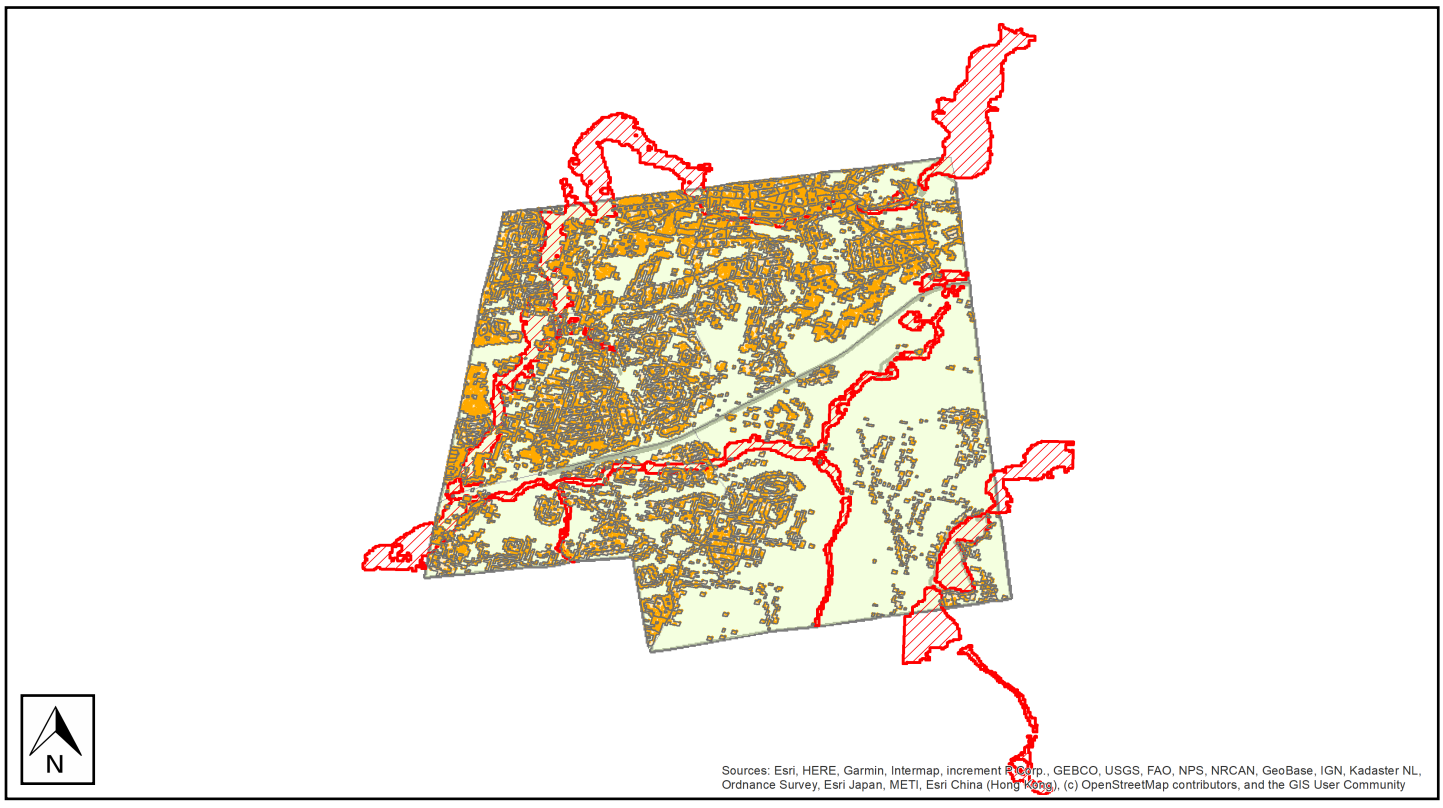
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Vernon_FL
Scenario Name:	Vernon_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 44 buildings will be at least moderately damaged. This is over 97% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

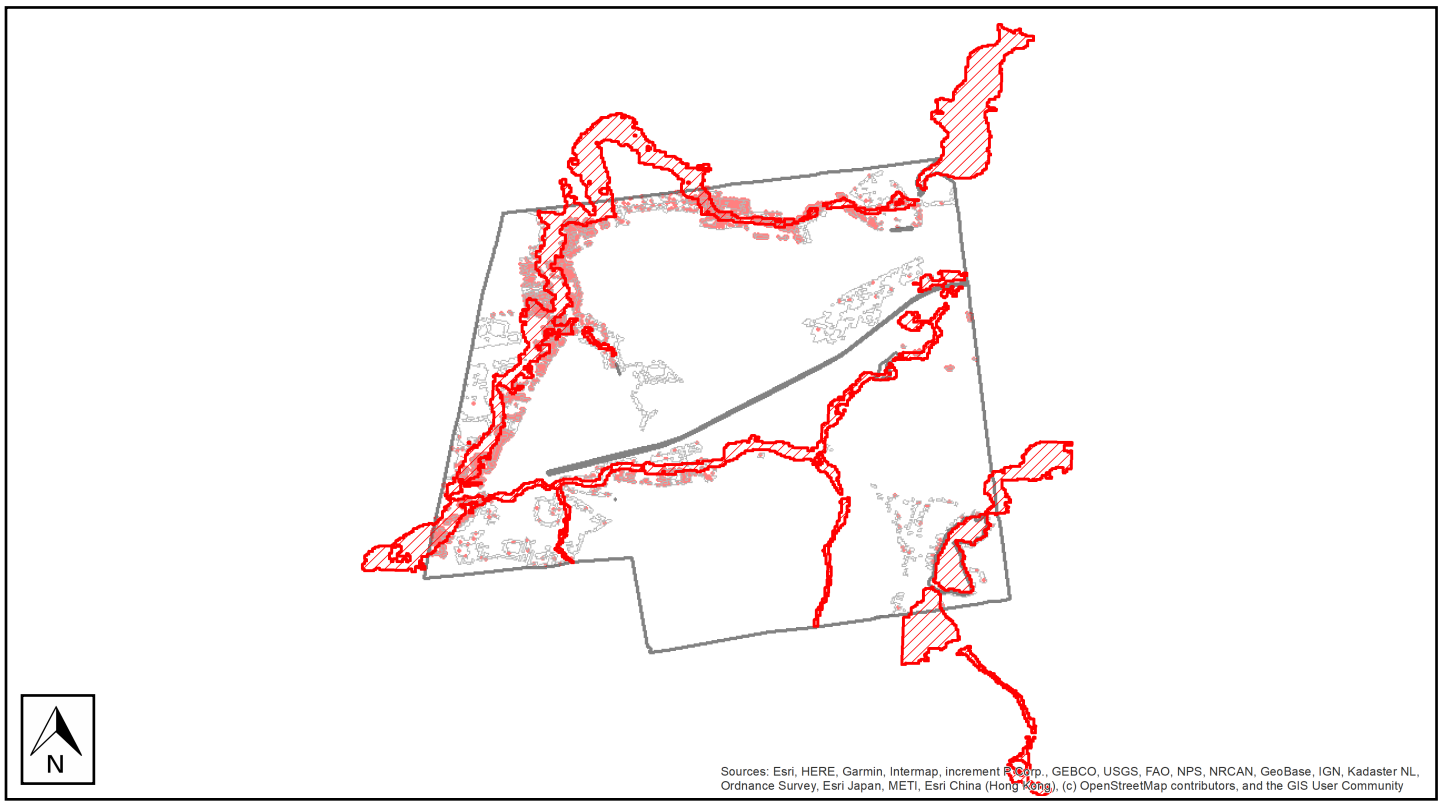


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	8	11	92	0	0	0	0	0	0	0	0
Education	1	100	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	23	42	24	44	7	13	1	2	0	0	0	0
Total	**25**		**36**		**7**		**1**		**0**		**0**	

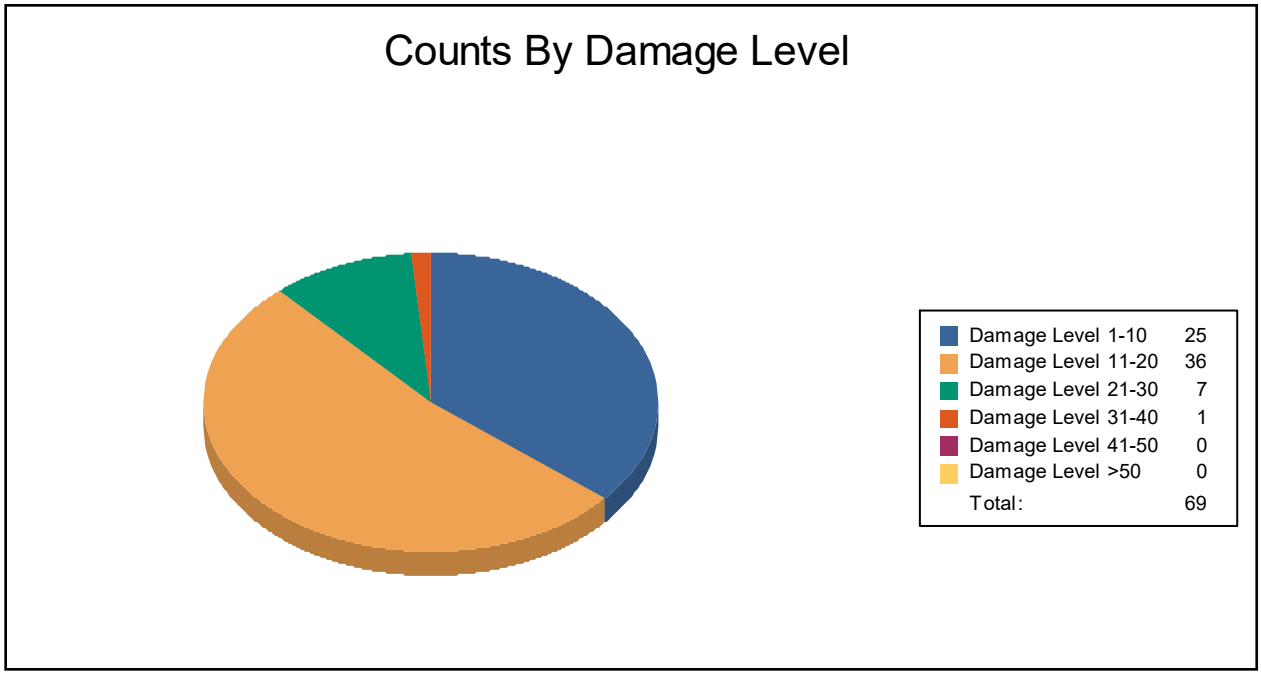


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	1	100	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	5	100	0	0	0	0	0	0	0	0
Steel	0	0	6	100	0	0	0	0	0	0	0	0
Wood	23	41	25	45	7	13	1	2	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 102 hospital beds available for use. On the day of the scenario flood event, the model estimates that 102 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	7	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

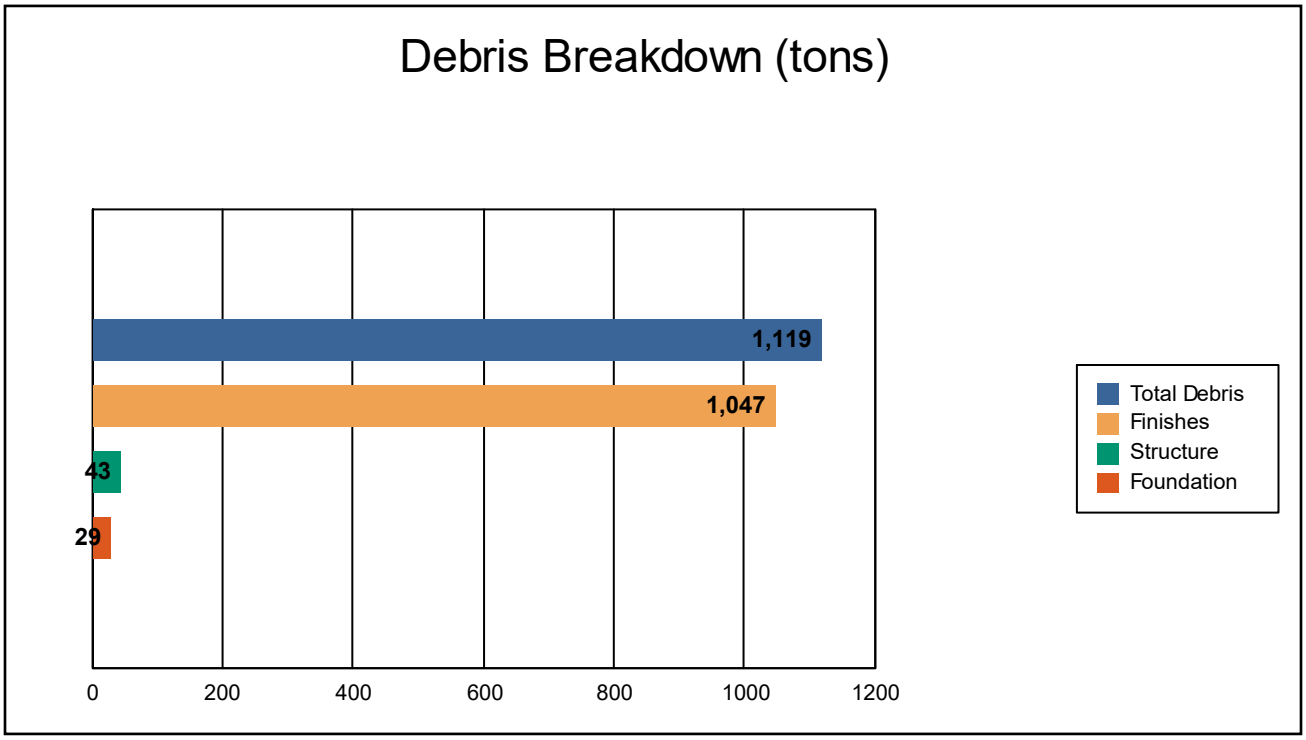
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

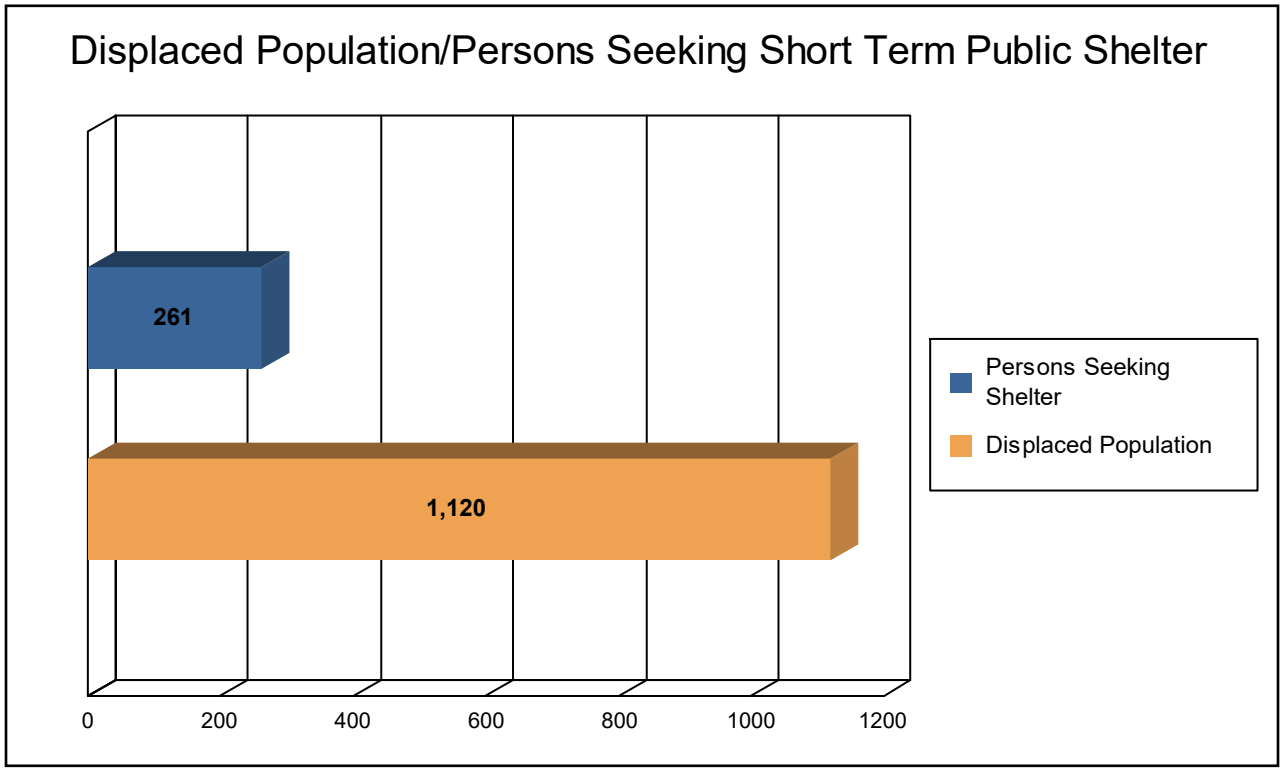


The model estimates that a total of 1,119 tons of debris will be generated. Of the total amount, Finishes comprises 94% of the total, Structure comprises 4% of the total, and Foundation comprises 3%. If the debris tonnage is converted into an estimated number of truckloads, it will require 45 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 373 households (or 1,120 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 261 people (out of a total population of 30,215) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 259.68 million dollars, which represents 15.54 % of the total replacement value of the scenario buildings.

Building-Related Losses

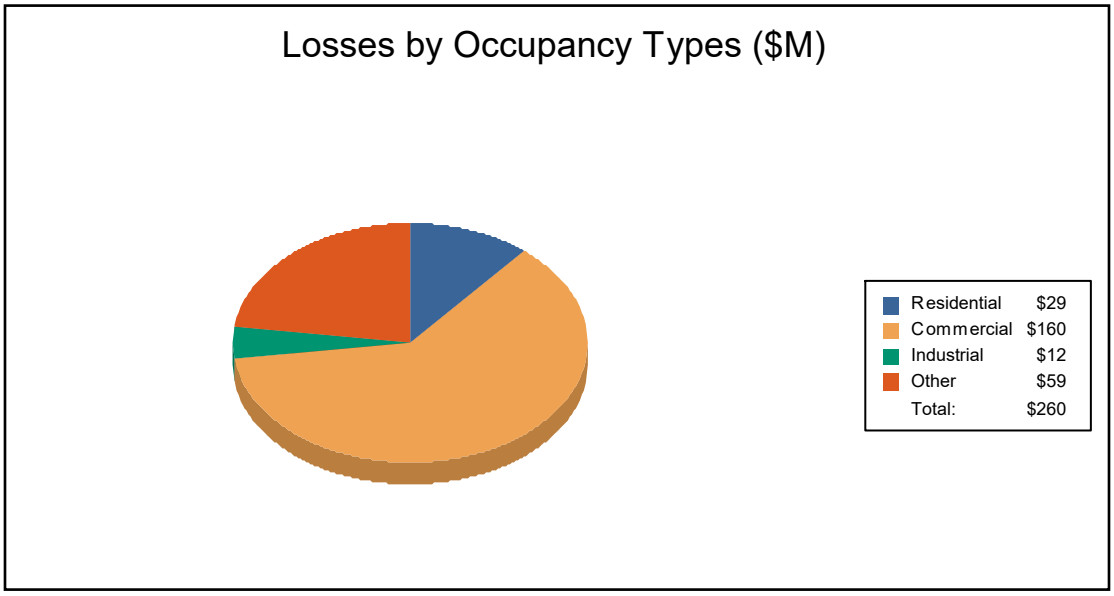
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 121.92 million dollars. 53% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 11.11% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	12.98	14.31	3.00	1.94	32.23
	Content	7.27	52.35	6.78	12.05	78.45
	Inventory	0.00	10.14	1.02	0.08	11.24
	Subtotal	**20.25**	**76.80**	**10.80**	**14.07**	**121.92**
Business Interruption						
	Income	0.42	28.74	0.27	3.65	33.08
	Relocation	3.56	9.16	0.19	2.57	15.48
	Rental Income	3.62	6.52	0.07	0.45	10.66
	Wage	0.99	38.60	0.38	38.57	78.54
	Subtotal	**8.59**	**83.03**	**0.90**	**45.24**	**137.76**
ALL	**Total**	**28.85**	**159.83**	**11.70**	**59.31**	**259.68**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,478	1,410,486	4,837,964
Total	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**
Total Study Region	**30,215**	**3,427,478**	**1,410,486**	**4,837,964**

Hazus: Flood Global Risk Report

Region Name: West_Hartford_FL

Flood Scenario: West_Hartford_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 11 square miles and contains 703 census blocks. The region contains over 26 thousand households and has a total population of 64,083 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 21,341 buildings in the region with a total building replacement value (excluding contents) of 13,218 million dollars. Approximately 89.34% of the buildings (and 71.93% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 21,341 buildings in the region which have an aggregate total replacement value of 13,218 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	9,507,581	71.9%
Commercial	2,043,871	15.5%
Industrial	408,881	3.1%
Agricultural	13,663	0.1%
Religion	189,128	1.4%
Government	242,128	1.8%
Education	812,779	6.1%
Total	**13,218,031**	**100%**

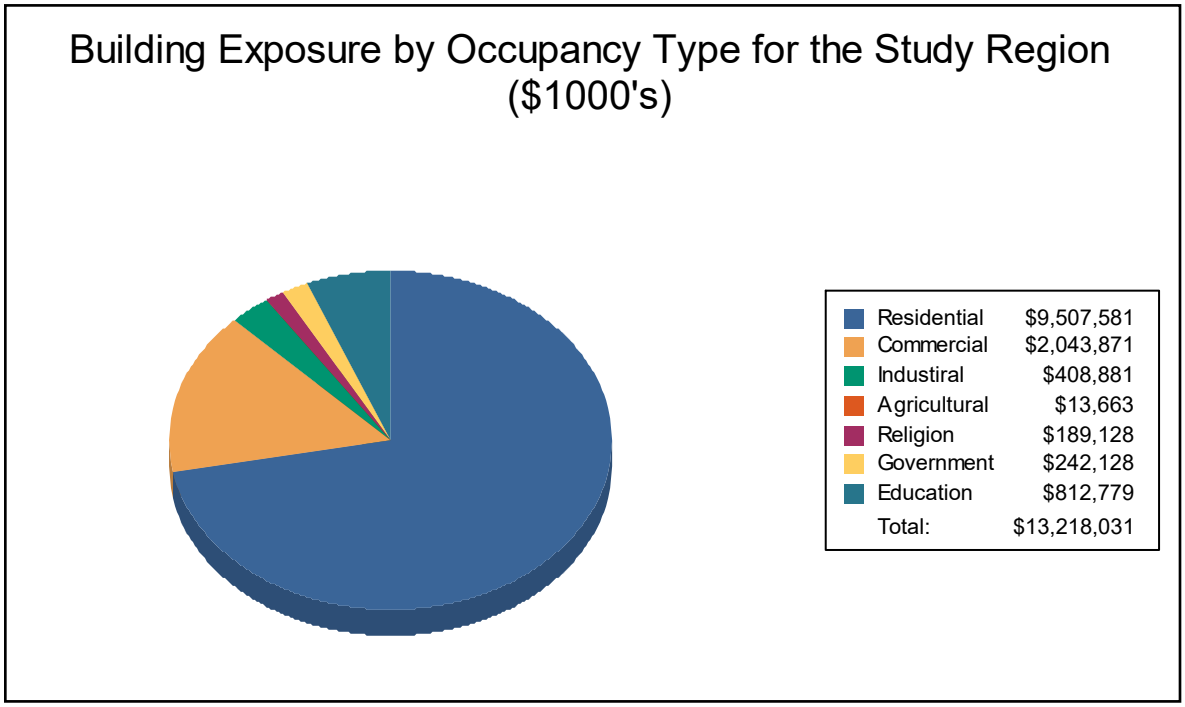
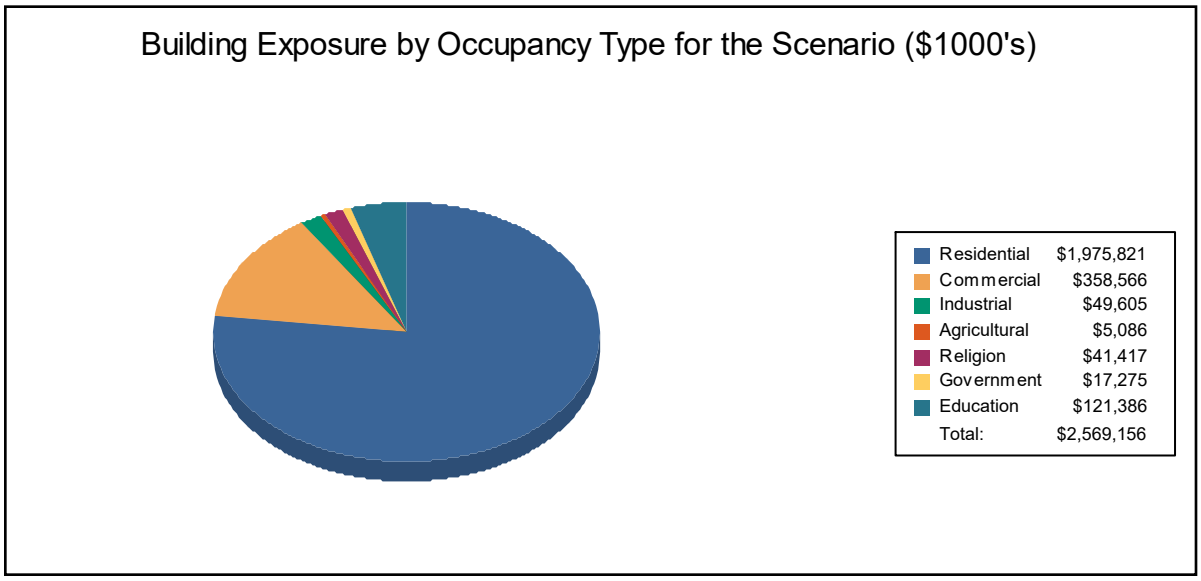


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,975,821	76.9%
Commercial	358,566	14.0%
Industrial	49,605	1.9%
Agricultural	5,086	0.2%
Religion	41,417	1.6%
Government	17,275	0.7%
Education	121,386	4.7%
Total	**2,569,156**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds.
There are 34 schools, 5 fire stations, 1 police station and 1 emergency operation center.

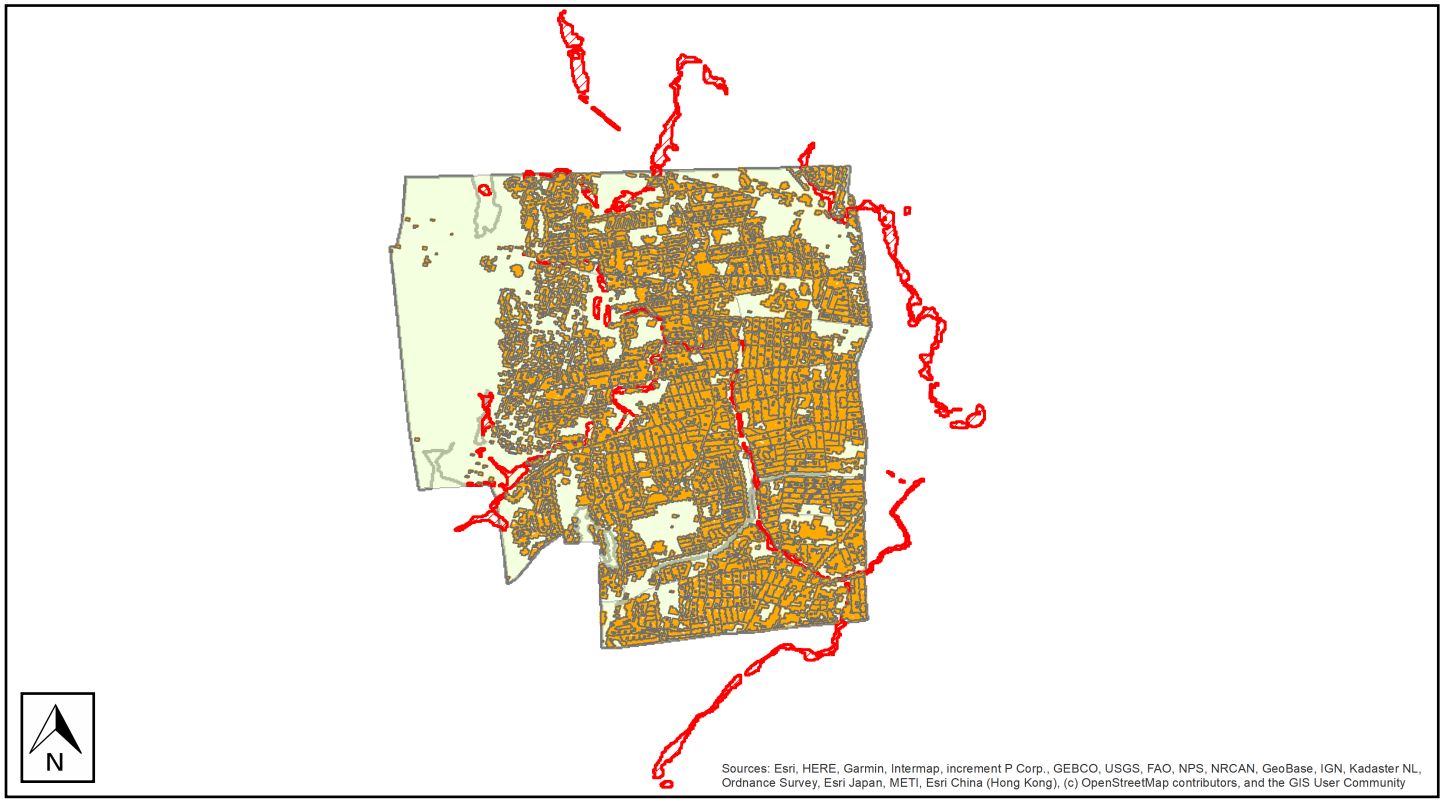
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	West_Hartford_FL
Scenario Name:	West_Hartford_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 49 buildings will be at least moderately damaged. This is over 93% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

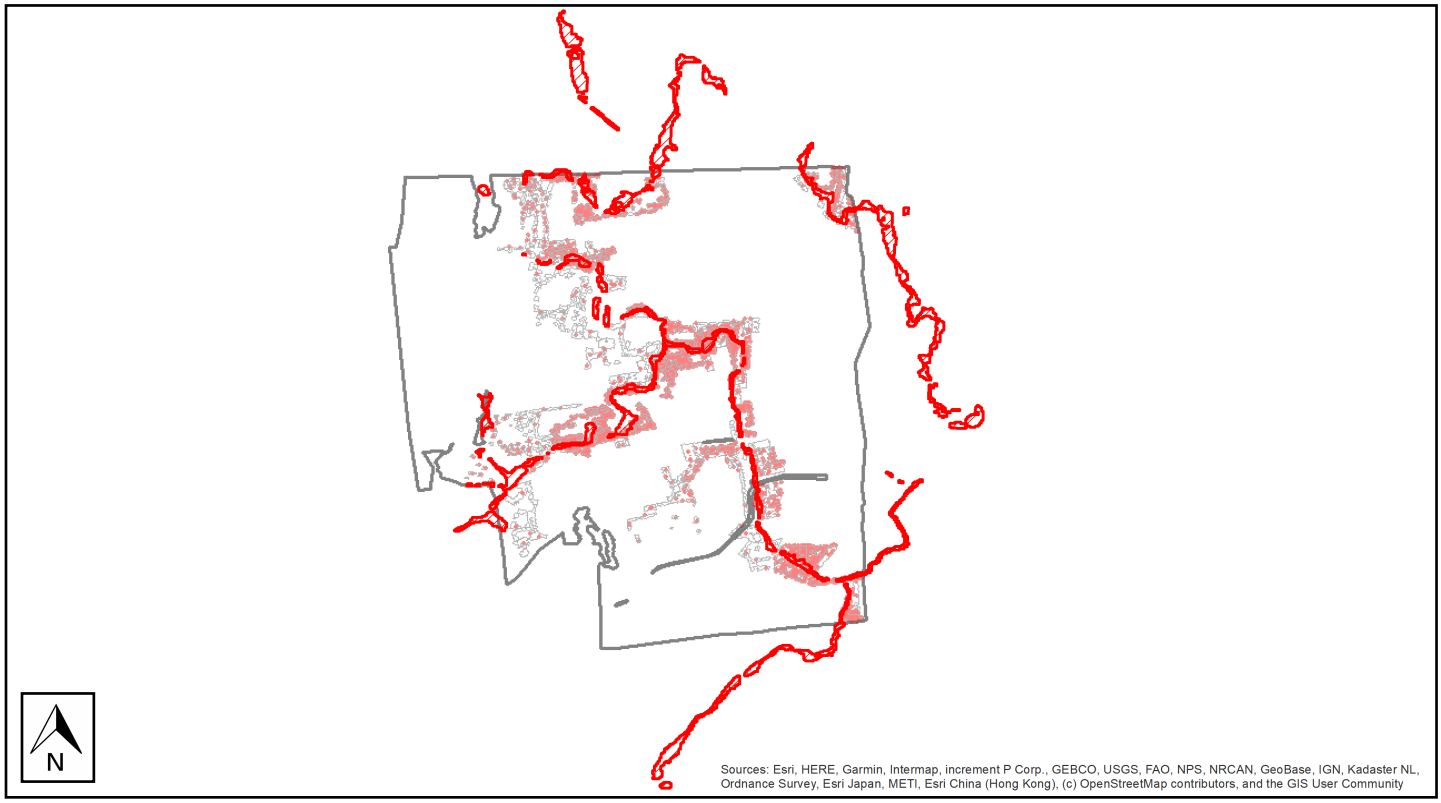


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	38	44	39	45	9	10	1	1	0	0	0	0
Total	**38**		**39**		**9**		**1**		**0**		**0**	

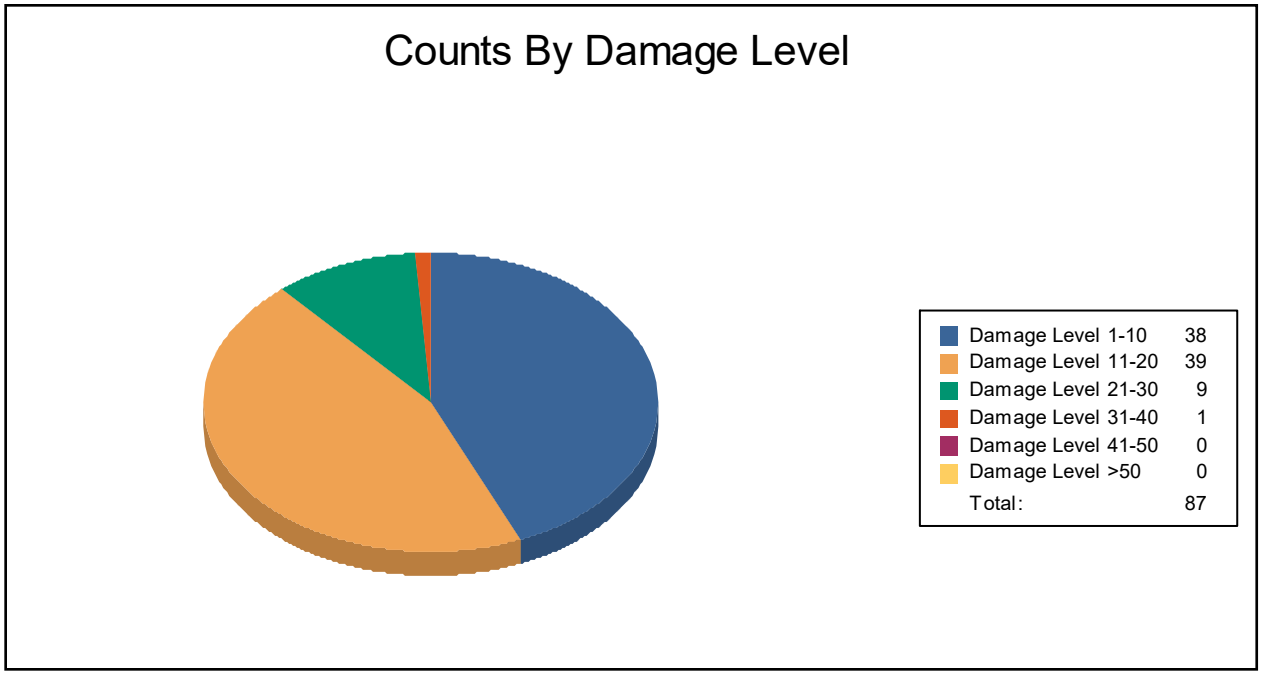


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	38	44	39	45	9	10	1	1	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 332 hospital beds available for use. On the day of the scenario flood event, the model estimates that 332 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	34	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

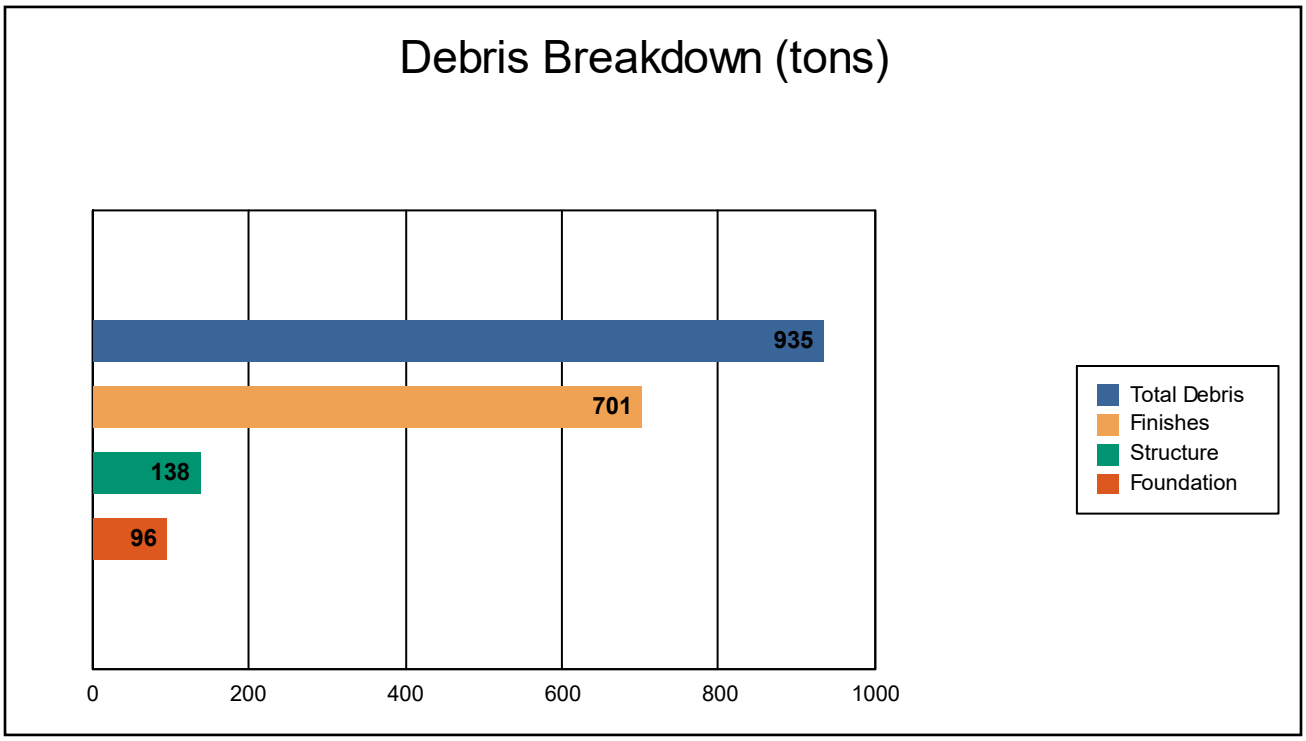
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

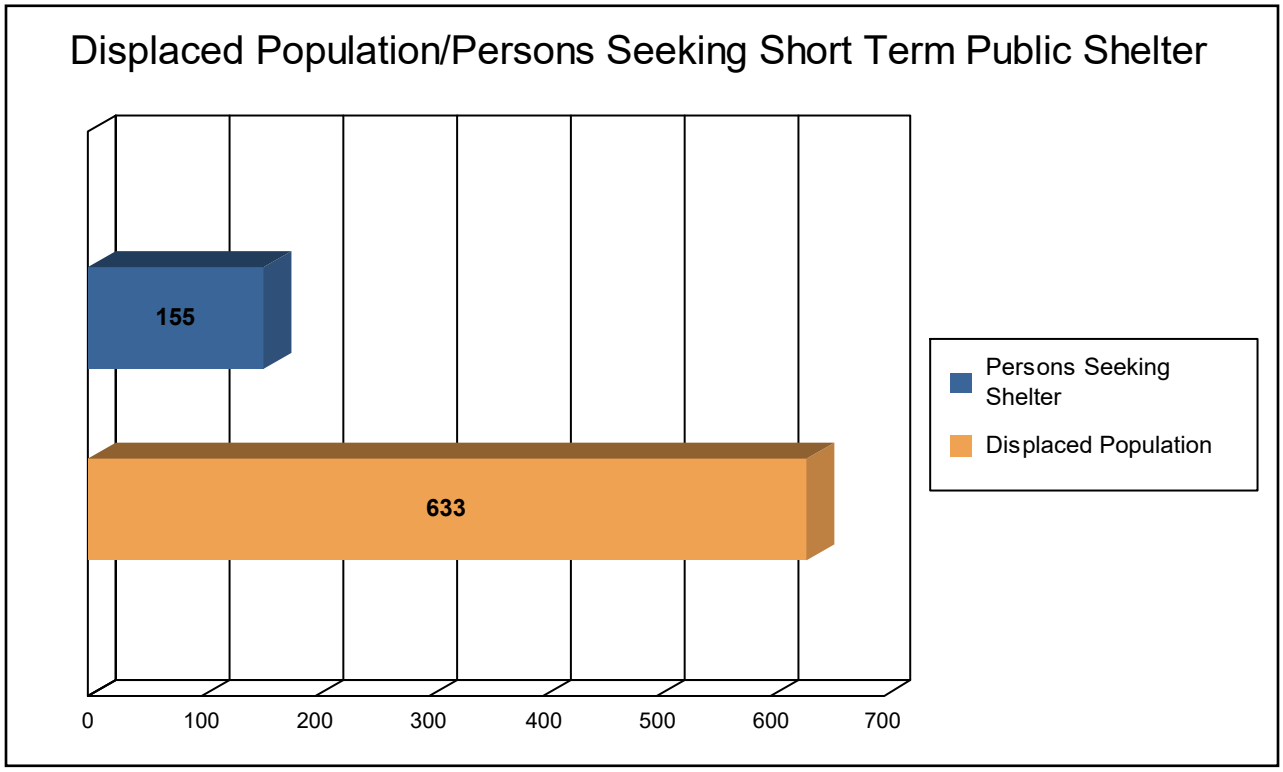


The model estimates that a total of 935 tons of debris will be generated. Of the total amount, Finishes comprises 75% of the total, Structure comprises 15% of the total, and Foundation comprises 10%. If the debris tonnage is converted into an estimated number of truckloads, it will require 38 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 211 households (or 633 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 155 people (out of a total population of 64,083) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 63.46 million dollars, which represents 2.47 % of the total replacement value of the scenario buildings.

Building-Related Losses

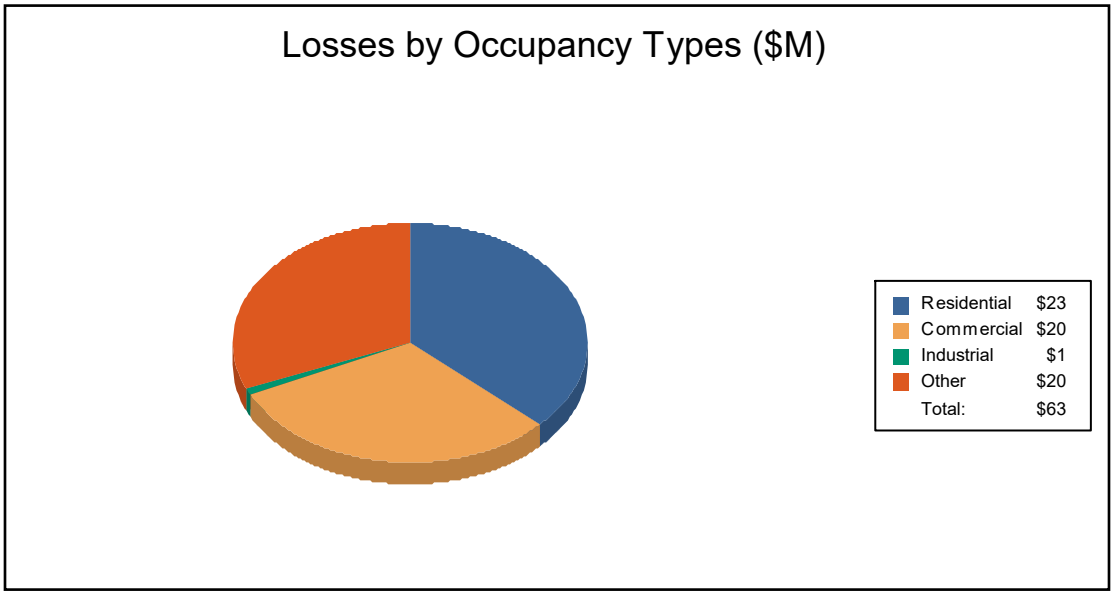
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 33.68 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 36.98% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	12.70	1.89	0.19	0.70	15.48
	Content	5.59	6.87	0.32	4.05	16.83
	Inventory	0.00	1.26	0.04	0.07	1.37
	Subtotal	**18.29**	**10.02**	**0.56**	**4.81**	**33.68**
Business Interruption						
	Income	0.01	3.37	0.01	2.05	5.44
	Relocation	3.79	0.83	0.01	1.26	5.89
	Rental Income	1.34	0.58	0.00	0.19	2.11
	Wage	0.03	4.72	0.02	11.57	16.34
	Subtotal	**5.18**	**9.50**	**0.04**	**15.06**	**29.78**
ALL	**Total**	**23.47**	**19.52**	**0.60**	**19.87**	**63.46**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,507,581	3,710,450	13,218,031
Total	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**
Total Study Region	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**

Hazus: Flood Global Risk Report

Region Name: West_Hartford_FL

Flood Scenario: West_Hartford_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 11 square miles and contains 703 census blocks. The region contains over 26 thousand households and has a total population of 64,083 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 21,341 buildings in the region with a total building replacement value (excluding contents) of 13,218 million dollars. Approximately 89.34% of the buildings (and 71.93% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 21,341 buildings in the region which have an aggregate total replacement value of 13,218 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	9,507,581	71.9%
Commercial	2,043,871	15.5%
Industrial	408,881	3.1%
Agricultural	13,663	0.1%
Religion	189,128	1.4%
Government	242,128	1.8%
Education	812,779	6.1%
Total	**13,218,031**	**100%**

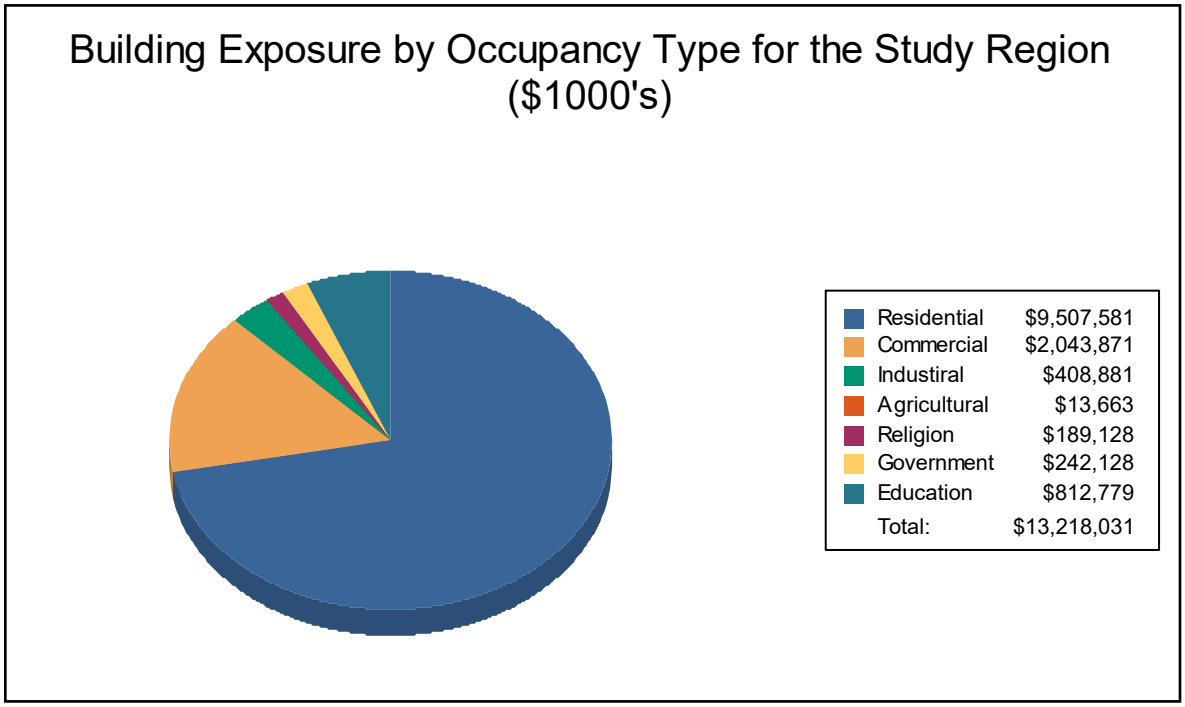
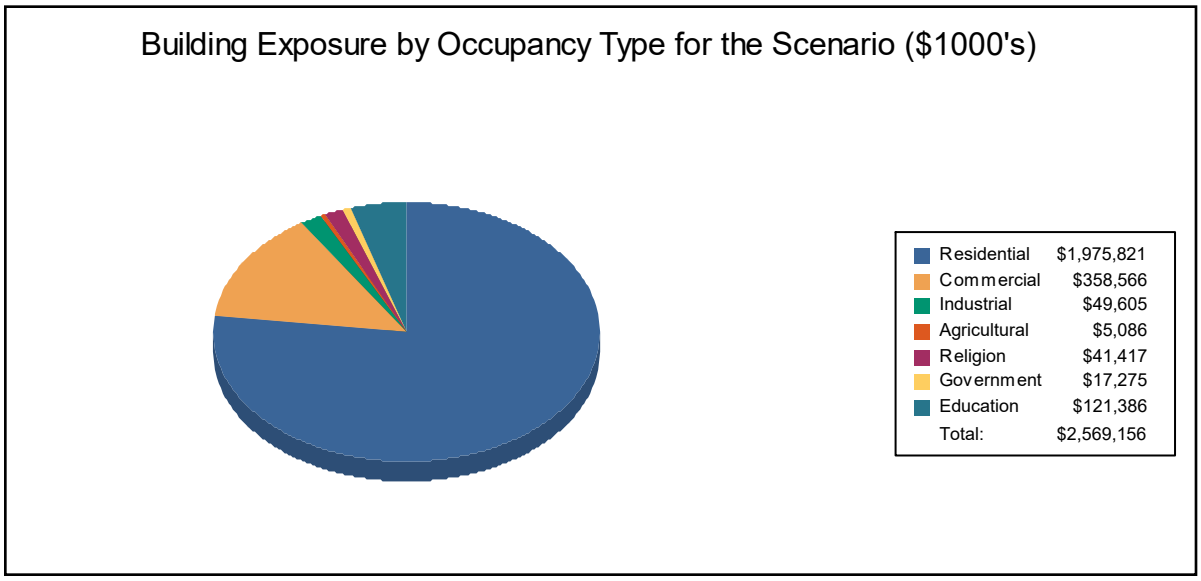


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,975,821	76.9%
Commercial	358,566	14.0%
Industrial	49,605	1.9%
Agricultural	5,086	0.2%
Religion	41,417	1.6%
Government	17,275	0.7%
Education	121,386	4.7%
Total	**2,569,156**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds.
There are 34 schools, 5 fire stations, 1 police station and 1 emergency operation center.

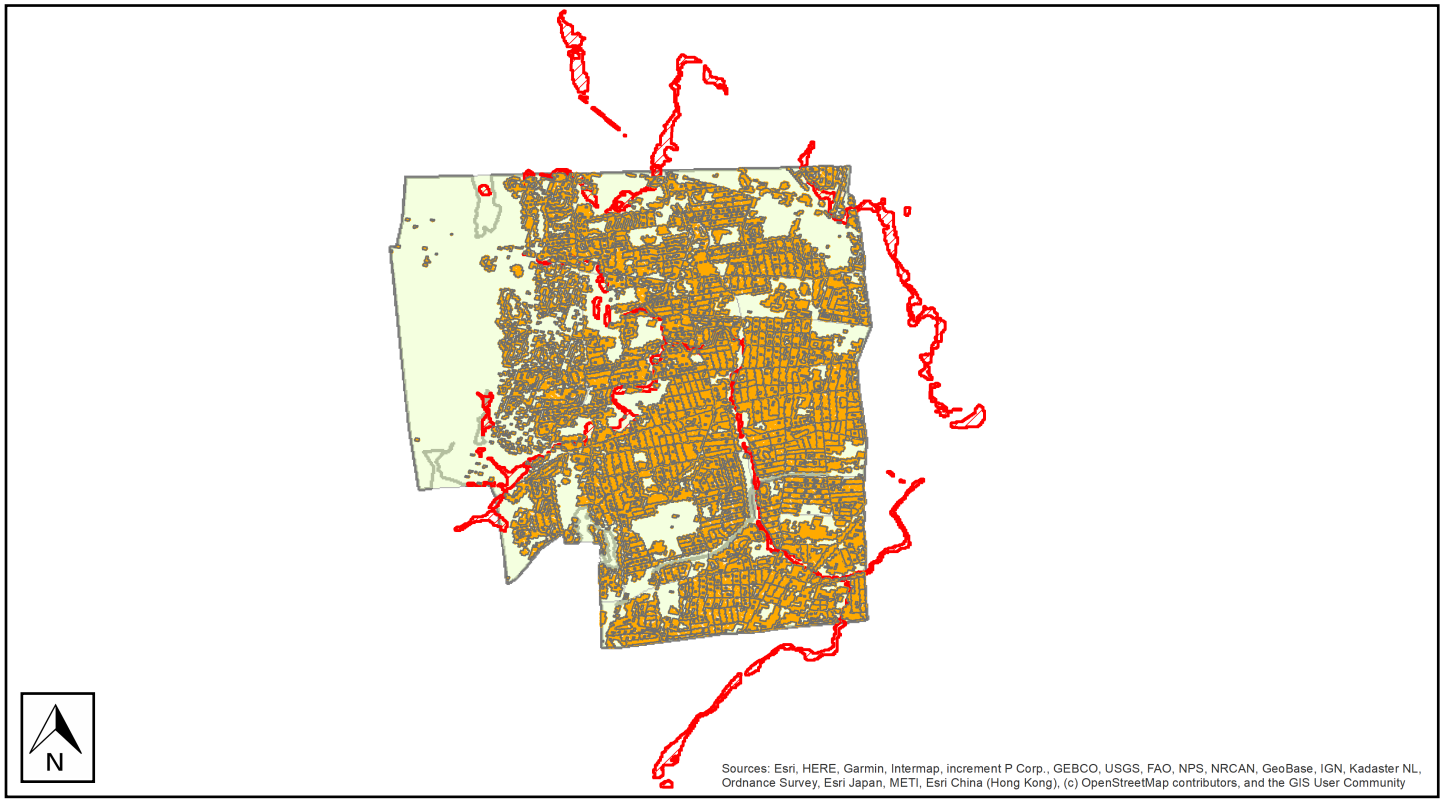
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	West_Hartford_FL
Scenario Name:	West_Hartford_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 61 buildings will be at least moderately damaged. This is over 91% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

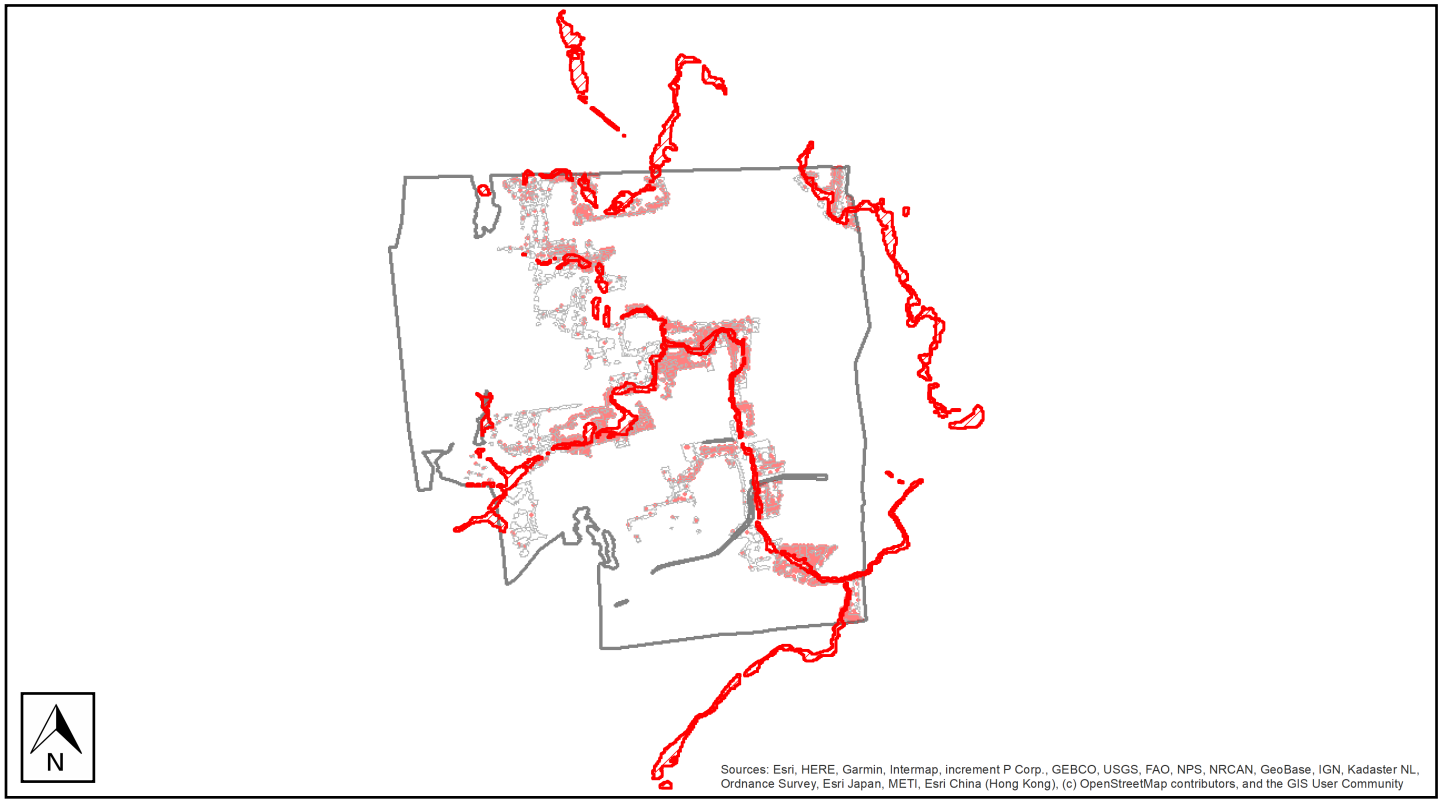


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	40	40	50	50	10	10	1	1	0	0	0	0
Total	**40**		**50**		**10**		**1**		**0**		**0**	

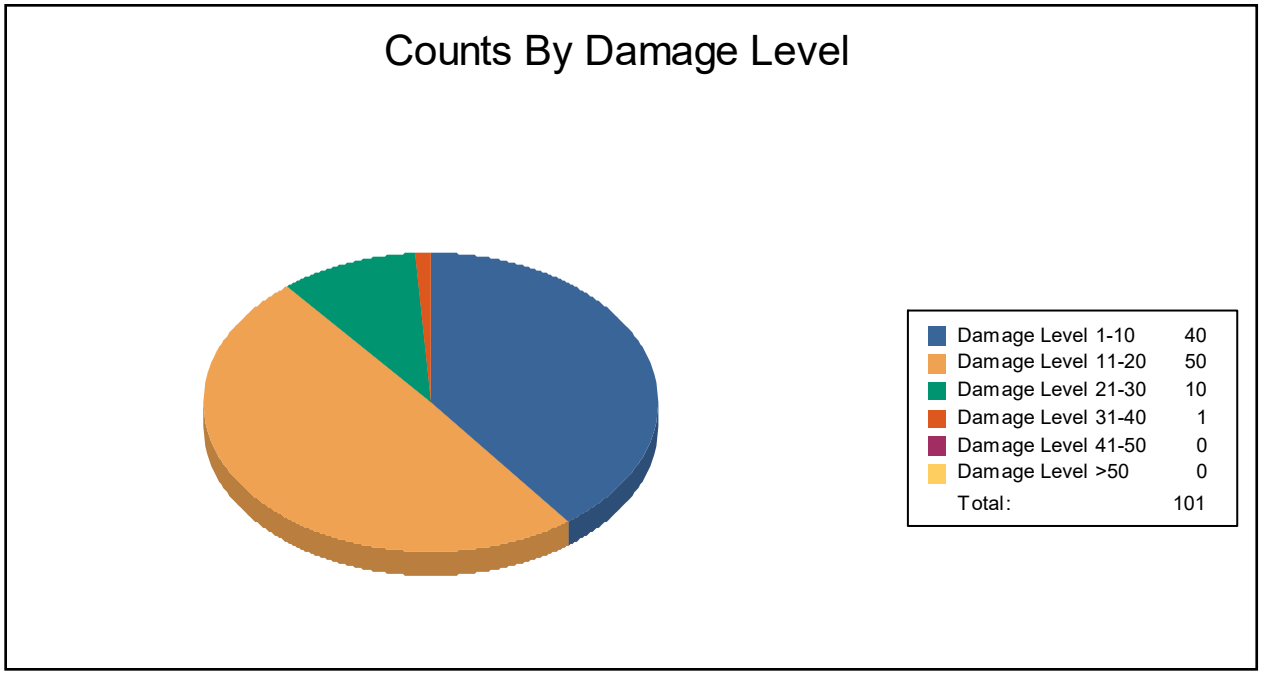


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	40	40	50	50	10	10	1	1	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 332 hospital beds available for use. On the day of the scenario flood event, the model estimates that 332 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	34	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

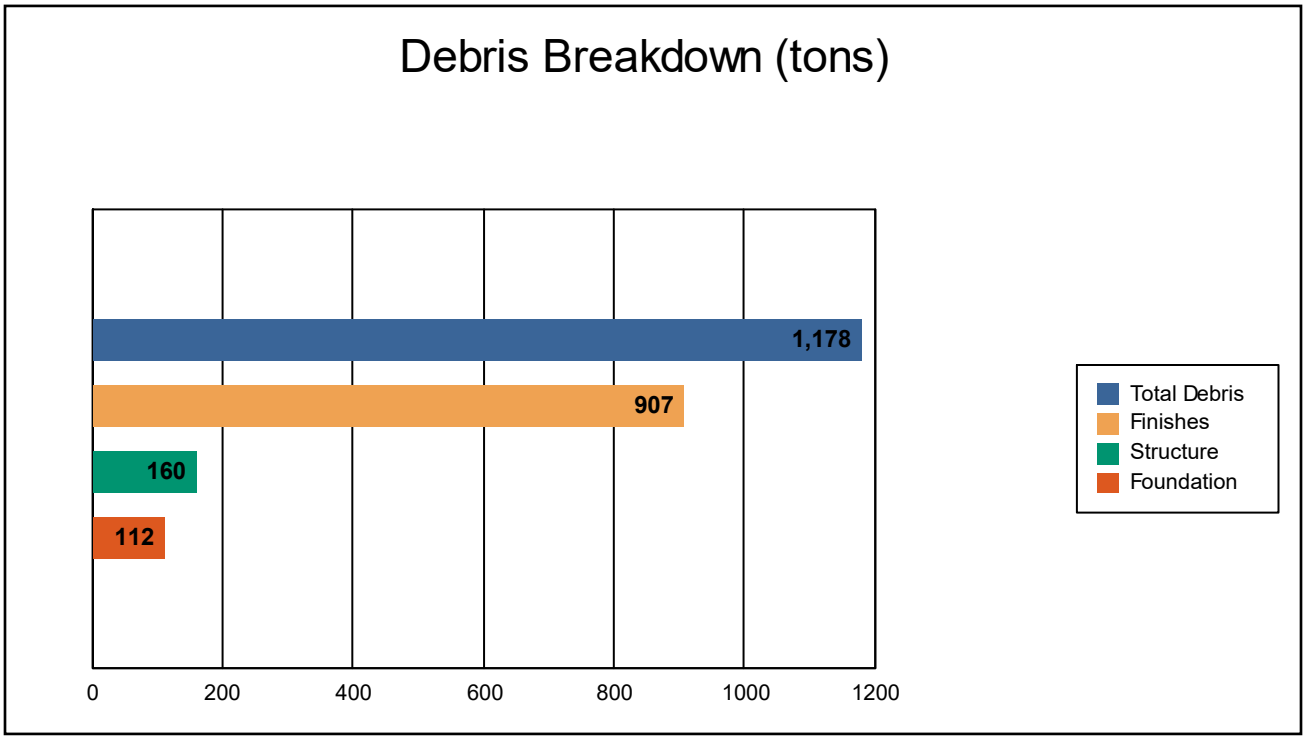
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

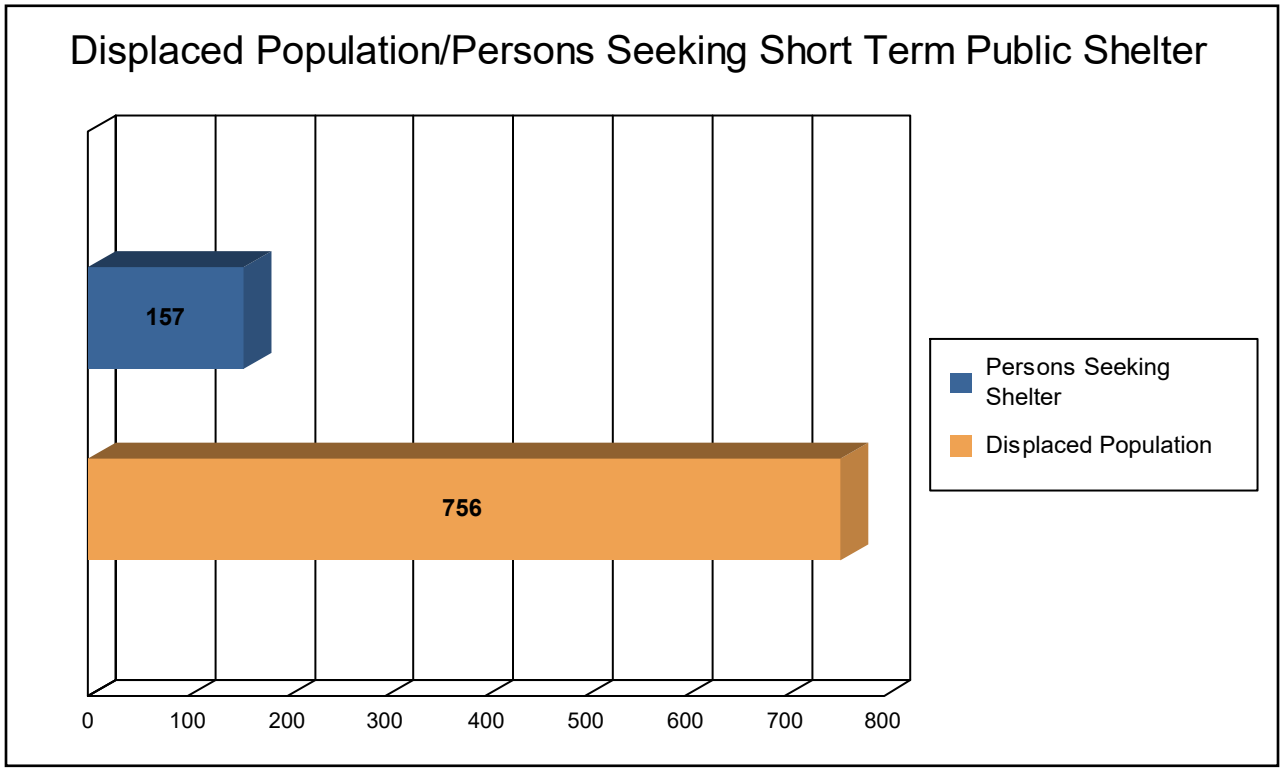


The model estimates that a total of 1,178 tons of debris will be generated. Of the total amount, Finishes comprises 77% of the total, Structure comprises 14% of the total, and Foundation comprises 9%. If the debris tonnage is converted into an estimated number of truckloads, it will require 48 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 252 households (or 756 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 157 people (out of a total population of 64,083) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 75.97 million dollars, which represents 2.96 % of the total replacement value of the scenario buildings.

Building-Related Losses

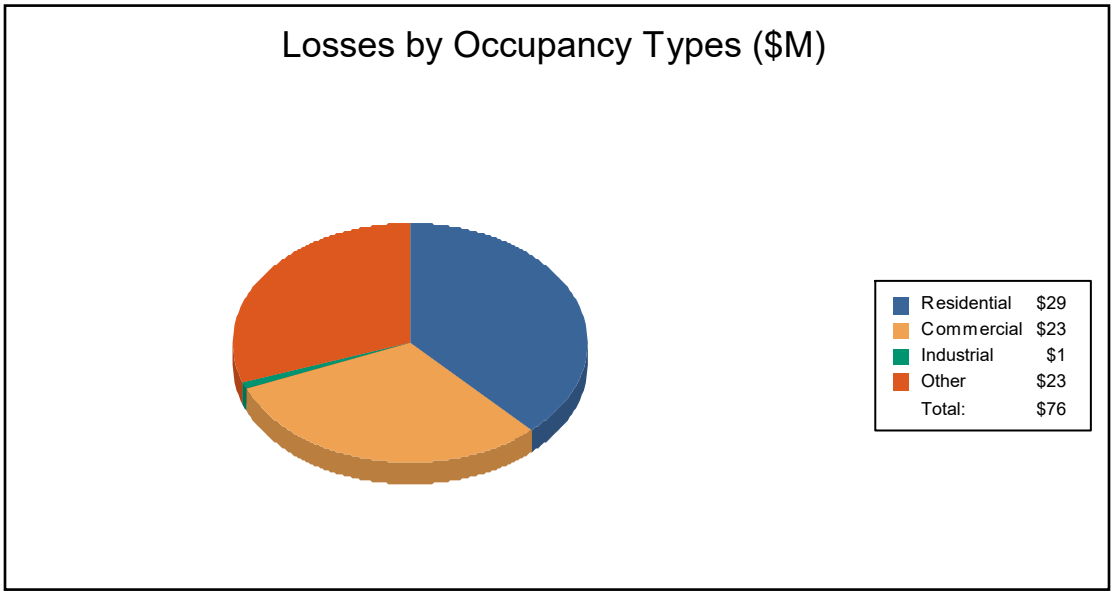
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 41.18 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 37.92% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	15.67	2.33	0.25	0.88	19.14
	Content	6.92	7.95	0.45	5.12	20.44
	Inventory	0.00	1.47	0.06	0.08	1.60
	Subtotal	**22.59**	**11.75**	**0.76**	**6.08**	**41.18**
Business Interruption						
	Income	0.01	4.10	0.01	2.33	6.46
	Relocation	4.53	1.10	0.02	1.41	7.06
	Rental Income	1.63	0.76	0.00	0.21	2.61
	Wage	0.04	5.70	0.02	12.91	18.67
	Subtotal	**6.21**	**11.66**	**0.05**	**16.87**	**34.79**
ALL	**Total**	**28.81**	**23.41**	**0.82**	**22.95**	**75.97**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,507,581	3,710,450	13,218,031
Total	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**
Total Study Region	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**

Hazus: Flood Global Risk Report

Region Name: West_Hartford_FL

Flood Scenario: West_Hartford_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 11 square miles and contains 703 census blocks. The region contains over 26 thousand households and has a total population of 64,083 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 21,341 buildings in the region with a total building replacement value (excluding contents) of 13,218 million dollars. Approximately 89.34% of the buildings (and 71.93% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 21,341 buildings in the region which have an aggregate total replacement value of 13,218 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

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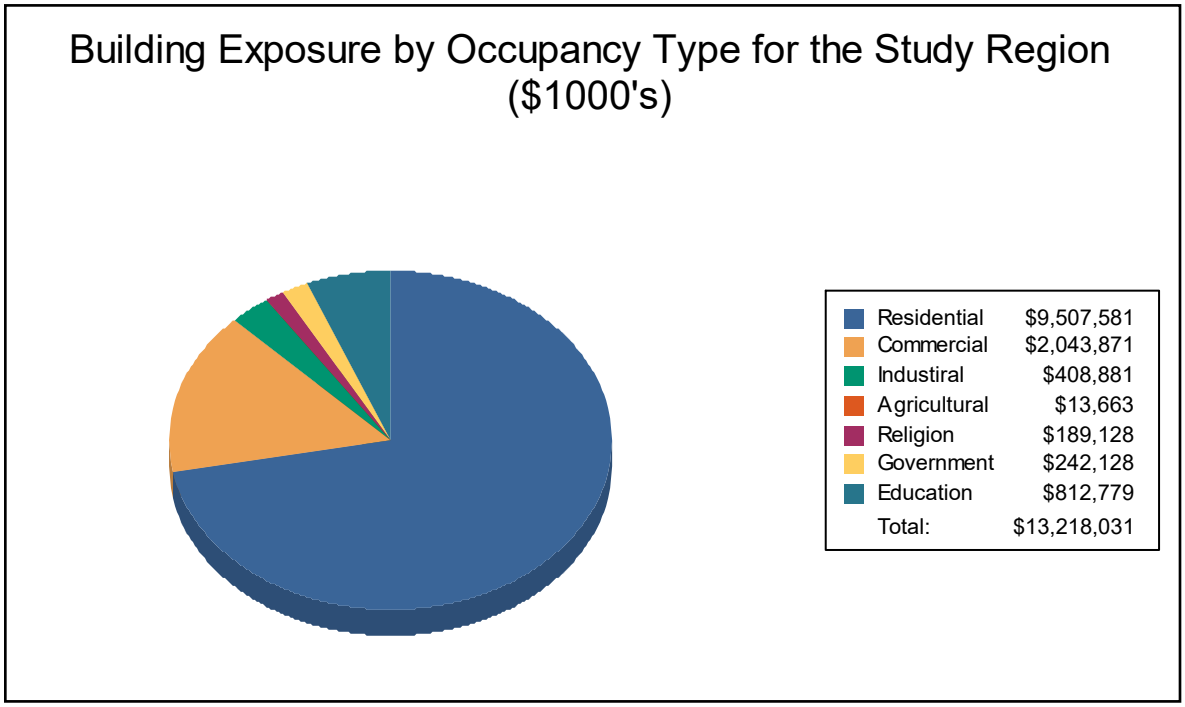

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,975,821	76.9%
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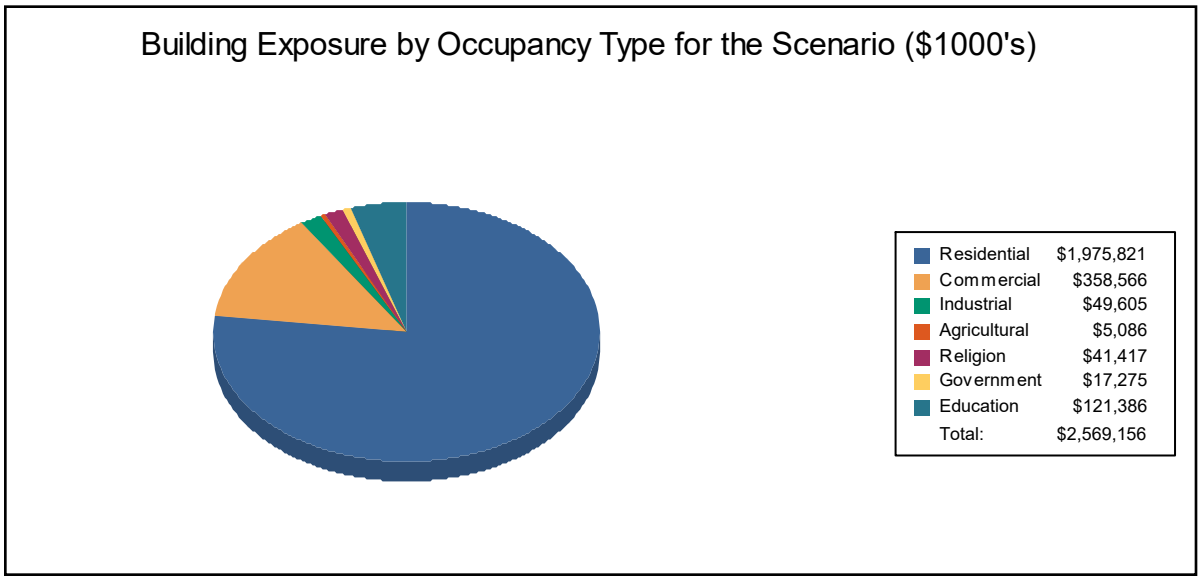
Industrial	49,605	1.9%
Agricultural	5,086	0.2%
Religion	41,417	1.6%
Government	17,275	0.7%
Education	121,386	4.7%
Total	**2,569,156**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds.
There are 34 schools, 5 fire stations, 1 police station and 1 emergency operation center.

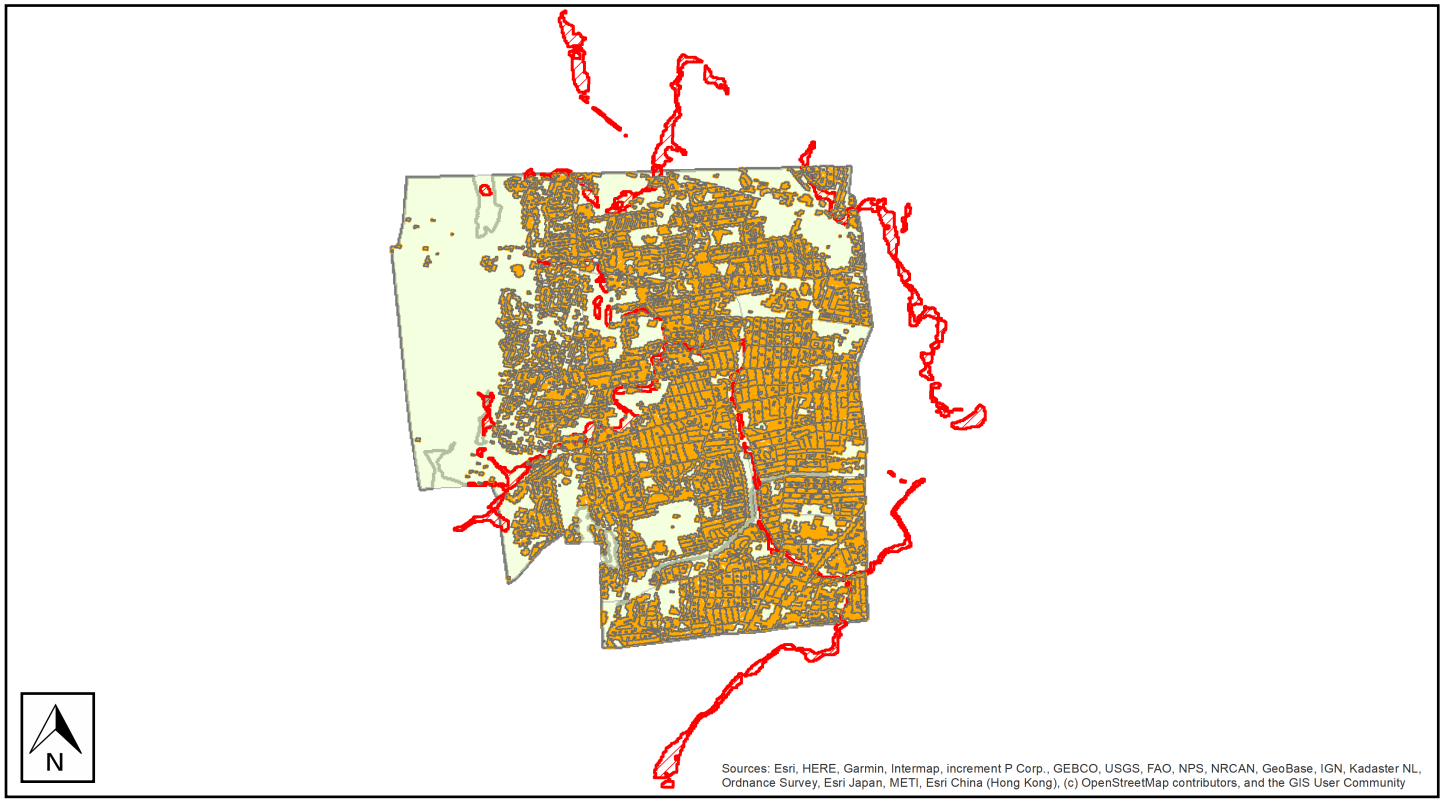
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	West_Hartford_FL
Scenario Name:	West_Hartford_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 71 buildings will be at least moderately damaged. This is over 88% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

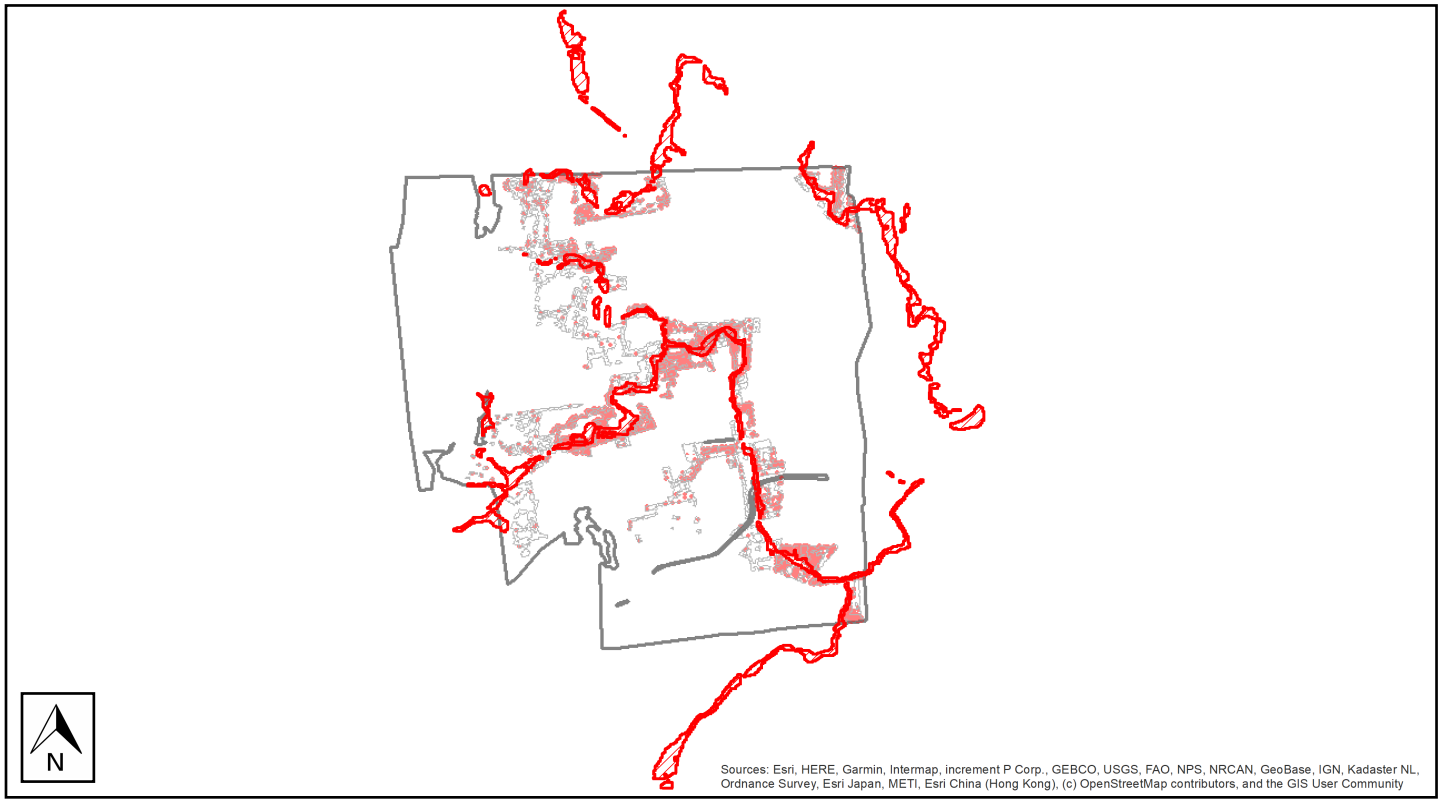


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	55	44	51	40	16	13	4	3	0	0	0	0
Total	**55**		**51**		**16**		**4**		**0**		**0**	

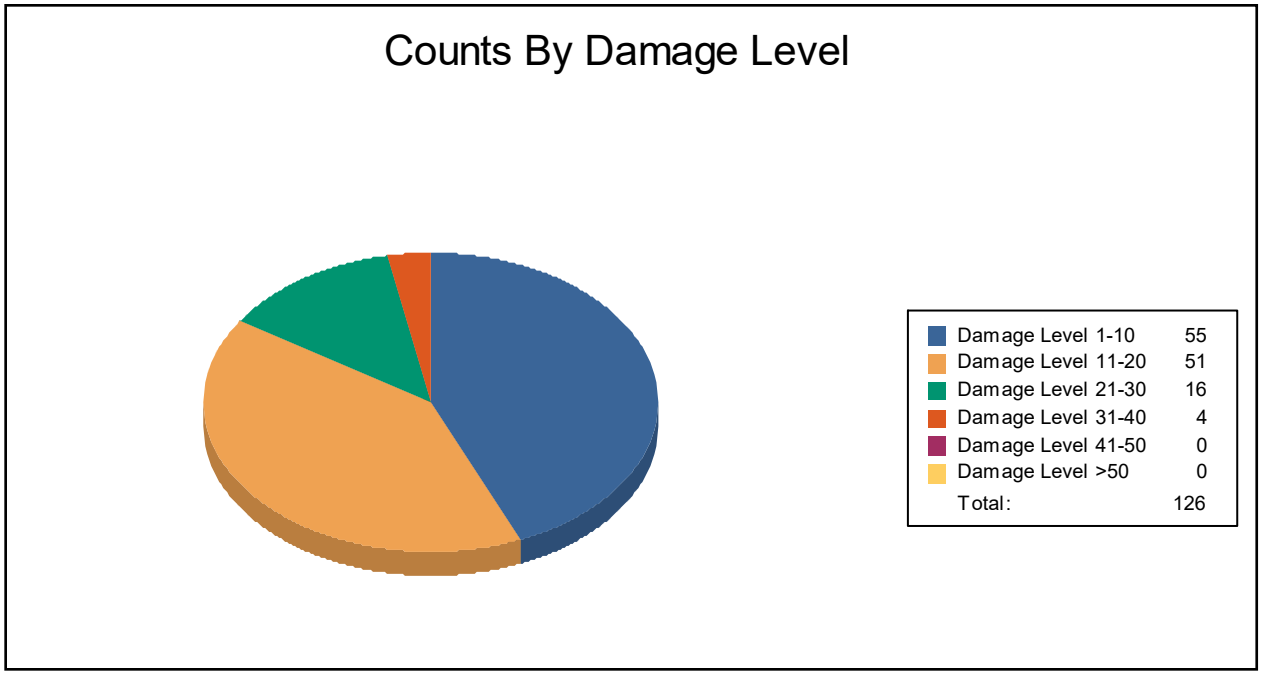


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	55	44	51	40	16	13	4	3	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 332 hospital beds available for use. On the day of the scenario flood event, the model estimates that 332 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	34	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

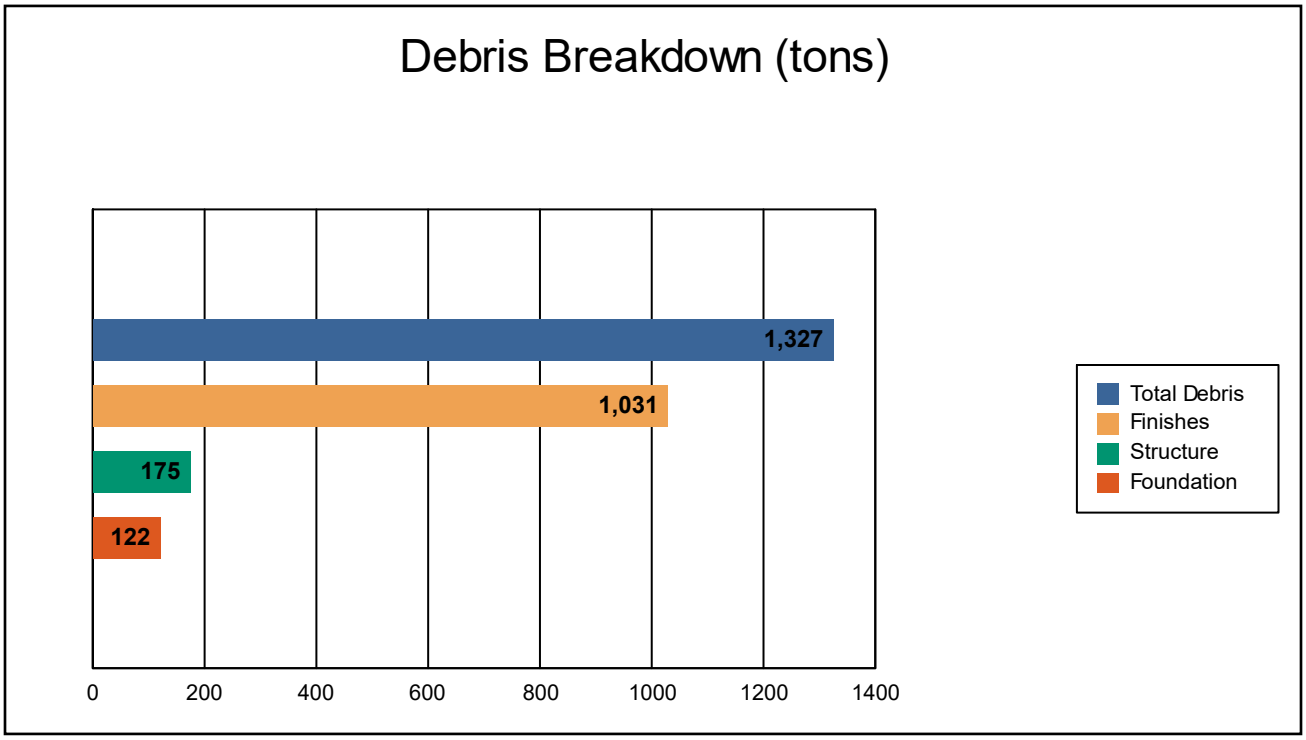
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

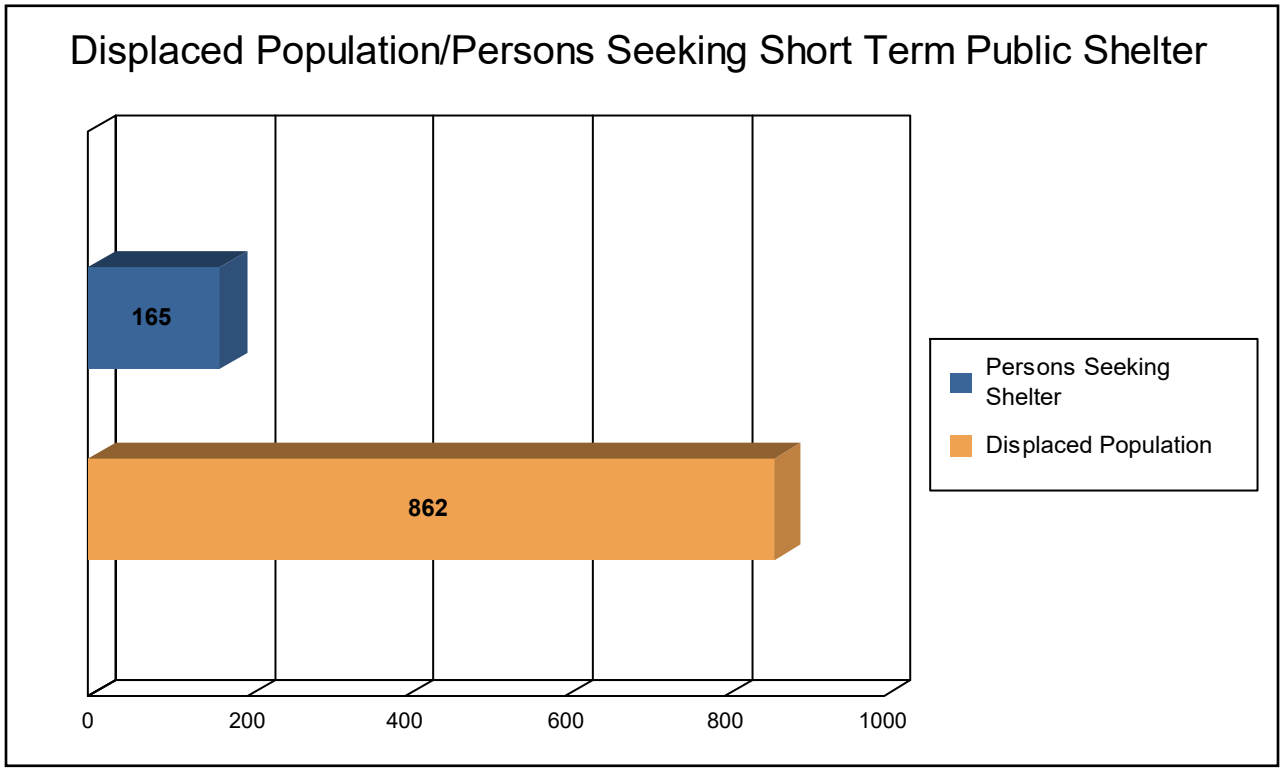


The model estimates that a total of 1,327 tons of debris will be generated. Of the total amount, Finishes comprises 78% of the total, Structure comprises 13% of the total, and Foundation comprises 9%. If the debris tonnage is converted into an estimated number of truckloads, it will require 54 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 287 households (or 862 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 165 people (out of a total population of 64,083) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 87.31 million dollars, which represents 3.40 % of the total replacement value of the scenario buildings.

Building-Related Losses

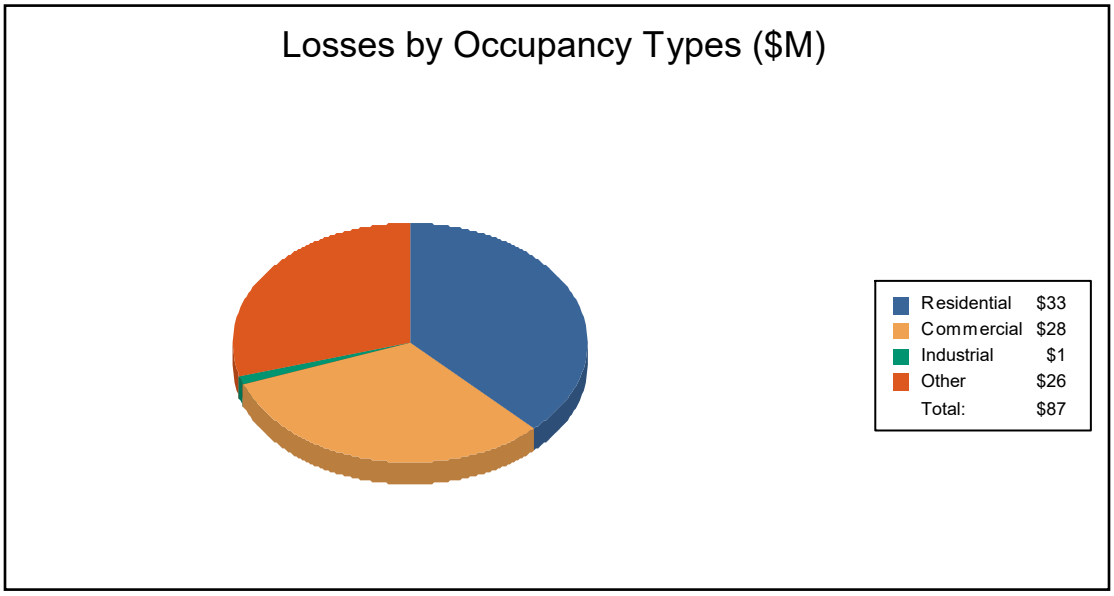
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 47.71 million dollars. 45% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 37.74% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	17.87	2.85	0.31	1.04	22.07
	Content	7.95	9.24	0.59	5.98	23.75
	Inventory	0.00	1.72	0.08	0.09	1.89
	Subtotal	**25.82**	**13.81**	**0.98**	**7.11**	**47.71**
Business Interruption						
	Income	0.02	4.92	0.02	2.63	7.58
	Relocation	5.19	1.33	0.02	1.58	8.11
	Rental Income	1.89	0.93	0.00	0.23	3.05
	Wage	0.04	6.68	0.03	14.11	20.85
	Subtotal	**7.13**	**13.85**	**0.07**	**18.55**	**39.60**
ALL	**Total**	**32.95**	**27.66**	**1.04**	**25.65**	**87.31**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,507,581	3,710,450	13,218,031
Total	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**
Total Study Region	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**

Hazus: Flood Global Risk Report

Region Name: West_Hartford_FL

Flood Scenario: West_Hartford_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 11 square miles and contains 703 census blocks. The region contains over 26 thousand households and has a total population of 64,083 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 21,341 buildings in the region with a total building replacement value (excluding contents) of 13,218 million dollars. Approximately 89.34% of the buildings (and 71.93% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 21,341 buildings in the region which have an aggregate total replacement value of 13,218 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	9,507,581	71.9%
Commercial	2,043,871	15.5%
Industrial	408,881	3.1%
Agricultural	13,663	0.1%
Religion	189,128	1.4%
Government	242,128	1.8%
Education	812,779	6.1%
Total	**13,218,031**	**100%**

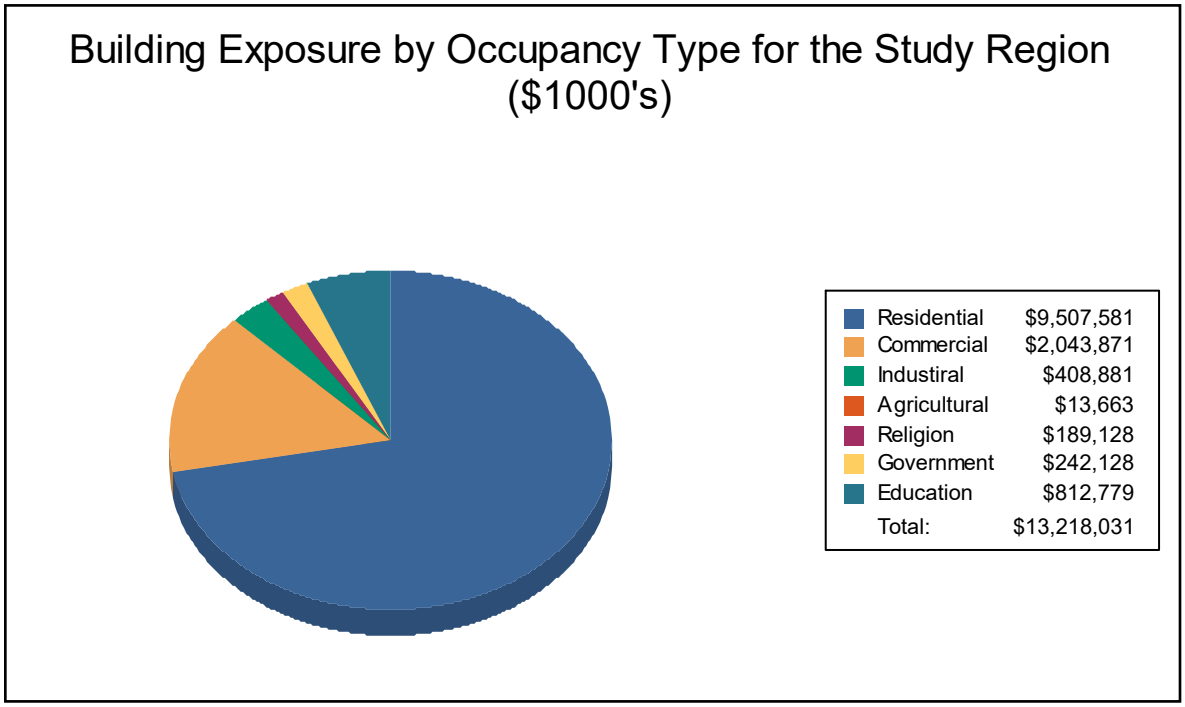
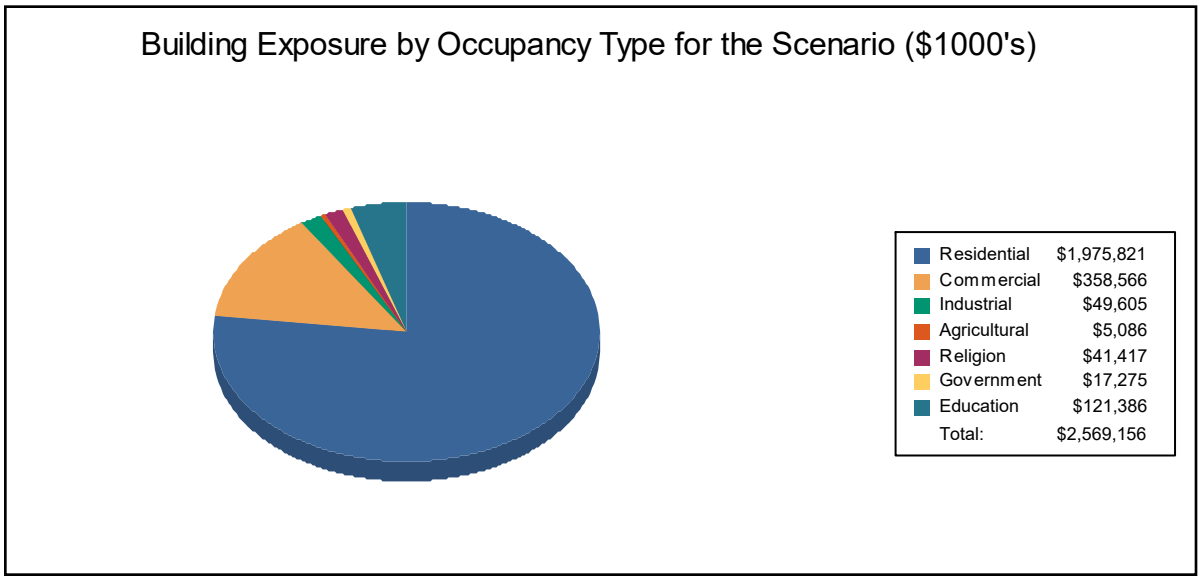


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,975,821	76.9%
Commercial	358,566	14.0%
Industrial	49,605	1.9%
Agricultural	5,086	0.2%
Religion	41,417	1.6%
Government	17,275	0.7%
Education	121,386	4.7%
Total	**2,569,156**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds.
There are 34 schools, 5 fire stations, 1 police station and 1 emergency operation center.

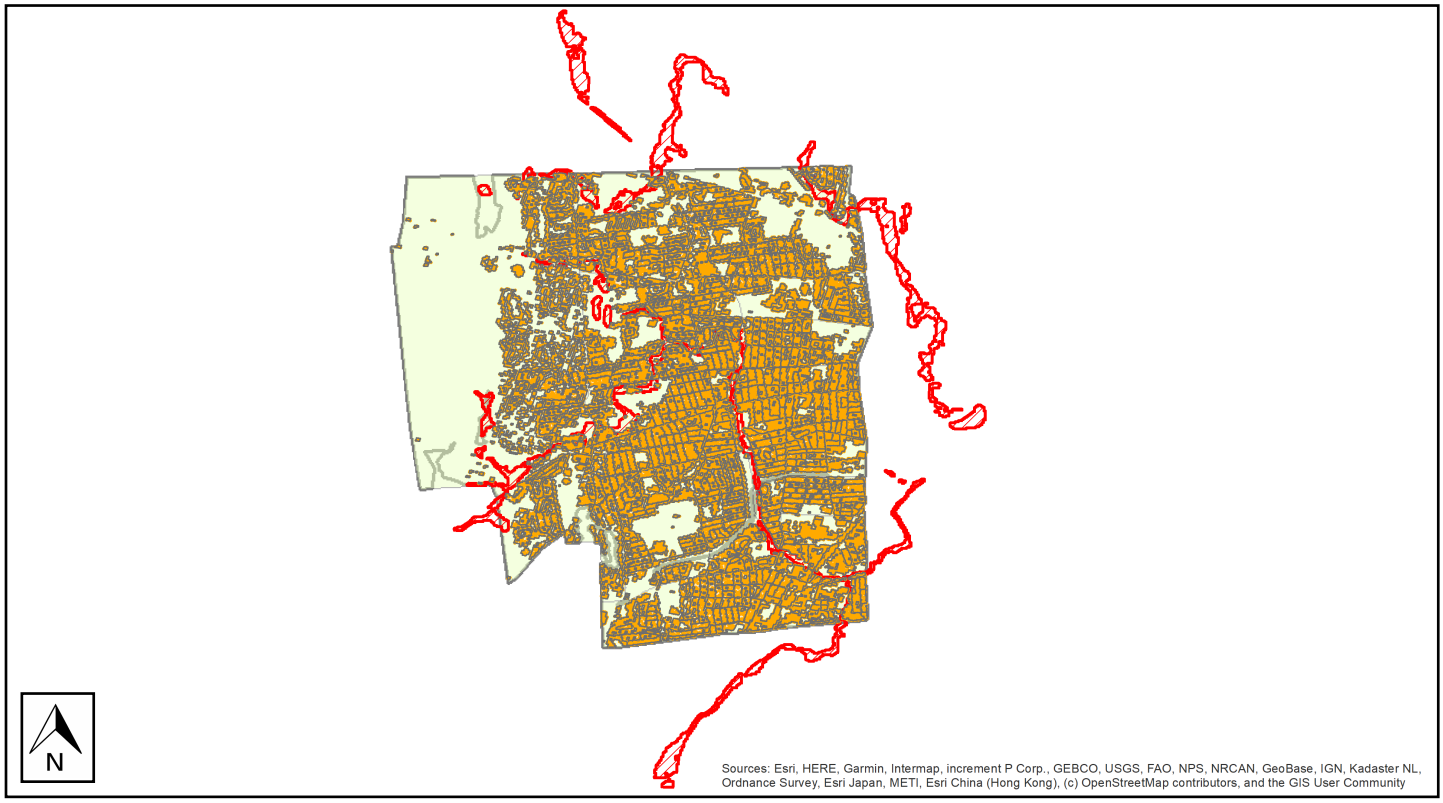
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	West_Hartford_FL
Scenario Name:	West_Hartford_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 105 buildings will be at least moderately damaged. This is over 85% of the total number of buildings in the scenario. There are an estimated 3 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

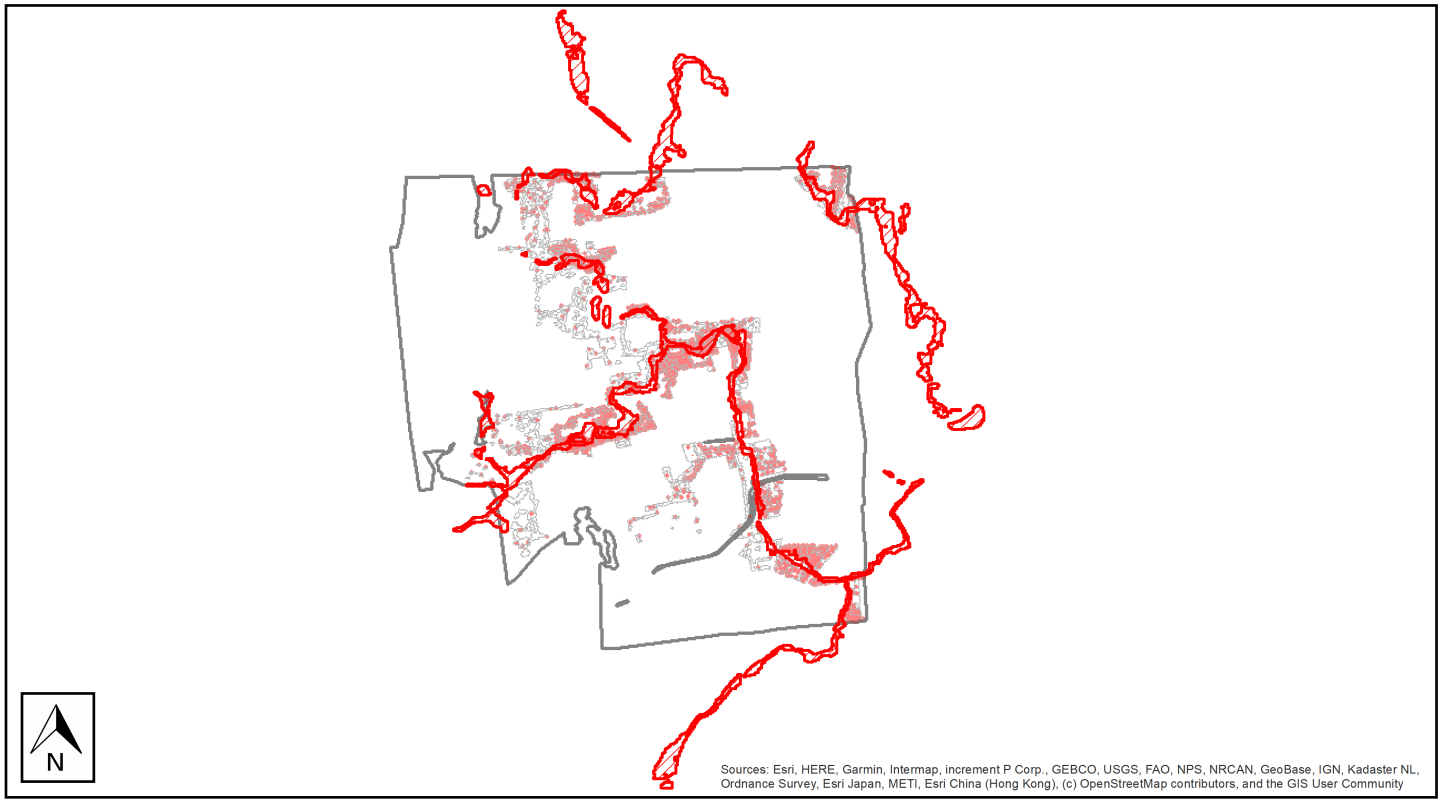


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	66	39	68	40	24	14	7	4	3	2	3	2
Total	**66**		**68**		**24**		**7**		**3**		**3**	

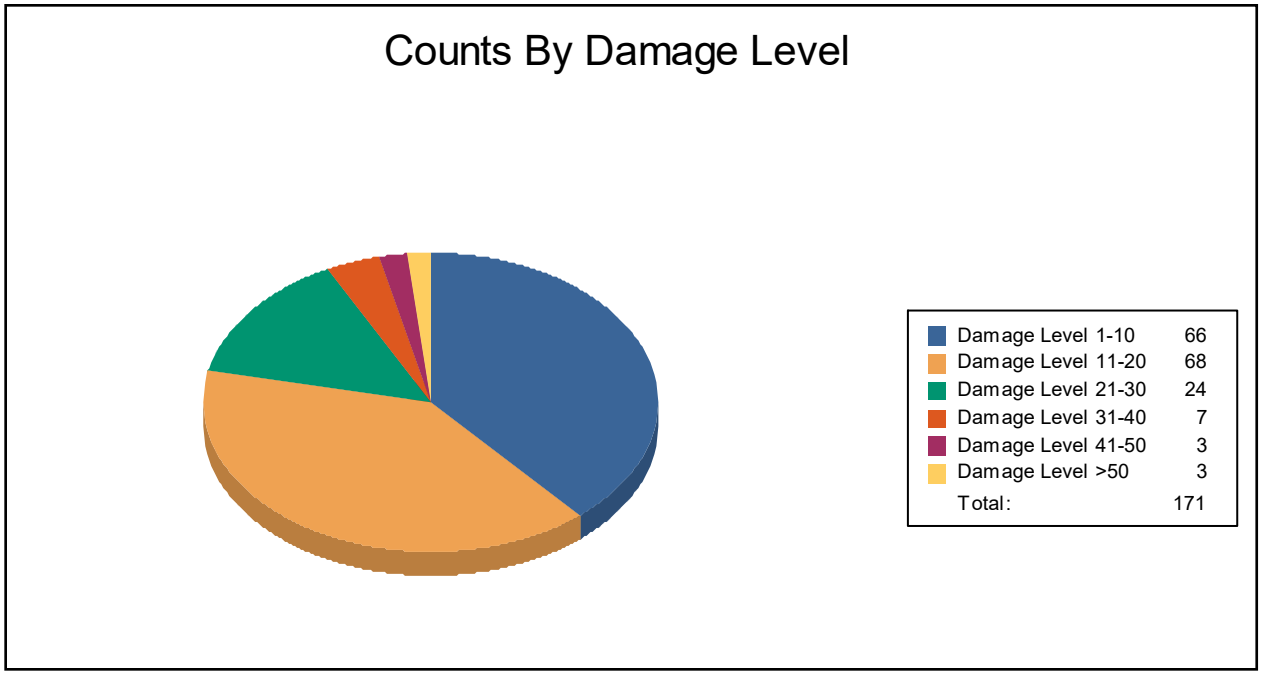


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	66	39	68	40	24	14	7	4	3	2	3	2

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 332 hospital beds available for use. On the day of the scenario flood event, the model estimates that 332 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	34	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

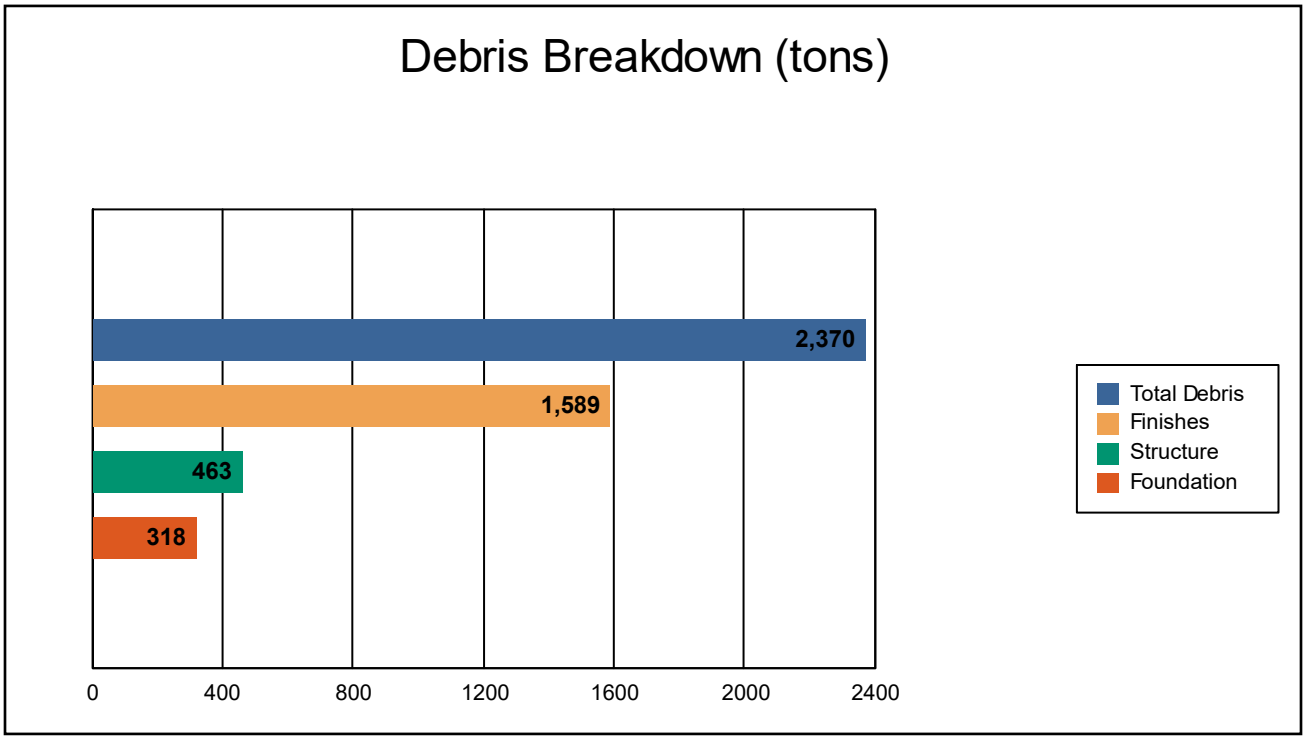
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

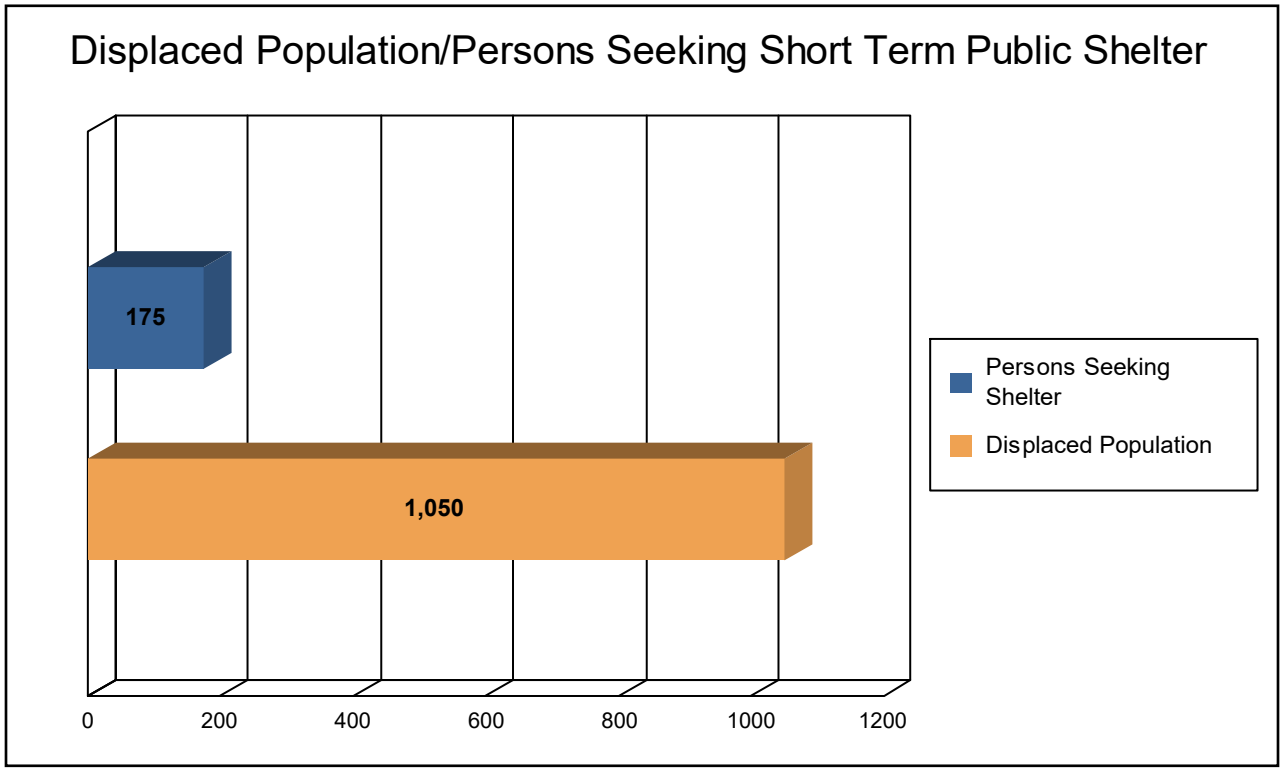


The model estimates that a total of 2,370 tons of debris will be generated. Of the total amount, Finishes comprises 67% of the total, Structure comprises 20% of the total, and Foundation comprises 13%. If the debris tonnage is converted into an estimated number of truckloads, it will require 95 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 350 households (or 1,050 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 175 people (out of a total population of 64,083) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 111.72 million dollars, which represents 4.35 % of the total replacement value of the scenario buildings.

Building-Related Losses

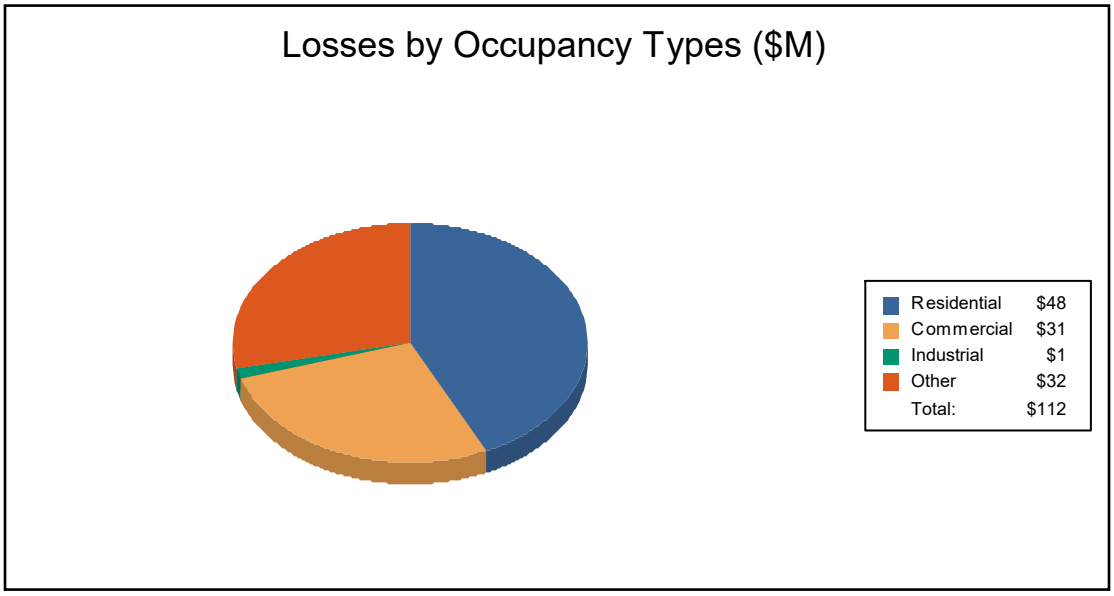
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 64.90 million dollars. 42% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 42.97% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	26.77	3.27	0.36	1.42	31.81
	Content	11.84	10.29	0.68	8.26	31.07
	Inventory	0.00	1.83	0.09	0.10	2.01
	Subtotal	**38.61**	**15.39**	**1.13**	**9.77**	**64.90**
Business Interruption						
	Income	0.02	5.46	0.02	3.32	8.81
	Relocation	6.87	1.42	0.03	1.95	10.27
	Rental Income	2.47	0.98	0.01	0.26	3.72
	Wage	0.04	7.39	0.04	16.56	24.03
	Subtotal	**9.40**	**15.24**	**0.10**	**22.09**	**46.83**
ALL	**Total**	**48.01**	**30.63**	**1.23**	**31.86**	**111.72**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,507,581	3,710,450	13,218,031
Total	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**
Total Study Region	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**

Hazus: Flood Global Risk Report

Region Name: West_Hartford_FL

Flood Scenario: West_Hartford_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 11 square miles and contains 703 census blocks. The region contains over 26 thousand households and has a total population of 64,083 people. The distribution of population by State and County for the study region is provided in Appendix B.

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Building Inventory

General Building Stock

Hazus estimates that there are 21,341 buildings in the region which have an aggregate total replacement value of 13,218 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
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Agricultural	13,663	0.1%
Religion	189,128	1.4%
Government	242,128	1.8%
Education	812,779	6.1%
Total	**13,218,031**	**100%**

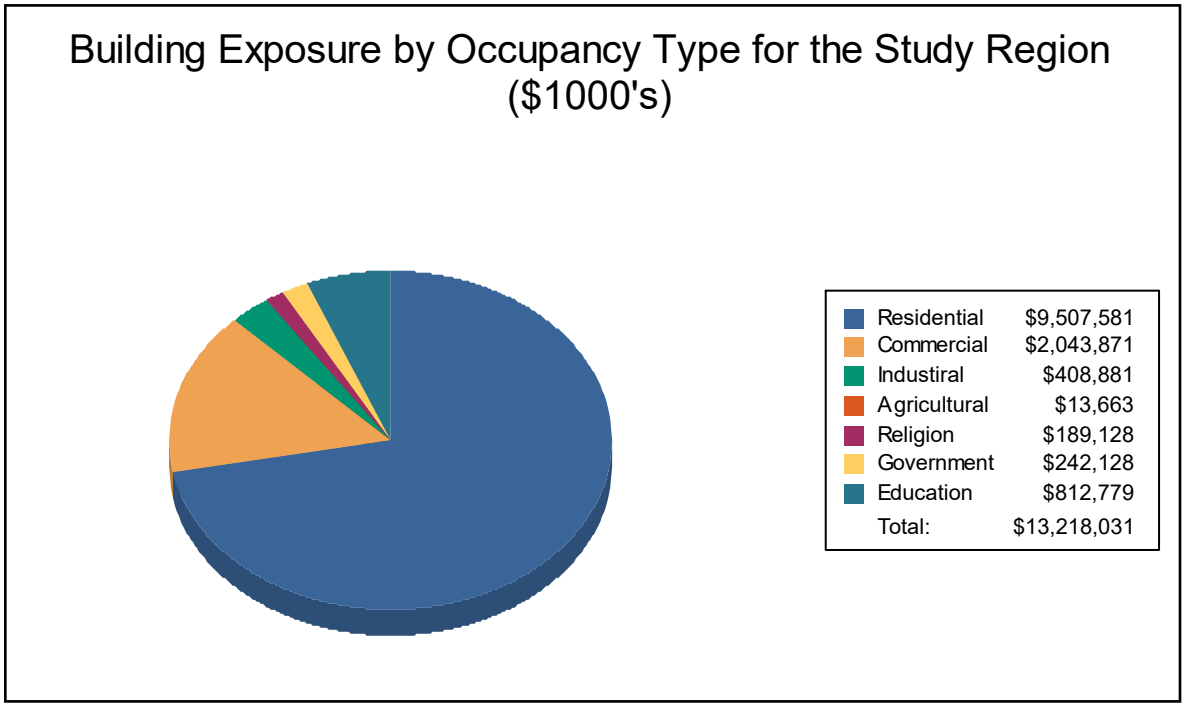
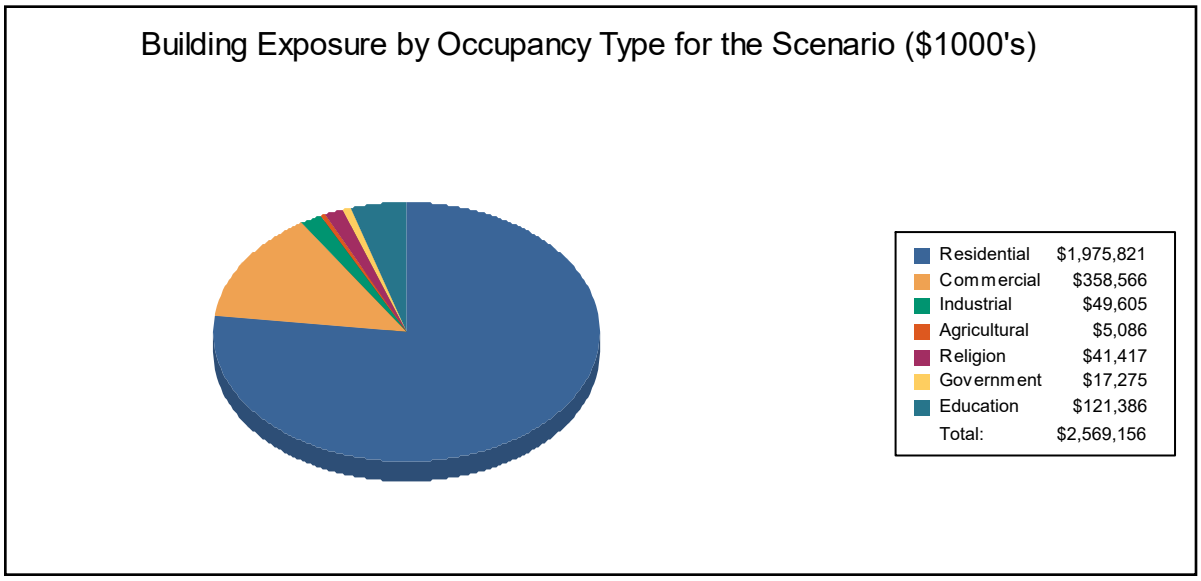


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,975,821	76.9%
Commercial	358,566	14.0%
Industrial	49,605	1.9%
Agricultural	5,086	0.2%
Religion	41,417	1.6%
Government	17,275	0.7%
Education	121,386	4.7%
Total	**2,569,156**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds.
There are 34 schools, 5 fire stations, 1 police station and 1 emergency operation center.

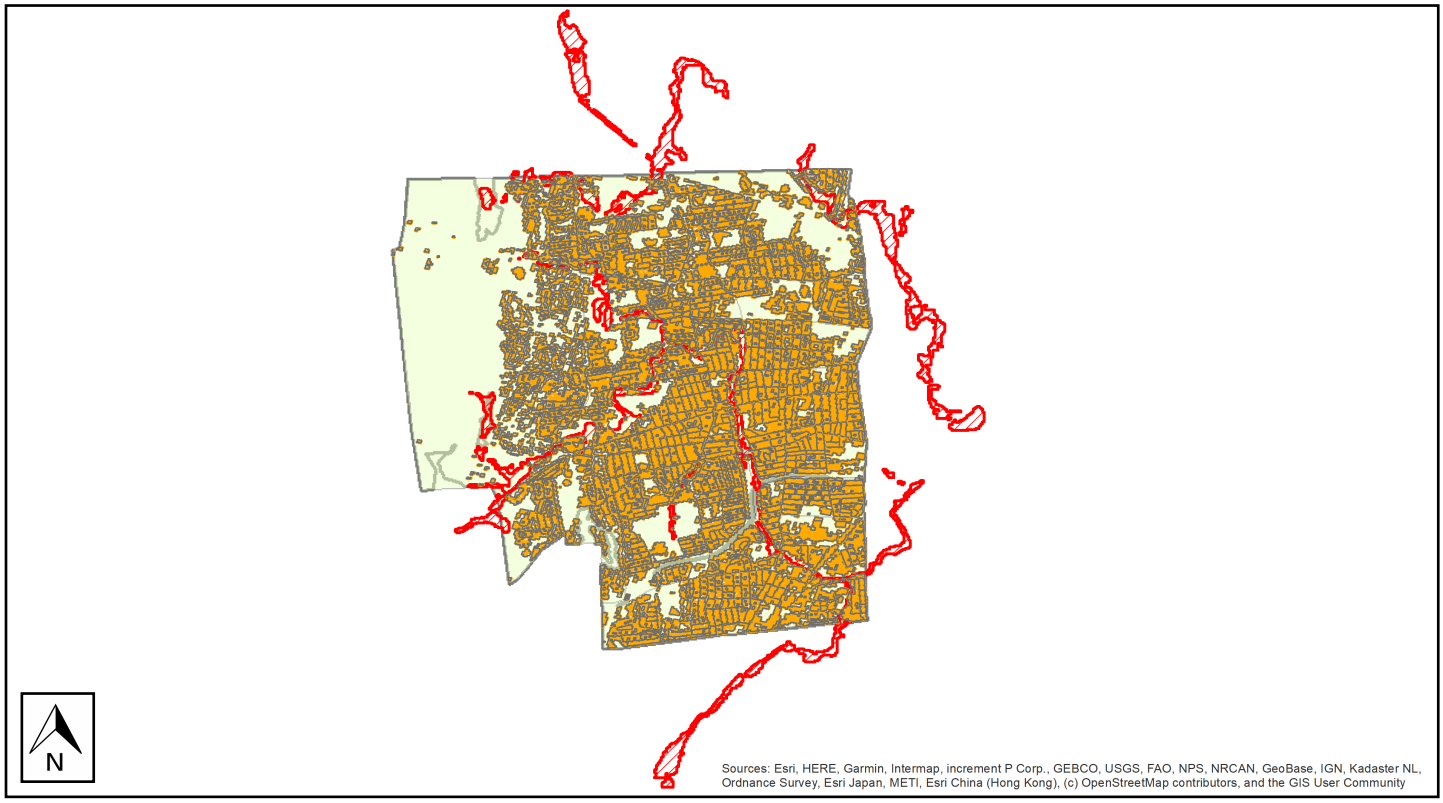
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	West_Hartford_FL
Scenario Name:	West_Hartford_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 156 buildings will be at least moderately damaged. This is over 87% of the total number of buildings in the scenario. There are an estimated 3 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

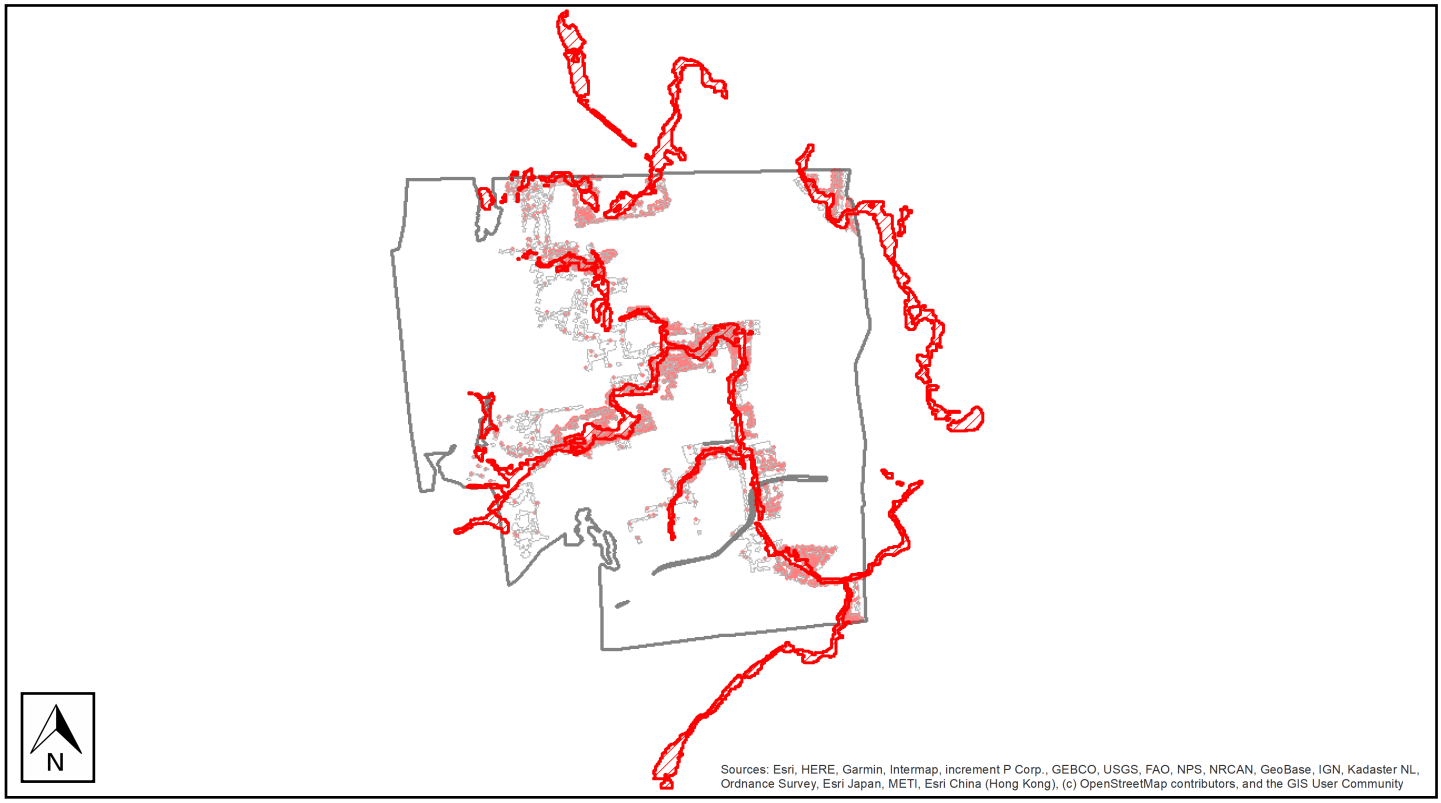


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	123	44	100	36	39	14	7	3	7	3	3	1
Total	**123**		**100**		**39**		**7**		**7**		**3**	

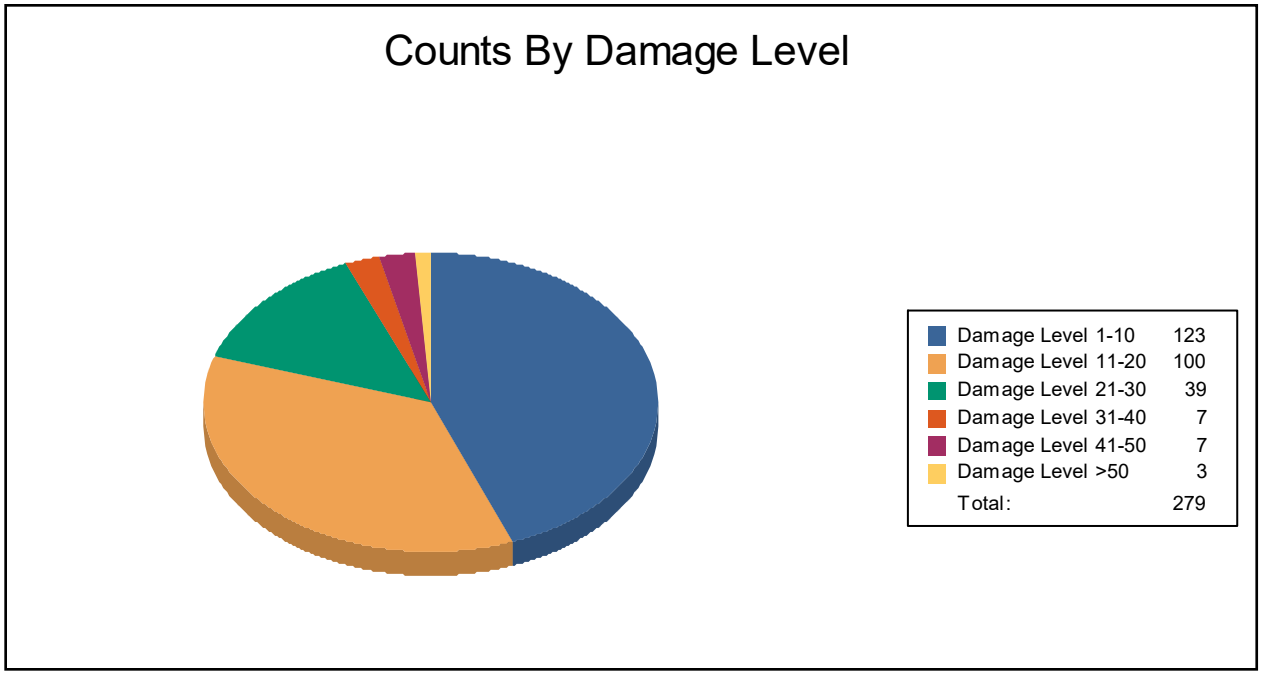


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	50	1	50	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	122	44	99	36	39	14	7	3	7	3	3	1

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 332 hospital beds available for use. On the day of the scenario flood event, the model estimates that 332 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	5	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	34	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

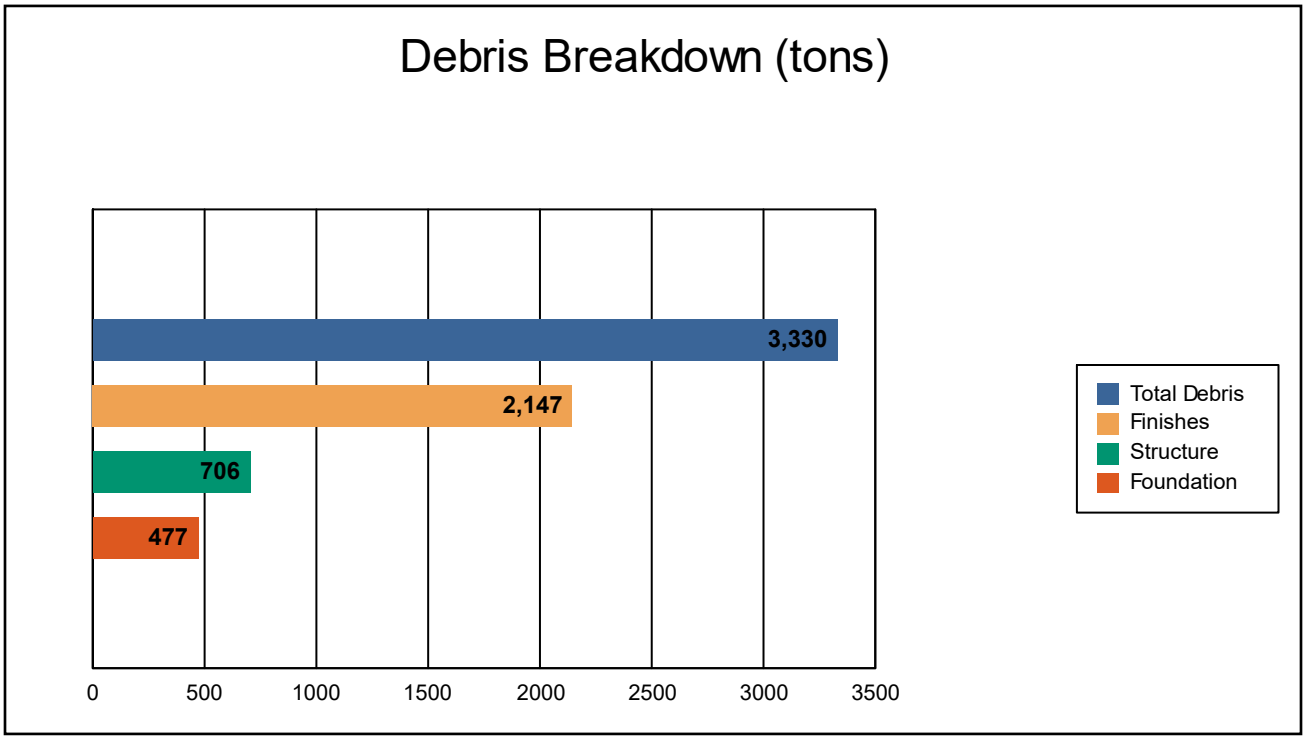
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

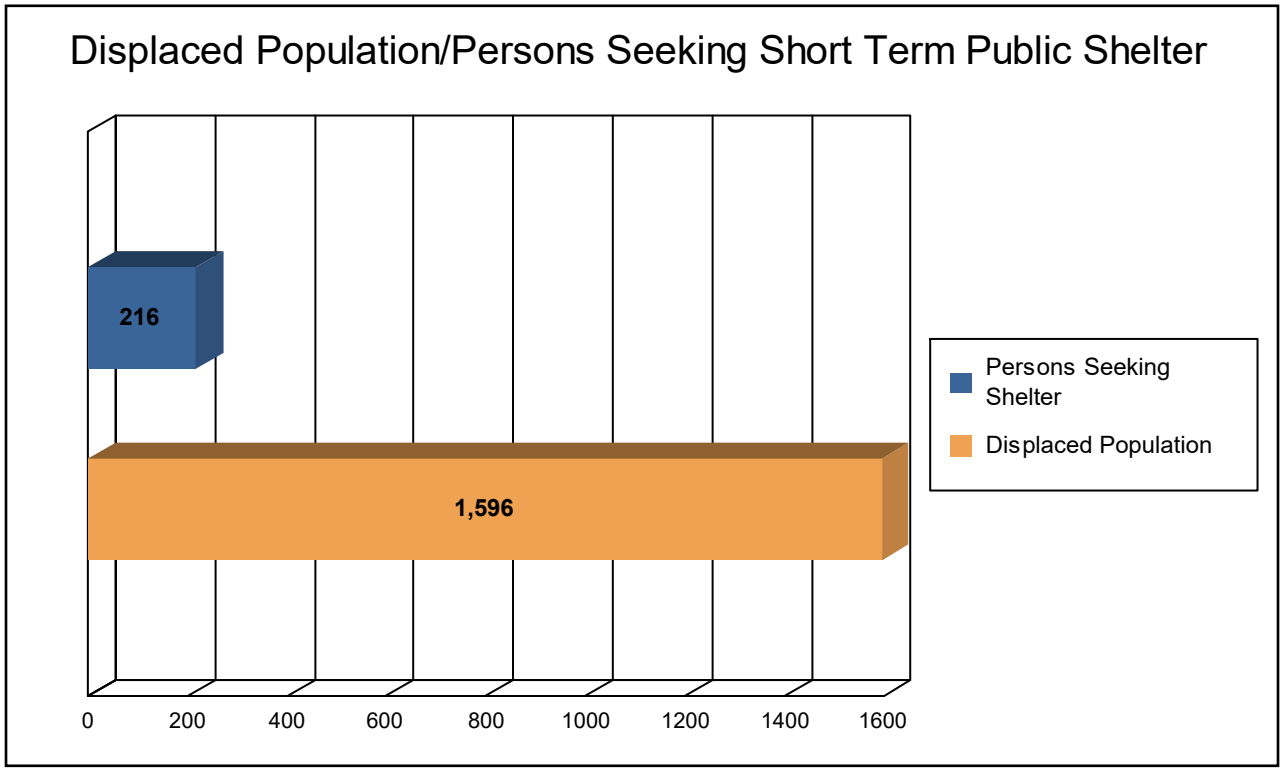


The model estimates that a total of 3,330 tons of debris will be generated. Of the total amount, Finishes comprises 64% of the total, Structure comprises 21% of the total, and Foundation comprises 14%. If the debris tonnage is converted into an estimated number of truckloads, it will require 134 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 532 households (or 1,596 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 216 people (out of a total population of 64,083) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 157.29 million dollars, which represents 6.12 % of the total replacement value of the scenario buildings.

Building-Related Losses

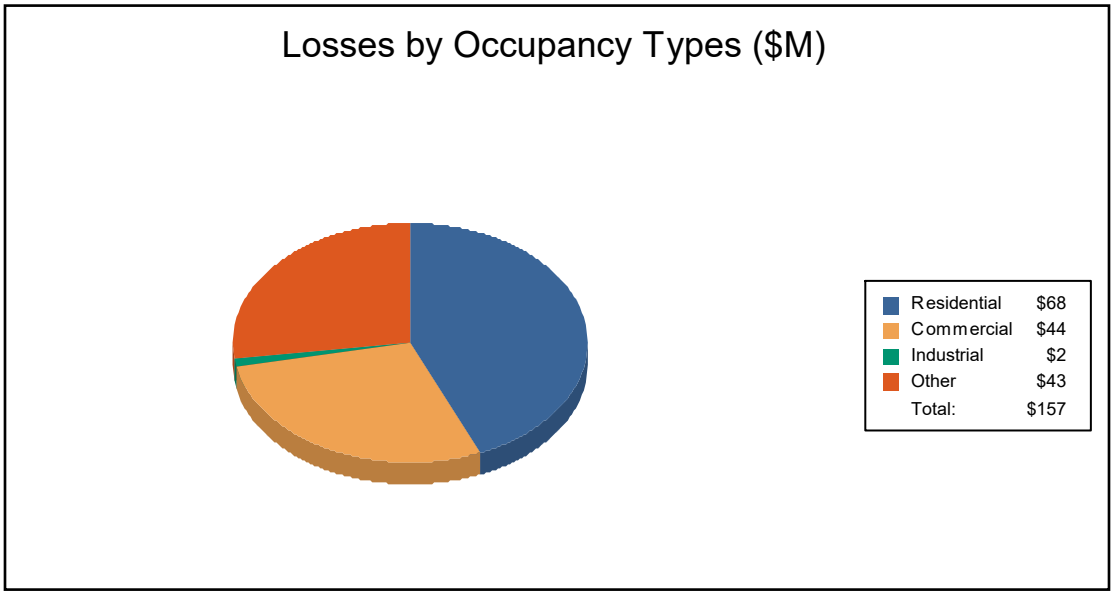
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 90.92 million dollars. 42% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 43.51% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	37.78	4.59	0.50	1.94	44.81
	Content	16.67	14.42	0.97	11.28	43.34
	Inventory	0.00	2.48	0.13	0.16	2.77
	Subtotal	**54.46**	**21.49**	**1.60**	**13.38**	**90.92**
Business Interruption						
	Income	0.02	8.27	0.03	4.26	12.58
	Relocation	10.26	2.10	0.04	2.53	14.93
	Rental Income	3.64	1.43	0.01	0.36	5.45
	Wage	0.06	11.06	0.06	22.24	33.42
	Subtotal	**13.98**	**22.86**	**0.14**	**29.40**	**66.37**
ALL	**Total**	**68.43**	**44.35**	**1.74**	**42.77**	**157.29**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,507,581	3,710,450	13,218,031
Total	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**
Total Study Region	**64,083**	**9,507,581**	**3,710,450**	**13,218,031**

Hazus: Flood Global Risk Report

Region Name: Wethersfield_FL

Flood Scenario: Wethersfield_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 356 census blocks. The region contains over 11 thousand households and has a total population of 27,298 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,172 buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92.08% of the buildings (and 78.50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,172 buildings in the region which have an aggregate total replacement value of 5,449 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,277,252	78.5%
Commercial	638,203	11.7%
Industrial	200,919	3.7%
Agricultural	10,152	0.2%
Religion	84,461	1.6%
Government	46,582	0.9%
Education	191,120	3.5%
Total	**5,448,689**	**100%**

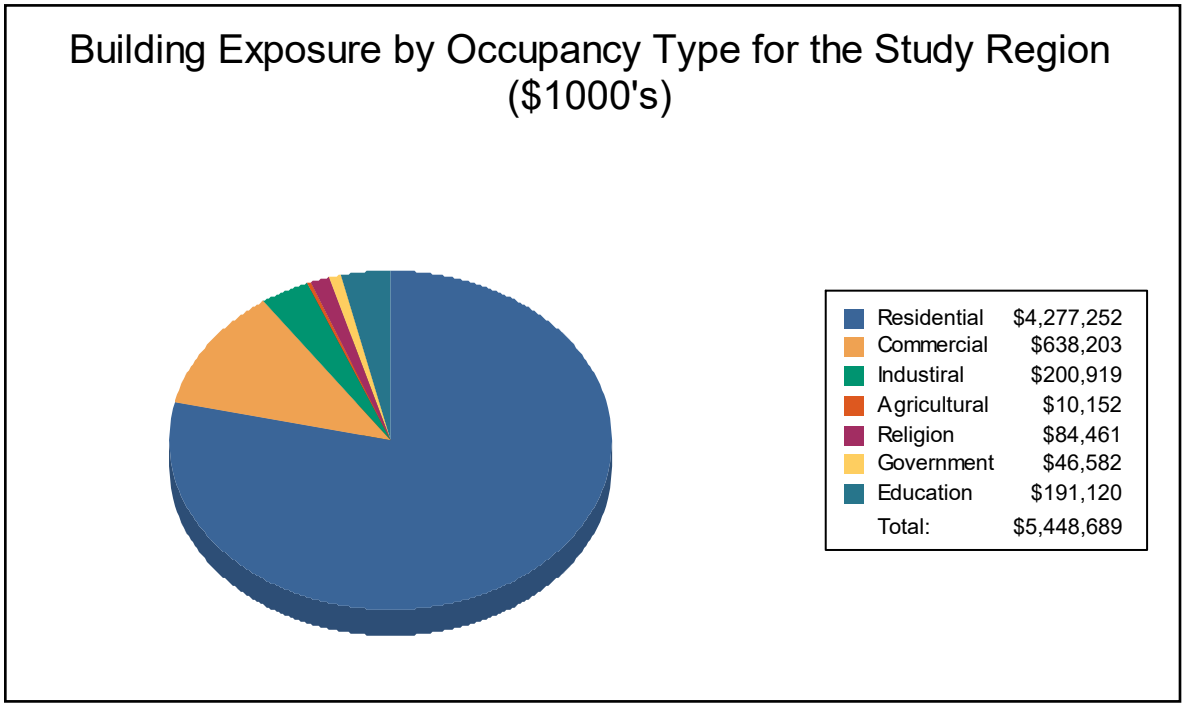
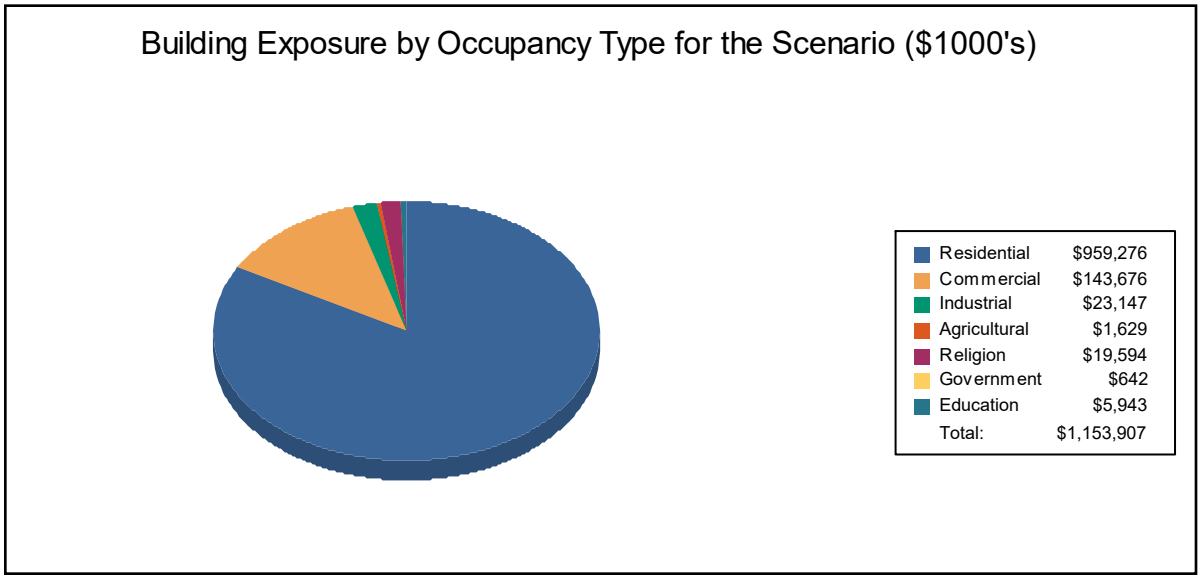


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	959,276	83.1%
Commercial	143,676	12.5%
Industrial	23,147	2.0%
Agricultural	1,629	0.1%
Religion	19,594	1.7%
Government	642	0.1%
Education	5,943	0.5%
Total	**1,153,907**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 3 fire stations, 1 police station and 1 emergency operation center.

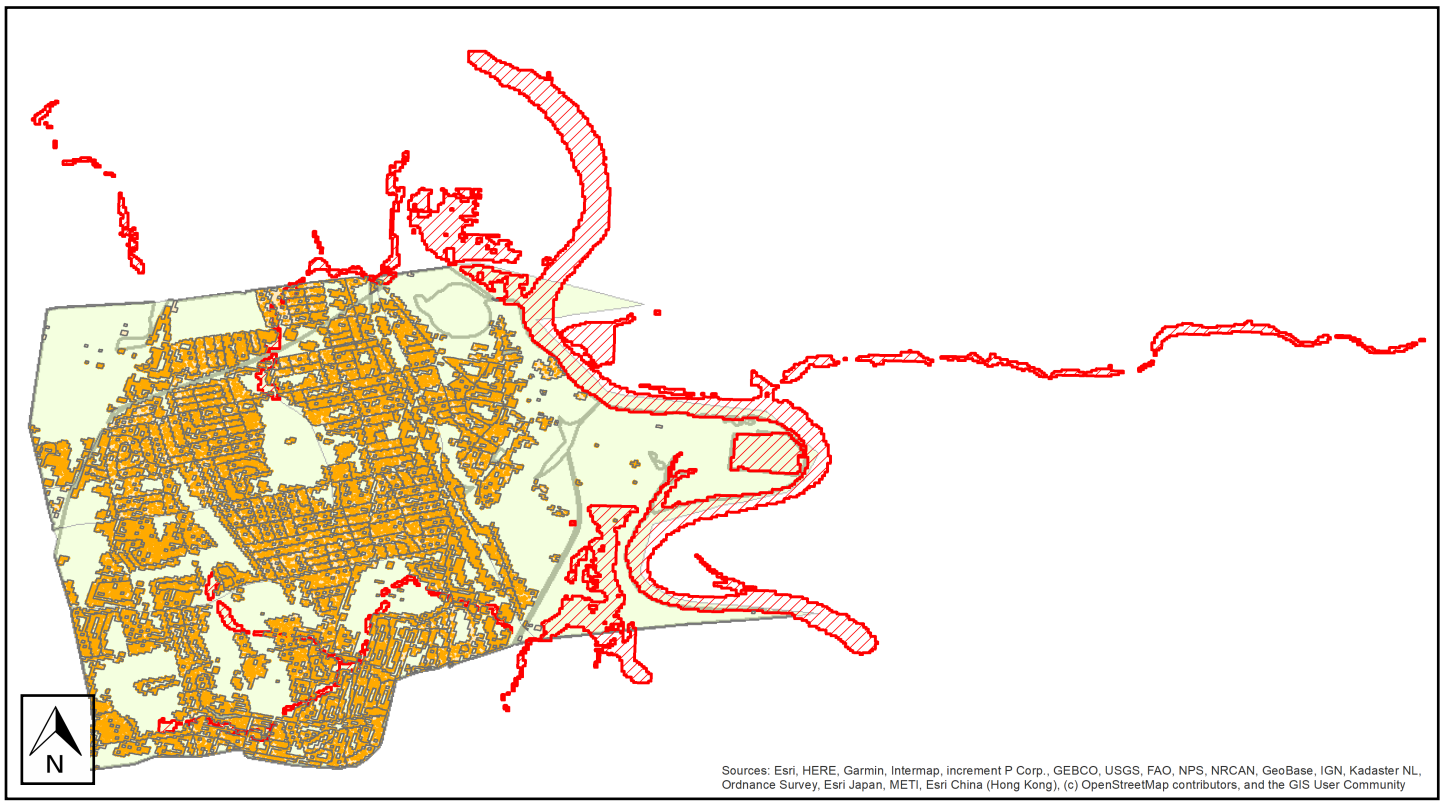
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Wethersfield_FL
Scenario Name:	Wethersfield_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 7 buildings will be at least moderately damaged. This is over 94% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

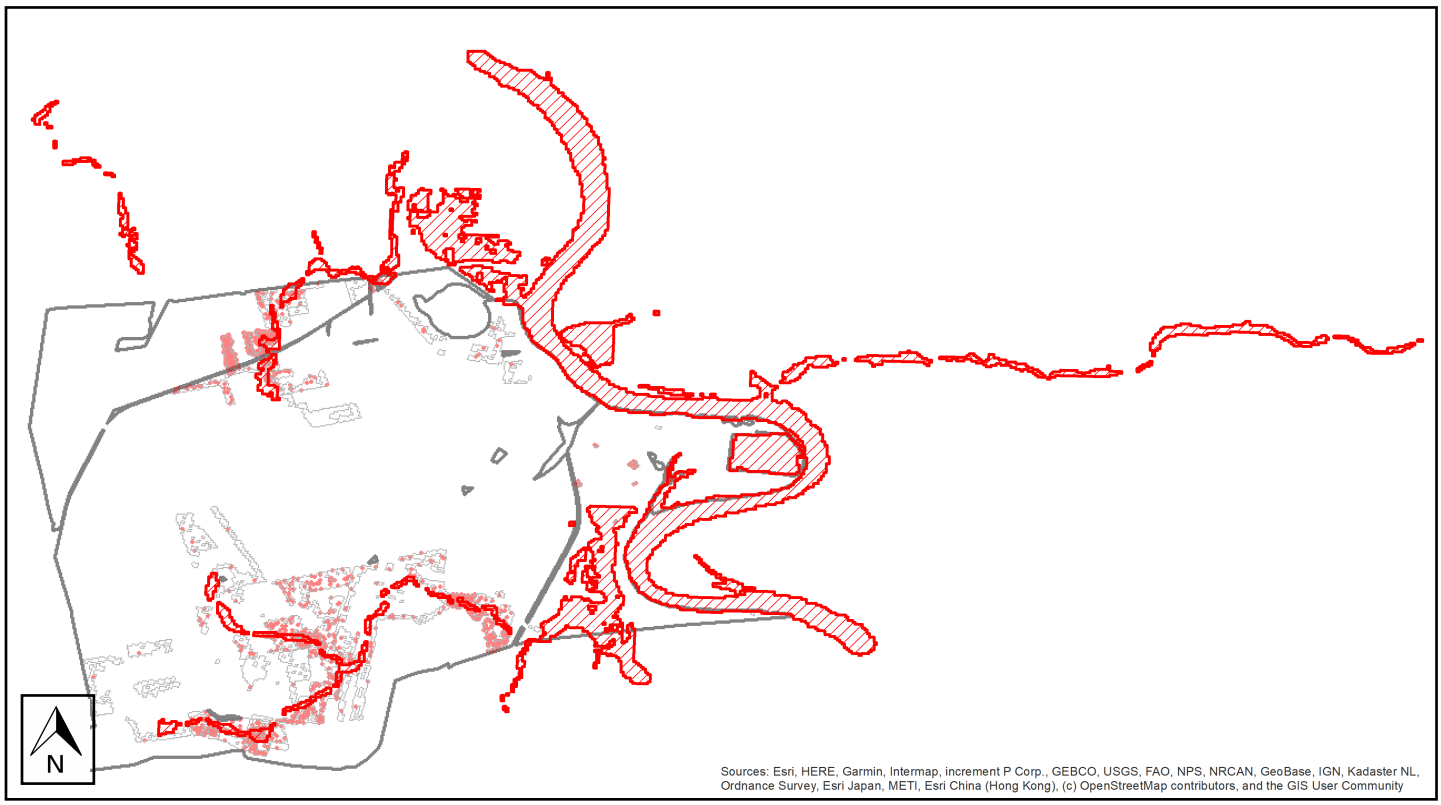


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	10	59	6	35	1	6	0	0	0	0	0	0
Total	**10**		**6**		**1**		**0**		**0**		**0**	

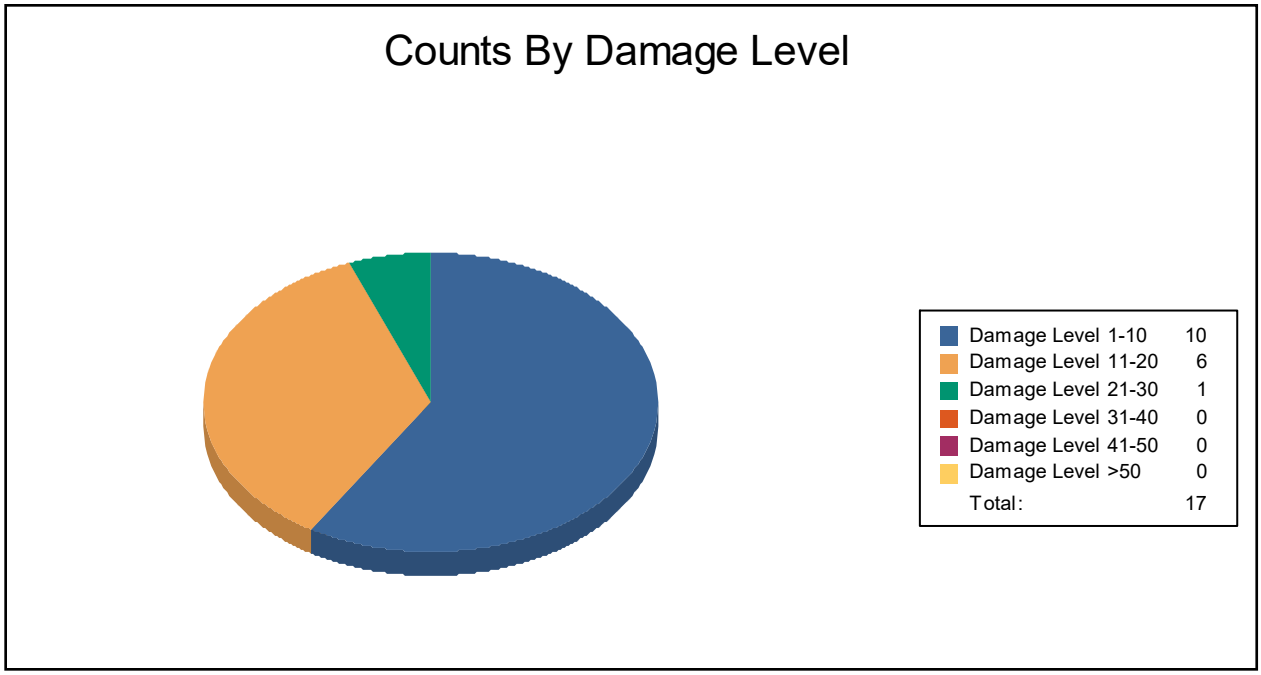


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	9	56	6	38	1	6	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

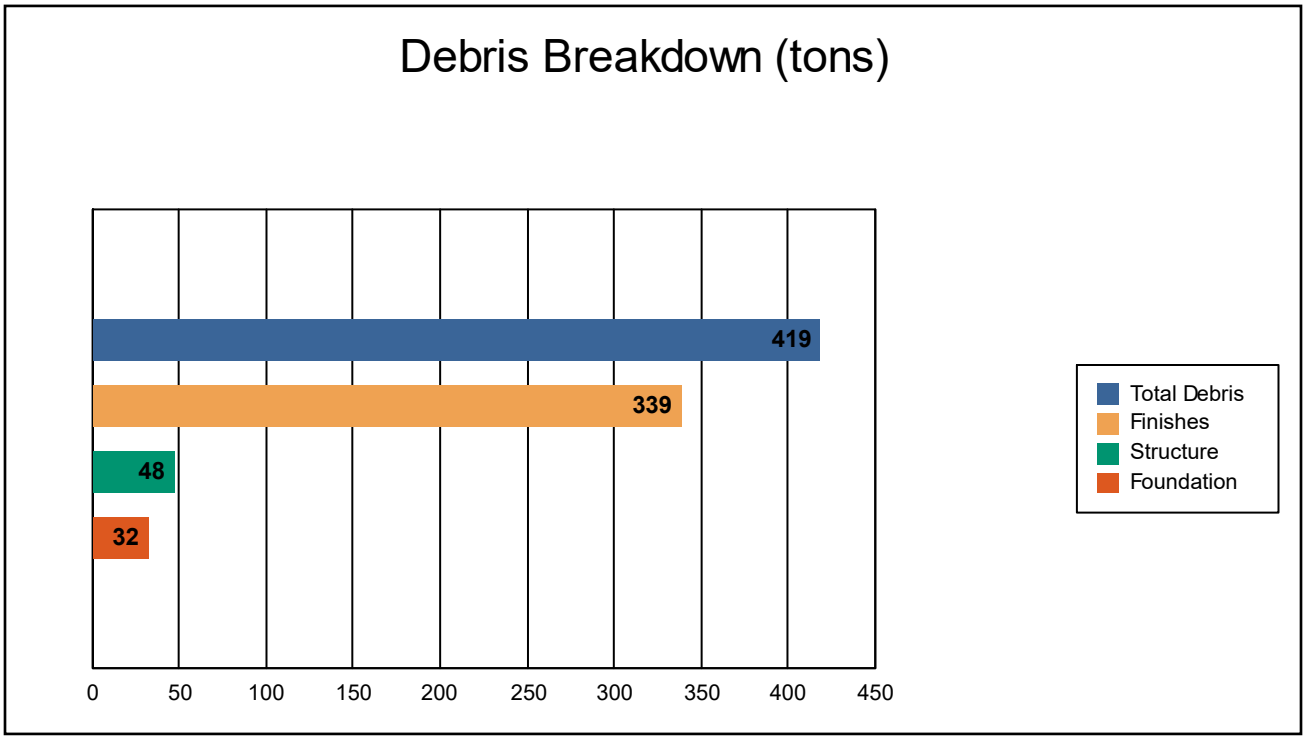
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

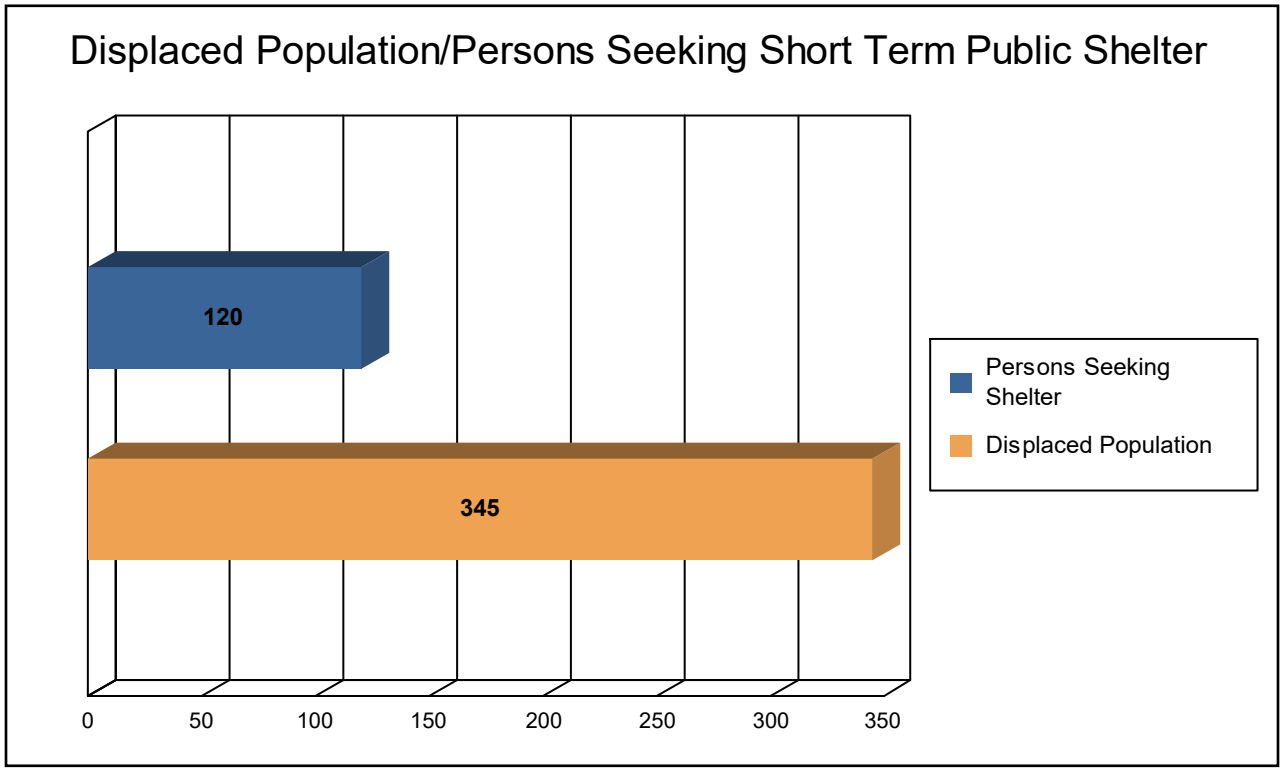


The model estimates that a total of 419 tons of debris will be generated. Of the total amount, Finishes comprises 81% of the total, Structure comprises 11% of the total, and Foundation comprises 8%. If the debris tonnage is converted into an estimated number of truckloads, it will require 17 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 115 households (or 345 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 120 people (out of a total population of 27,298) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 18.00 million dollars, which represents 1.56 % of the total replacement value of the scenario buildings.

Building-Related Losses

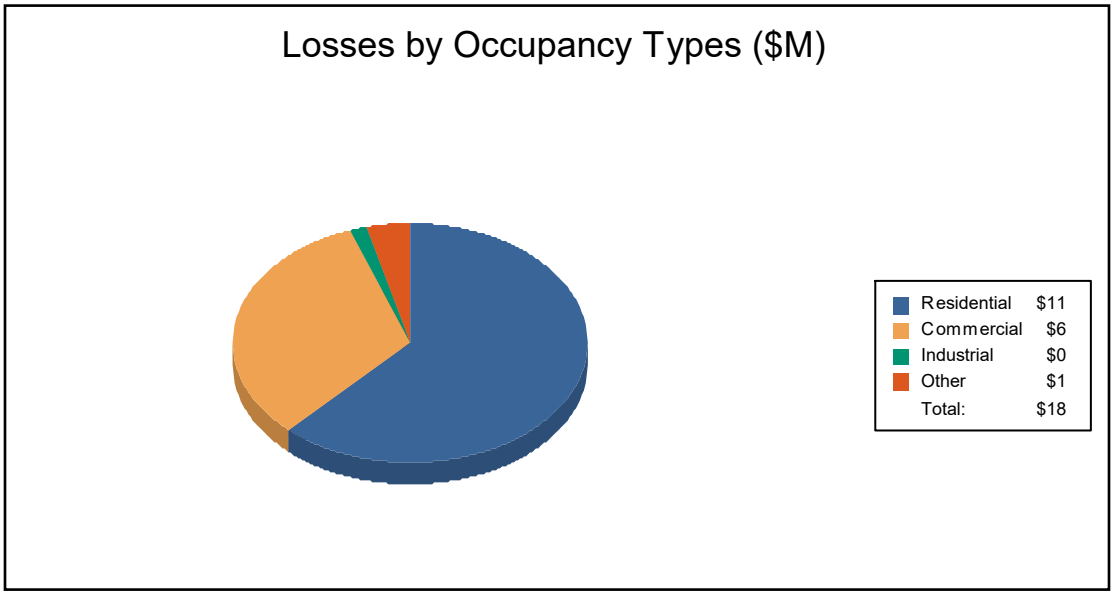
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 11.54 million dollars. 36% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 61.89% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4.18	0.55	0.11	0.03	4.88
	Content	4.42	1.64	0.17	0.22	6.44
	Inventory	0.00	0.18	0.02	0.02	0.22
	Subtotal	**8.60**	**2.36**	**0.31**	**0.27**	**11.54**
Business Interruption						
	Income	0.02	1.33	0.01	0.10	1.45
	Relocation	1.40	0.29	0.01	0.02	1.72
	Rental Income	1.08	0.20	0.00	0.00	1.28
	Wage	0.05	1.67	0.01	0.29	2.02
	Subtotal	**2.55**	**3.49**	**0.03**	**0.41**	**6.47**
ALL	**Total**	**11.14**	**5.85**	**0.33**	**0.68**	**18.00**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,252	1,171,437	5,448,689
Total	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**
Total Study Region	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**

Hazus: Flood Global Risk Report

Region Name: Wethersfield_FL

Flood Scenario: Wethersfield_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 356 census blocks. The region contains over 11 thousand households and has a total population of 27,298 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,172 buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92.08% of the buildings (and 78.50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,172 buildings in the region which have an aggregate total replacement value of 5,449 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,277,252	78.5%
Commercial	638,203	11.7%
Industrial	200,919	3.7%
Agricultural	10,152	0.2%
Religion	84,461	1.6%
Government	46,582	0.9%
Education	191,120	3.5%
Total	**5,448,689**	**100%**

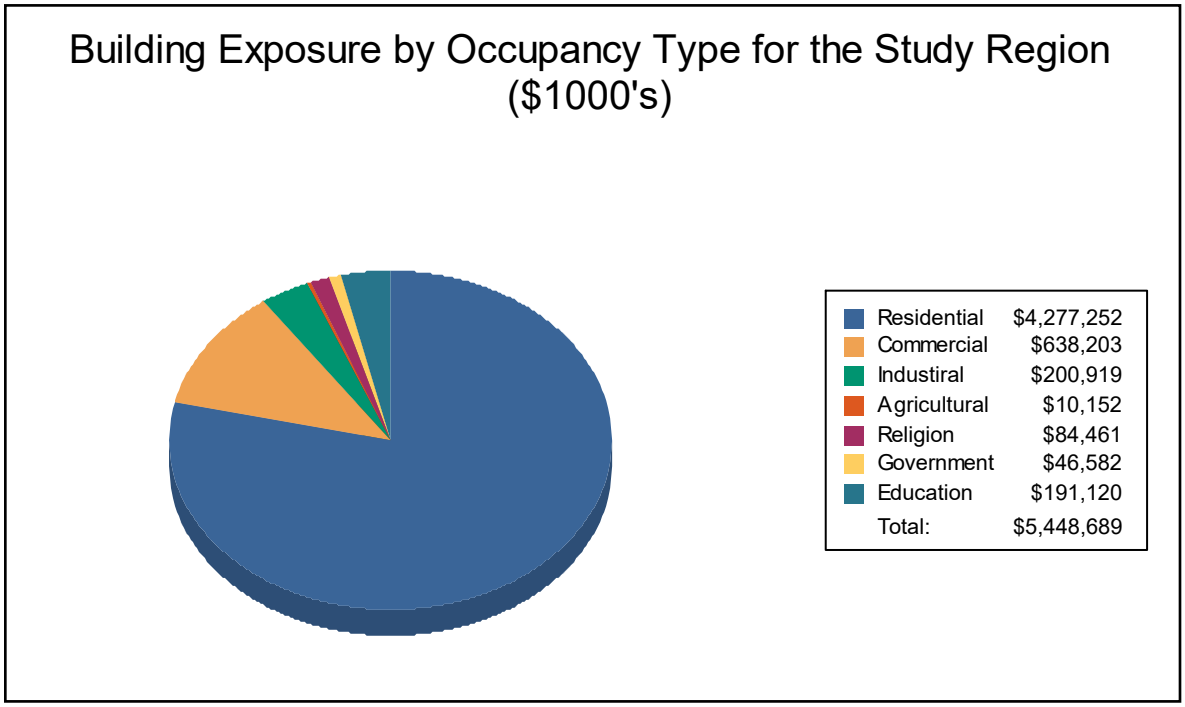
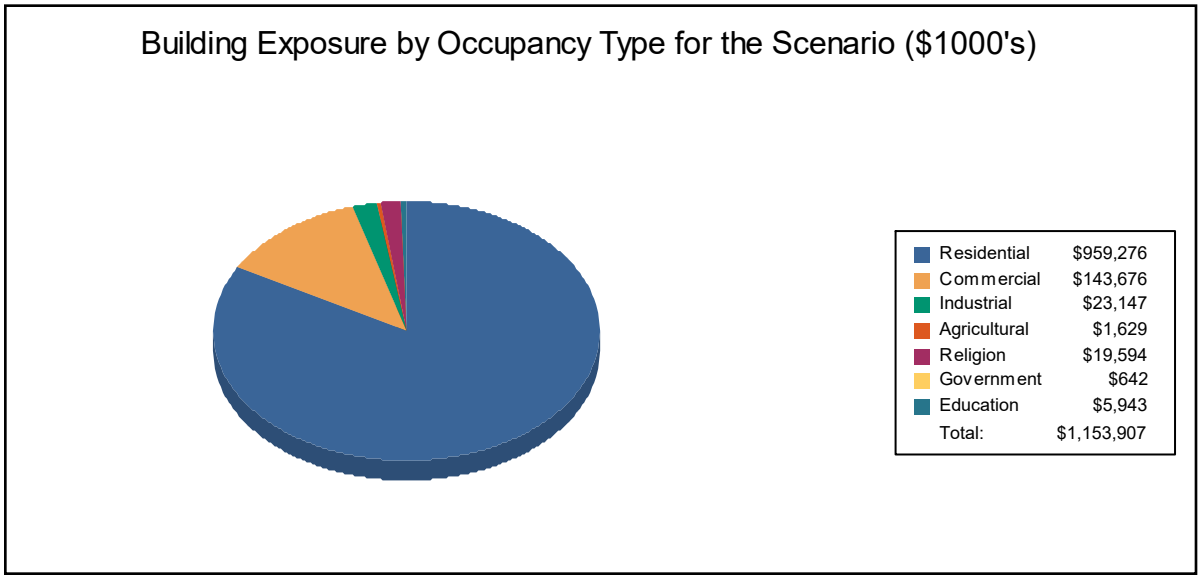


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	959,276	83.1%
Commercial	143,676	12.5%
Industrial	23,147	2.0%
Agricultural	1,629	0.1%
Religion	19,594	1.7%
Government	642	0.1%
Education	5,943	0.5%
Total	**1,153,907**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 3 fire stations, 1 police station and 1 emergency operation center.

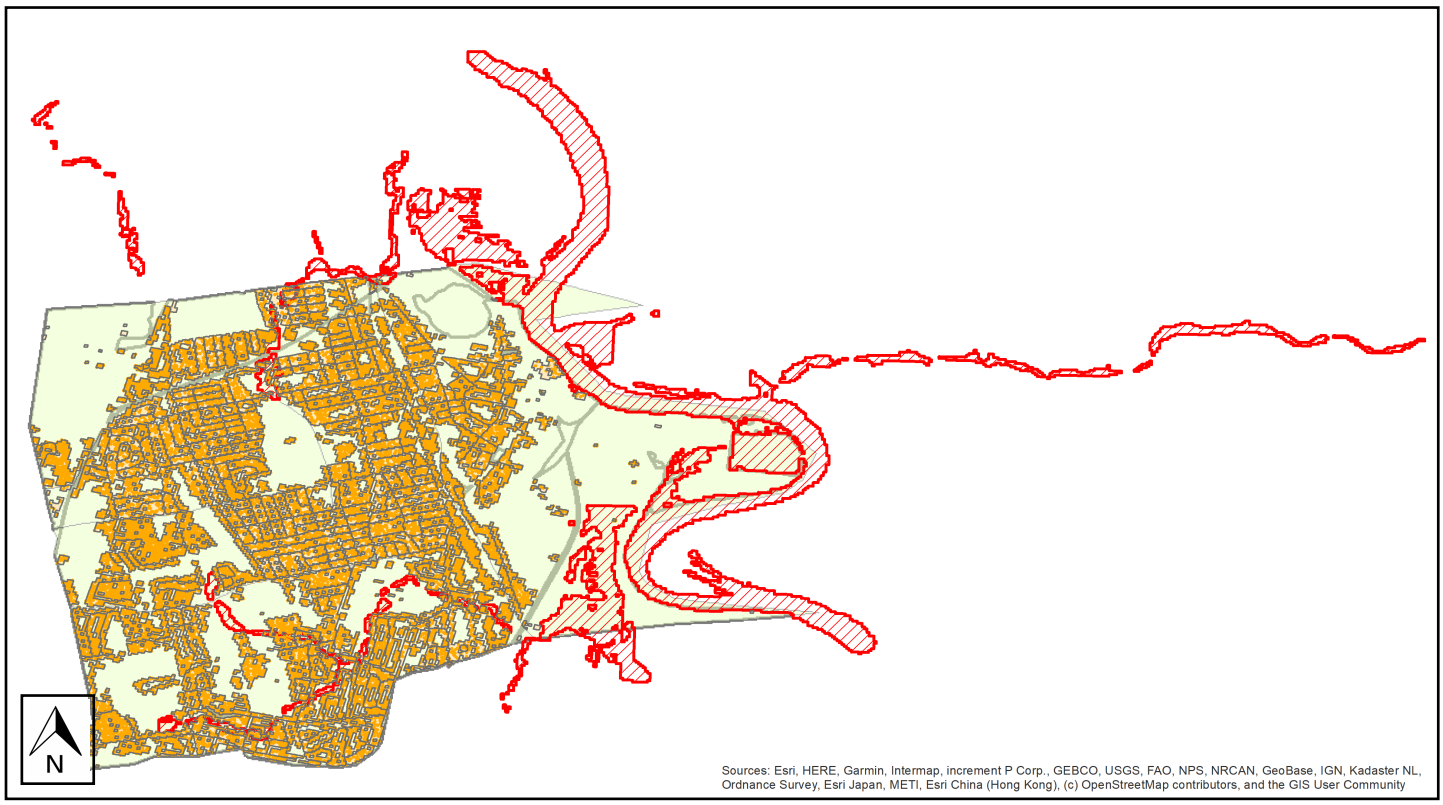
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Wethersfield_FL
Scenario Name:	Wethersfield_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 95% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

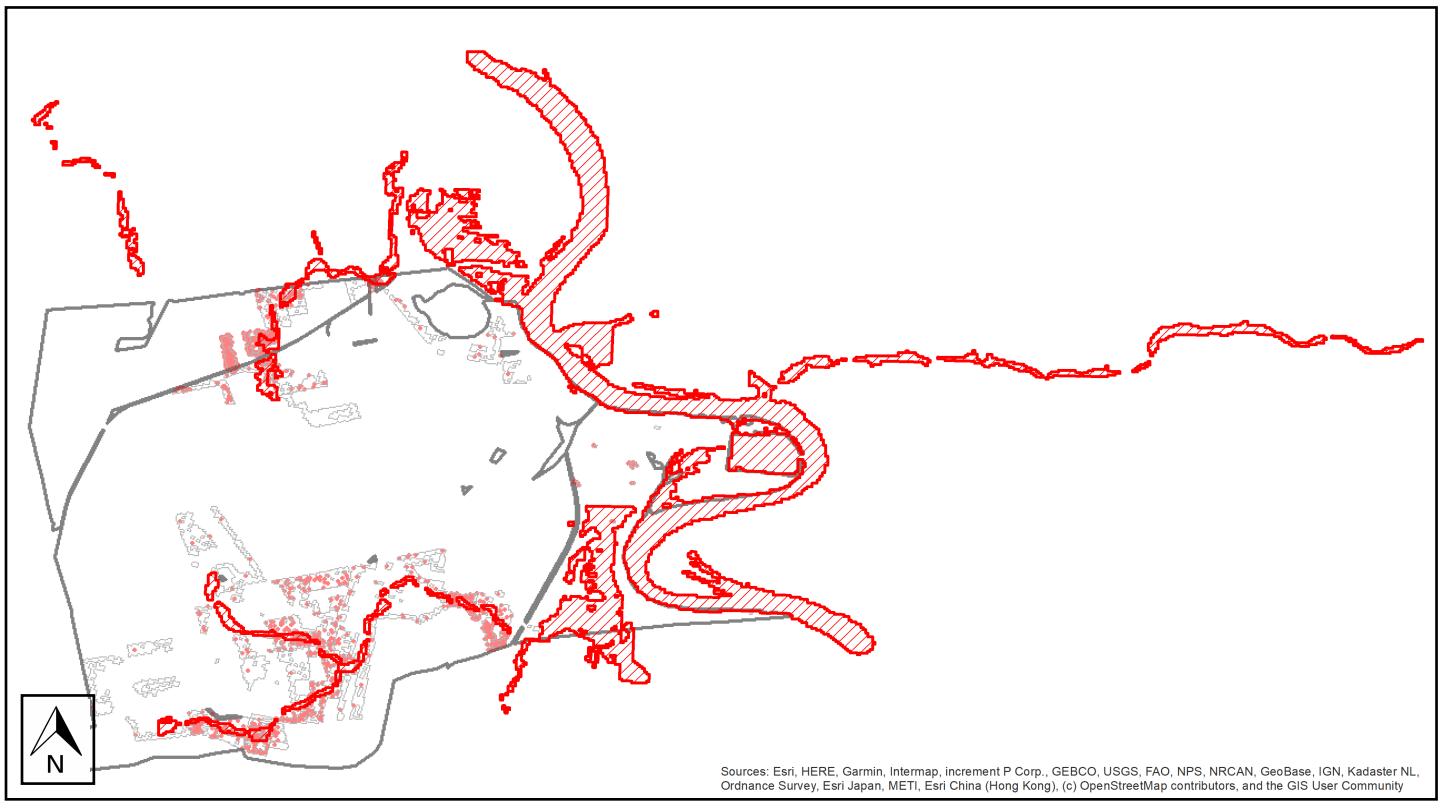


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	11	55	8	40	1	5	0	0	0	0	0	0
Total	**11**		**8**		**1**		**0**		**0**		**0**	

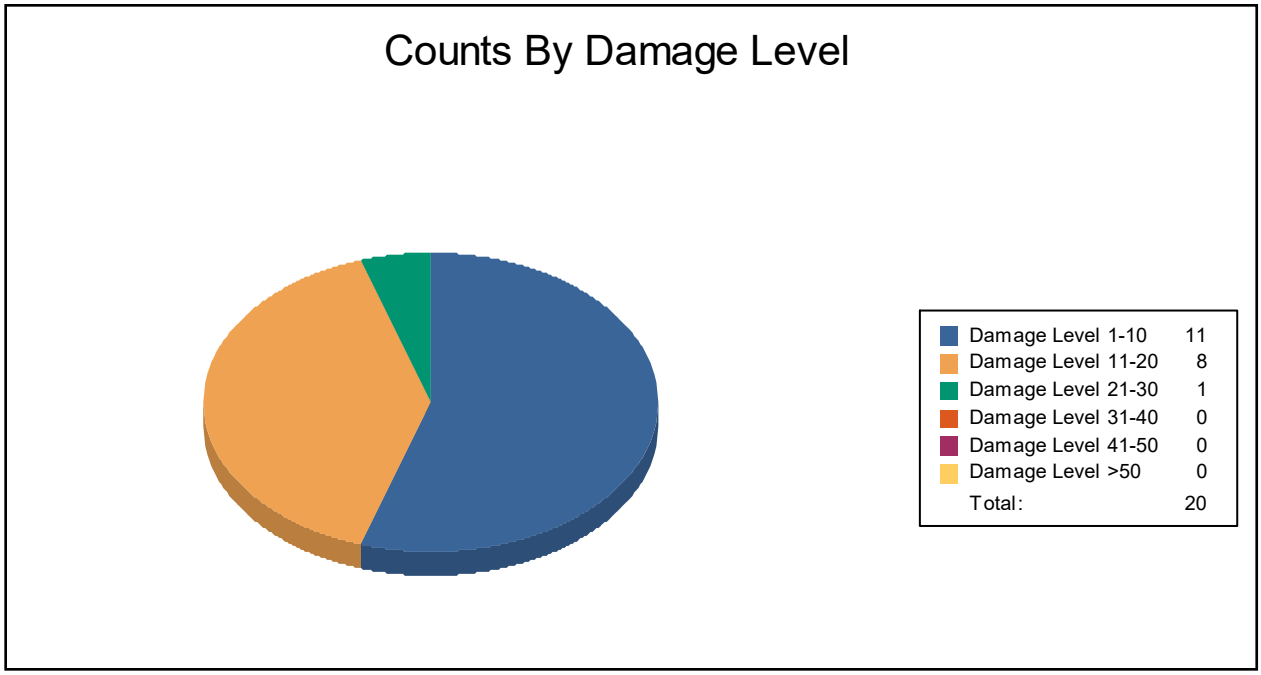


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	10	53	8	42	1	5	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

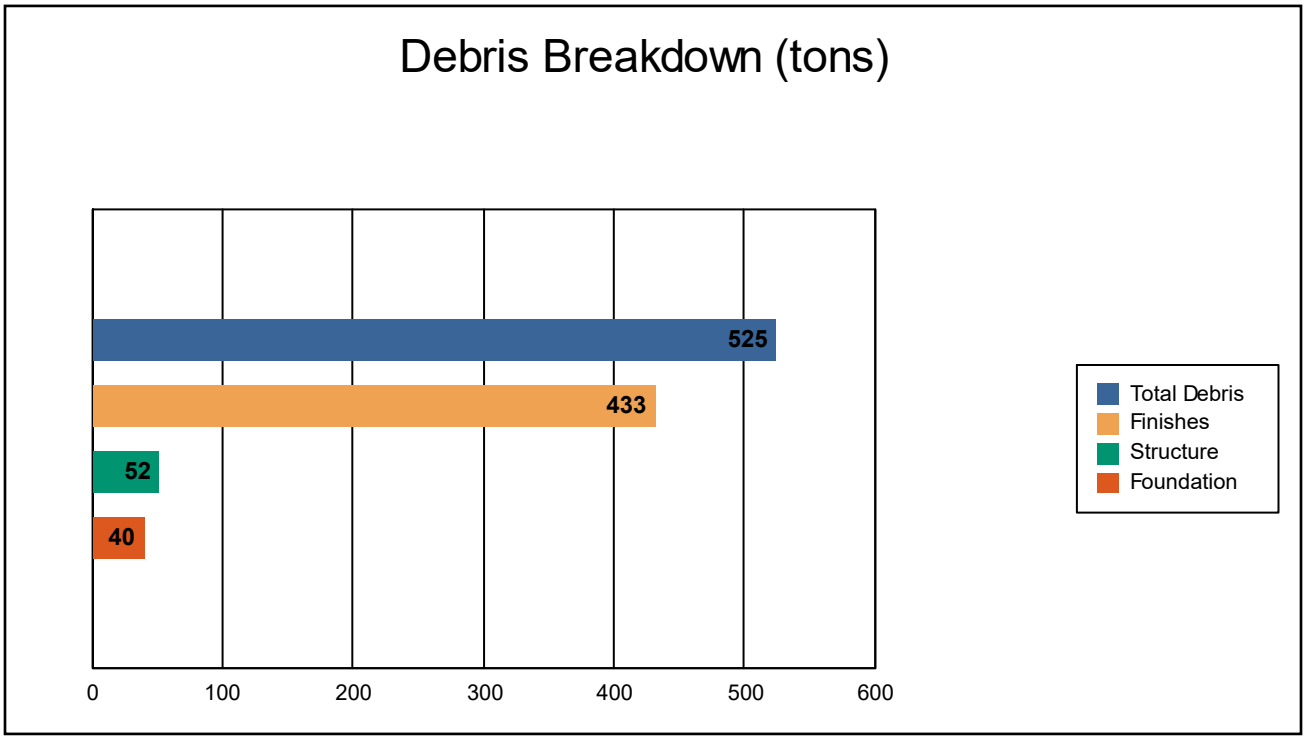
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

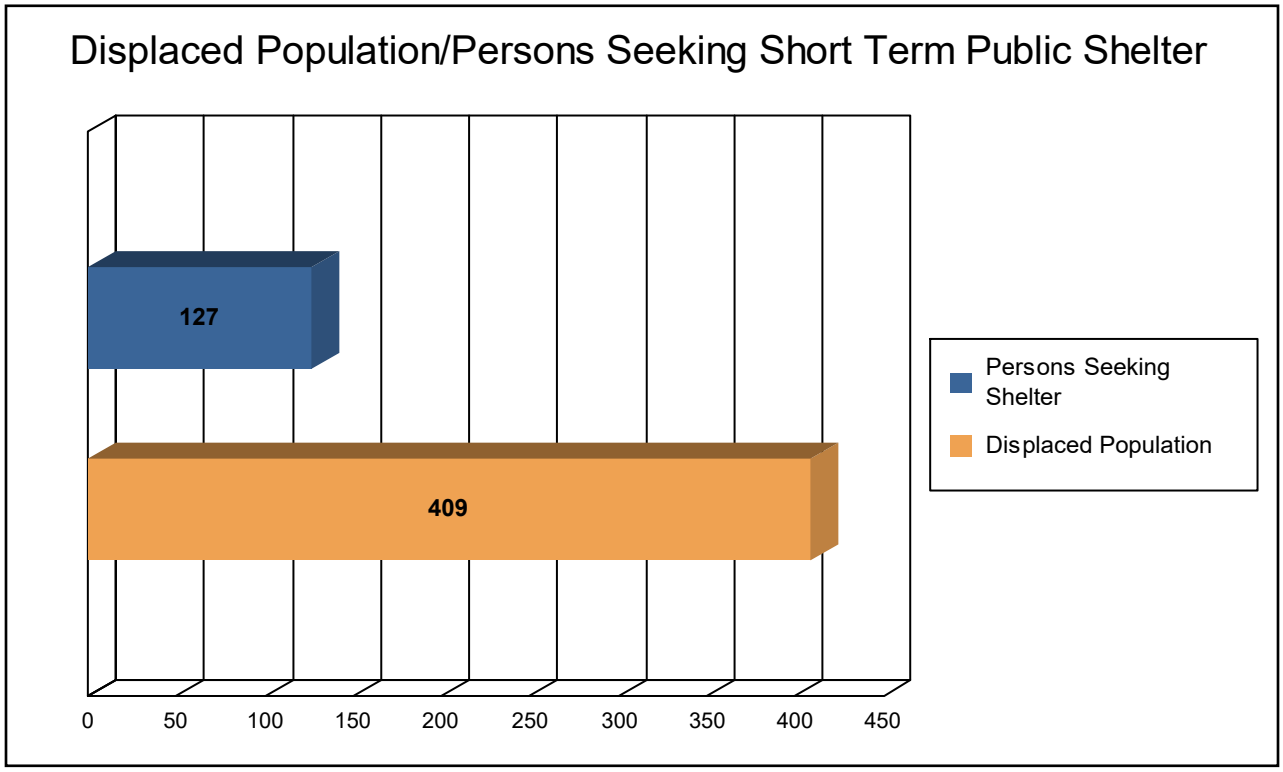


The model estimates that a total of 525 tons of debris will be generated. Of the total amount, Finishes comprises 82% of the total, Structure comprises 10% of the total, and Foundation comprises 8%. If the debris tonnage is converted into an estimated number of truckloads, it will require 21 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 136 households (or 409 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 127 people (out of a total population of 27,298) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 22.27 million dollars, which represents 1.93 % of the total replacement value of the scenario buildings.

Building-Related Losses

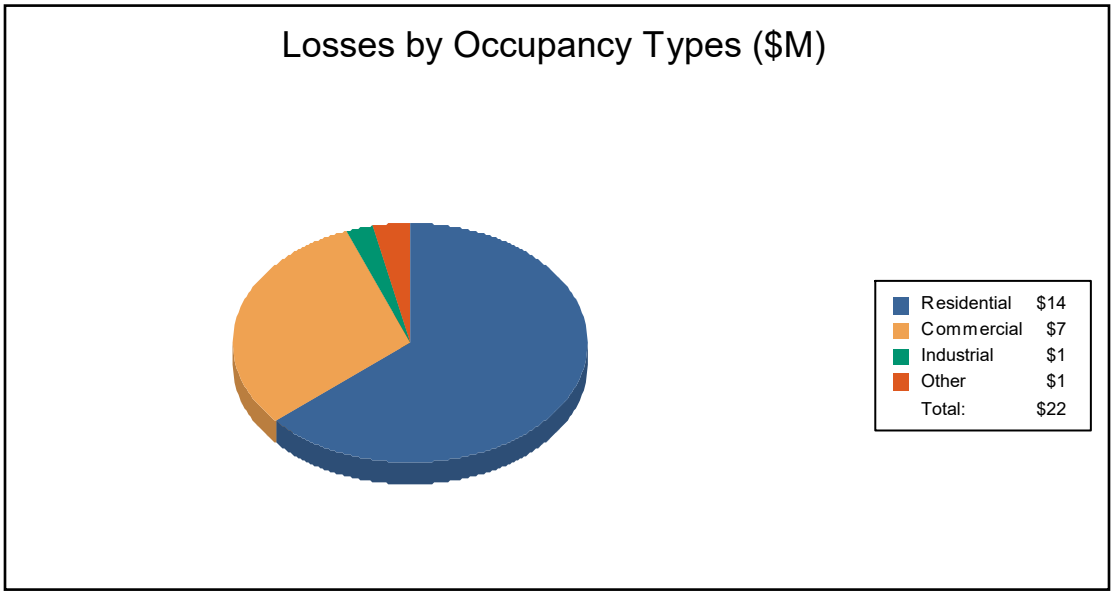
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 15.03 million dollars. 32% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 63.55% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.27	0.72	0.17	0.04	6.20
	Content	5.83	2.14	0.28	0.25	8.51
	Inventory	0.00	0.25	0.04	0.03	0.32
	Subtotal	**11.11**	**3.11**	**0.50**	**0.32**	**15.03**
Business Interruption						
	Income	0.02	1.41	0.01	0.11	1.54
	Relocation	1.66	0.31	0.01	0.01	1.99
	Rental Income	1.31	0.22	0.00	0.00	1.53
	Wage	0.06	1.79	0.02	0.32	2.18
	Subtotal	**3.05**	**3.72**	**0.03**	**0.44**	**7.23**
ALL	**Total**	**14.15**	**6.83**	**0.53**	**0.76**	**22.27**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,252	1,171,437	5,448,689
Total	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**
Total Study Region	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**

Hazus: Flood Global Risk Report

Region Name: Wethersfield_FL

Flood Scenario: Wethersfield_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 356 census blocks. The region contains over 11 thousand households and has a total population of 27,298 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,172 buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92.08% of the buildings (and 78.50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,172 buildings in the region which have an aggregate total replacement value of 5,449 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,277,252	78.5%
Commercial	638,203	11.7%
Industrial	200,919	3.7%
Agricultural	10,152	0.2%
Religion	84,461	1.6%
Government	46,582	0.9%
Education	191,120	3.5%
Total	**5,448,689**	**100%**

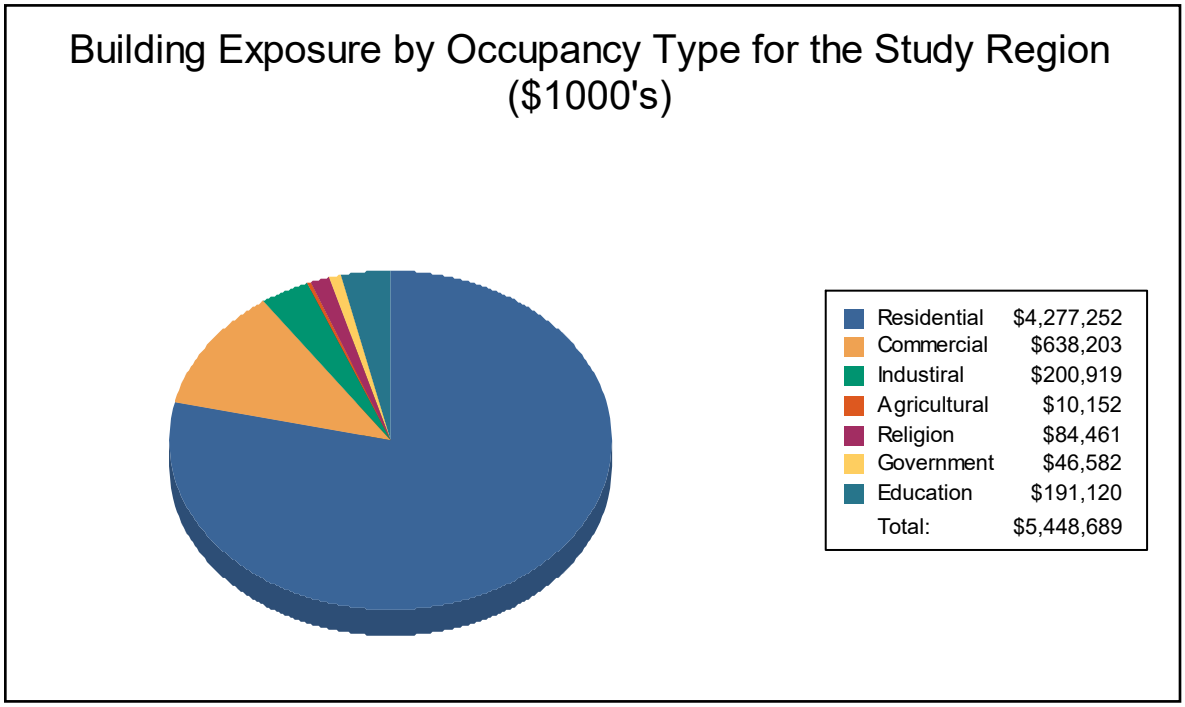
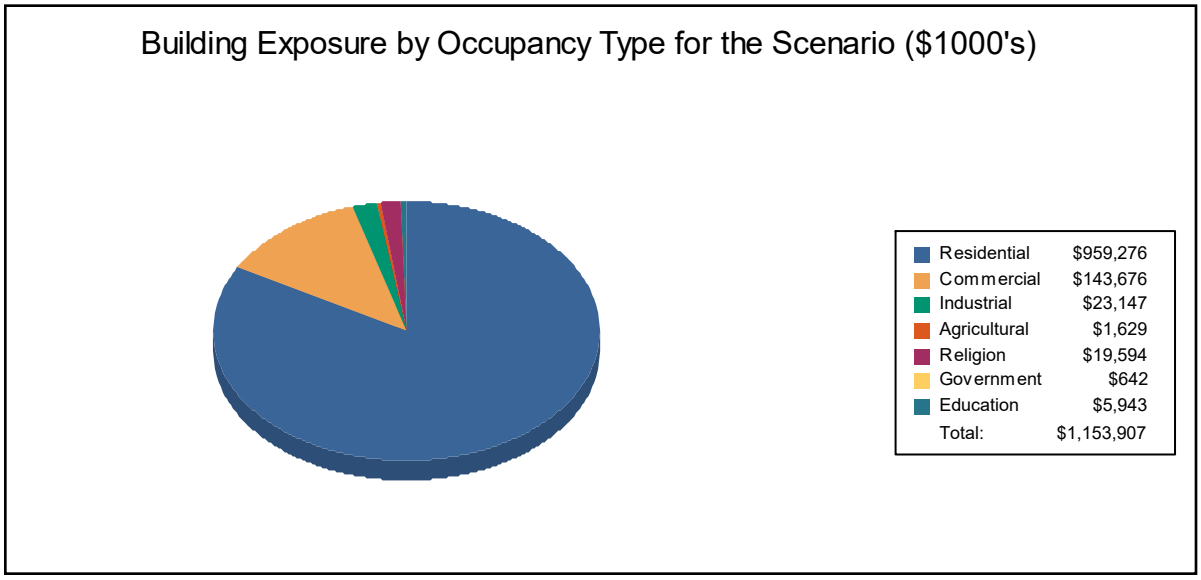


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	959,276	83.1%
Commercial	143,676	12.5%
Industrial	23,147	2.0%
Agricultural	1,629	0.1%
Religion	19,594	1.7%
Government	642	0.1%
Education	5,943	0.5%
Total	**1,153,907**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 3 fire stations, 1 police station and 1 emergency operation center.

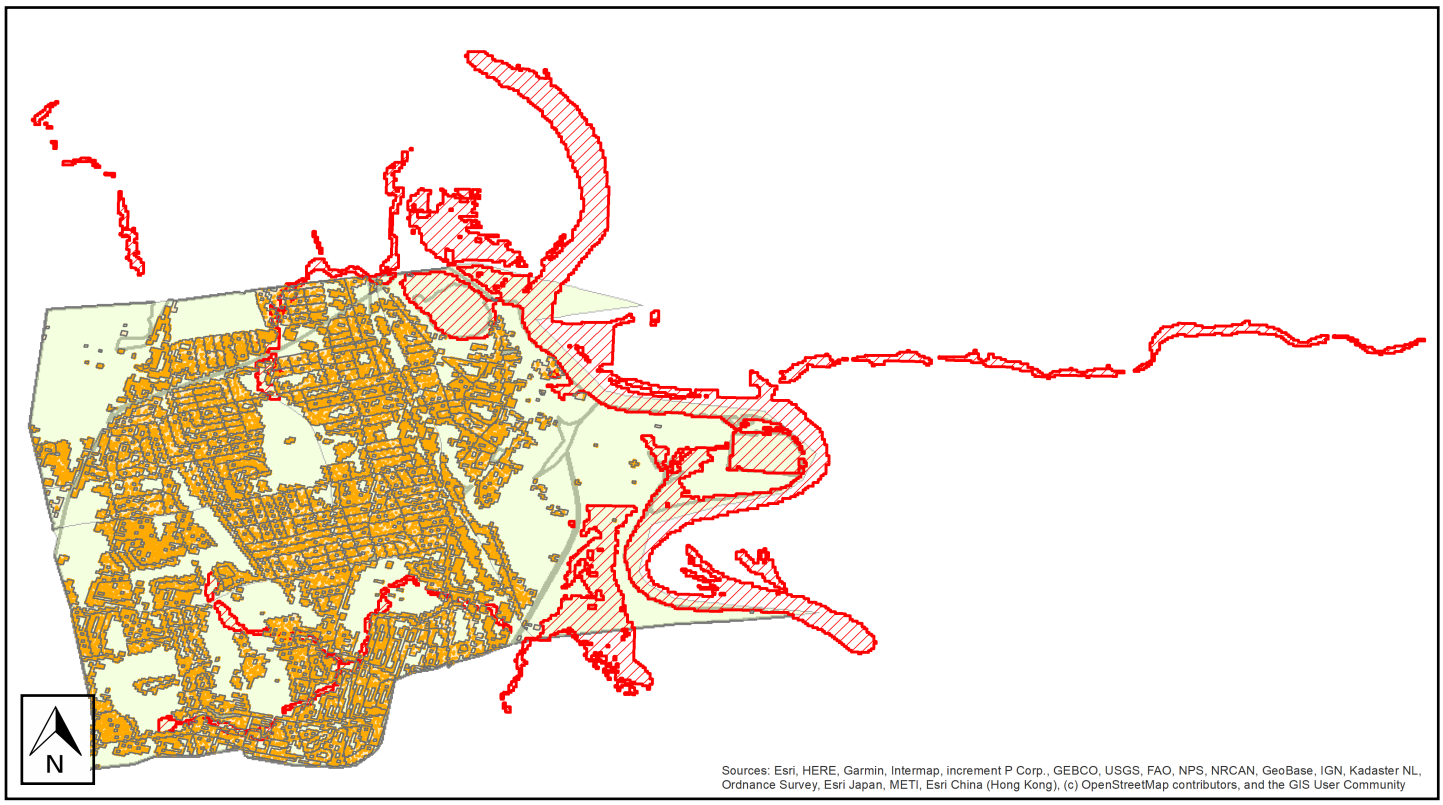
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Wethersfield_FL
Scenario Name:	Wethersfield_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 10 buildings will be at least moderately damaged. This is over 85% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

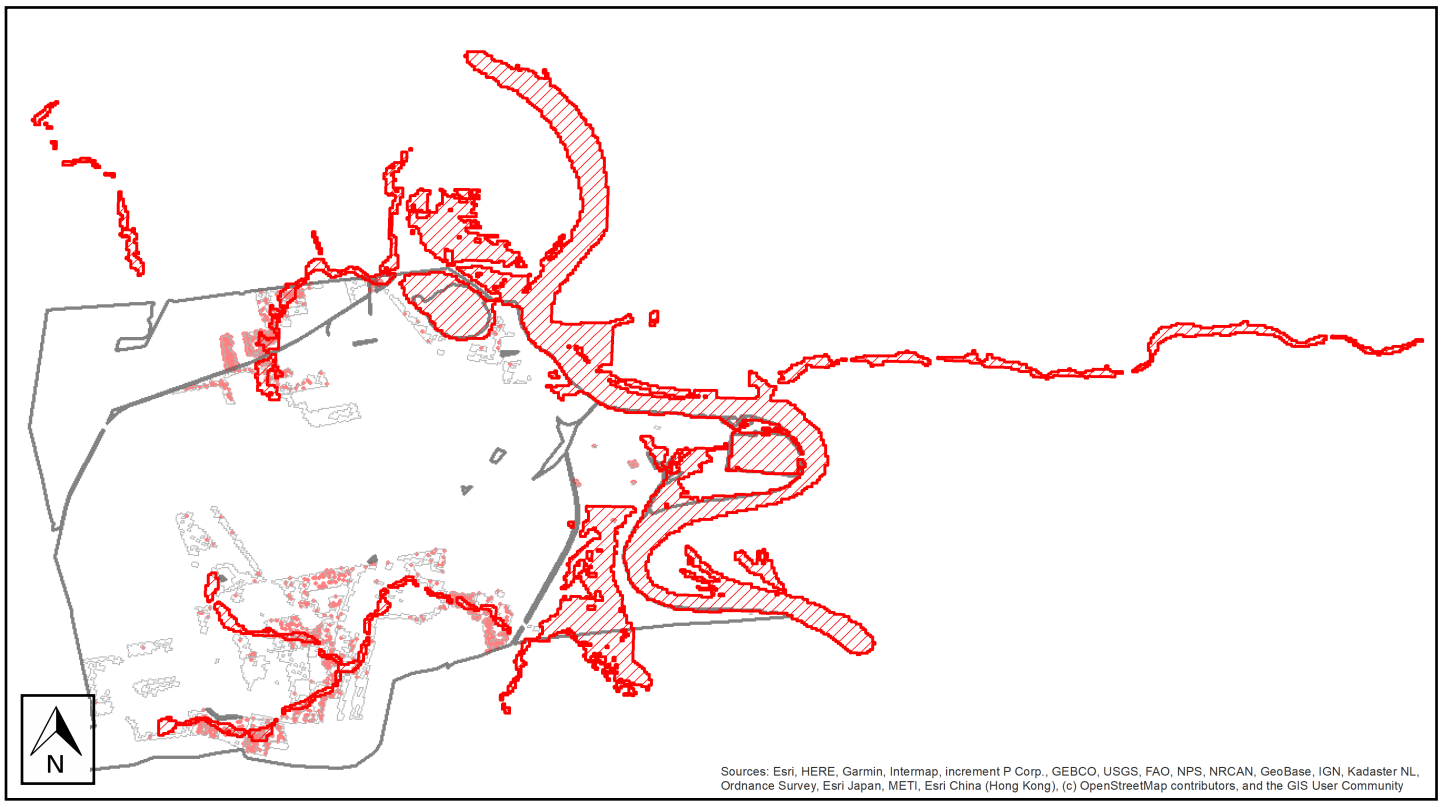


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	12	55	8	36	2	9	0	0	0	0	0	0
Total	**12**		**8**		**2**		**0**		**0**		**0**	

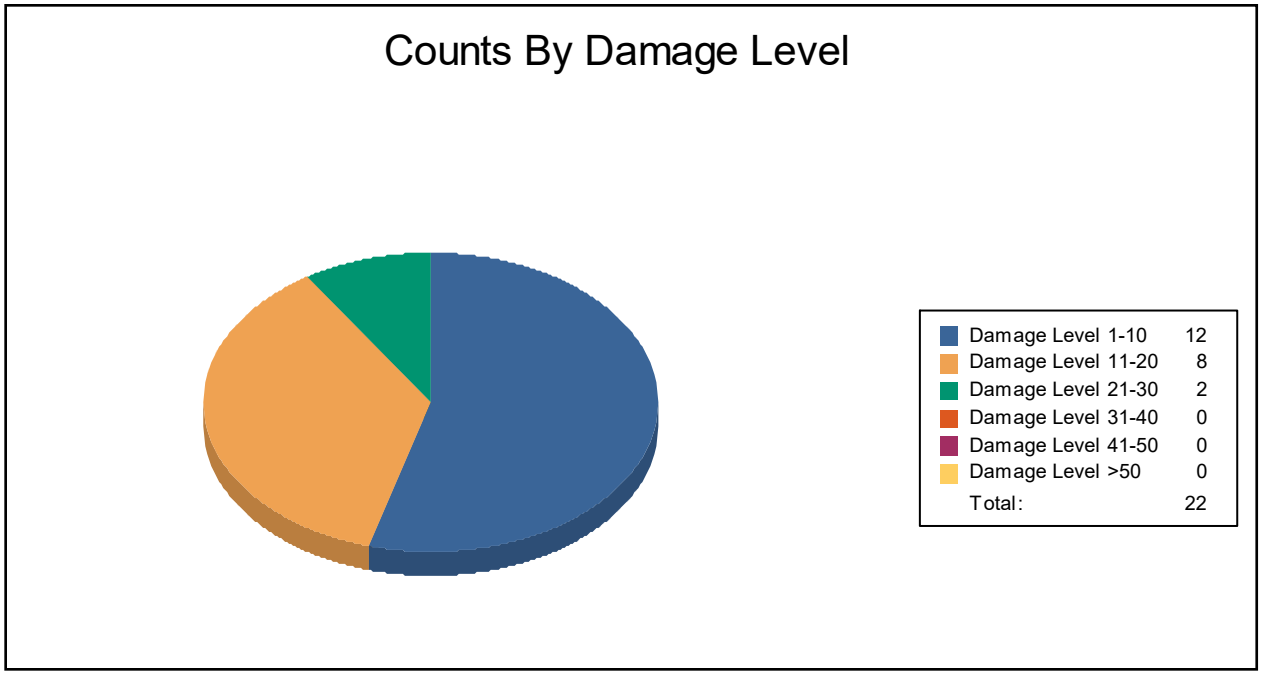


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	11	52	8	38	2	10	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

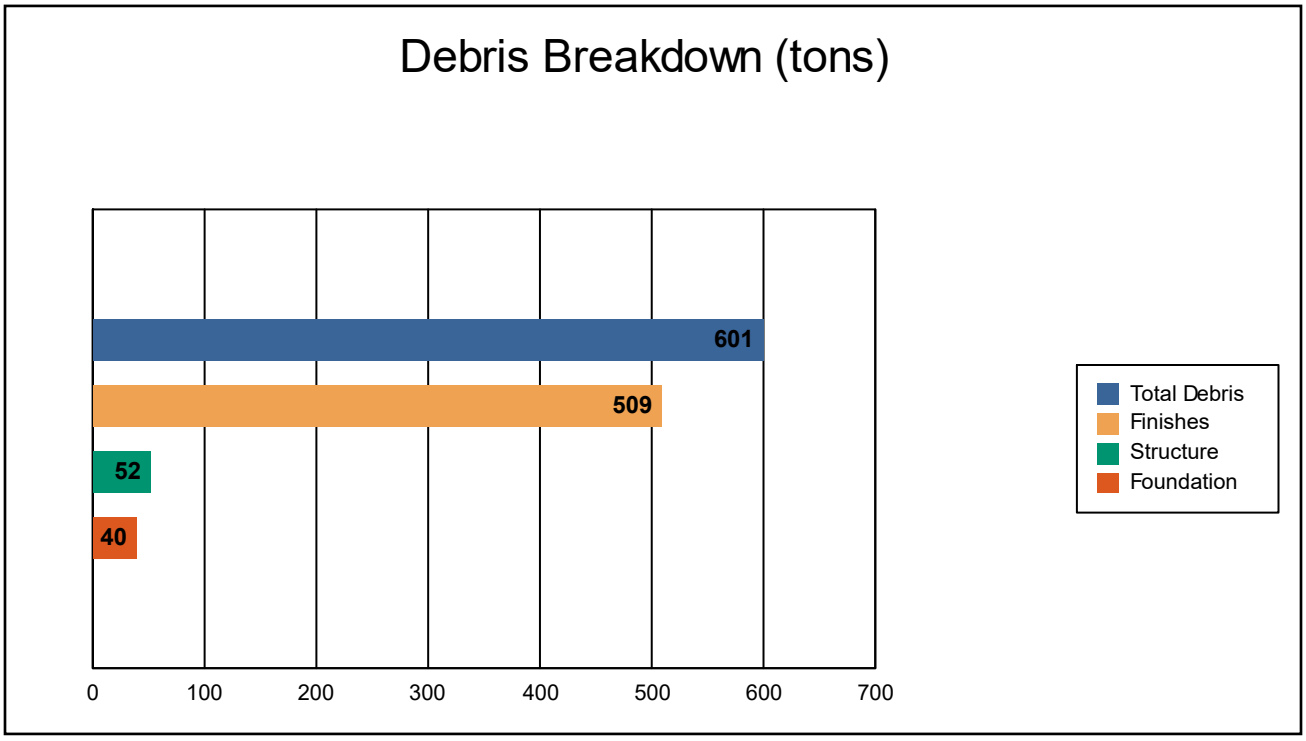
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

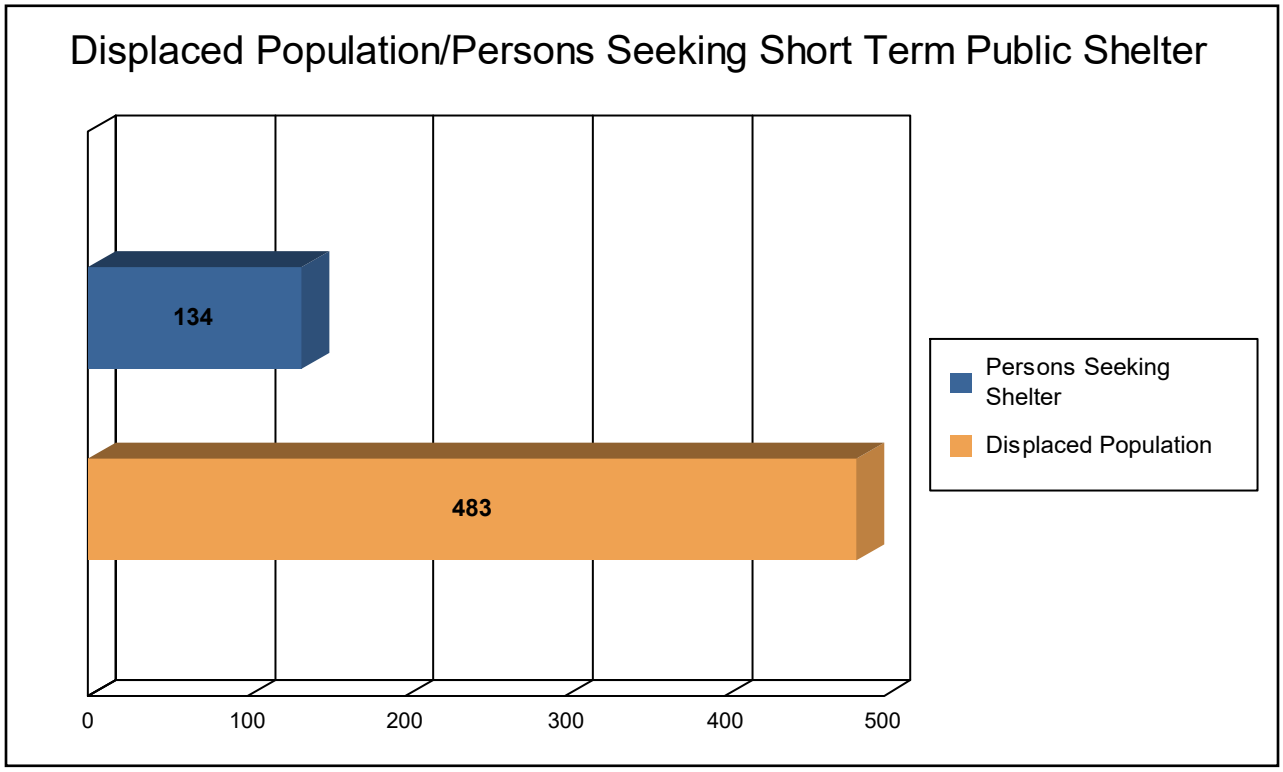


The model estimates that a total of 601 tons of debris will be generated. Of the total amount, Finishes comprises 85% of the total, Structure comprises 9% of the total, and Foundation comprises 7%. If the debris tonnage is converted into an estimated number of truckloads, it will require 25 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 161 households (or 483 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 134 people (out of a total population of 27,298) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 25.44 million dollars, which represents 2.20 % of the total replacement value of the scenario buildings.

Building-Related Losses

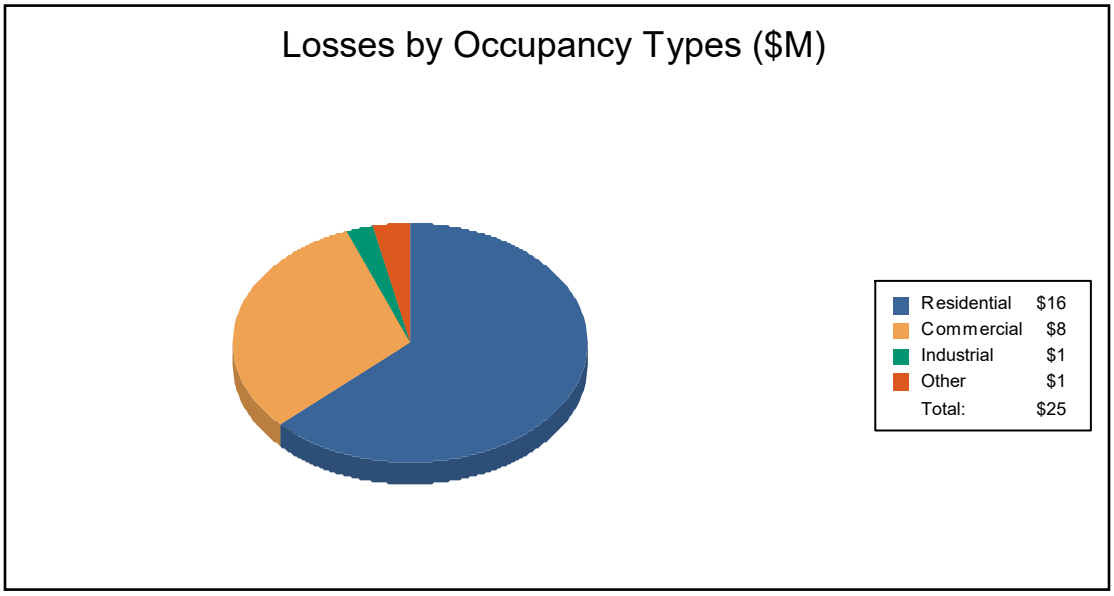
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 17.26 million dollars. 32% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 63.17% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6.07	0.84	0.21	0.05	7.16
	Content	6.49	2.58	0.35	0.30	9.71
	Inventory	0.00	0.31	0.05	0.03	0.39
	Subtotal	**12.56**	**3.72**	**0.61**	**0.38**	**17.26**
Business Interruption						
	Income	0.03	1.60	0.01	0.11	1.75
	Relocation	1.88	0.33	0.01	0.02	2.24
	Rental Income	1.54	0.23	0.00	0.00	1.77
	Wage	0.07	2.00	0.02	0.33	2.41
	Subtotal	**3.51**	**4.17**	**0.03**	**0.46**	**8.17**
ALL	**Total**	**16.07**	**7.89**	**0.64**	**0.84**	**25.44**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,252	1,171,437	5,448,689
Total	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**
Total Study Region	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**

Hazus: Flood Global Risk Report

Region Name: Wethersfield_FL

Flood Scenario: Wethersfield_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 356 census blocks. The region contains over 11 thousand households and has a total population of 27,298 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,172 buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92.08% of the buildings (and 78.50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,172 buildings in the region which have an aggregate total replacement value of 5,449 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,277,252	78.5%
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Industrial	200,919	3.7%
Agricultural	10,152	0.2%
Religion	84,461	1.6%
Government	46,582	0.9%
Education	191,120	3.5%
Total	**5,448,689**	**100%**

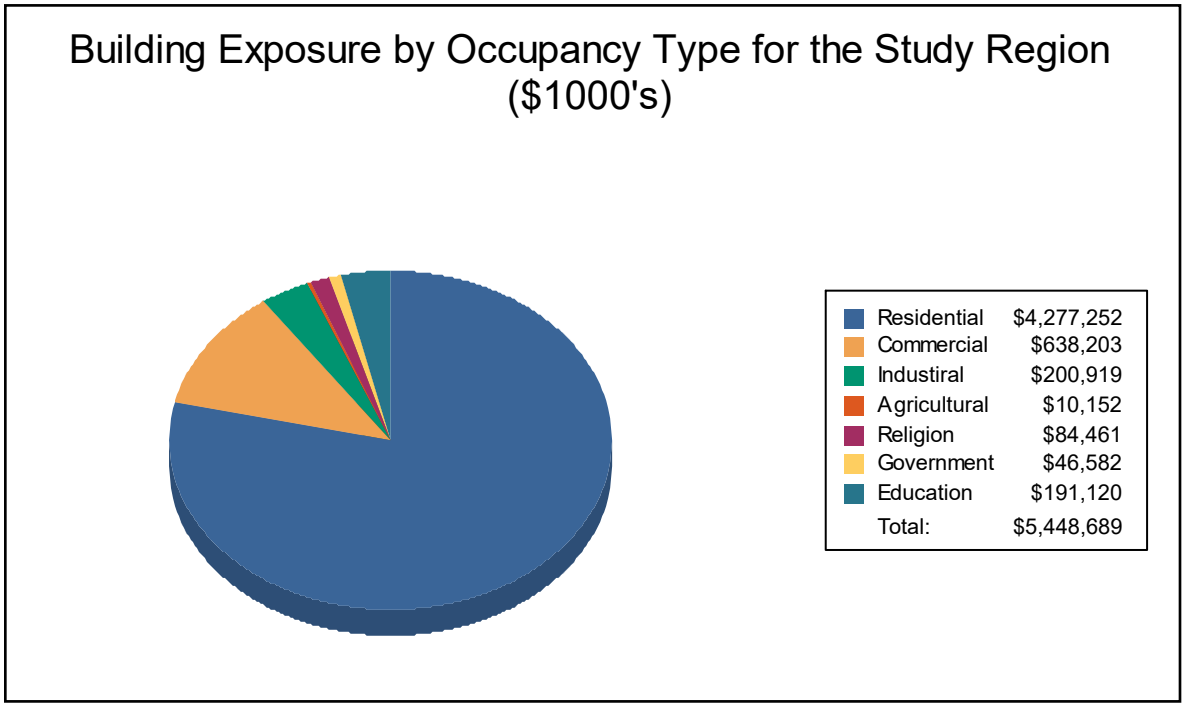
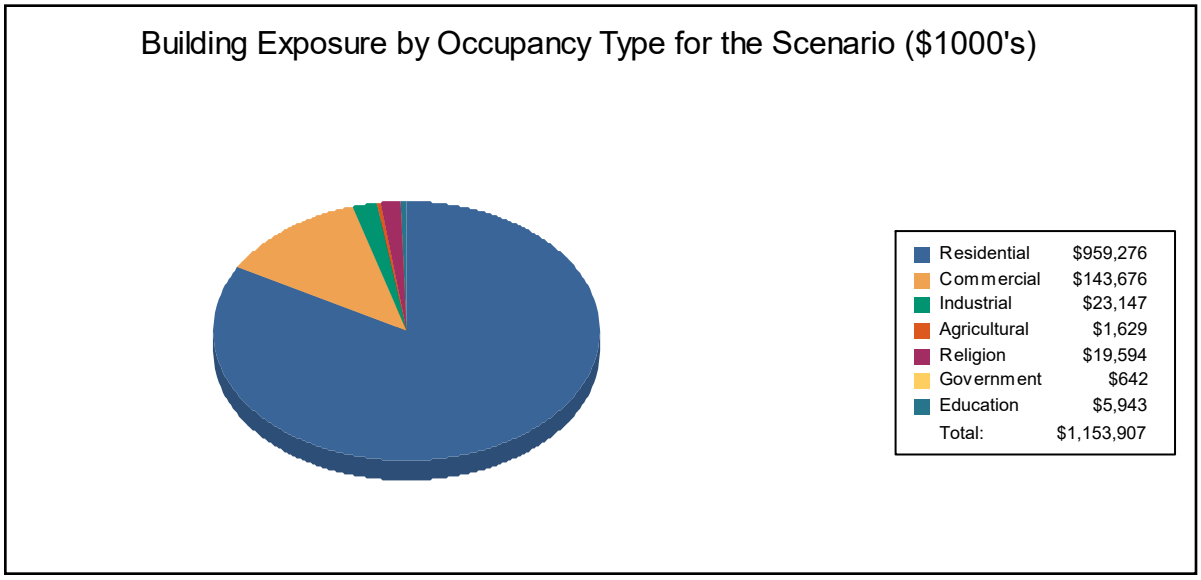


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	959,276	83.1%
Commercial	143,676	12.5%
Industrial	23,147	2.0%
Agricultural	1,629	0.1%
Religion	19,594	1.7%
Government	642	0.1%
Education	5,943	0.5%
Total	**1,153,907**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 3 fire stations, 1 police station and 1 emergency operation center.

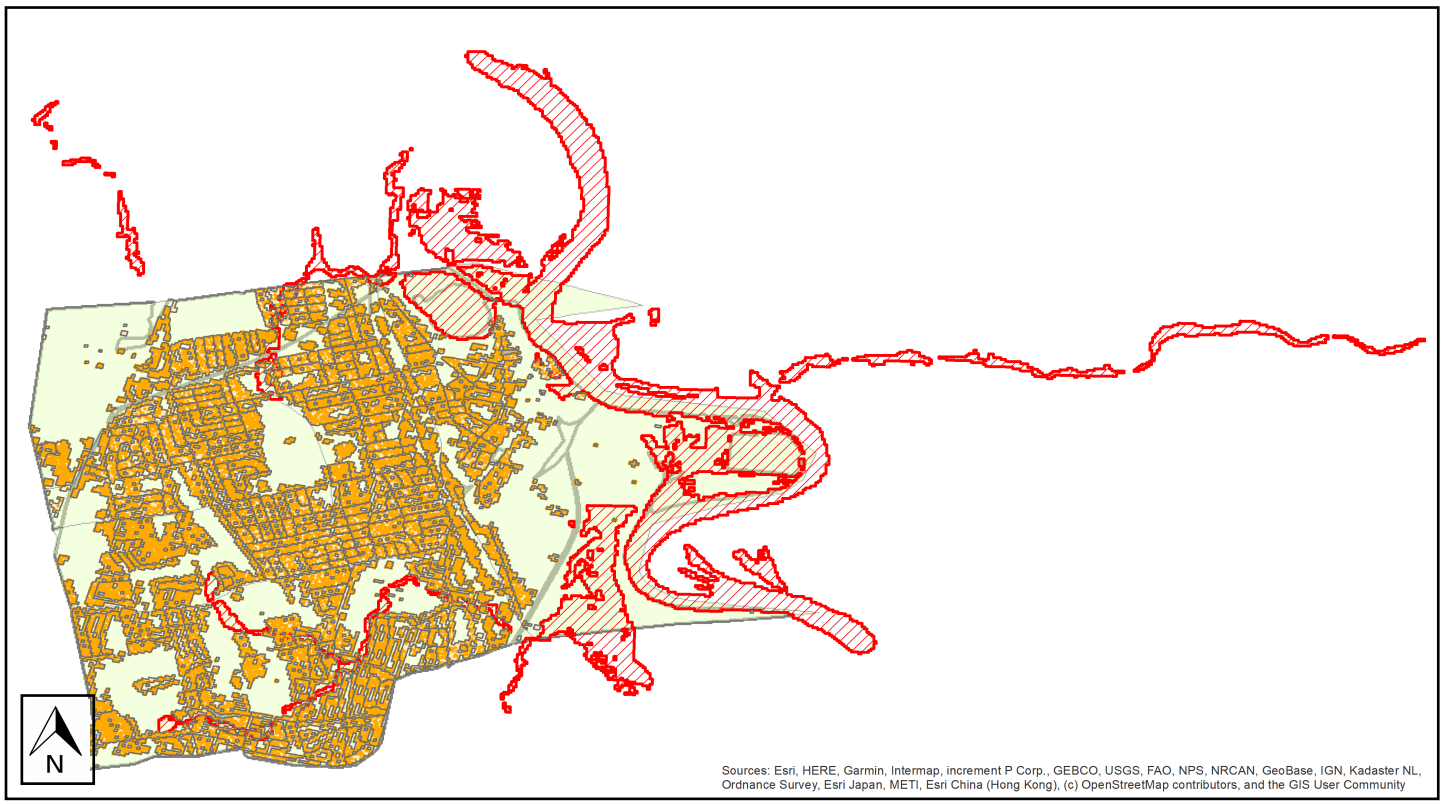
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Wethersfield_FL
Scenario Name:	Wethersfield_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 10 buildings will be at least moderately damaged. This is over 88% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

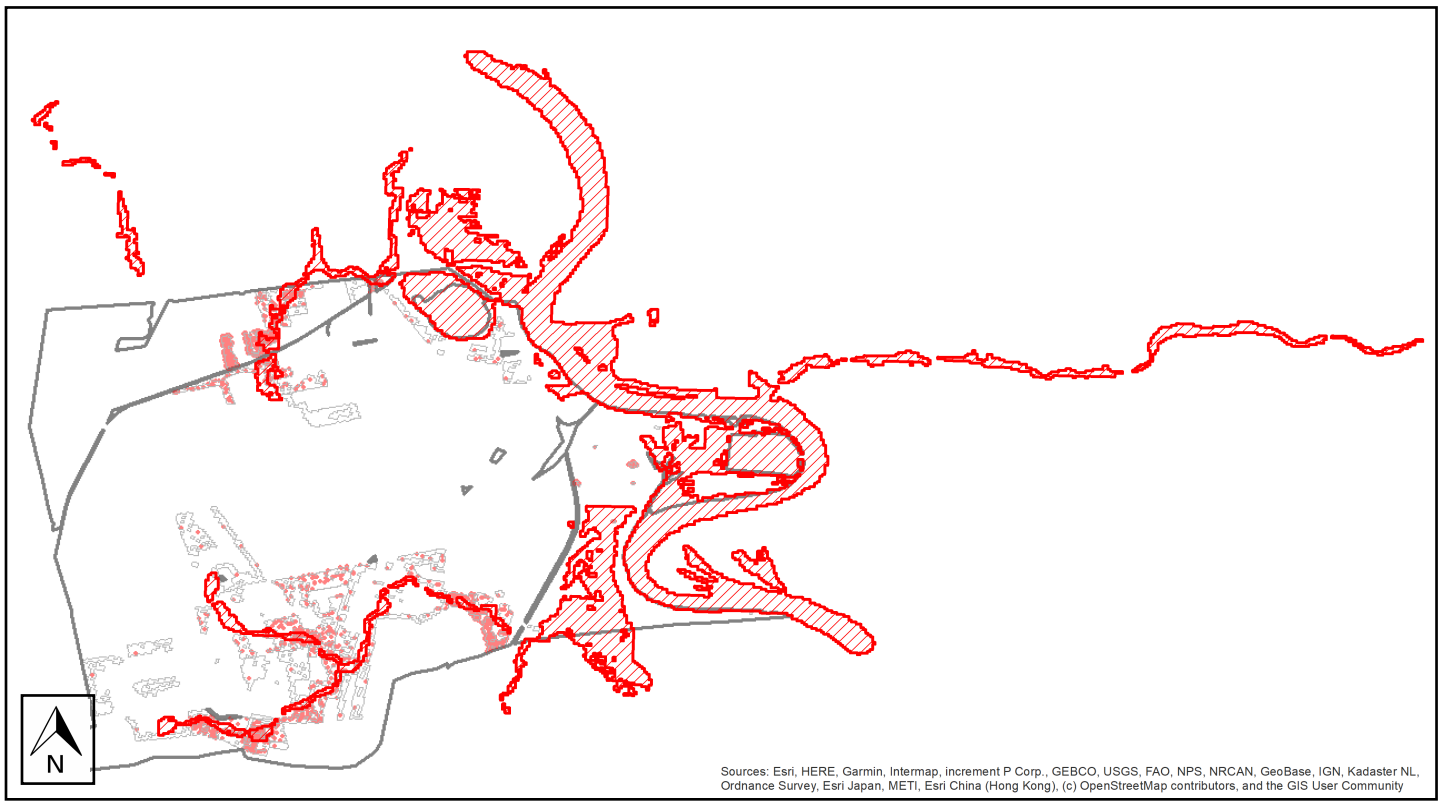


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	13	57	8	35	2	9	0	0	0	0	0	0
Total	**13**		**8**		**2**		**0**		**0**		**0**	

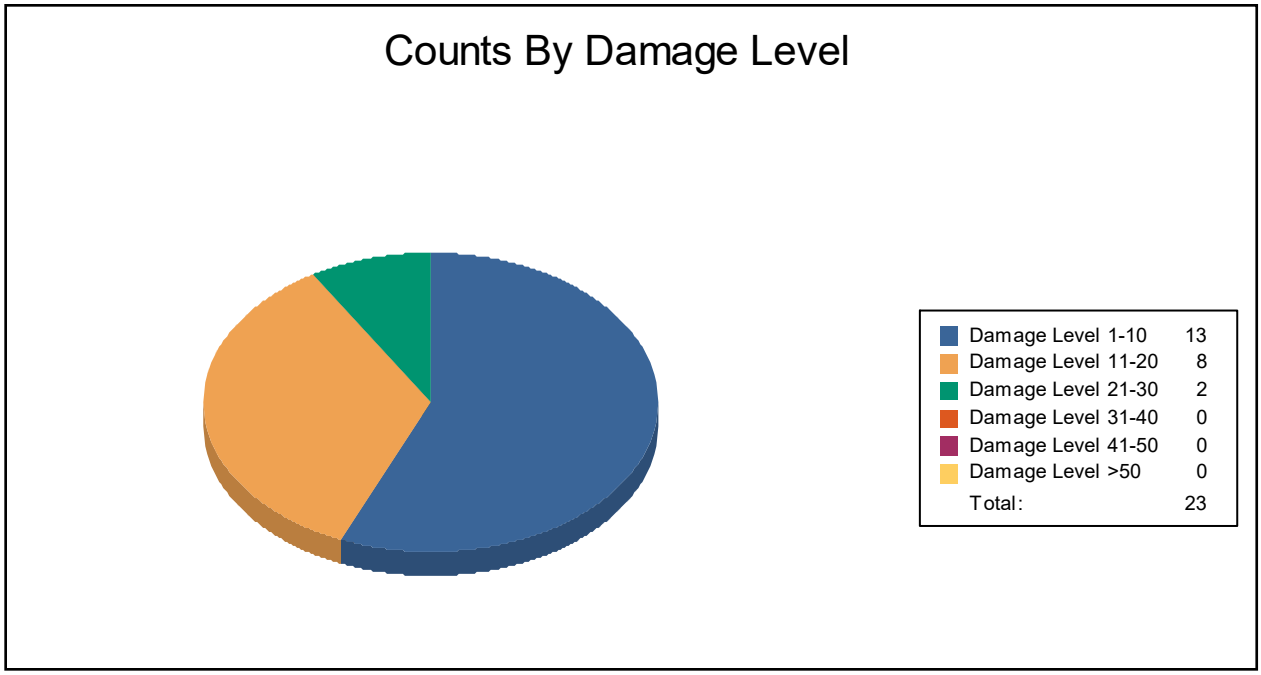


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	100	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	12	55	8	36	2	9	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

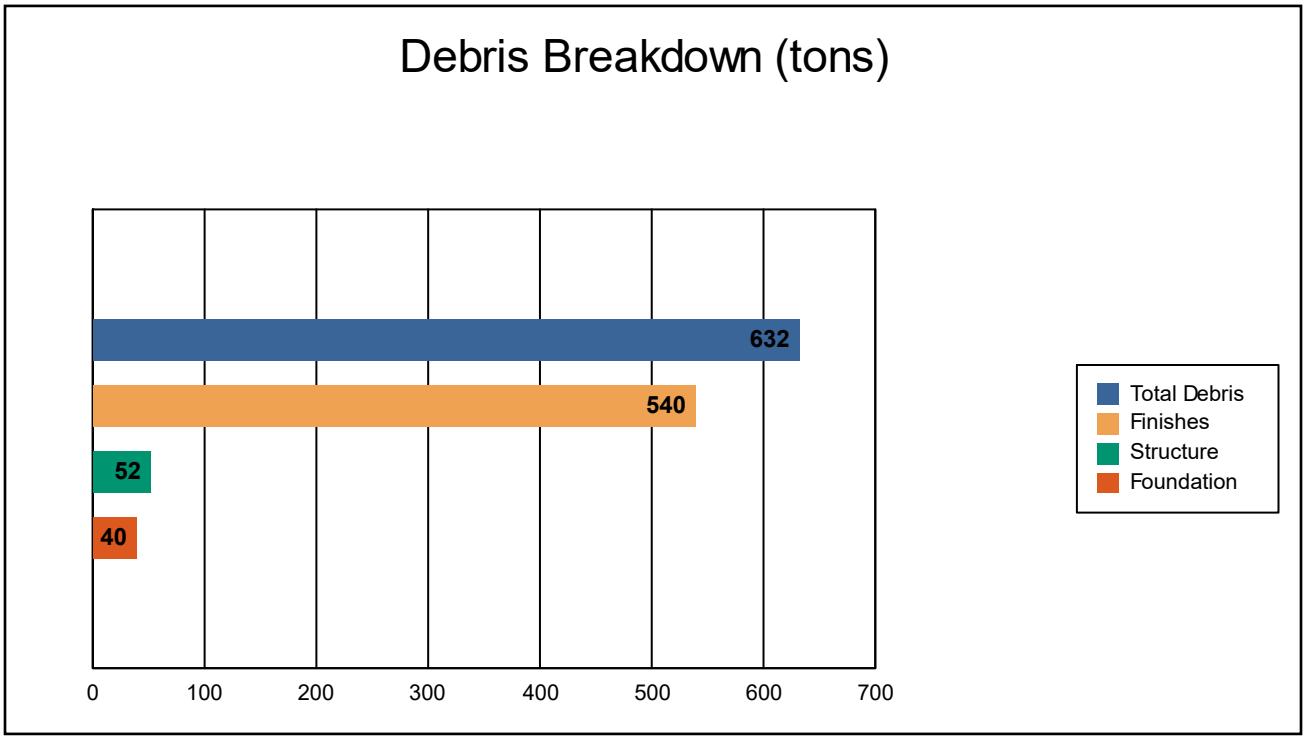
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

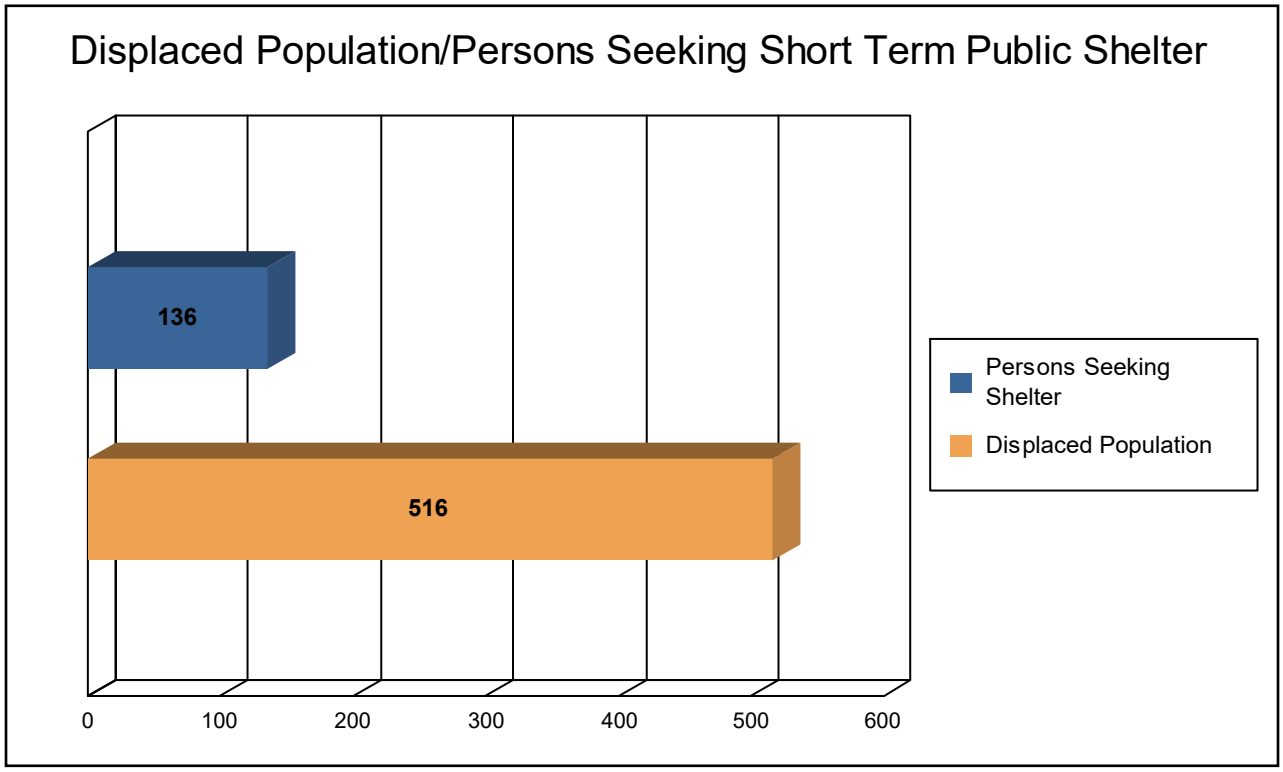


The model estimates that a total of 632 tons of debris will be generated. Of the total amount, Finishes comprises 85% of the total, Structure comprises 8% of the total, and Foundation comprises 6%. If the debris tonnage is converted into an estimated number of truckloads, it will require 26 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 172 households (or 516 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 136 people (out of a total population of 27,298) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 26.66 million dollars, which represents 2.31 % of the total replacement value of the scenario buildings.

Building-Related Losses

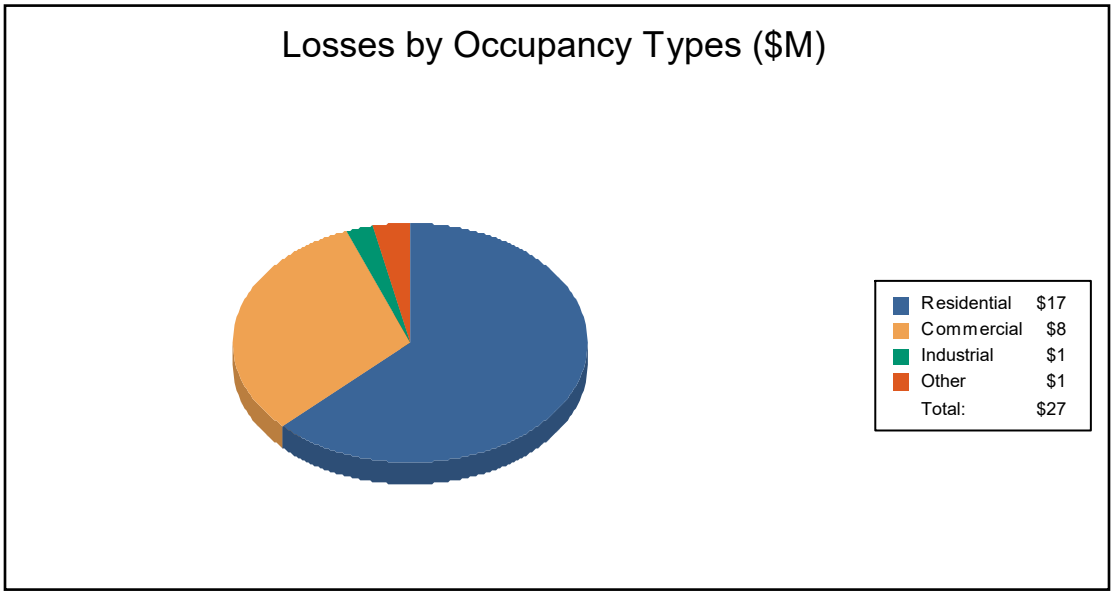
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 18.03 million dollars. 32% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 62.87% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6.38	0.87	0.22	0.05	7.51
	Content	6.73	2.71	0.37	0.32	10.12
	Inventory	0.00	0.32	0.05	0.03	0.41
	Subtotal	**13.11**	**3.89**	**0.63**	**0.40**	**18.03**
Business Interruption						
	Income	0.03	1.68	0.01	0.12	1.84
	Relocation	1.95	0.37	0.01	0.03	2.36
	Rental Income	1.60	0.26	0.00	0.00	1.86
	Wage	0.07	2.14	0.02	0.35	2.57
	Subtotal	**3.65**	**4.44**	**0.03**	**0.50**	**8.63**
ALL	**Total**	**16.76**	**8.34**	**0.67**	**0.90**	**26.66**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,252	1,171,437	5,448,689
Total	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**
Total Study Region	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**

Hazus: Flood Global Risk Report

Region Name: Wethersfield_FL

Flood Scenario: Wethersfield_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 5 square miles and contains 356 census blocks. The region contains over 11 thousand households and has a total population of 27,298 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,172 buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92.08% of the buildings (and 78.50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,172 buildings in the region which have an aggregate total replacement value of 5,449 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,277,252	78.5%
Commercial	638,203	11.7%
Industrial	200,919	3.7%
Agricultural	10,152	0.2%
Religion	84,461	1.6%
Government	46,582	0.9%
Education	191,120	3.5%
Total	**5,448,689**	**100%**

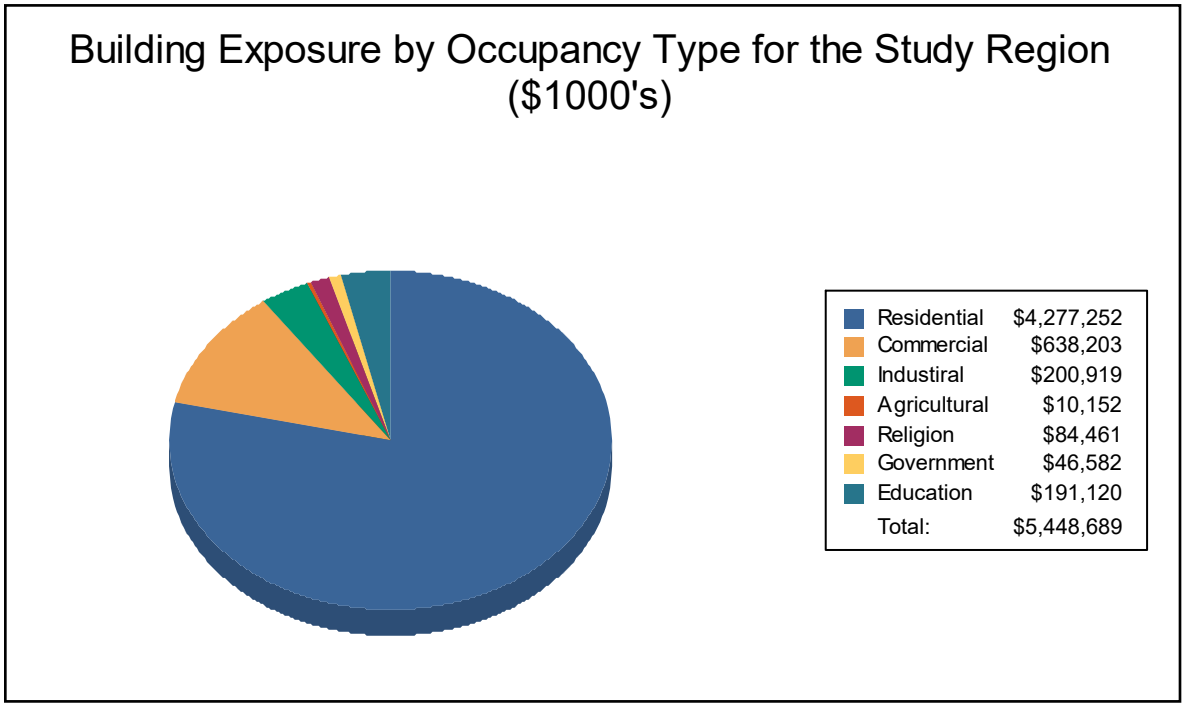
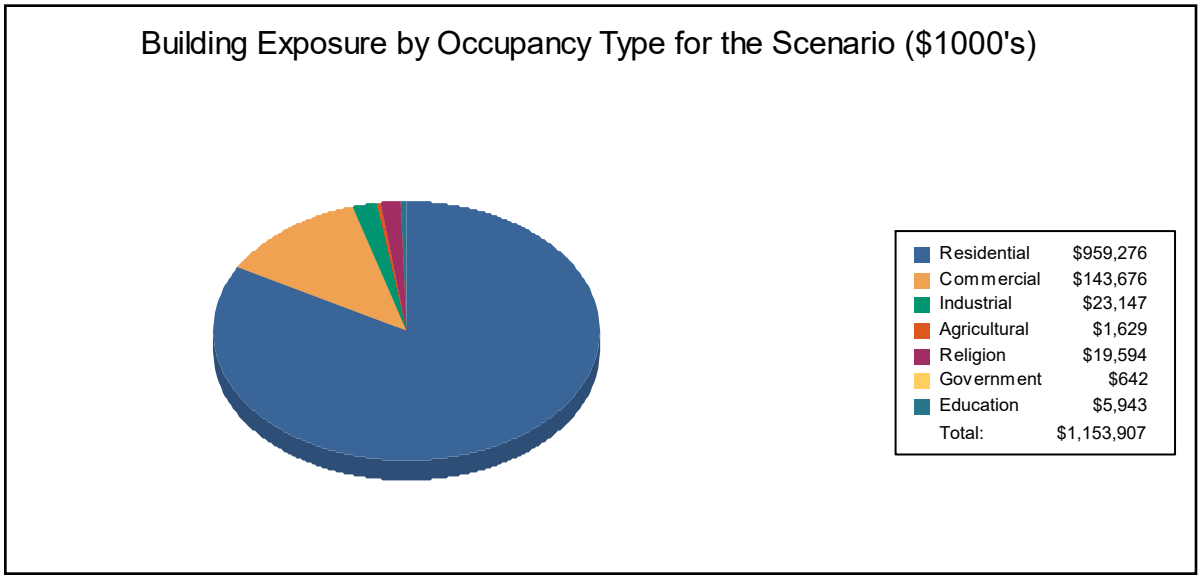


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	959,276	83.1%
Commercial	143,676	12.5%
Industrial	23,147	2.0%
Agricultural	1,629	0.1%
Religion	19,594	1.7%
Government	642	0.1%
Education	5,943	0.5%
Total	**1,153,907**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 3 fire stations, 1 police station and 1 emergency operation center.

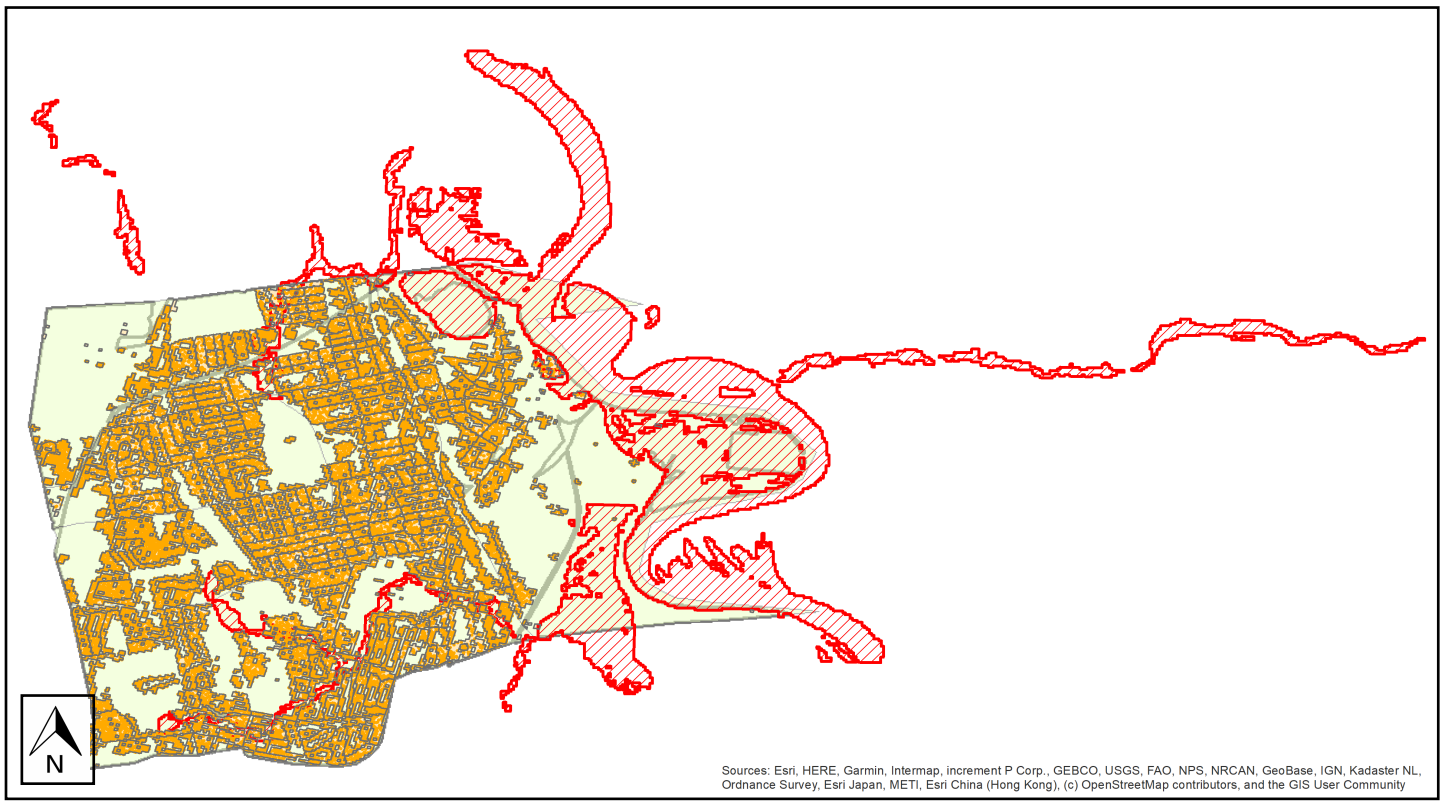
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Wethersfield_FL
Scenario Name:	Wethersfield_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 26 buildings will be at least moderately damaged. This is over 89% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

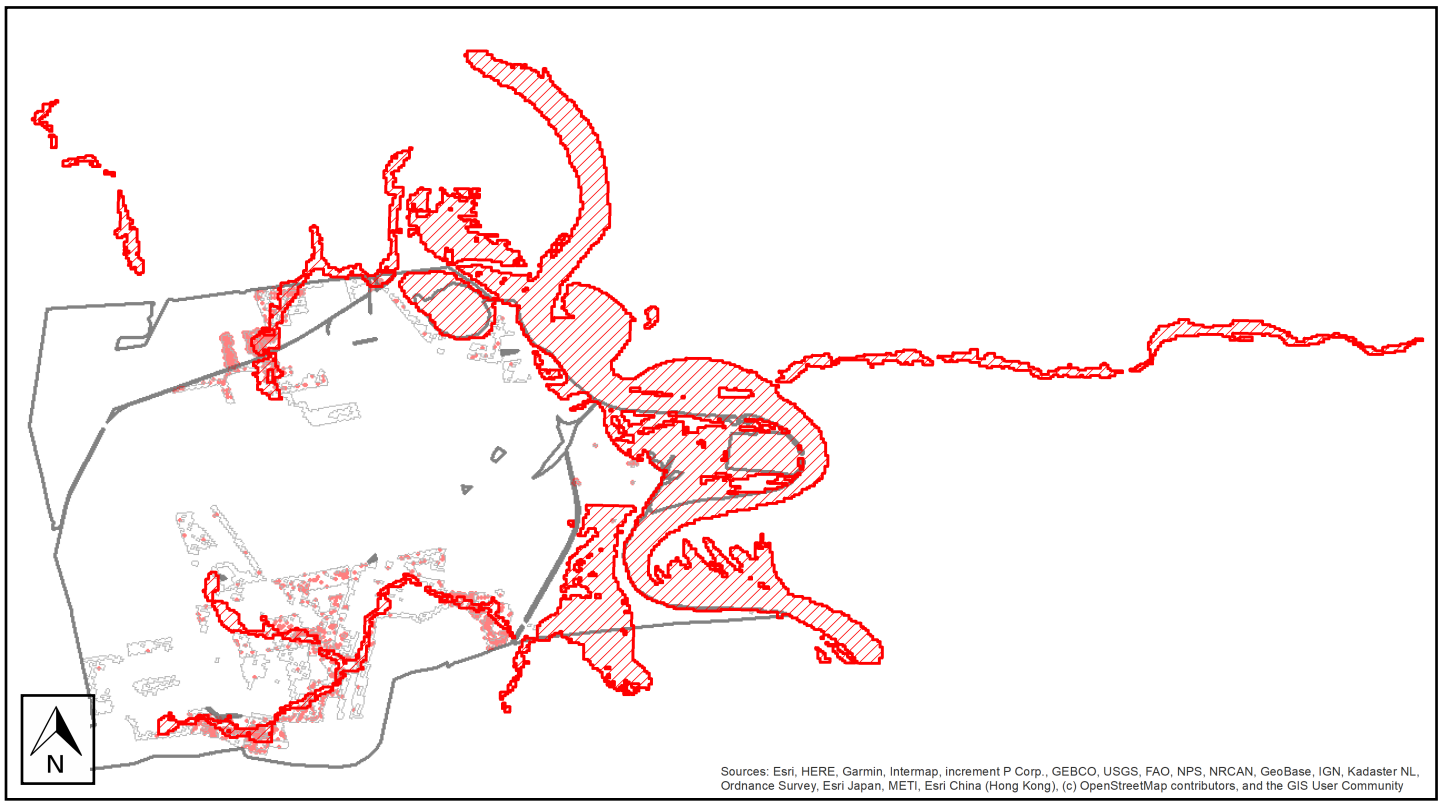


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	24	48	22	44	4	8	0	0	0	0	0	0
Total	**24**		**22**		**4**		**0**		**0**		**0**	

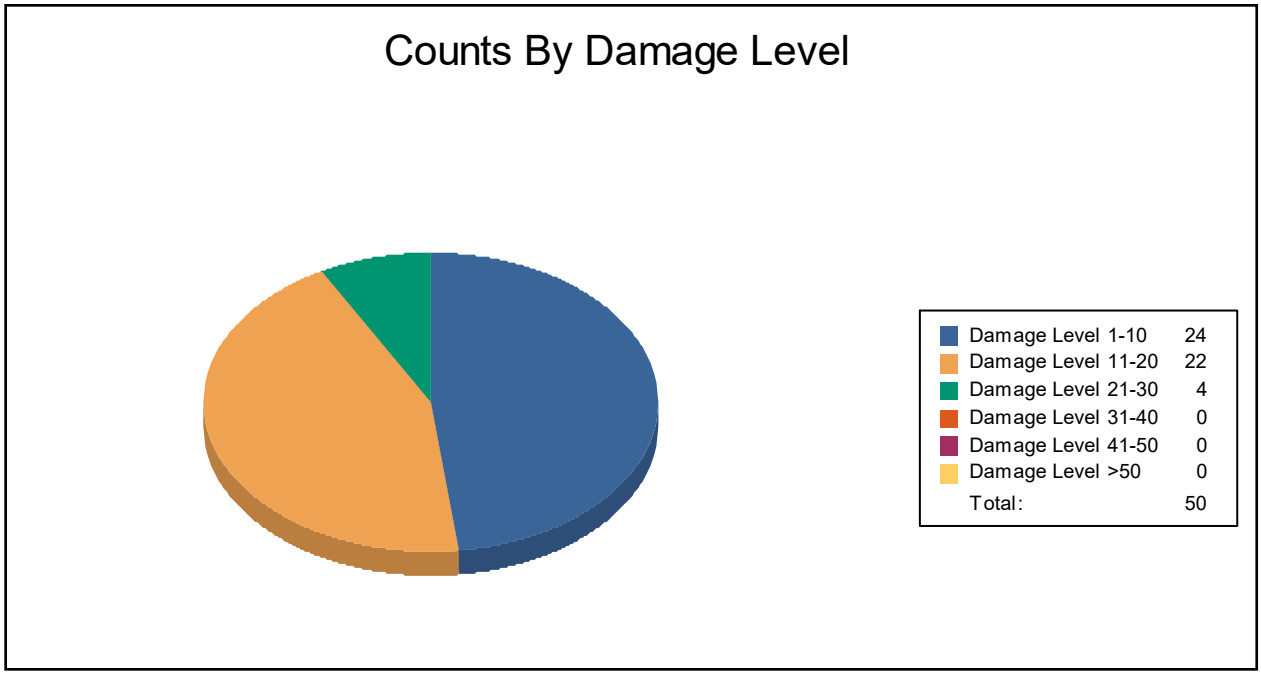


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	1	33	1	33	1	33	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	23	49	21	45	3	6	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	1	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

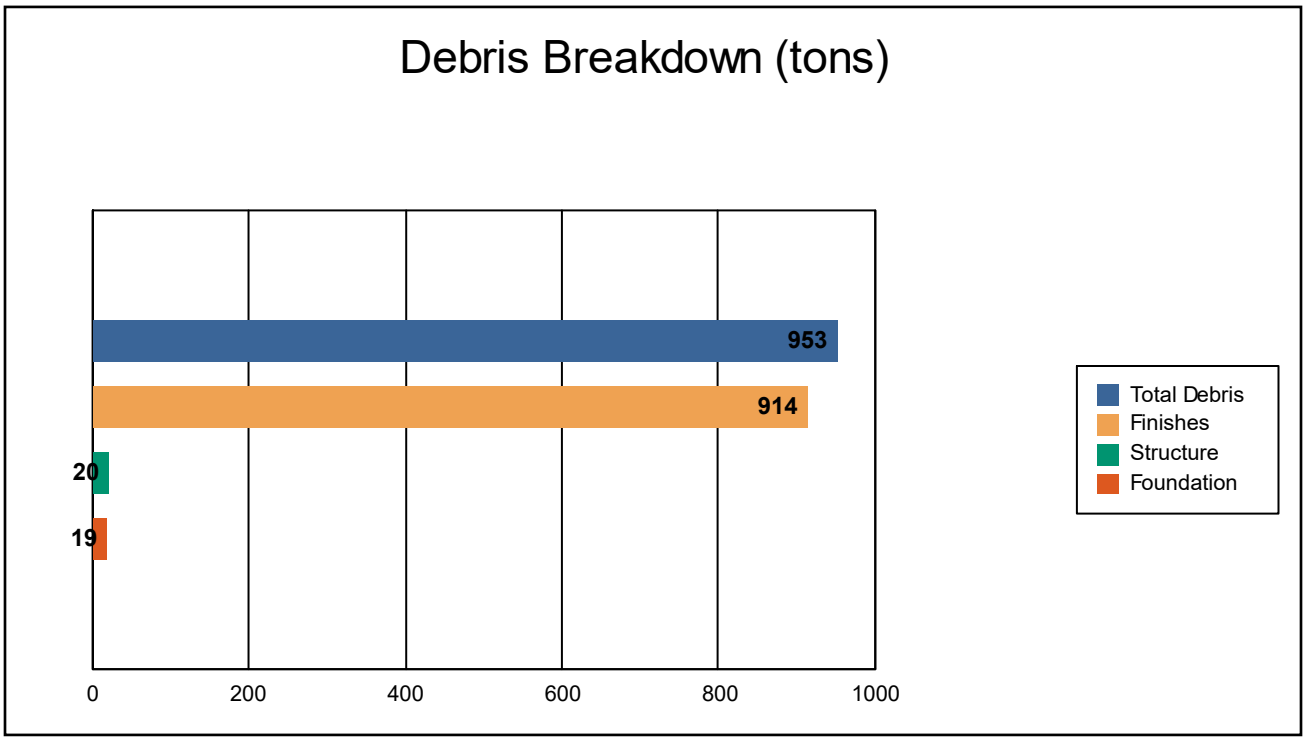
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

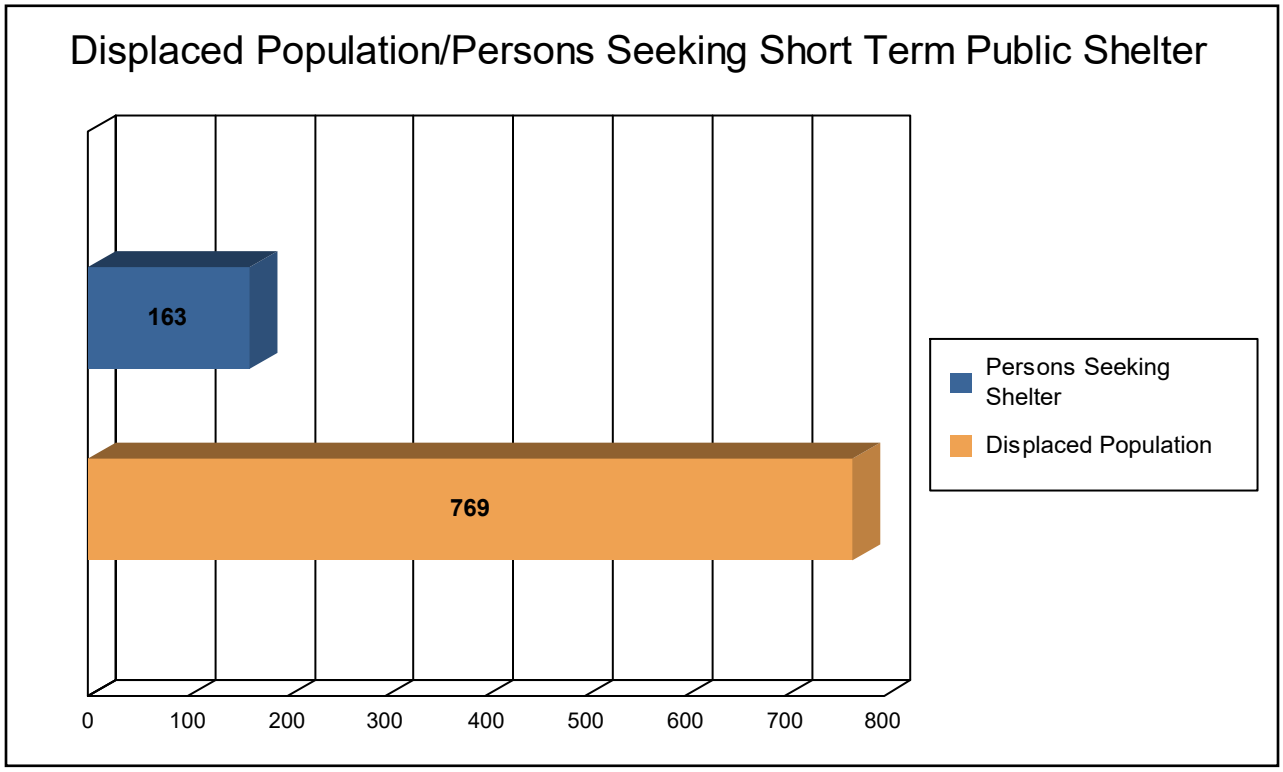


The model estimates that a total of 953 tons of debris will be generated. Of the total amount, Finishes comprises 96% of the total, Structure comprises 2% of the total, and Foundation comprises 2%. If the debris tonnage is converted into an estimated number of truckloads, it will require 39 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 256 households (or 769 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 163 people (out of a total population of 27,298) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 44.47 million dollars, which represents 3.85 % of the total replacement value of the scenario buildings.

Building-Related Losses

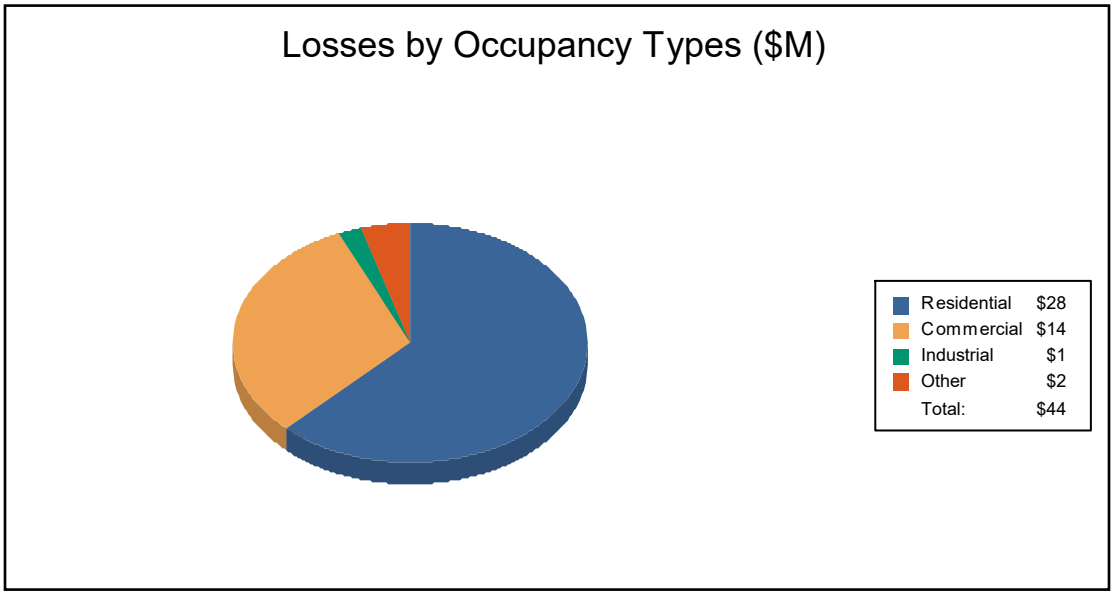
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 29.55 million dollars. 34% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 62.13% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	10.64	1.30	0.32	0.11	12.36
	Content	10.97	4.28	0.55	0.68	16.48
	Inventory	0.00	0.58	0.07	0.06	0.72
	Subtotal	**21.61**	**6.16**	**0.94**	**0.85**	**29.55**
Business Interruption						
	Income	0.04	2.92	0.01	0.25	3.22
	Relocation	3.31	0.70	0.01	0.08	4.09
	Rental Income	2.57	0.51	0.00	0.01	3.08
	Wage	0.10	3.60	0.02	0.81	4.53
	Subtotal	**6.02**	**7.71**	**0.04**	**1.14**	**14.92**
ALL	**Total**	**27.63**	**13.87**	**0.99**	**1.99**	**44.47**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,252	1,171,437	5,448,689
Total	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**
Total Study Region	**27,298**	**4,277,252**	**1,171,437**	**5,448,689**

Hazus: Flood Global Risk Report

Region Name: Willington_FL

Flood Scenario: Willington_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 5,566 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,102 buildings in the region with a total building replacement value (excluding contents) of 969 million dollars. Approximately 91.96% of the buildings (and 75.07% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,102 buildings in the region which have an aggregate total replacement value of 969 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	727,183	75.1%
Commercial	138,336	14.3%
Industrial	44,353	4.6%
Agricultural	674	0.1%
Religion	6,313	0.7%
Government	22,521	2.3%
Education	29,341	3.0%
Total	**968,721**	**100%**

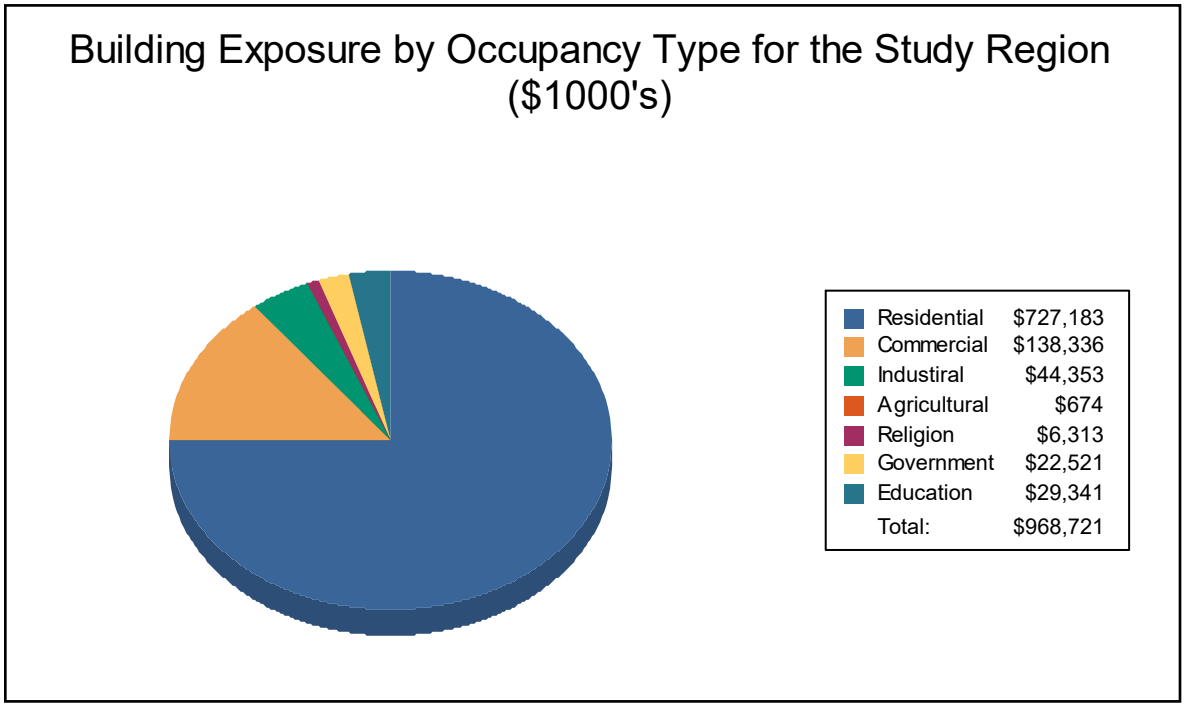
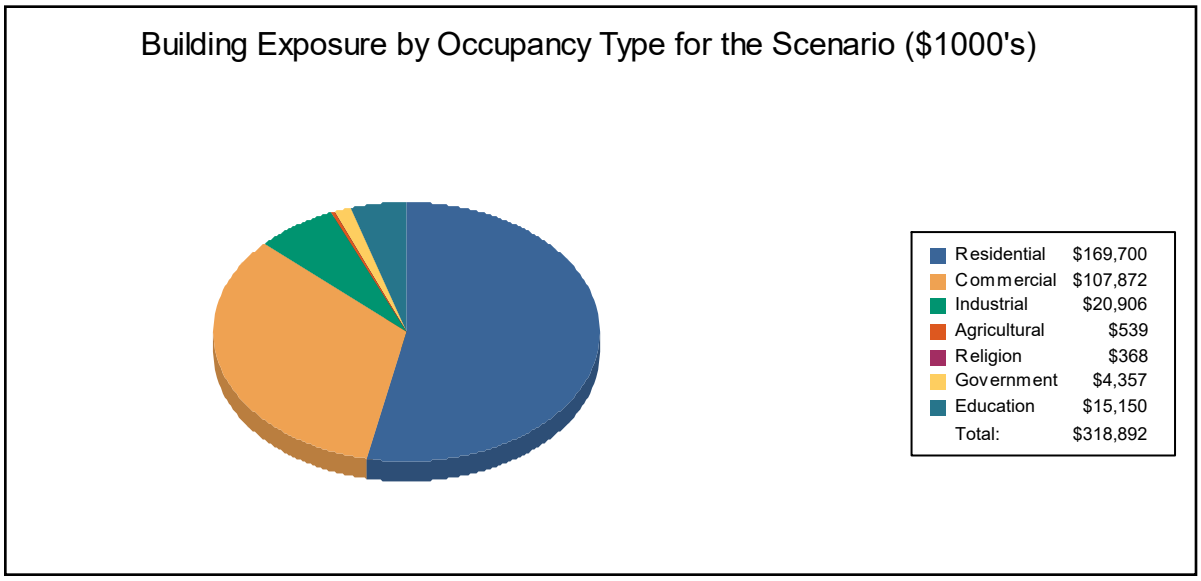


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	169,700	53.2%
Commercial	107,872	33.8%
Industrial	20,906	6.6%
Agricultural	539	0.2%
Religion	368	0.1%
Government	4,357	1.4%
Education	15,150	4.8%
Total	**318,892**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 3 fire stations, no police stations and 1 emergency operation center.

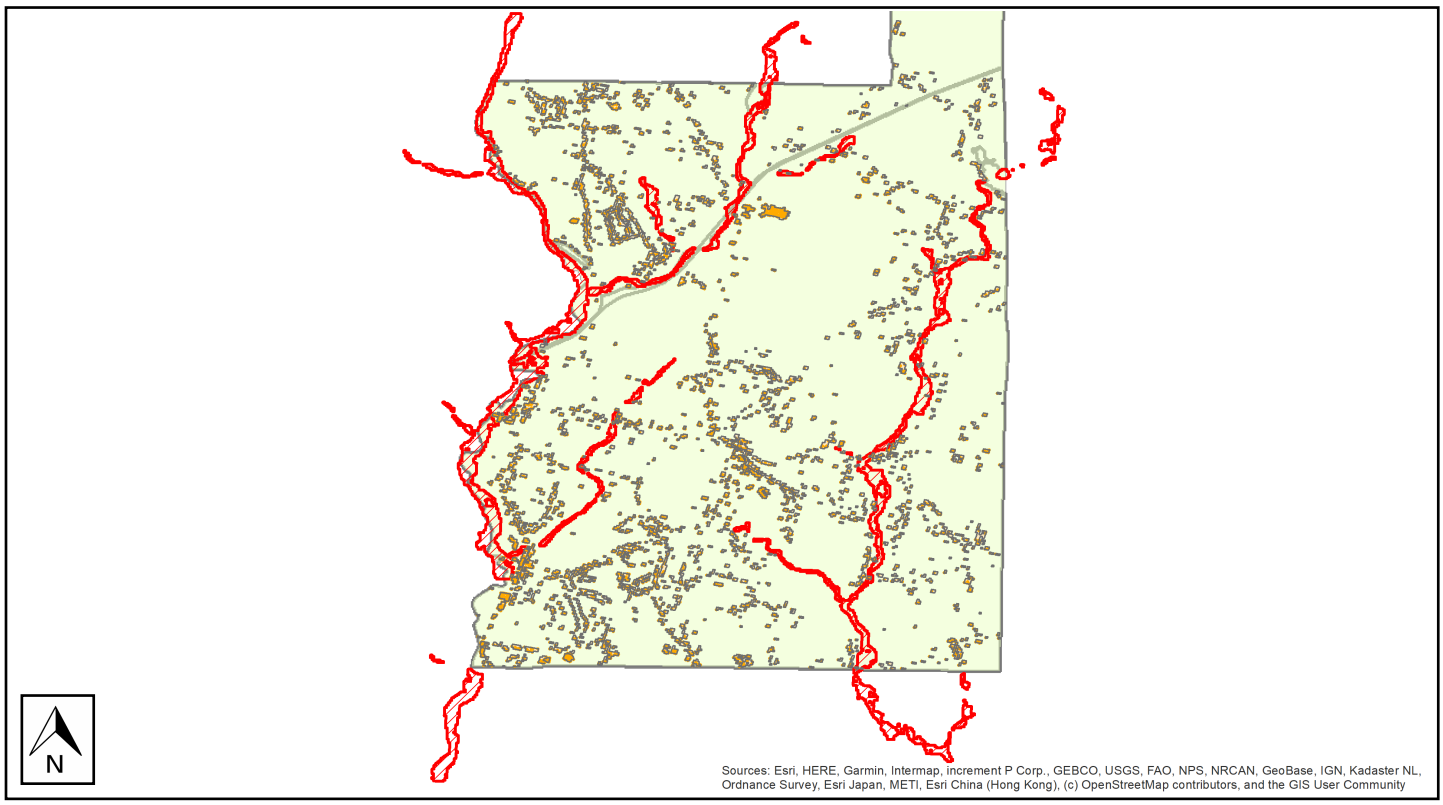
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Willington_FL
Scenario Name:	Willington_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

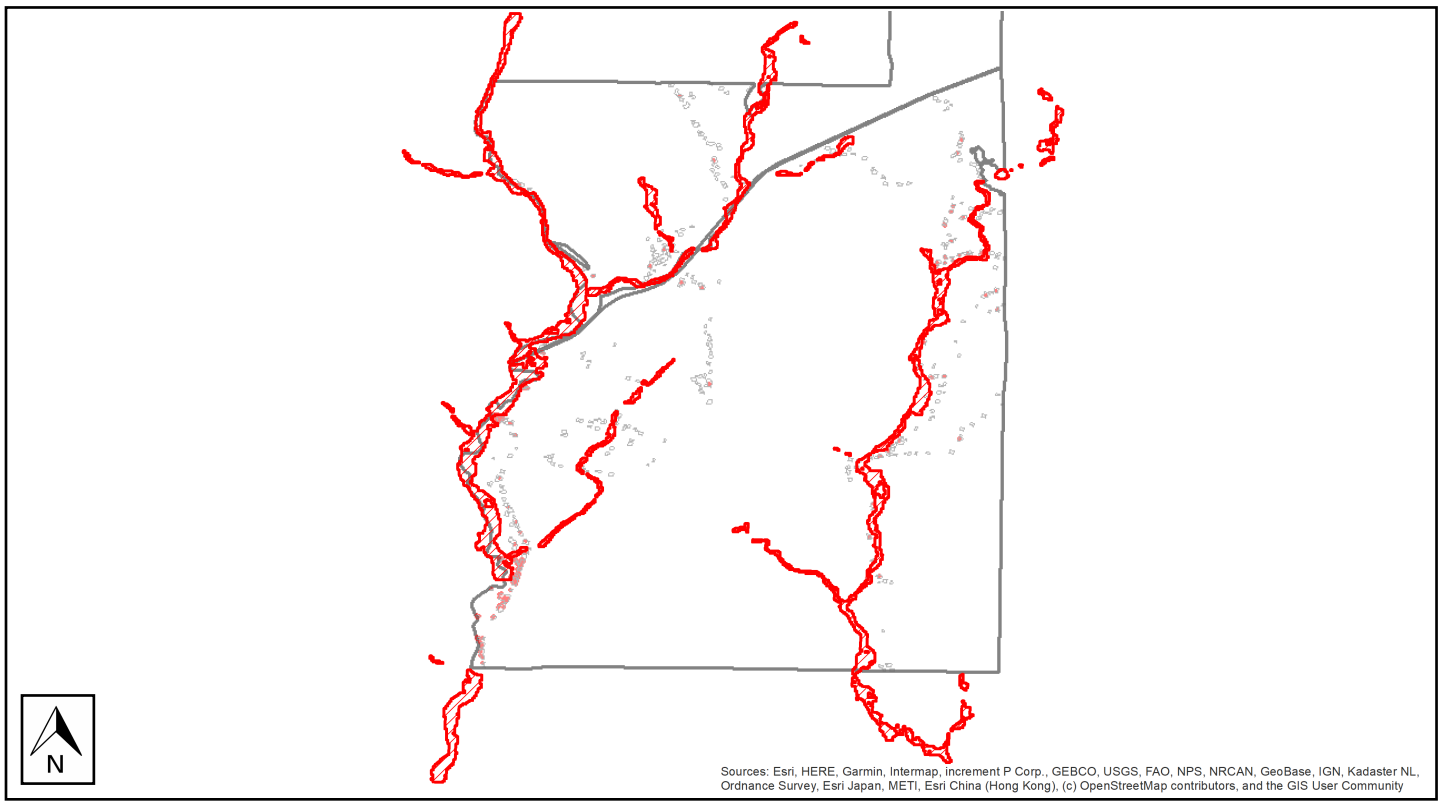


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

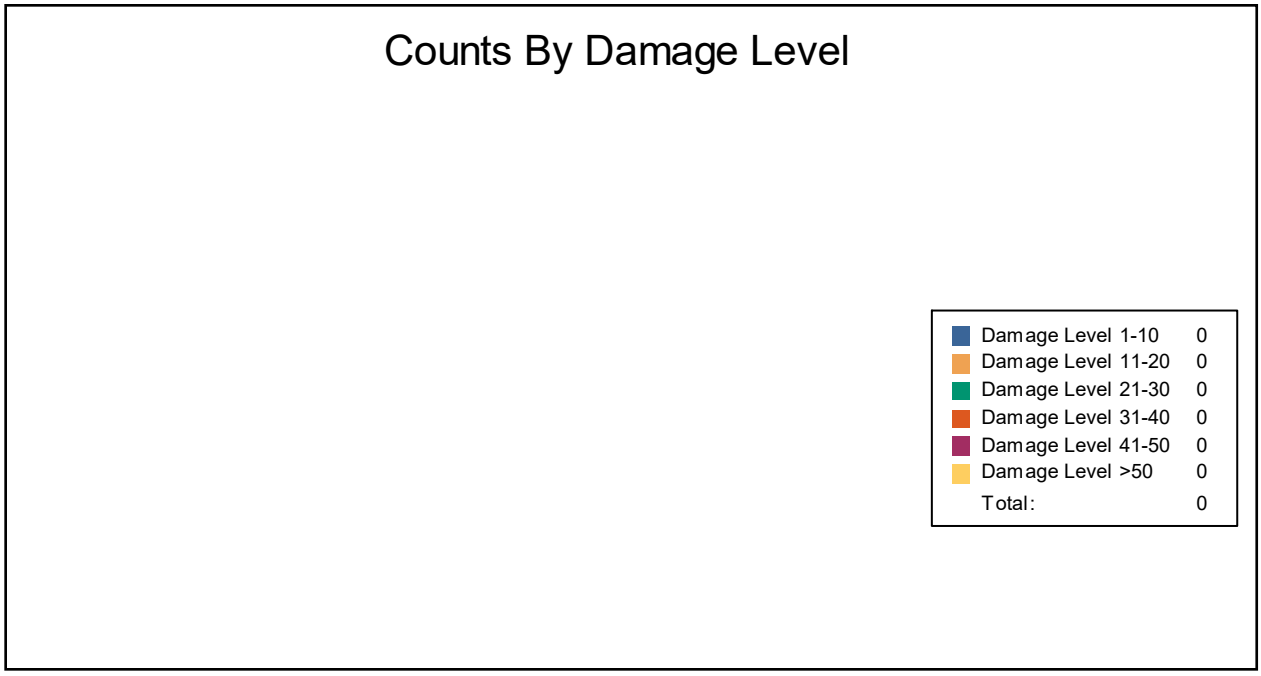


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

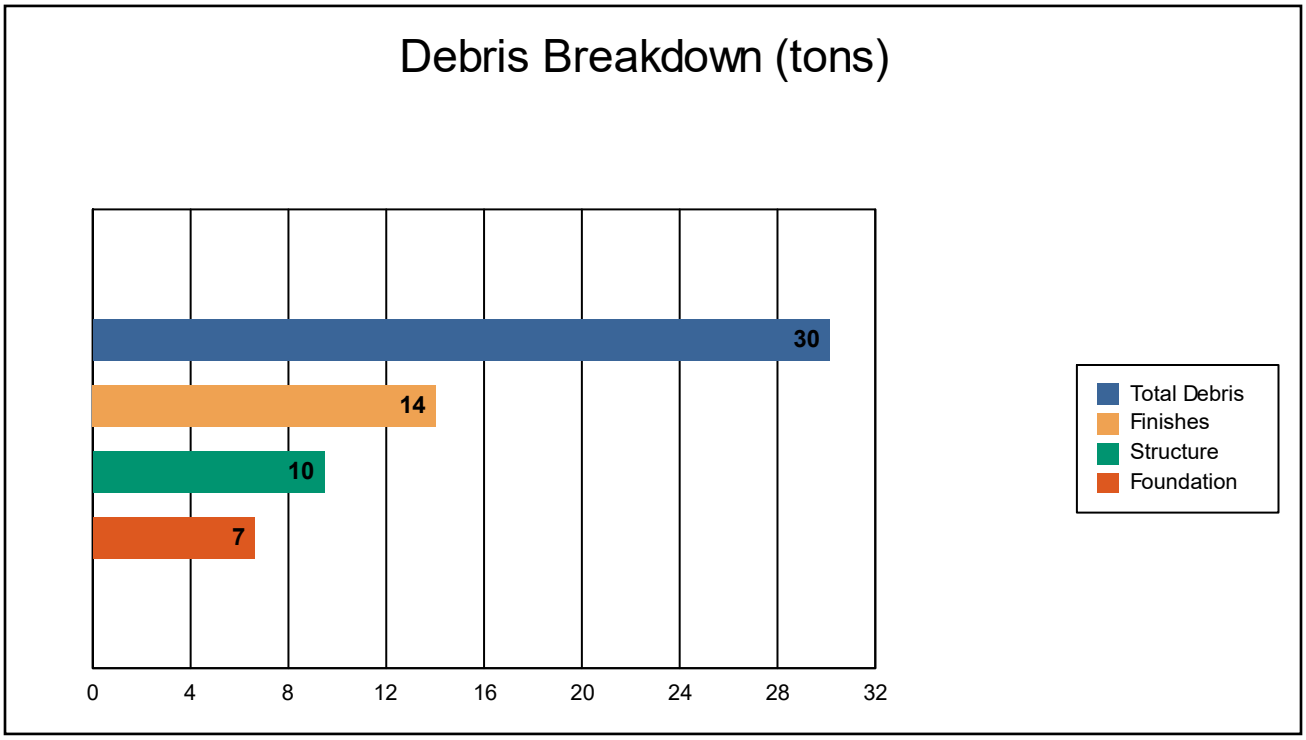
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

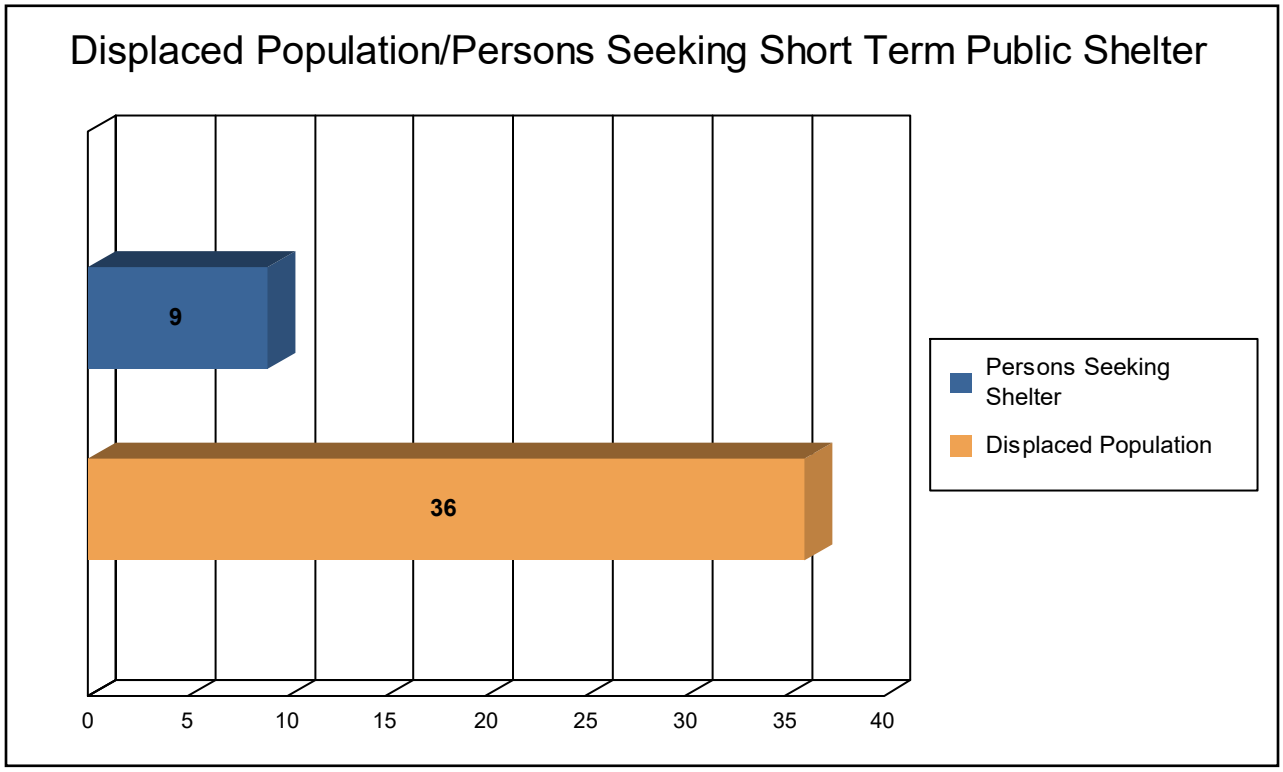


The model estimates that a total of 30 tons of debris will be generated. Of the total amount, Finishes comprises 47% of the total, Structure comprises 32% of the total, and Foundation comprises 22%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 12 households (or 36 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 9 people (out of a total population of 5,566) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 2.98 million dollars, which represents 0.93 % of the total replacement value of the scenario buildings.

Building-Related Losses

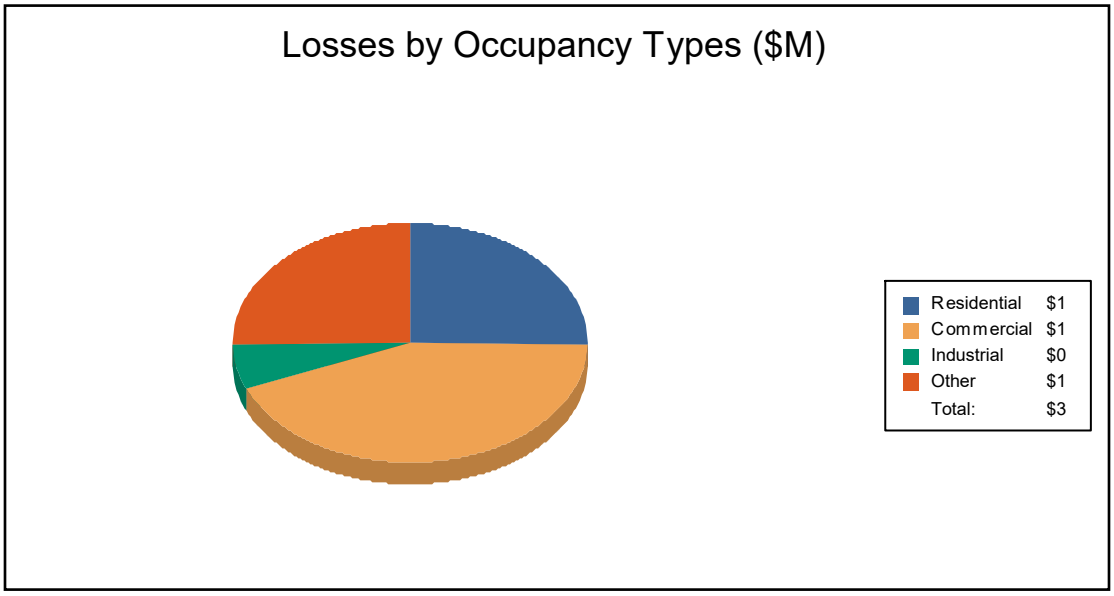
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 1.21 million dollars. 59% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 25.28% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.39	0.08	0.05	0.00	0.52
	Content	0.16	0.34	0.10	0.02	0.63
	Inventory	0.00	0.05	0.01	0.01	0.07
	Subtotal	**0.55**	**0.47**	**0.16**	**0.03**	**1.21**
Business Interruption						
	Income	0.00	0.36	0.00	0.14	0.50
	Relocation	0.16	0.05	0.01	0.07	0.29
	Rental Income	0.05	0.04	0.00	0.00	0.09
	Wage	0.00	0.37	0.00	0.52	0.89
	Subtotal	**0.21**	**0.82**	**0.02**	**0.73**	**1.77**
ALL	**Total**	**0.75**	**1.29**	**0.17**	**0.76**	**2.98**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,183	241,538	968,721
Total	**5,566**	**727,183**	**241,538**	**968,721**
Total Study Region	**5,566**	**727,183**	**241,538**	**968,721**

Hazus: Flood Global Risk Report

Region Name: Willington_FL

Flood Scenario: Willington_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 5,566 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,102 buildings in the region with a total building replacement value (excluding contents) of 969 million dollars. Approximately 91.96% of the buildings (and 75.07% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,102 buildings in the region which have an aggregate total replacement value of 969 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	727,183	75.1%
Commercial	138,336	14.3%
Industrial	44,353	4.6%
Agricultural	674	0.1%
Religion	6,313	0.7%
Government	22,521	2.3%
Education	29,341	3.0%
Total	**968,721**	**100%**

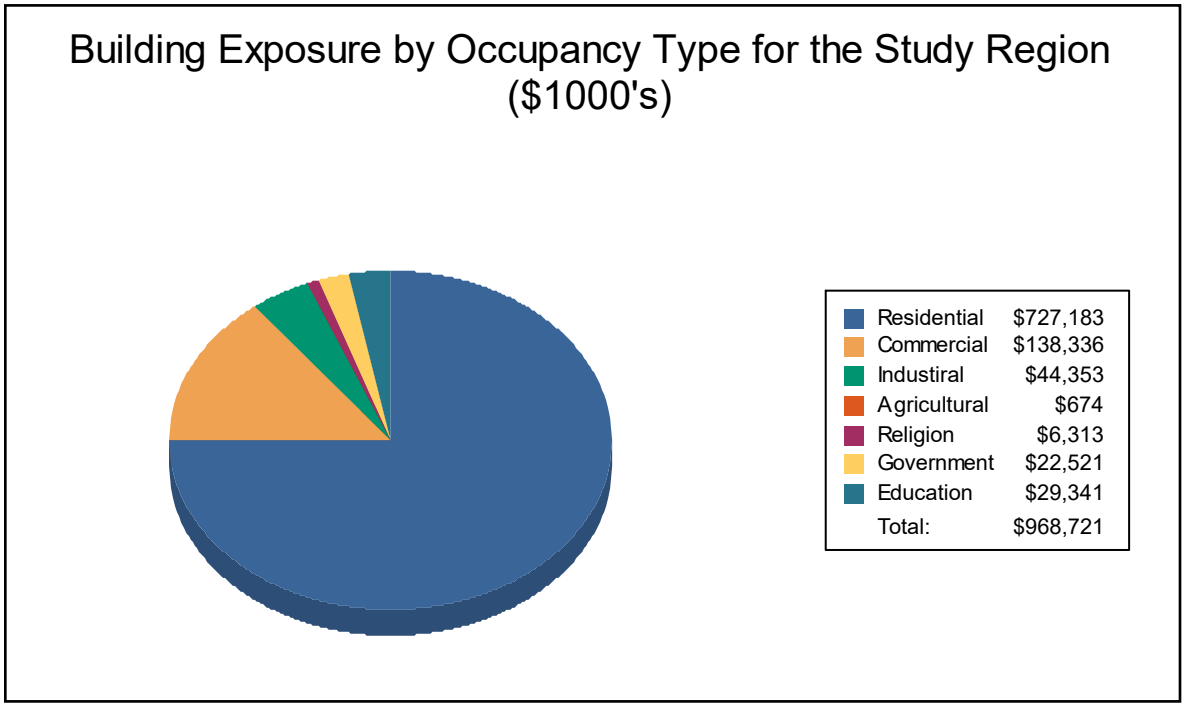
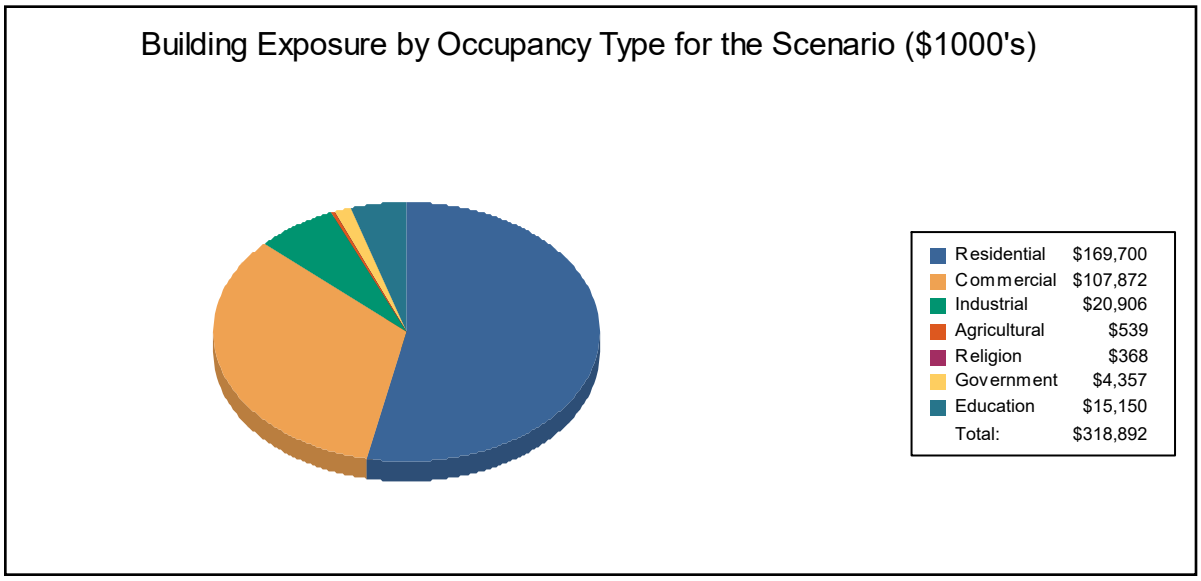


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	169,700	53.2%
Commercial	107,872	33.8%
Industrial	20,906	6.6%
Agricultural	539	0.2%
Religion	368	0.1%
Government	4,357	1.4%
Education	15,150	4.8%
Total	**318,892**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 3 fire stations, no police stations and 1 emergency operation center.

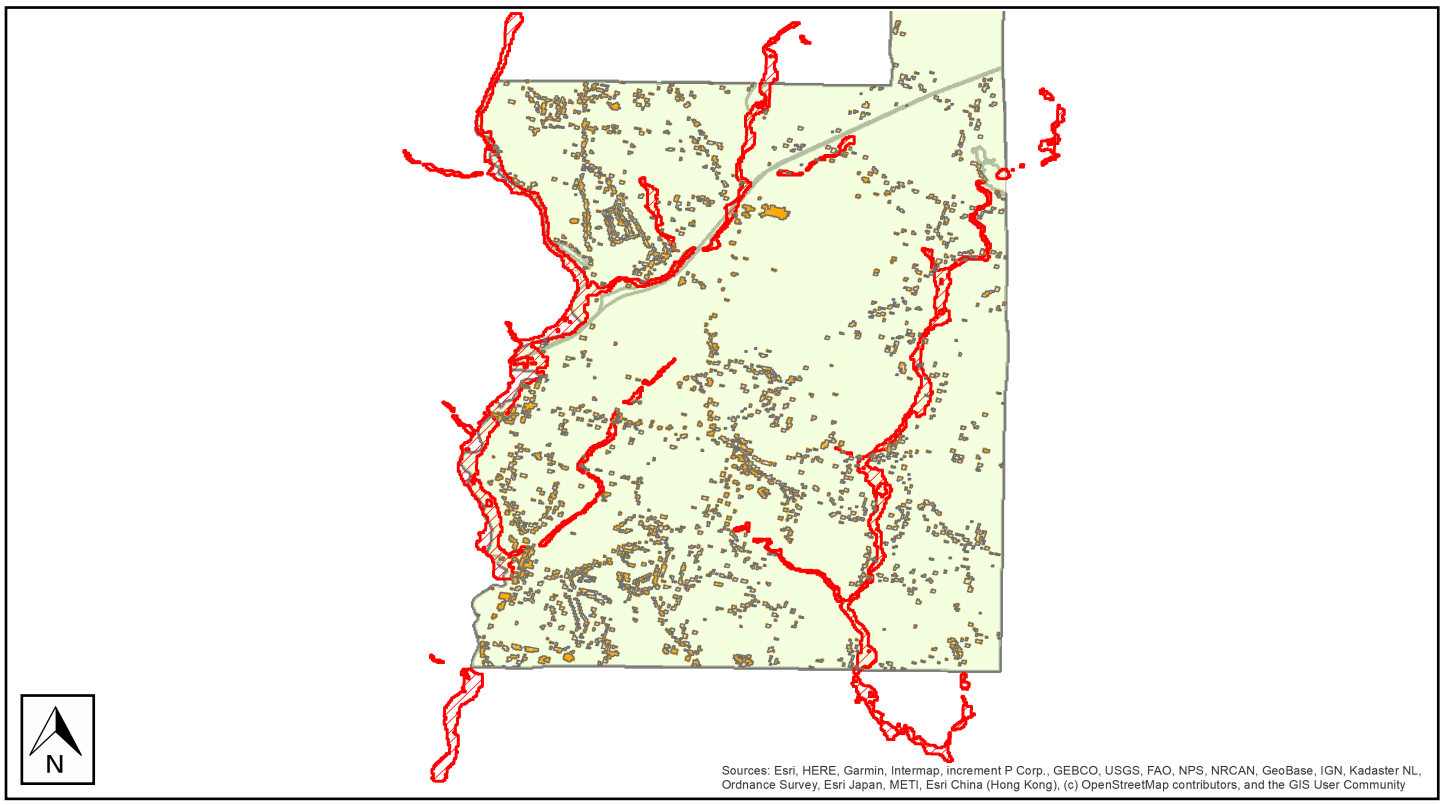
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Willington_FL
Scenario Name:	Willington_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

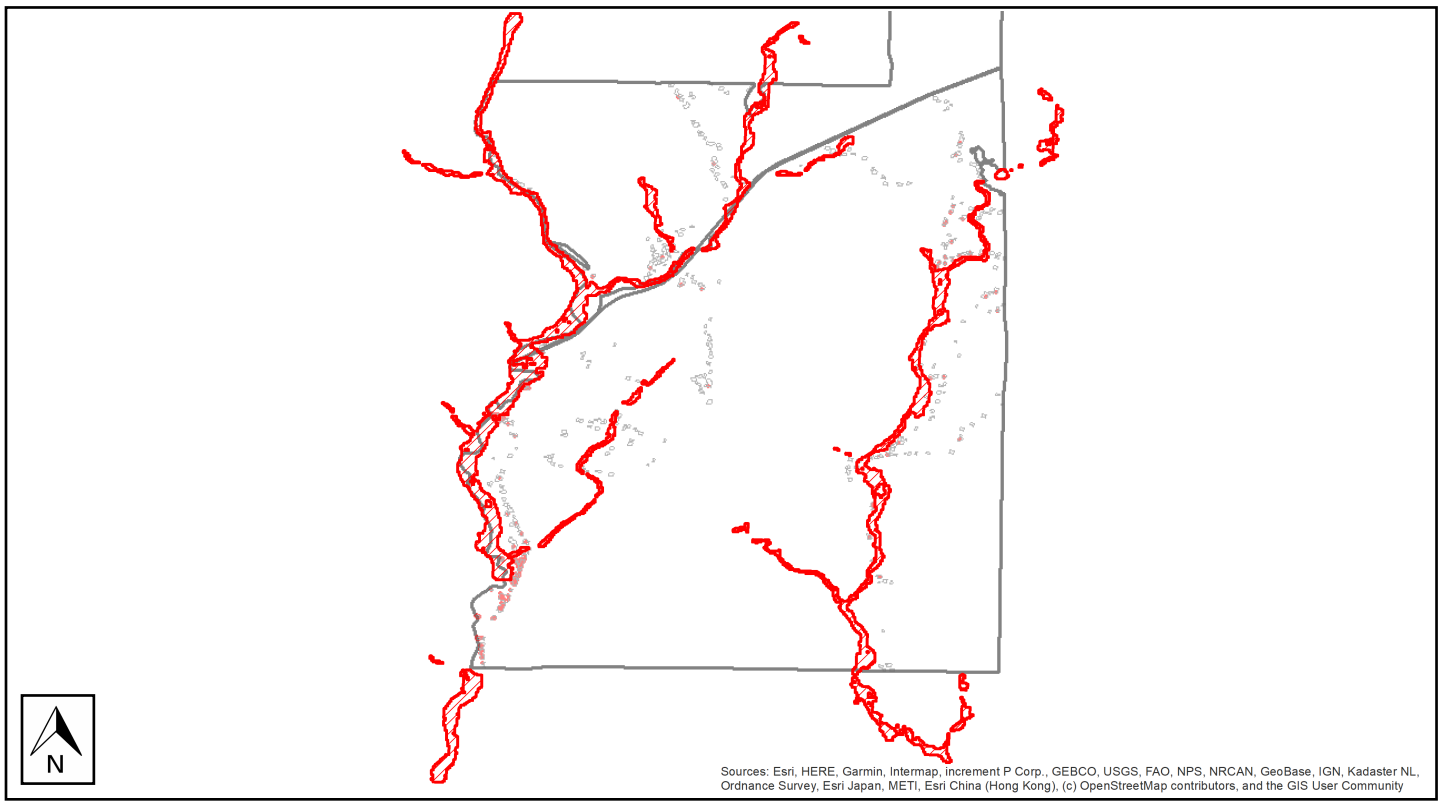


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

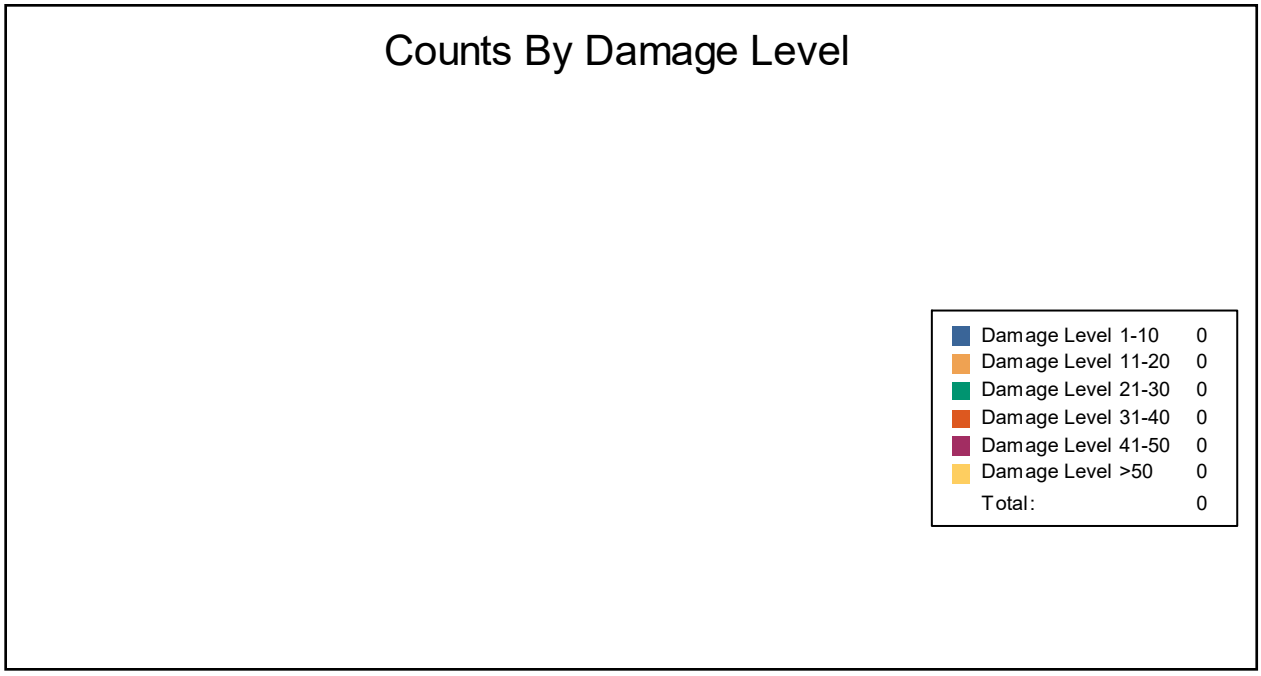


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

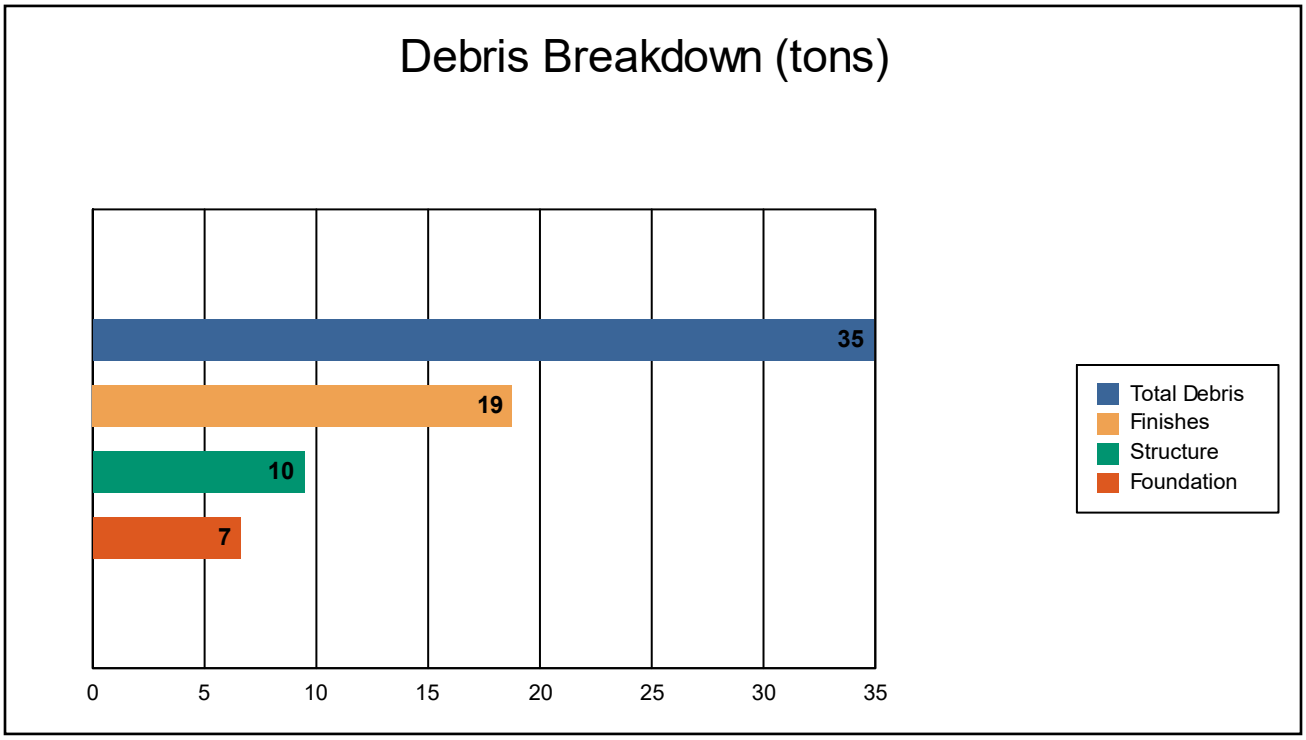
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

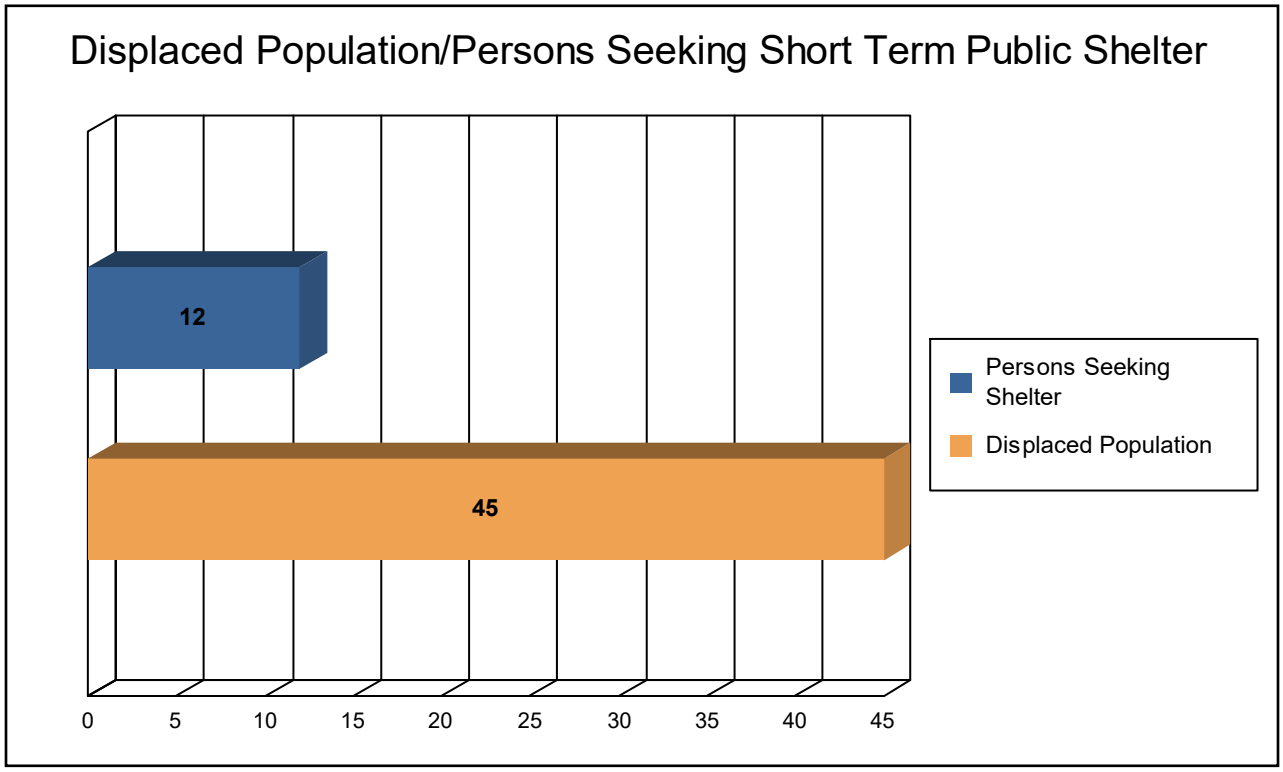


The model estimates that a total of 35 tons of debris will be generated. Of the total amount, Finishes comprises 54% of the total, Structure comprises 27% of the total, and Foundation comprises 19%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 15 households (or 45 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 12 people (out of a total population of 5,566) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 5.02 million dollars, which represents 1.58 % of the total replacement value of the scenario buildings.

Building-Related Losses

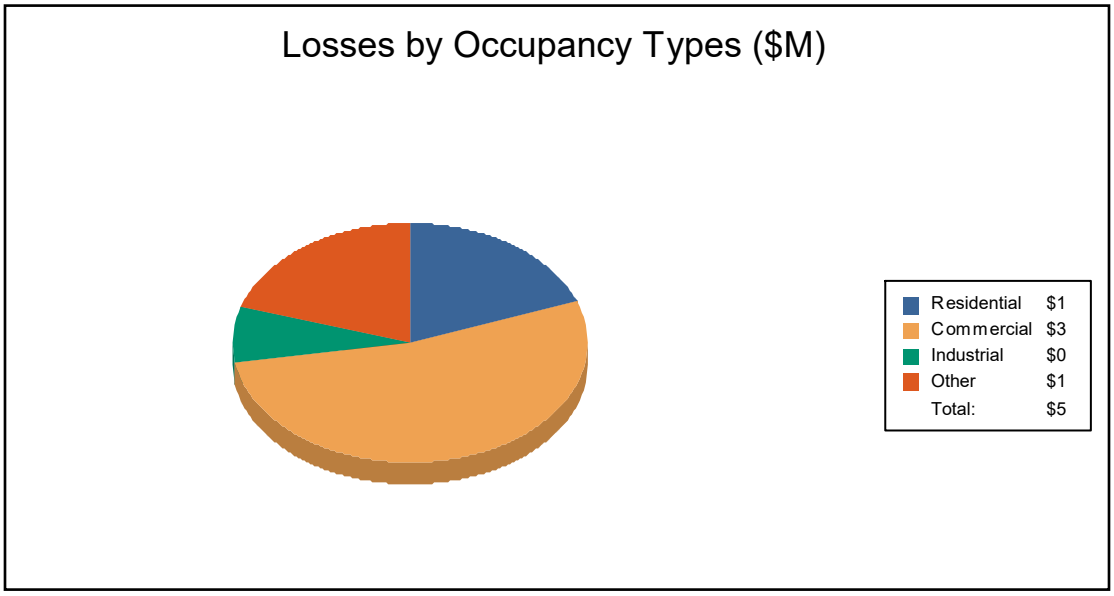
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 2.35 million dollars. 53% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.57% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.52	0.18	0.10	0.04	0.85
	Content	0.22	0.69	0.22	0.23	1.36
	Inventory	0.00	0.10	0.03	0.02	0.14
	Subtotal	**0.74**	**0.97**	**0.35**	**0.29**	**2.35**
Business Interruption						
	Income	0.00	0.73	0.00	0.14	0.87
	Relocation	0.18	0.13	0.01	0.07	0.39
	Rental Income	0.06	0.10	0.00	0.00	0.16
	Wage	0.00	0.73	0.01	0.52	1.25
	Subtotal	**0.24**	**1.68**	**0.02**	**0.74**	**2.67**
ALL	**Total**	**0.98**	**2.65**	**0.37**	**1.02**	**5.02**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,183	241,538	968,721
Total	**5,566**	**727,183**	**241,538**	**968,721**
Total Study Region	**5,566**	**727,183**	**241,538**	**968,721**

Hazus: Flood Global Risk Report

Region Name: Willington_FL

Flood Scenario: Willington_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 5,566 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,102 buildings in the region with a total building replacement value (excluding contents) of 969 million dollars. Approximately 91.96% of the buildings (and 75.07% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,102 buildings in the region which have an aggregate total replacement value of 969 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
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Occupancy	Exposure ($1000)	Percent of Total
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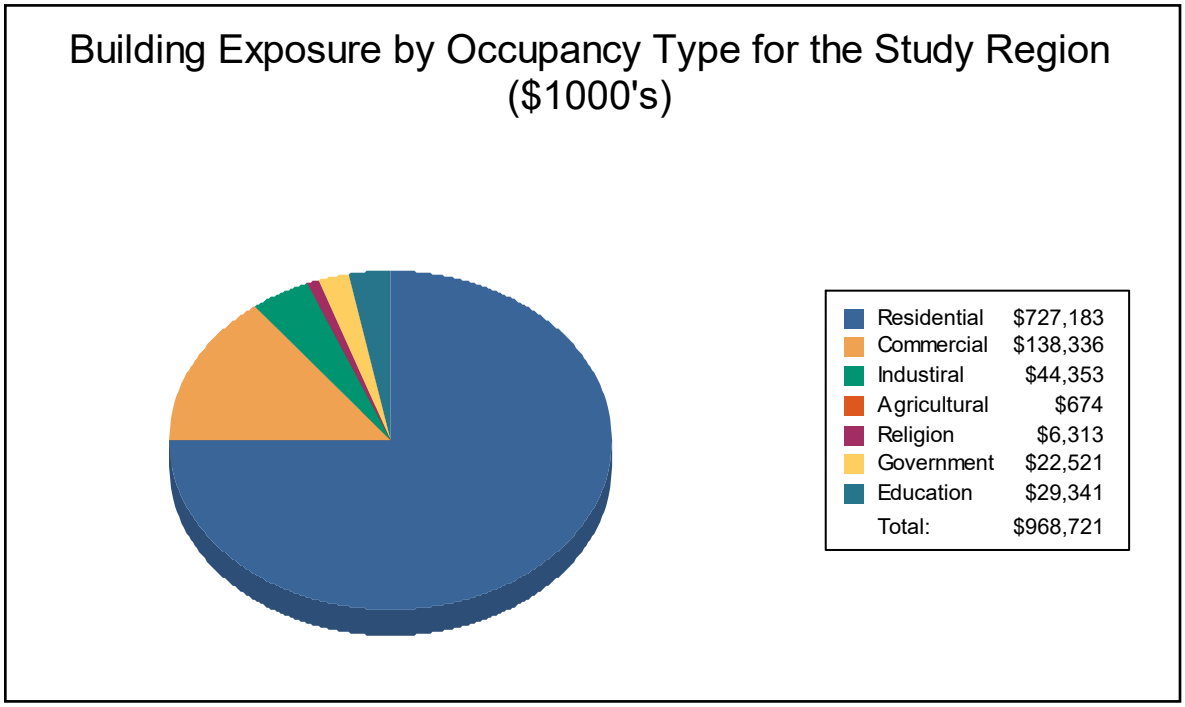

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Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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Industrial	20,906	6.6%
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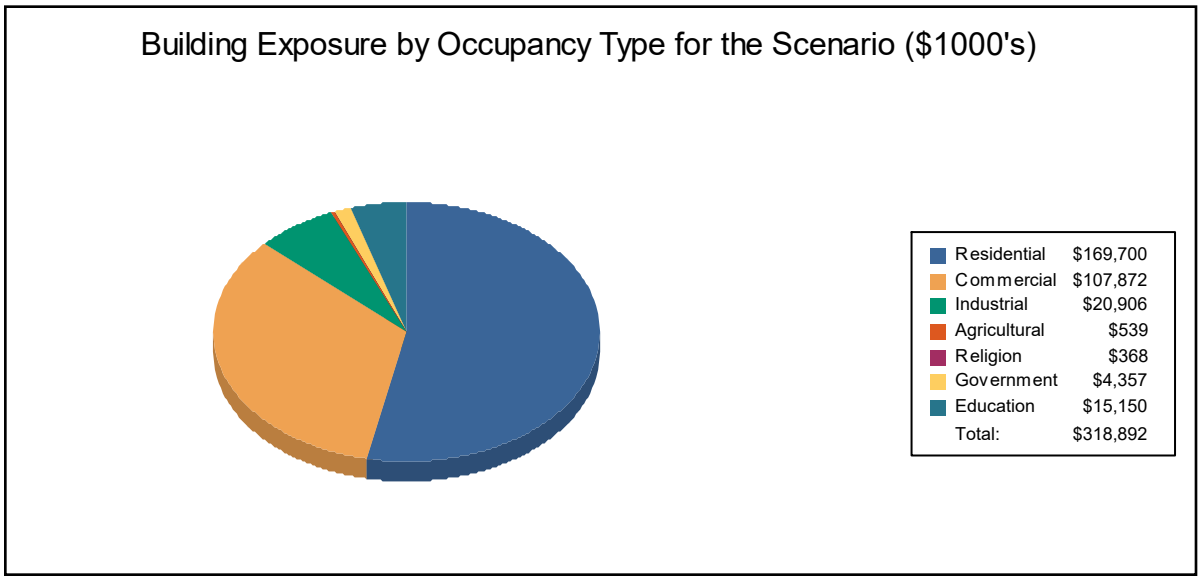
Total	**318,892**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 3 fire stations, no police stations and 1 emergency operation center.

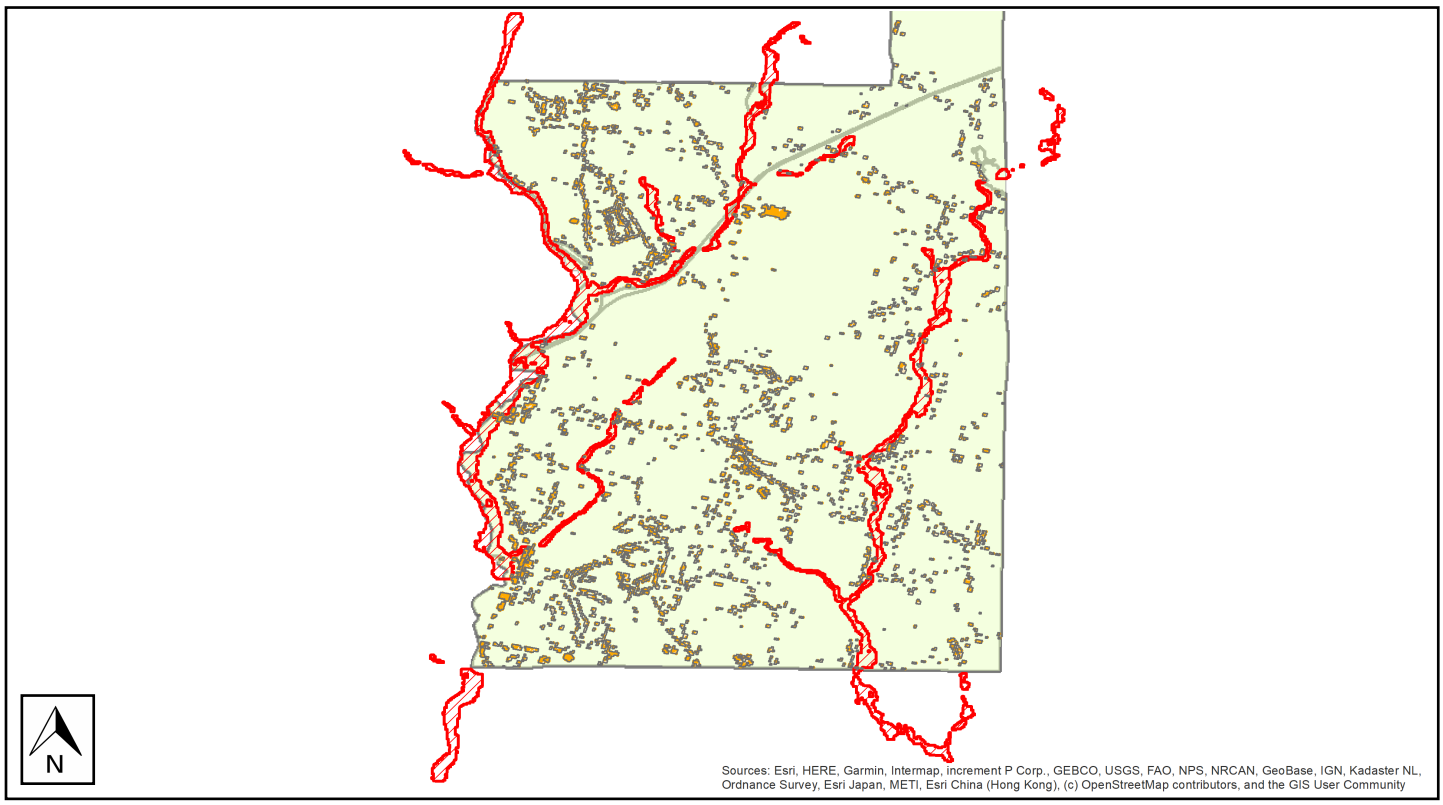
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Willington_FL
Scenario Name:	Willington_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

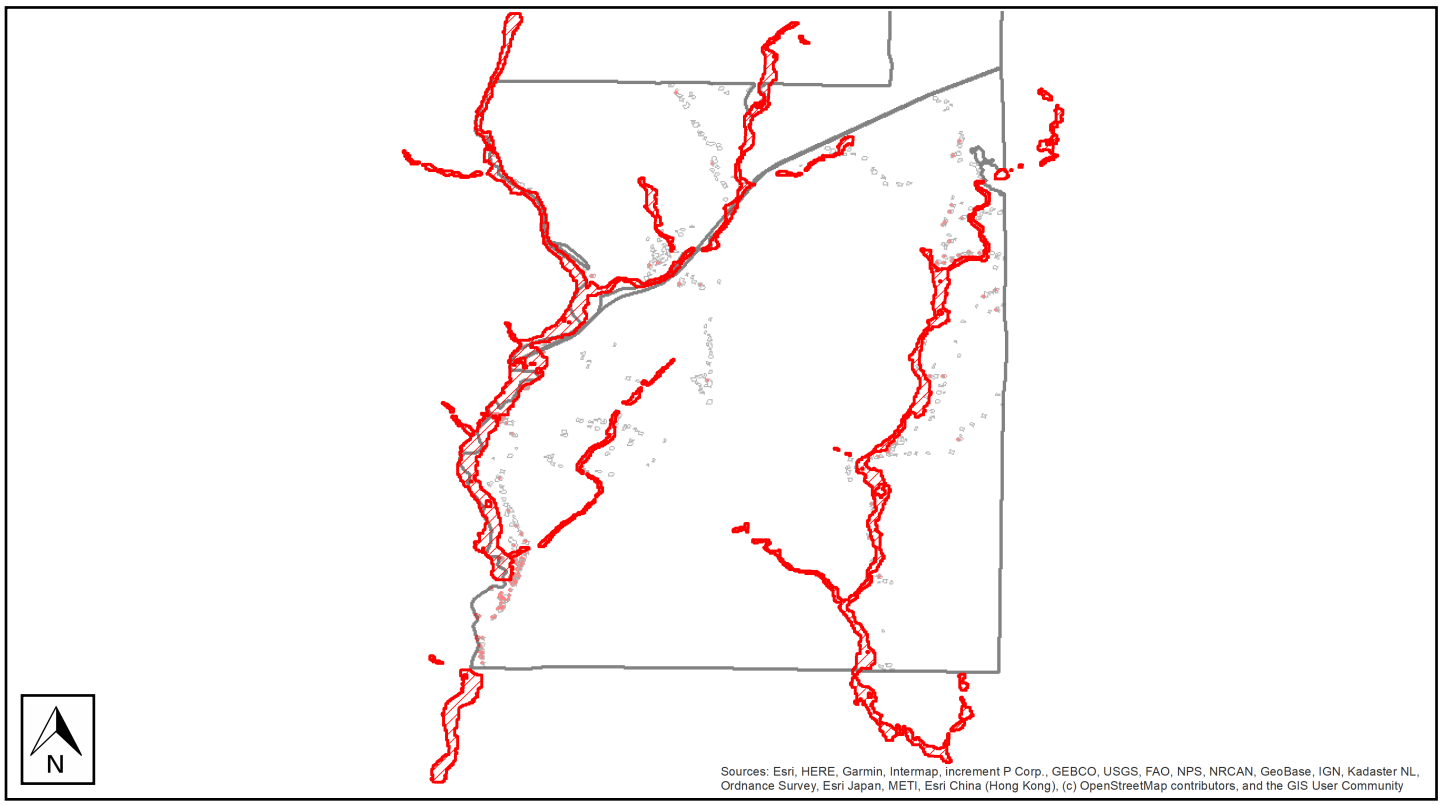


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

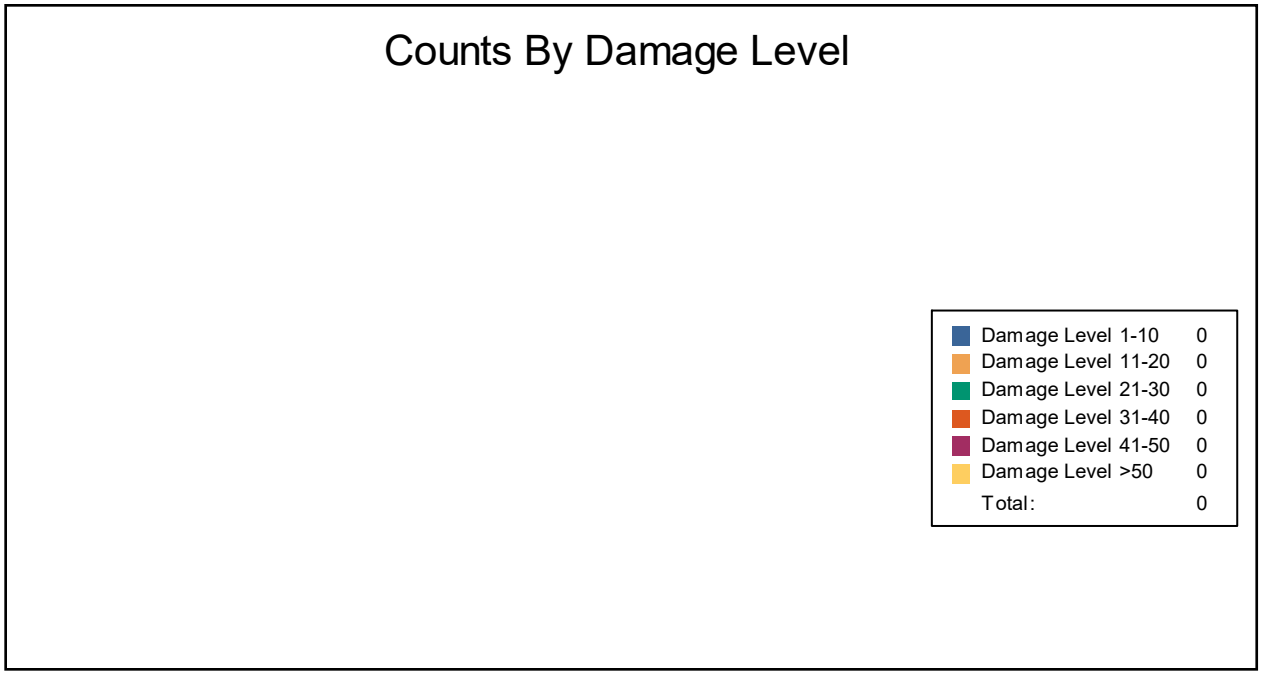


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

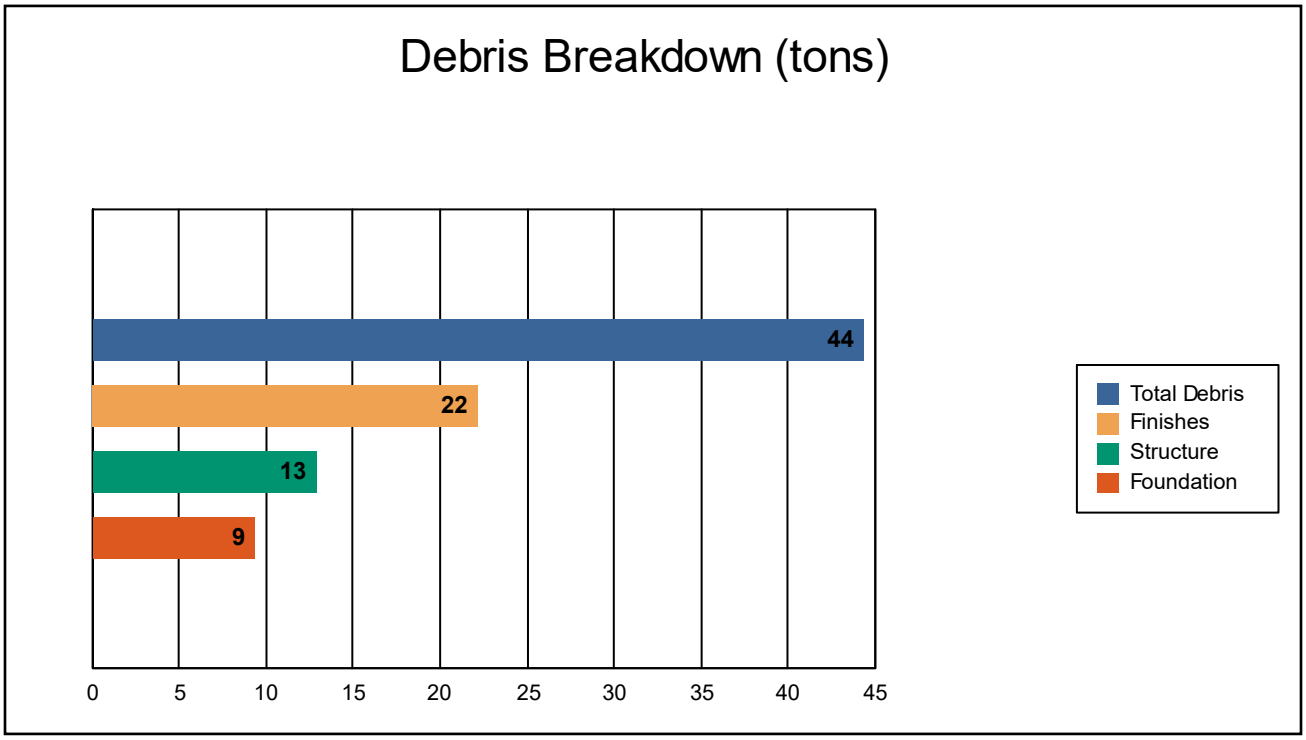
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

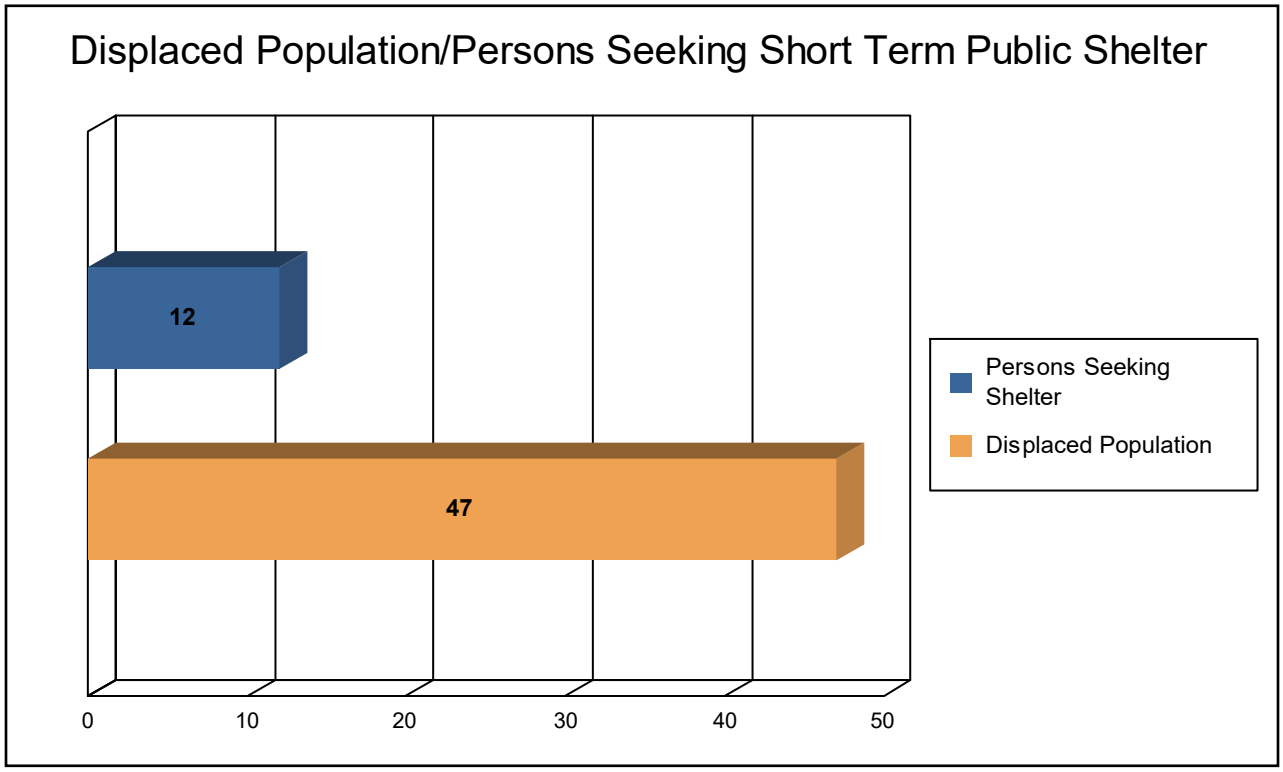


The model estimates that a total of 44 tons of debris will be generated. Of the total amount, Finishes comprises 50% of the total, Structure comprises 29% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 16 households (or 47 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 12 people (out of a total population of 5,566) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 6.38 million dollars, which represents 2.00 % of the total replacement value of the scenario buildings.

Building-Related Losses

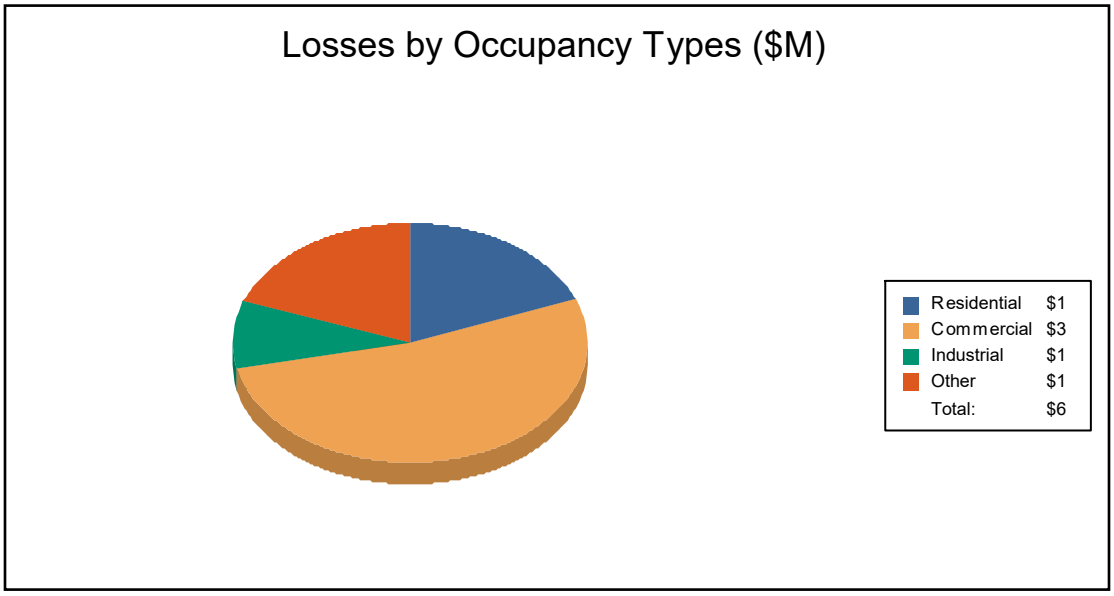
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 3.53 million dollars. 45% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 18.98% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.67	0.29	0.15	0.07	1.18
	Content	0.28	1.06	0.37	0.39	2.11
	Inventory	0.00	0.17	0.04	0.03	0.24
	Subtotal	**0.95**	**1.52**	**0.57**	**0.49**	**3.53**
Business Interruption						
	Income	0.00	0.77	0.01	0.14	0.91
	Relocation	0.19	0.15	0.01	0.07	0.43
	Rental Income	0.06	0.11	0.00	0.00	0.18
	Wage	0.00	0.80	0.01	0.53	1.34
	Subtotal	**0.26**	**1.82**	**0.03**	**0.75**	**2.86**
ALL	**Total**	**1.21**	**3.34**	**0.60**	**1.24**	**6.38**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,183	241,538	968,721
Total	**5,566**	**727,183**	**241,538**	**968,721**
Total Study Region	**5,566**	**727,183**	**241,538**	**968,721**

Hazus: Flood Global Risk Report

Region Name: Willington_FL

Flood Scenario: Willington_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 5,566 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,102 buildings in the region with a total building replacement value (excluding contents) of 969 million dollars. Approximately 91.96% of the buildings (and 75.07% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,102 buildings in the region which have an aggregate total replacement value of 969 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	727,183	75.1%
Commercial	138,336	14.3%
Industrial	44,353	4.6%
Agricultural	674	0.1%
Religion	6,313	0.7%
Government	22,521	2.3%
Education	29,341	3.0%
Total	**968,721**	**100%**

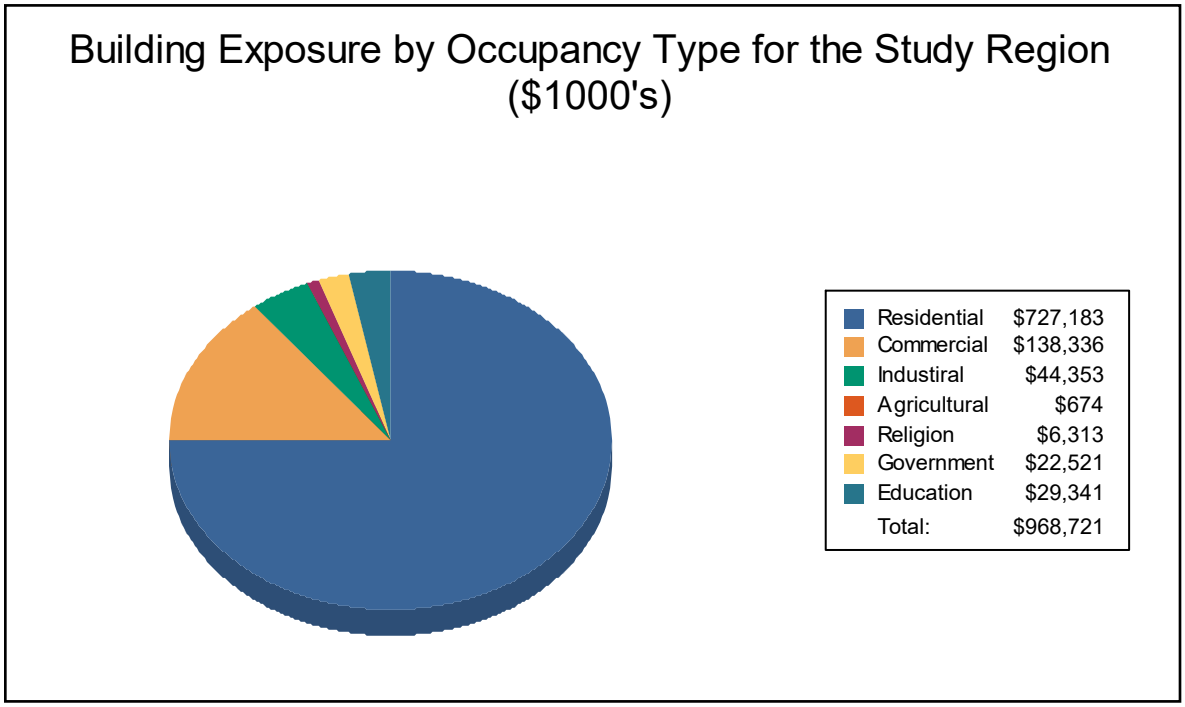
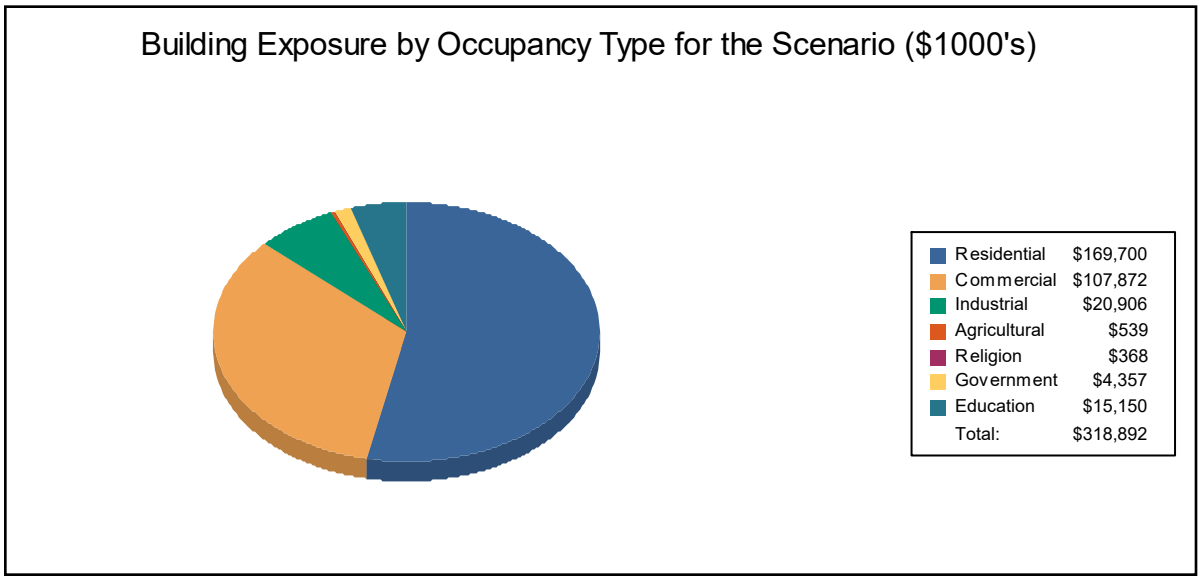


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	169,700	53.2%
Commercial	107,872	33.8%
Industrial	20,906	6.6%
Agricultural	539	0.2%
Religion	368	0.1%
Government	4,357	1.4%
Education	15,150	4.8%
Total	**318,892**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 3 fire stations, no police stations and 1 emergency operation center.

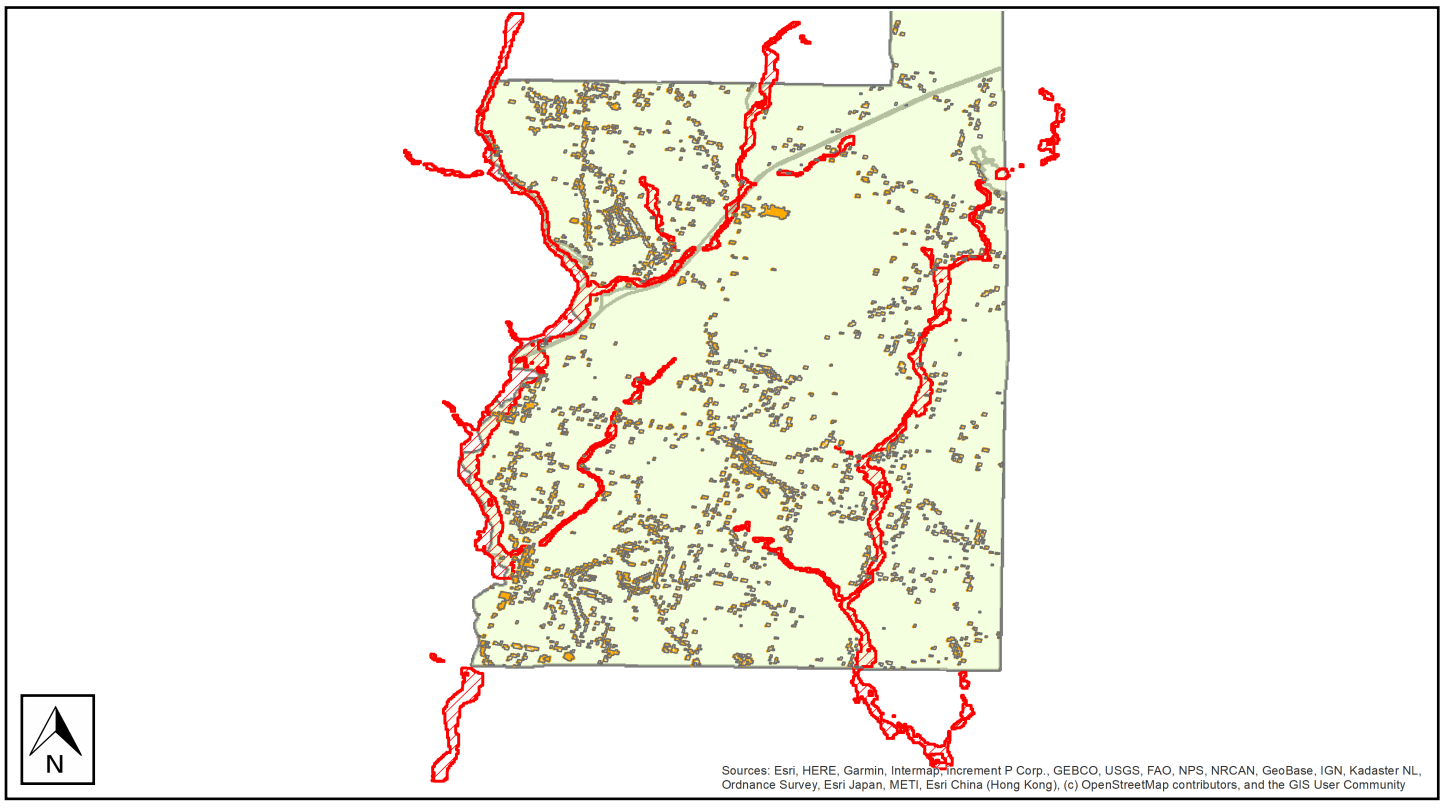
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Willington_FL
Scenario Name:	Willington_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

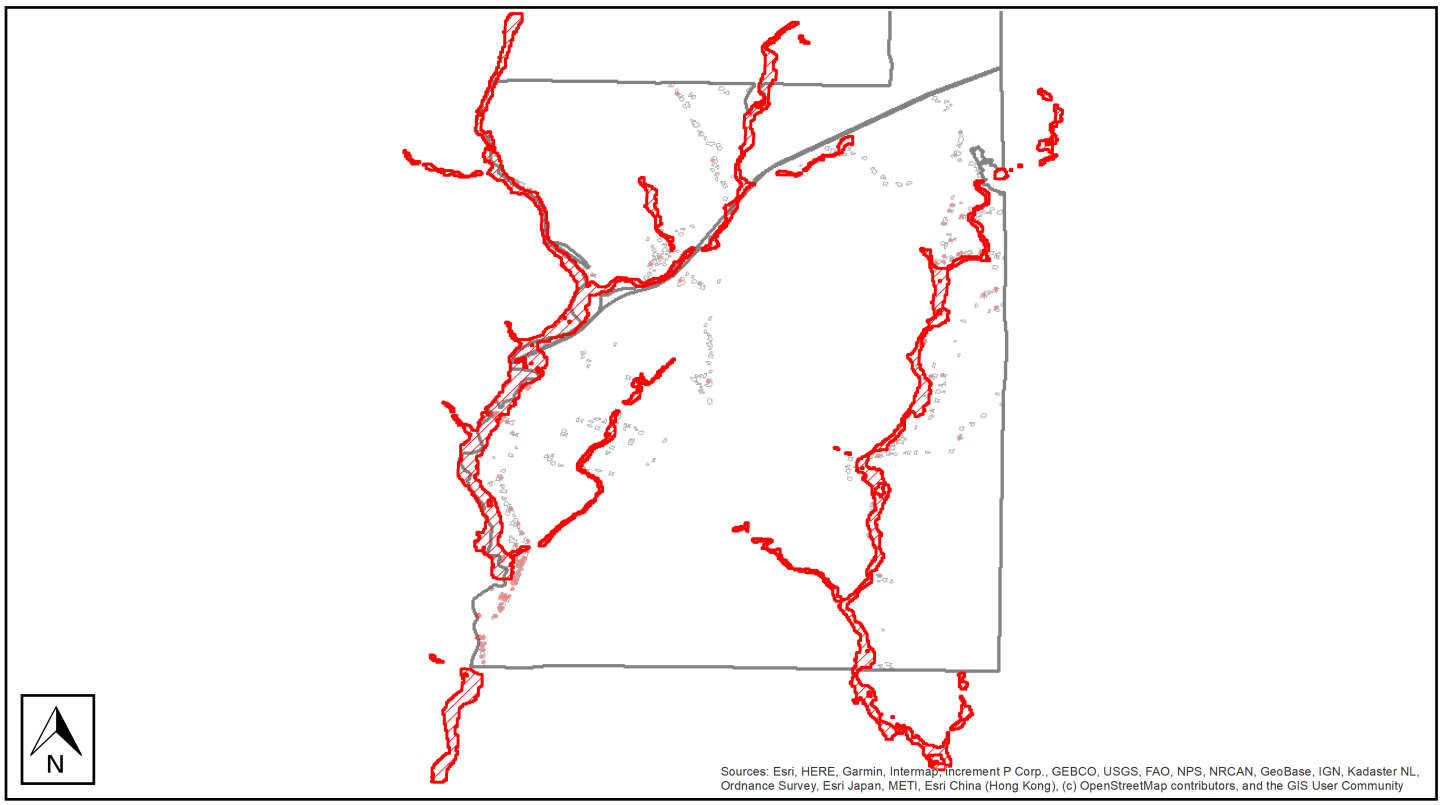


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

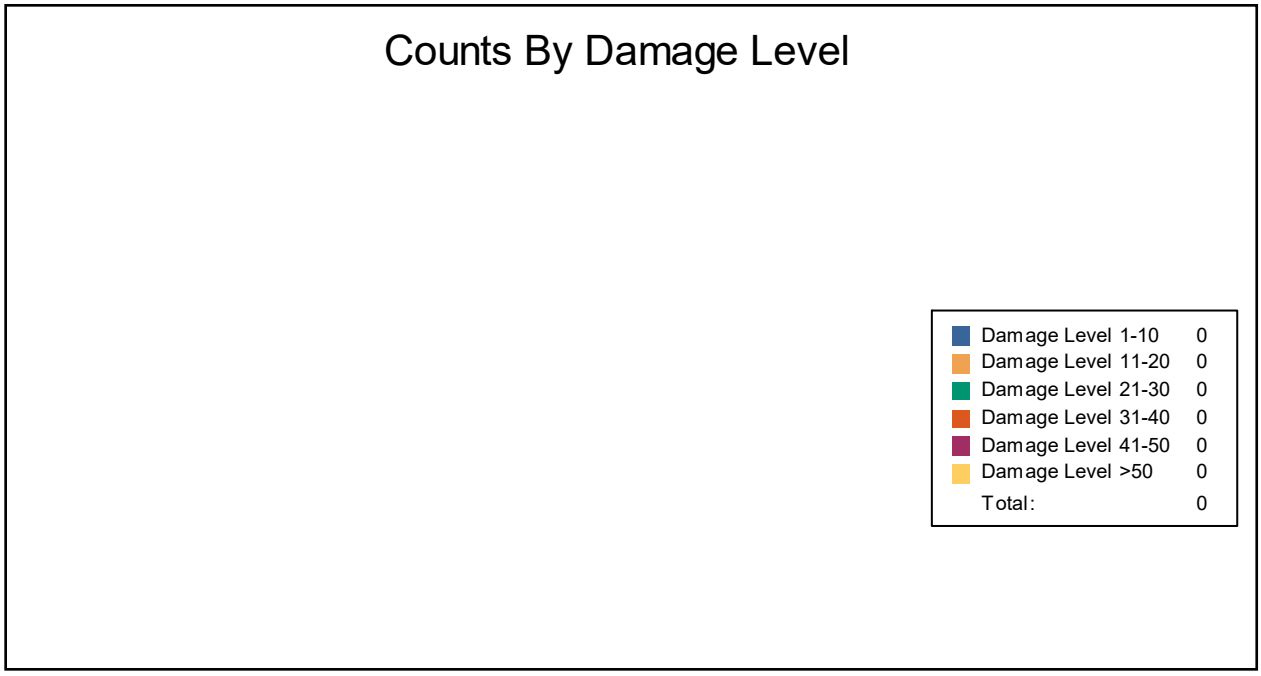


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

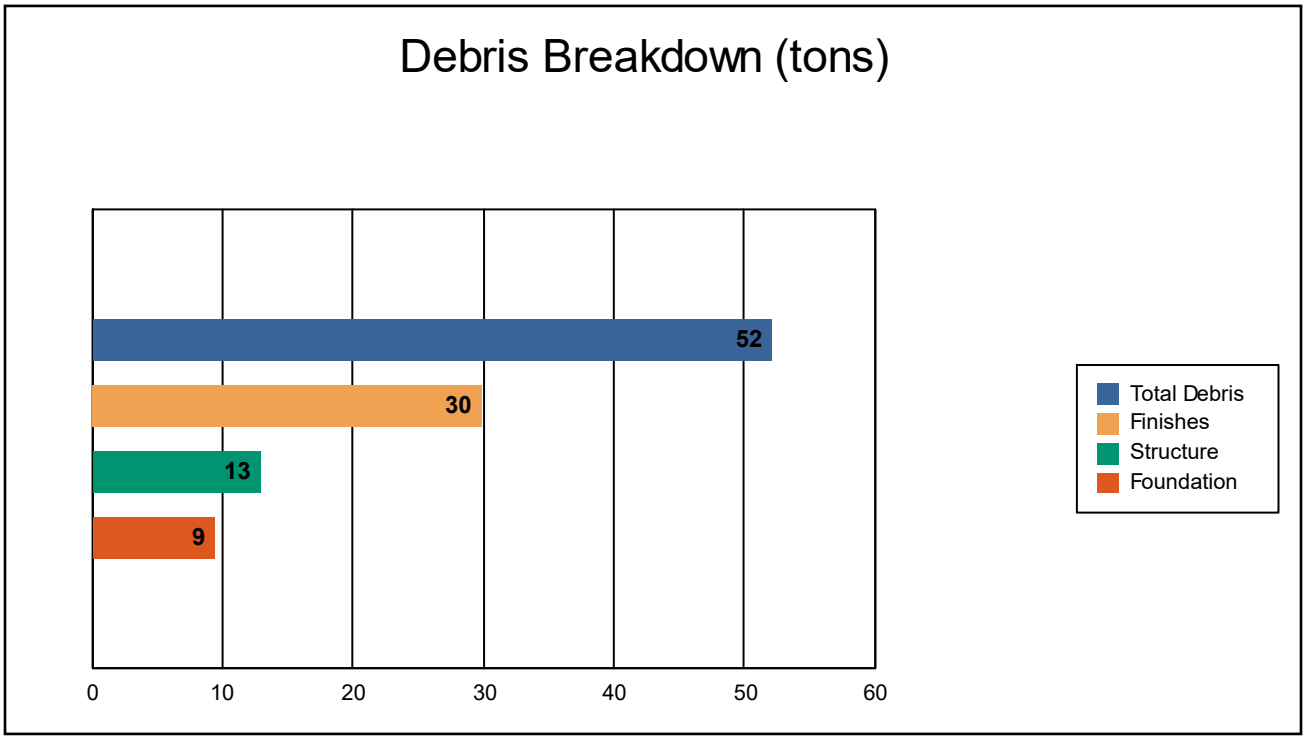
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

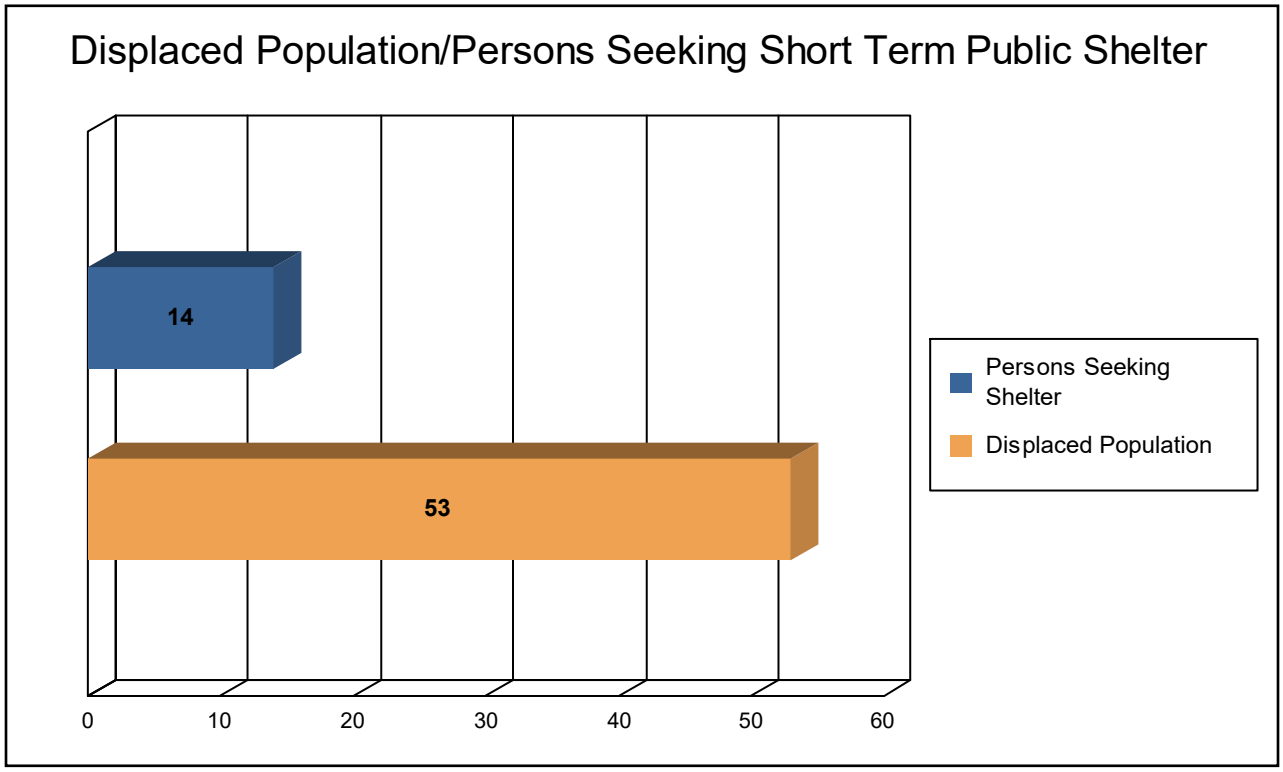


The model estimates that a total of 52 tons of debris will be generated. Of the total amount, Finishes comprises 57% of the total, Structure comprises 25% of the total, and Foundation comprises 18%. If the debris tonnage is converted into an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 18 households (or 53 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 14 people (out of a total population of 5,566) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 8.23 million dollars, which represents 2.58 % of the total replacement value of the scenario buildings.

Building-Related Losses

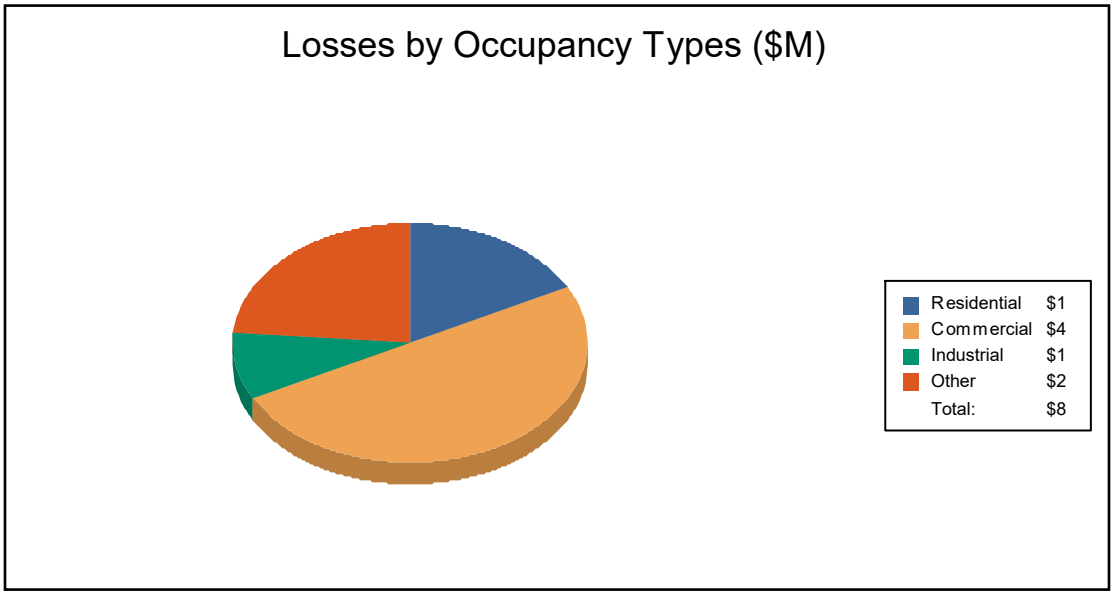
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 4.42 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 17.27% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.79	0.37	0.18	0.09	1.43
	Content	0.34	1.33	0.48	0.52	2.67
	Inventory	0.00	0.22	0.05	0.04	0.32
	Subtotal	**1.13**	**1.92**	**0.72**	**0.65**	**4.42**
Business Interruption						
	Income	0.00	0.91	0.01	0.24	1.15
	Relocation	0.22	0.18	0.01	0.12	0.52
	Rental Income	0.08	0.13	0.00	0.00	0.22
	Wage	0.00	0.97	0.01	0.95	1.92
	Subtotal	**0.29**	**2.19**	**0.03**	**1.30**	**3.81**
ALL	**Total**	**1.42**	**4.11**	**0.75**	**1.95**	**8.23**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,183	241,538	968,721
Total	**5,566**	**727,183**	**241,538**	**968,721**
Total Study Region	**5,566**	**727,183**	**241,538**	**968,721**

Hazus: Flood Global Risk Report

Region Name: Willington_FL

Flood Scenario: Willington_Flood

Print Date: Friday, April 21, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

RiskMAP
Increasing Resilience Together

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 104 census blocks. The region contains over 2 thousand households and has a total population of 5,566 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 2,102 buildings in the region with a total building replacement value (excluding contents) of 969 million dollars. Approximately 91.96% of the buildings (and 75.07% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,102 buildings in the region which have an aggregate total replacement value of 969 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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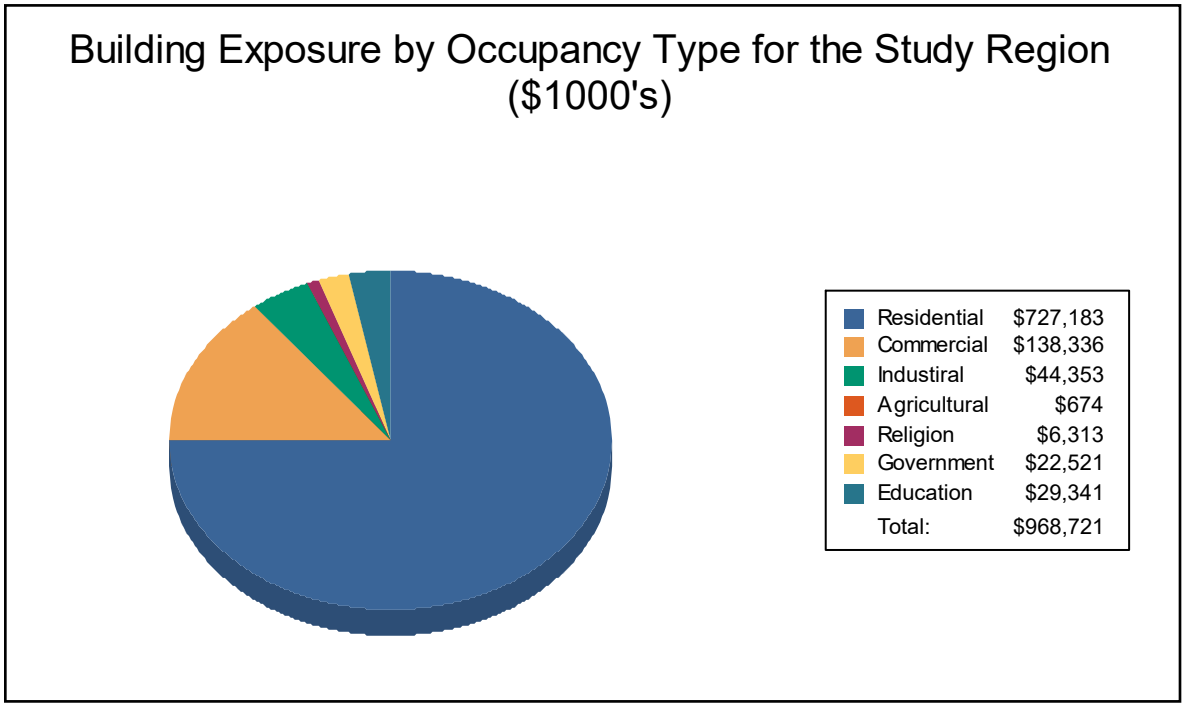

Table 2
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Occupancy	Exposure ($1000)	Percent of Total
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Industrial	20,906	6.6%
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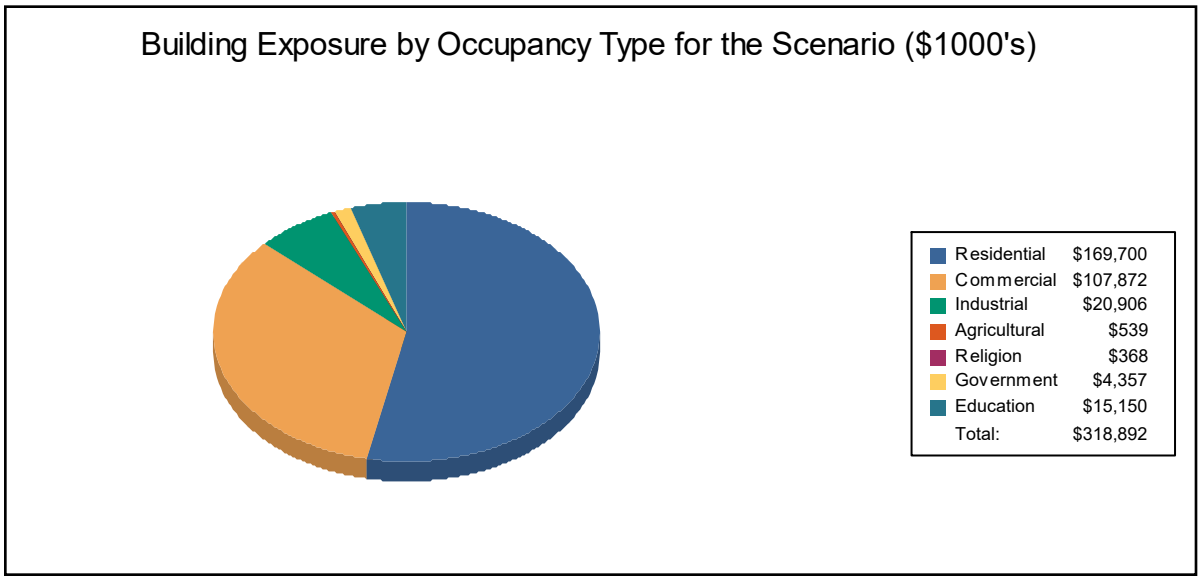
Religion	368	0.1%
Government	4,357	1.4%
Education	15,150	4.8%
Total	**318,892**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 2 schools, 3 fire stations, no police stations and 1 emergency operation center.

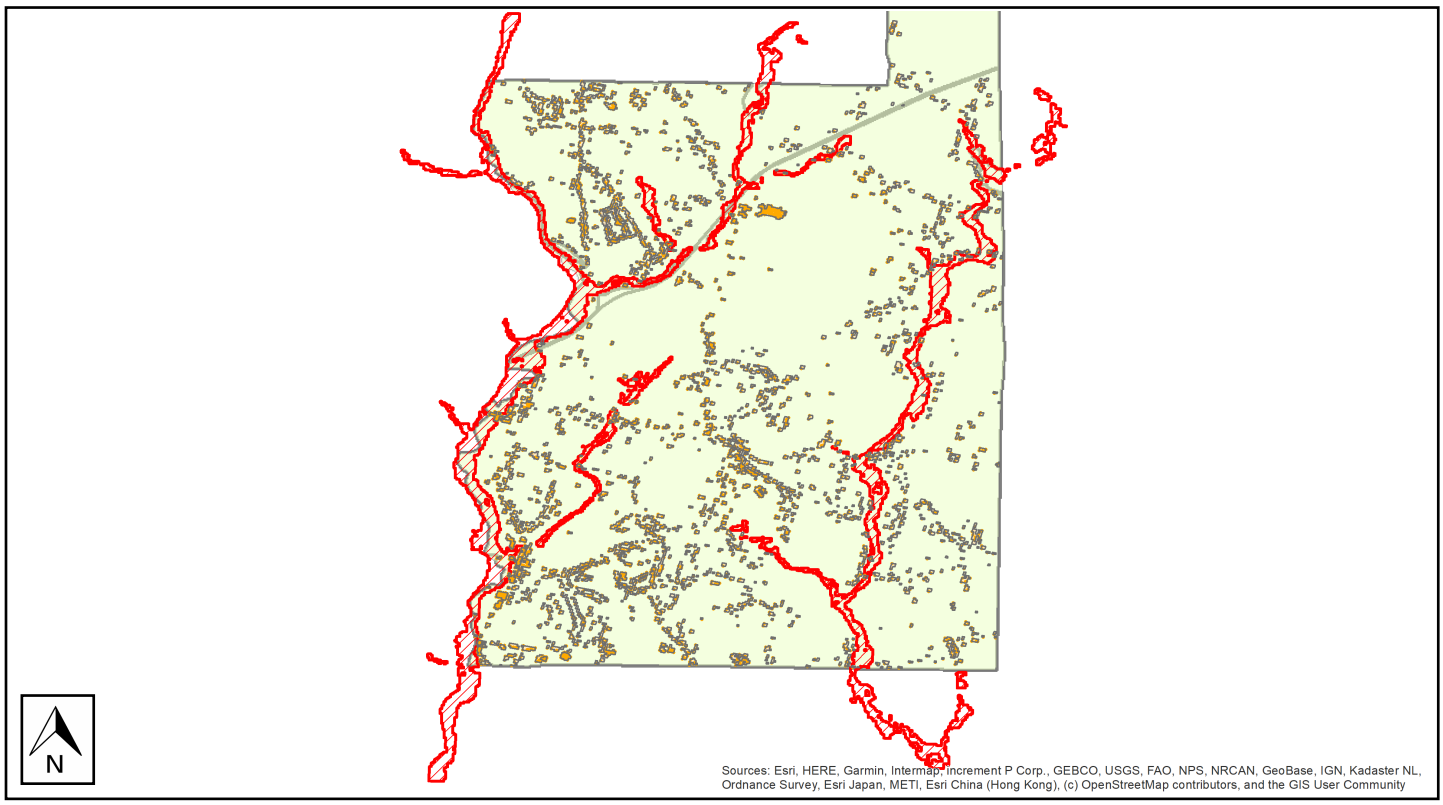
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Willington_FL
Scenario Name:	Willington_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

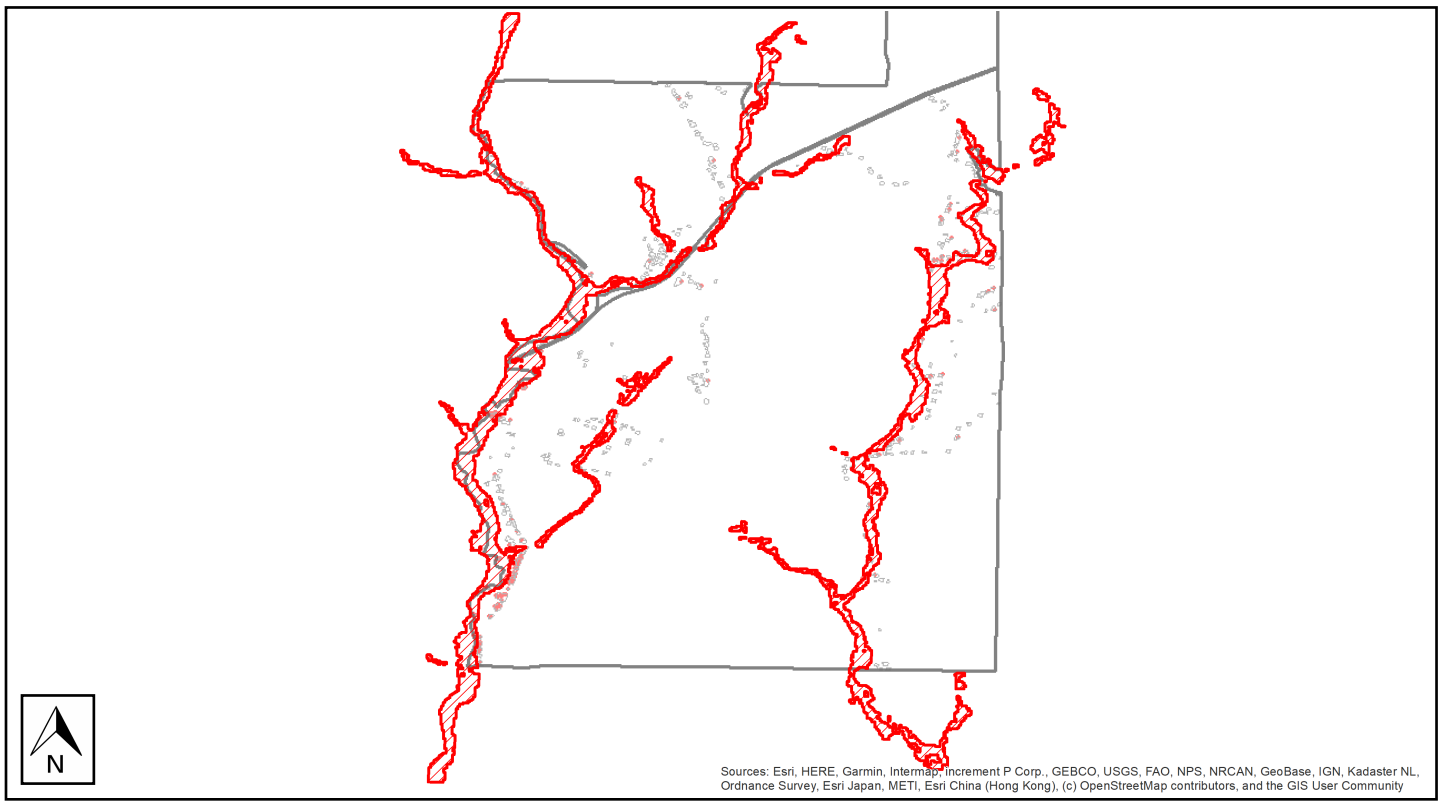


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

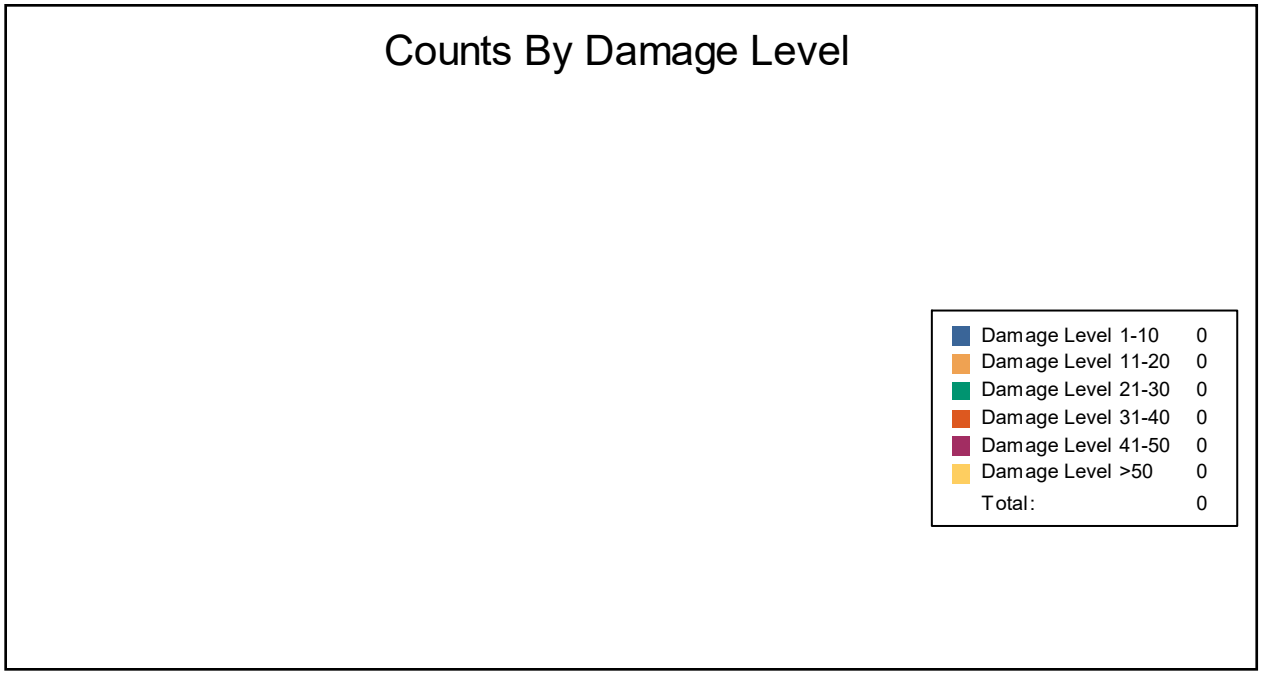


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	2	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

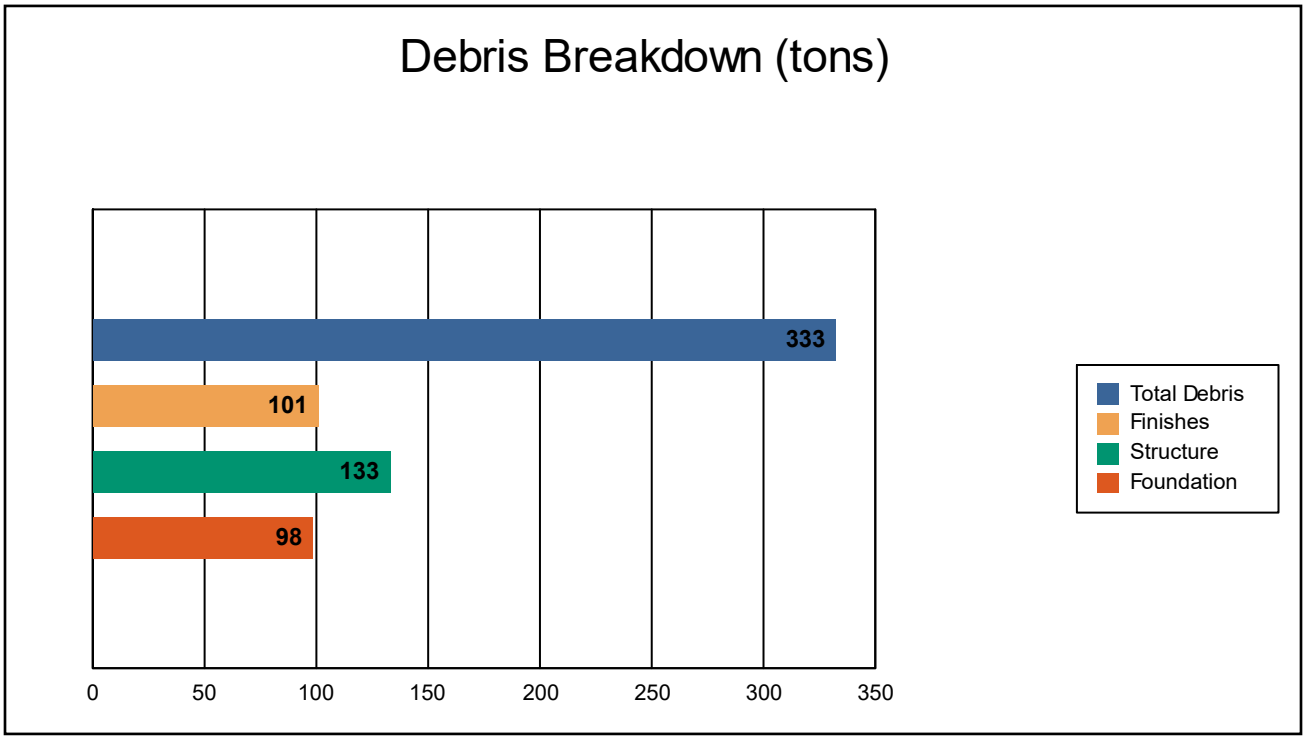
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

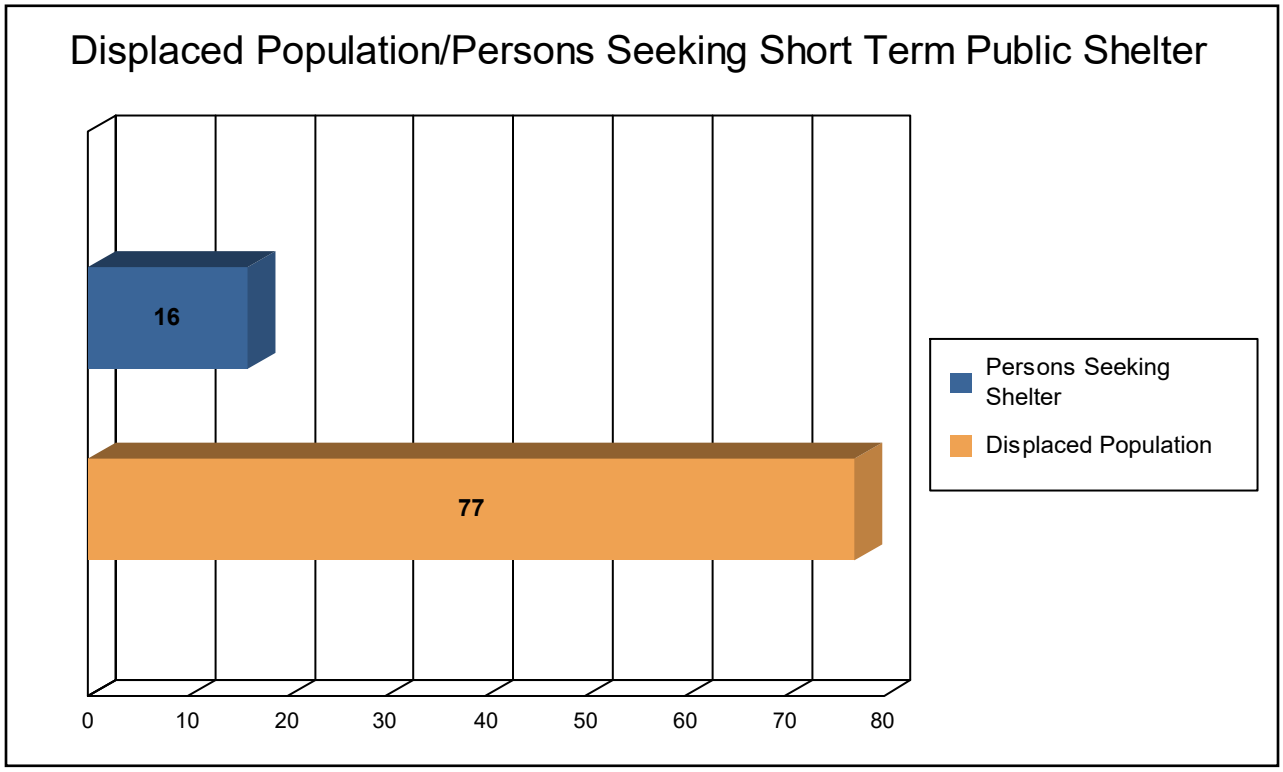


The model estimates that a total of 333 tons of debris will be generated. Of the total amount, Finishes comprises 30% of the total, Structure comprises 40% of the total, and Foundation comprises 29%. If the debris tonnage is converted into an estimated number of truckloads, it will require 14 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 26 households (or 77 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 16 people (out of a total population of 5,566) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 16.51 million dollars, which represents 5.18 % of the total replacement value of the scenario buildings.

Building-Related Losses

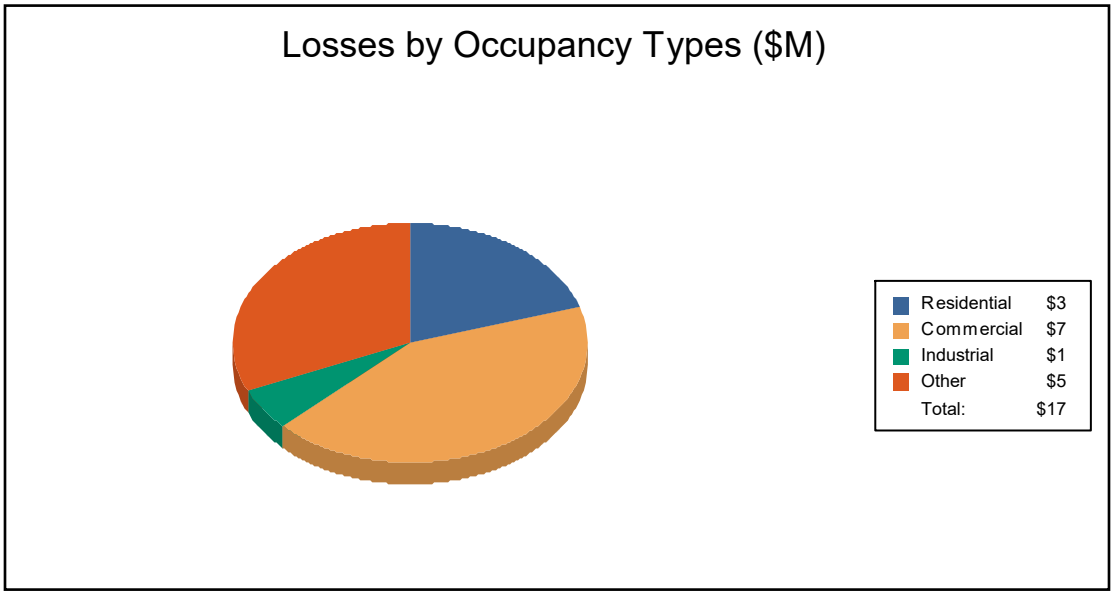
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 8.68 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 20.32% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	1.94	0.86	0.22	0.41	3.44
	Content	0.84	2.30	0.61	1.01	4.76
	Inventory	0.00	0.35	0.07	0.06	0.48
	Subtotal	**2.79**	**3.51**	**0.90**	**1.48**	**8.68**
Business Interruption						
	Income	0.00	1.51	0.01	0.47	1.99
	Relocation	0.42	0.26	0.01	0.29	0.98
	Rental Income	0.15	0.19	0.00	0.04	0.38
	Wage	0.00	1.53	0.01	2.94	4.48
	Subtotal	**0.57**	**3.48**	**0.03**	**3.75**	**7.83**
ALL	**Total**	**3.35**	**6.99**	**0.93**	**5.23**	**16.51**



Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,183	241,538	968,721
Total	**5,566**	**727,183**	**241,538**	**968,721**
Total Study Region	**5,566**	**727,183**	**241,538**	**968,721**

Hazus: Flood Global Risk Report

Region Name: Windsor_FL

Flood Scenario: Windsor_Flood

Print Date: Monday, April 24, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 12 thousand households and has a total population of 29,433 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,744 buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90.32% of the buildings (and 55.41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of 5,529 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,063,483	55.4%
Commercial	1,193,937	21.6%
Industrial	701,684	12.7%
Agricultural	19,615	0.4%
Religion	164,813	3.0%
Government	125,212	2.3%
Education	260,268	4.7%
Total	**5,529,012**	**100%**

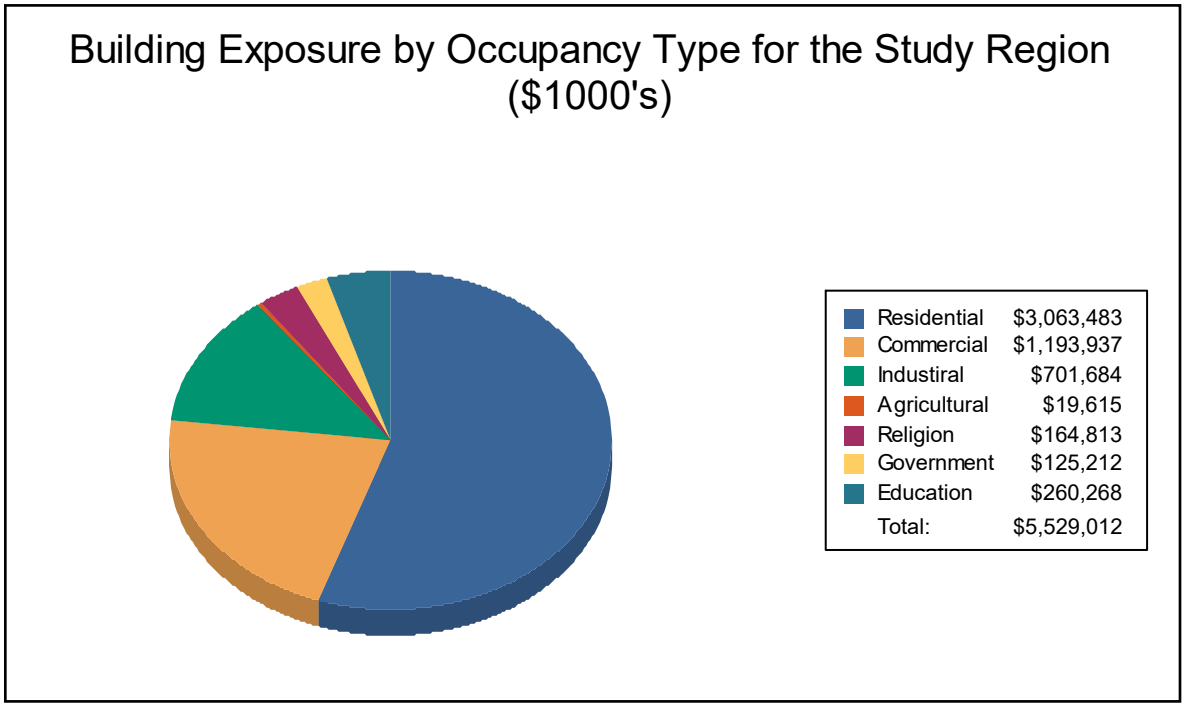
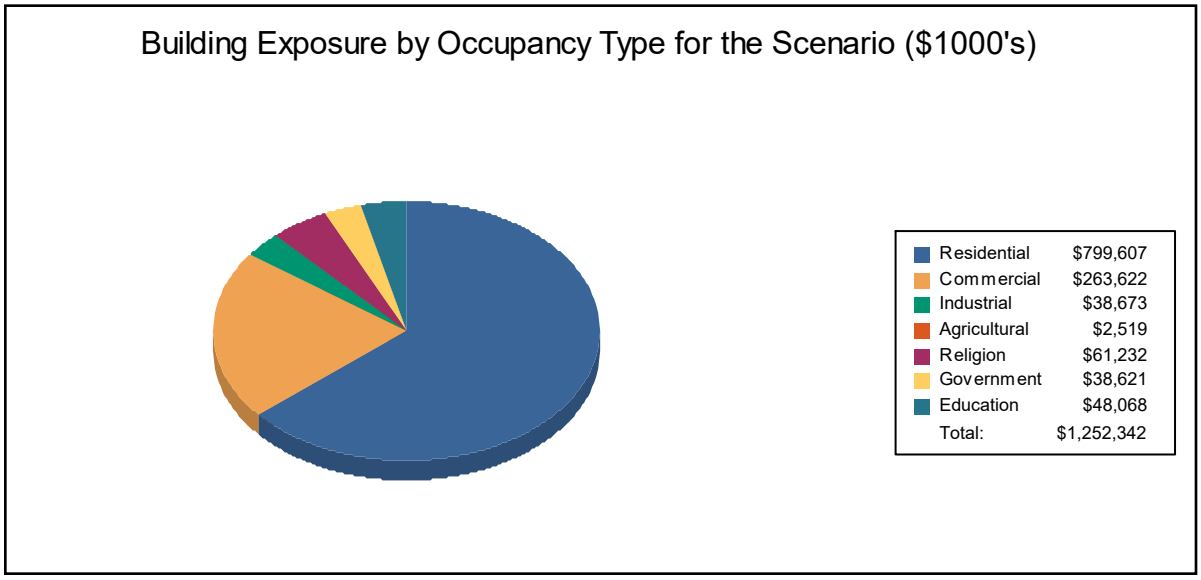


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	799,607	63.8%
Commercial	263,622	21.1%
Industrial	38,673	3.1%
Agricultural	2,519	0.2%
Religion	61,232	4.9%
Government	38,621	3.1%
Education	48,068	3.8%
Total	**1,252,342**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 4 fire stations, 1 police station and 1 emergency operation center.

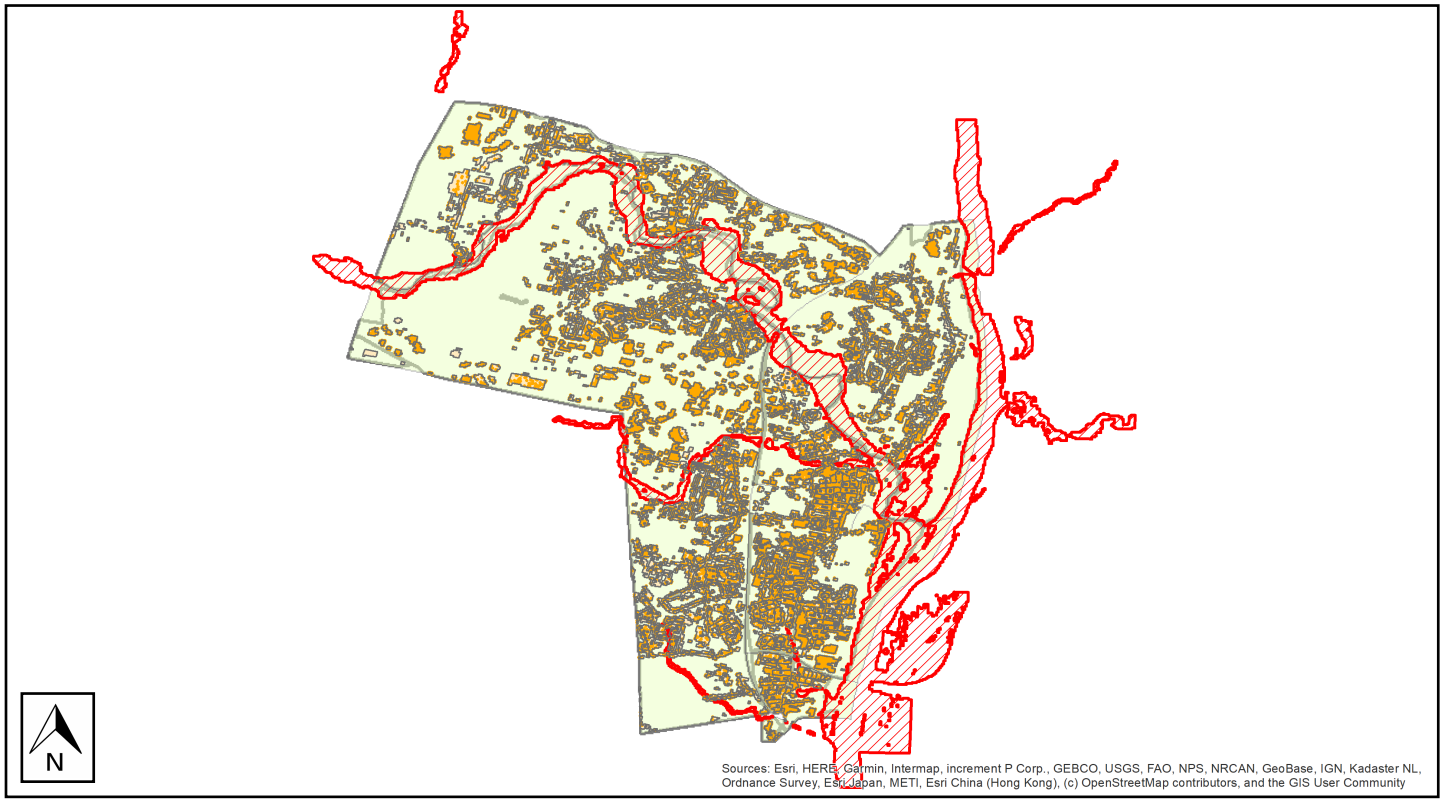
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_FL
Scenario Name:	Windsor_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

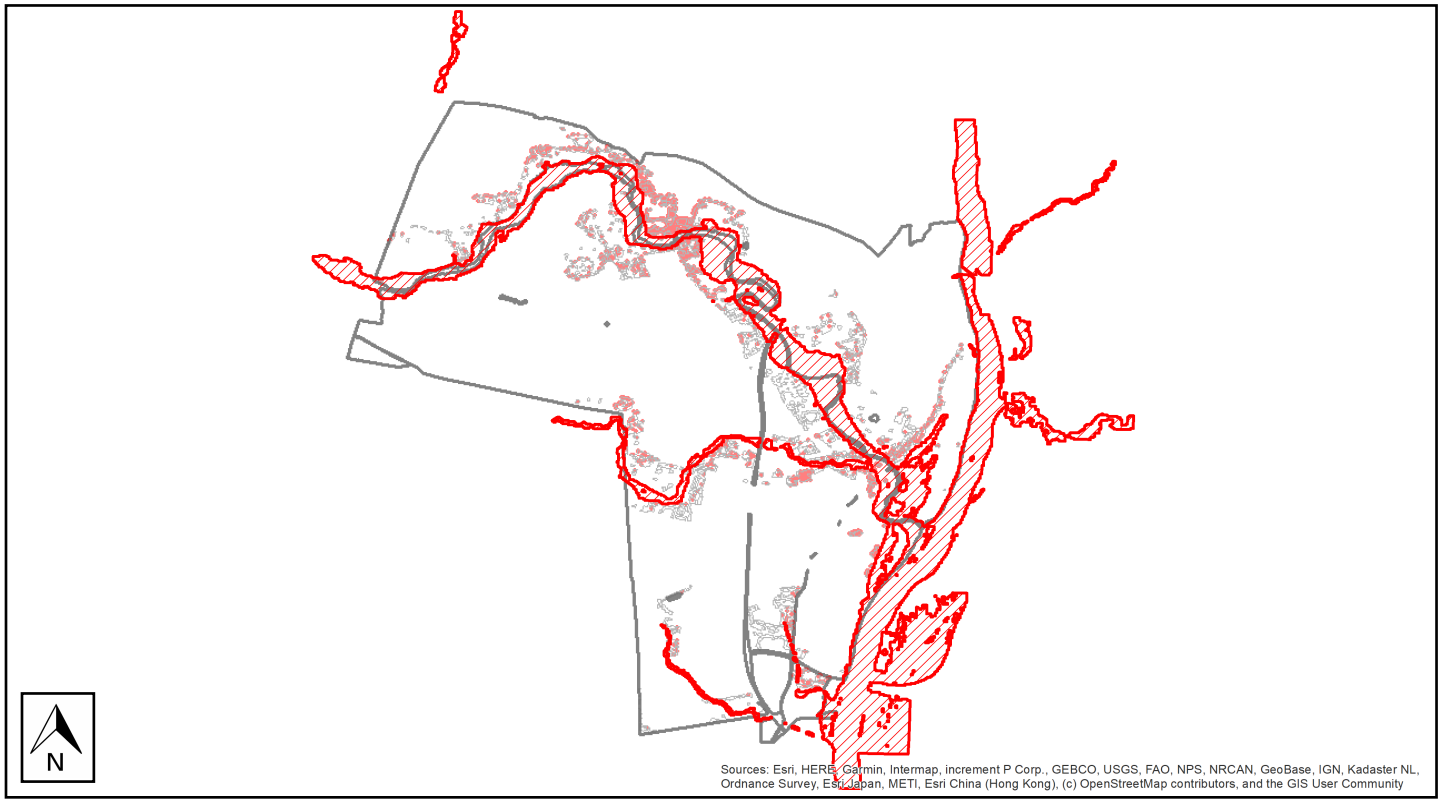


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	3	75	1	25	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	60	2	40	0	0	0	0	0	0	0	0
Total	**3**		**5**		**1**		**0**		**0**		**0**	

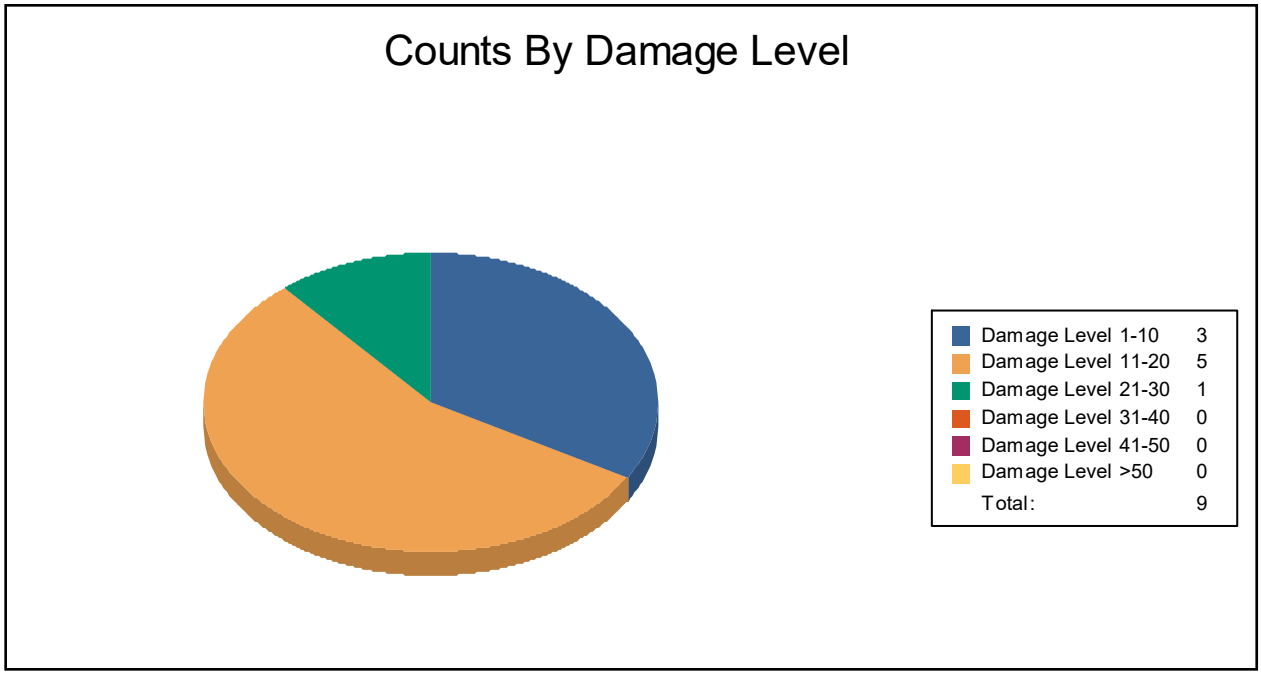


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	1	100	0	0	0	0	0	0	0	0
Steel	0	0	1	100	0	0	0	0	0	0	0	0
Wood	3	50	3	50	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

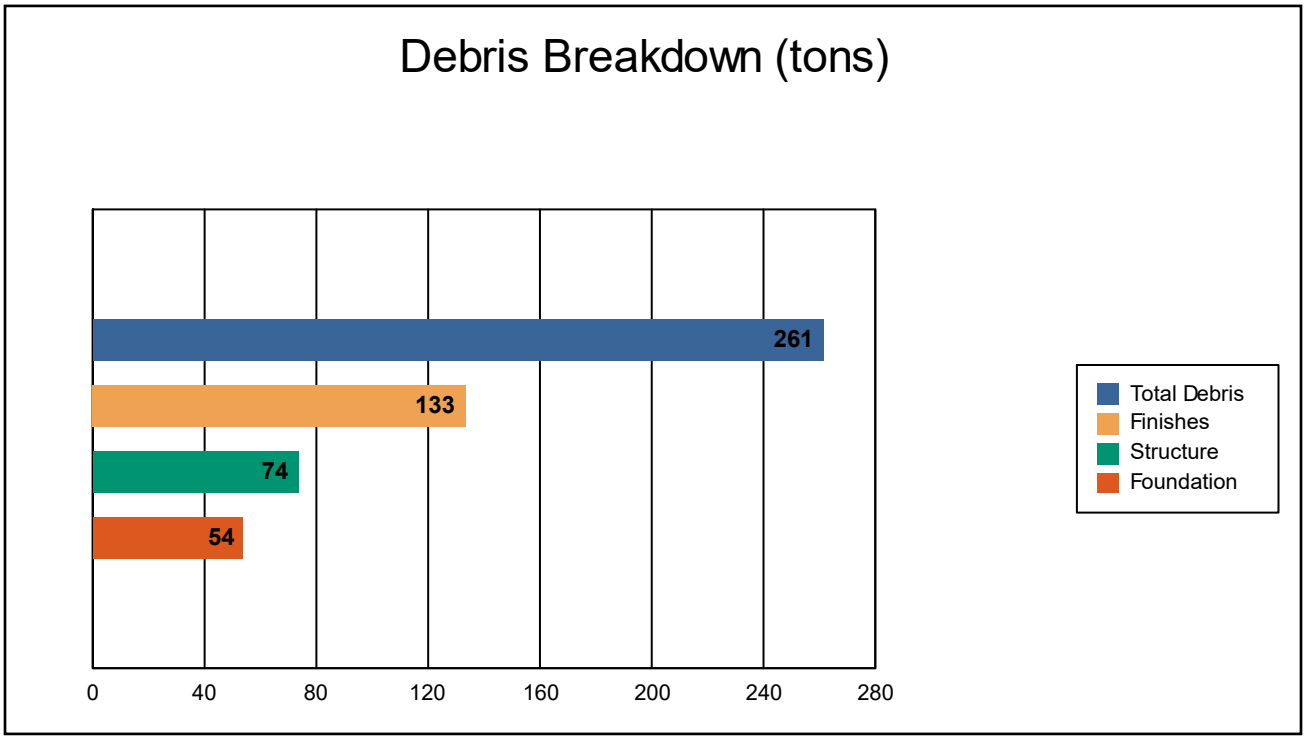
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

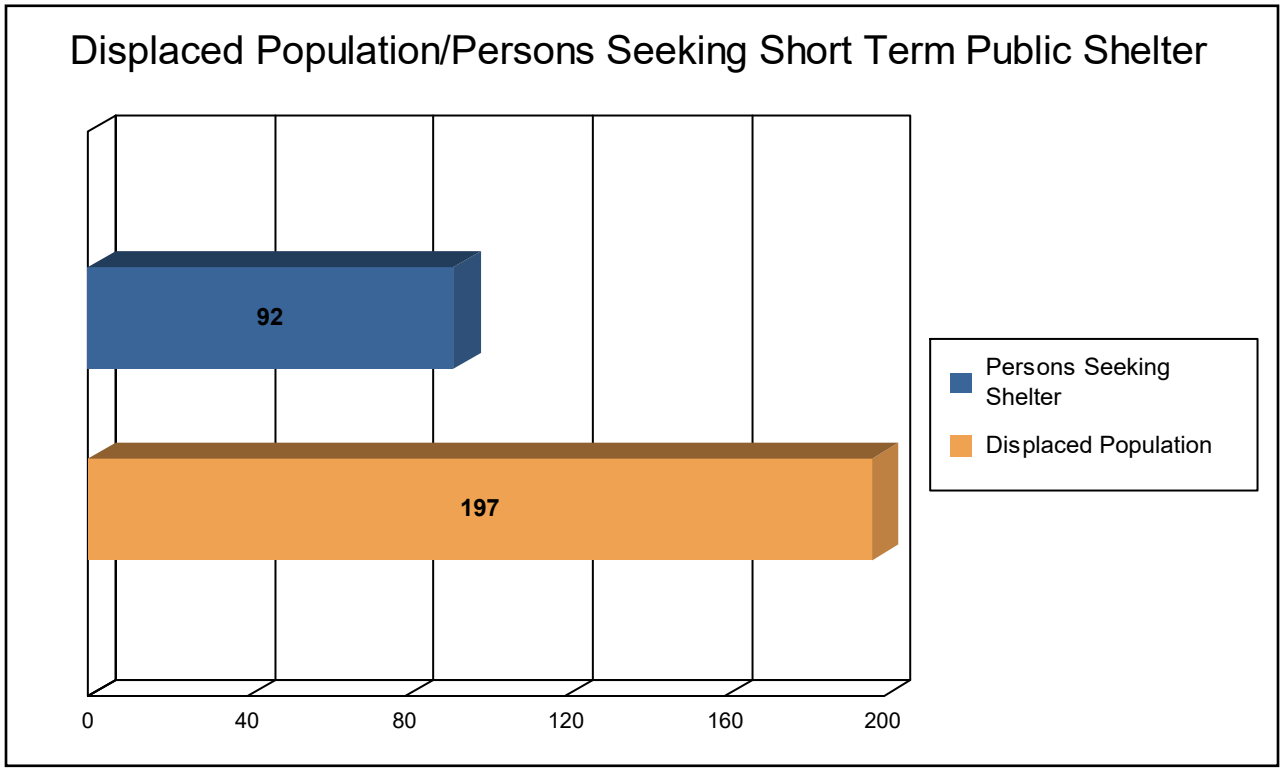


The model estimates that a total of 261 tons of debris will be generated. Of the total amount, Finishes comprises 51% of the total, Structure comprises 28% of the total, and Foundation comprises 21%. If the debris tonnage is converted into an estimated number of truckloads, it will require 11 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 66 households (or 197 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 92 people (out of a total population of 29,433) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 23.69 million dollars, which represents 1.89 % of the total replacement value of the scenario buildings.

Building-Related Losses

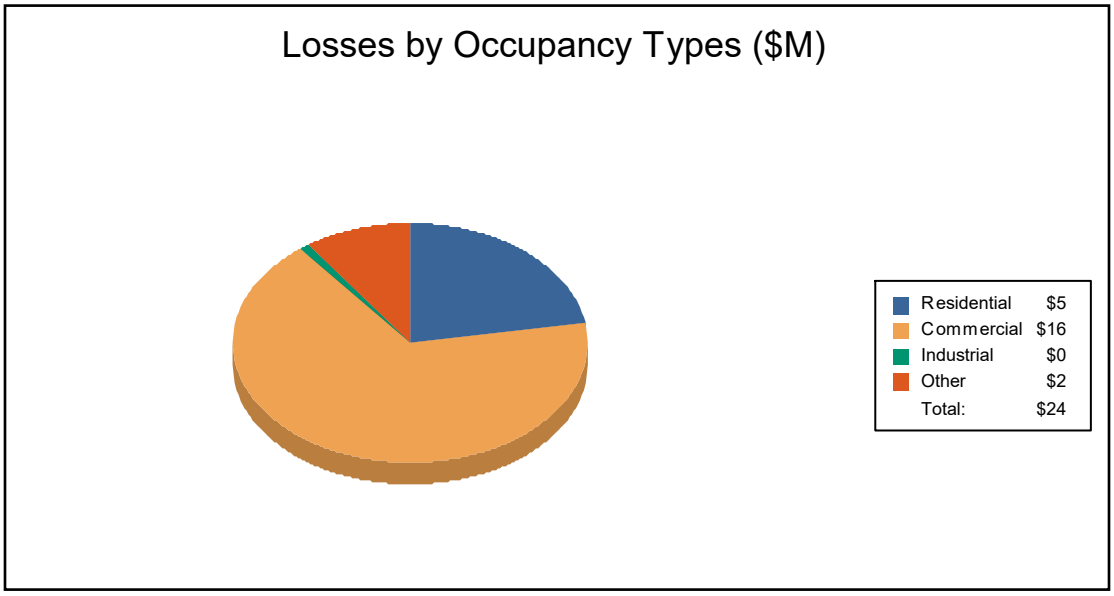
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 11.63 million dollars. 51% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.17% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.84	1.47	0.06	0.07	4.43
	Content	1.28	5.14	0.09	0.47	6.97
	Inventory	0.00	0.21	0.01	0.00	0.22
	Subtotal	**4.12**	**6.82**	**0.15**	**0.54**	**11.63**
Business Interruption						
	Income	0.00	3.65	0.00	0.24	3.89
	Relocation	0.83	0.68	0.00	0.07	1.58
	Rental Income	0.31	0.53	0.00	0.01	0.85
	Wage	0.00	4.28	0.00	1.47	5.75
	Subtotal	**1.14**	**9.14**	**0.00**	**1.79**	**12.06**
ALL	**Total**	**5.25**	**15.96**	**0.16**	**2.33**	**23.69**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	29,433	3,063,483	2,465,529	5,529,012
Total	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**
Total Study Region	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**

Hazus: Flood Global Risk Report

Region Name: Windsor_FL

Flood Scenario: Windsor_Flood

Print Date: Monday, April 24, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
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The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 12 thousand households and has a total population of 29,433 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,744 buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90.32% of the buildings (and 55.41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of 5,529 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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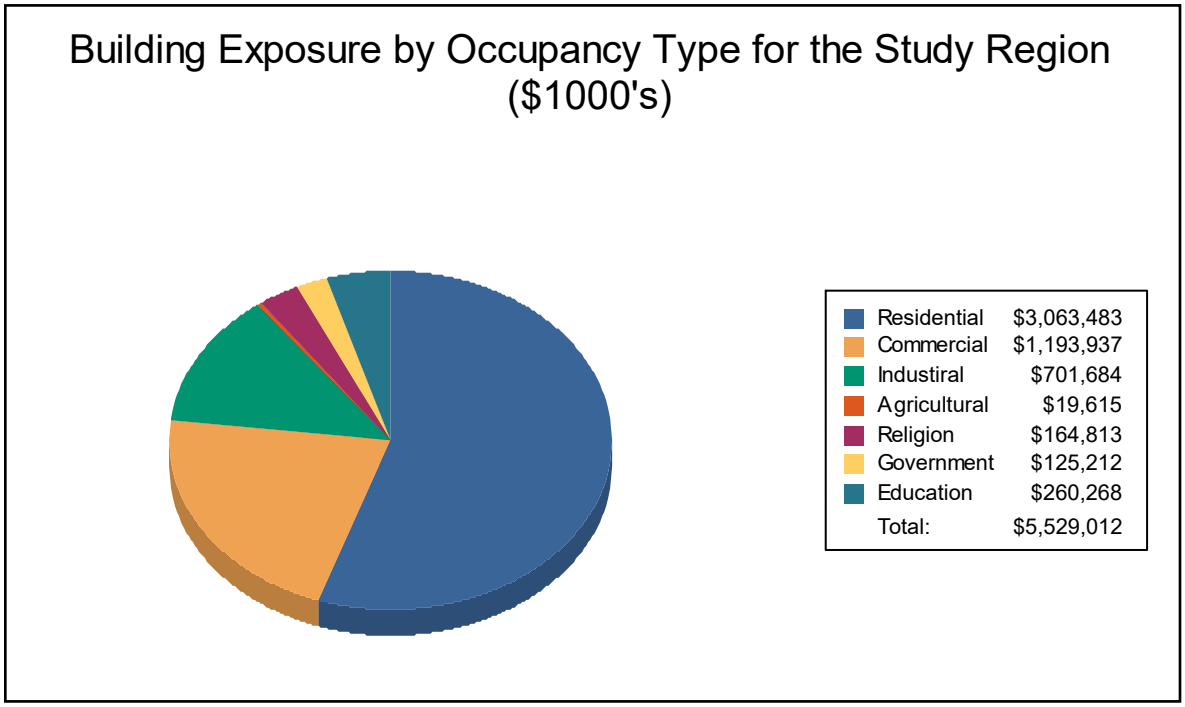

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Building Exposure by Occupancy Type for the Scenario

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Commercial	263,622	21.1%
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Agricultural	2,519	0.2%
Religion	61,232	4.9%
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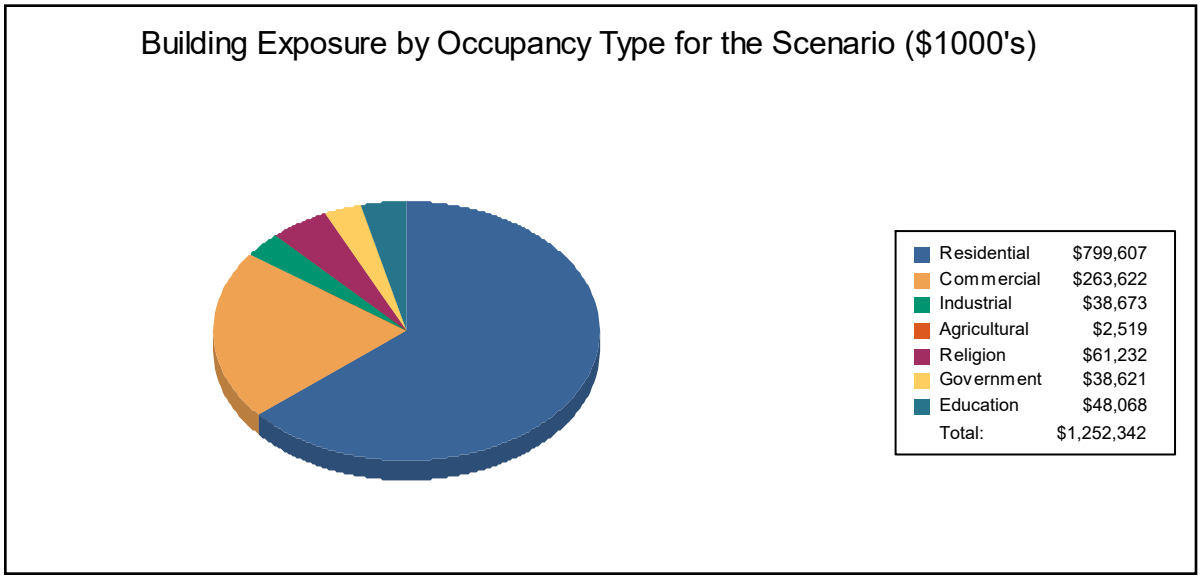
Education	48,068	3.8%
Total	**1,252,342**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 4 fire stations, 1 police station and 1 emergency operation center.

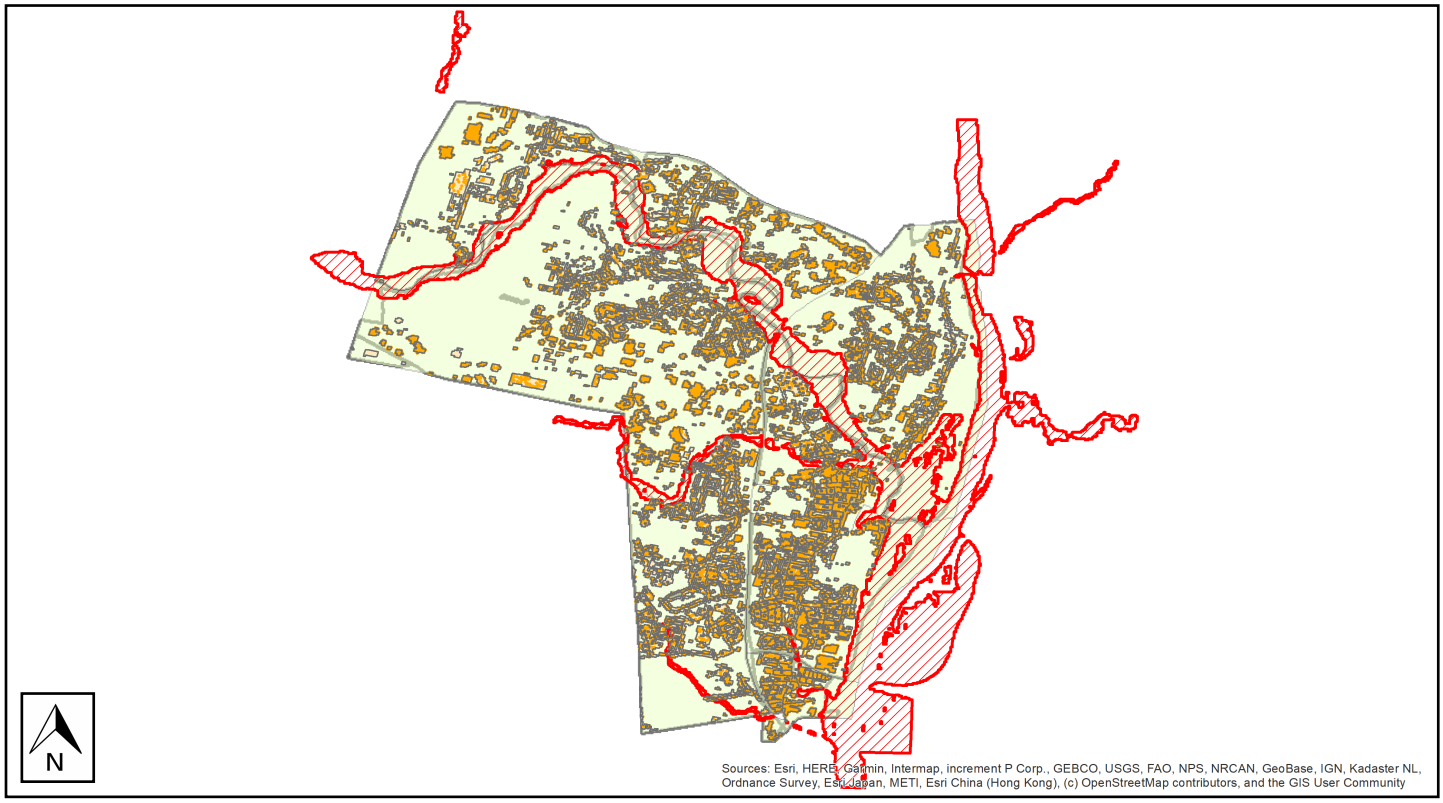
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_FL
Scenario Name:	Windsor_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 8 buildings will be at least moderately damaged. This is over 83% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

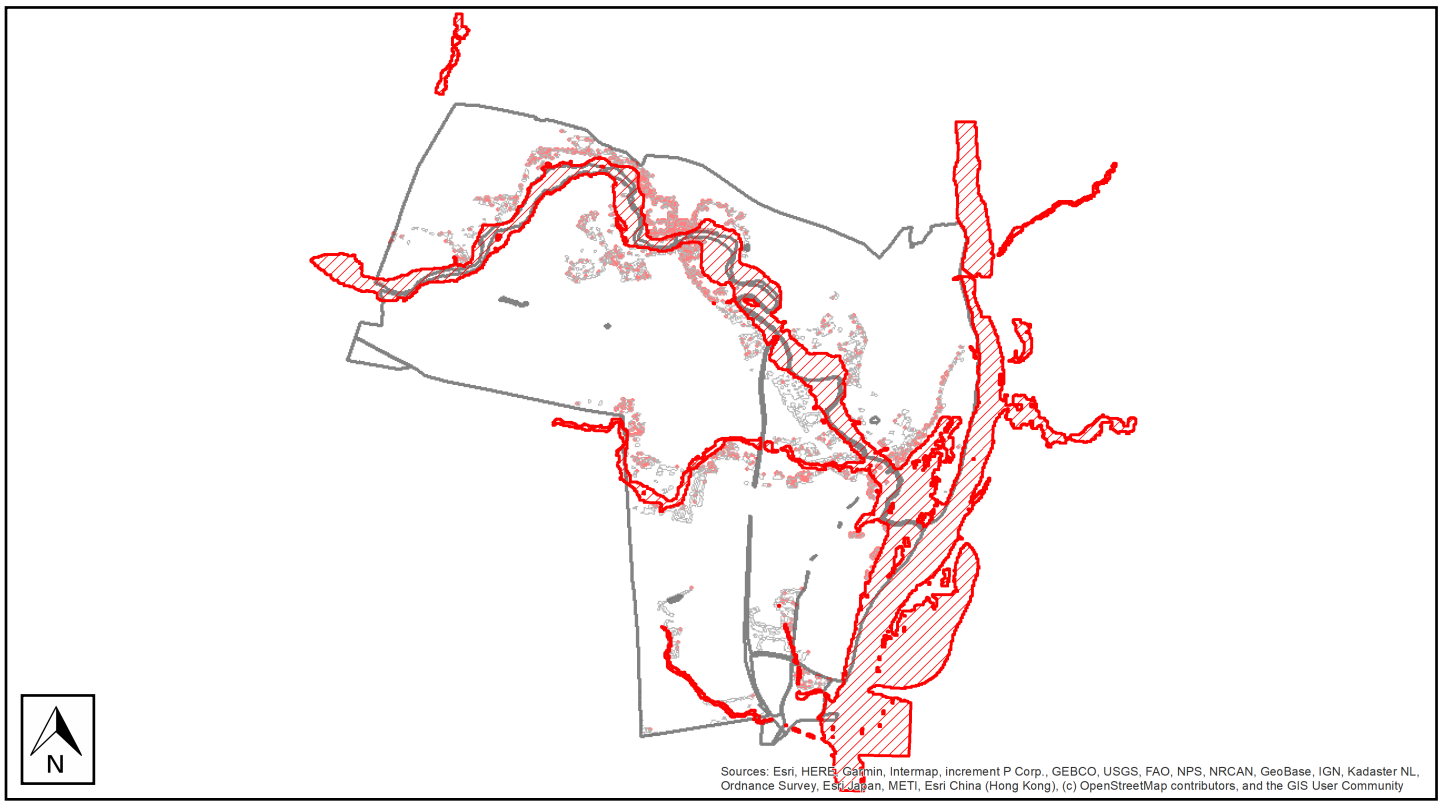


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	1	25	2	50	1	25	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	4	50	2	25	1	13	1	13	0	0	0	0
Total	**4**		**3**		**3**		**2**		**0**		**0**	

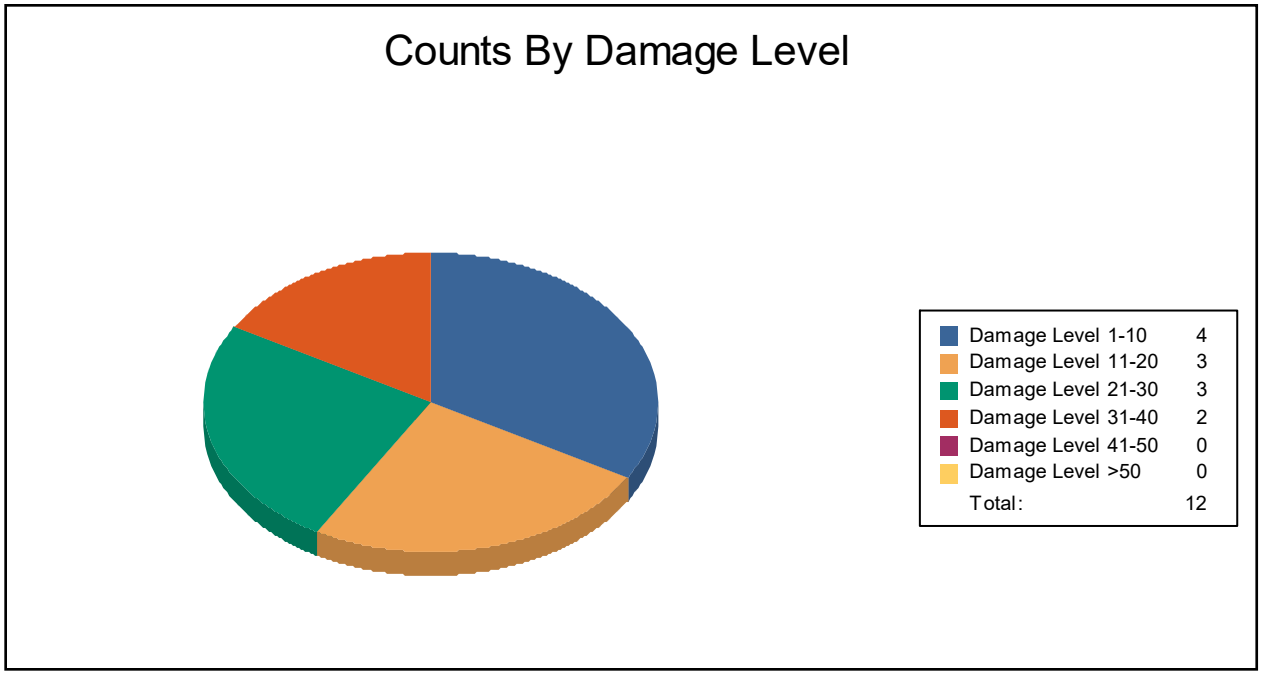


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	1	100	0	0	0	0	0	0
Steel	0	0	1	50	1	50	0	0	0	0	0	0
Wood	4	50	2	25	1	13	1	13	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

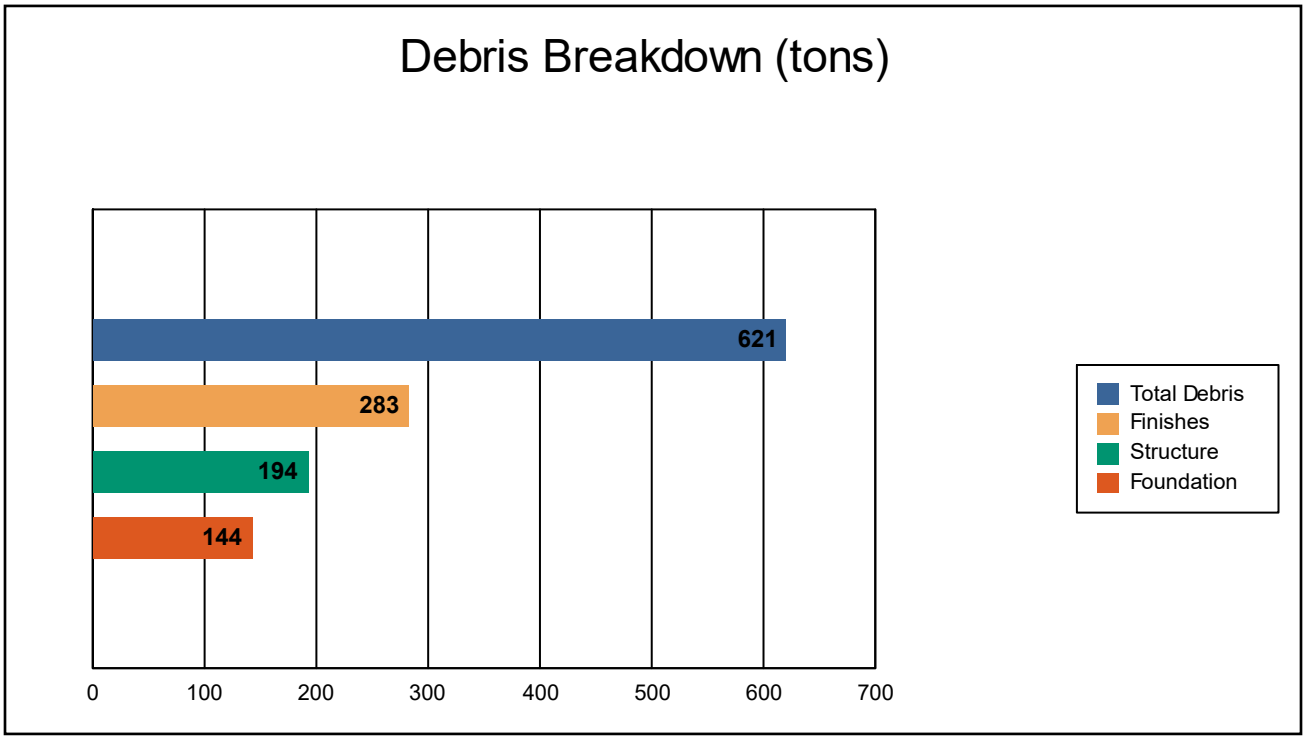
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

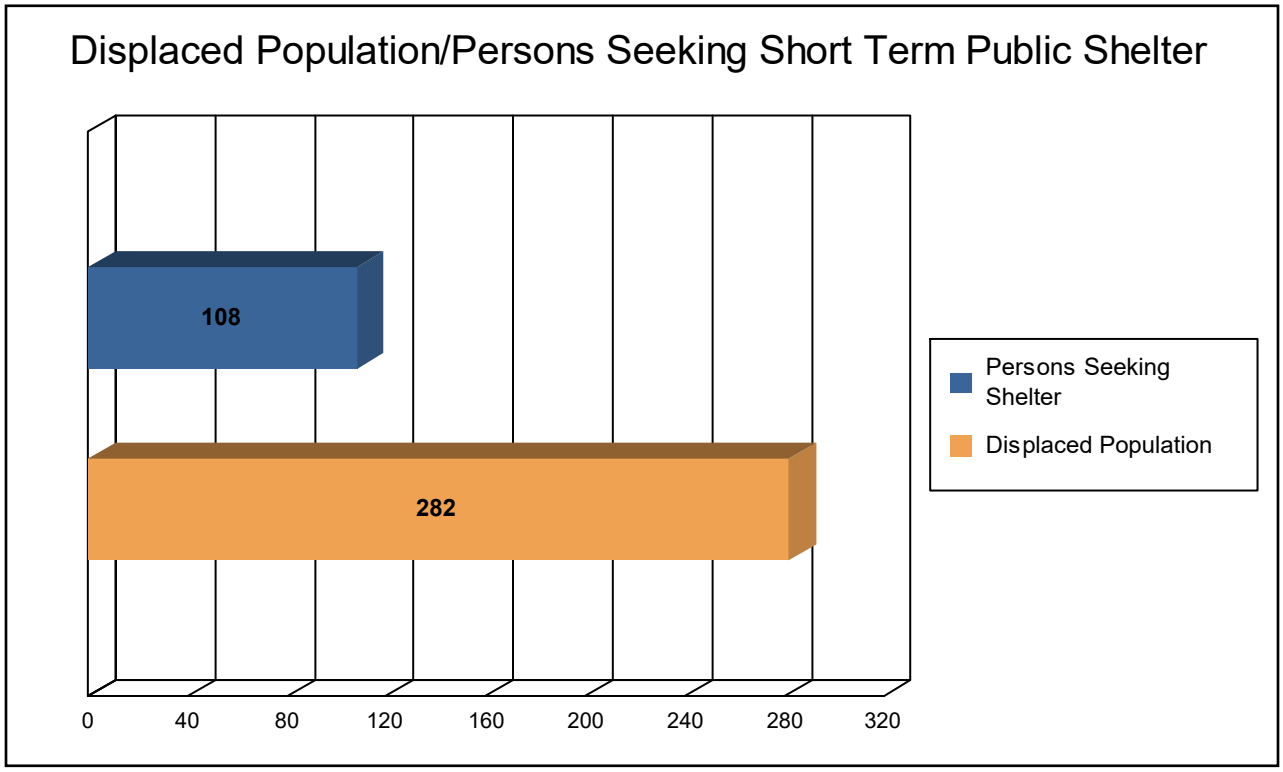


The model estimates that a total of 621 tons of debris will be generated. Of the total amount, Finishes comprises 46% of the total, Structure comprises 31% of the total, and Foundation comprises 23%. If the debris tonnage is converted into an estimated number of truckloads, it will require 25 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 94 households (or 282 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 108 people (out of a total population of 29,433) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 38.73 million dollars, which represents 3.09 % of the total replacement value of the scenario buildings.

Building-Related Losses

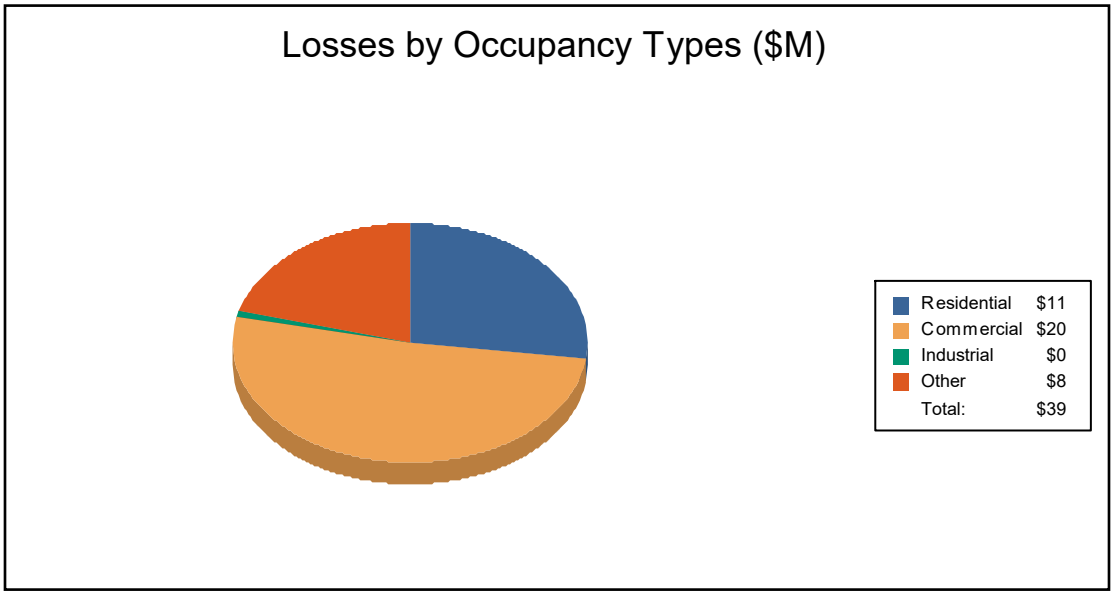
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 20.15 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 27.13% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.89	2.21	0.10	0.30	8.49
	Content	2.63	6.59	0.17	1.81	11.20
	Inventory	0.00	0.44	0.02	0.00	0.46
	Subtotal	**8.53**	**9.23**	**0.29**	**2.11**	**20.15**
Business Interruption						
	Income	0.00	4.28	0.00	0.53	4.82
	Relocation	1.45	0.77	0.00	0.31	2.53
	Rental Income	0.53	0.59	0.00	0.08	1.20
	Wage	0.00	5.03	0.00	5.01	10.04
	Subtotal	**1.98**	**10.67**	**0.01**	**5.92**	**18.58**
ALL	**Total**	**10.51**	**19.90**	**0.29**	**8.03**	**38.73**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	29,433	3,063,483	2,465,529	5,529,012
Total	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**
Total Study Region	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**

Hazus: Flood Global Risk Report

Region Name: Windsor_FL

Flood Scenario: Windsor_Flood

Print Date: Monday, April 24, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 12 thousand households and has a total population of 29,433 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,744 buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90.32% of the buildings (and 55.41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of 5,529 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,063,483	55.4%
Commercial	1,193,937	21.6%
Industrial	701,684	12.7%
Agricultural	19,615	0.4%
Religion	164,813	3.0%
Government	125,212	2.3%
Education	260,268	4.7%
Total	**5,529,012**	**100%**

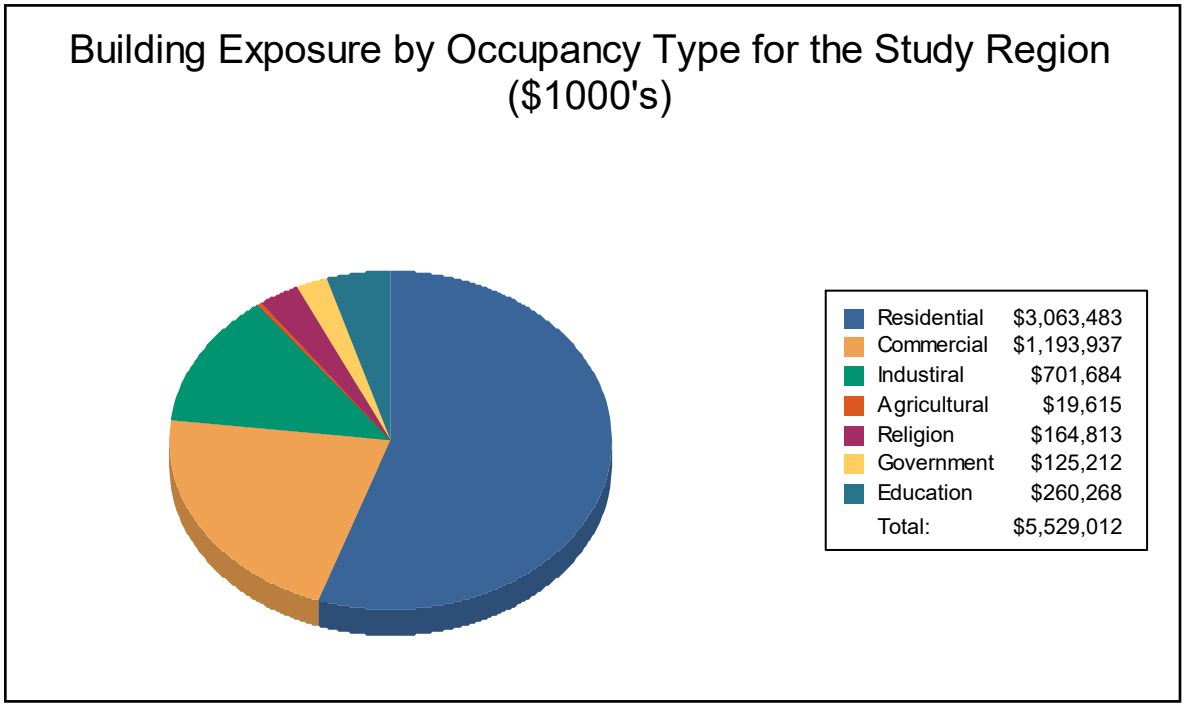
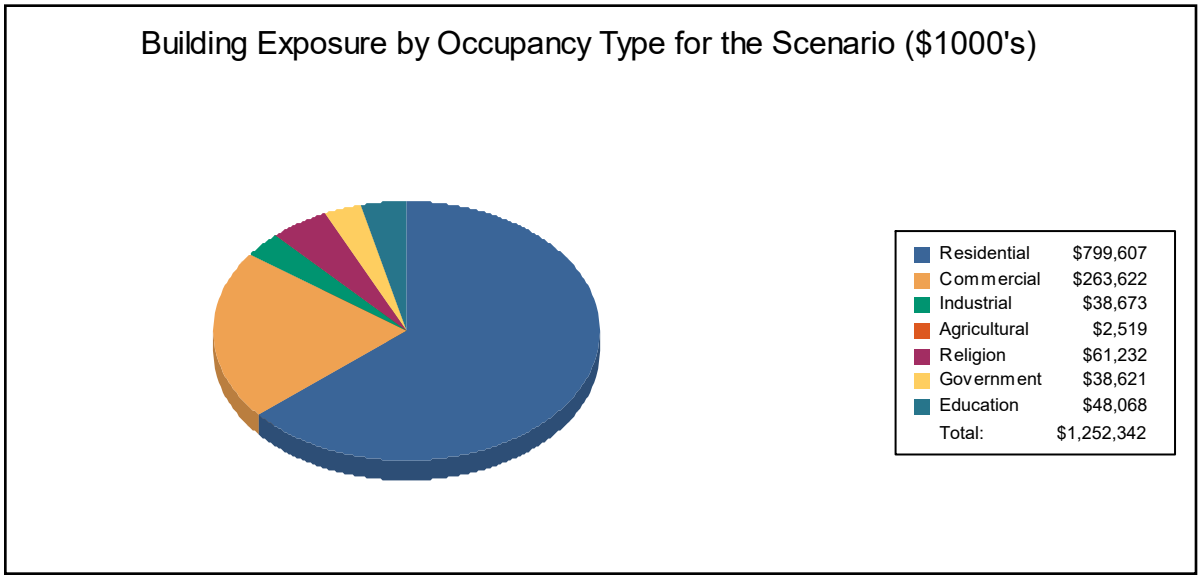


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	799,607	63.8%
Commercial	263,622	21.1%
Industrial	38,673	3.1%
Agricultural	2,519	0.2%
Religion	61,232	4.9%
Government	38,621	3.1%
Education	48,068	3.8%
Total	**1,252,342**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 4 fire stations, 1 police station and 1 emergency operation center.

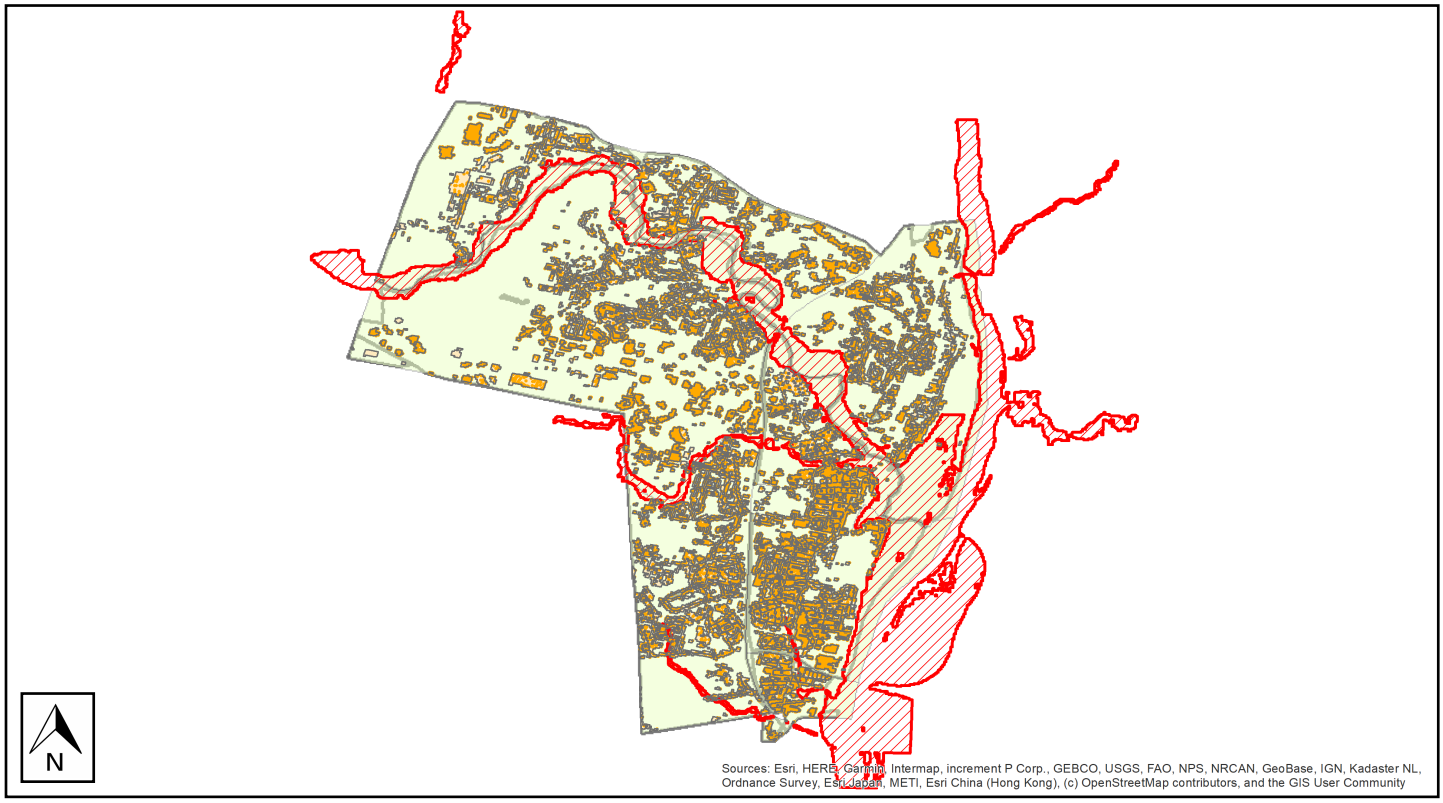
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_FL
Scenario Name:	Windsor_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 15 buildings will be at least moderately damaged. This is over 79% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

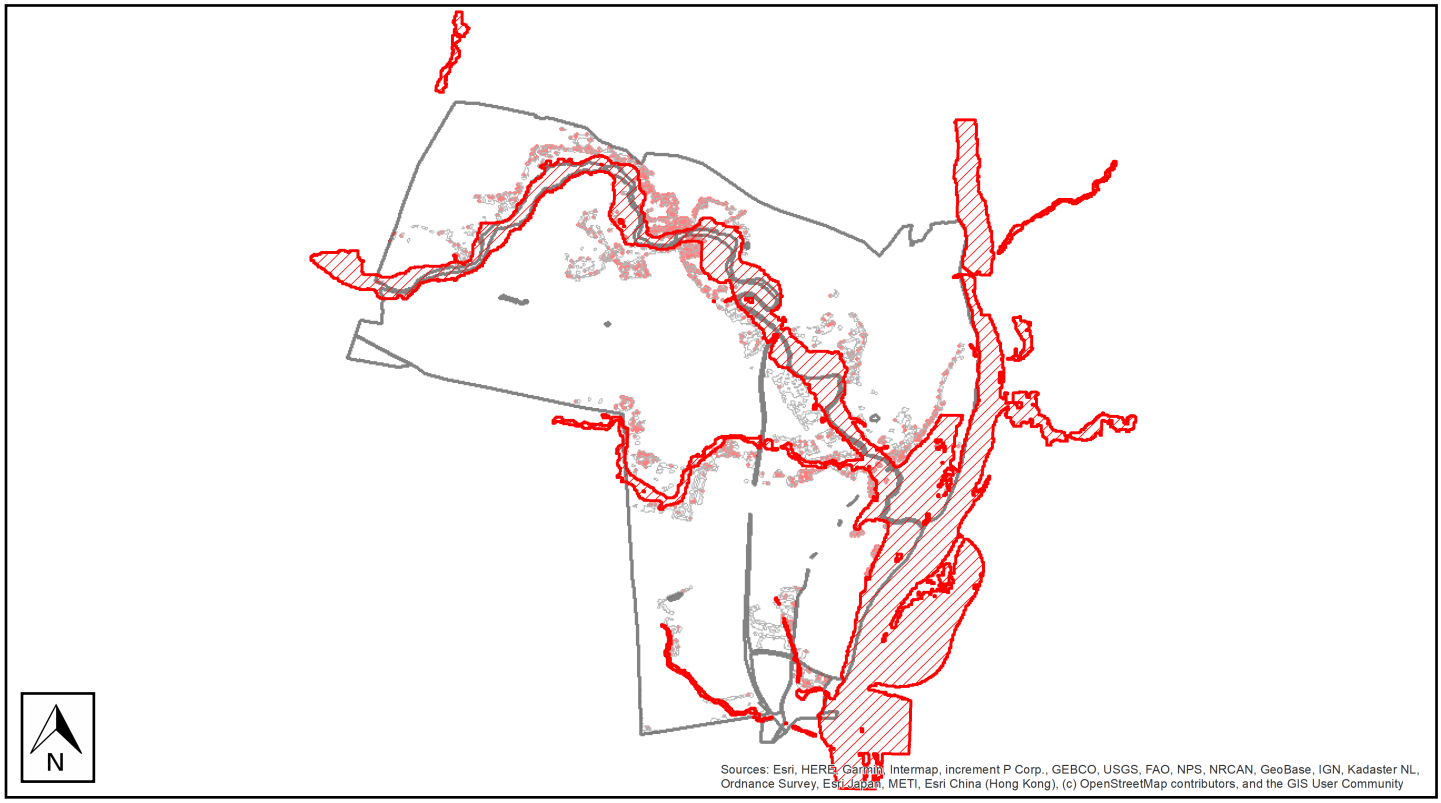


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	2	50	2	50	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	4	27	6	40	3	20	1	7	0	0	1	7
Total	**4**		**6**		**5**		**3**		**0**		**1**	

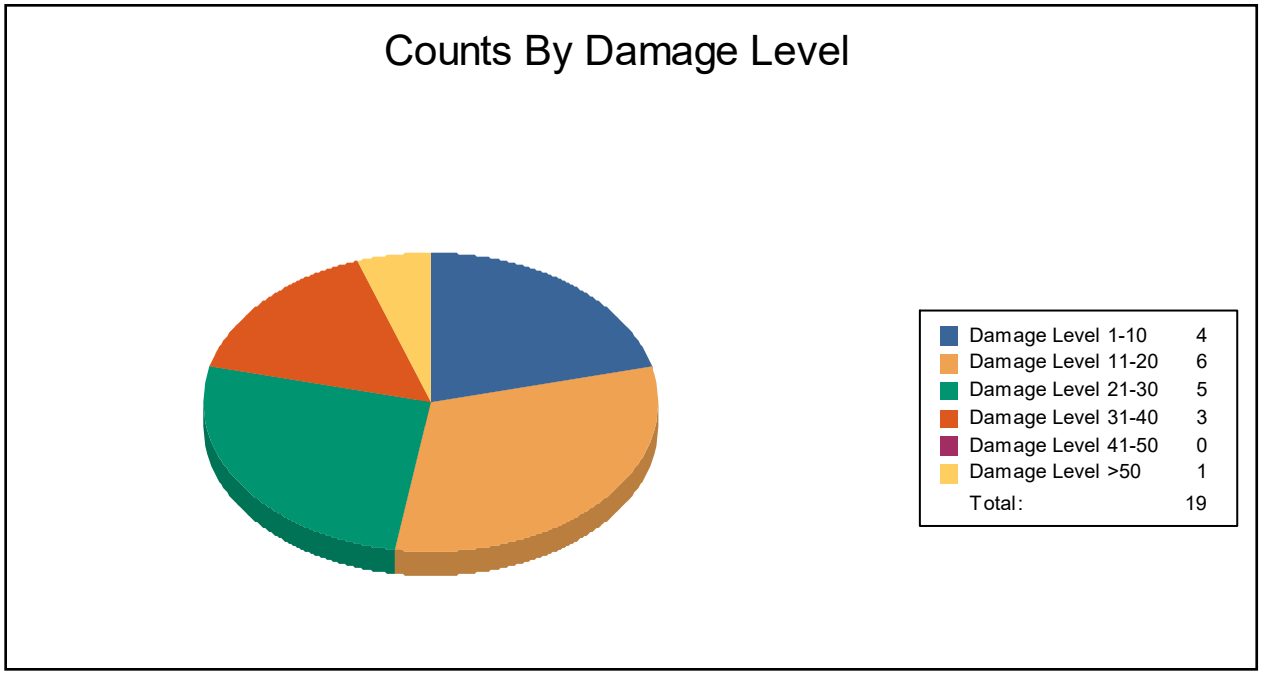


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	1	50	1	50	0	0	0	0
Steel	0	0	0	0	1	50	1	50	0	0	0	0
Wood	4	27	6	40	3	20	1	7	0	0	1	7

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

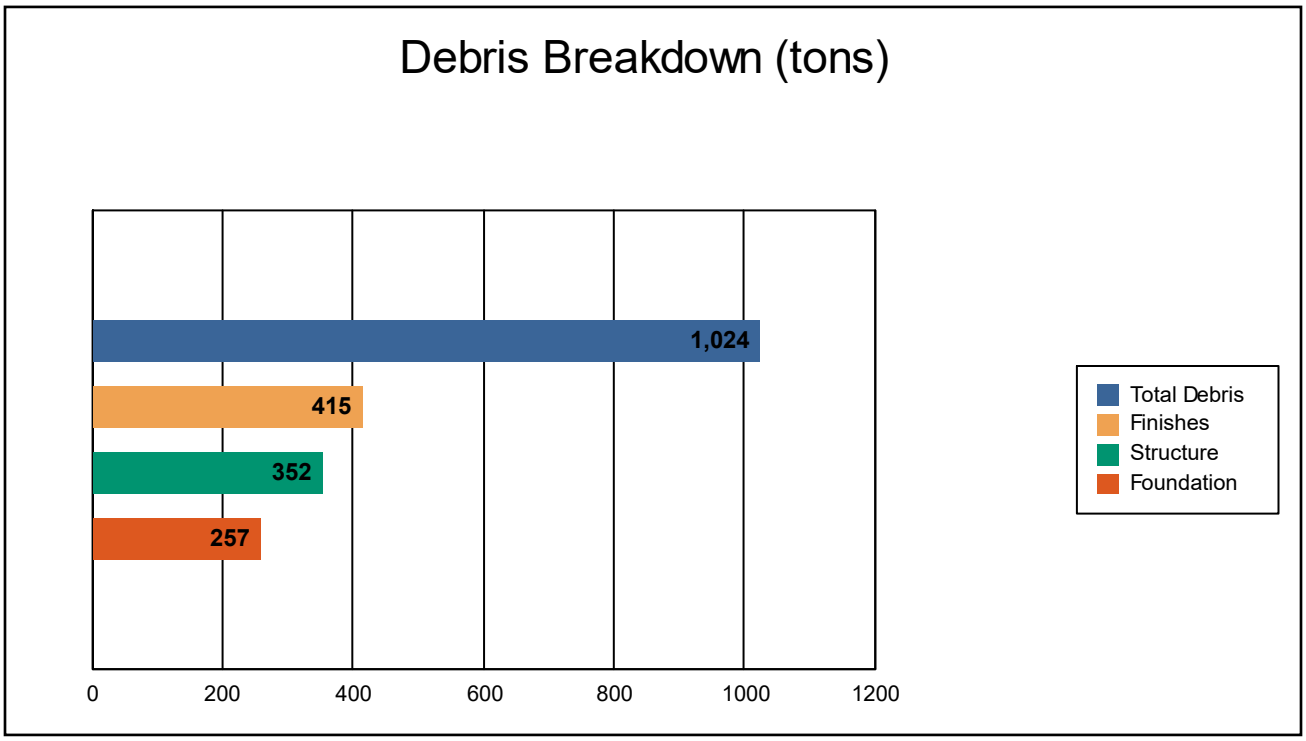
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

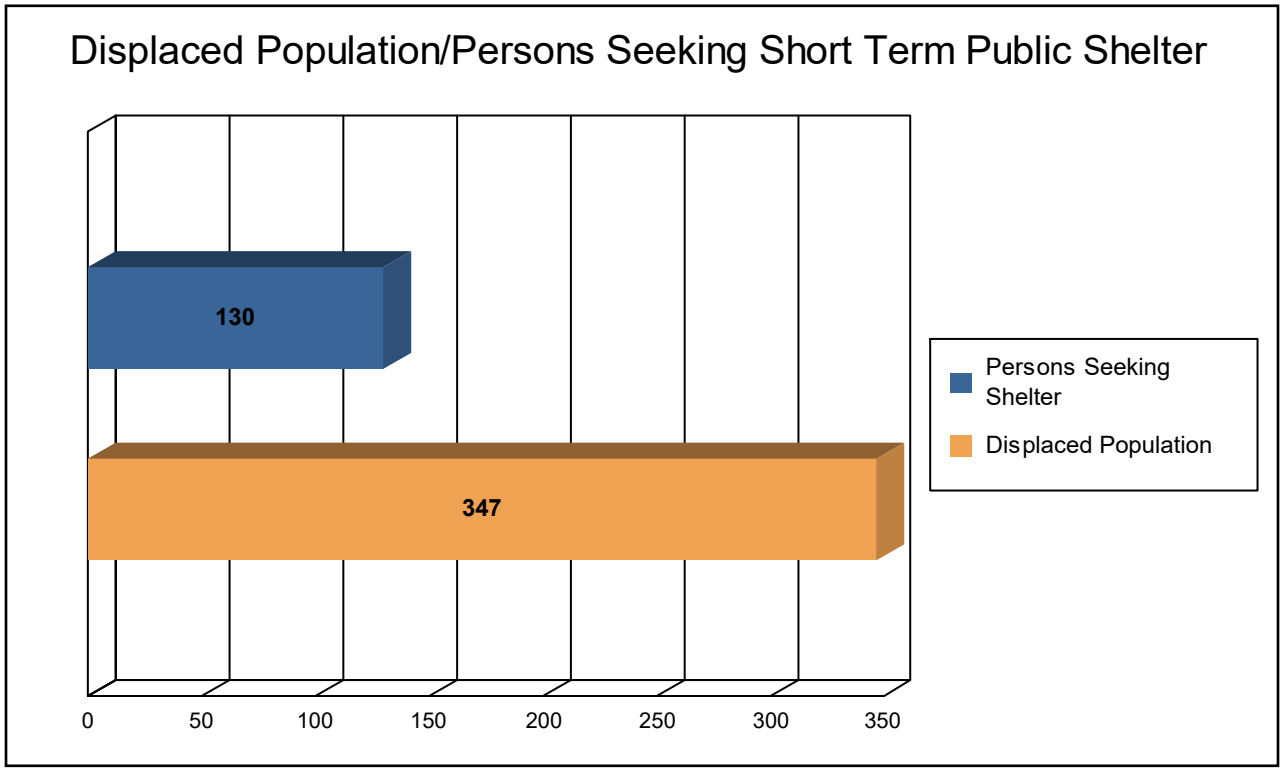


The model estimates that a total of 1,024 tons of debris will be generated. Of the total amount, Finishes comprises 41% of the total, Structure comprises 34% of the total, and Foundation comprises 25%. If the debris tonnage is converted into an estimated number of truckloads, it will require 41 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 116 households (or 347 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 130 people (out of a total population of 29,433) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 54.31 million dollars, which represents 4.34 % of the total replacement value of the scenario buildings.

Building-Related Losses

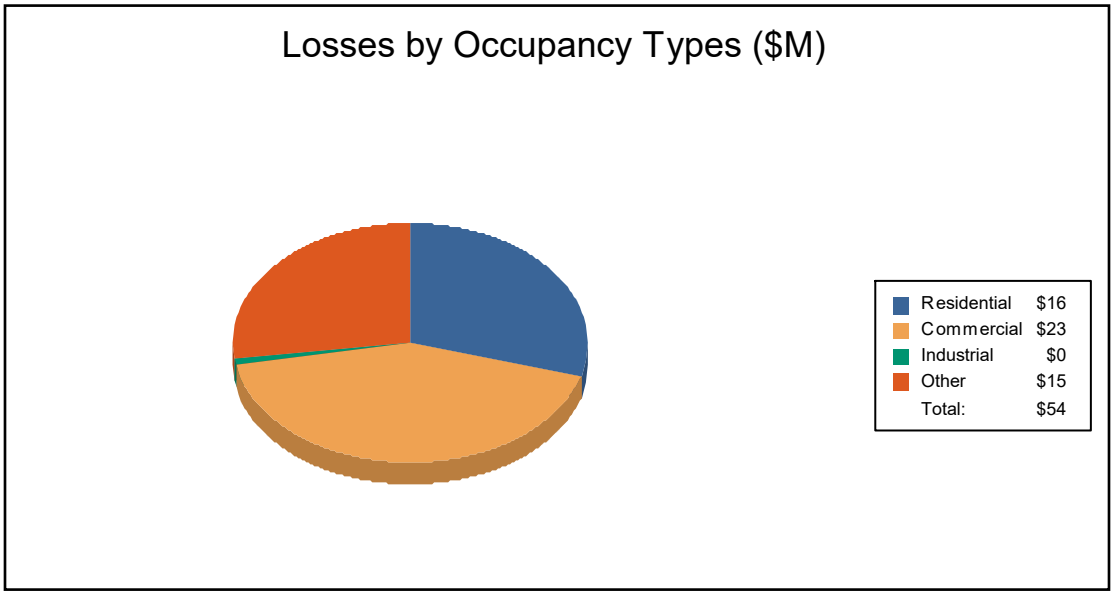
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 28.51 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 29.32% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.14	2.81	0.13	0.64	12.72
	Content	4.09	7.54	0.24	3.29	15.16
	Inventory	0.00	0.60	0.03	0.00	0.63
	Subtotal	**13.23**	**10.96**	**0.40**	**3.93**	**28.51**
Business Interruption						
	Income	0.00	4.80	0.00	0.84	5.65
	Relocation	1.98	0.89	0.00	0.56	3.43
	Rental Income	0.72	0.68	0.00	0.16	1.56
	Wage	0.00	5.81	0.01	9.34	15.16
	Subtotal	**2.70**	**12.18**	**0.01**	**10.91**	**25.79**
ALL	**Total**	**15.92**	**23.14**	**0.41**	**14.84**	**54.31**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	29,433	3,063,483	2,465,529	5,529,012
Total	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**
Total Study Region	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**

Hazus: Flood Global Risk Report

Region Name: Windsor_FL

Flood Scenario: Windsor_Flood

Print Date: Monday, April 24, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

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Note:
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The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 12 thousand households and has a total population of 29,433 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,744 buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90.32% of the buildings (and 55.41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of 5,529 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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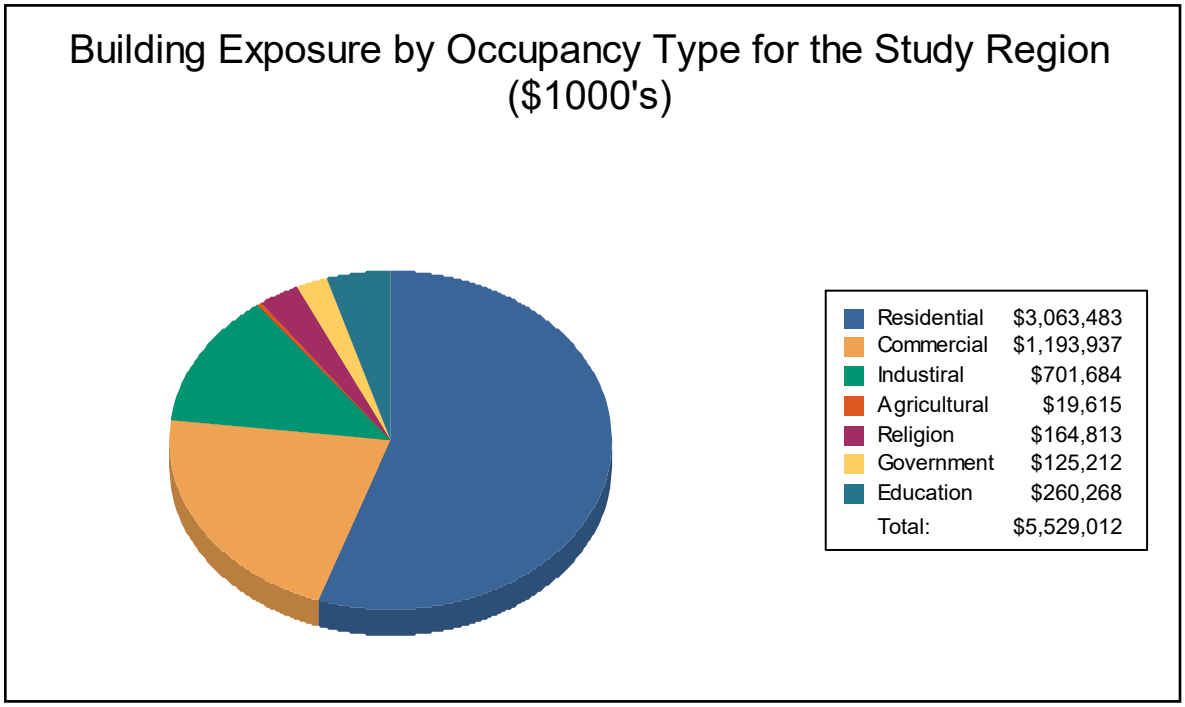

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Building Exposure by Occupancy Type for the Scenario

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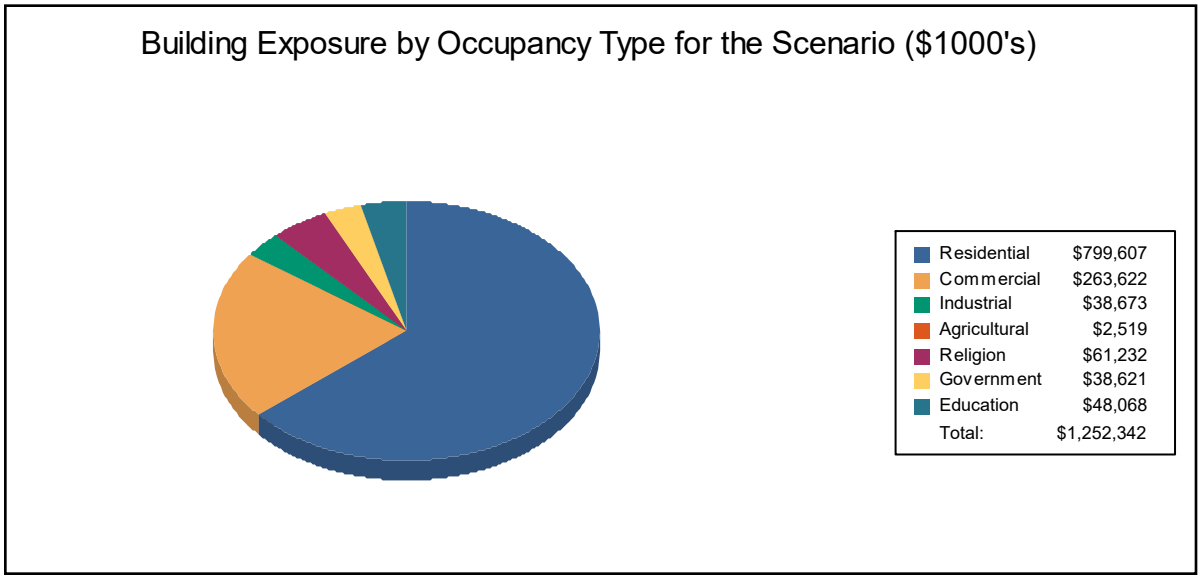
Agricultural	2,519	0.2%
Religion	61,232	4.9%
Government	38,621	3.1%
Education	48,068	3.8%
Total	**1,252,342**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 4 fire stations, 1 police station and 1 emergency operation center.

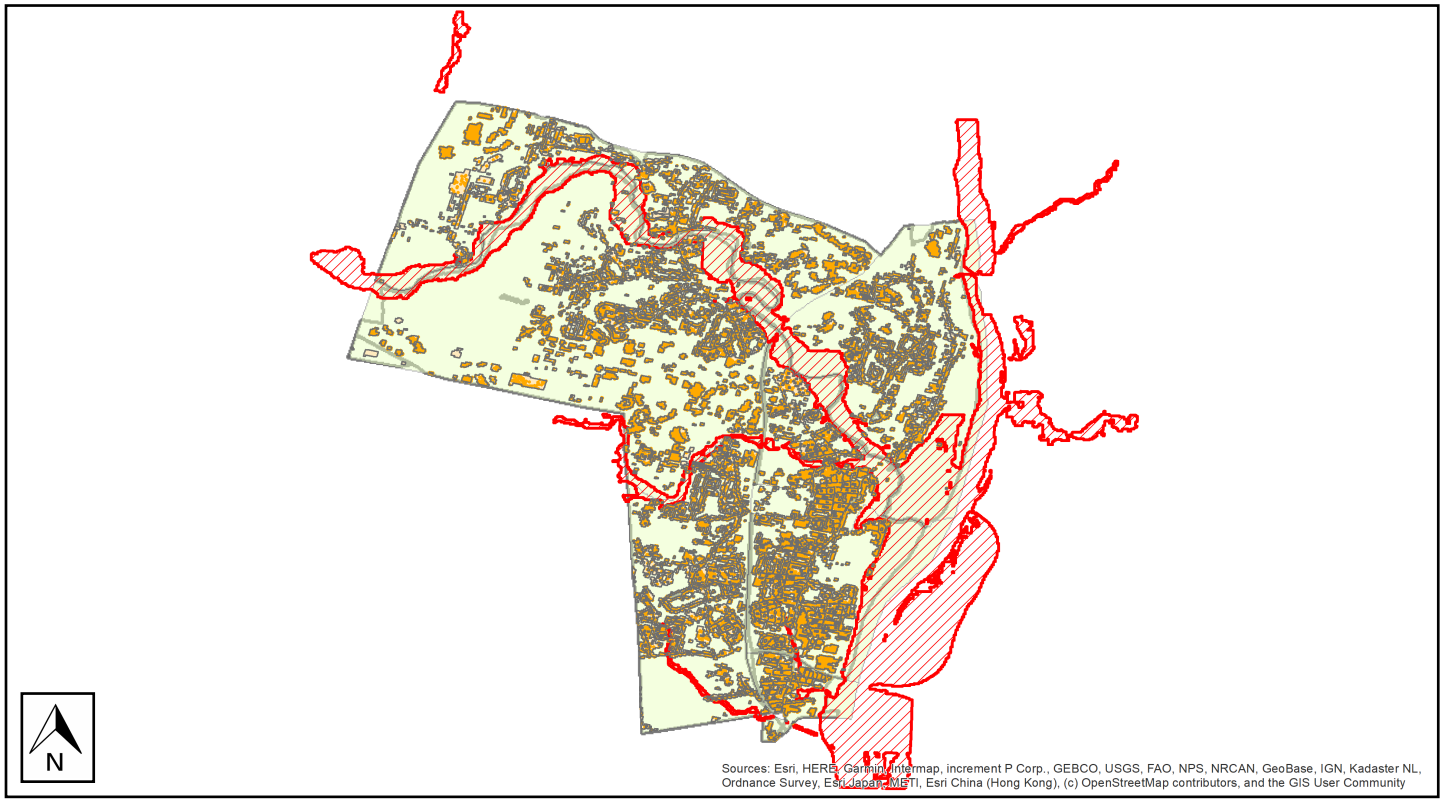
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_FL
Scenario Name:	Windsor_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 18 buildings will be at least moderately damaged. This is over 57% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

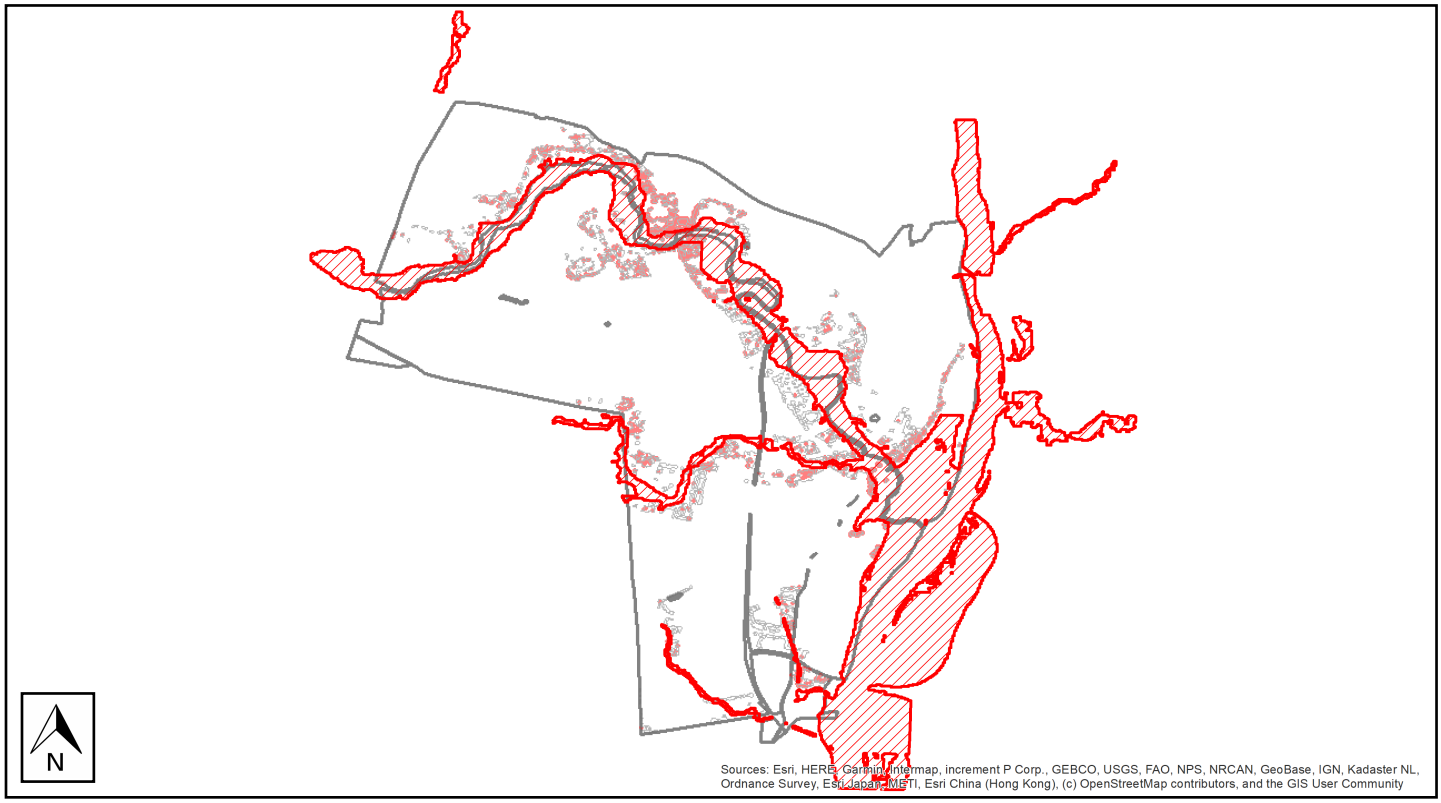


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	3	75	1	25	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	3	18	6	35	3	18	3	18	1	6	1	6
Total	**3**		**6**		**3**		**6**		**2**		**1**	

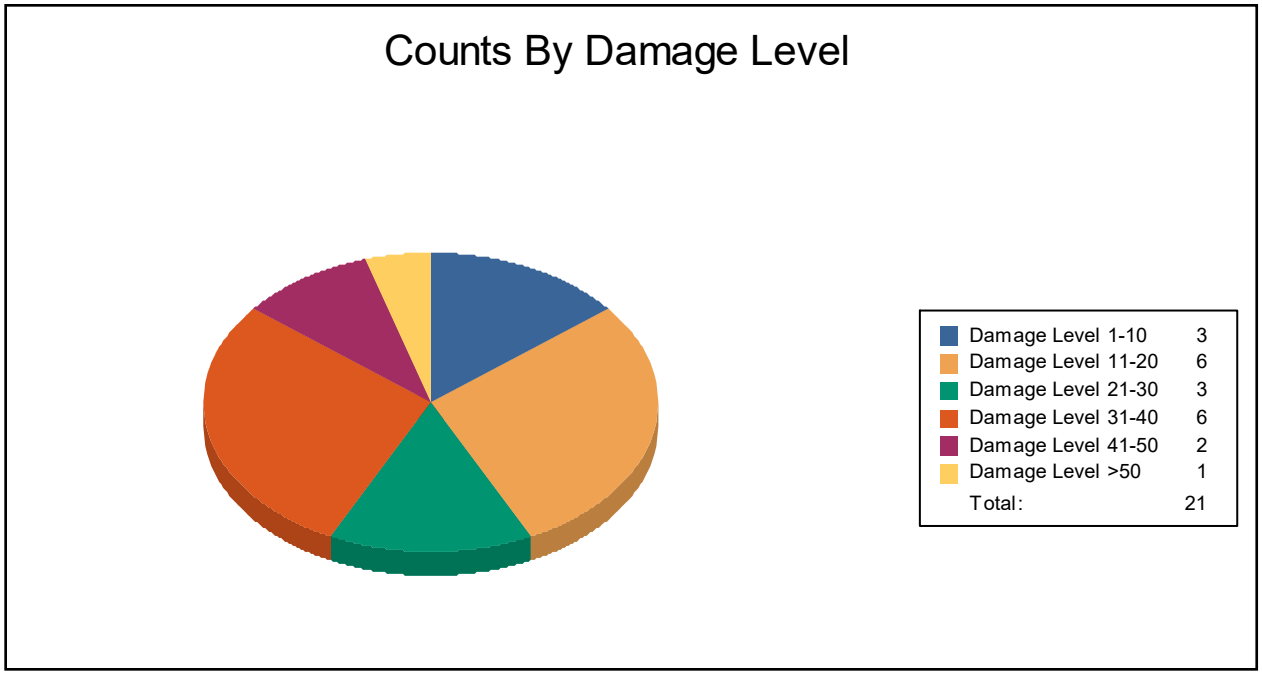


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	1	100	0	0	0	0
Steel	0	0	0	0	0	0	1	100	0	0	0	0
Wood	3	17	6	33	3	17	4	22	1	6	1	6

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

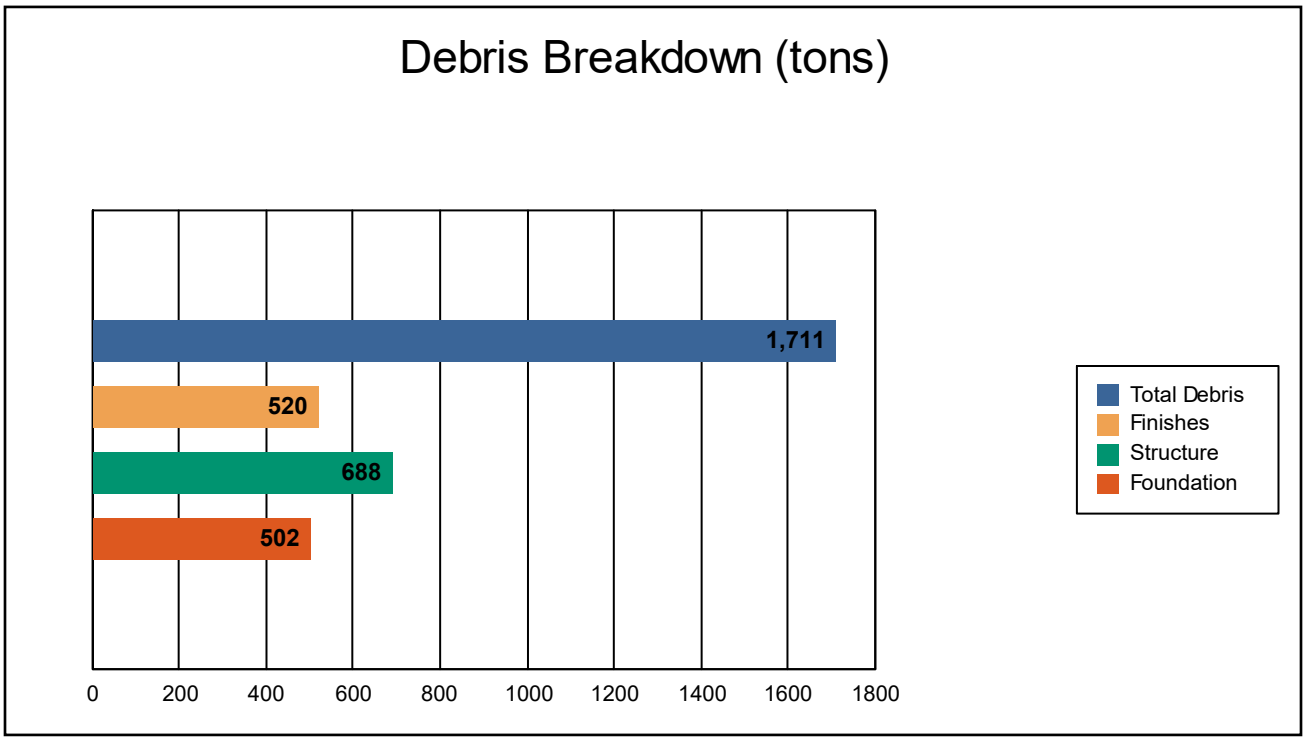
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

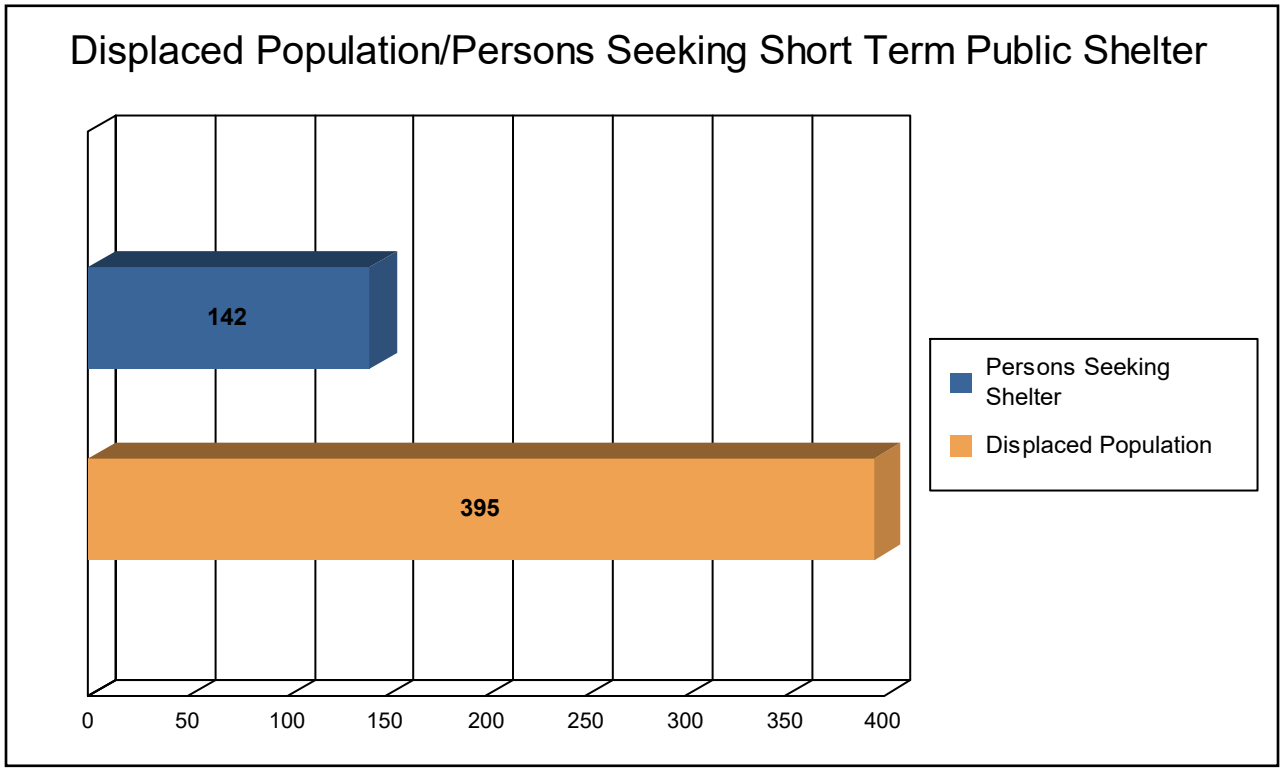


The model estimates that a total of 1,711 tons of debris will be generated. Of the total amount, Finishes comprises 30% of the total, Structure comprises 40% of the total, and Foundation comprises 29%. If the debris tonnage is converted into an estimated number of truckloads, it will require 69 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 132 households (or 395 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 142 people (out of a total population of 29,433) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 68.01 million dollars, which represents 5.43 % of the total replacement value of the scenario buildings.

Building-Related Losses

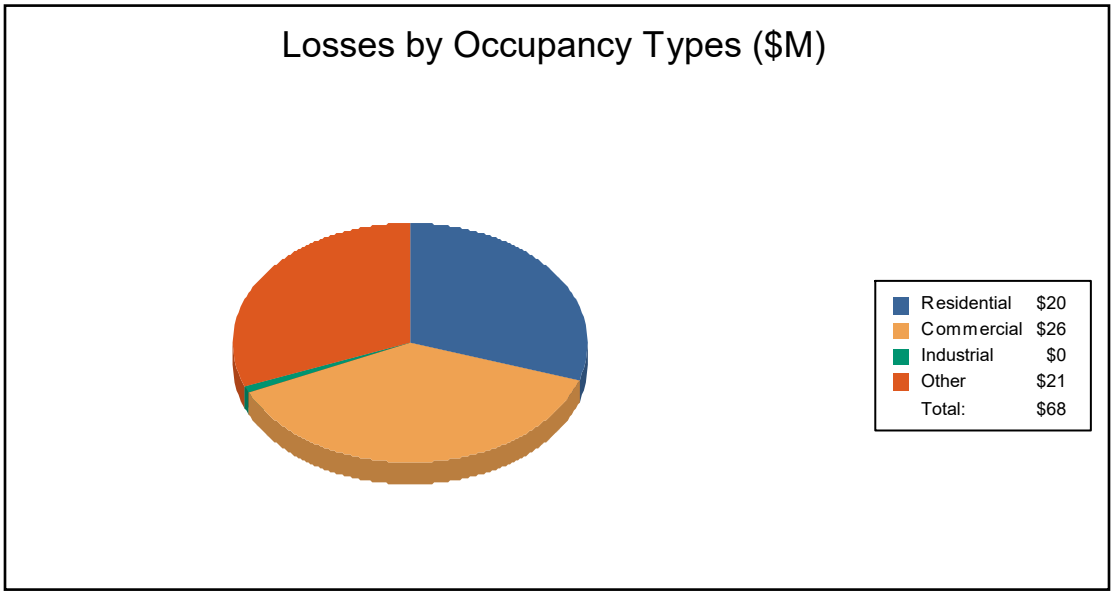
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 36.33 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 30.04% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	11.89	3.60	0.16	1.08	16.73
	Content	5.32	8.29	0.29	4.94	18.84
	Inventory	0.00	0.73	0.03	0.00	0.76
	Subtotal	**17.21**	**12.62**	**0.48**	**6.03**	**36.33**
Business Interruption						
	Income	0.00	5.30	0.00	1.18	6.48
	Relocation	2.35	0.96	0.00	0.82	4.14
	Rental Income	0.86	0.74	0.00	0.23	1.83
	Wage	0.00	6.29	0.01	12.93	19.23
	Subtotal	**3.22**	**13.29**	**0.01**	**15.16**	**31.67**
ALL	**Total**	**20.43**	**25.91**	**0.49**	**21.19**	**68.01**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	29,433	3,063,483	2,465,529	5,529,012
Total	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**
Total Study Region	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**

Hazus: Flood Global Risk Report

Region Name: Windsor_FL

Flood Scenario: Windsor_Flood

Print Date: Monday, April 24, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 8 square miles and contains 359 census blocks. The region contains over 12 thousand households and has a total population of 29,433 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,744 buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90.32% of the buildings (and 55.41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of 5,529 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,063,483	55.4%
Commercial	1,193,937	21.6%
Industrial	701,684	12.7%
Agricultural	19,615	0.4%
Religion	164,813	3.0%
Government	125,212	2.3%
Education	260,268	4.7%
Total	**5,529,012**	**100%**

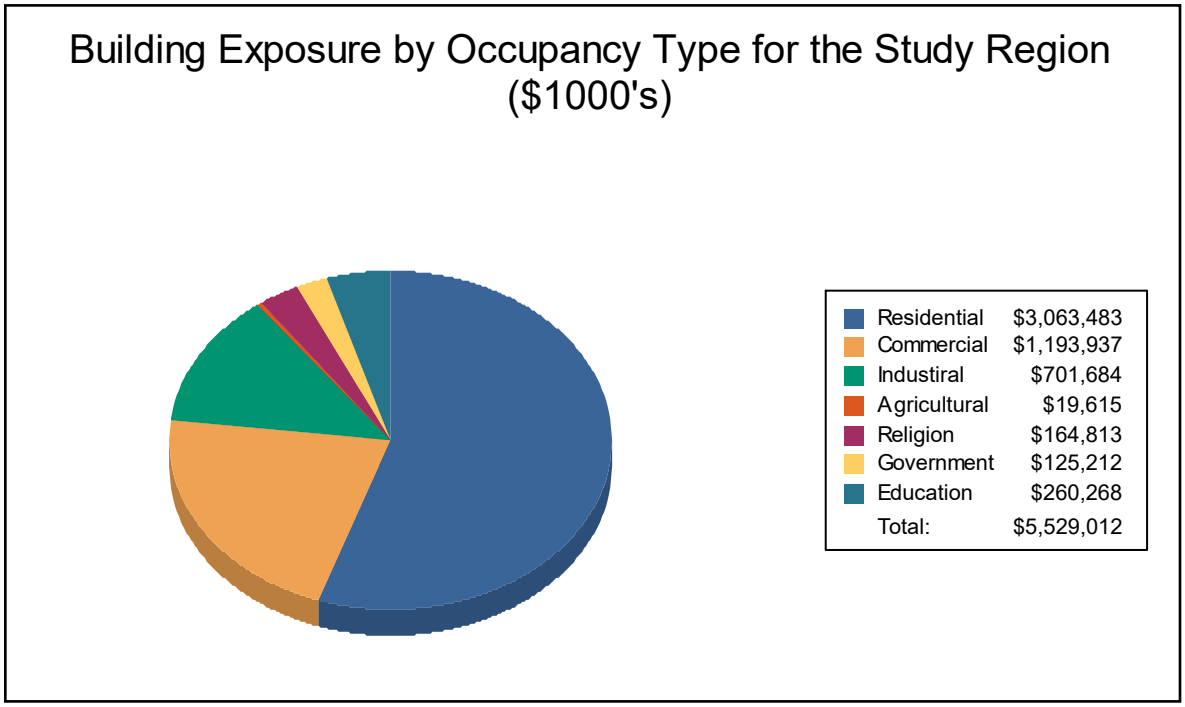
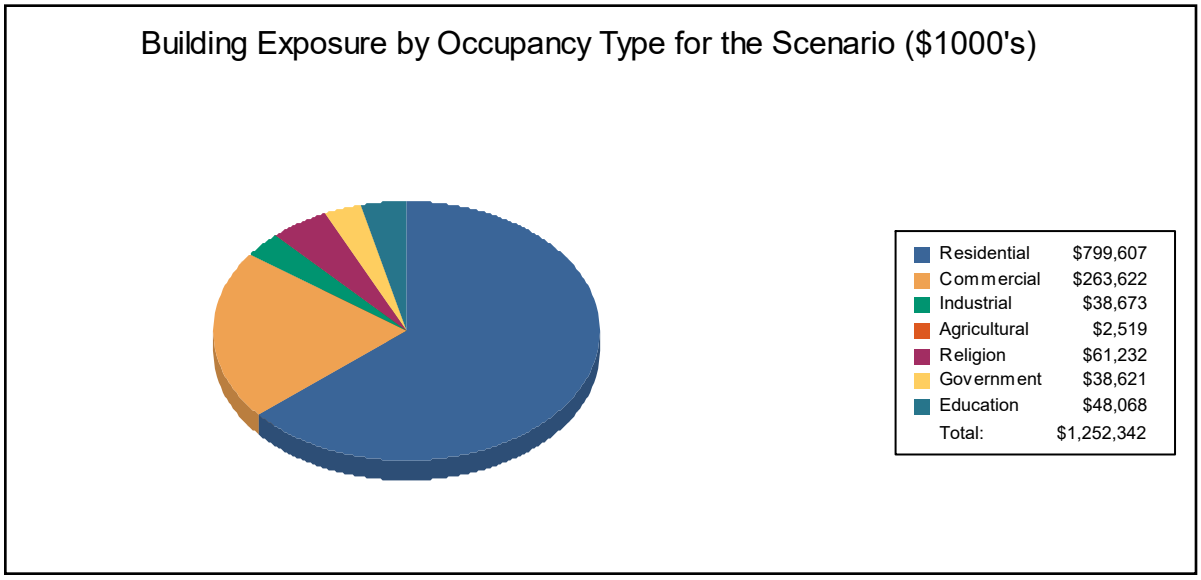


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	799,607	63.8%
Commercial	263,622	21.1%
Industrial	38,673	3.1%
Agricultural	2,519	0.2%
Religion	61,232	4.9%
Government	38,621	3.1%
Education	48,068	3.8%
Total	**1,252,342**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 11 schools, 4 fire stations, 1 police station and 1 emergency operation center.

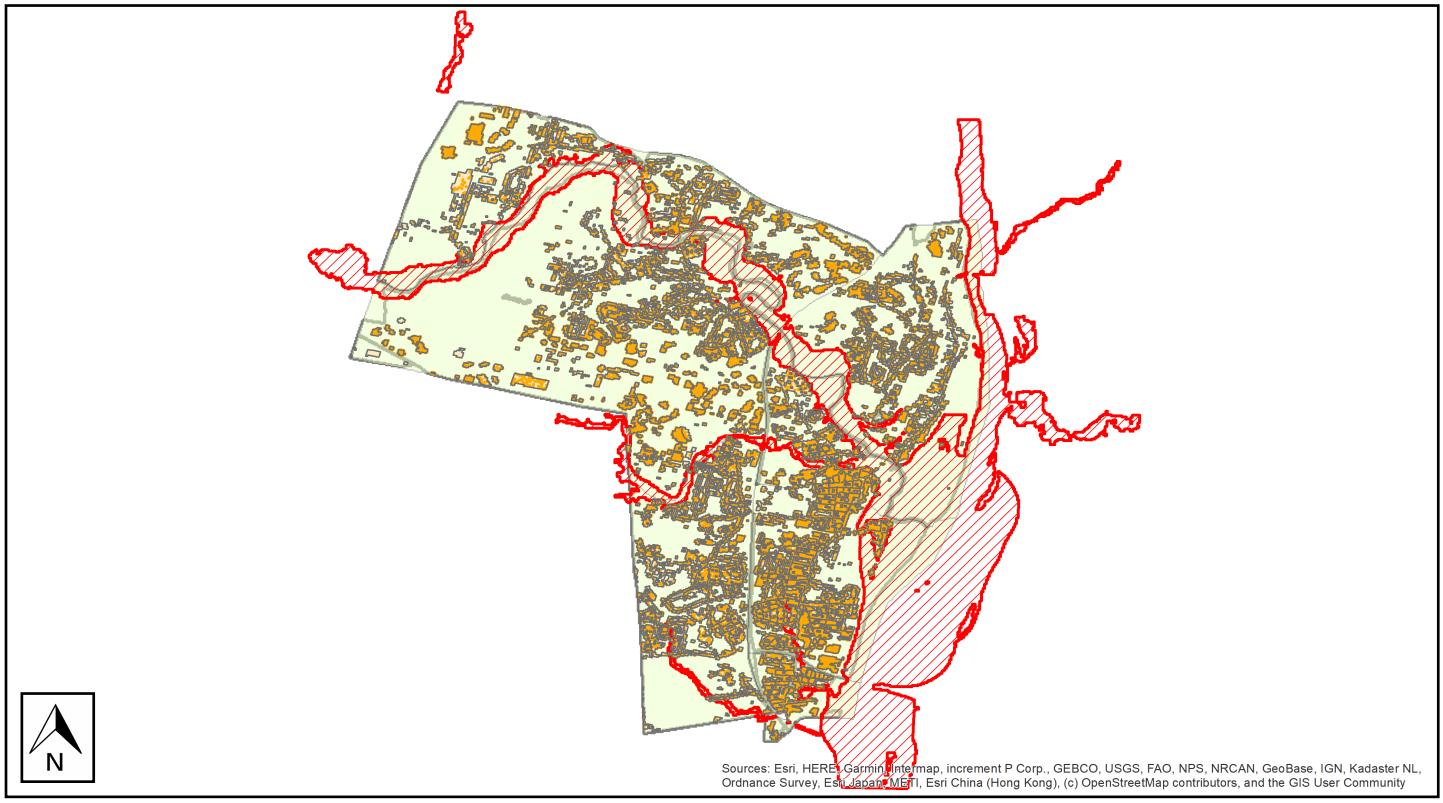
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_FL
Scenario Name:	Windsor_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 33 buildings will be at least moderately damaged. This is over 49% of the total number of buildings in the scenario. There are an estimated 18 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

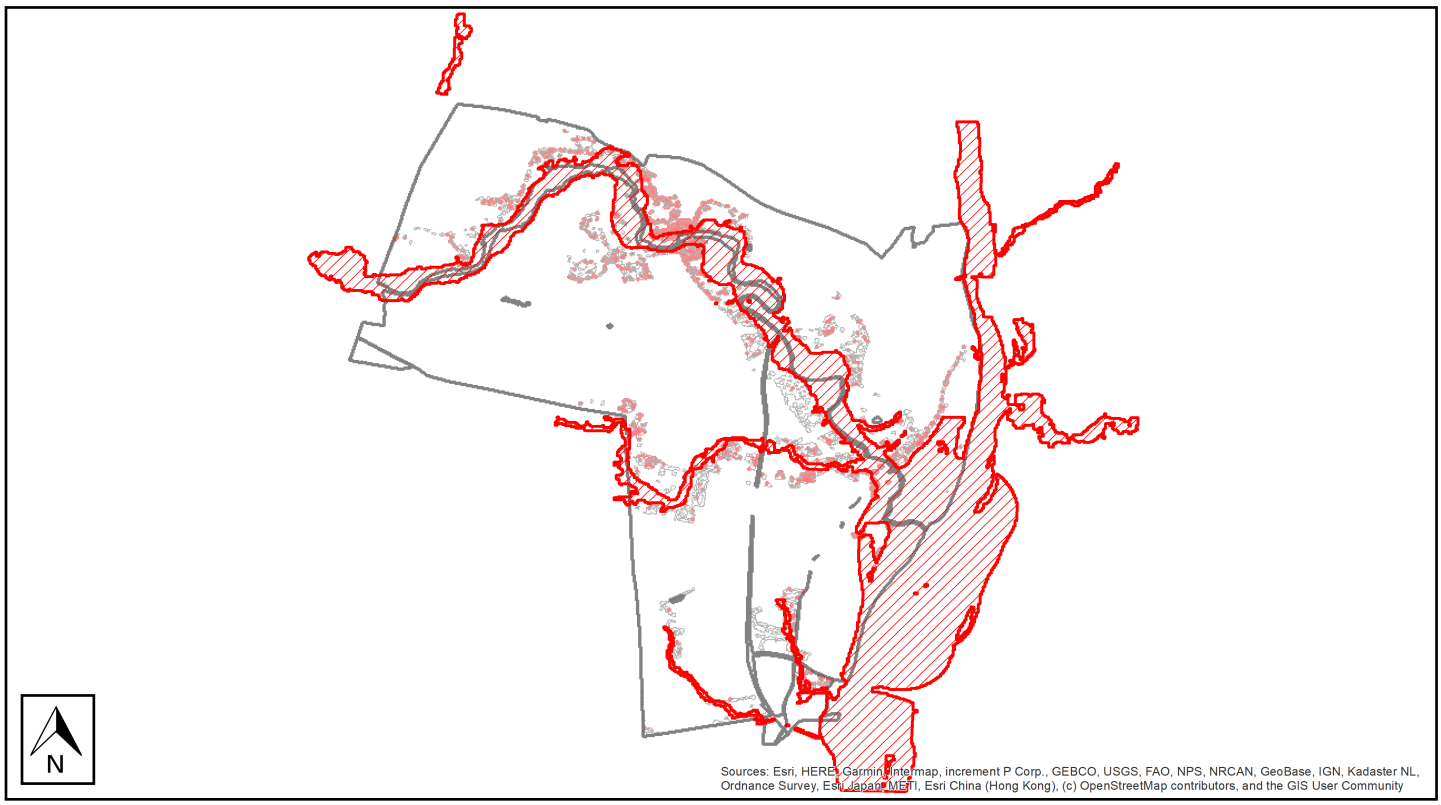


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	4	100
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	9	24	10	26	2	5	2	5	1	3	14	37
Total	**9**		**10**		**2**		**2**		**1**		**18**	

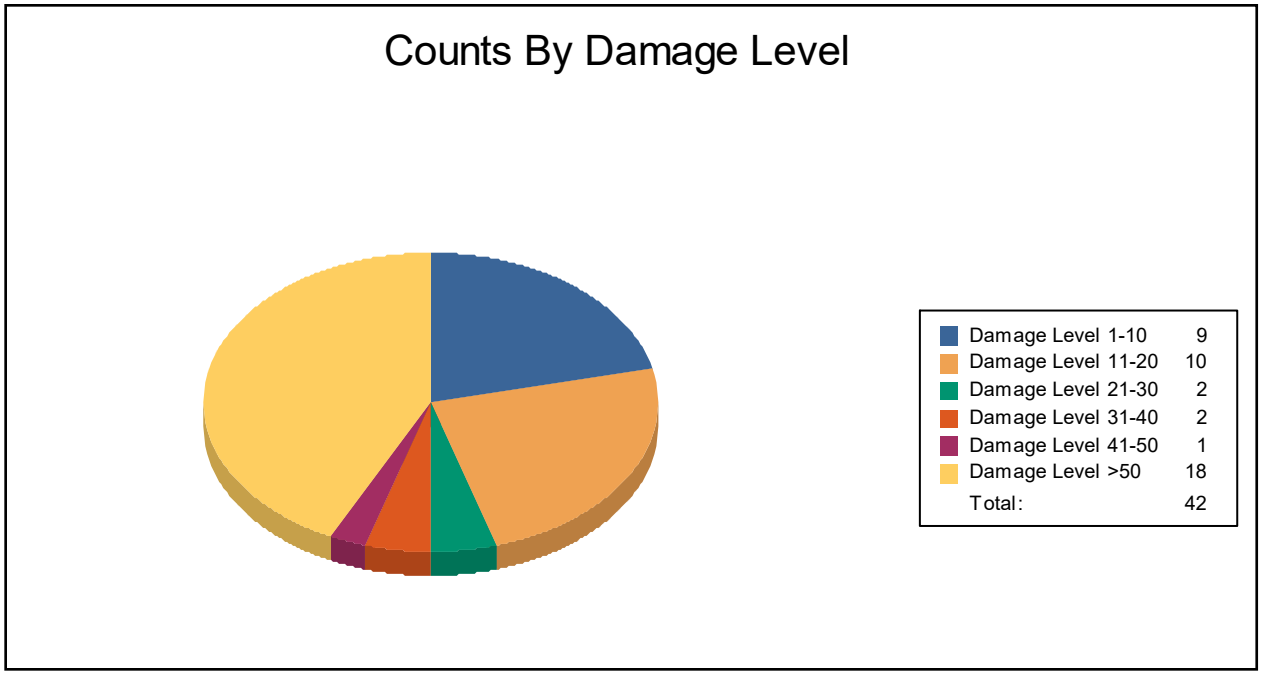


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	2	100
Steel	0	0	0	0	0	0	0	0	0	0	2	100
Wood	9	24	10	26	2	5	2	5	1	3	14	37

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	11	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

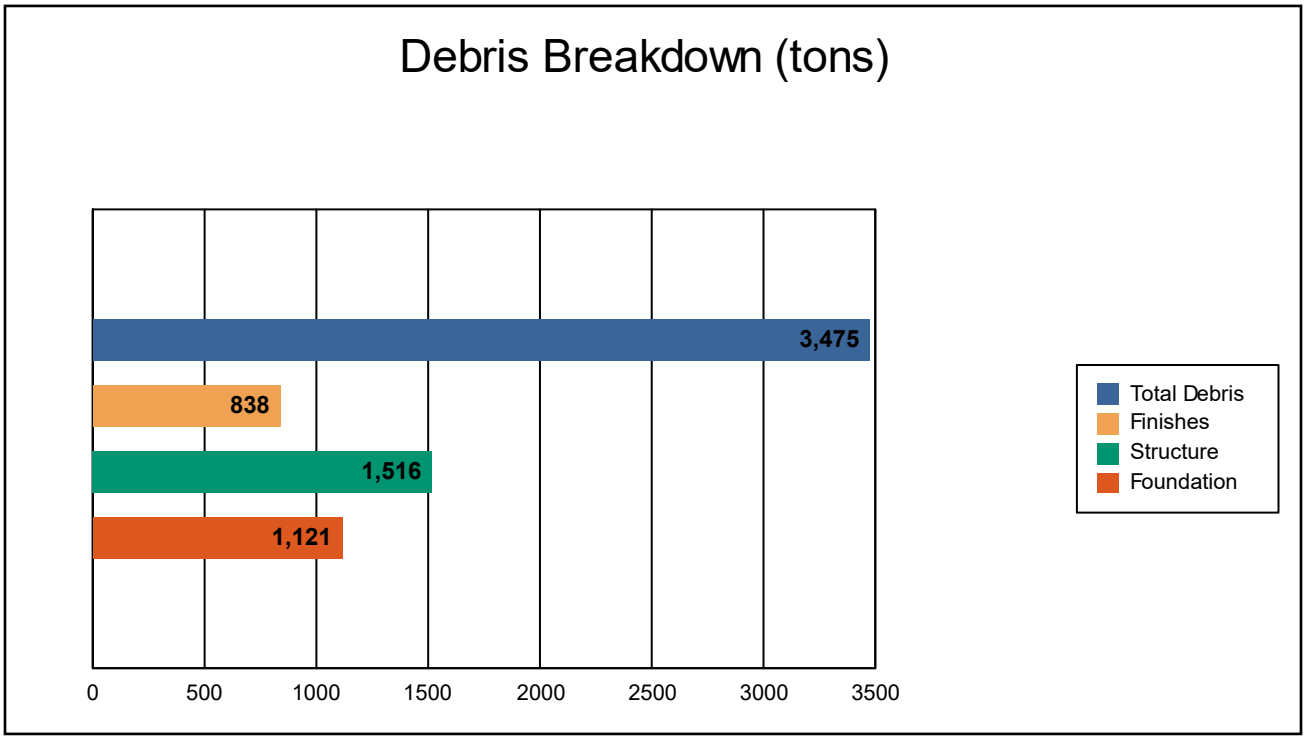
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

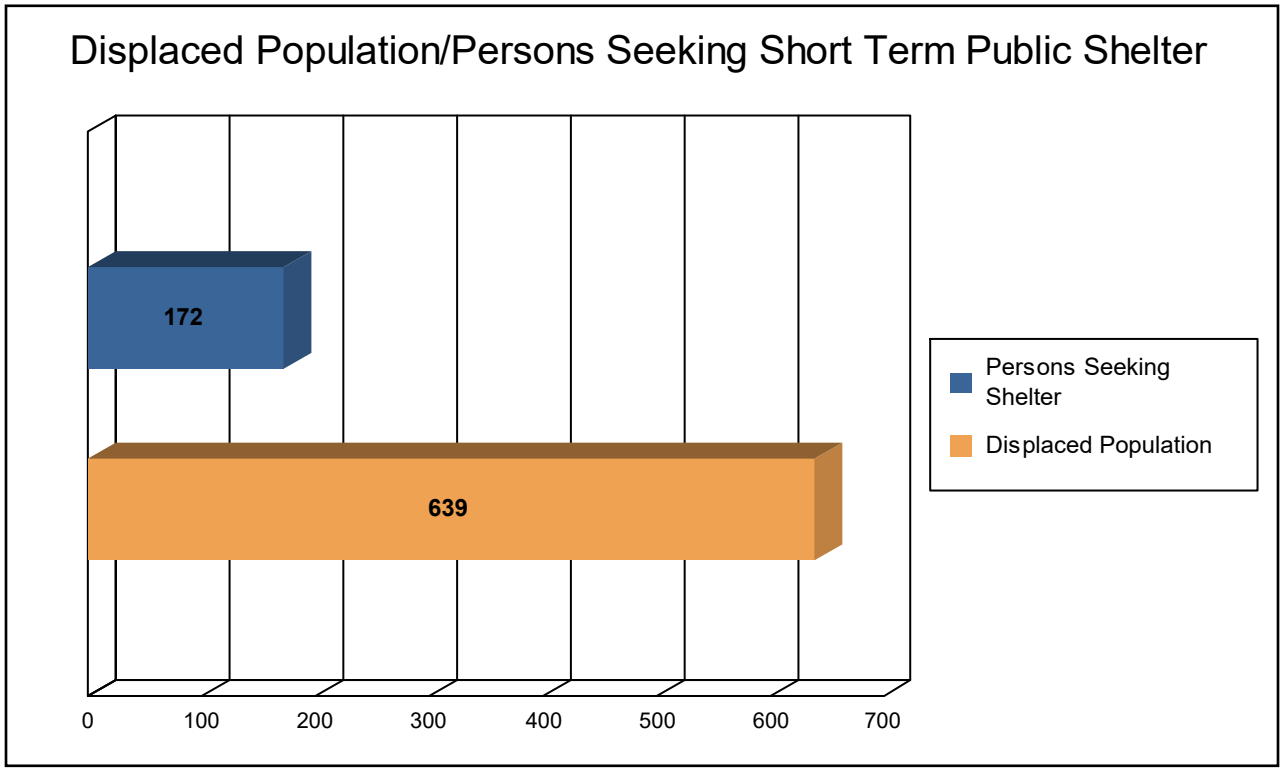


The model estimates that a total of 3,475 tons of debris will be generated. Of the total amount, Finishes comprises 24% of the total, Structure comprises 44% of the total, and Foundation comprises 32%. If the debris tonnage is converted into an estimated number of truckloads, it will require 139 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 213 households (or 639 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 172 people (out of a total population of 29,433) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 106.17 million dollars, which represents 8.48 % of the total replacement value of the scenario buildings.

Building-Related Losses

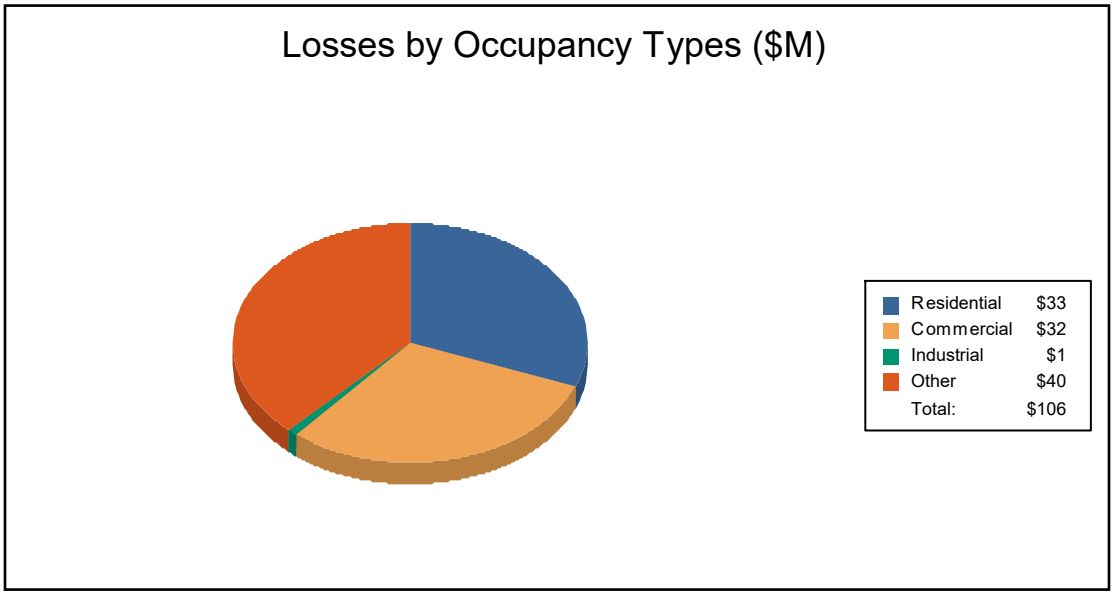
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 57.34 million dollars. 46% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 30.84% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	19.21	5.56	0.33	2.85	27.95
	Content	8.61	9.93	0.60	9.21	28.34
	Inventory	0.00	0.97	0.07	0.01	1.05
	Subtotal	**27.82**	**16.46**	**0.99**	**12.07**	**57.34**
Business Interruption						
	Income	0.00	6.29	0.01	2.31	8.60
	Relocation	3.53	1.09	0.01	1.64	6.27
	Rental Income	1.40	0.84	0.00	0.44	2.67
	Wage	0.00	7.37	0.02	23.90	31.29
	Subtotal	**4.93**	**15.58**	**0.04**	**28.28**	**48.83**
ALL	**Total**	**32.75**	**32.04**	**1.03**	**40.35**	**106.17**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	29,433	3,063,483	2,465,529	5,529,012
Total	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**
Total Study Region	**29,433**	**3,063,483**	**2,465,529**	**5,529,012**

Hazus: Flood Global Risk Report

Region Name: Windsor_Locks_FL

Flood Scenario: Windsor_Locks_Flood

Print Date: Monday, April 24, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 3 square miles and contains 184 census blocks. The region contains over 6 thousand households and has a total population of 12,557 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,784 buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86.48% of the buildings (and 50.27% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,784 buildings in the region which have an aggregate total replacement value of 2,973 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,494,751	50.3%
Commercial	850,300	28.6%
Industrial	334,044	11.2%
Agricultural	3,769	0.1%
Religion	26,168	0.9%
Government	123,716	4.2%
Education	140,421	4.7%
Total	**2,973,169**	**100%**

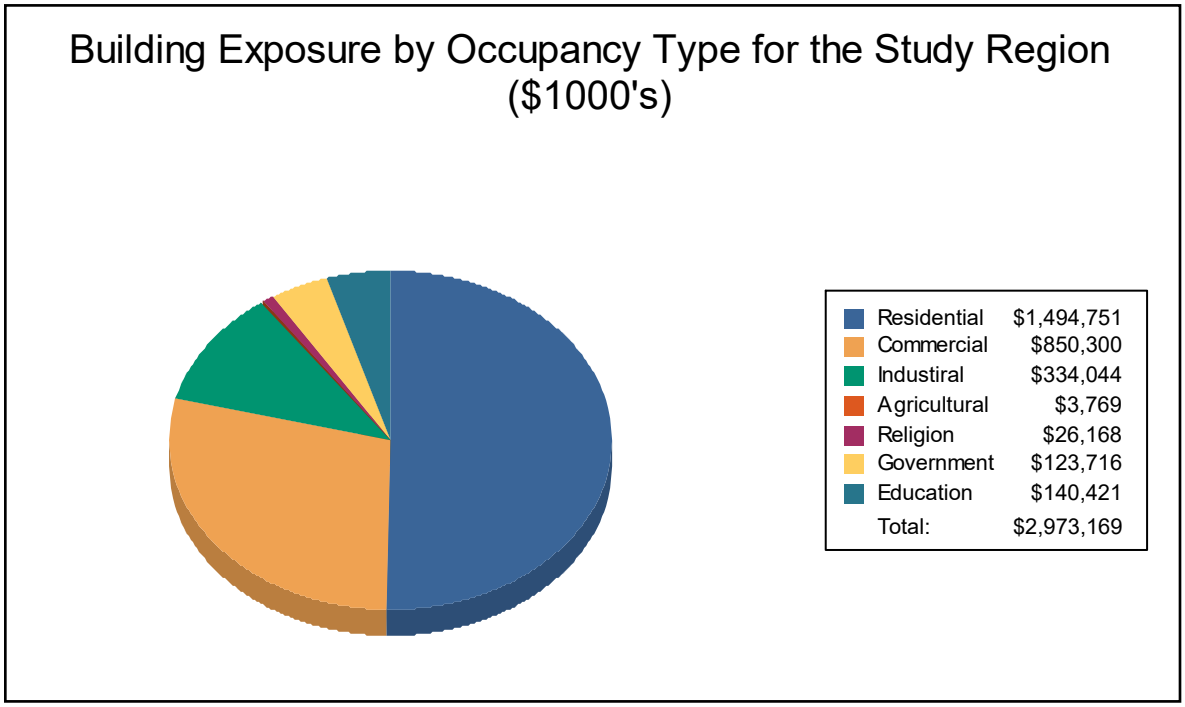
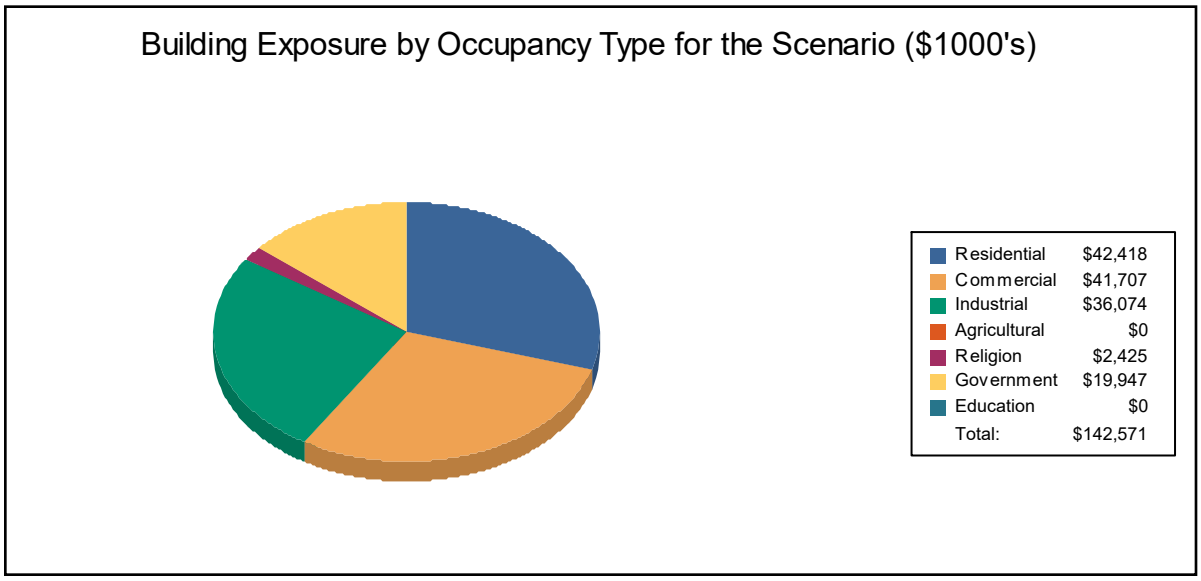


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	42,418	29.8%
Commercial	41,707	29.3%
Industrial	36,074	25.3%
Agricultural	0	0.0%
Religion	2,425	1.7%
Government	19,947	14.0%
Education	0	0.0%
Total	**142,571**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

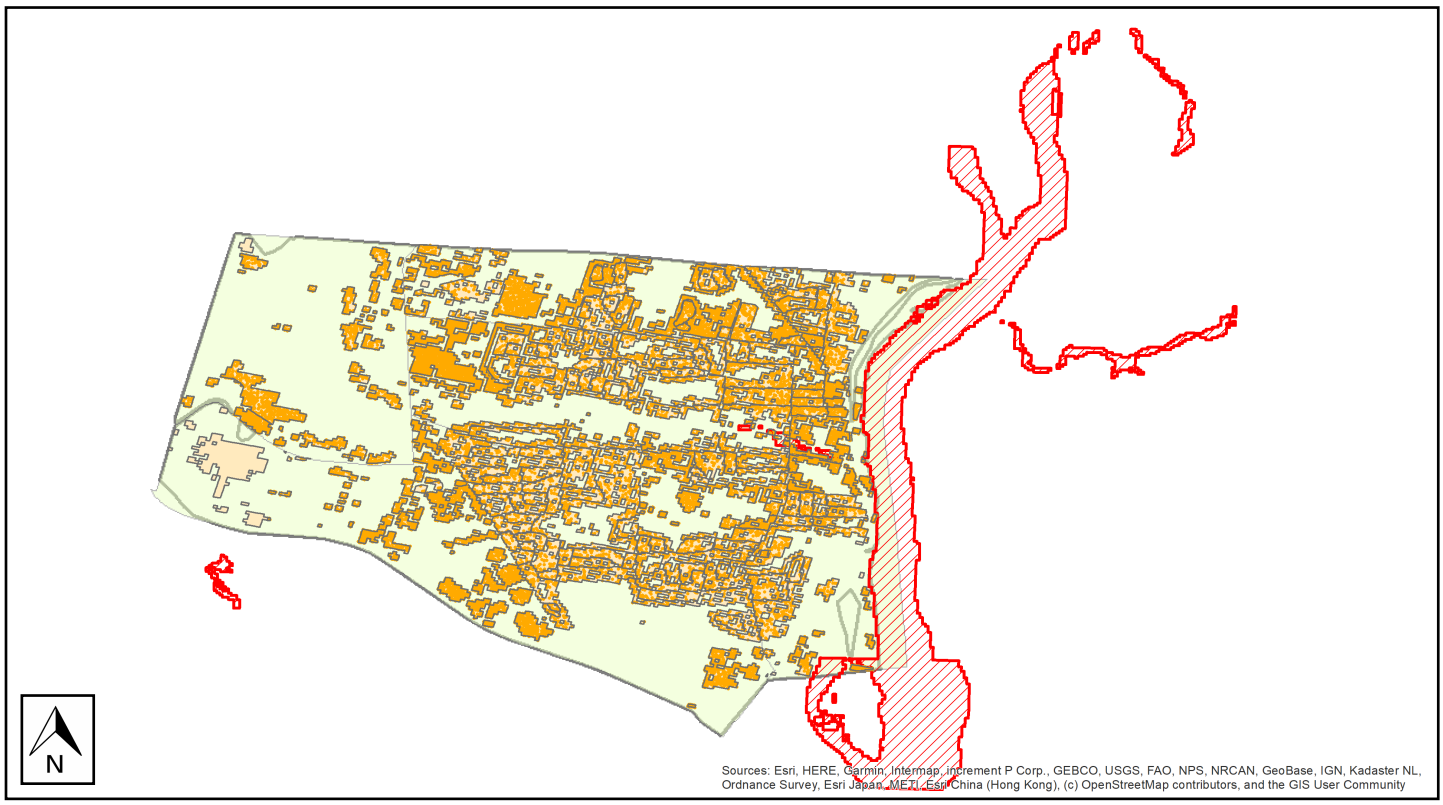
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_Locks_FL
Scenario Name:	Windsor_Locks_Flood
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

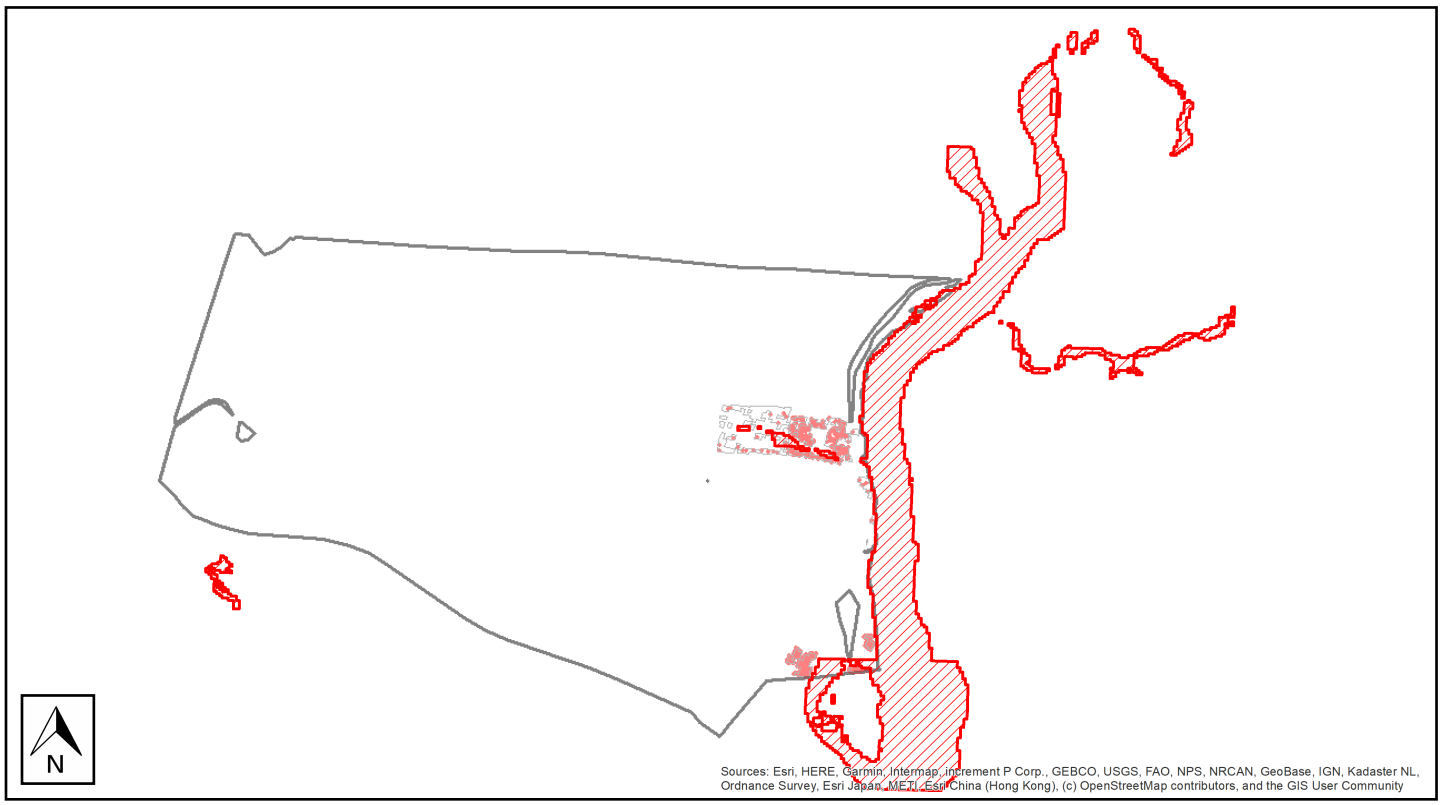


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	1	100	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

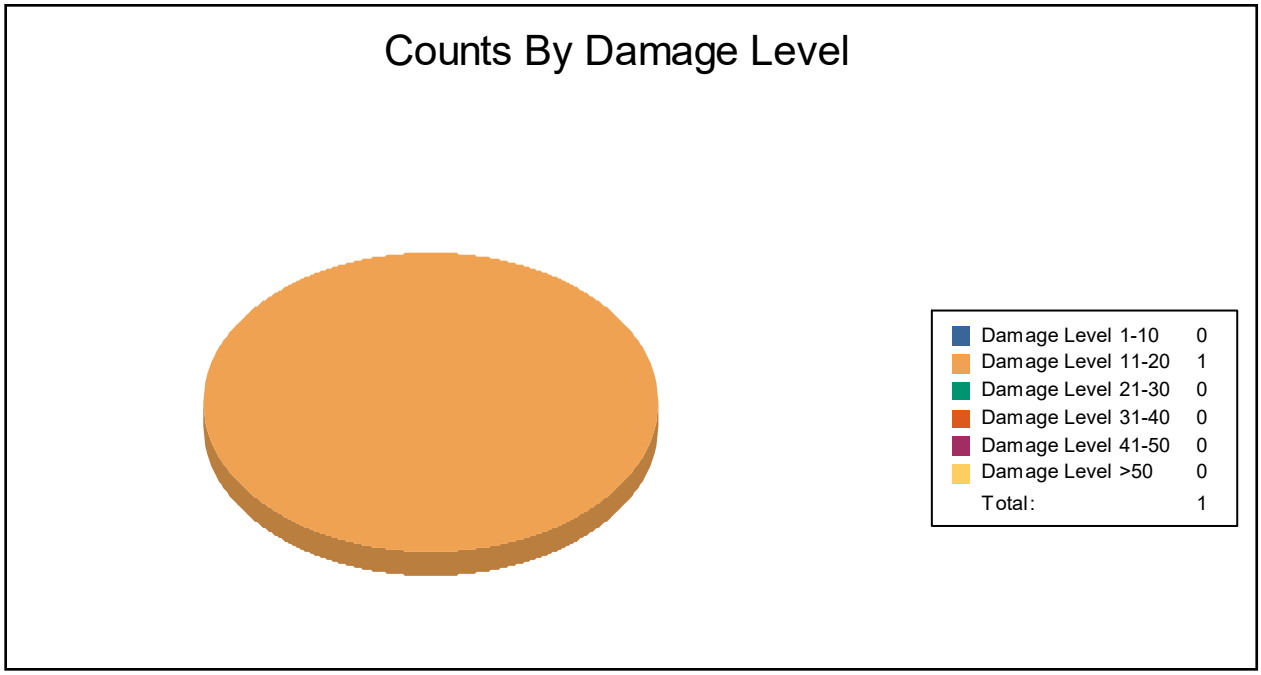


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	1	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	2	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

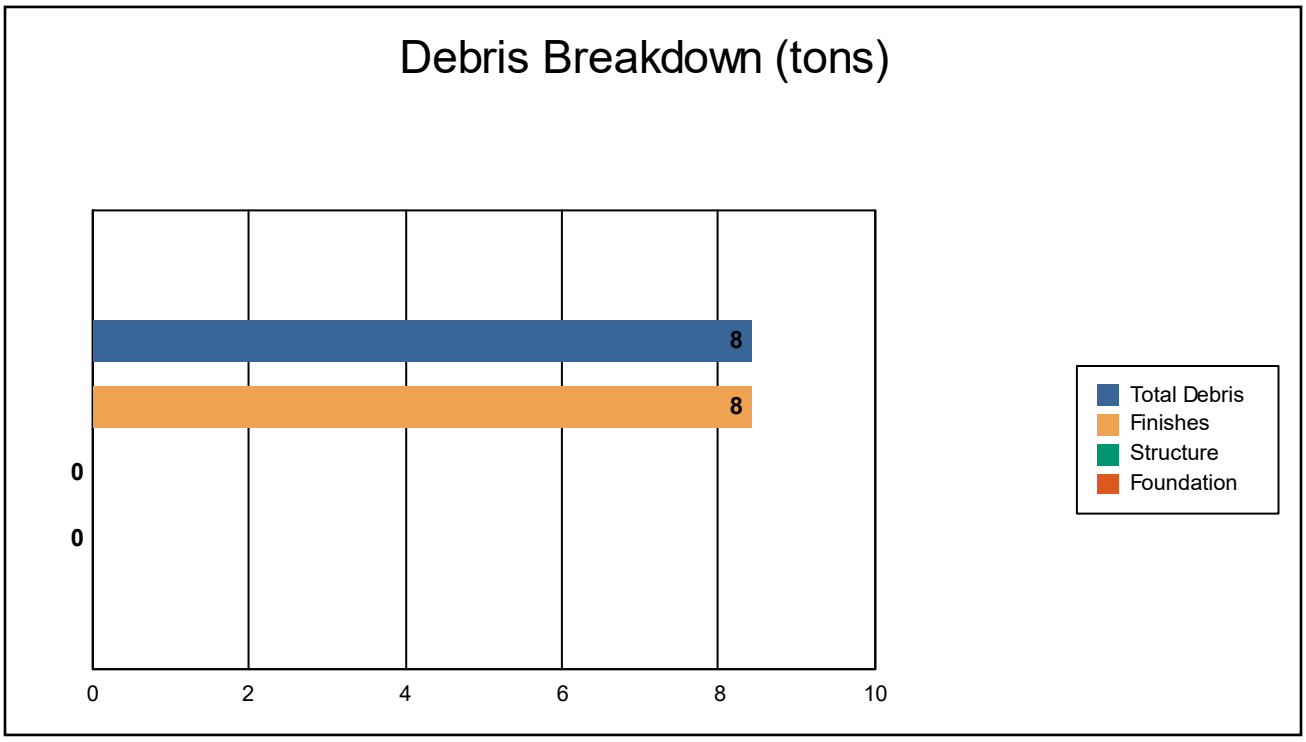
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

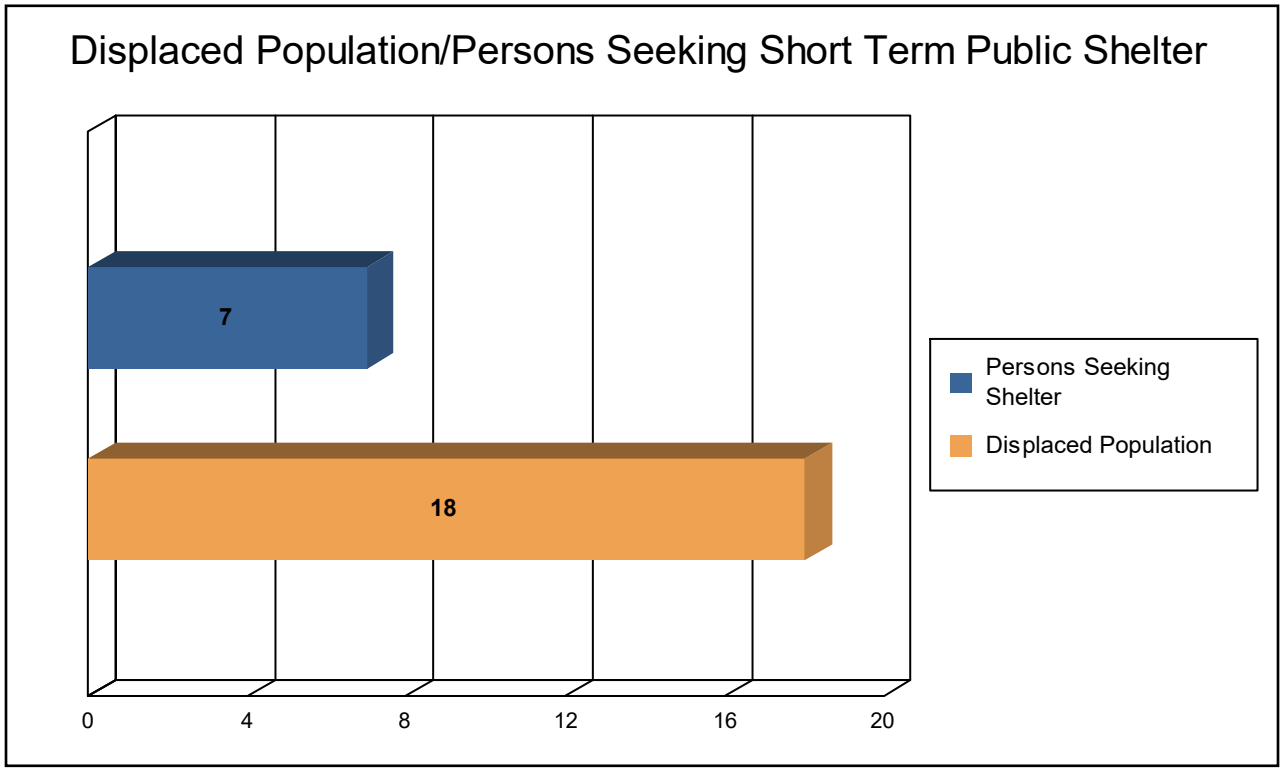


The model estimates that a total of 8 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 6 households (or 18 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 7 people (out of a total population of 12,557) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 2.49 million dollars, which represents 1.74 % of the total replacement value of the scenario buildings.

Building-Related Losses

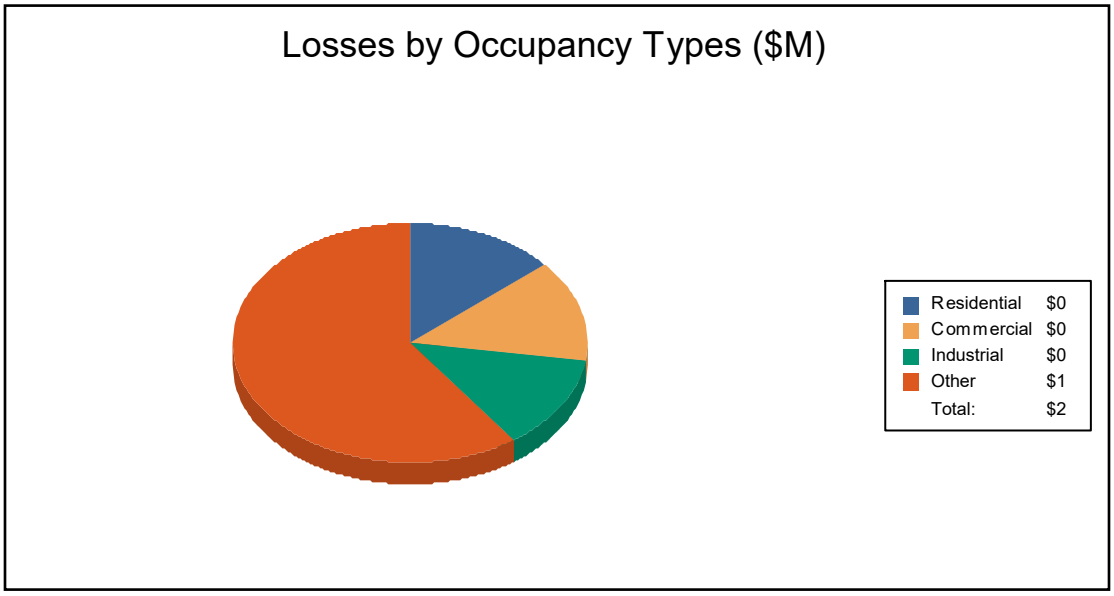
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 0.72 million dollars. 71% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 13.71% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.18	0.02	0.08	0.01	0.28
	Content	0.07	0.07	0.21	0.06	0.40
	Inventory	0.00	0.01	0.02	0.00	0.03
	Subtotal	**0.25**	**0.10**	**0.30**	**0.07**	**0.72**
Business Interruption						
	Income	0.00	0.10	0.00	0.05	0.15
	Relocation	0.07	0.02	0.00	0.05	0.14
	Rental Income	0.02	0.01	0.00	0.02	0.05
	Wage	0.01	0.11	0.00	1.32	1.43
	Subtotal	**0.10**	**0.24**	**0.01**	**1.43**	**1.77**
ALL	**Total**	**0.34**	**0.34**	**0.31**	**1.50**	**2.49**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	12,557	1,494,751	1,478,418	2,973,169
Total	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**
Total Study Region	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**

Hazus: Flood Global Risk Report

Region Name: Windsor_Locks_FL

Flood Scenario: Windsor_Locks_Flood

Print Date: Monday, April 24, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 3 square miles and contains 184 census blocks. The region contains over 6 thousand households and has a total population of 12,557 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,784 buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86.48% of the buildings (and 50.27% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,784 buildings in the region which have an aggregate total replacement value of 2,973 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,494,751	50.3%
Commercial	850,300	28.6%
Industrial	334,044	11.2%
Agricultural	3,769	0.1%
Religion	26,168	0.9%
Government	123,716	4.2%
Education	140,421	4.7%
Total	**2,973,169**	**100%**

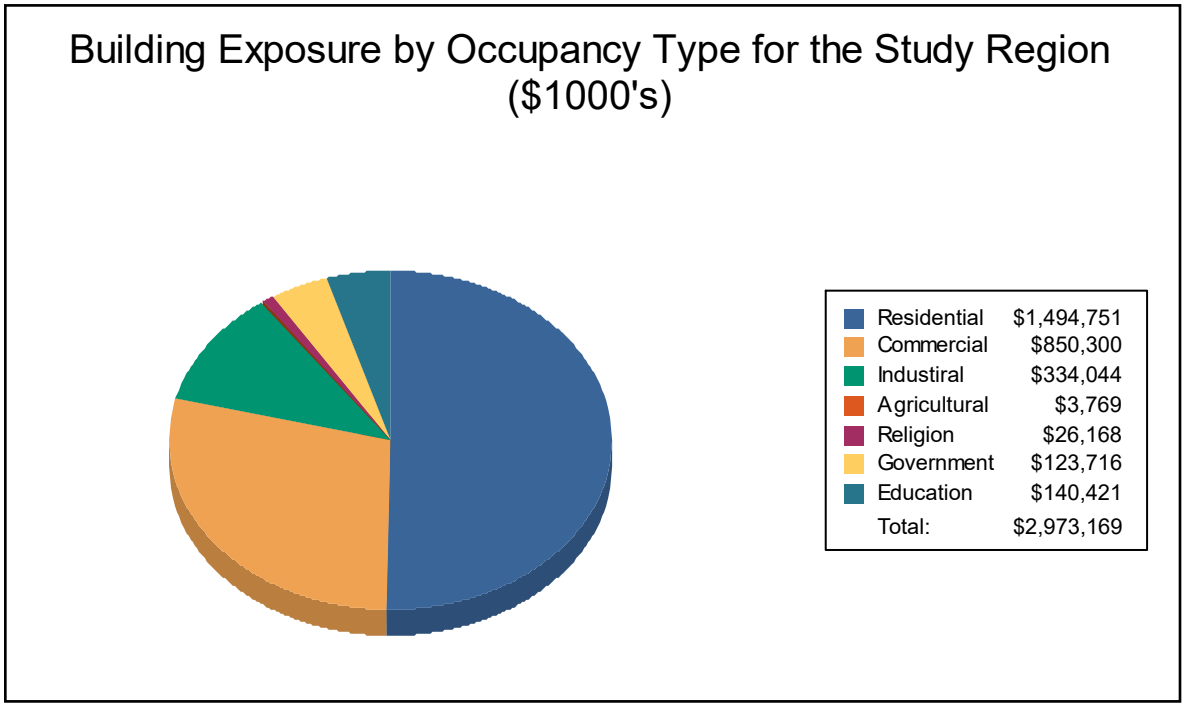
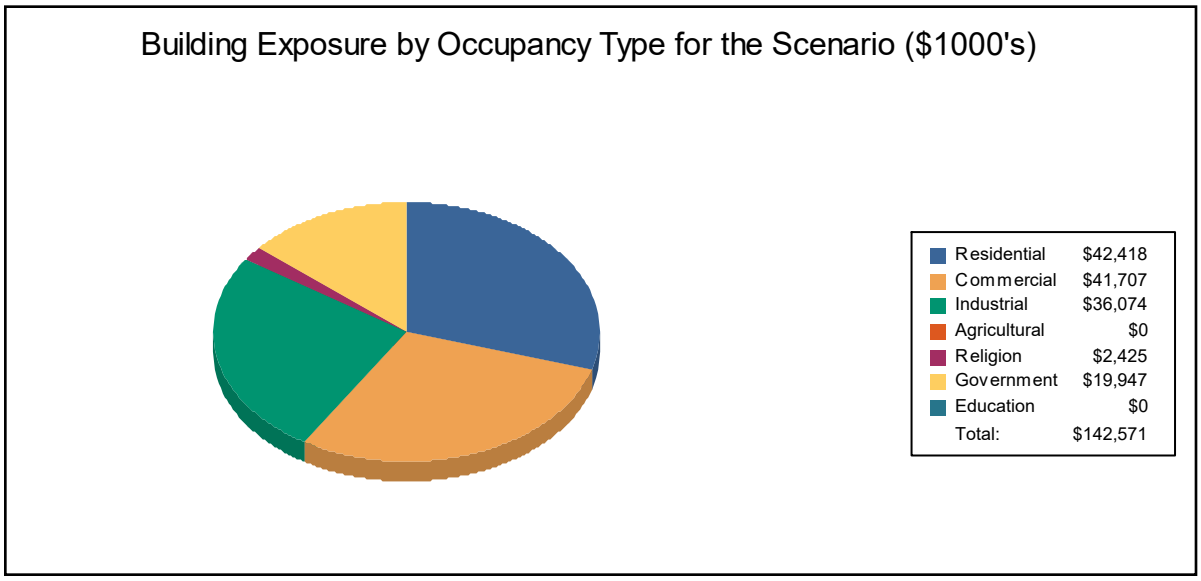


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	42,418	29.8%
Commercial	41,707	29.3%
Industrial	36,074	25.3%
Agricultural	0	0.0%
Religion	2,425	1.7%
Government	19,947	14.0%
Education	0	0.0%
Total	**142,571**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

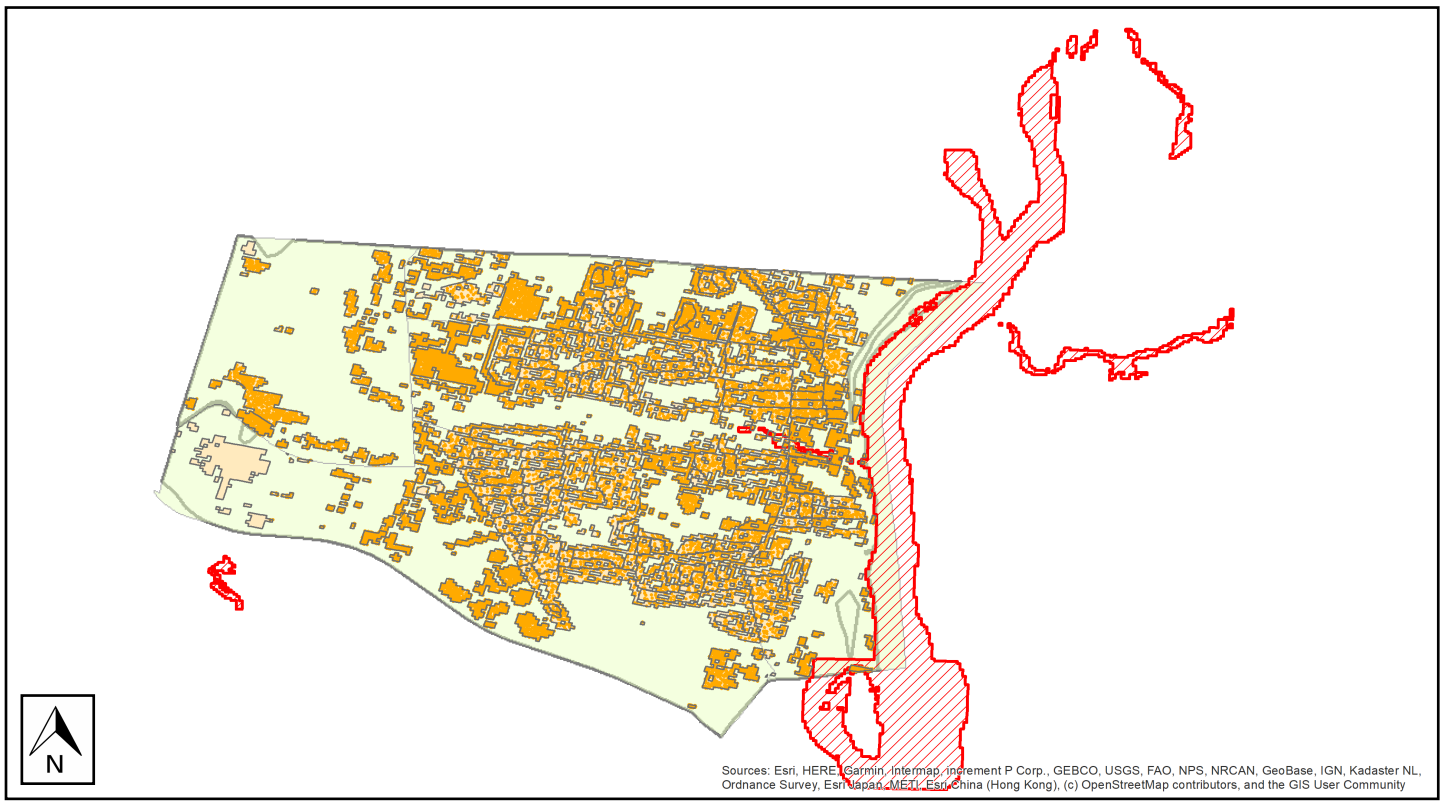
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_Locks_FL
Scenario Name:	Windsor_Locks_Flood
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

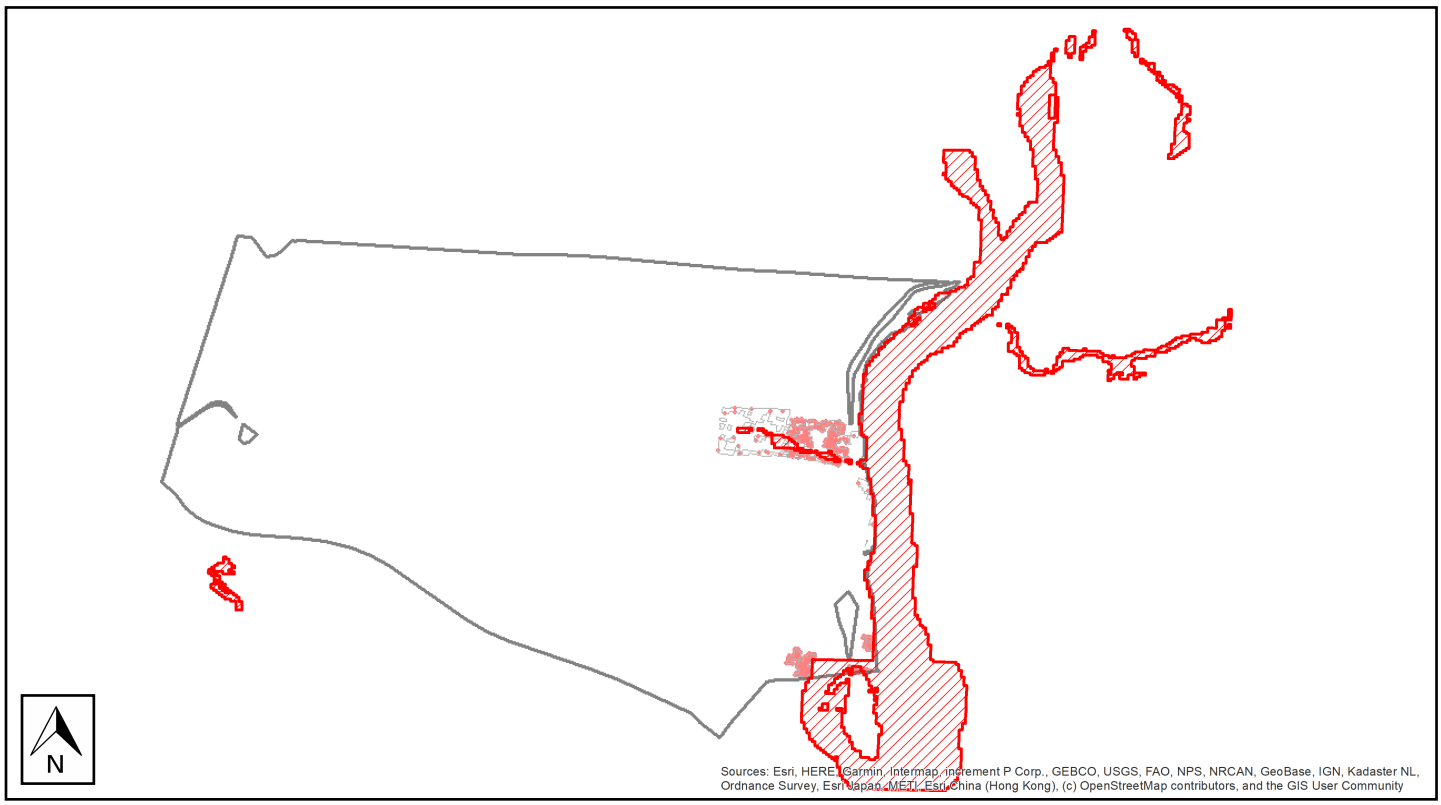


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	1	100	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

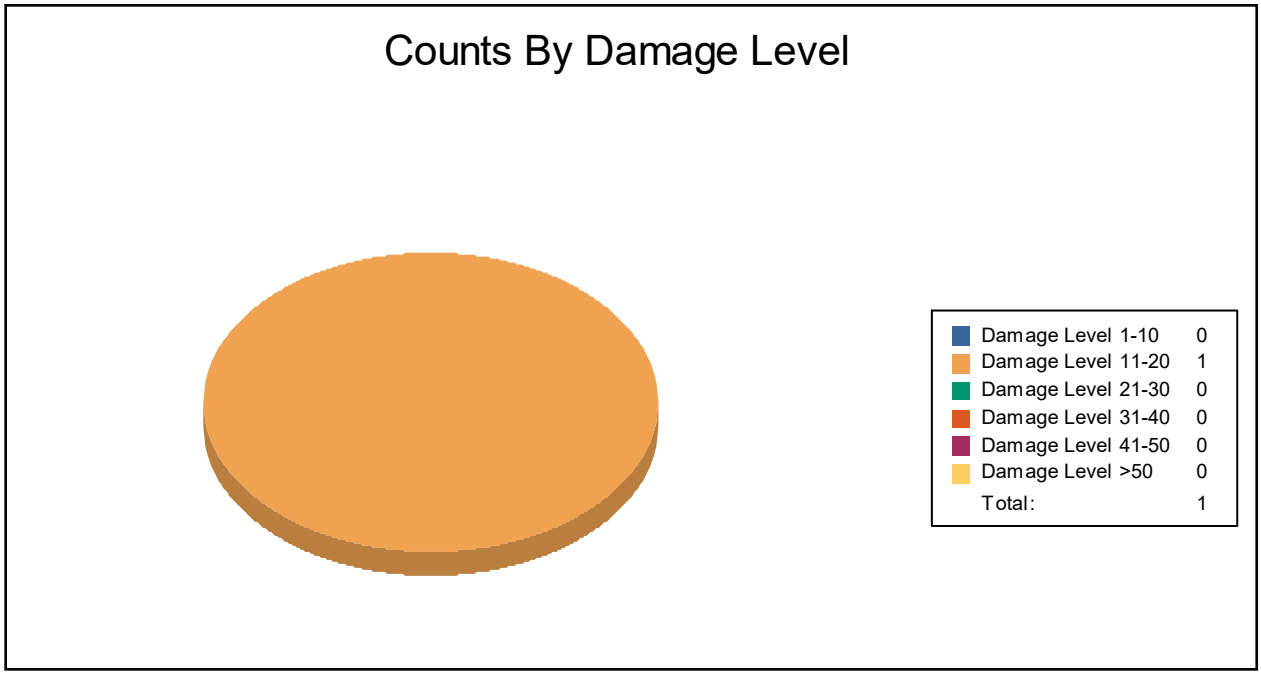


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	1	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	2	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

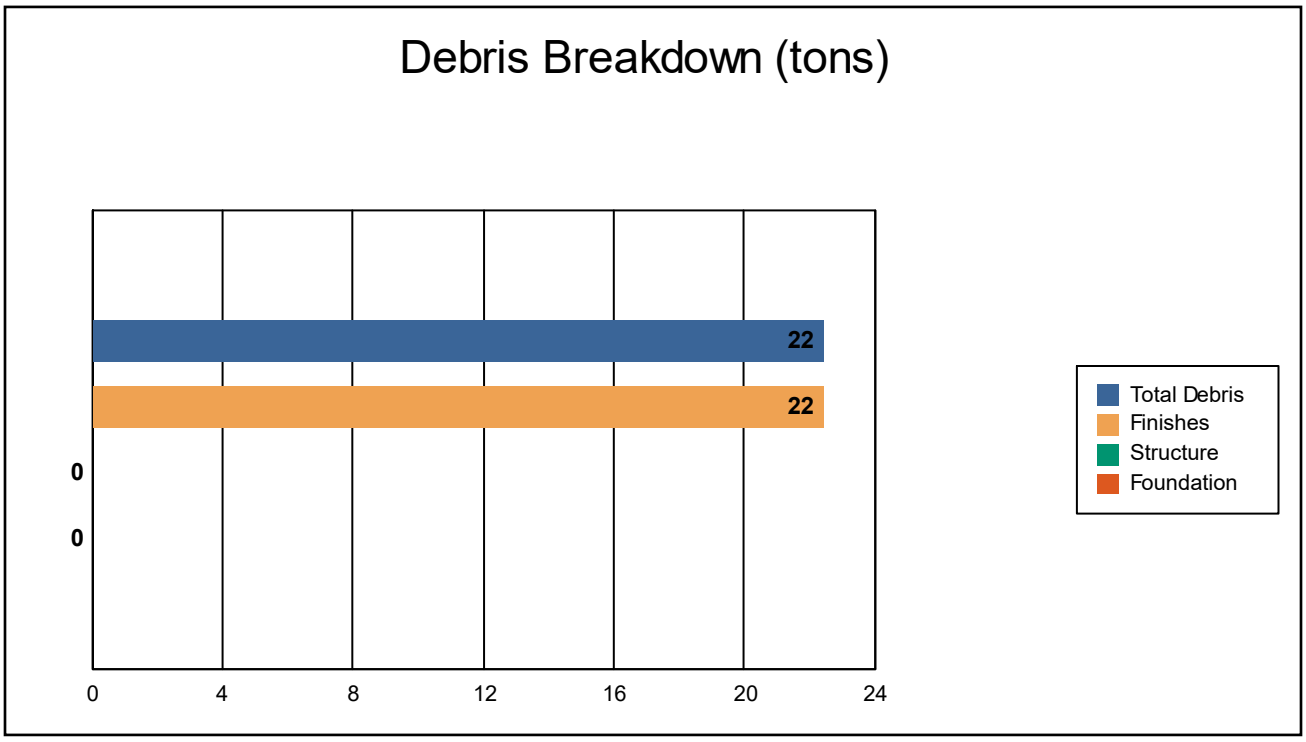
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

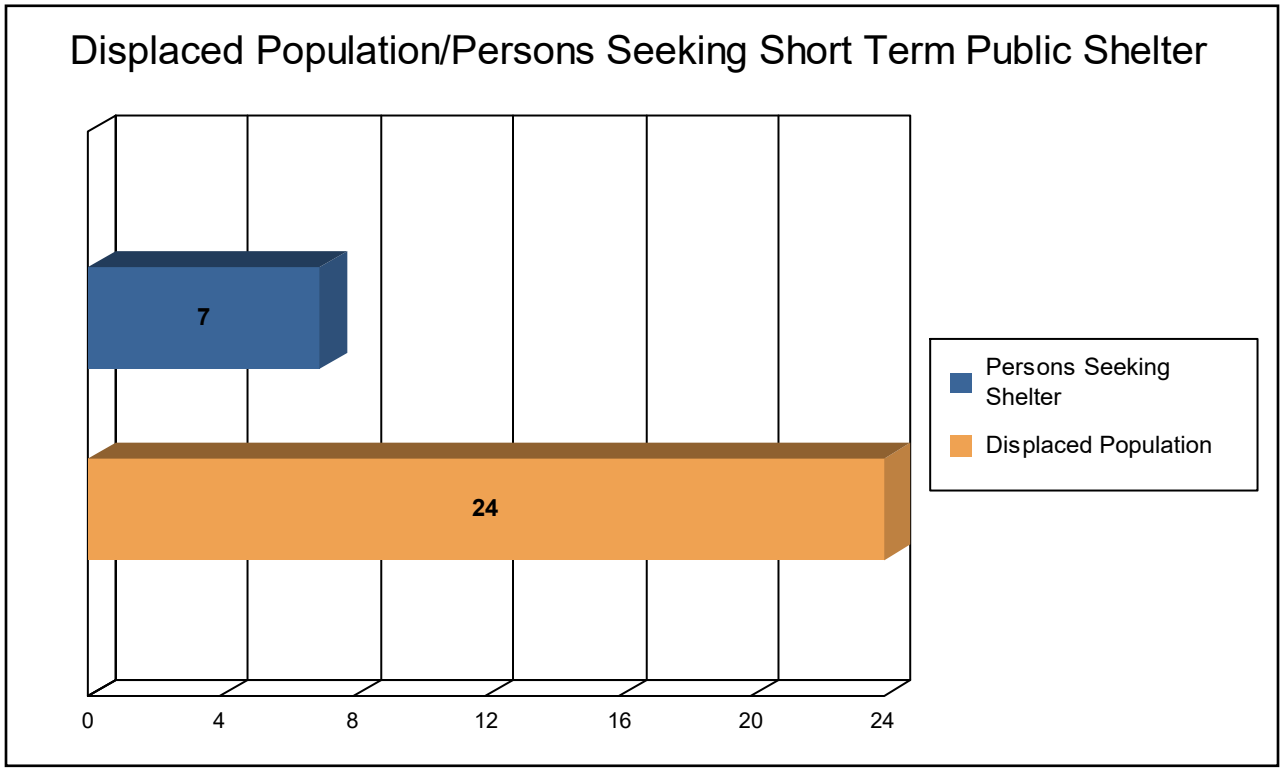


The model estimates that a total of 22 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 8 households (or 24 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 7 people (out of a total population of 12,557) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 5.12 million dollars, which represents 3.59 % of the total replacement value of the scenario buildings.

Building-Related Losses

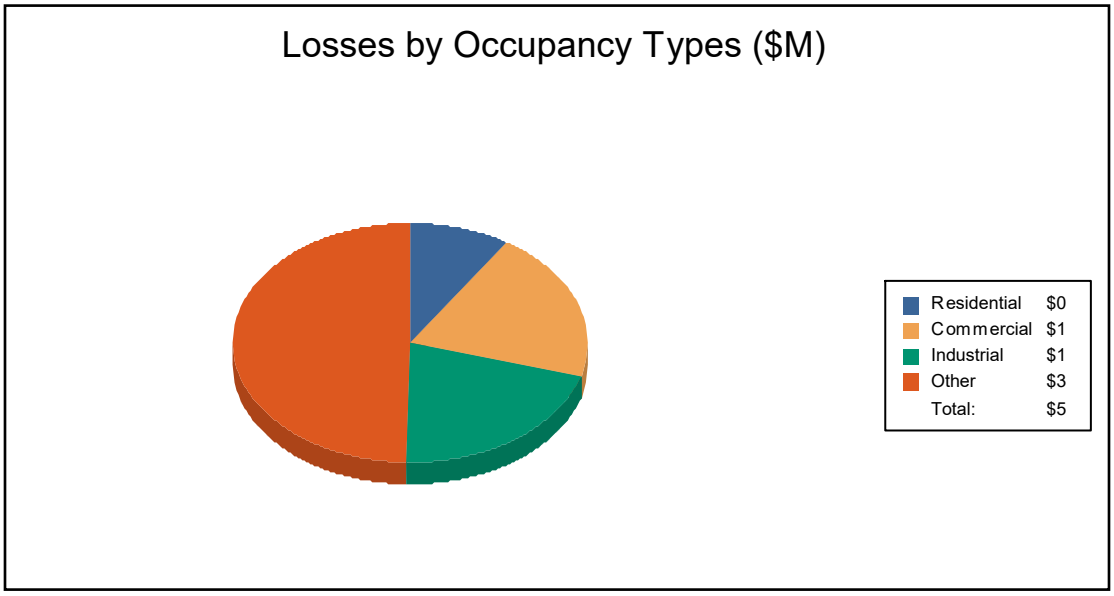
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 1.87 million dollars. 63% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 9.09% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.23	0.08	0.28	0.02	0.61
	Content	0.10	0.26	0.62	0.13	1.11
	Inventory	0.00	0.07	0.09	0.00	0.16
	Subtotal	**0.33**	**0.41**	**0.99**	**0.15**	**1.87**
Business Interruption						
	Income	0.01	0.22	0.02	0.08	0.32
	Relocation	0.09	0.07	0.02	0.09	0.27
	Rental Income	0.03	0.05	0.00	0.04	0.12
	Wage	0.01	0.30	0.03	2.19	2.54
	Subtotal	**0.14**	**0.64**	**0.07**	**2.40**	**3.24**
ALL	**Total**	**0.47**	**1.04**	**1.06**	**2.55**	**5.12**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	12,557	1,494,751	1,478,418	2,973,169
Total	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**
Total Study Region	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**

Hazus: Flood Global Risk Report

Region Name: Windsor_Locks_FL

Flood Scenario: Windsor_Locks_Flood

Print Date: Monday, April 24, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
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The geographical size of the region is approximately 3 square miles and contains 184 census blocks. The region contains over 6 thousand households and has a total population of 12,557 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,784 buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86.48% of the buildings (and 50.27% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,784 buildings in the region which have an aggregate total replacement value of 2,973 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

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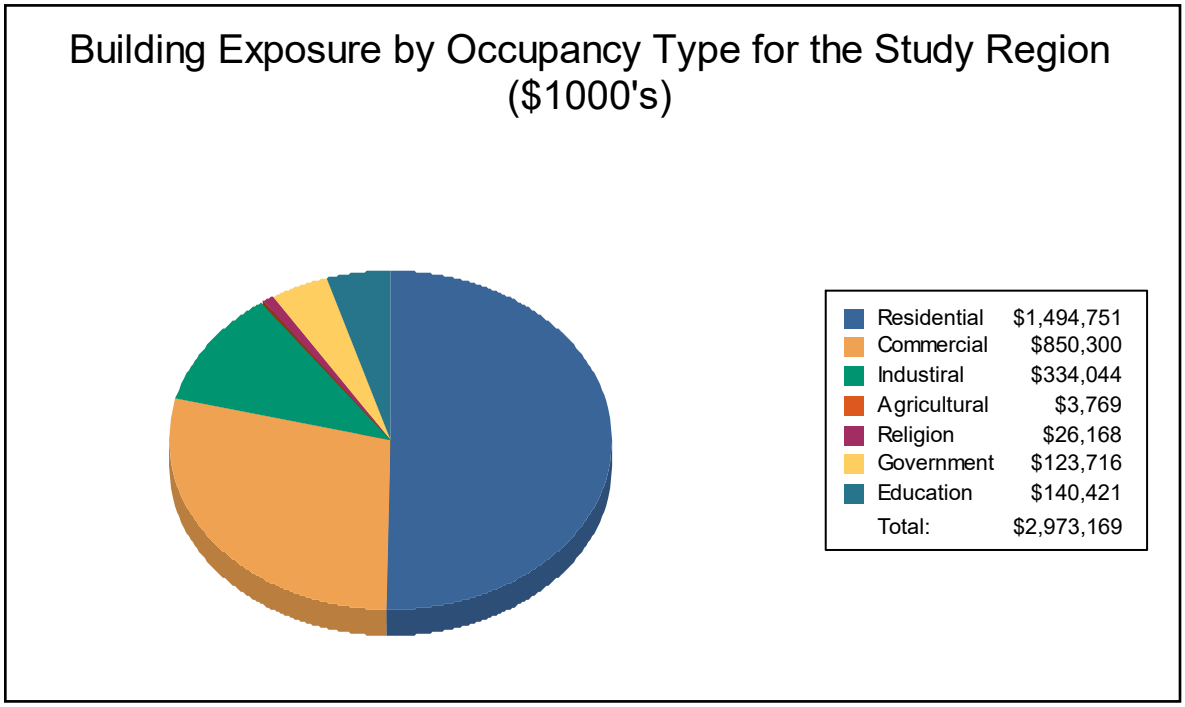

Table 2
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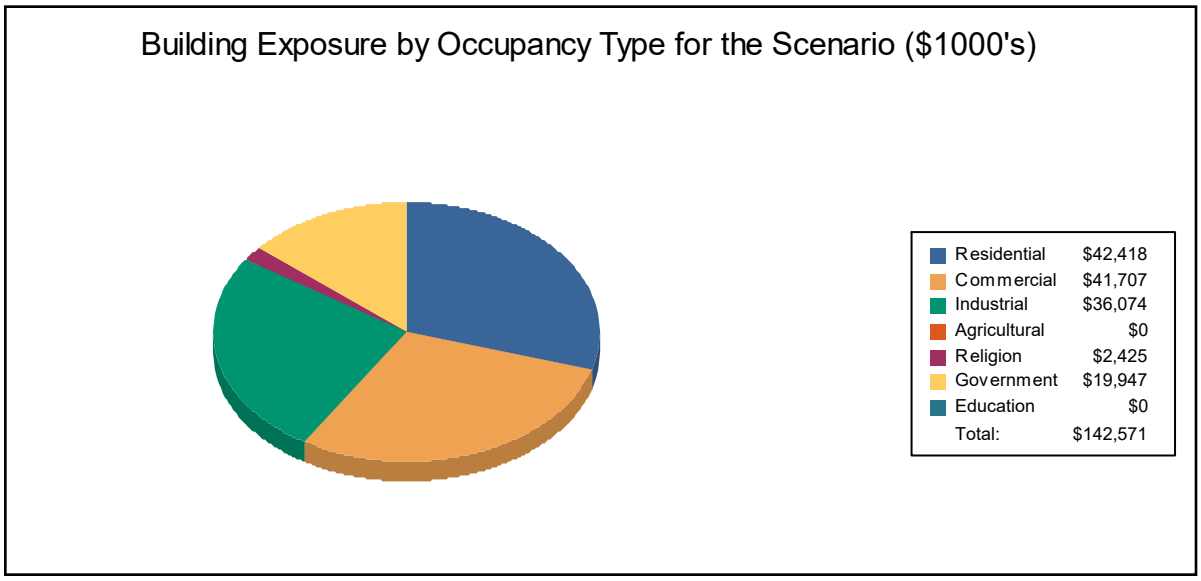
Industrial	36,074	25.3%
Agricultural	0	0.0%
Religion	2,425	1.7%
Government	19,947	14.0%
Education	0	0.0%
Total	**142,571**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

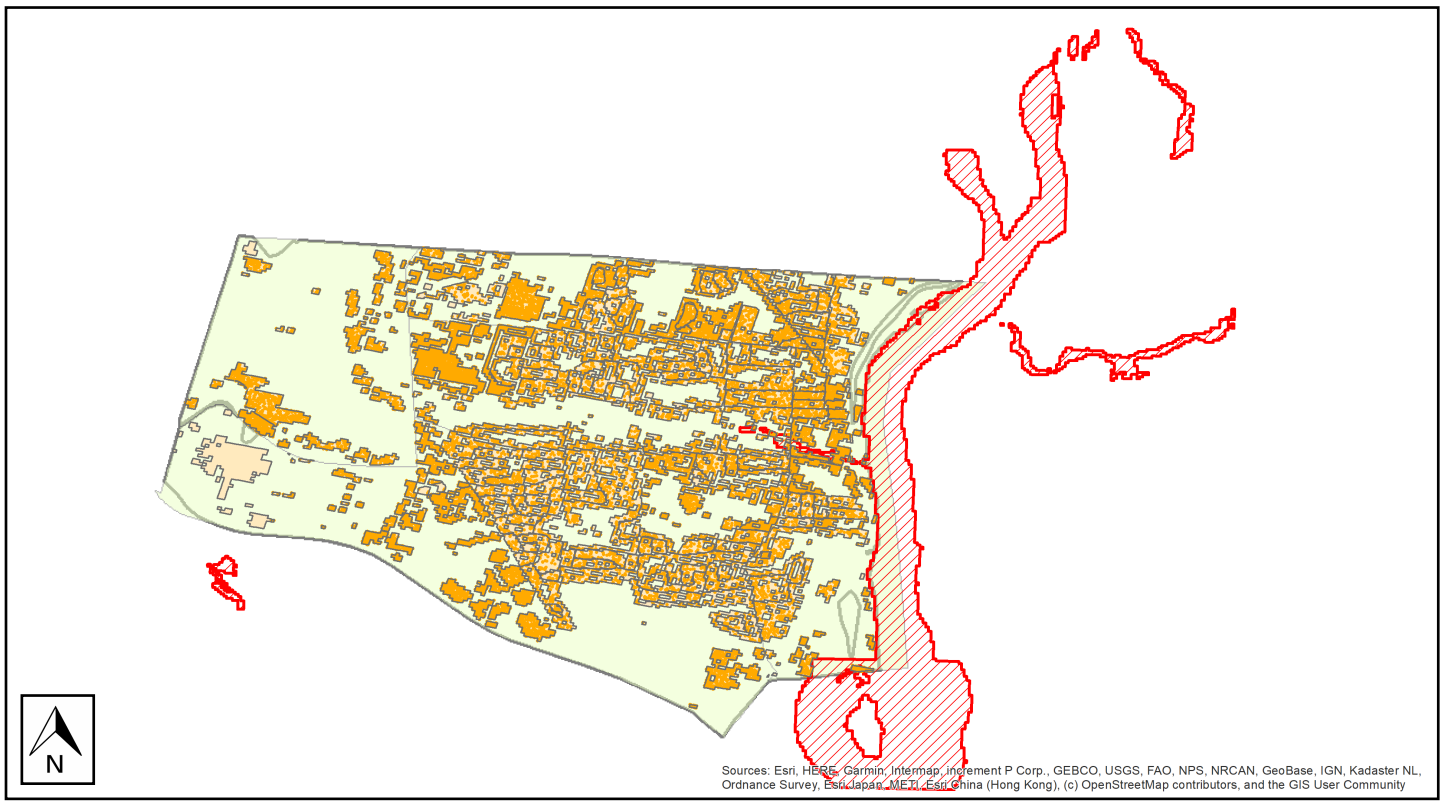
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_Locks_FL
Scenario Name:	Windsor_Locks_Flood
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

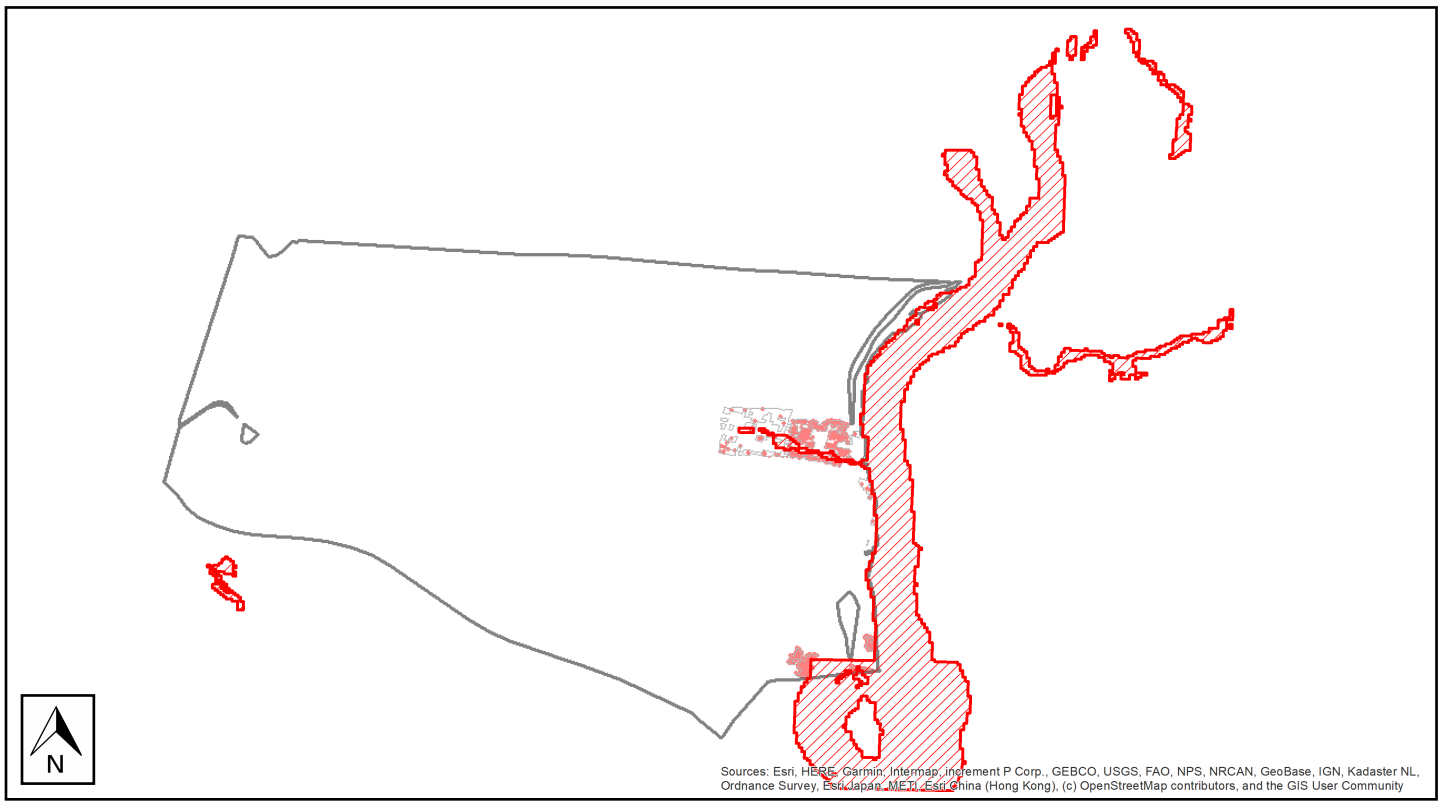


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	1	100	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

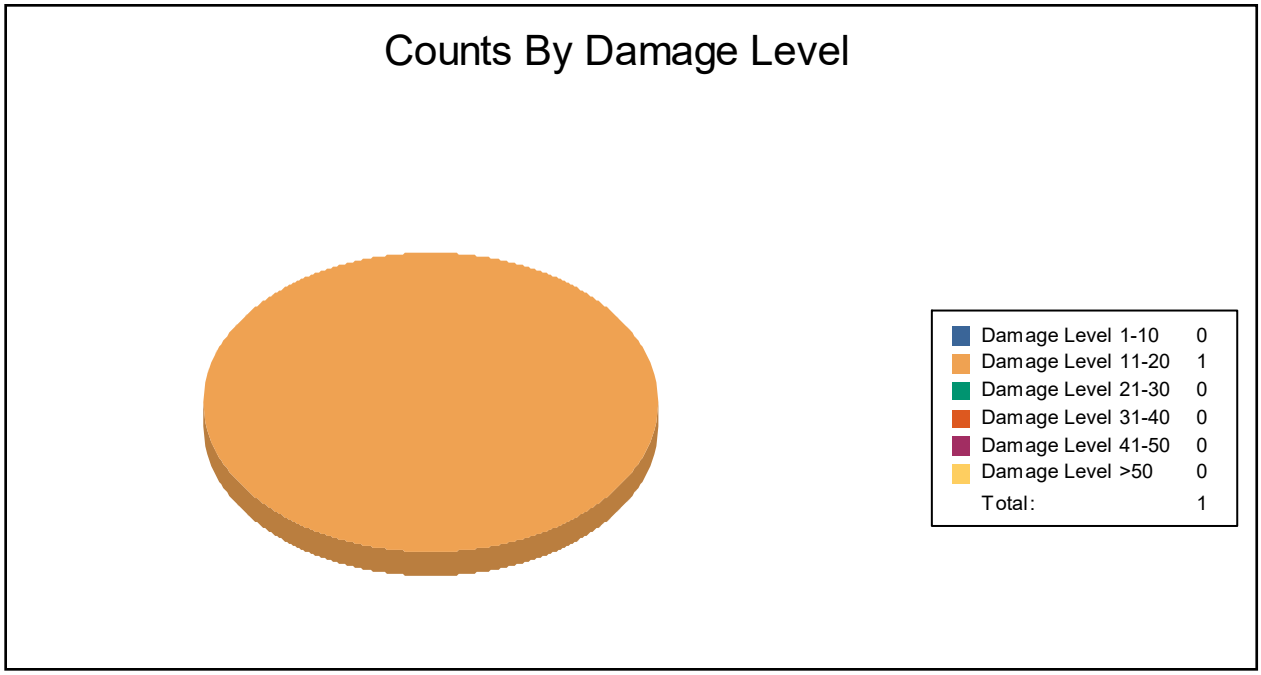


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	1	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	2	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

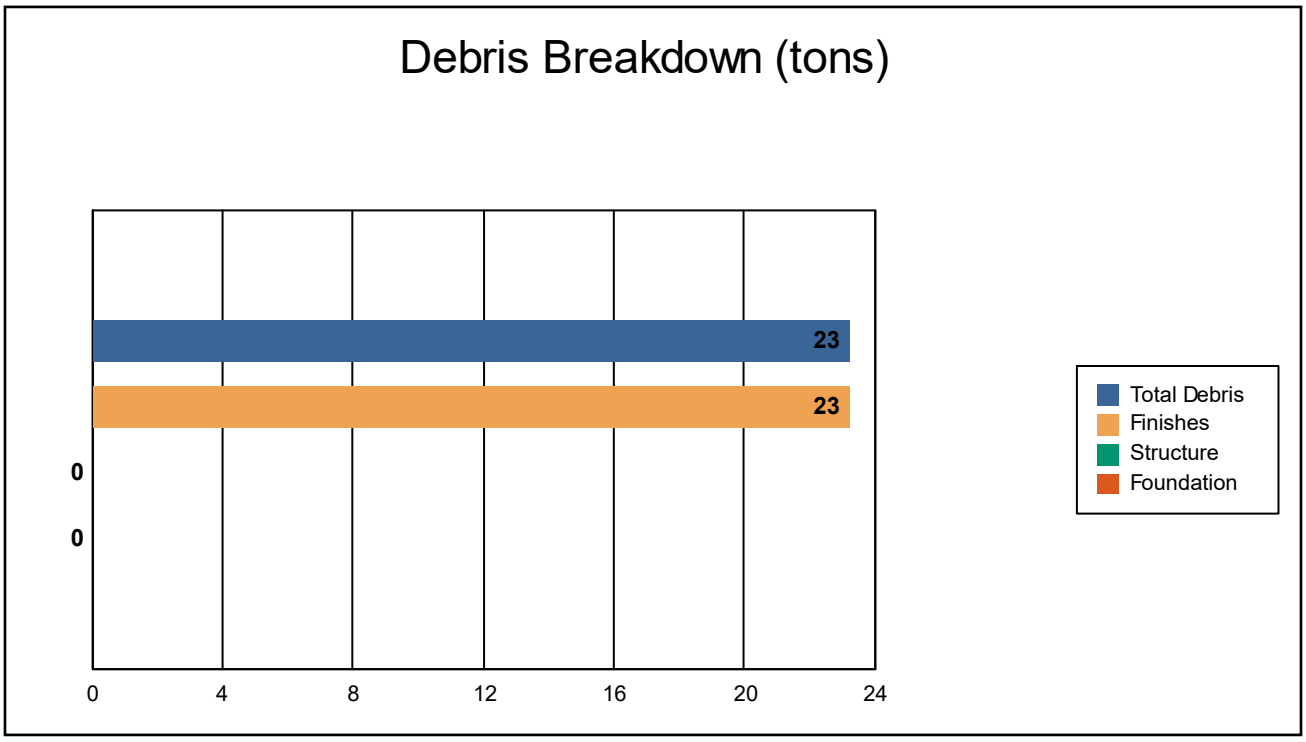
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

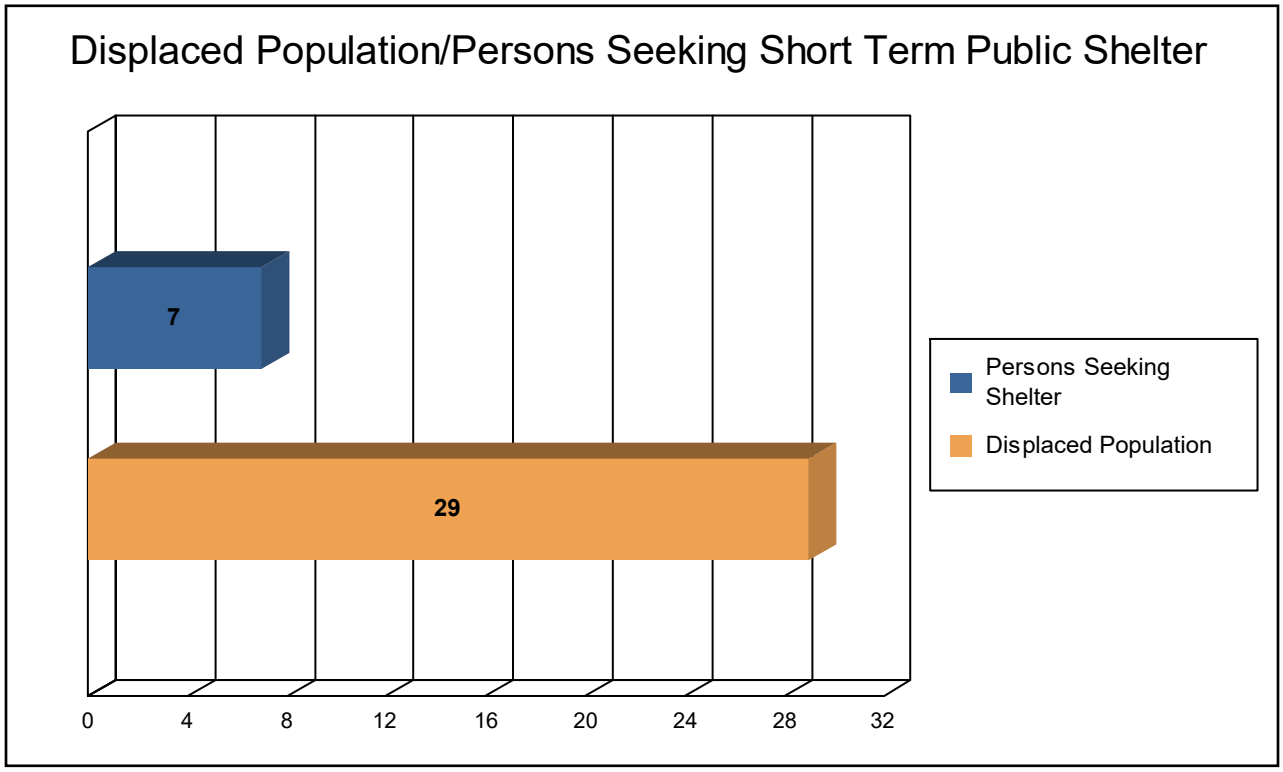


The model estimates that a total of 23 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 10 households (or 29 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 7 people (out of a total population of 12,557) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 7.85 million dollars, which represents 5.50 % of the total replacement value of the scenario buildings.

Building-Related Losses

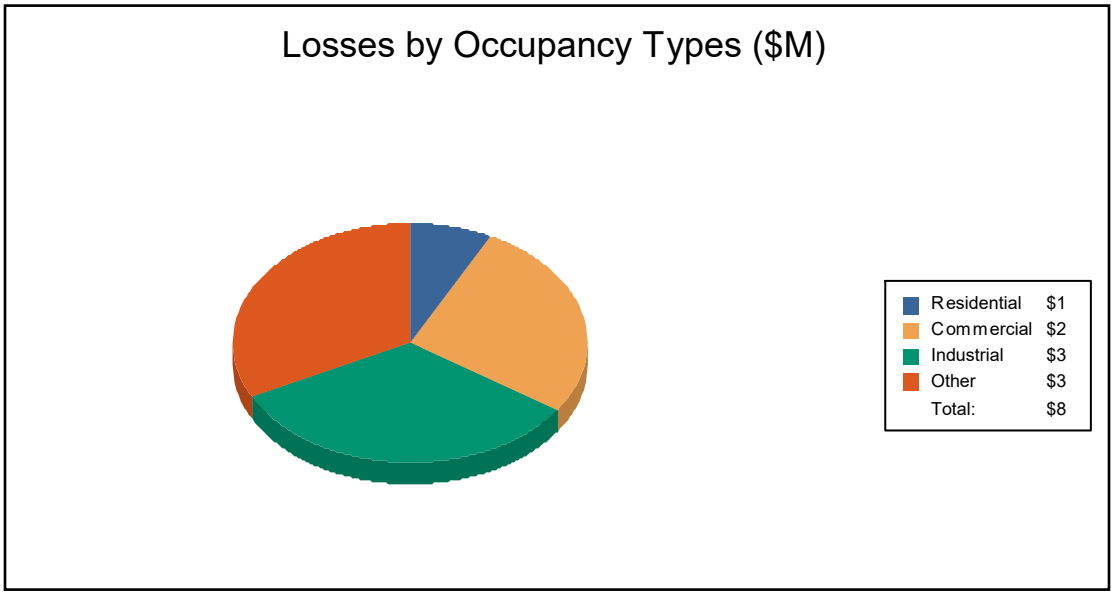
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 4.04 million dollars. 48% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 7.39% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.29	0.19	0.67	0.02	1.17
	Content	0.12	0.62	1.54	0.14	2.42
	Inventory	0.00	0.22	0.24	0.00	0.46
	Subtotal	**0.41**	**1.03**	**2.45**	**0.15**	**4.04**
Business Interruption						
	Income	0.01	0.30	0.04	0.08	0.42
	Relocation	0.11	0.16	0.04	0.09	0.40
	Rental Income	0.04	0.11	0.01	0.04	0.19
	Wage	0.01	0.52	0.07	2.19	2.79
	Subtotal	**0.17**	**1.08**	**0.16**	**2.40**	**3.80**
ALL	**Total**	**0.58**	**2.12**	**2.60**	**2.55**	**7.85**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	12,557	1,494,751	1,478,418	2,973,169
Total	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**
Total Study Region	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**

Hazus: Flood Global Risk Report

Region Name: Windsor_Locks_FL

Flood Scenario: Windsor_Locks_Flood

Print Date: Monday, April 24, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 3 square miles and contains 184 census blocks. The region contains over 6 thousand households and has a total population of 12,557 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,784 buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86.48% of the buildings (and 50.27% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,784 buildings in the region which have an aggregate total replacement value of 2,973 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,494,751	50.3%
Commercial	850,300	28.6%
Industrial	334,044	11.2%
Agricultural	3,769	0.1%
Religion	26,168	0.9%
Government	123,716	4.2%
Education	140,421	4.7%
Total	**2,973,169**	**100%**

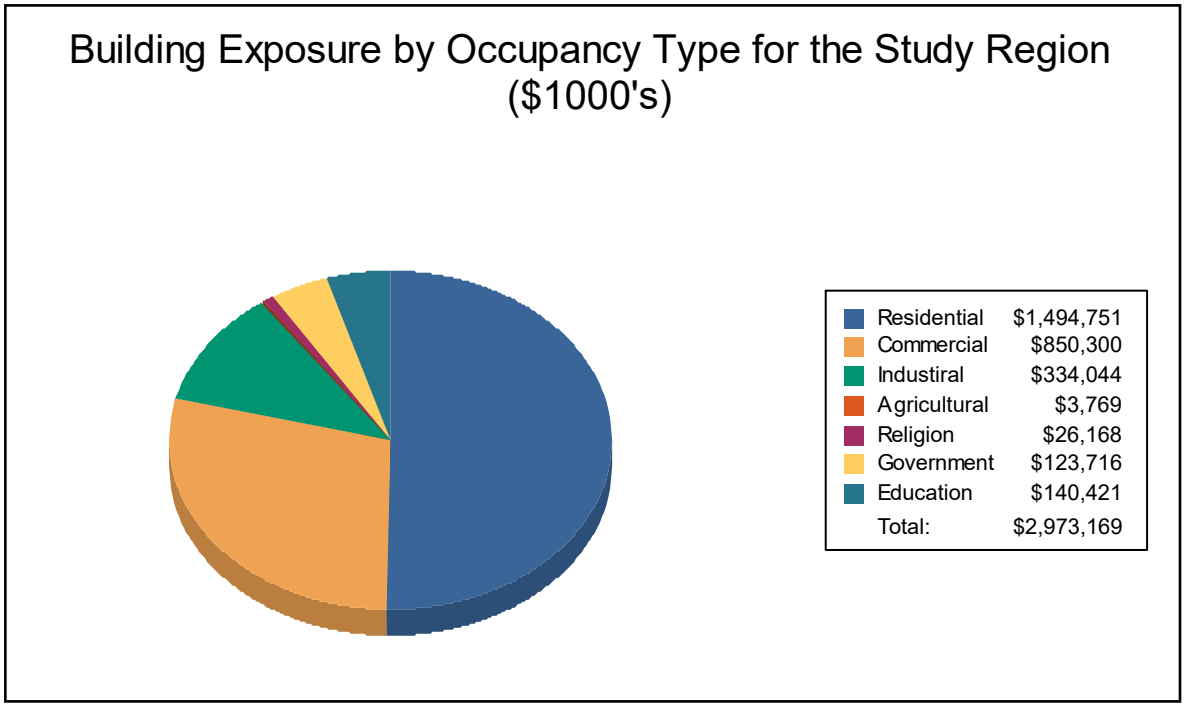
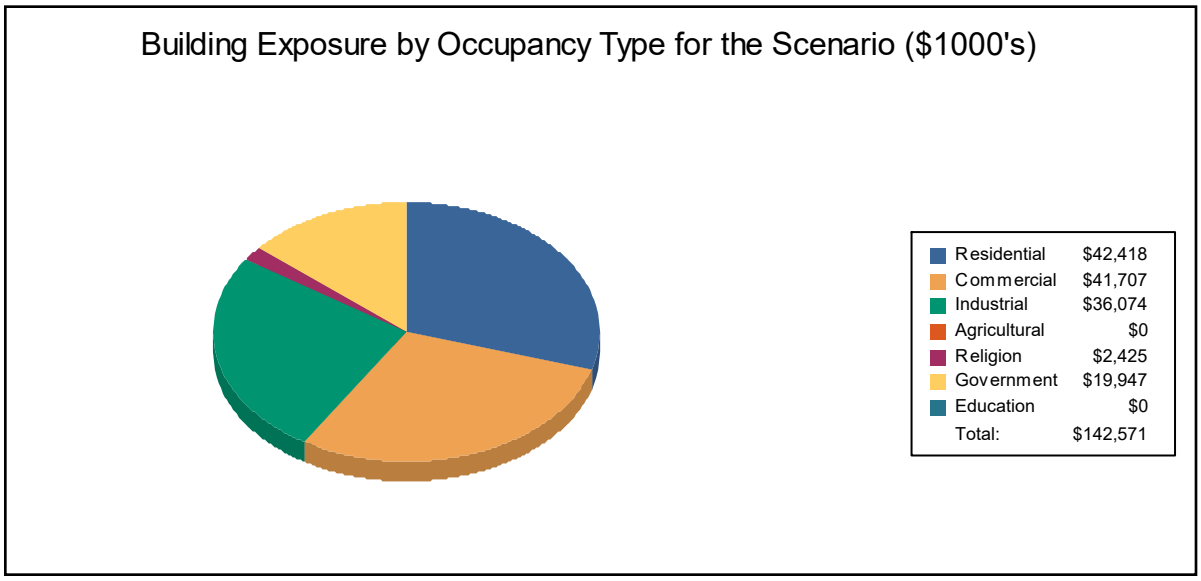


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	42,418	29.8%
Commercial	41,707	29.3%
Industrial	36,074	25.3%
Agricultural	0	0.0%
Religion	2,425	1.7%
Government	19,947	14.0%
Education	0	0.0%
Total	**142,571**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

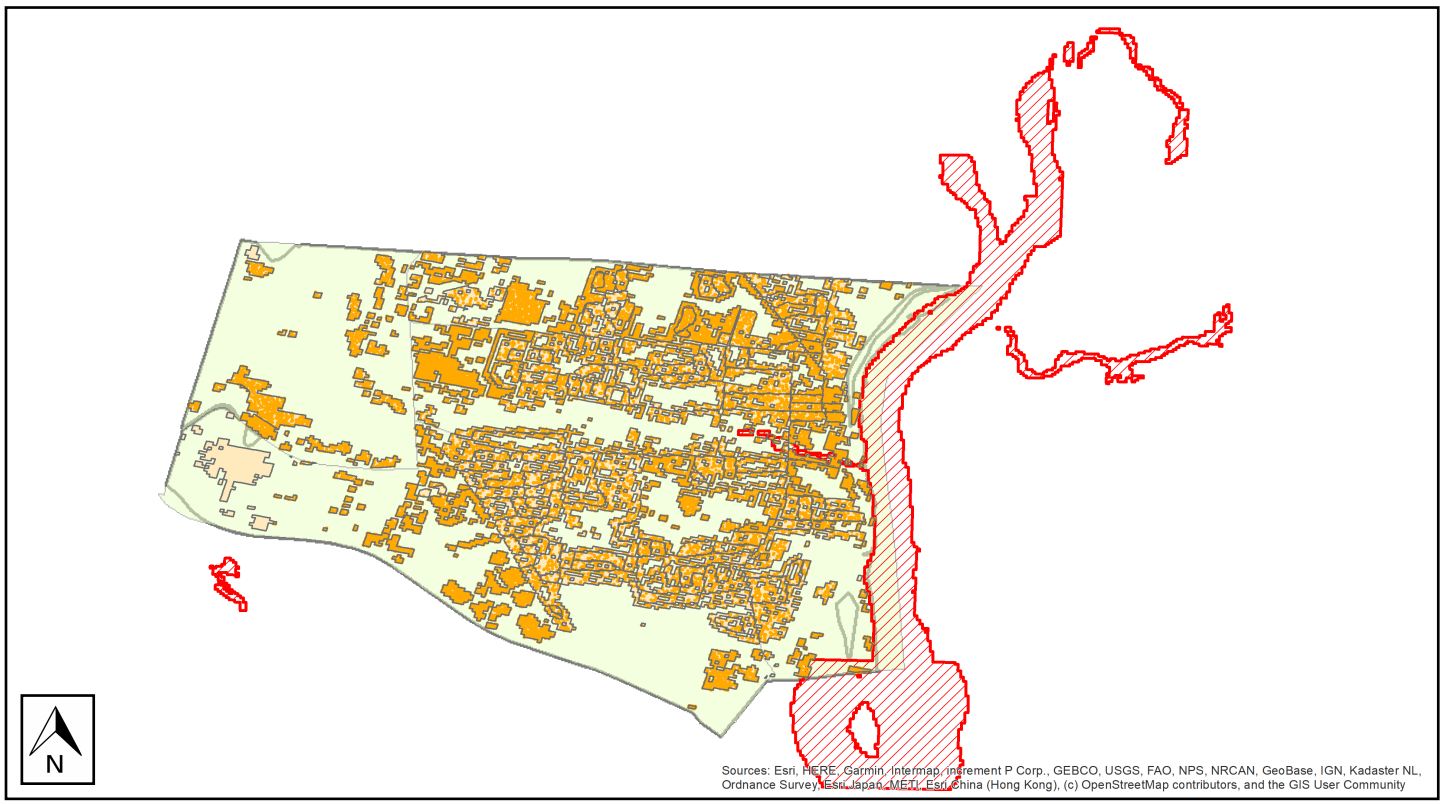
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_Locks_FL
Scenario Name:	Windsor_Locks_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

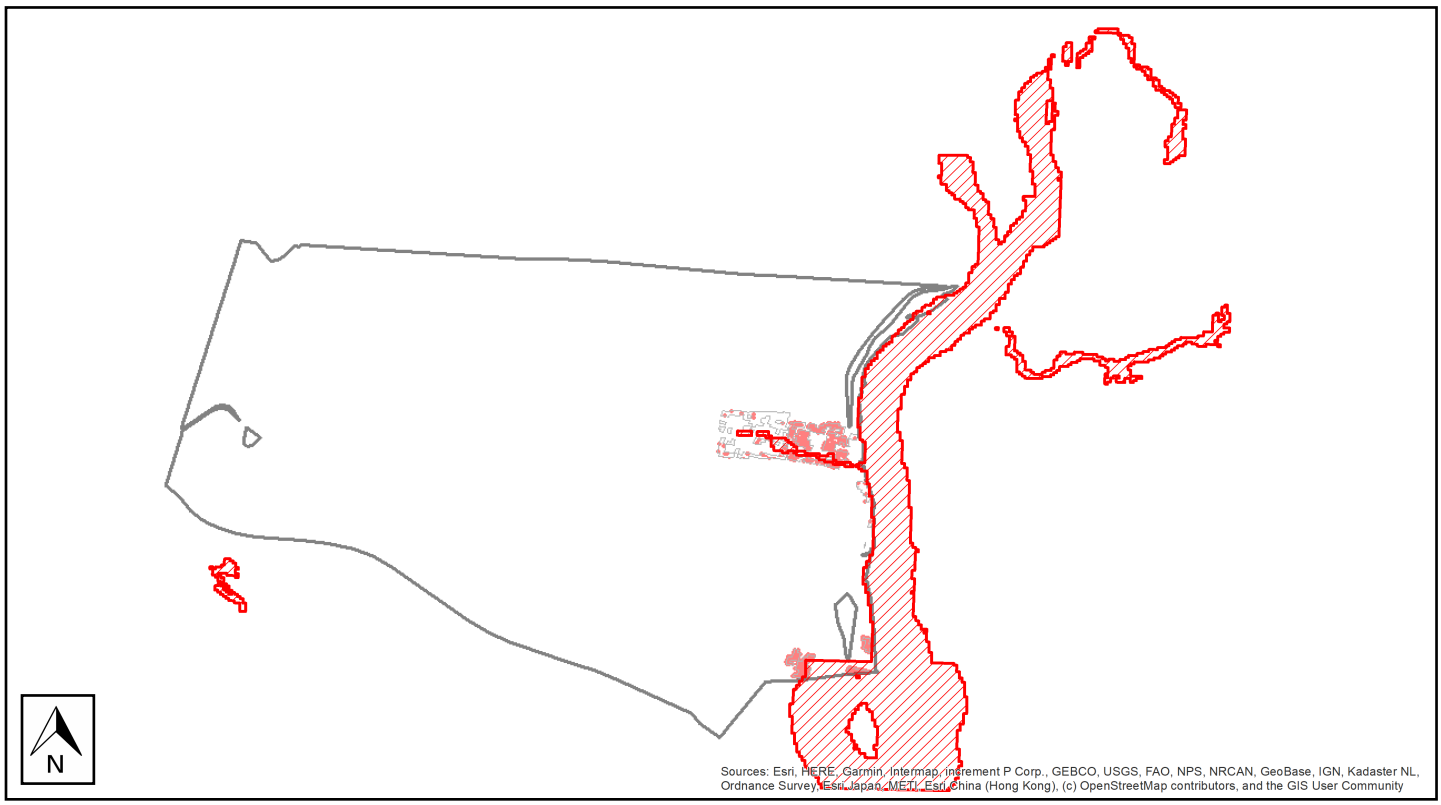


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	1	100	0	0	0	0	0	0	0	0
Total	**0**		**1**		**0**		**0**		**0**		**0**	

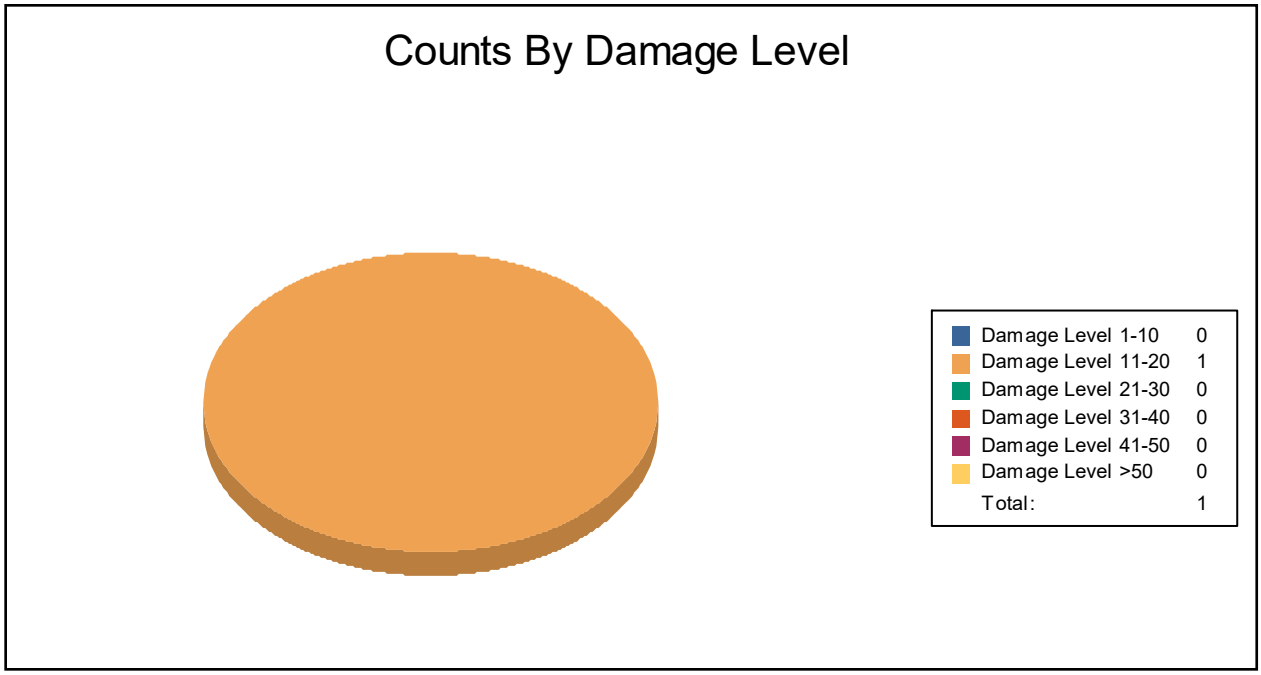


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	1	100	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	2	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

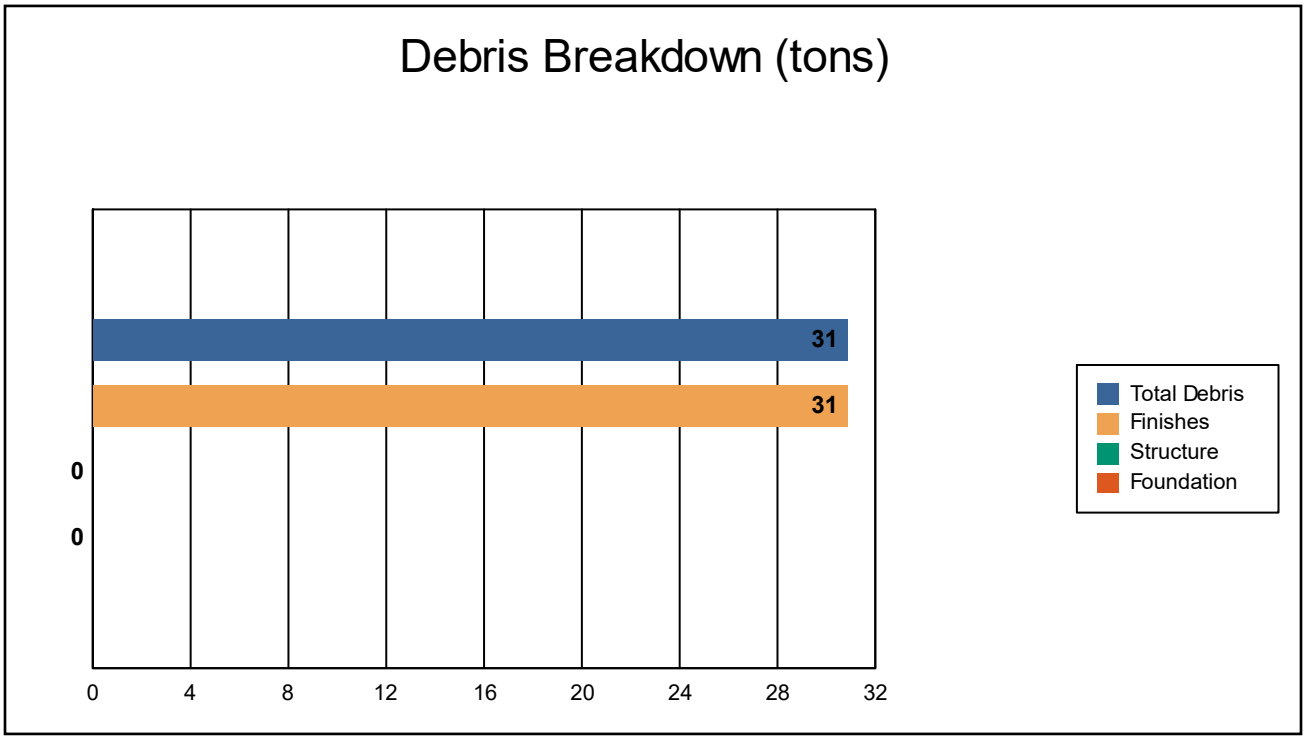
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

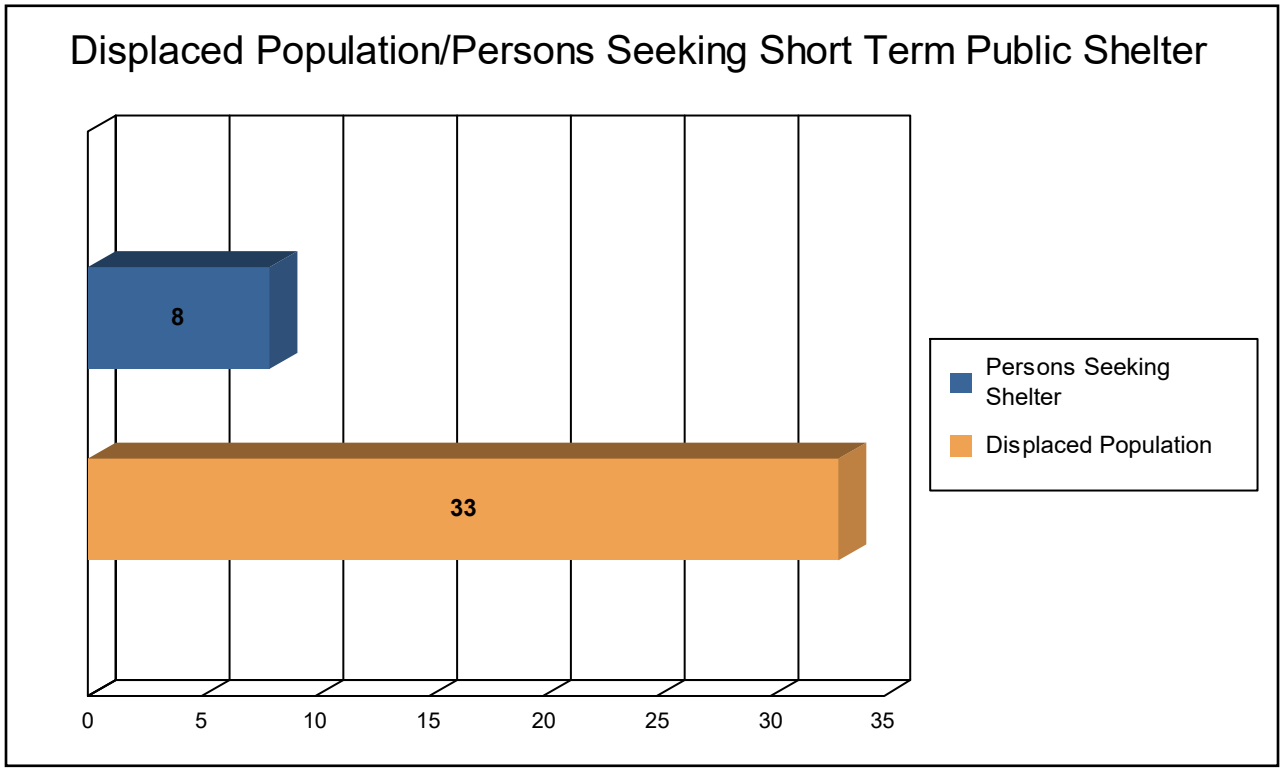


The model estimates that a total of 31 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 11 households (or 33 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 8 people (out of a total population of 12,557) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 12.99 million dollars, which represents 9.11 % of the total replacement value of the scenario buildings.

Building-Related Losses

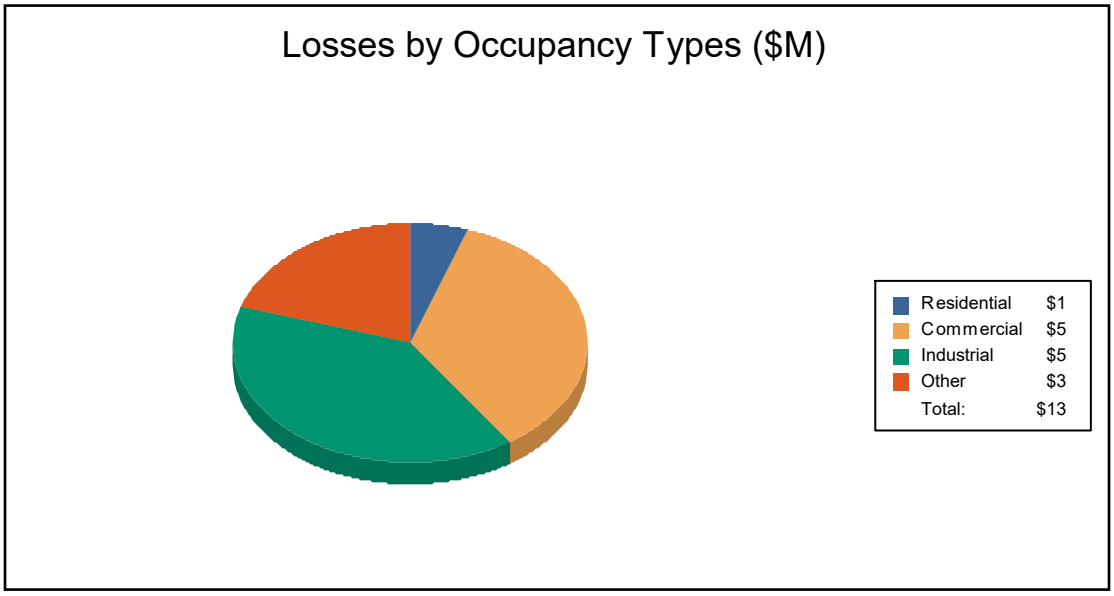
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 8.17 million dollars. 37% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 5.19% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.35	0.45	1.33	0.03	2.15
	Content	0.15	1.51	3.01	0.20	4.87
	Inventory	0.00	0.69	0.47	0.00	1.15
	Subtotal	**0.50**	**2.64**	**4.80**	**0.23**	**8.17**
Business Interruption						
	Income	0.01	0.46	0.07	0.08	0.61
	Relocation	0.12	0.34	0.07	0.09	0.63
	Rental Income	0.04	0.25	0.01	0.04	0.34
	Wage	0.01	0.91	0.13	2.19	3.24
	Subtotal	**0.18**	**1.95**	**0.29**	**2.40**	**4.82**
ALL	**Total**	**0.67**	**4.59**	**5.09**	**2.63**	**12.99**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	12,557	1,494,751	1,478,418	2,973,169
Total	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**
Total Study Region	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**

Hazus: Flood Global Risk Report

Region Name: Windsor_Locks_FL

Flood Scenario: Windsor_Locks_Flood

Print Date: Monday, April 24, 2023

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	
General Building Stock	4
Essential Facility Inventory	5
Flood Scenario Parameters	6
Building Damage	
General Building Stock	7
Essential Facilities Damage	9
Induced Flood Damage	10
Debris Generation	
Social Impact	10
Shelter Requirements	
Economic Loss	12
Building-Related Losses	
Appendix A: County Listing for the Region	15
Appendix B: Regional Population and Building Value Data	16

General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
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The geographical size of the region is approximately 3 square miles and contains 184 census blocks. The region contains over 6 thousand households and has a total population of 12,557 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 4,784 buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86.48% of the buildings (and 50.27% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,784 buildings in the region which have an aggregate total replacement value of 2,973 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
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Agricultural	3,769	0.1%
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Government	123,716	4.2%
Education	140,421	4.7%
Total	**2,973,169**	**100%**

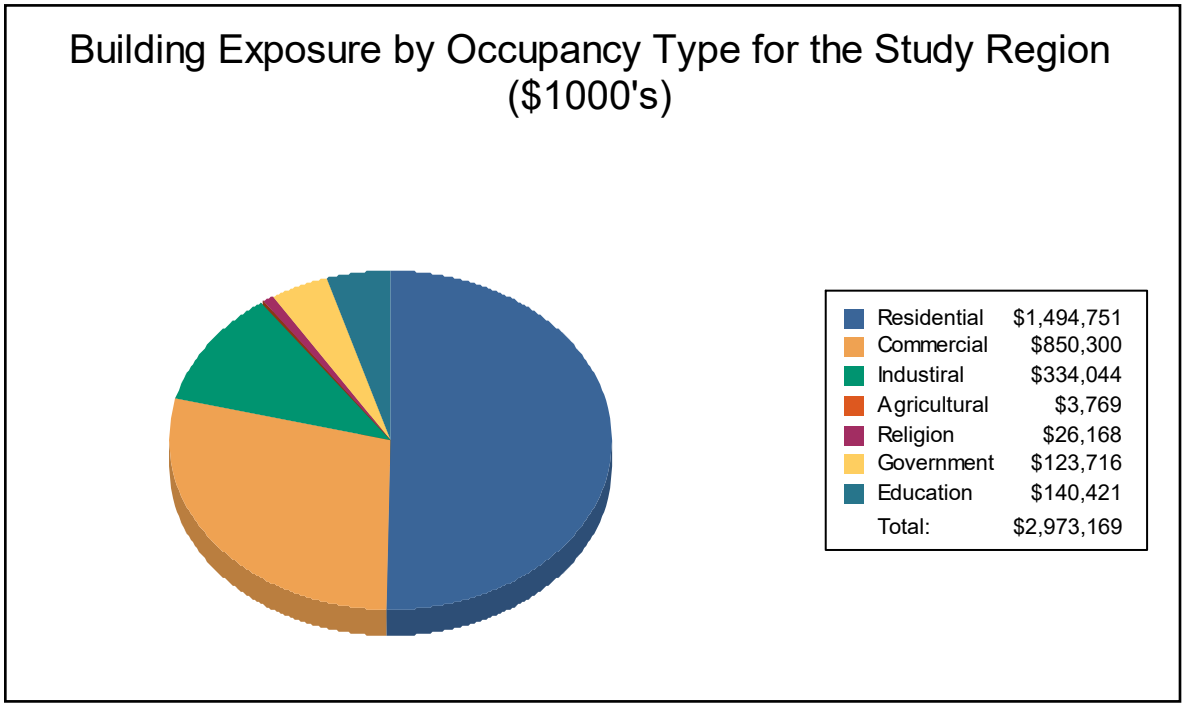

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
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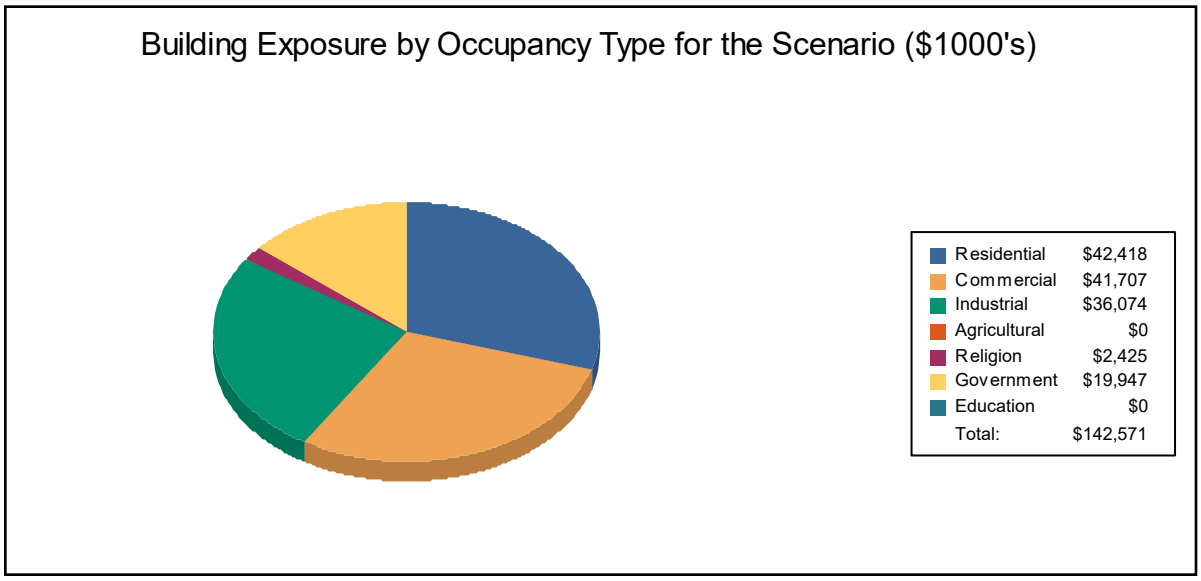
Commercial	41,707	29.3%
Industrial	36,074	25.3%
Agricultural	0	0.0%
Religion	2,425	1.7%
Government	19,947	14.0%
Education	0	0.0%
Total	**142,571**	**100%**



Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation center.

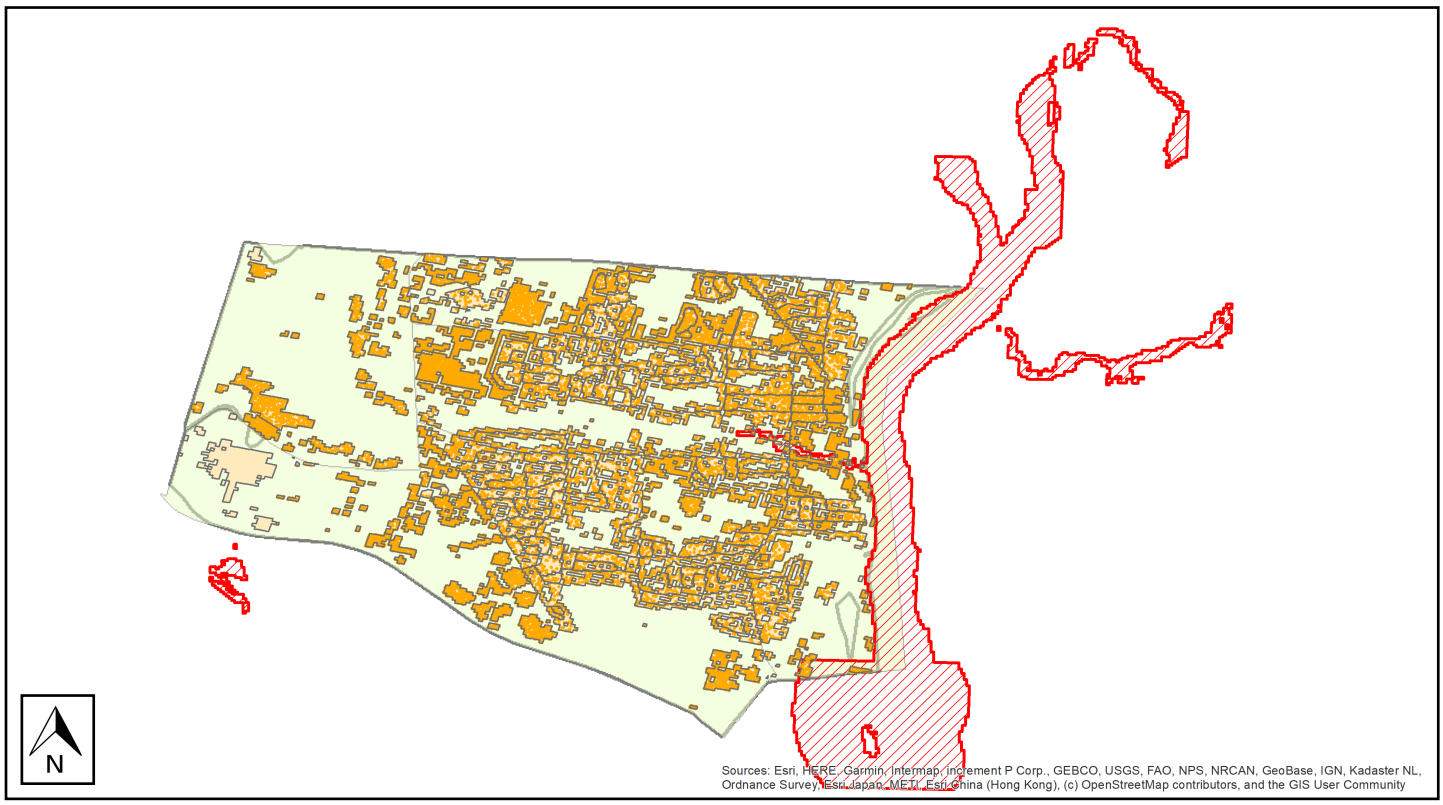
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Windsor_Locks_FL
Scenario Name:	Windsor_Locks_Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

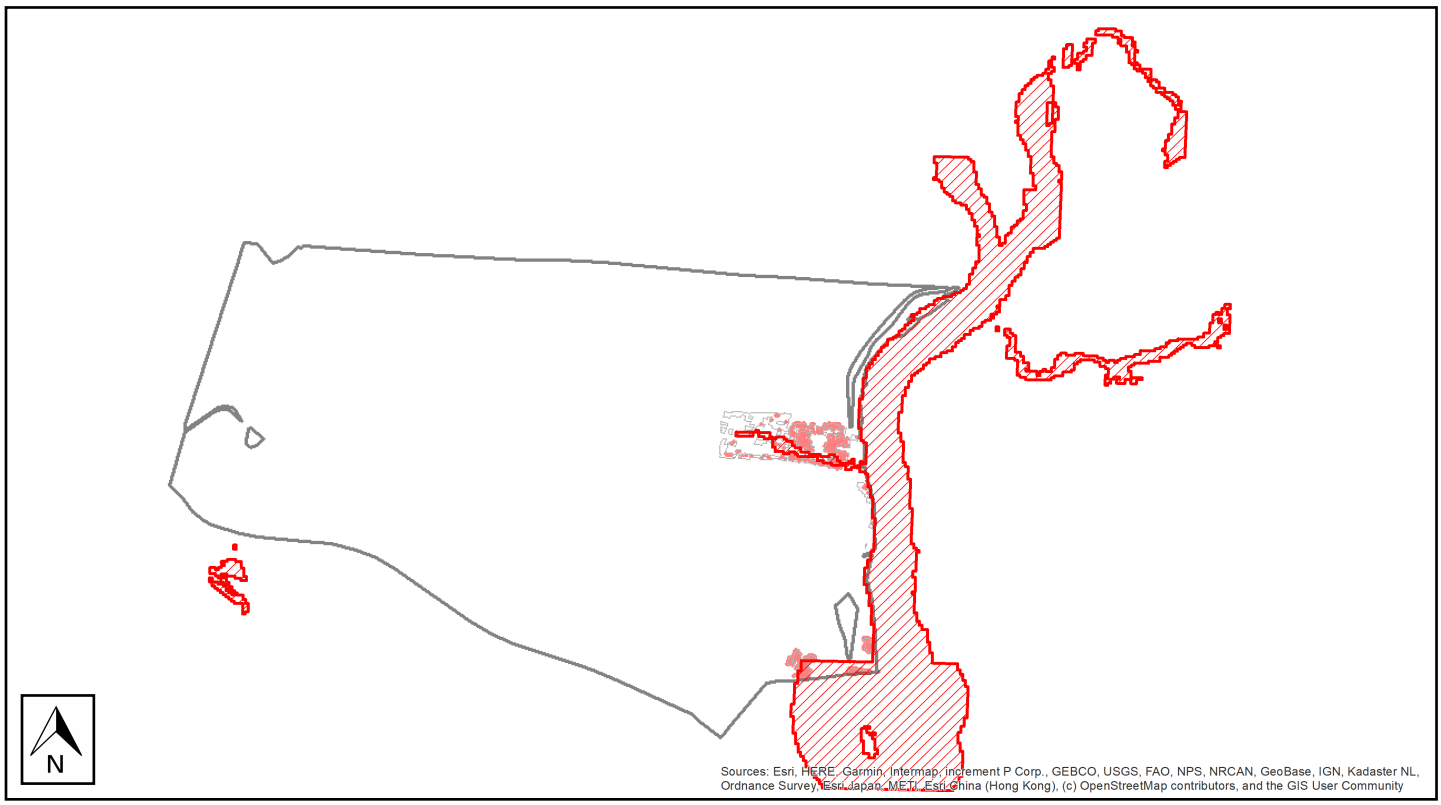


Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**		**0**		**0**		**0**		**0**		**0**	

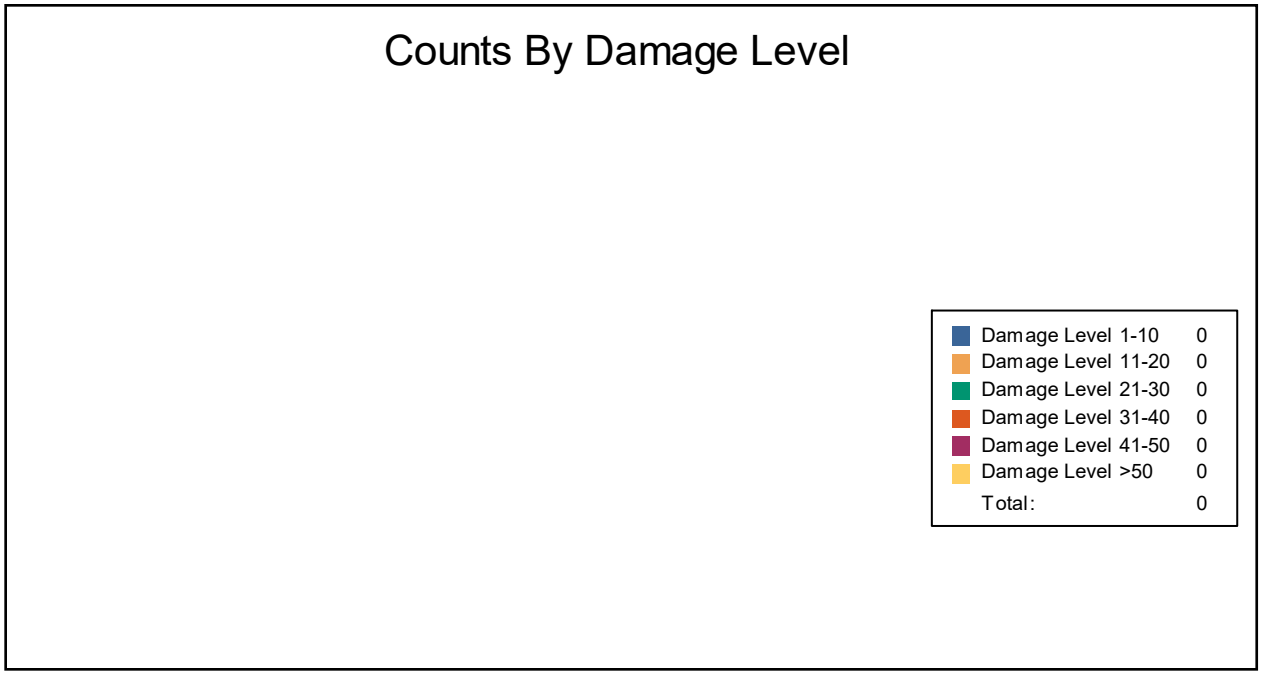


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0	0	0	0	0	0

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	4	0	0	0
Hospitals	0	0	0	0
Police Stations	2	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

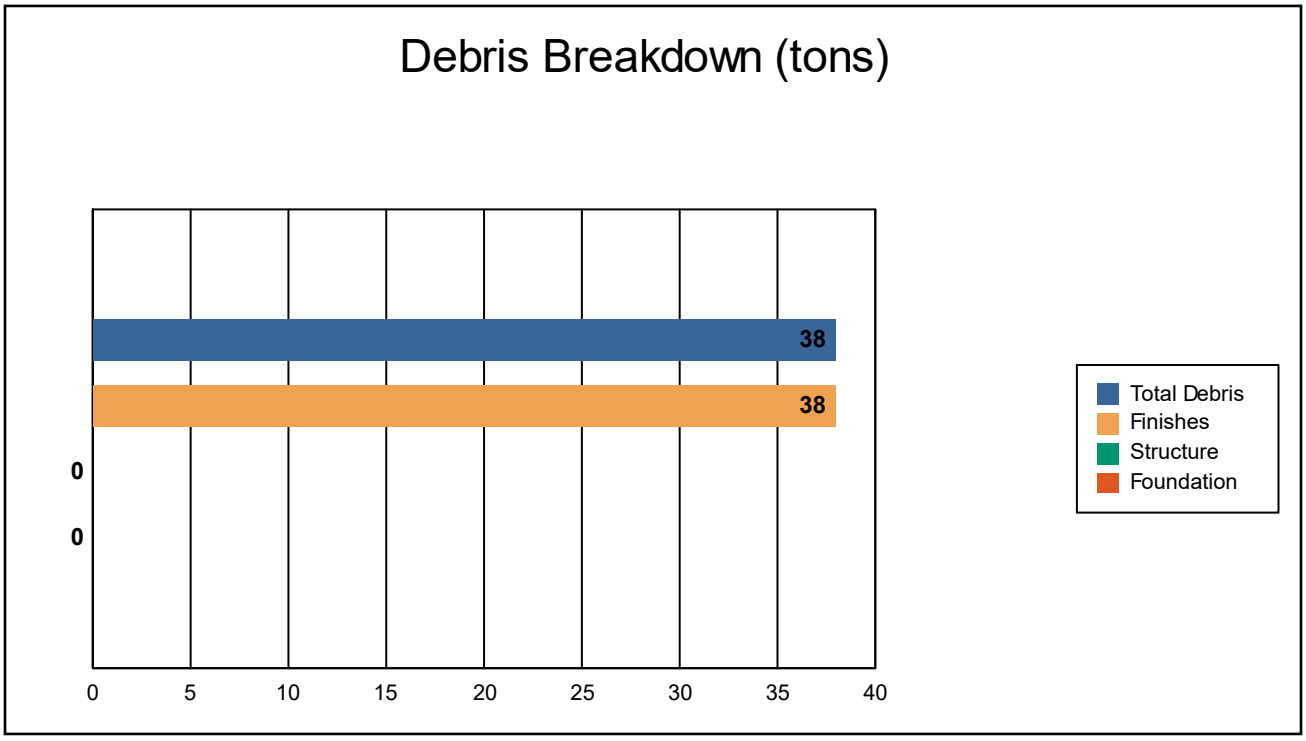
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

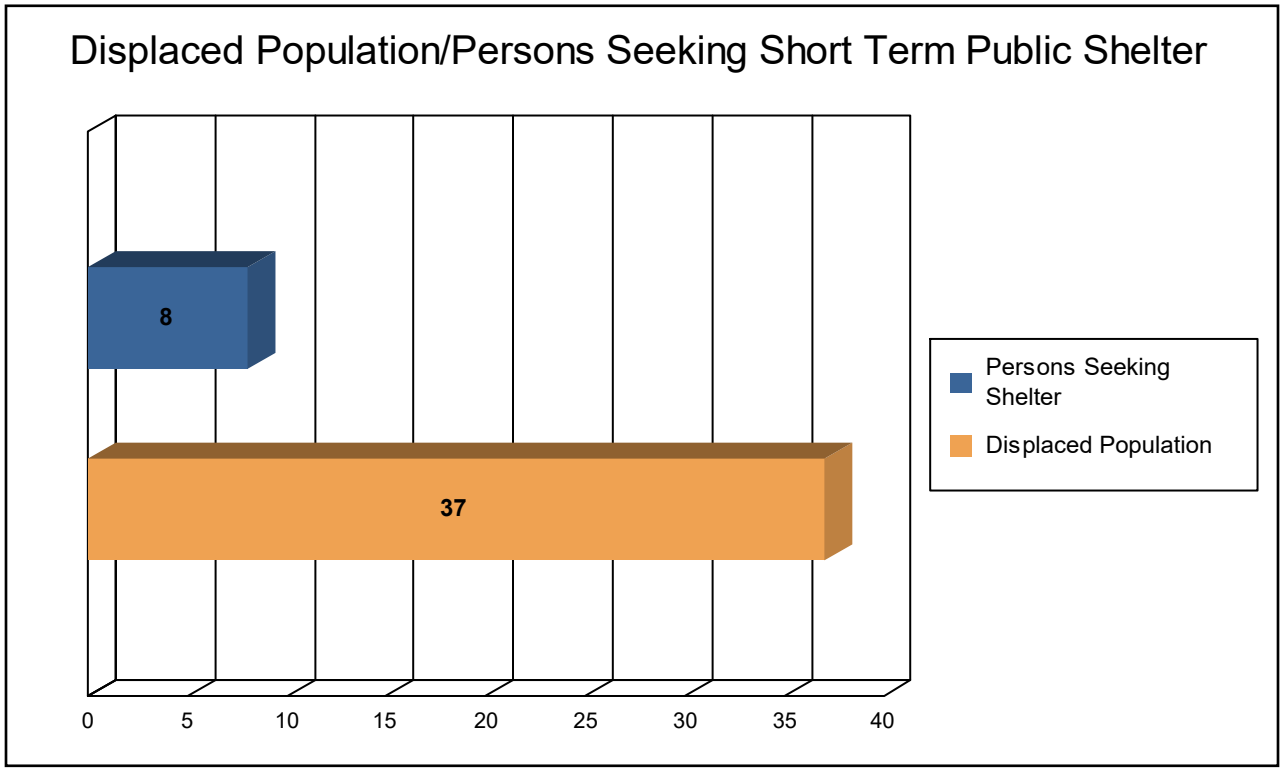


The model estimates that a total of 38 tons of debris will be generated. Of the total amount, Finishes comprises 100% of the total, Structure comprises 0% of the total, and Foundation comprises 0%. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 12 households (or 37 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 8 people (out of a total population of 12,557) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 26.93 million dollars, which represents 18.89 % of the total replacement value of the scenario buildings.

Building-Related Losses

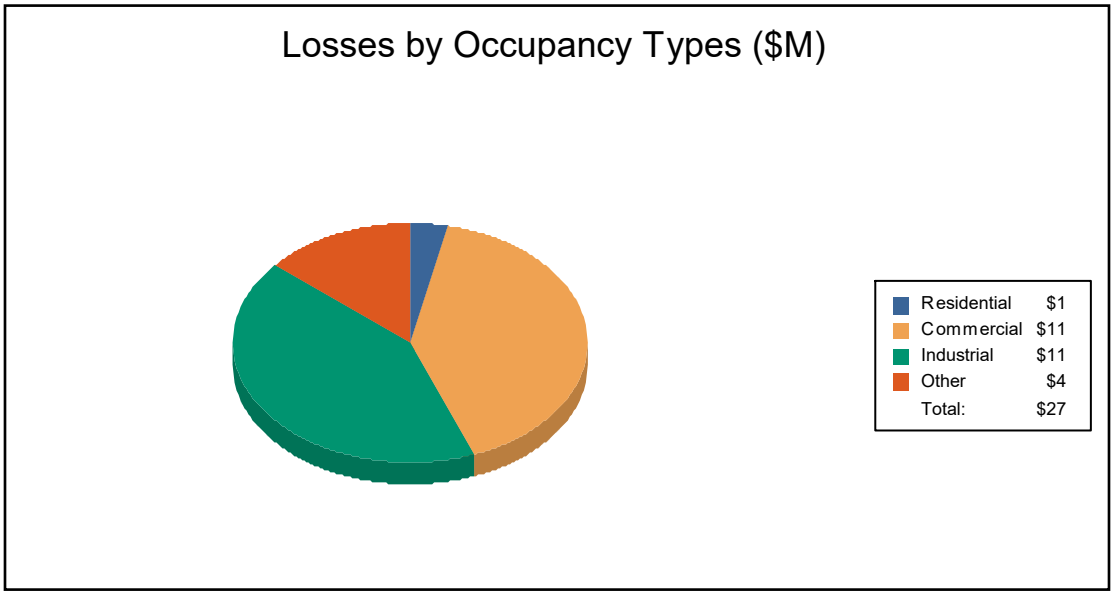
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 19.59 million dollars. 27% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 3.27% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.47	1.30	3.07	0.05	4.89
	Content	0.21	4.23	6.82	0.32	11.57
	Inventory	0.00	2.12	1.01	0.00	3.13
	Subtotal	**0.68**	**7.65**	**10.90**	**0.37**	**19.59**
Business Interruption						
	Income	0.01	0.75	0.10	0.11	0.97
	Relocation	0.14	0.64	0.10	0.13	1.01
	Rental Income	0.05	0.47	0.02	0.05	0.59
	Wage	0.02	1.51	0.18	3.07	4.77
	Subtotal	**0.21**	**3.37**	**0.40**	**3.36**	**7.34**
ALL	**Total**	**0.88**	**11.02**	**11.30**	**3.73**	**26.93**



Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Connecticut				
Hartford	12,557	1,494,751	1,478,418	2,973,169
Total	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**
Total Study Region	**12,557**	**1,494,751**	**1,478,418**	**2,973,169**

Hazus: Hurricane Global Risk Report

Region Name:	Andover_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 15.70 square miles and contains 1 census tracts. There are over 1 thousand households in the region and a total population of 3,151 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 565 million dollars. Approximately 93% of the buildings (and 82% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,311 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

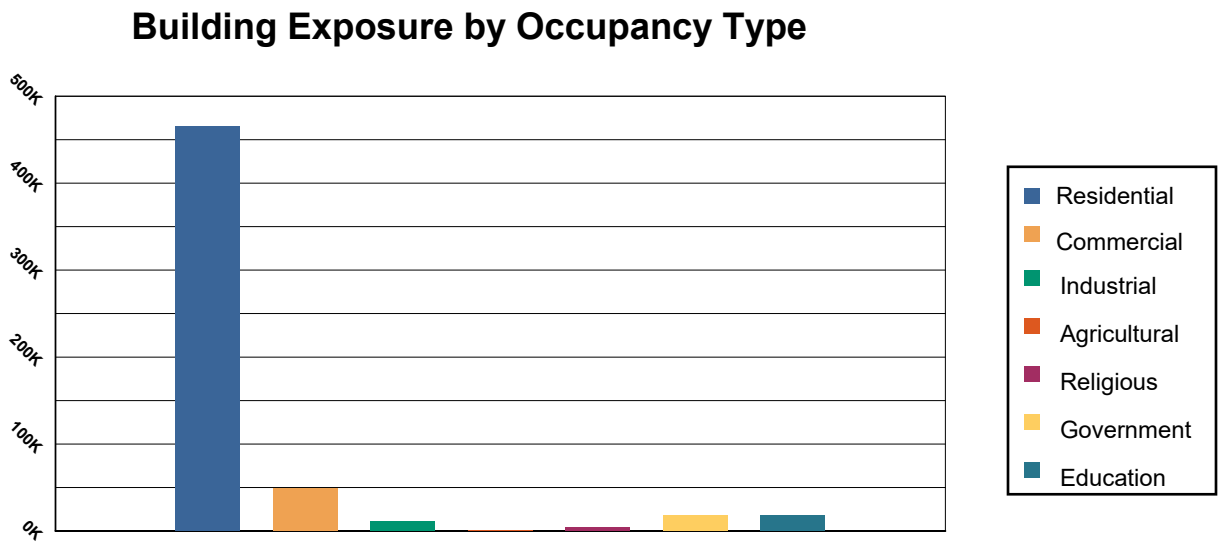


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	465,632	82.42%
Commercial	48,926	8.66%
Industrial	10,758	1.90%
Agricultural	1,016	0.18%
Religious	3,671	0.65%
Government	17,769	3.15%
Education	17,173	3.04%
Total	**564,945**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

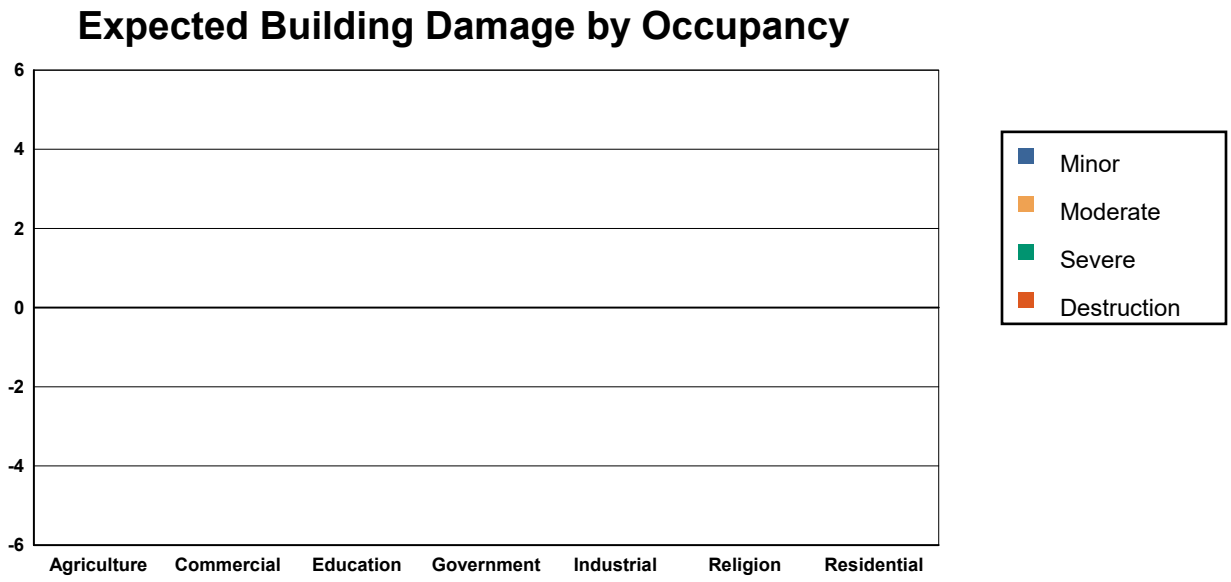


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	2.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	45.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	1.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	37.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	8.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	3.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	1,215.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1,311.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	11	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	82	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	48	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	1,168	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

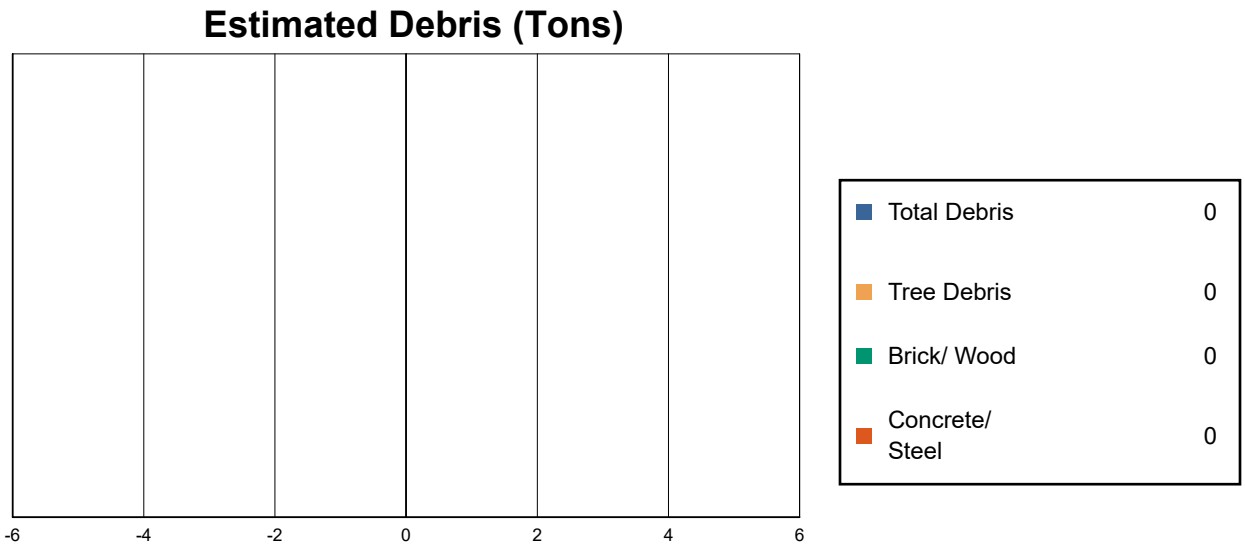
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

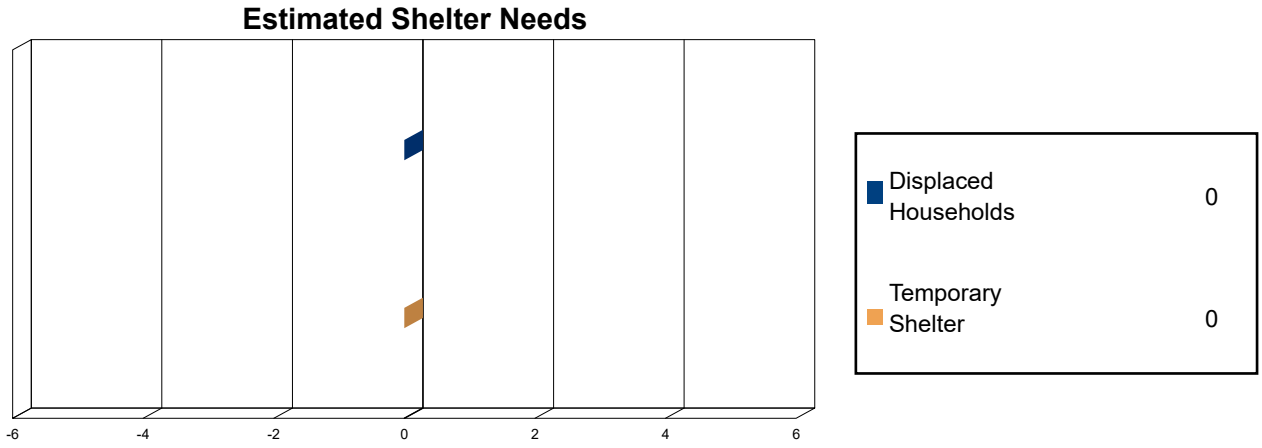


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 3,151) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

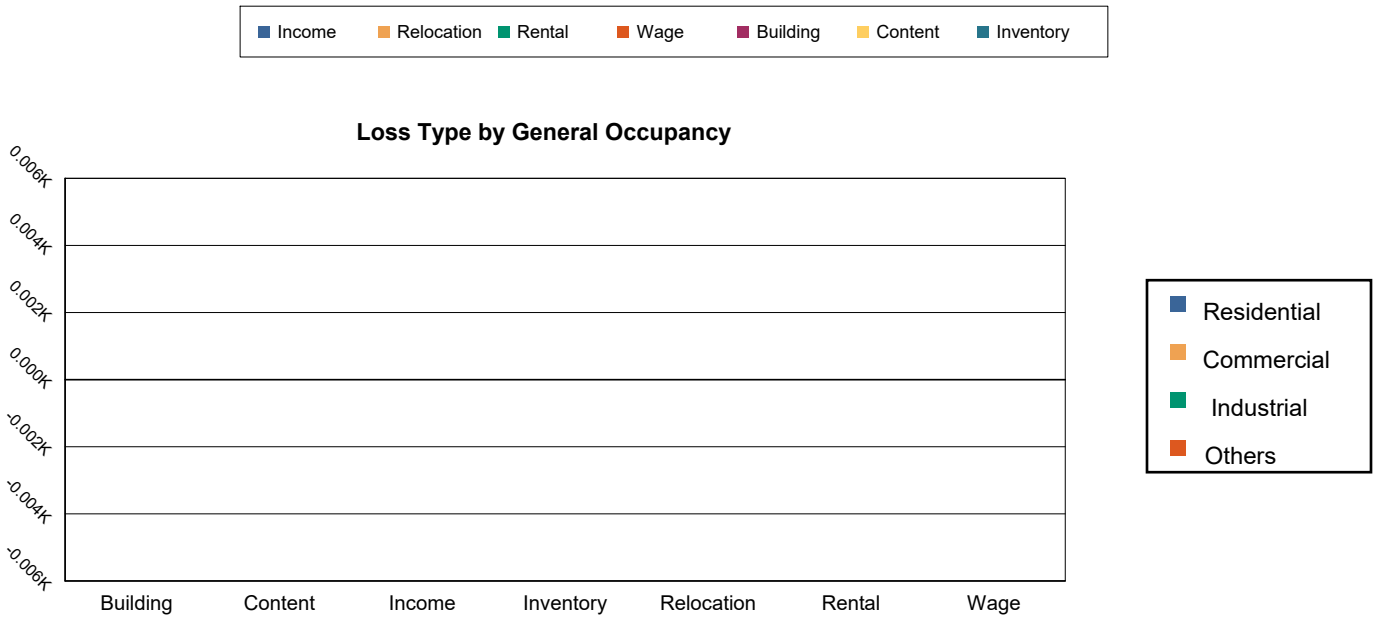


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,632	99,313	564,945
Total	**3,151**	**465,632**	**99,313**	**564,945**
Study Region Total	**3,151**	**465,632**	**99,313**	**564,945**

Hazus: Hurricane Global Risk Report

Region Name:	Andover_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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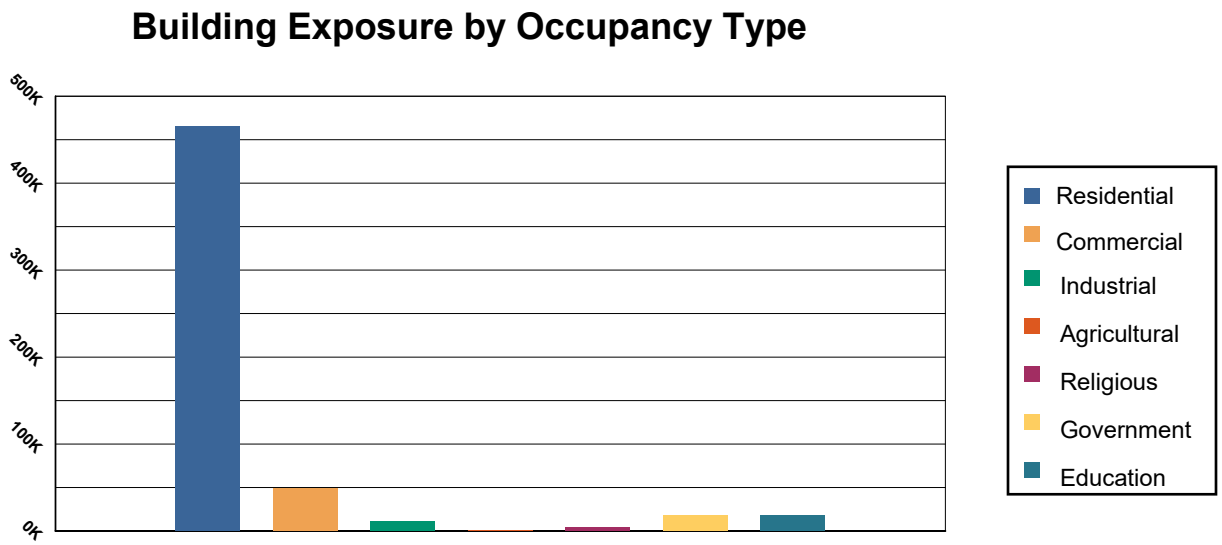

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Total	**564,945**	**100.00%**

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For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

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Type:	Probabilistic

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General Building Stock Damage

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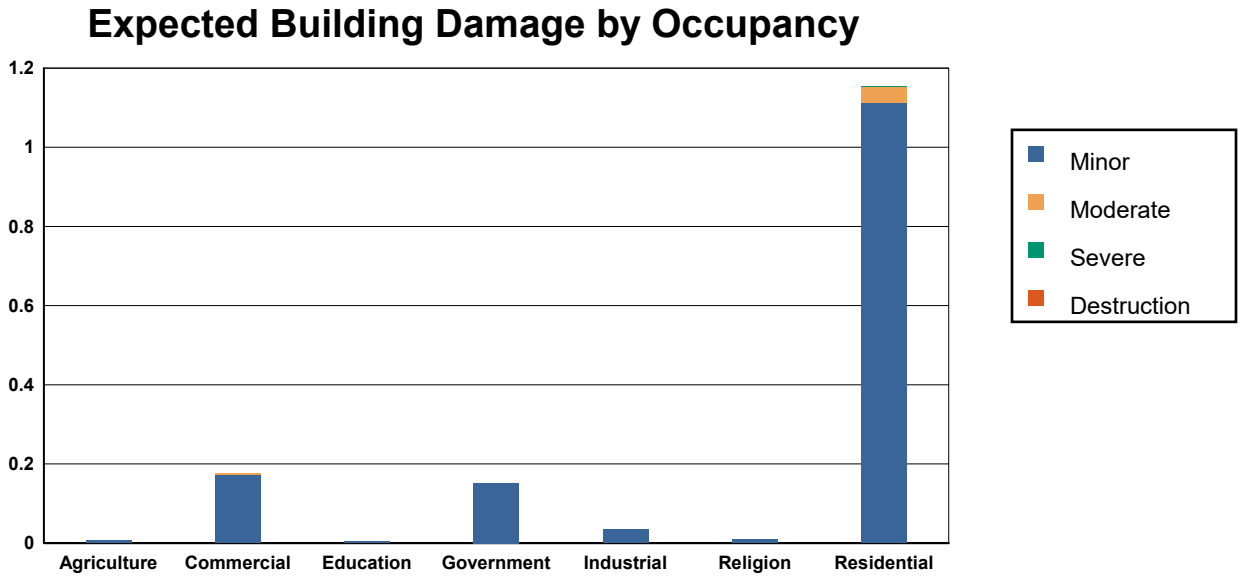


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	1.99	99.70	0.01	0.29	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	44.82	99.61	0.17	0.38	0.00	0.01	0.00	0.00	0.00	0.00
Education	1.00	99.61	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Government	36.85	99.59	0.15	0.41	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	7.97	99.57	0.03	0.43	0.00	0.00	0.00	0.00	0.00	0.00
Religion	2.99	99.69	0.01	0.30	0.00	0.01	0.00	0.00	0.00	0.00
Residential	1,213.85	99.91	1.11	0.09	0.04	0.00	0.00	0.00	0.00	0.00
Total	**1,309.46**		**1.49**		**0.04**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	11	99.47	0	0.53	0	0.00	0	0.00	0	0.00
Masonry	82	99.48	0	0.50	0	0.02	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	48	99.56	0	0.43	0	0.00	0	0.00	0	0.00
Wood	1,167	99.94	1	0.06	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

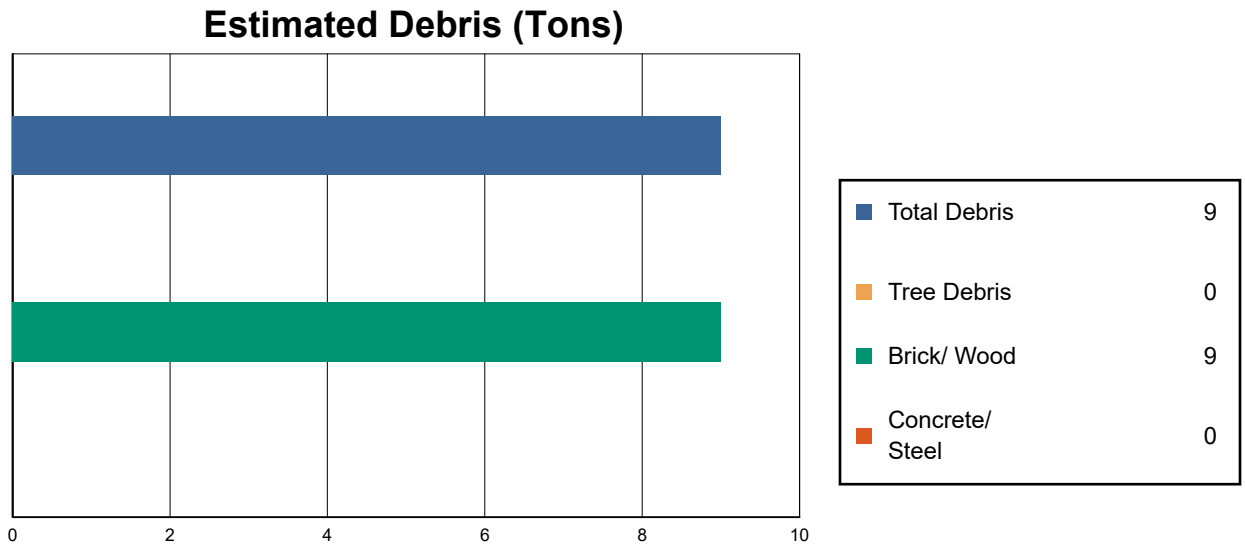
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

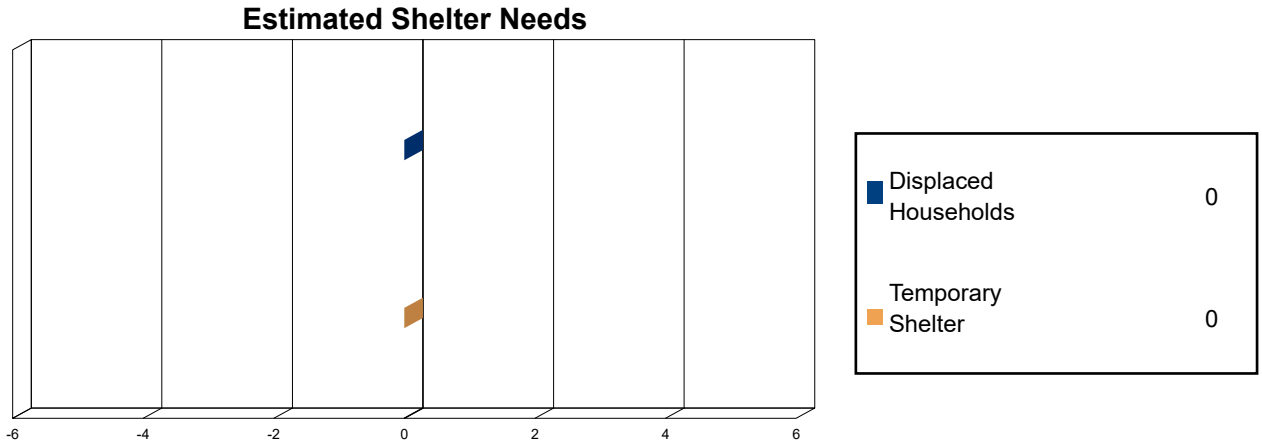


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 9 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 9 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 3,151) will seek temporary shelter in public shelters.

Economic Loss

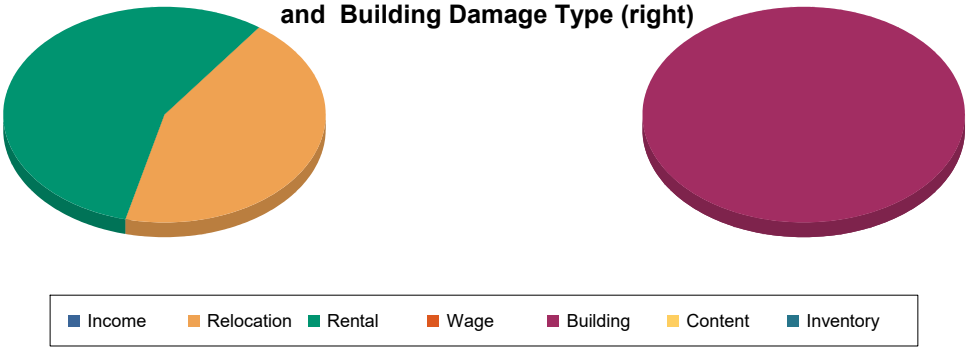
The total economic loss estimated for the hurricane is 0.2 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

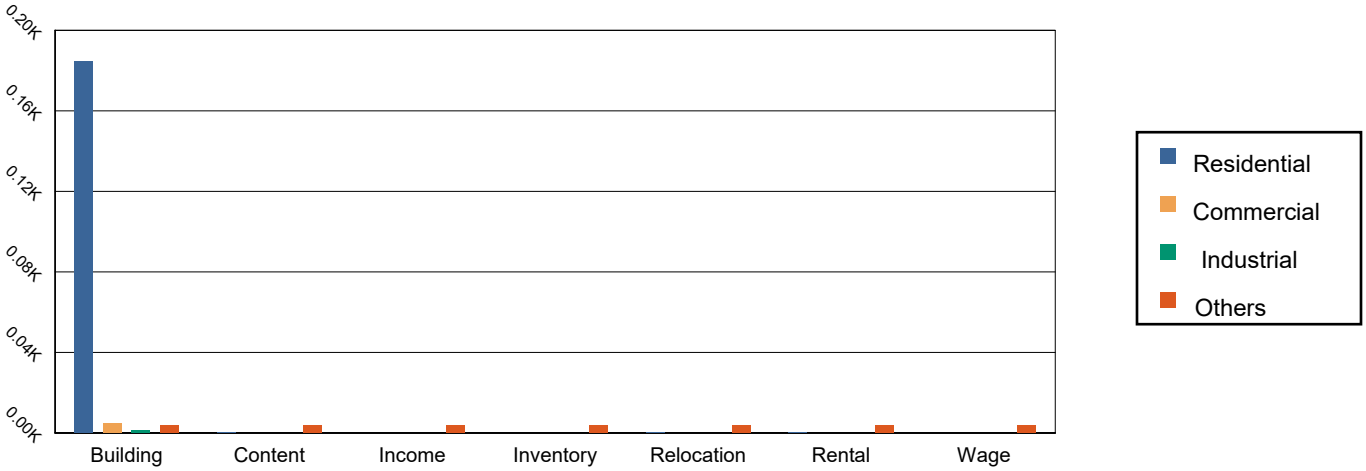


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	184.68	4.89	1.08	3.86	194.51
	Content	0.17	0.00	0.00	0.00	0.17
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**184.85**	**4.89**	**1.08**	**3.86**	**194.68**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.33	0.02	0.00	0.00	0.36
	Rental	0.46	0.00	0.00	0.00	0.46
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.79**	**0.02**	**0.00**	**0.00**	**0.82**

Total

Total	**185.64**	**4.91**	**1.08**	**3.86**	**195.50**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,632	99,313	564,945
Total	**3,151**	**465,632**	**99,313**	**564,945**
Study Region Total	**3,151**	**465,632**	**99,313**	**564,945**

Hazus: Hurricane Global Risk Report

Region Name:	Andover_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
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General Building Stock	
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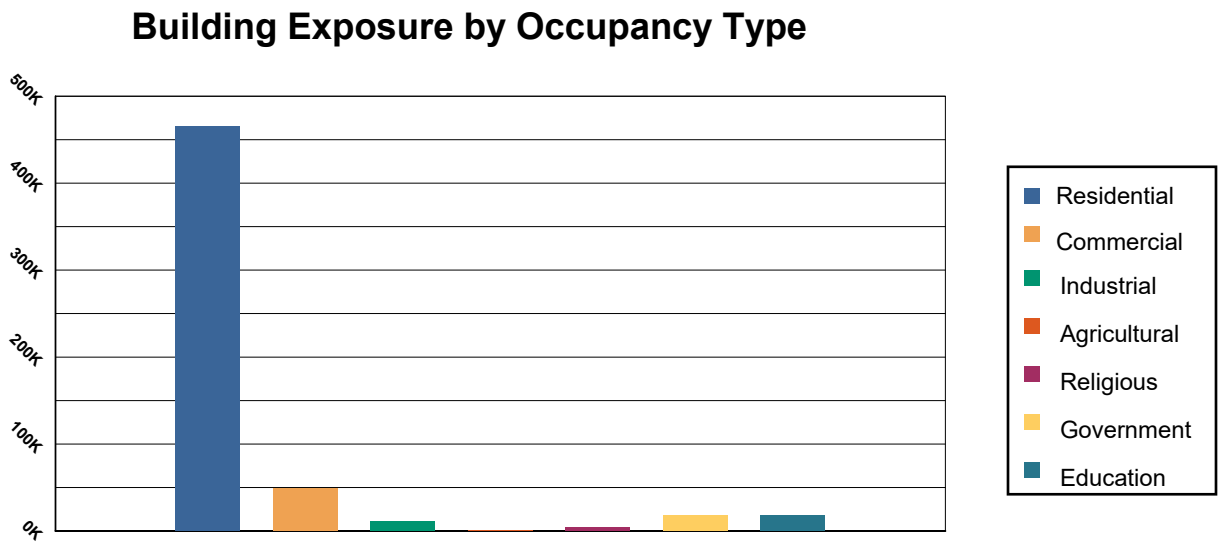

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General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

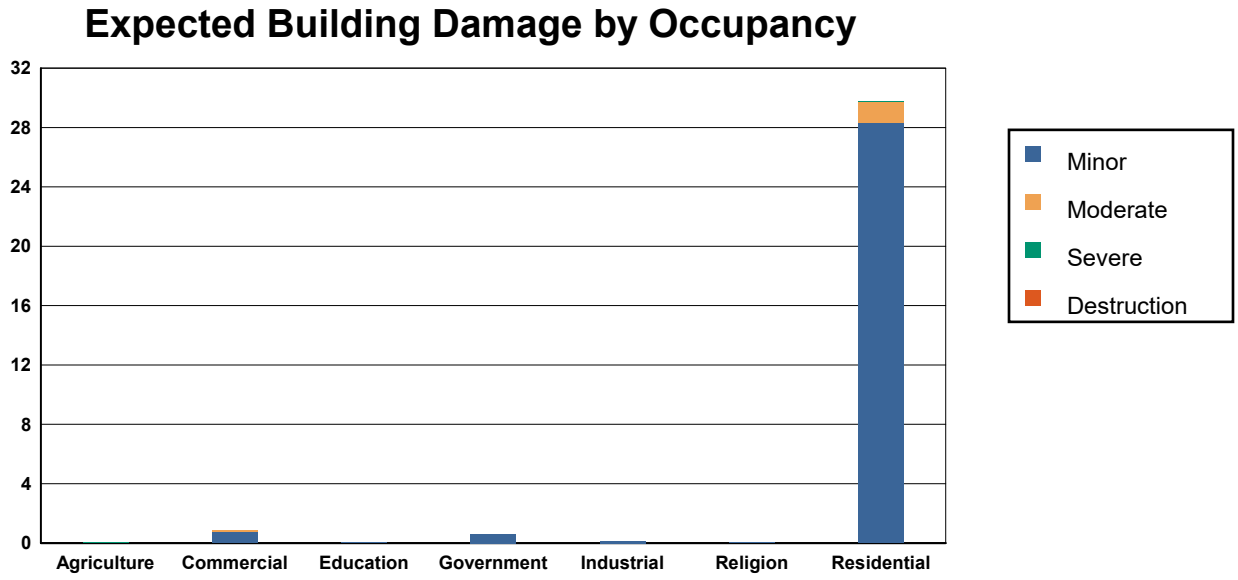


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	1.96	97.75	0.04	1.94	0.00	0.24	0.00	0.07	0.00	0.00
Commercial	44.11	98.02	0.79	1.76	0.09	0.21	0.00	0.01	0.00	0.00
Education	0.98	98.32	0.02	1.65	0.00	0.03	0.00	0.00	0.00	0.00
Government	36.37	98.31	0.62	1.67	0.01	0.02	0.00	0.00	0.00	0.00
Industrial	7.85	98.13	0.14	1.79	0.01	0.07	0.00	0.02	0.00	0.00
Religion	2.95	98.41	0.05	1.55	0.00	0.04	0.00	0.00	0.00	0.00
Residential	1,185.22	97.55	28.34	2.33	1.43	0.12	0.02	0.00	0.00	0.00
Total	**1,279.44**		**29.99**		**1.54**		**0.02**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	11	97.68	0	2.26	0	0.06	0	0.00	0	0.00
Masonry	79	96.64	2	2.78	0	0.57	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	47	98.13	1	1.75	0	0.11	0	0.01	0	0.00
Wood	1,142	97.73	26	2.20	1	0.06	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

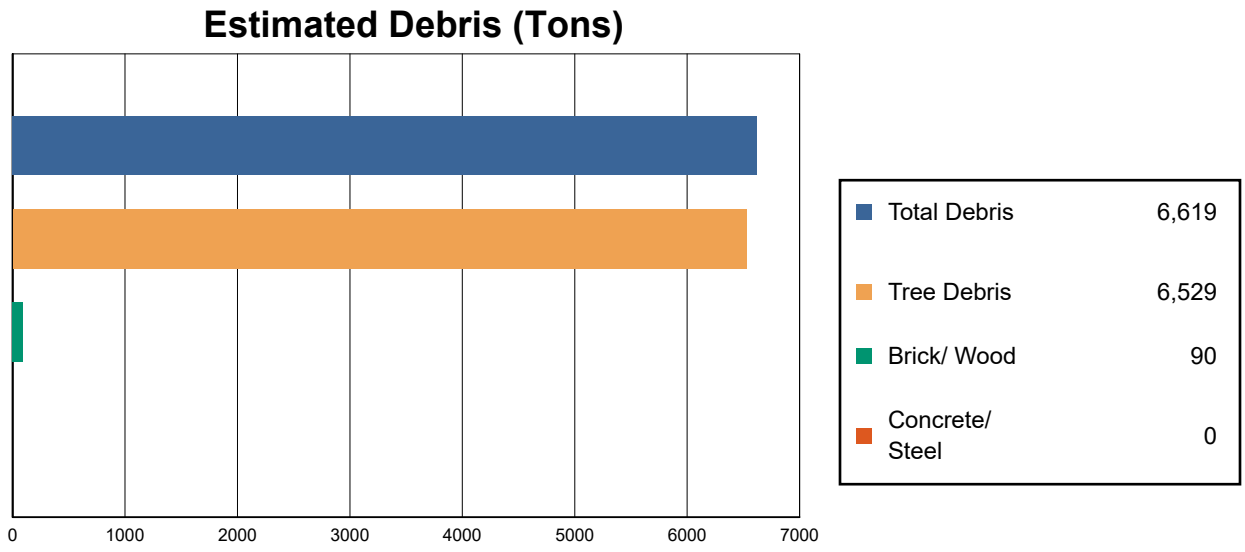
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

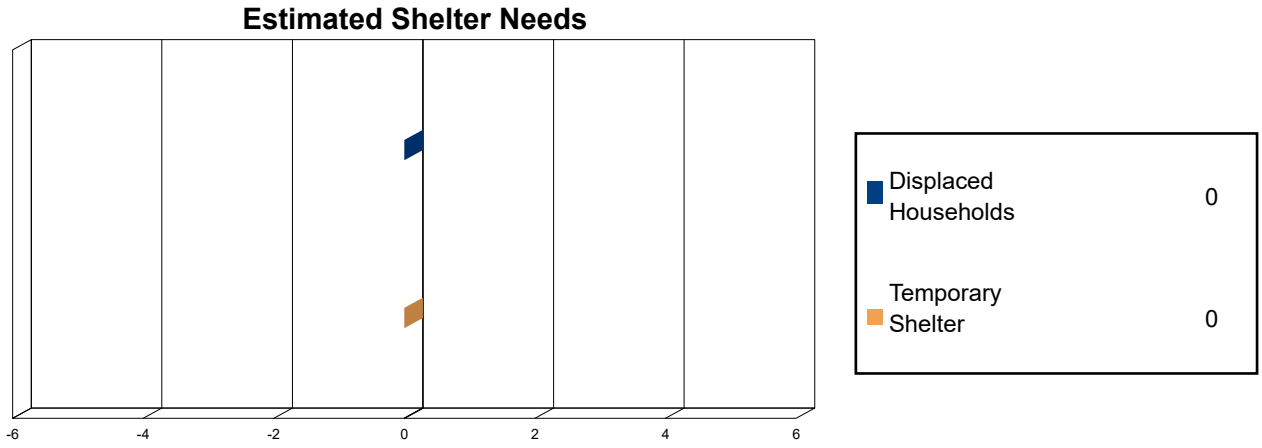


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,619 tons of debris will be generated. Of the total amount, 5,550 tons (84%) is Other Tree Debris. Of the remaining 1,069 tons, Brick/Wood comprises 8% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 979 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 3,151) will seek temporary shelter in public shelters.

Economic Loss

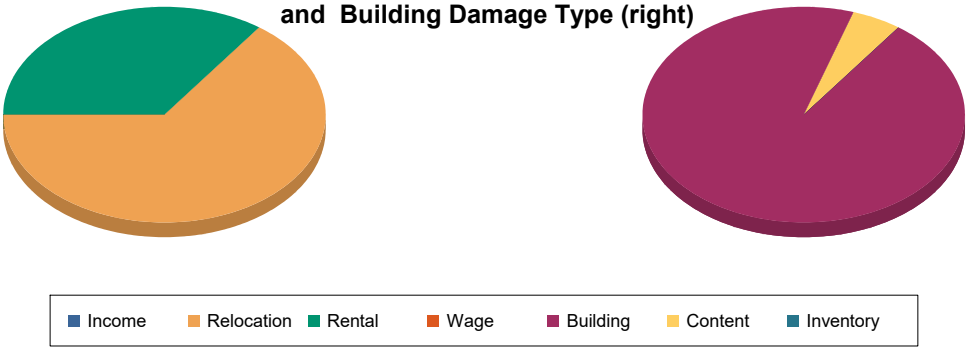
The total economic loss estimated for the hurricane is 1.7 million dollars, which represents 0.30 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

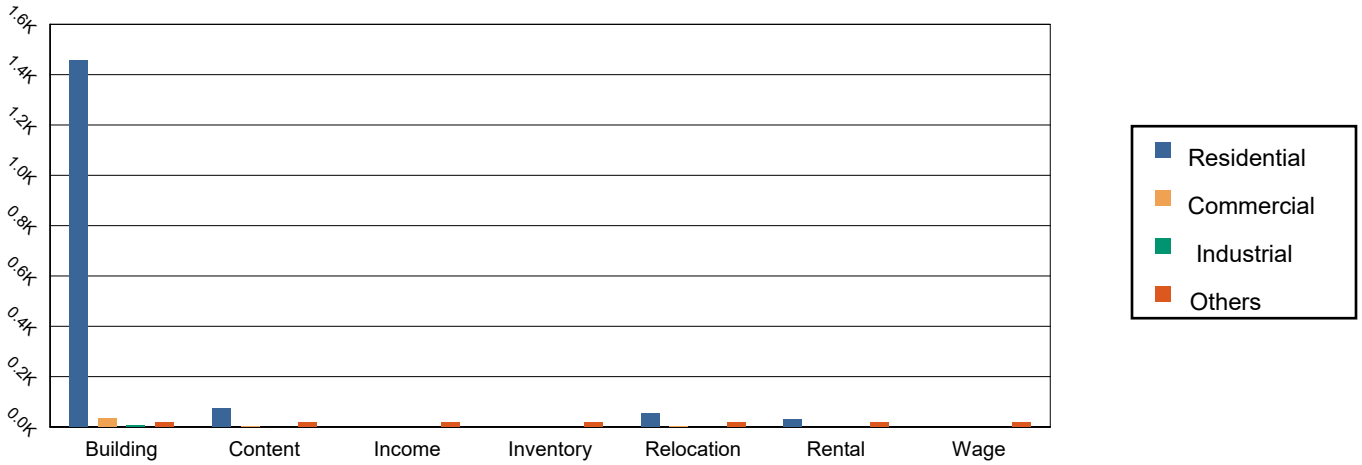


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,455.61	34.63	4.71	16.99	1,511.94
	Content	75.00	3.62	0.31	0.10	79.03
	Inventory	0.00	0.13	0.04	0.07	0.25
	Subtotal	**1,530.61**	**38.39**	**5.05**	**17.17**	**1,591.23**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	54.48	0.67	0.01	0.08	55.23
	Rental	29.92	0.00	0.00	0.00	29.92
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**84.40**	**0.67**	**0.01**	**0.08**	**85.16**

Total

Total	**1,615.01**	**39.06**	**5.06**	**17.25**	**1,676.38**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,632	99,313	564,945
Total	**3,151**	**465,632**	**99,313**	**564,945**
Study Region Total	**3,151**	**465,632**	**99,313**	**564,945**

Hazus: Hurricane Global Risk Report

Region Name:	Andover_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 15.70 square miles and contains 1 census tracts. There are over 1 thousand households in the region and a total population of 3,151 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 565 million dollars. Approximately 93% of the buildings (and 82% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,311 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

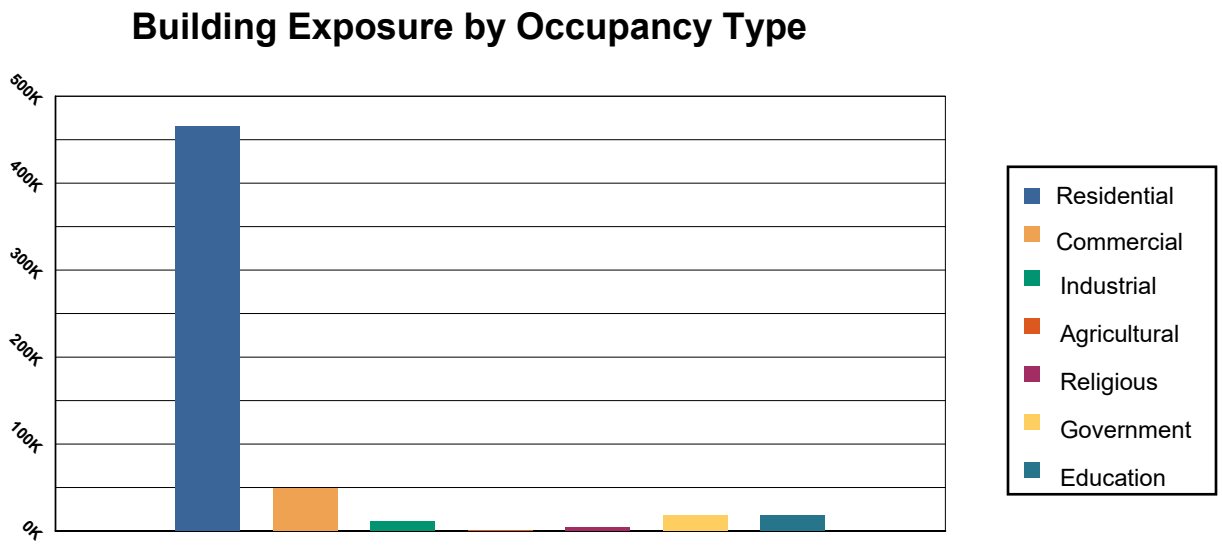


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	465,632	82.42%
Commercial	48,926	8.66%
Industrial	10,758	1.90%
Agricultural	1,016	0.18%
Religious	3,671	0.65%
Government	17,769	3.15%
Education	17,173	3.04%
Total	**564,945**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 8 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

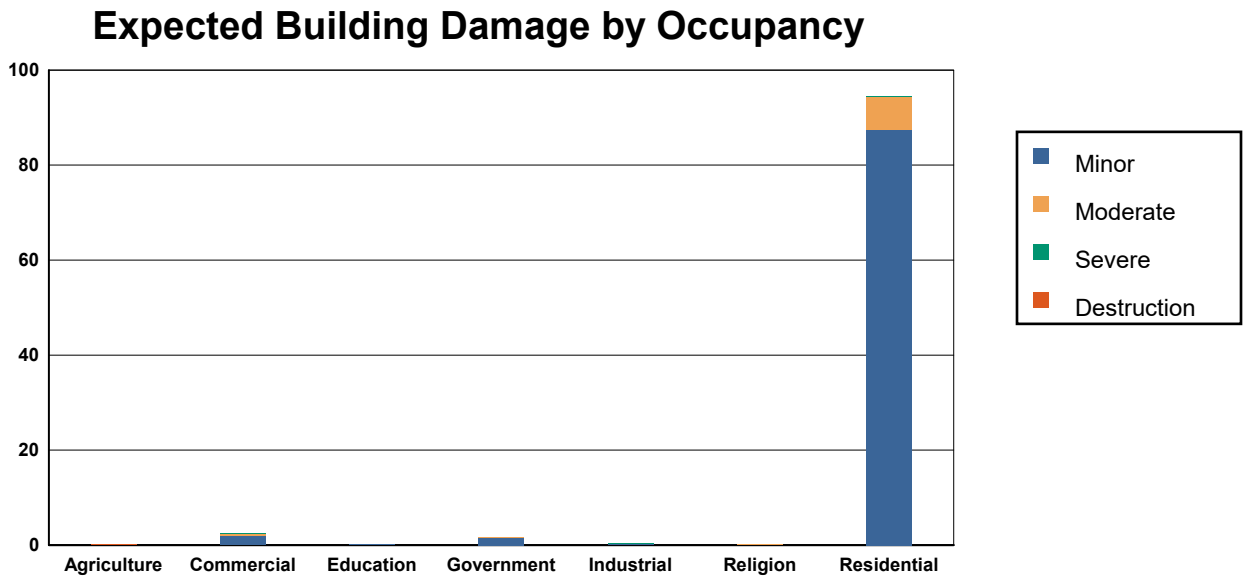


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	1.86	92.96	0.11	5.61	0.02	0.99	0.01	0.42	0.00	0.02
Commercial	42.63	94.74	2.03	4.51	0.31	0.69	0.03	0.06	0.00	0.00
Education	0.96	95.64	0.04	4.16	0.00	0.20	0.00	0.00	0.00	0.00
Government	35.43	95.75	1.50	4.06	0.07	0.19	0.00	0.00	0.00	0.00
Industrial	7.62	95.21	0.34	4.29	0.03	0.39	0.01	0.10	0.00	0.00
Religion	2.86	95.27	0.14	4.53	0.01	0.19	0.00	0.01	0.00	0.00
Residential	1,120.48	92.22	87.43	7.20	7.02	0.58	0.06	0.01	0.00	0.00
Total	**1,211.83**		**91.60**		**7.46**		**0.11**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	10	94.26	1	5.31	0	0.43	0	0.00	0	0.00
Masonry	75	91.78	5	6.36	1	1.80	0	0.05	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	46	95.36	2	4.11	0	0.47	0	0.06	0	0.00
Wood	1,081	92.51	82	7.06	5	0.42	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

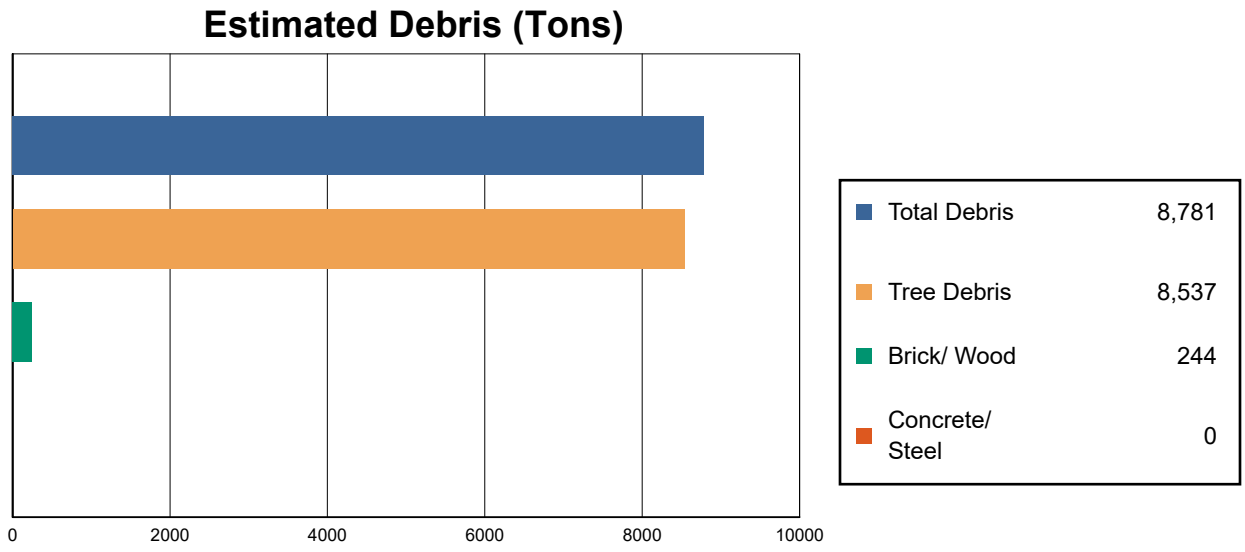
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

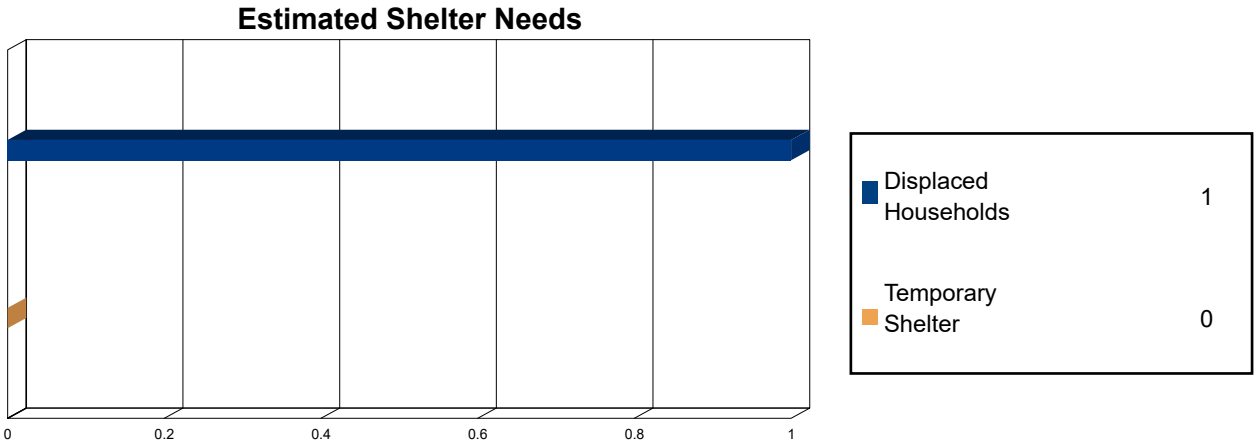


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 8,781 tons of debris will be generated. Of the total amount, 7,256 tons (83%) is Other Tree Debris. Of the remaining 1,525 tons, Brick/Wood comprises 16% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 10 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,281 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 3,151) will seek temporary shelter in public shelters.

Economic Loss

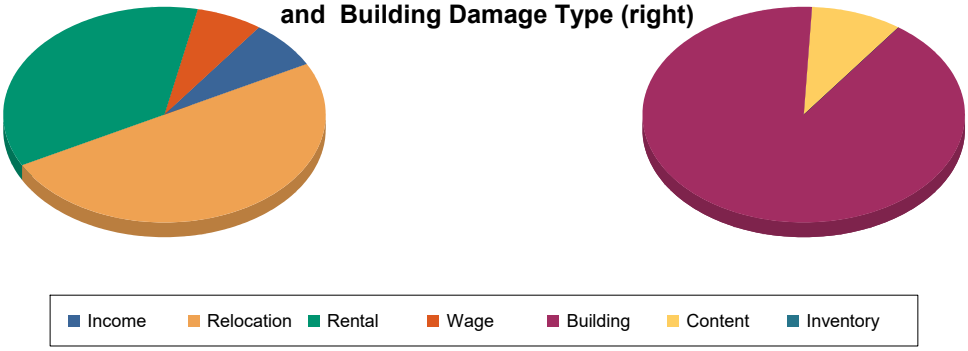
The total economic loss estimated for the hurricane is 3.5 million dollars, which represents 0.62 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 3 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

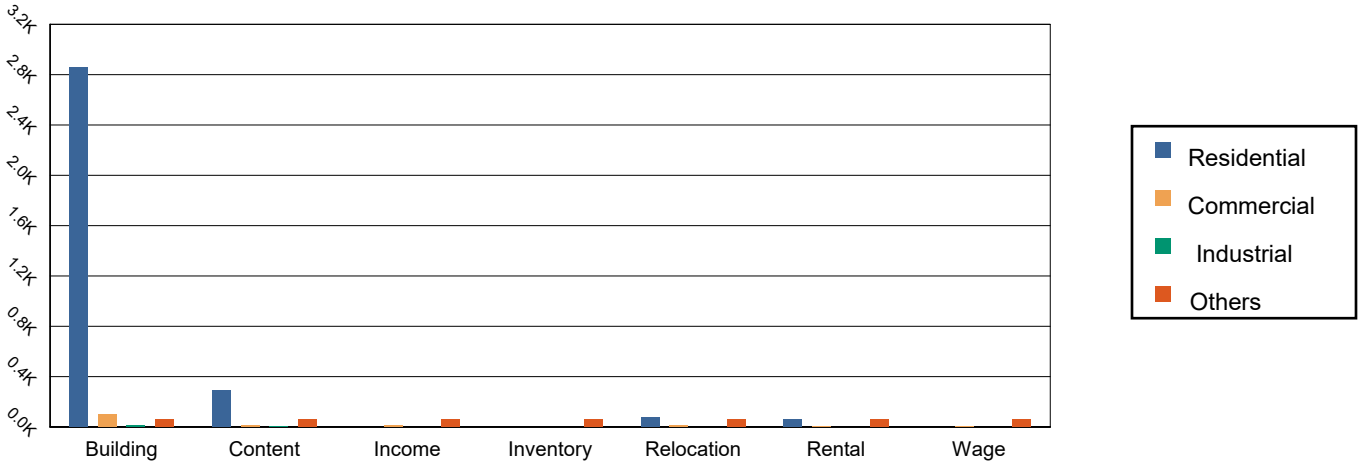


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,861.06	96.51	12.94	42.89	3,013.40
	Content	287.75	12.13	2.76	3.16	305.80
	Inventory	0.00	0.84	0.38	0.52	1.74
	Subtotal	**3,148.81**	**109.48**	**16.08**	**46.57**	**3,320.94**
Business Interruption Loss						
	Income	0.00	10.49	0.04	2.04	12.57
	Relocation	73.78	9.39	0.18	2.04	85.40
	Rental	55.91	5.61	0.03	0.16	61.70
	Wage	0.00	6.51	0.07	4.81	11.39
	Subtotal	**129.70**	**32.00**	**0.31**	**9.05**	**171.06**

Total

Total	**3,278.51**	**141.48**	**16.39**	**55.62**	**3,492.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,632	99,313	564,945
Total	**3,151**	**465,632**	**99,313**	**564,945**
Study Region Total	**3,151**	**465,632**	**99,313**	**564,945**

Hazus: Hurricane Global Risk Report

Region Name:	Andover_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 15.70 square miles and contains 1 census tracts. There are over 1 thousand households in the region and a total population of 3,151 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 565 million dollars. Approximately 93% of the buildings (and 82% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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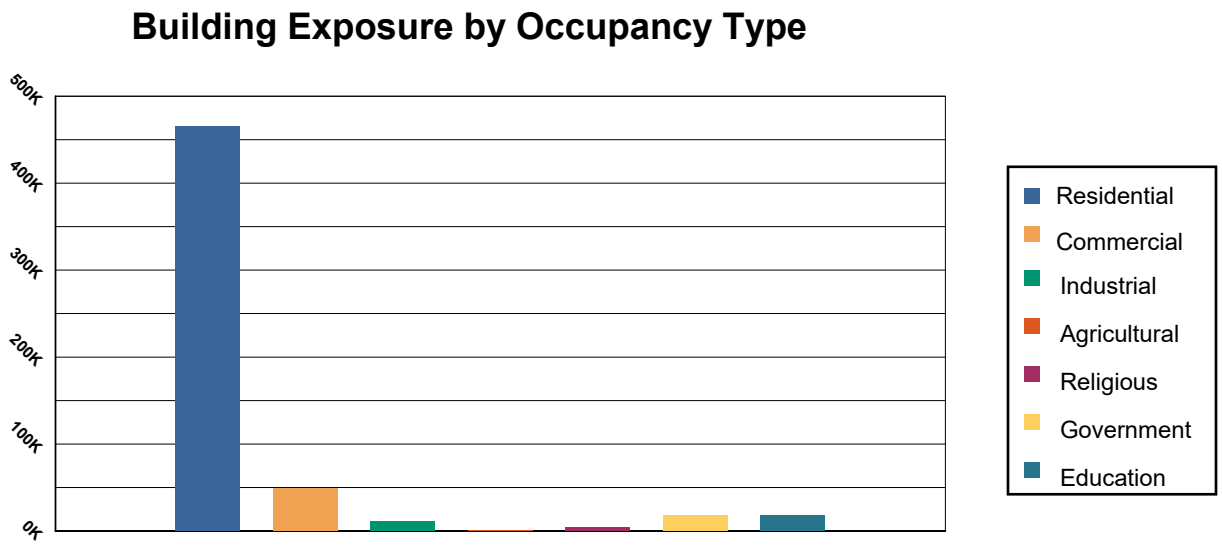


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	465,632	82.42%
Commercial	48,926	8.66%
Industrial	10,758	1.90%
Agricultural	1,016	0.18%
Religious	3,671	0.65%
Government	17,769	3.15%
Education	17,173	3.04%
Total	**564,945**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 23 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

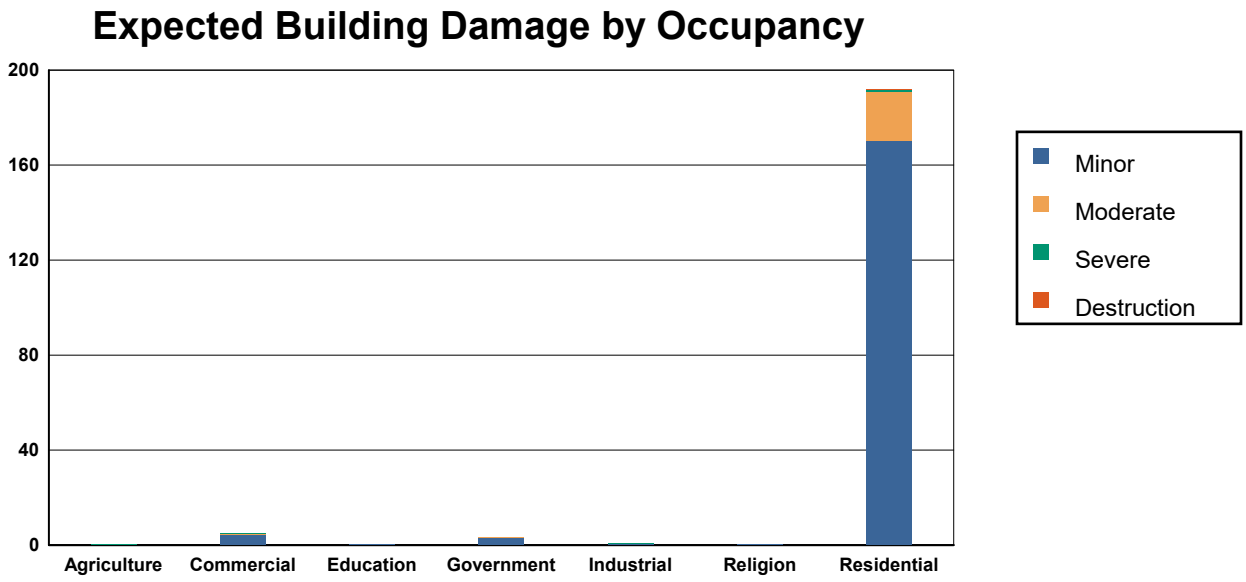


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	1.70	85.13	0.22	11.06	0.05	2.50	0.02	1.20	0.00	0.11
Commercial	39.93	88.73	4.13	9.18	0.83	1.85	0.11	0.24	0.00	0.00
Education	0.90	90.30	0.09	8.69	0.01	0.97	0.00	0.04	0.00	0.00
Government	33.51	90.56	3.12	8.43	0.36	0.98	0.01	0.03	0.00	0.00
Industrial	7.17	89.65	0.69	8.61	0.11	1.40	0.03	0.32	0.00	0.03
Religion	2.68	89.35	0.29	9.67	0.03	0.94	0.00	0.04	0.00	0.00
Residential	1,023.02	84.20	170.07	14.00	20.99	1.73	0.70	0.06	0.22	0.02
Total	**1,108.91**		**178.61**		**22.38**		**0.87**		**0.22**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	10	87.90	1	10.23	0	1.85	0	0.02	0	0.00
Masonry	69	84.55	9	11.40	3	3.88	0	0.16	0	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	43	89.90	4	8.29	1	1.57	0	0.24	0	0.00
Wood	988	84.57	163	13.94	17	1.43	1	0.05	0	0.02

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

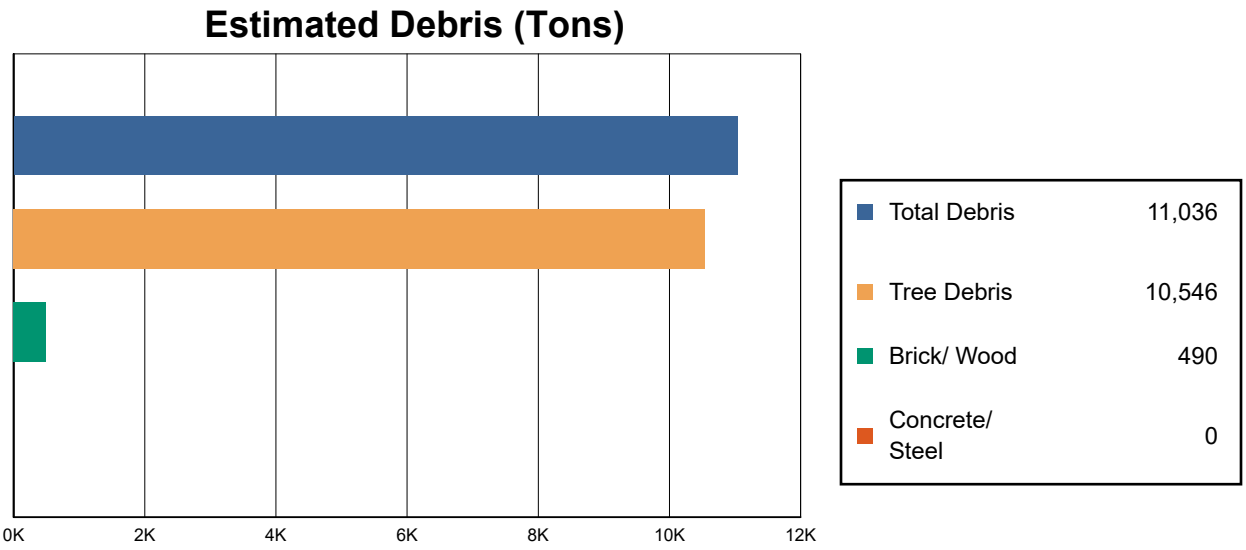
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

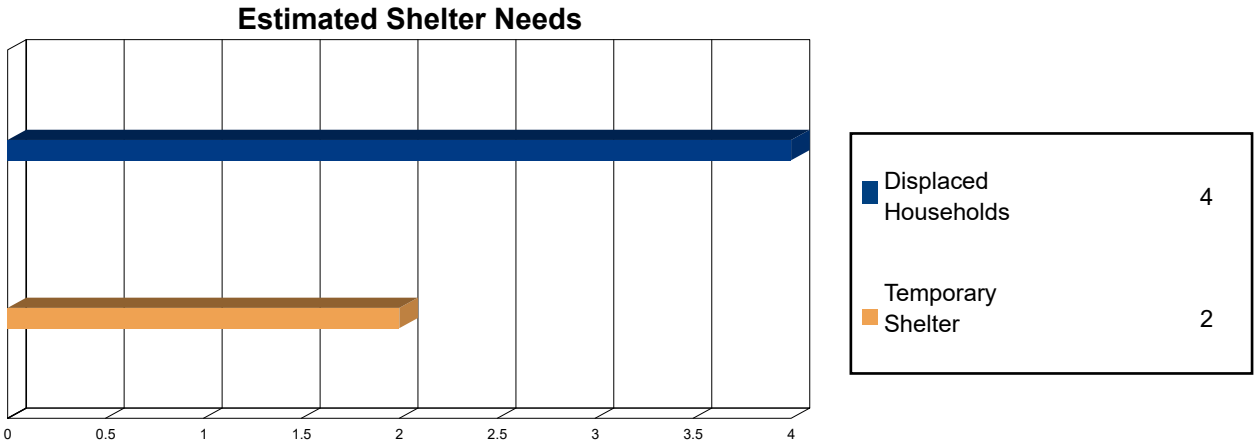


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 11,036 tons of debris will be generated. Of the total amount, 8,964 tons (81%) is Other Tree Debris. Of the remaining 2,072 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 20 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,582 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 4 households to be displaced due to the hurricane. Of these, 2 people (out of a total population of 3,151) will seek temporary shelter in public shelters.

Economic Loss

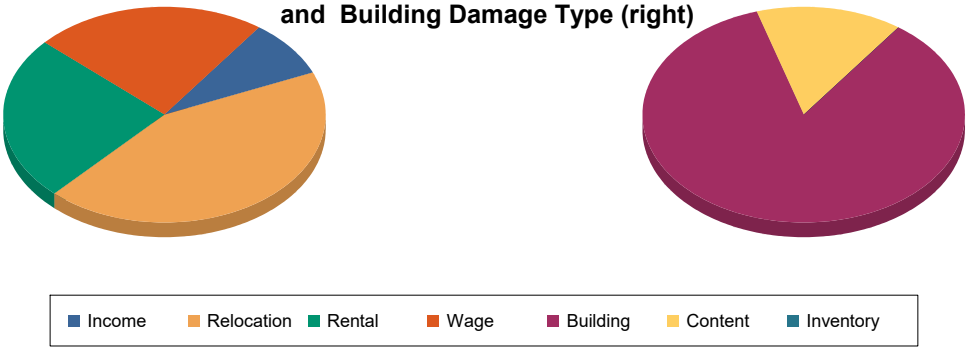
The total economic loss estimated for the hurricane is 7.0 million dollars, which represents 1.24 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 7 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

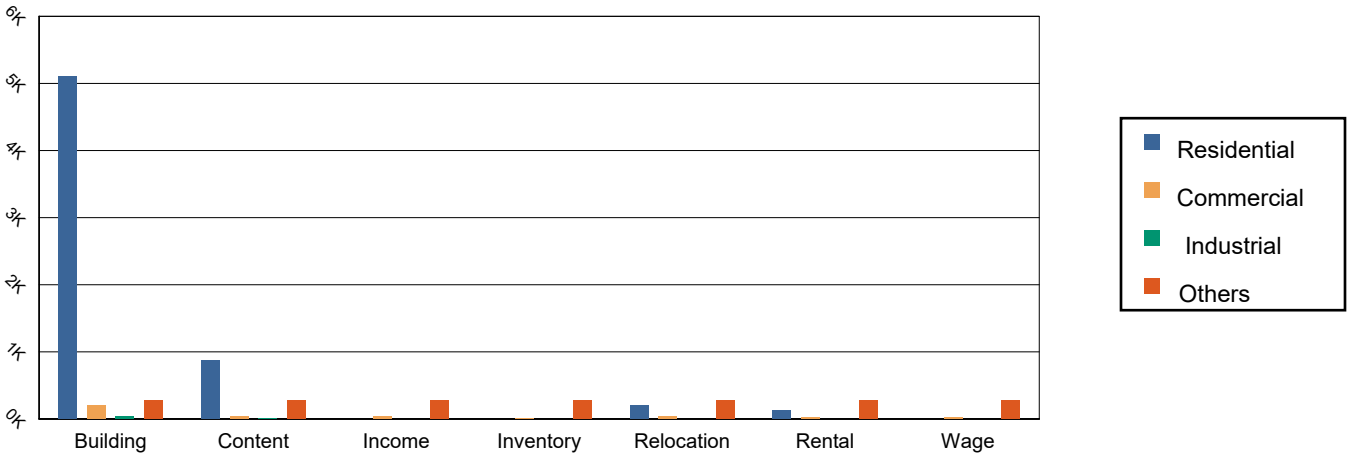


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,108.80	205.13	34.33	105.64	5,453.90
	Content	869.54	37.18	12.90	13.36	932.99
	Inventory	0.00	3.35	1.77	1.95	7.06
	Subtotal	**5,978.34**	**245.67**	**48.99**	**120.95**	**6,393.95**
Business Interruption Loss						
	Income	0.00	40.47	0.59	10.52	51.58
	Relocation	208.36	33.55	1.47	19.47	262.85
	Rental	123.03	21.70	0.50	3.81	149.04
	Wage	0.00	24.00	0.99	116.27	141.26
	Subtotal	**331.39**	**119.72**	**3.56**	**150.07**	**604.74**

Total

Total	**6,309.74**	**365.39**	**52.54**	**271.02**	**6,998.69**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,632	99,313	564,945
Total	**3,151**	**465,632**	**99,313**	**564,945**
Study Region Total	**3,151**	**465,632**	**99,313**	**564,945**

Hazus: Hurricane Global Risk Report

Region Name:	Andover_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 15.70 square miles and contains 1 census tracts. There are over 1 thousand households in the region and a total population of 3,151 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 565 million dollars. Approximately 93% of the buildings (and 82% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,311 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

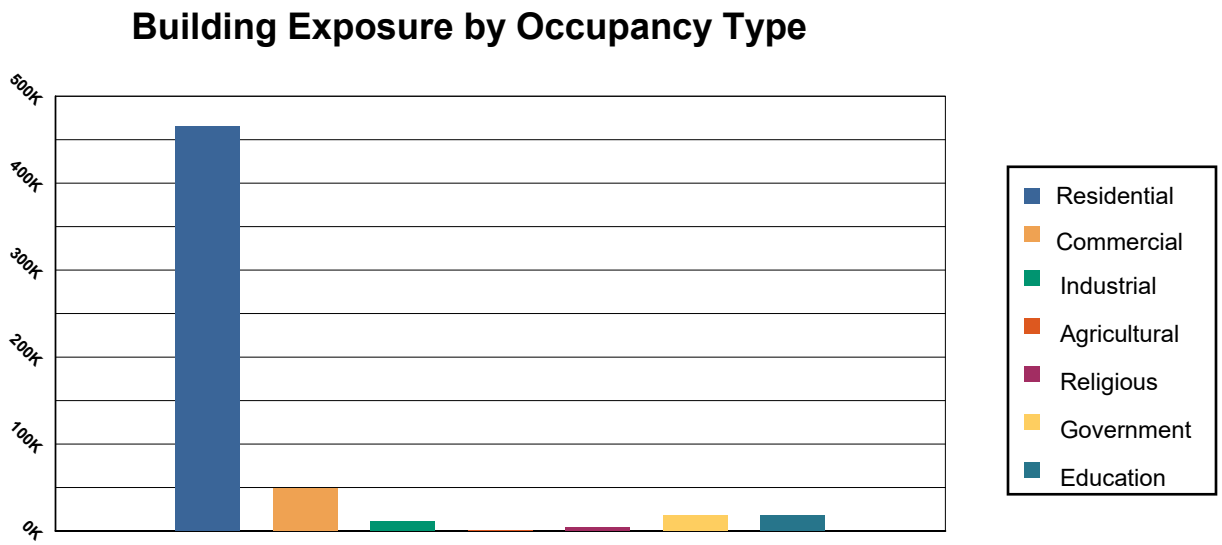


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	465,632	82.42%
Commercial	48,926	8.66%
Industrial	10,758	1.90%
Agricultural	1,016	0.18%
Religious	3,671	0.65%
Government	17,769	3.15%
Education	17,173	3.04%
Total	**564,945**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 59 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

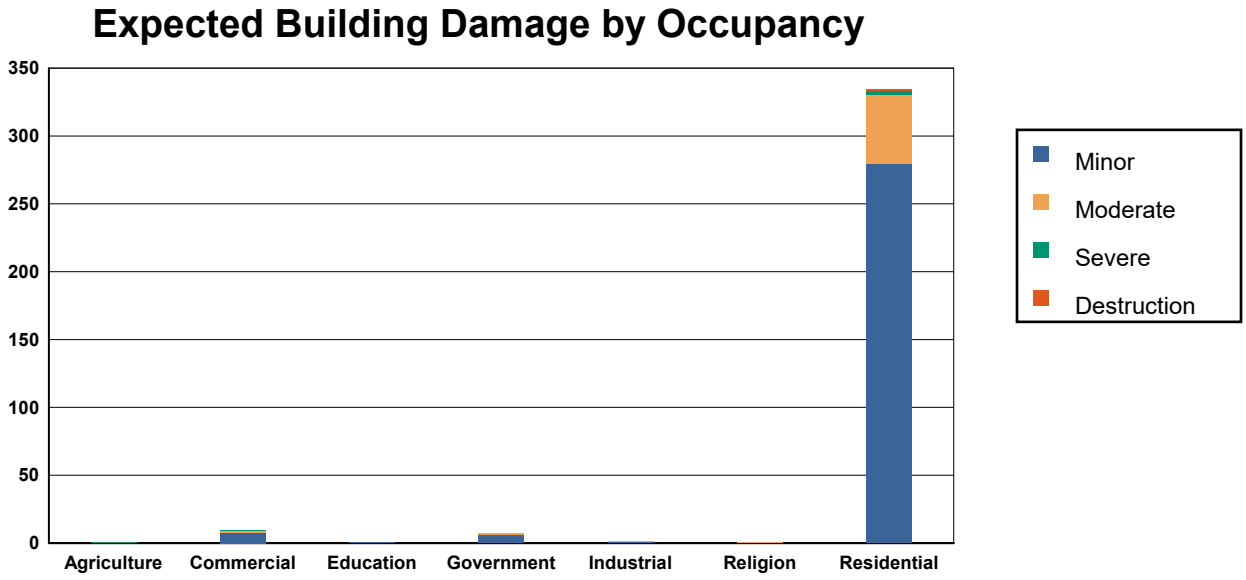


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	1.46	73.07	0.37	18.66	0.11	5.35	0.05	2.58	0.01	0.34
Commercial	35.27	78.38	7.33	16.30	2.11	4.69	0.28	0.63	0.00	0.00
Education	0.81	80.52	0.16	15.81	0.04	3.51	0.00	0.16	0.00	0.00
Government	29.93	80.89	5.69	15.39	1.32	3.57	0.06	0.16	0.00	0.00
Industrial	6.37	79.64	1.23	15.32	0.33	4.18	0.06	0.77	0.01	0.08
Religion	2.37	79.00	0.53	17.59	0.10	3.25	0.00	0.16	0.00	0.00
Residential	880.63	72.48	279.58	23.01	50.41	4.15	2.94	0.24	1.43	0.12
Total	**956.84**		**294.90**		**54.41**		**3.40**		**1.44**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	8	76.85	2	17.32	1	5.70	0	0.13	0	0.00
Masonry	60	73.50	15	18.35	6	7.67	0	0.42	0	0.06
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	38	79.96	7	14.83	2	4.56	0	0.64	0	0.00
Wood	852	72.91	270	23.10	42	3.63	3	0.24	1	0.12

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

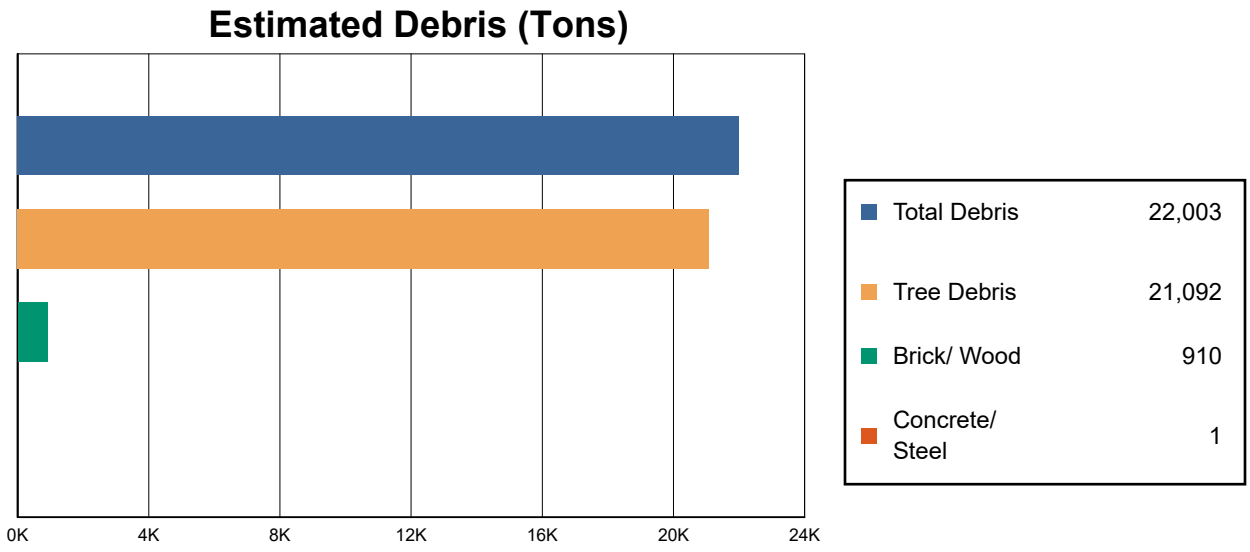
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

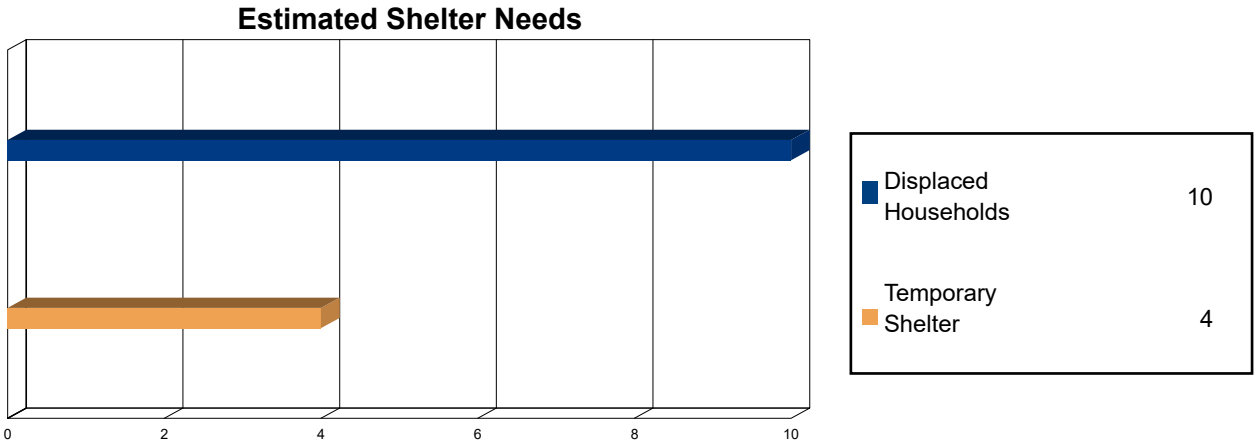


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 22,003 tons of debris will be generated. Of the total amount, 17,928 tons (81%) is Other Tree Debris. Of the remaining 4,075 tons, Brick/Wood comprises 22% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 36 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,164 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 10 households to be displaced due to the hurricane. Of these, 4 people (out of a total population of 3,151) will seek temporary shelter in public shelters.

Economic Loss

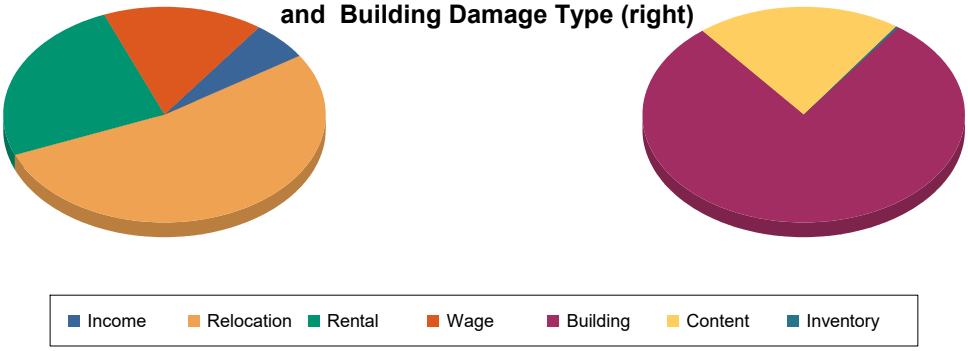
The total economic loss estimated for the hurricane is 14.1 million dollars, which represents 2.49 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 14 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

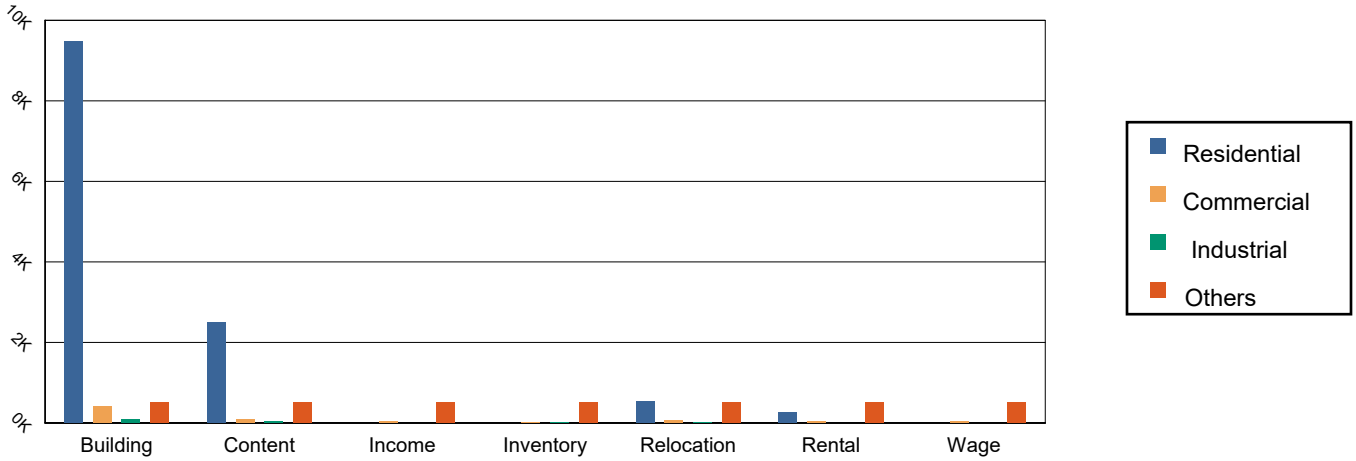


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	9,482.80	414.96	78.18	238.25	10,214.19
	Content	2,490.58	92.03	35.20	47.63	2,665.44
	Inventory	0.00	10.00	4.80	5.02	19.82
	Subtotal	**11,973.38**	**517.00**	**118.18**	**290.90**	**12,899.46**
Business Interruption Loss						
	Income	0.00	50.03	0.94	16.73	67.70
	Relocation	526.63	58.51	3.64	38.90	627.68
	Rental	252.30	33.69	0.84	6.01	292.84
	Wage	0.00	30.81	1.58	158.86	191.24
	Subtotal	**778.93**	**173.03**	**7.00**	**220.51**	**1,179.47**

Total

Total	**12,752.31**	**690.03**	**125.18**	**511.40**	**14,078.92**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,632	99,313	564,945
Total	**3,151**	**465,632**	**99,313**	**564,945**
Study Region Total	**3,151**	**465,632**	**99,313**	**564,945**

Hazus: Hurricane Global Risk Report

Region Name:	Andover_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
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There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 565 million dollars. Approximately 93% of the buildings (and 82% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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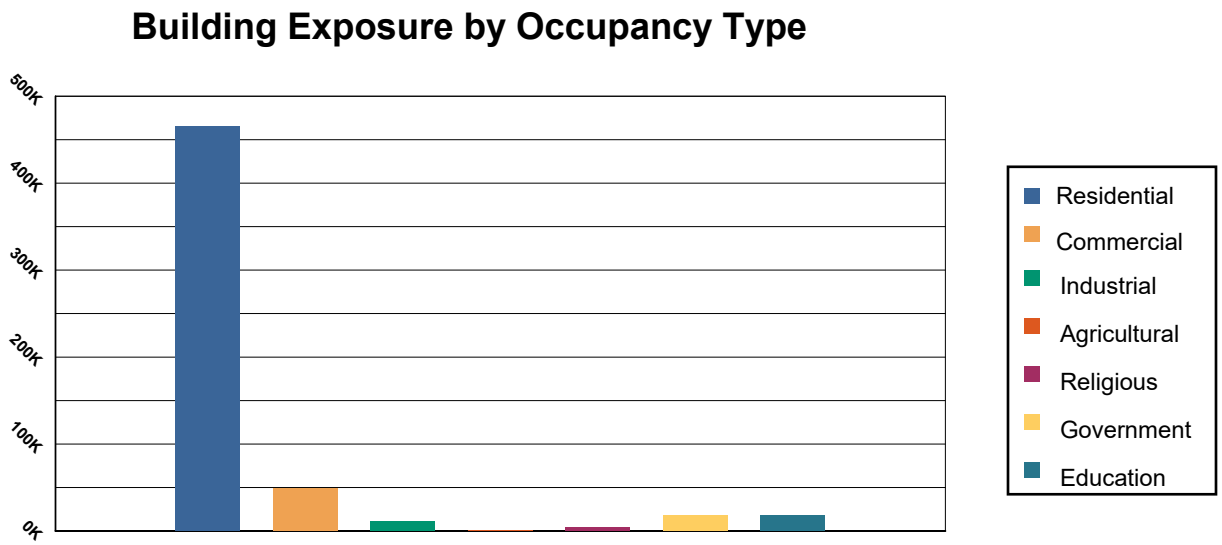


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	465,632	82.42%
Commercial	48,926	8.66%
Industrial	10,758	1.90%
Agricultural	1,016	0.18%
Religious	3,671	0.65%
Government	17,769	3.15%
Education	17,173	3.04%
Total	**564,945**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 99 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

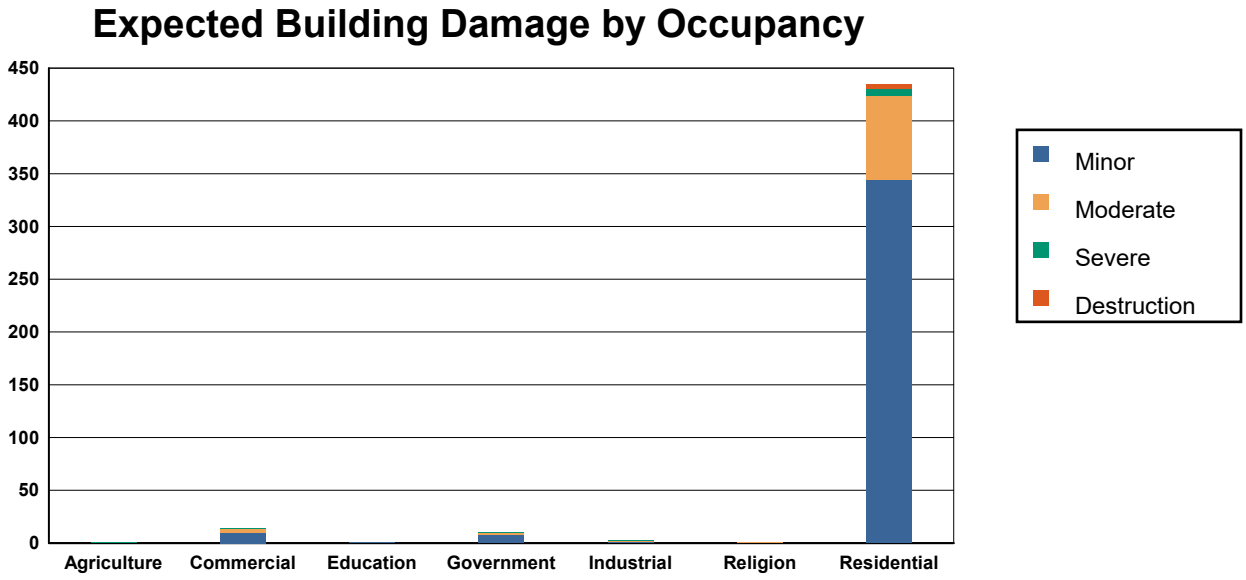


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	1.28	64.05	0.47	23.44	0.16	8.08	0.08	3.87	0.01	0.56
Commercial	31.35	69.67	9.41	20.91	3.68	8.19	0.55	1.22	0.00	0.01
Education	0.72	71.82	0.21	20.54	0.07	7.05	0.01	0.59	0.00	0.00
Government	26.71	72.20	7.38	19.96	2.68	7.25	0.22	0.60	0.00	0.00
Industrial	5.67	70.89	1.57	19.67	0.63	7.84	0.12	1.47	0.01	0.14
Religion	2.11	70.26	0.69	22.86	0.19	6.39	0.01	0.49	0.00	0.00
Residential	780.15	64.21	344.23	28.33	79.35	6.53	7.31	0.60	3.96	0.33
Total	**847.99**		**363.96**		**86.76**		**8.30**		**3.99**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	7	67.52	2	21.40	1	10.56	0	0.52	0	0.00
Masonry	53	65.07	18	22.47	9	11.43	1	0.88	0	0.15
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	34	71.15	9	19.01	4	8.51	1	1.33	0	0.01
Wood	755	64.64	334	28.60	68	5.84	7	0.59	4	0.33

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

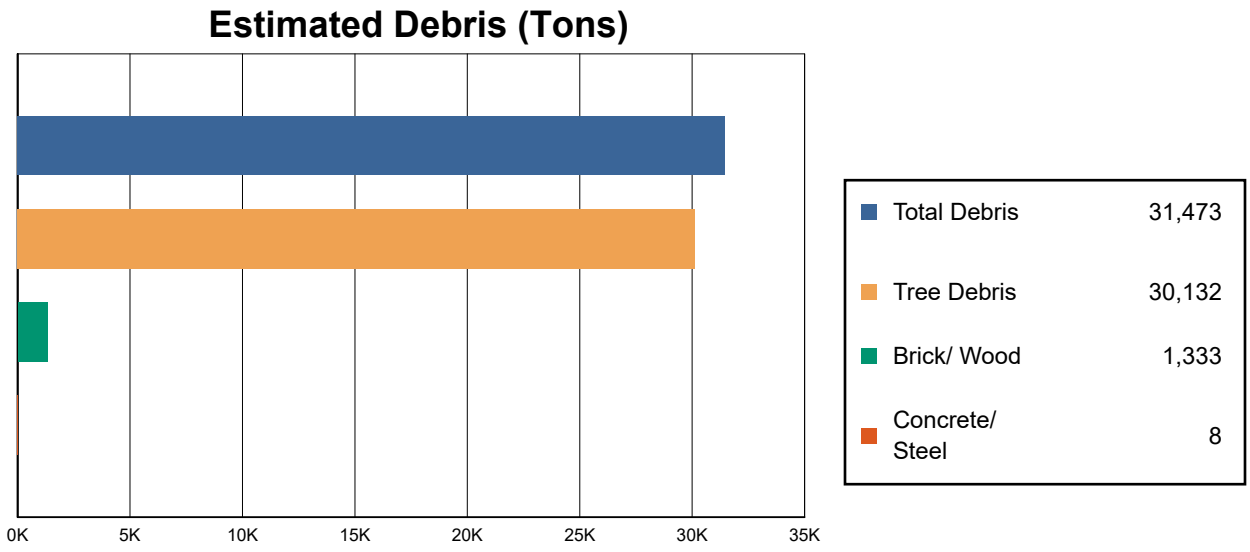
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	1	0	0	0

Induced Hurricane Damage

Debris Generation

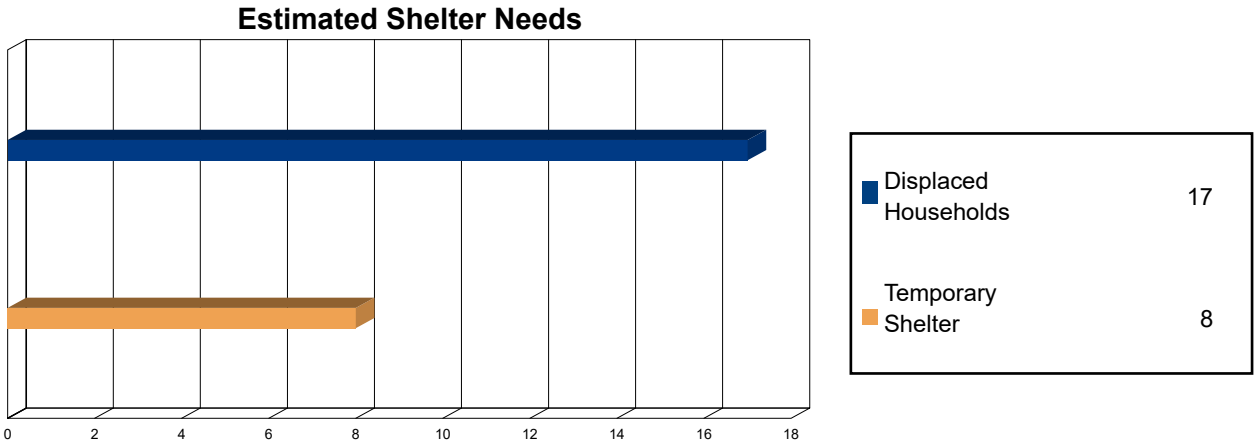


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 31,473 tons of debris will be generated. Of the total amount, 25,612 tons (81%) is Other Tree Debris. Of the remaining 5,861 tons, Brick/Wood comprises 23% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 54 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,520 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 17 households to be displaced due to the hurricane. Of these, 8 people (out of a total population of 3,151) will seek temporary shelter in public shelters.

Economic Loss

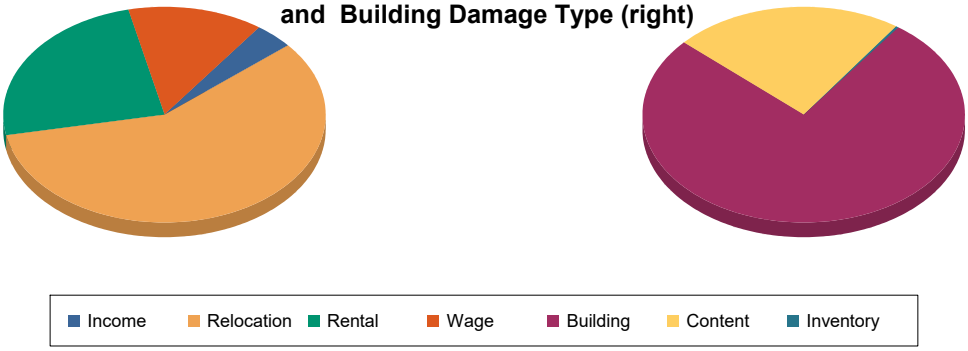
The total economic loss estimated for the hurricane is 22.1 million dollars, which represents 3.90 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 22 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

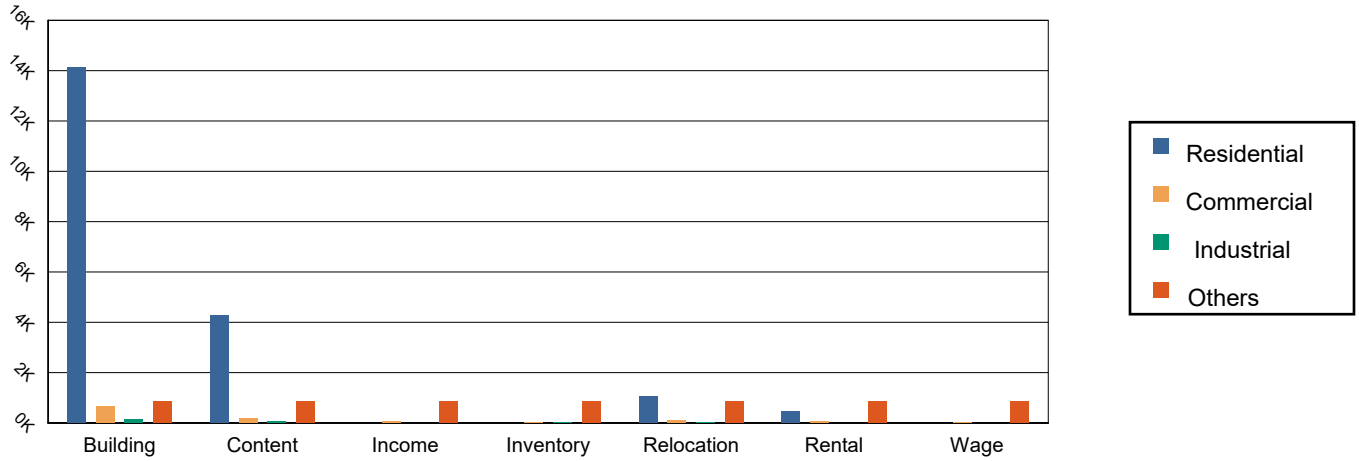


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	14,110.41	653.13	132.04	405.19	15,300.78
	Content	4,261.55	177.92	68.33	110.59	4,618.39
	Inventory	0.00	19.38	9.28	8.01	36.68
	Subtotal	**18,371.96**	**850.43**	**209.65**	**523.80**	**19,955.85**
Business Interruption Loss						
	Income	0.05	59.95	1.59	22.35	83.94
	Relocation	1,035.88	99.08	7.17	72.51	1,214.64
	Rental	444.18	56.19	1.56	11.60	513.54
	Wage	0.12	38.57	2.66	244.79	286.15
	Subtotal	**1,480.24**	**253.79**	**12.98**	**351.25**	**2,098.27**

Total

Total	**19,852.20**	**1,104.23**	**222.64**	**875.05**	**22,054.12**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	3,151	465,632	99,313	564,945
Total	**3,151**	**465,632**	**99,313**	**564,945**
Study Region Total	**3,151**	**465,632**	**99,313**	**564,945**

Hazus: Hurricane Global Risk Report

Region Name:	Avon_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Tuesday, May 2, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.59 square miles and contains 4 census tracts. There are over 7 thousand households in the region and a total population of 18,932 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,760 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

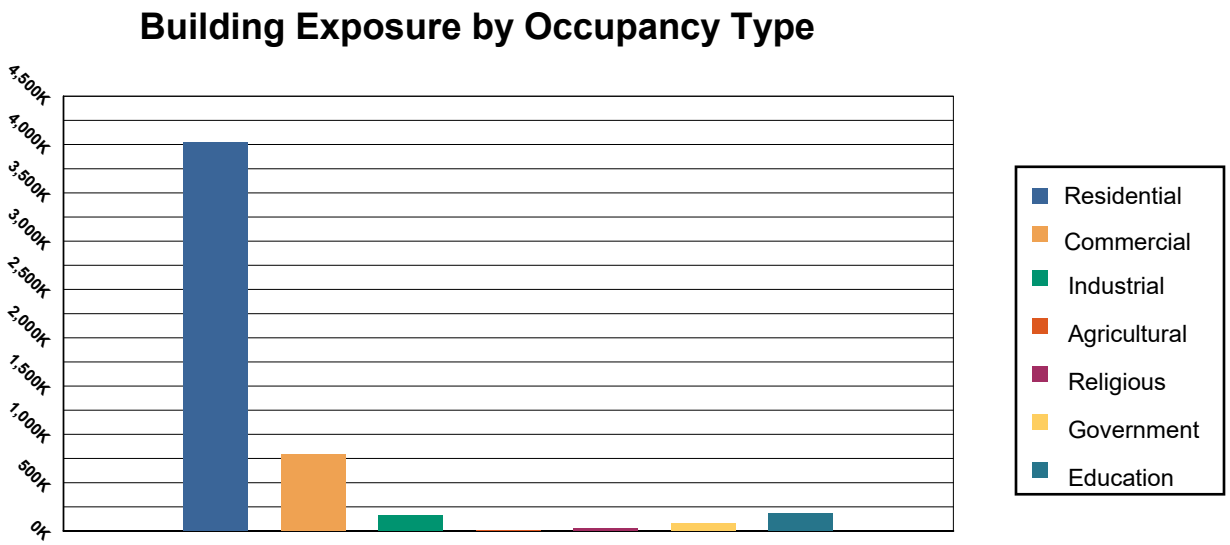


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,026,057	76.33%
Commercial	794,614	15.07%
Industrial	163,192	3.09%
Agricultural	4,372	0.08%
Religious	30,109	0.57%
Government	74,009	1.40%
Education	181,886	3.45%
Total	**5,274,239**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

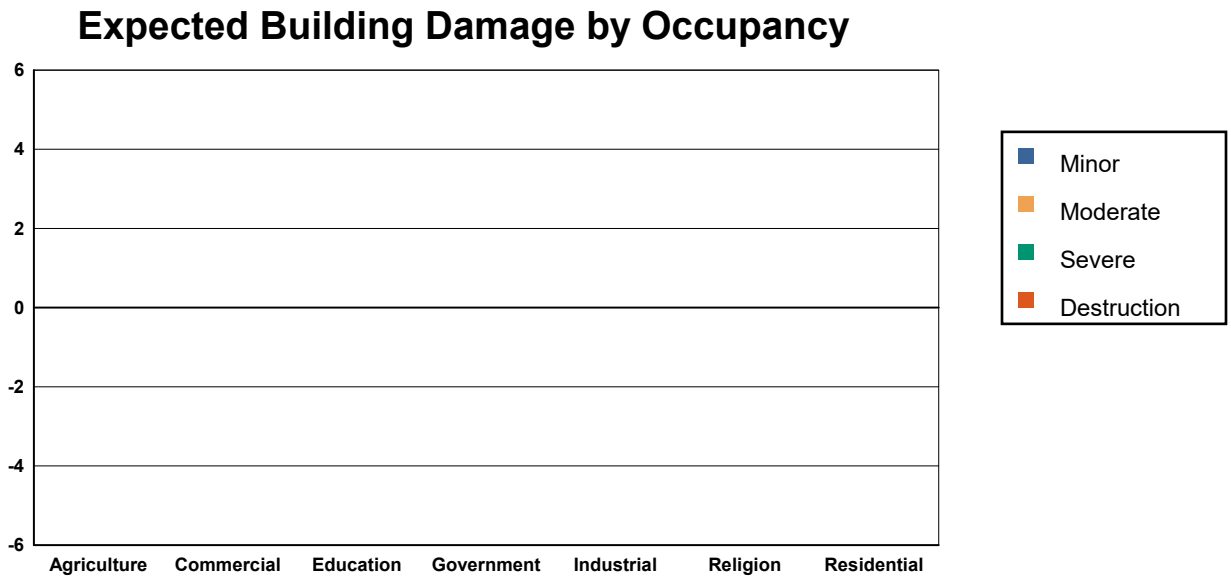


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	20.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	597.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	18.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	91.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	99.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	15.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	6,920.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**7,760.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	89	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	530	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	380	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	6,756	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

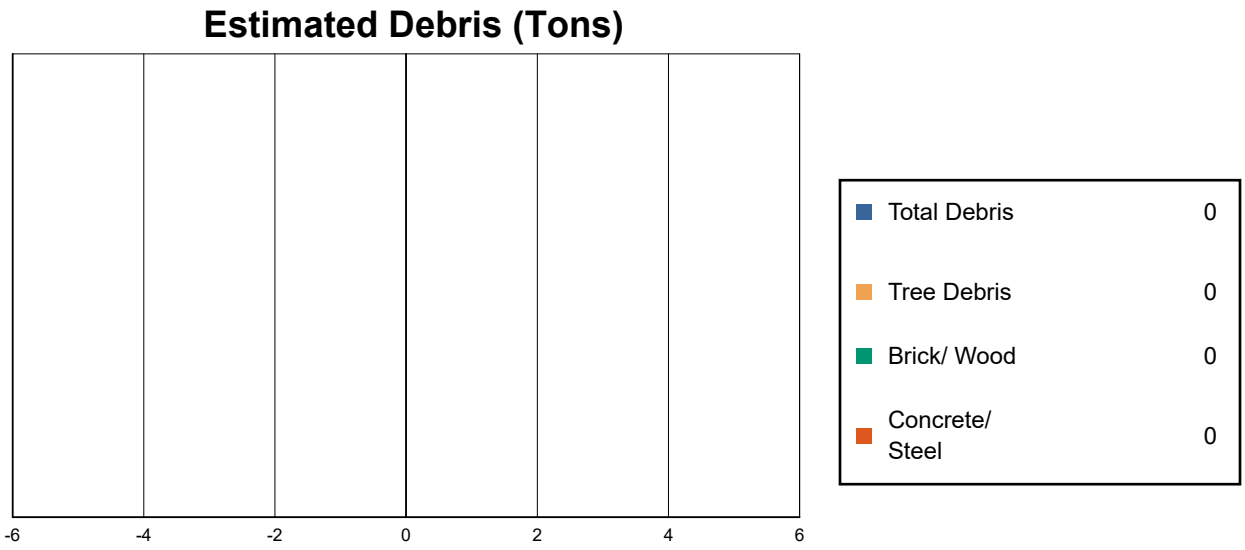
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

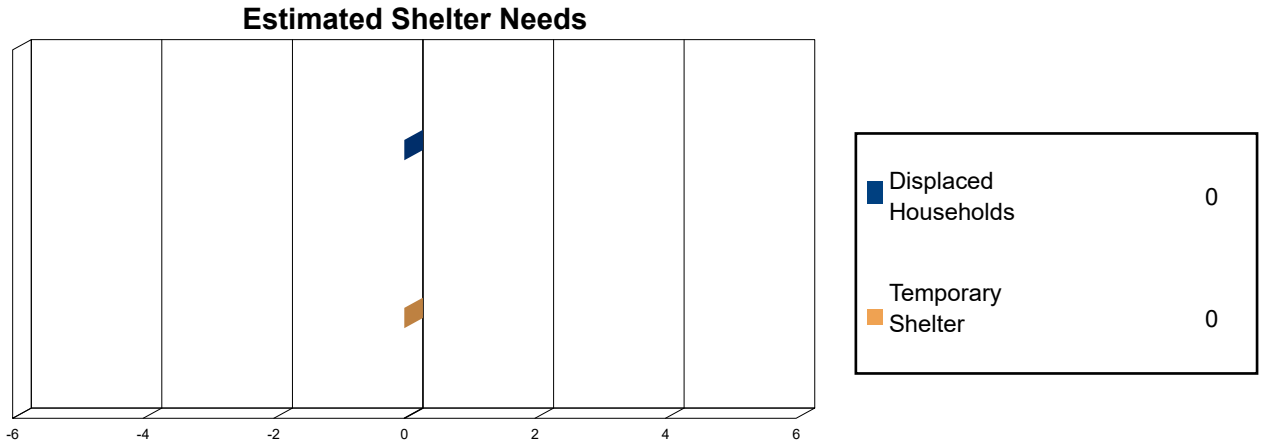


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 18,932) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

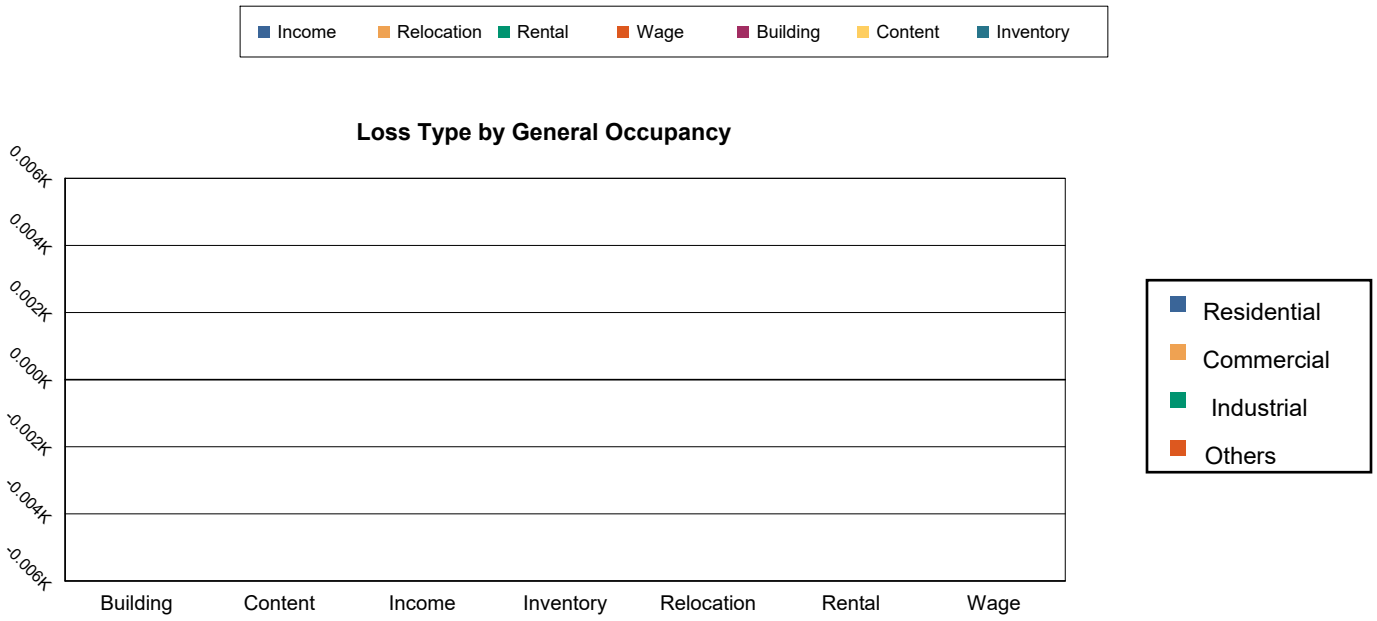


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,026,057	1,248,182	5,274,239
Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**
Study Region Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**

Hazus: Hurricane Global Risk Report

Region Name:	Avon_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Tuesday, May 2, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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Building Inventory

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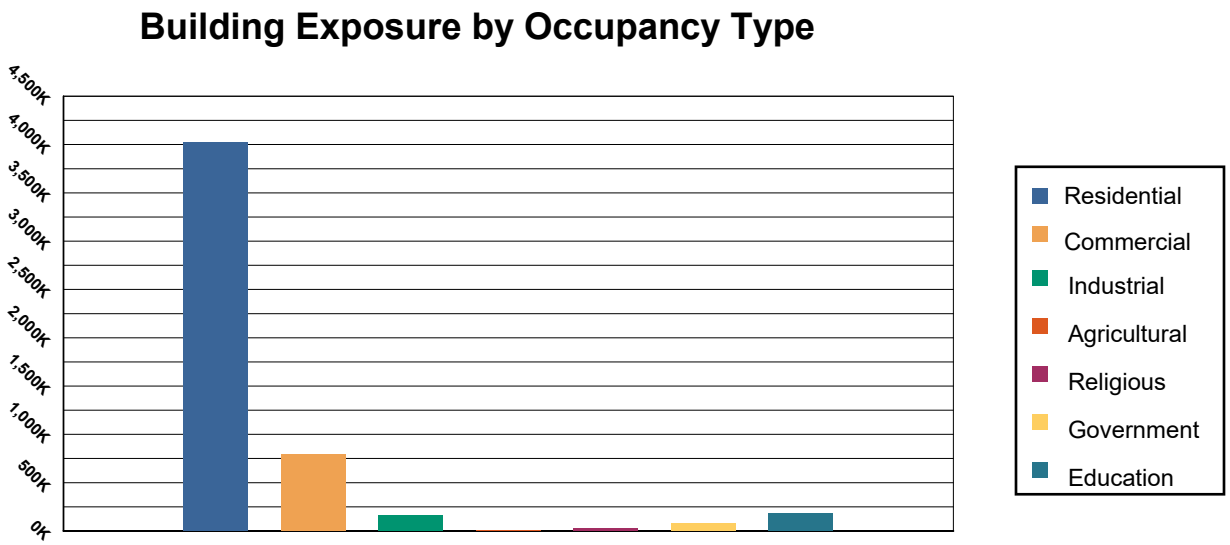

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
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Commercial	794,614	15.07%
Industrial	163,192	3.09%
Agricultural	4,372	0.08%
Religious	30,109	0.57%
Government	74,009	1.40%
Education	181,886	3.45%
Total	**5,274,239**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

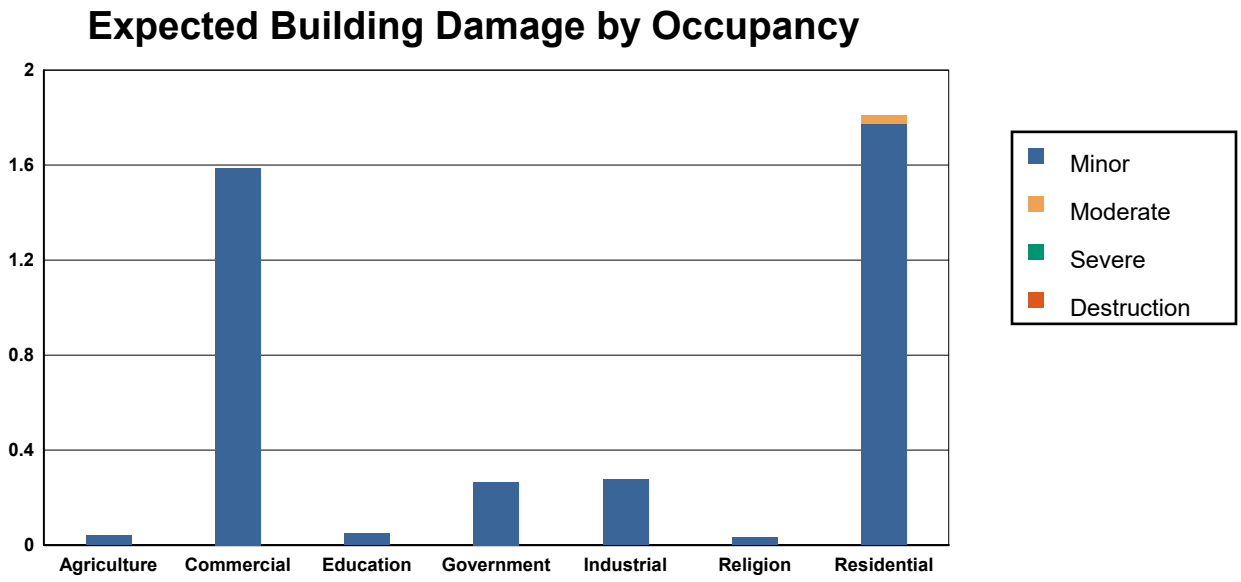


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.96	99.80	0.04	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	595.41	99.73	1.59	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Education	17.95	99.73	0.05	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Government	90.73	99.71	0.27	0.29	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	98.72	99.72	0.28	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Religion	14.97	99.78	0.03	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Residential	6,918.19	99.97	1.77	0.03	0.04	0.00	0.00	0.00	0.00	0.00
Total	**7,755.94**		**4.03**		**0.04**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	89	99.65	0	0.35	0	0.00	0	0.00	0	0.00
Masonry	529	99.73	1	0.27	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	379	99.70	1	0.30	0	0.00	0	0.00	0	0.00
Wood	6,755	99.99	1	0.01	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

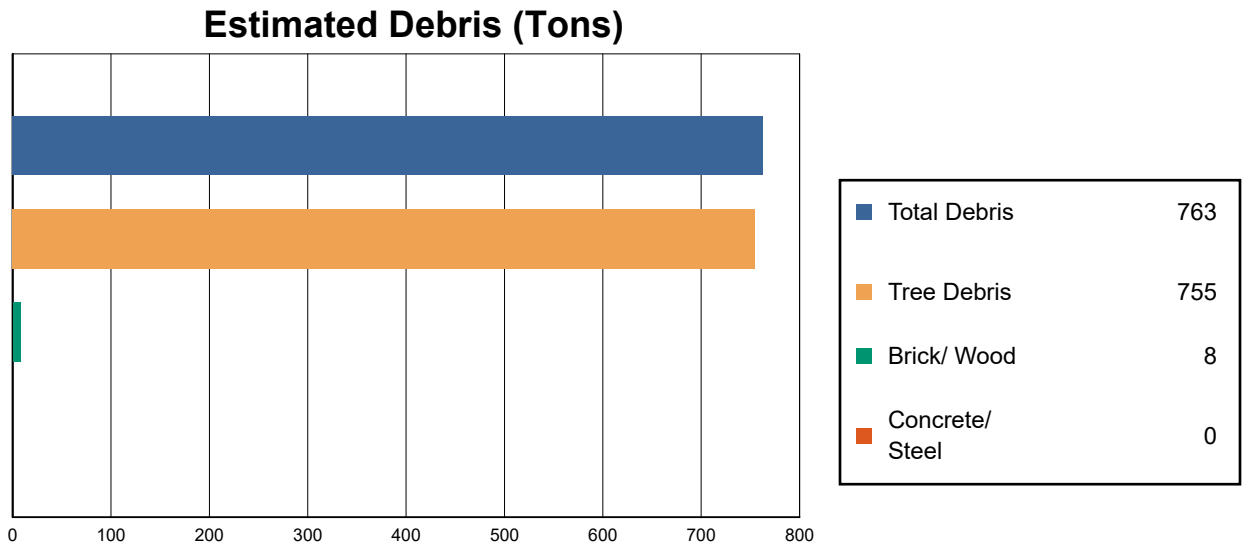
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

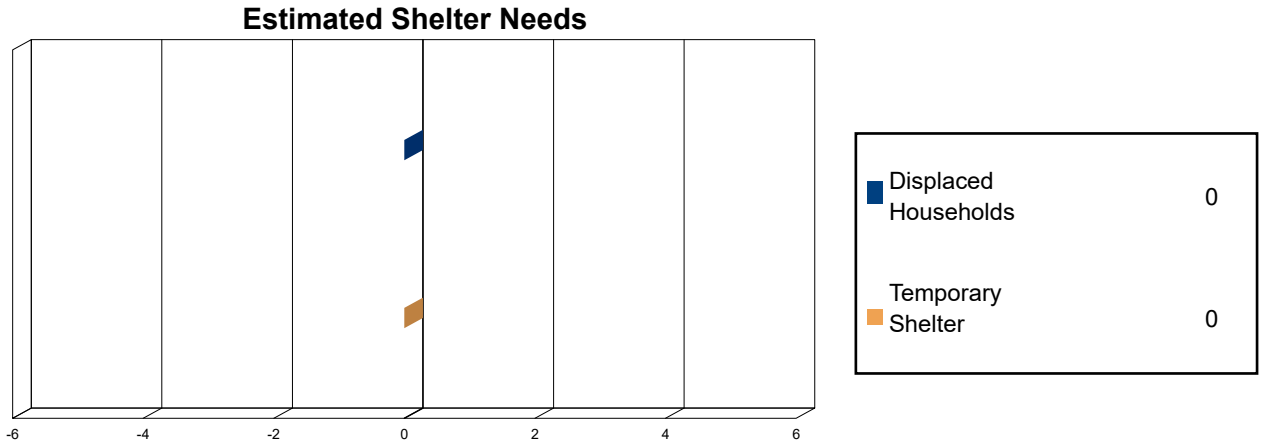


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 763 tons of debris will be generated. Of the total amount, 391 tons (51%) is Other Tree Debris. Of the remaining 372 tons, Brick/Wood comprises 2% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 364 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 18,932) will seek temporary shelter in public shelters.

Economic Loss

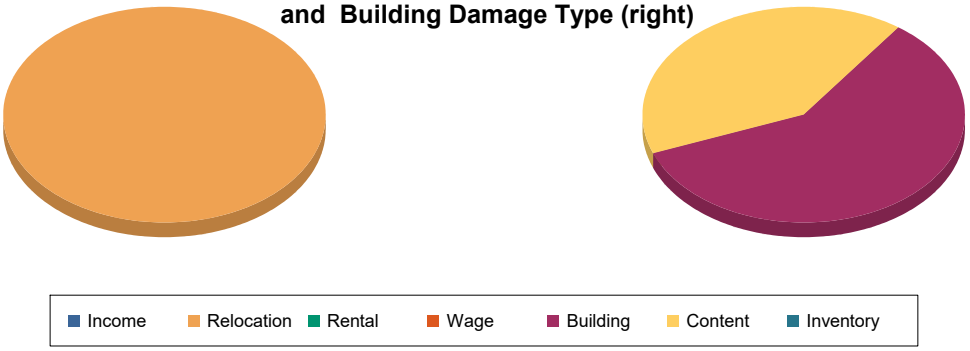
The total economic loss estimated for the hurricane is 3.5 million dollars, which represents 0.07 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 4 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

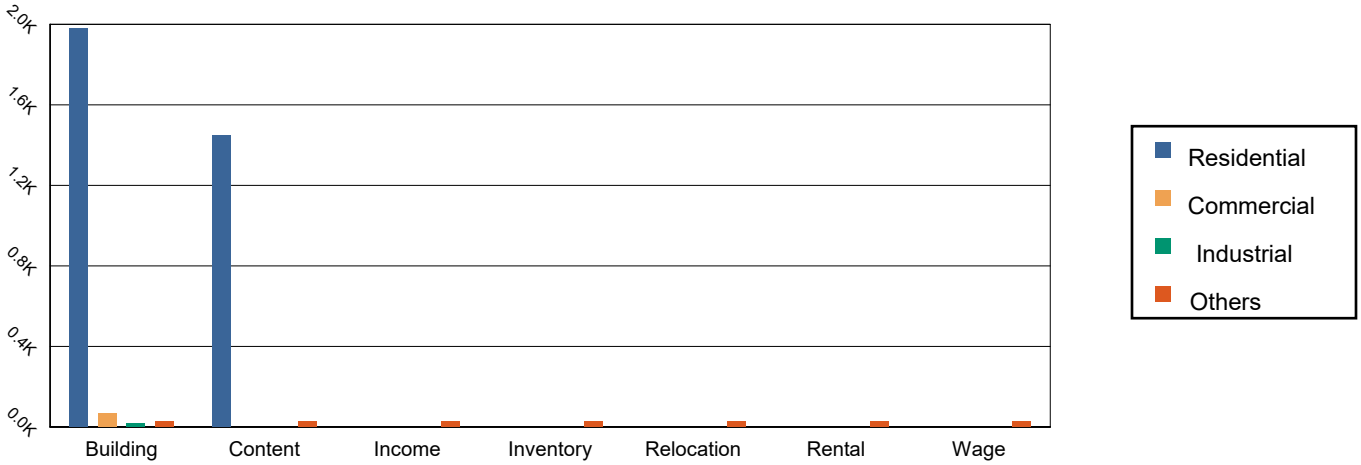


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,978.17	68.80	15.94	27.94	2,090.85
	Content	1,446.65	0.00	0.00	0.00	1,446.65
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**3,424.82**	**68.80**	**15.94**	**27.94**	**3,537.50**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.11	0.00	0.00	0.00	0.11
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.11**	**0.00**	**0.00**	**0.00**	**0.11**

Total

Total	**3,424.93**	**68.80**	**15.94**	**27.94**	**3,537.61**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,026,057	1,248,182	5,274,239
Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**
Study Region Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**

Hazus: Hurricane Global Risk Report

Region Name:	Avon_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Tuesday, May 2, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.59 square miles and contains 4 census tracts. There are over 7 thousand households in the region and a total population of 18,932 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,760 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

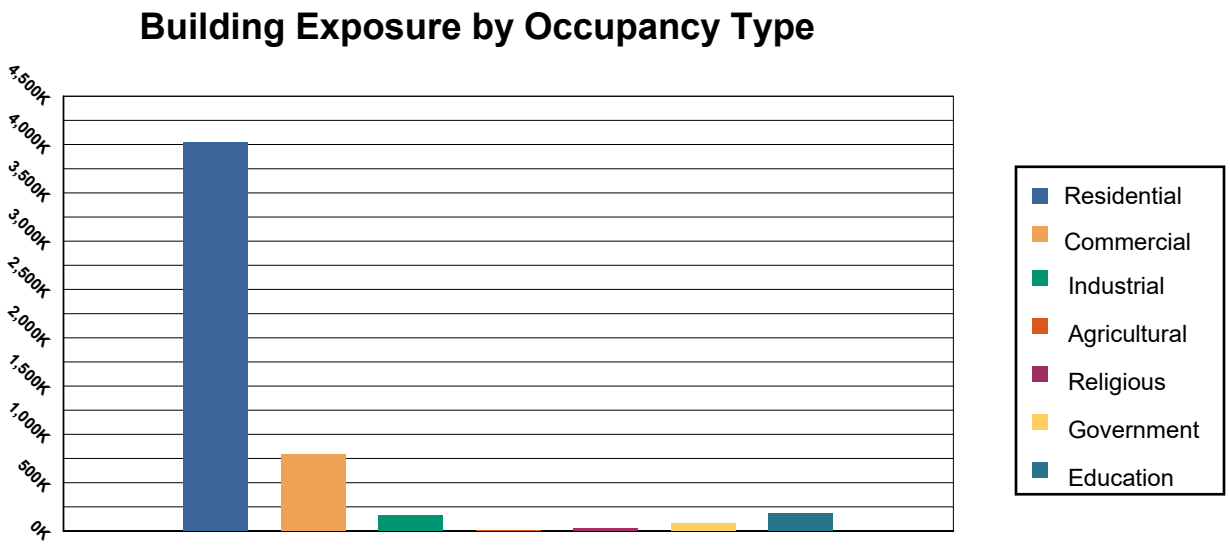


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,026,057	76.33%
Commercial	794,614	15.07%
Industrial	163,192	3.09%
Agricultural	4,372	0.08%
Religious	30,109	0.57%
Government	74,009	1.40%
Education	181,886	3.45%
Total	**5,274,239**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

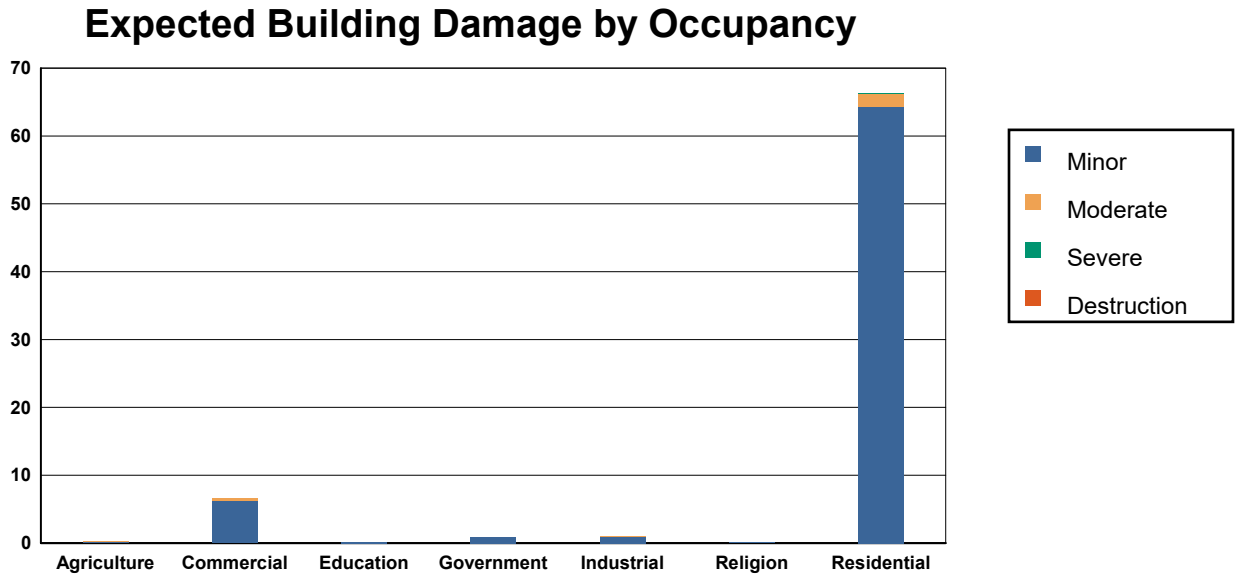


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.78	98.90	0.20	1.00	0.02	0.08	0.00	0.01	0.00	0.00
Commercial	590.32	98.88	6.27	1.05	0.41	0.07	0.00	0.00	0.00	0.00
Education	17.82	98.97	0.18	1.02	0.00	0.01	0.00	0.00	0.00	0.00
Government	90.09	99.00	0.90	0.99	0.01	0.01	0.00	0.00	0.00	0.00
Industrial	97.94	98.93	1.04	1.05	0.02	0.02	0.00	0.00	0.00	0.00
Religion	14.87	99.12	0.13	0.86	0.00	0.02	0.00	0.00	0.00	0.00
Residential	6,853.72	99.04	64.24	0.93	2.02	0.03	0.02	0.00	0.00	0.00
Total	**7,684.52**		**72.97**		**2.48**		**0.02**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	88	98.65	1	1.34	0	0.01	0	0.00	0	0.00
Masonry	522	98.46	7	1.39	1	0.14	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	376	98.90	4	1.05	0	0.05	0	0.00	0	0.00
Wood	6,697	99.13	57	0.85	1	0.02	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

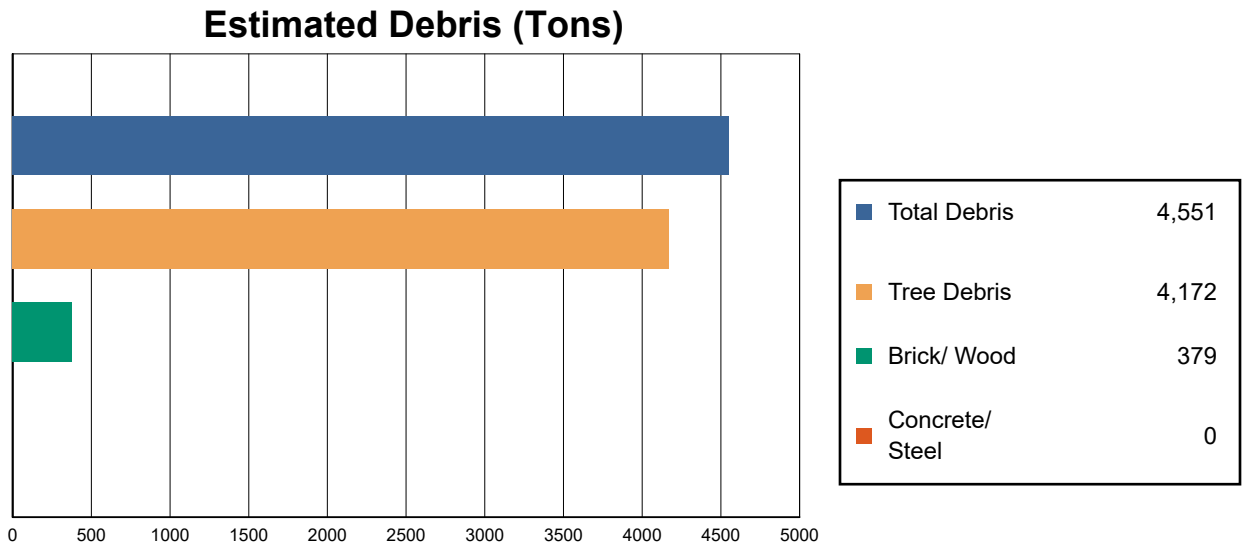
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

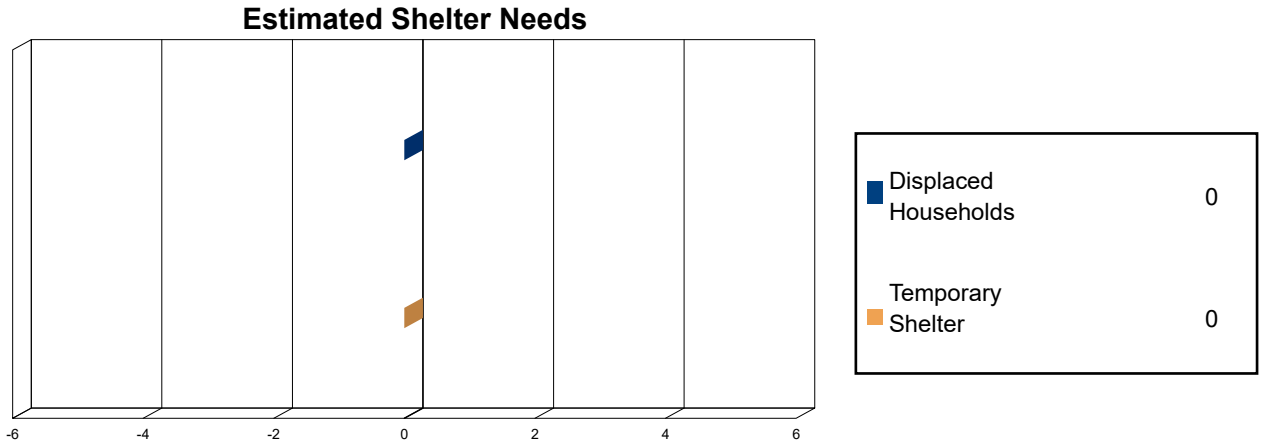


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 4,551 tons of debris will be generated. Of the total amount, 2,240 tons (49%) is Other Tree Debris. Of the remaining 2,311 tons, Brick/Wood comprises 16% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 15 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,932 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 18,932) will seek temporary shelter in public shelters.

Economic Loss

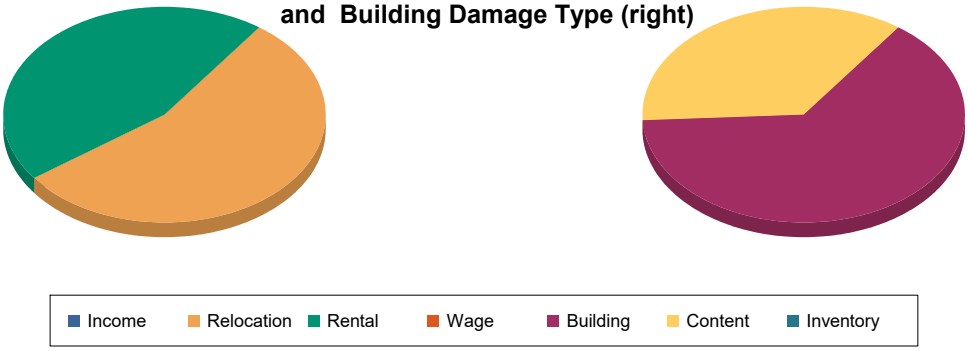
The total economic loss estimated for the hurricane is 22.9 million dollars, which represents 0.44 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 23 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	14,332.75	267.99	36.81	79.33	14,716.88
	Content	8,198.25	0.00	0.00	0.00	8,198.25
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**22,531.00**	**267.99**	**36.81**	**79.33**	**22,915.13**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	13.87	3.43	0.17	0.20	17.67
	Rental	14.42	0.00	0.00	0.00	14.42
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**28.28**	**3.43**	**0.17**	**0.20**	**32.09**

Total

Total	**22,559.29**	**271.42**	**36.98**	**79.53**	**22,947.22**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,026,057	1,248,182	5,274,239
Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**
Study Region Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**

Hazus: Hurricane Global Risk Report

Region Name:	Avon_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Tuesday, May 2, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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The geographical size of the region is 23.59 square miles and contains 4 census tracts. There are over 7 thousand households in the region and a total population of 18,932 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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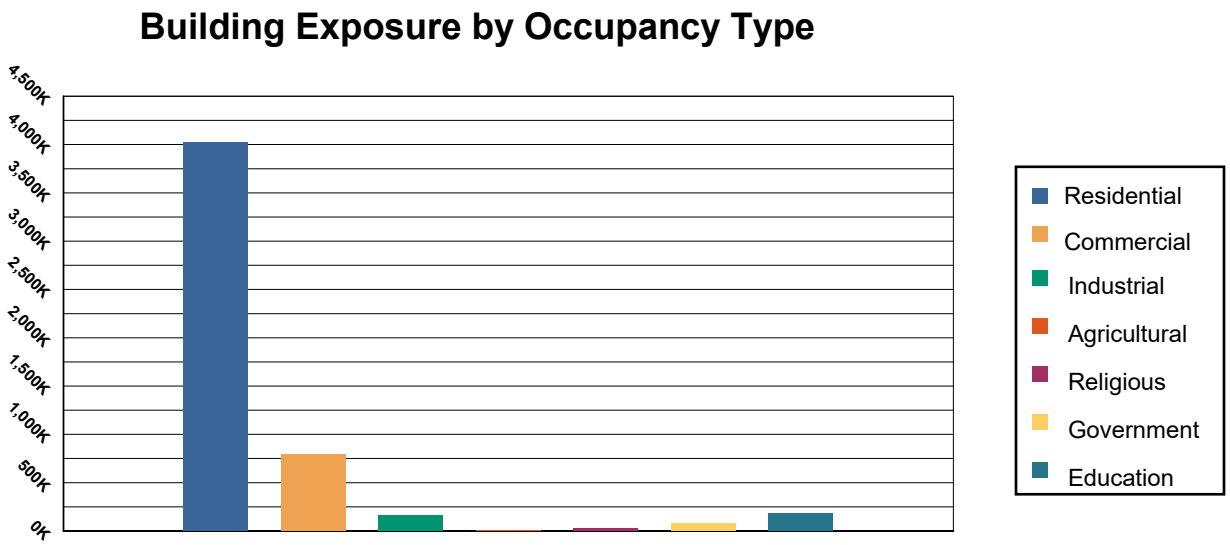


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,026,057	76.33%
Commercial	794,614	15.07%
Industrial	163,192	3.09%
Agricultural	4,372	0.08%
Religious	30,109	0.57%
Government	74,009	1.40%
Education	181,886	3.45%
Total	**5,274,239**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 19 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

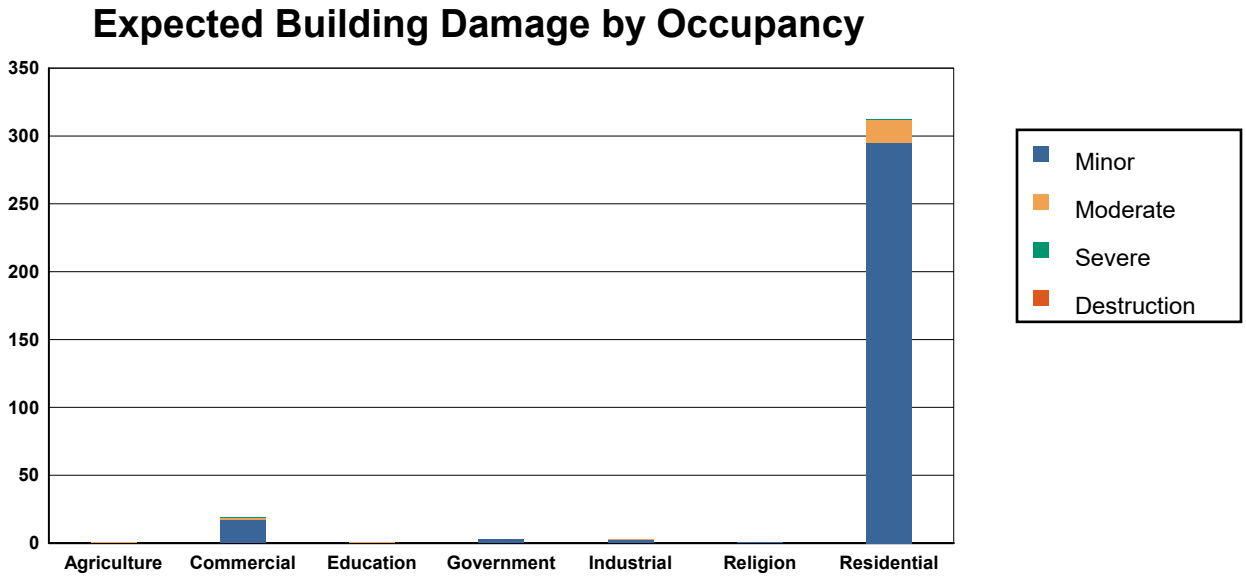


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.19	95.93	0.68	3.39	0.10	0.49	0.04	0.19	0.00	0.00
Commercial	577.75	96.78	17.14	2.87	1.95	0.33	0.15	0.02	0.00	0.00
Education	17.50	97.24	0.48	2.68	0.02	0.09	0.00	0.00	0.00	0.00
Government	88.55	97.31	2.38	2.62	0.06	0.07	0.00	0.00	0.00	0.00
Industrial	96.09	97.06	2.70	2.73	0.17	0.17	0.03	0.03	0.00	0.00
Religion	14.58	97.21	0.40	2.70	0.01	0.08	0.00	0.01	0.00	0.00
Residential	6,608.16	95.49	295.43	4.27	16.35	0.24	0.06	0.00	0.00	0.00
Total	**7,421.83**		**319.22**		**18.66**		**0.28**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	86	96.58	3	3.28	0	0.14	0	0.00	0	0.00
Masonry	506	95.44	21	3.90	3	0.65	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	369	97.13	10	2.58	1	0.26	0	0.02	0	0.00
Wood	6,465	95.69	280	4.14	11	0.17	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

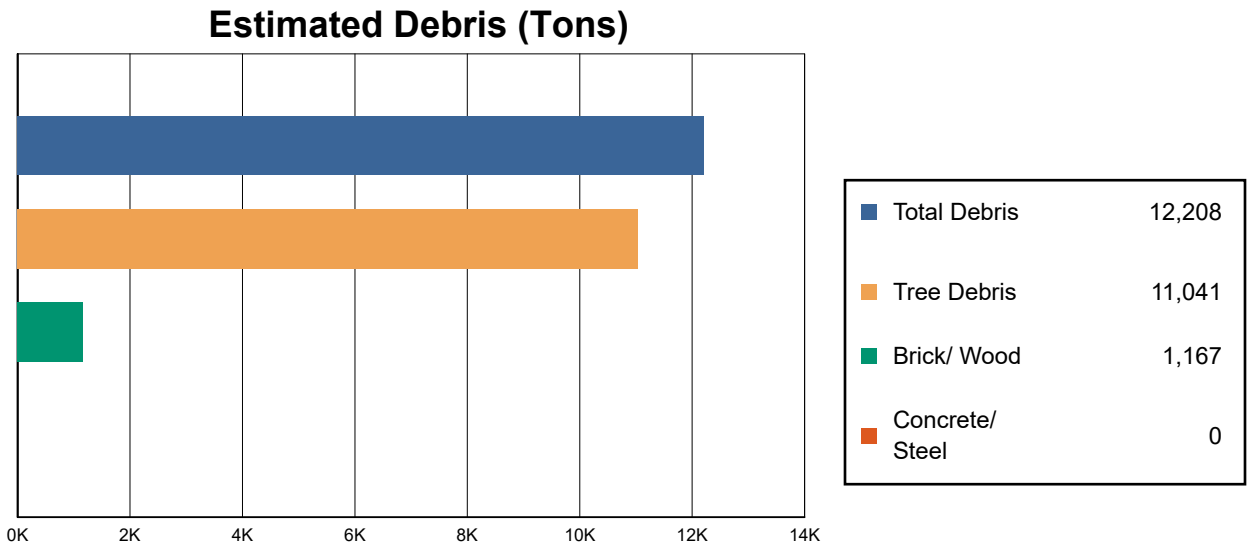
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

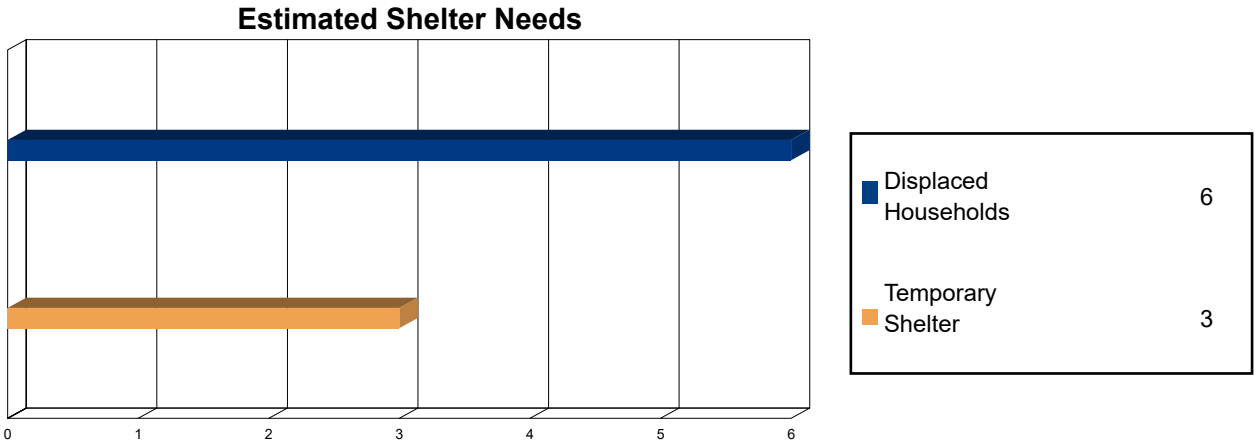


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 12,208 tons of debris will be generated. Of the total amount, 5,698 tons (47%) is Other Tree Debris. Of the remaining 6,510 tons, Brick/Wood comprises 18% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 47 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,343 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 6 households to be displaced due to the hurricane. Of these, 3 people (out of a total population of 18,932) will seek temporary shelter in public shelters.

Economic Loss

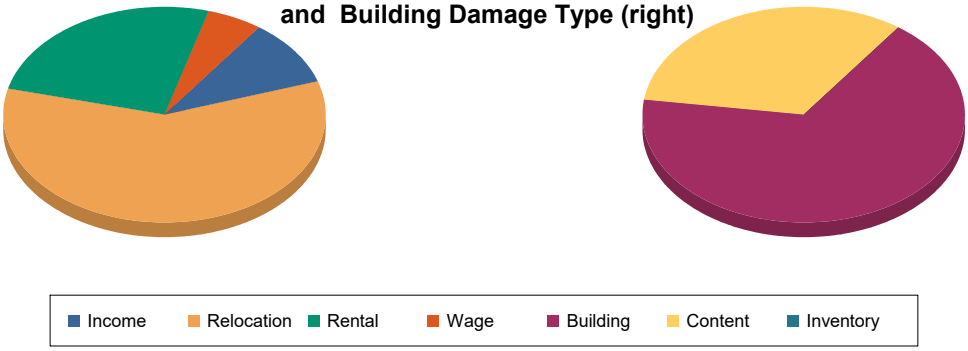
The total economic loss estimated for the hurricane is 46.8 million dollars, which represents 0.89 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 47 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

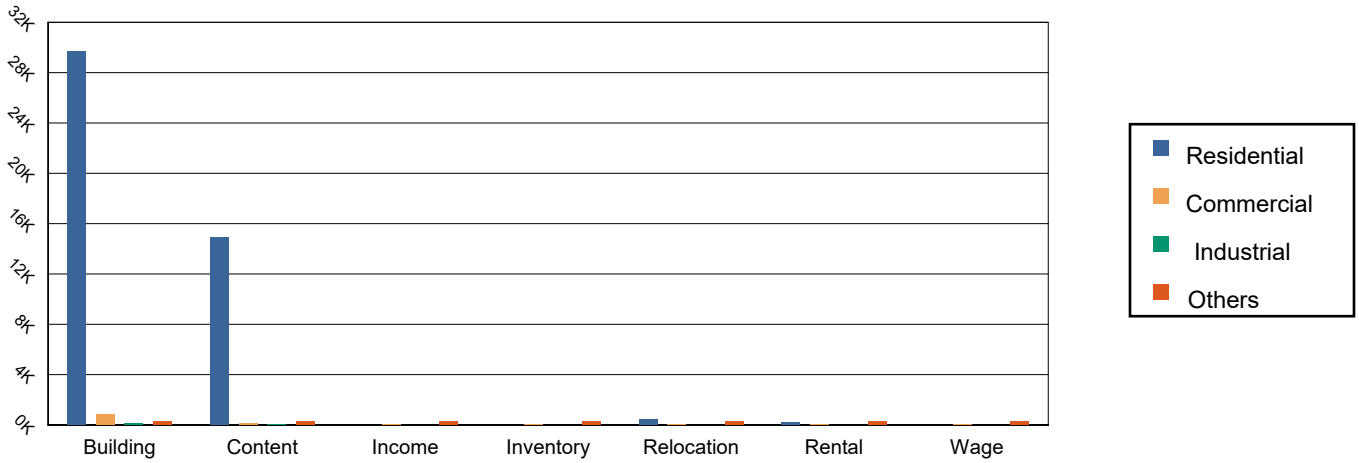


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	29,678.58	856.68	117.86	210.86	30,863.99
	Content	14,903.91	113.40	19.75	4.32	15,041.38
	Inventory	0.00	11.67	2.29	0.96	14.93
	Subtotal	**44,582.49**	**981.75**	**139.90**	**216.15**	**45,920.29**
Business Interruption Loss						
	Income	0.00	80.98	0.44	8.66	90.08
	Relocation	460.12	58.08	2.50	6.83	527.52
	Rental	194.45	33.91	0.30	0.59	229.25
	Wage	0.00	28.78	0.73	20.41	49.93
	Subtotal	**654.57**	**201.74**	**3.97**	**36.49**	**896.78**

Total

Total	**45,237.06**	**1,183.49**	**143.88**	**252.64**	**46,817.07**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,026,057	1,248,182	5,274,239
Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**
Study Region Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**

Hazus: Hurricane Global Risk Report

Region Name:	Avon_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Tuesday, May 2, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.59 square miles and contains 4 census tracts. There are over 7 thousand households in the region and a total population of 18,932 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,760 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

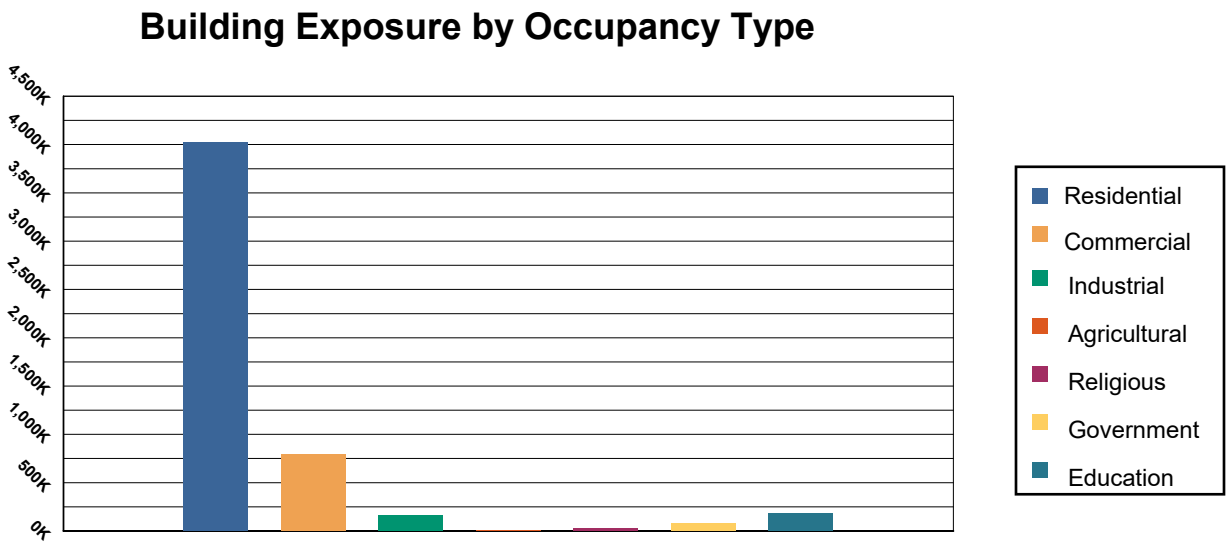


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,026,057	76.33%
Commercial	794,614	15.07%
Industrial	163,192	3.09%
Agricultural	4,372	0.08%
Religious	30,109	0.57%
Government	74,009	1.40%
Education	181,886	3.45%
Total	**5,274,239**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 71 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

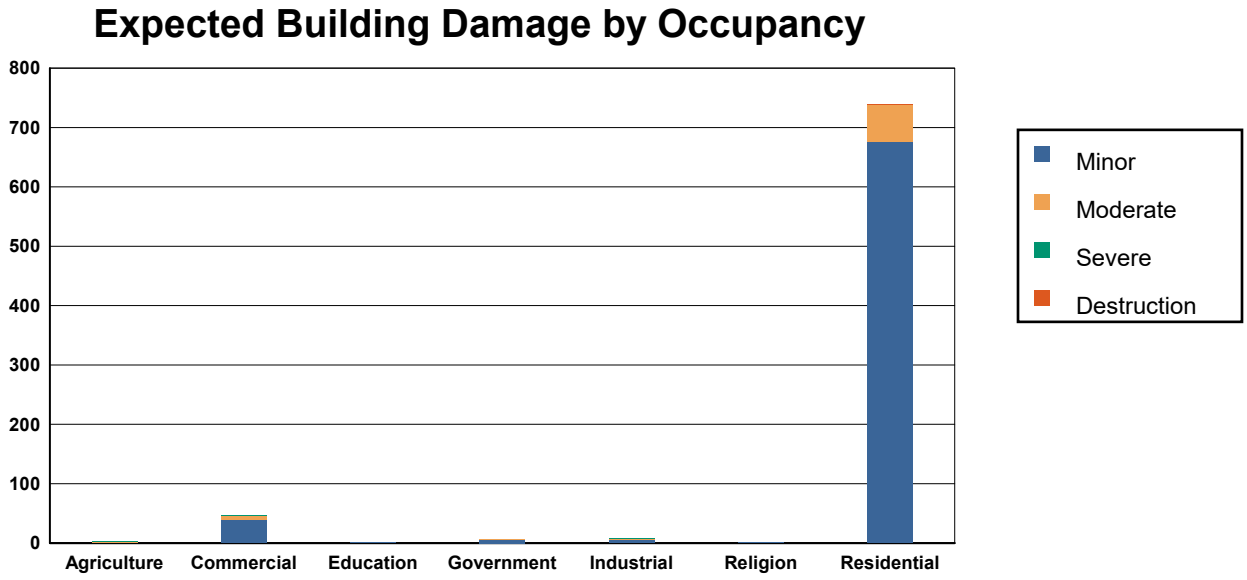


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.96	89.80	1.58	7.88	0.31	1.55	0.14	0.71	0.01	0.06
Commercial	550.11	92.15	39.77	6.66	6.37	1.07	0.75	0.13	0.00	0.00
Education	16.78	93.21	1.13	6.26	0.09	0.52	0.00	0.01	0.00	0.00
Government	85.32	93.76	5.27	5.79	0.40	0.44	0.01	0.01	0.00	0.00
Industrial	91.96	92.89	6.09	6.15	0.78	0.79	0.17	0.17	0.01	0.01
Religion	13.91	92.77	1.01	6.75	0.07	0.47	0.00	0.02	0.00	0.00
Residential	6,181.19	89.32	676.62	9.78	61.19	0.88	0.50	0.01	0.51	0.01
Total	**6,957.23**		**731.45**		**69.21**		**1.57**		**0.53**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	82	92.03	6	7.11	1	0.85	0	0.01	0	0.00
Masonry	478	90.12	43	8.04	9	1.78	0	0.05	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	354	93.19	22	5.71	4	0.94	1	0.16	0	0.00
Wood	6,052	89.58	654	9.68	49	0.72	1	0.02	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

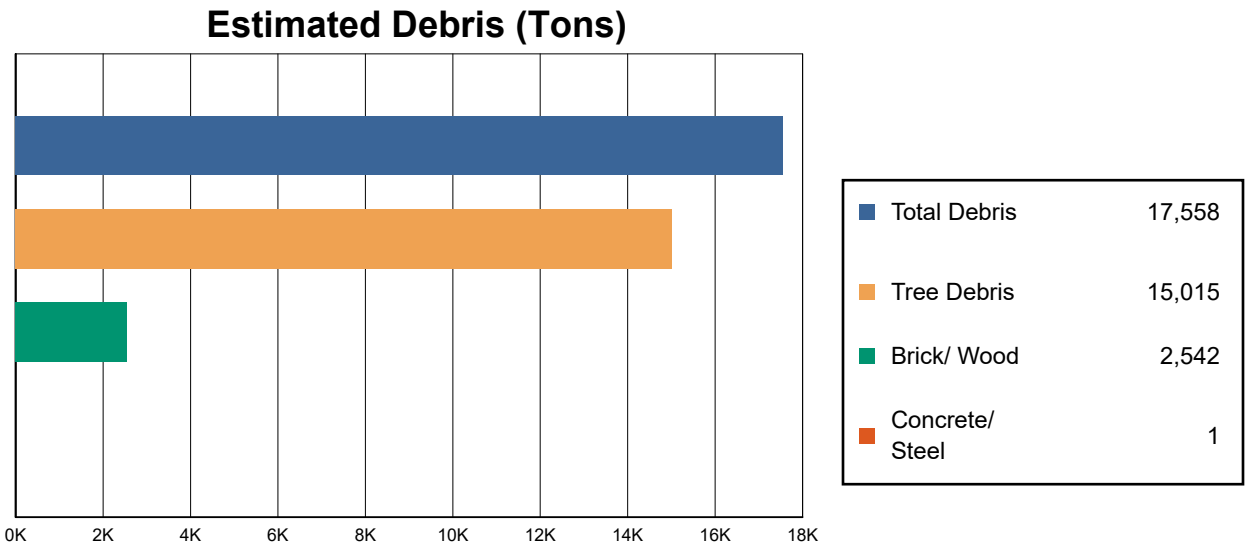
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

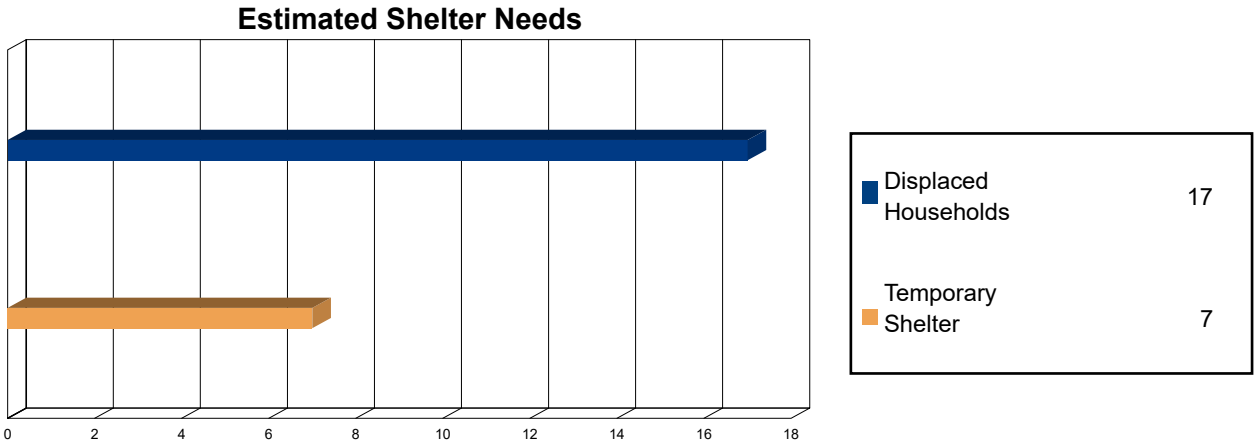


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 17,558 tons of debris will be generated. Of the total amount, 7,795 tons (44%) is Other Tree Debris. Of the remaining 9,763 tons, Brick/Wood comprises 26% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 102 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,220 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 17 households to be displaced due to the hurricane. Of these, 7 people (out of a total population of 18,932) will seek temporary shelter in public shelters.

Economic Loss

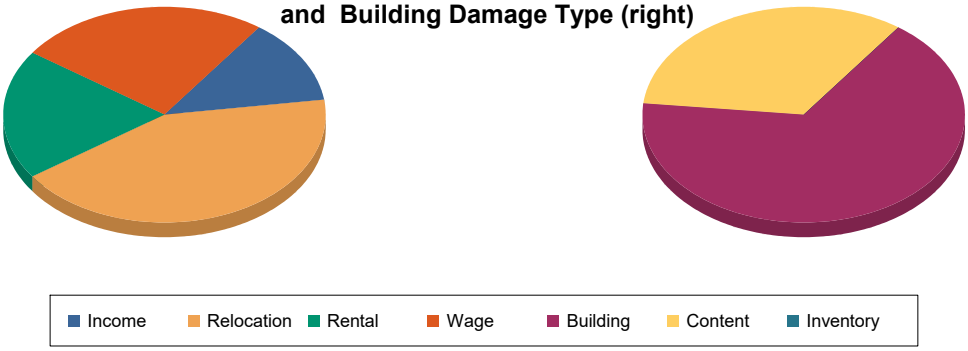
The total economic loss estimated for the hurricane is 82.7 million dollars, which represents 1.57 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 83 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

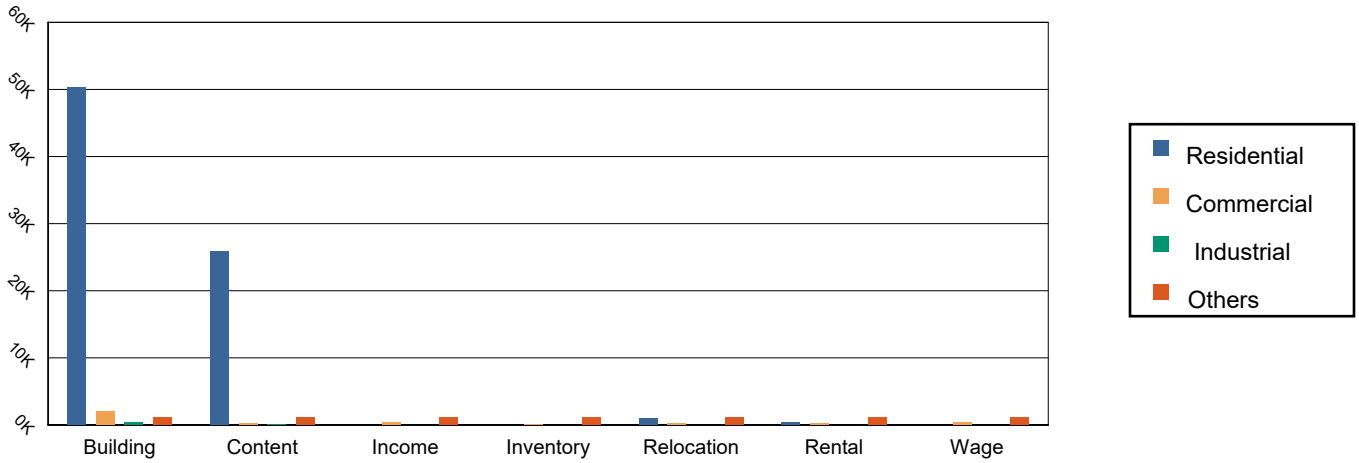


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	50,328.36	2,001.26	339.72	513.80	53,183.13
	Content	25,936.44	294.81	125.38	58.72	26,415.36
	Inventory	0.00	32.86	14.85	4.56	52.28
	Subtotal	**76,264.80**	**2,328.94**	**479.95**	**577.08**	**79,650.78**
Business Interruption Loss						
	Income	0.00	332.99	3.57	49.72	386.27
	Relocation	909.18	289.77	17.13	66.86	1,282.94
	Rental	403.10	175.31	2.33	8.01	588.76
	Wage	0.00	413.95	6.14	347.70	767.79
	Subtotal	**1,312.28**	**1,212.03**	**29.16**	**472.29**	**3,025.76**

Total

Total	**77,577.08**	**3,540.96**	**509.11**	**1,049.38**	**82,676.54**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,026,057	1,248,182	5,274,239
Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**
Study Region Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**

Hazus: Hurricane Global Risk Report

Region Name:	Avon_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Tuesday, May 2, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

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There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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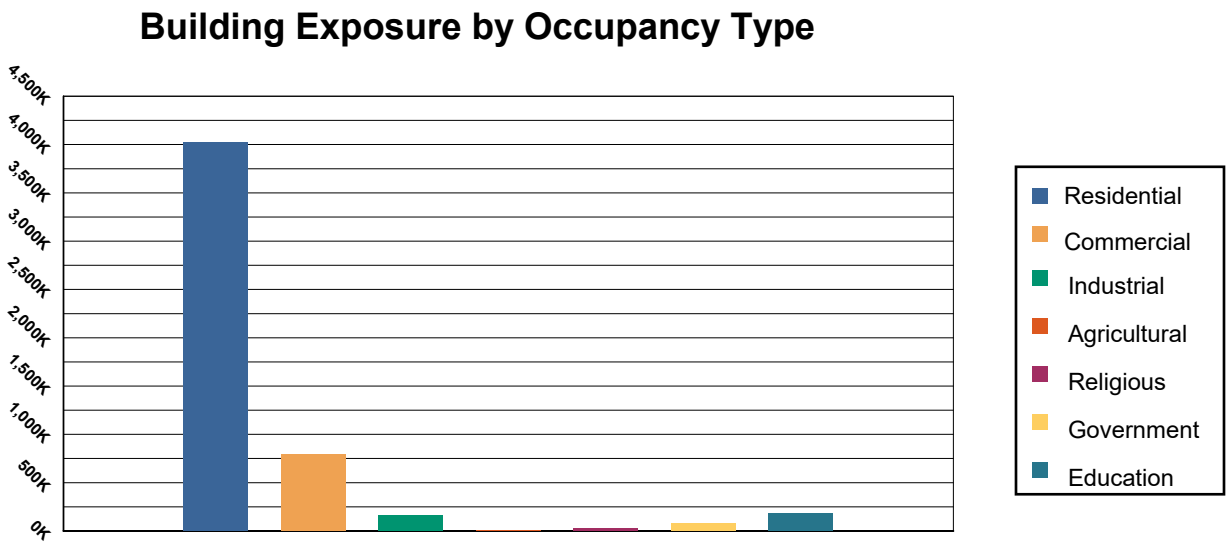


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,026,057	76.33%
Commercial	794,614	15.07%
Industrial	163,192	3.09%
Agricultural	4,372	0.08%
Religious	30,109	0.57%
Government	74,009	1.40%
Education	181,886	3.45%
Total	**5,274,239**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 233 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

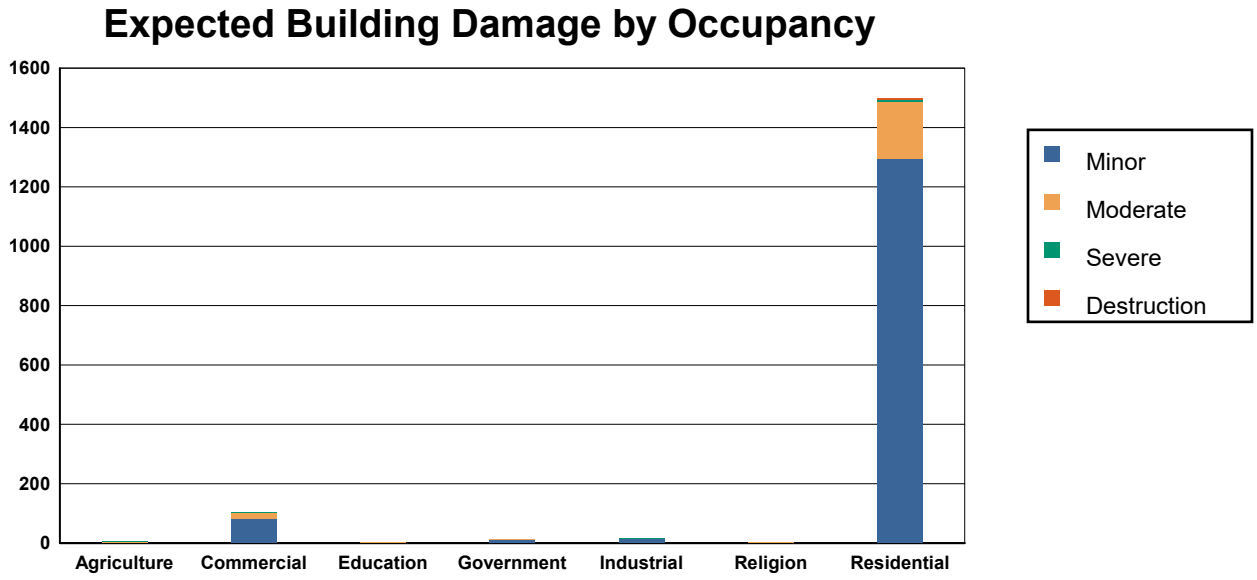


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15.71	78.57	3.06	15.31	0.79	3.97	0.39	1.94	0.04	0.21
Commercial	493.64	82.69	80.38	13.46	20.18	3.38	2.79	0.47	0.01	0.00
Education	15.19	84.41	2.34	13.00	0.44	2.46	0.02	0.13	0.00	0.00
Government	77.78	85.47	11.08	12.18	2.05	2.25	0.09	0.10	0.00	0.00
Industrial	83.10	83.94	12.33	12.45	2.96	2.99	0.57	0.58	0.04	0.04
Religion	12.50	83.35	2.15	14.32	0.33	2.21	0.02	0.12	0.00	0.00
Residential	5,422.05	78.35	1,296.04	18.73	189.19	2.73	7.93	0.11	4.78	0.07
Total	**6,119.97**		**1,407.39**		**215.95**		**11.82**		**4.87**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	73	82.49	12	13.84	3	3.56	0	0.10	0	0.00
Masonry	424	80.05	80	15.11	24	4.58	1	0.22	0	0.03
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	321	84.50	44	11.67	12	3.22	2	0.60	0	0.01
Wood	5,314	78.65	1,266	18.73	164	2.43	8	0.12	4	0.06

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

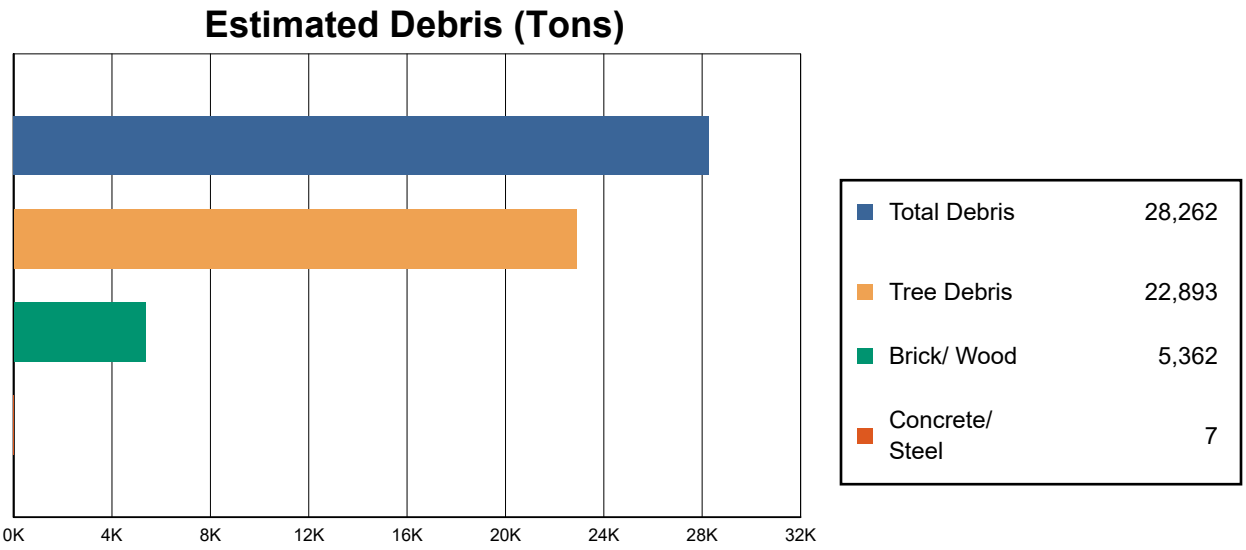
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

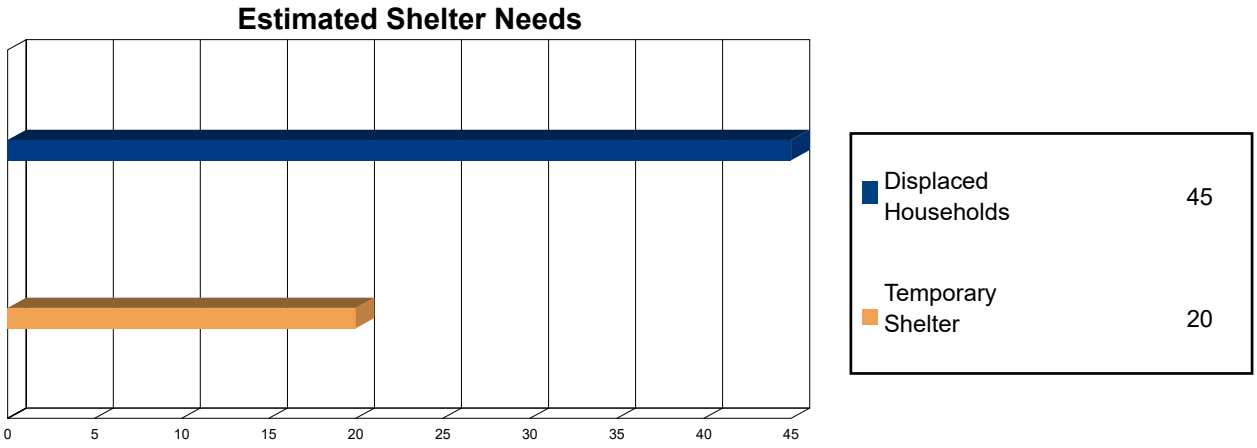


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 28,262 tons of debris will be generated. Of the total amount, 11,936 tons (42%) is Other Tree Debris. Of the remaining 16,326 tons, Brick/Wood comprises 33% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 215 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 10,957 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 45 households to be displaced due to the hurricane. Of these, 20 people (out of a total population of 18,932) will seek temporary shelter in public shelters.

Economic Loss

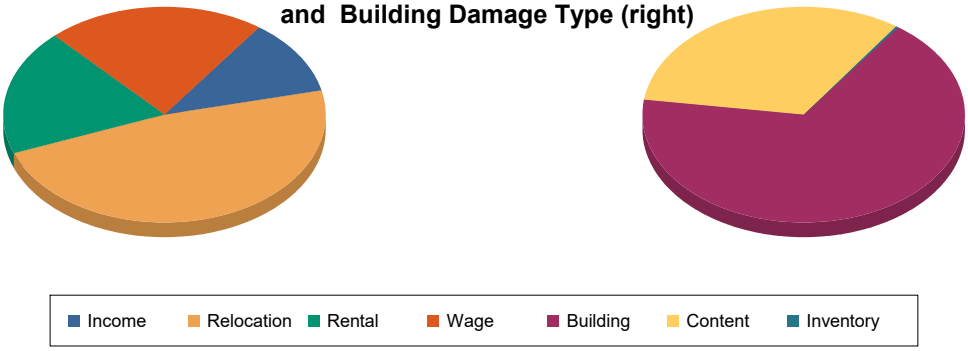
The total economic loss estimated for the hurricane is 147.8 million dollars, which represents 2.80 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 148 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

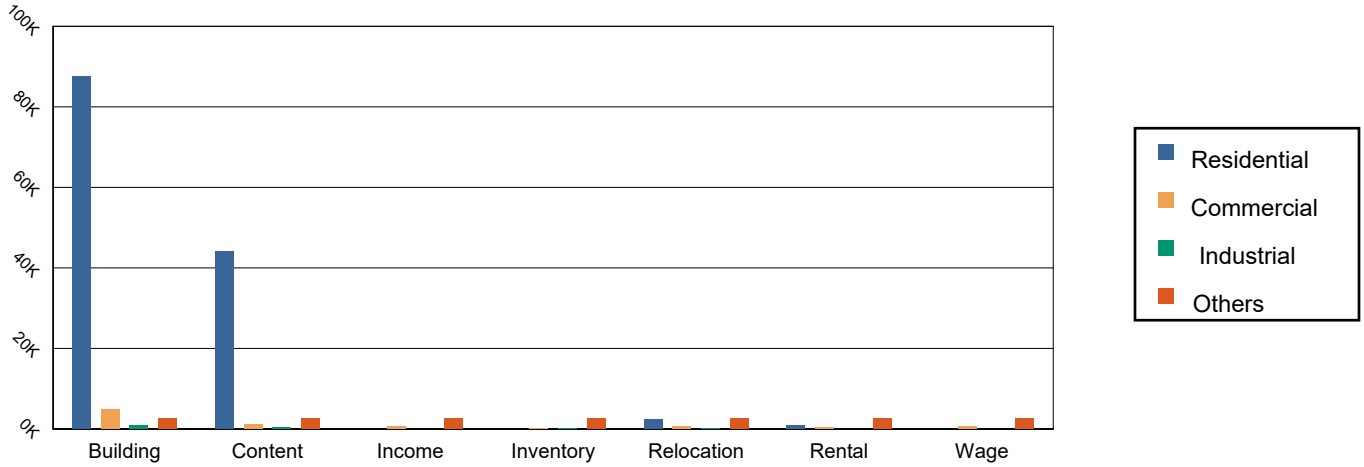


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	87,506.21	4,837.19	974.03	1,331.58	94,649.00
	Content	44,219.71	1,137.90	490.90	247.02	46,095.53
	Inventory	0.00	146.06	57.77	15.13	218.96
	Subtotal	**131,725.92**	**6,121.15**	**1,522.70**	**1,593.73**	**140,963.49**
Business Interruption Loss						
	Income	0.00	652.84	10.70	121.30	784.84
	Relocation	2,289.89	697.85	67.21	203.41	3,258.35
	Rental	868.48	388.84	8.75	20.90	1,286.98
	Wage	0.00	738.42	18.15	741.51	1,498.07
	Subtotal	**3,158.38**	**2,477.94**	**104.81**	**1,087.13**	**6,828.25**

Total

Total	**134,884.29**	**8,599.09**	**1,627.50**	**2,680.85**	**147,791.74**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,026,057	1,248,182	5,274,239
Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**
Study Region Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**

Hazus: Hurricane Global Risk Report

Region Name:	Avon_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Tuesday, May 2, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.59 square miles and contains 4 census tracts. There are over 7 thousand households in the region and a total population of 18,932 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 5,274 million dollars. Approximately 89% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,760 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

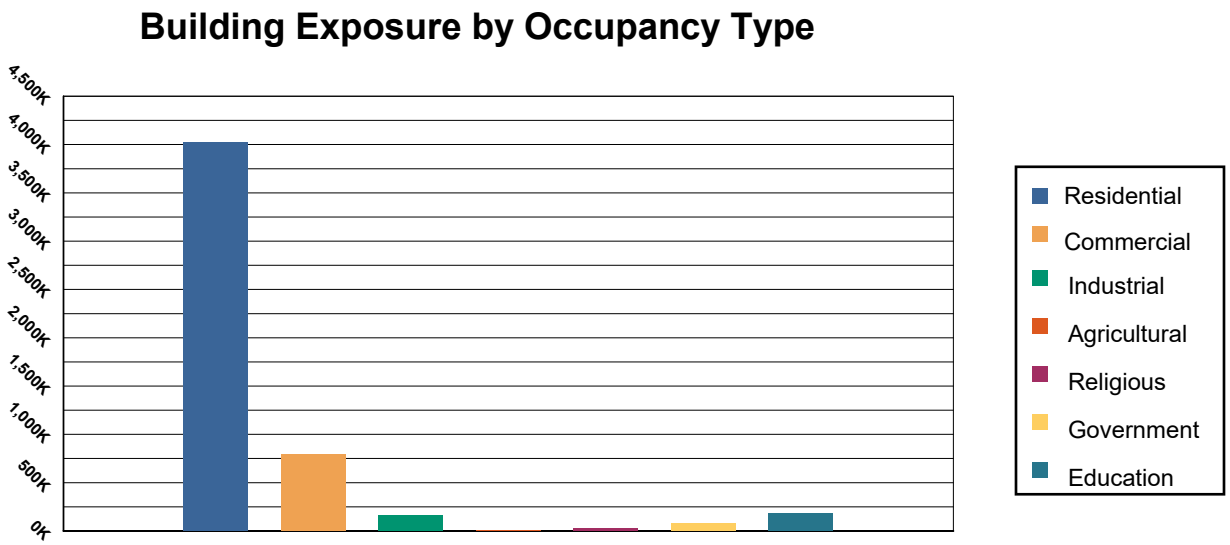


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,026,057	76.33%
Commercial	794,614	15.07%
Industrial	163,192	3.09%
Agricultural	4,372	0.08%
Religious	30,109	0.57%
Government	74,009	1.40%
Education	181,886	3.45%
Total	**5,274,239**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 424 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 15 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

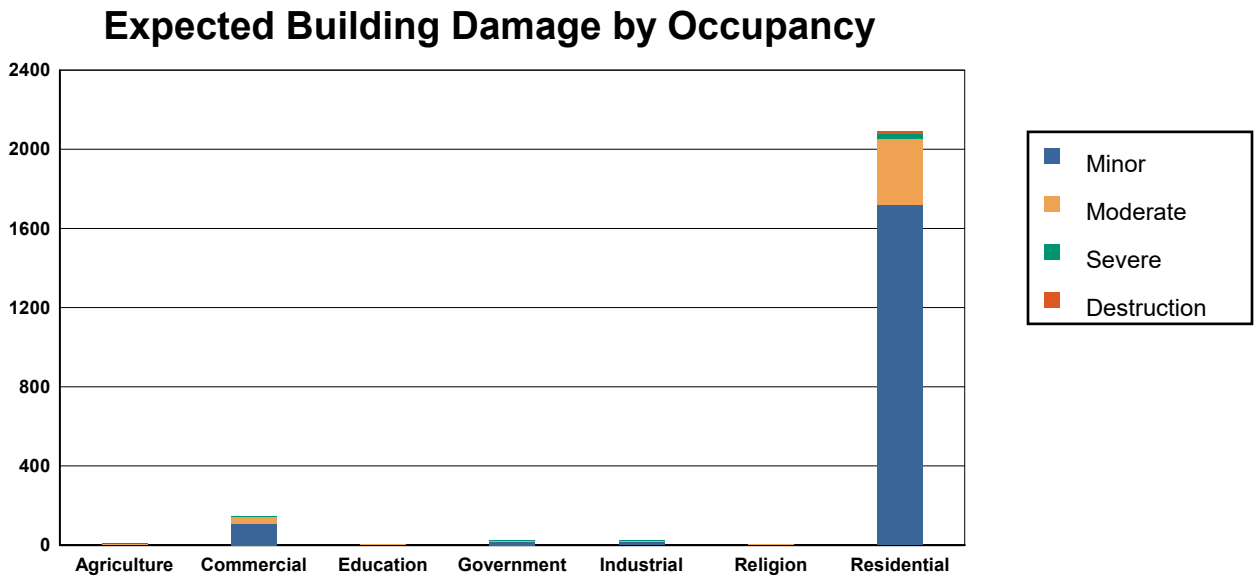


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	14.03	70.17	4.04	20.18	1.25	6.24	0.60	2.99	0.08	0.42
Commercial	451.14	75.57	106.52	17.84	34.43	5.77	4.88	0.82	0.03	0.00
Education	13.94	77.45	3.15	17.50	0.85	4.75	0.05	0.30	0.00	0.00
Government	69.74	76.63	16.06	17.65	4.87	5.35	0.33	0.37	0.00	0.00
Industrial	75.74	76.51	16.70	16.87	5.50	5.56	0.99	1.00	0.07	0.07
Religion	11.34	75.63	2.94	19.63	0.67	4.45	0.04	0.29	0.00	0.00
Residential	4,829.32	69.79	1,721.02	24.87	329.84	4.77	25.11	0.36	14.72	0.21
Total	**5,465.26**		**1,870.43**		**377.41**		**32.00**		**14.89**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	67	75.06	16	18.16	6	6.49	0	0.29	0	0.00
Masonry	382	72.04	106	20.01	39	7.36	3	0.49	1	0.10
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	293	77.21	60	15.88	22	5.83	4	1.07	0	0.01
Wood	4,737	70.12	1,686	24.95	295	4.37	24	0.36	14	0.20

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

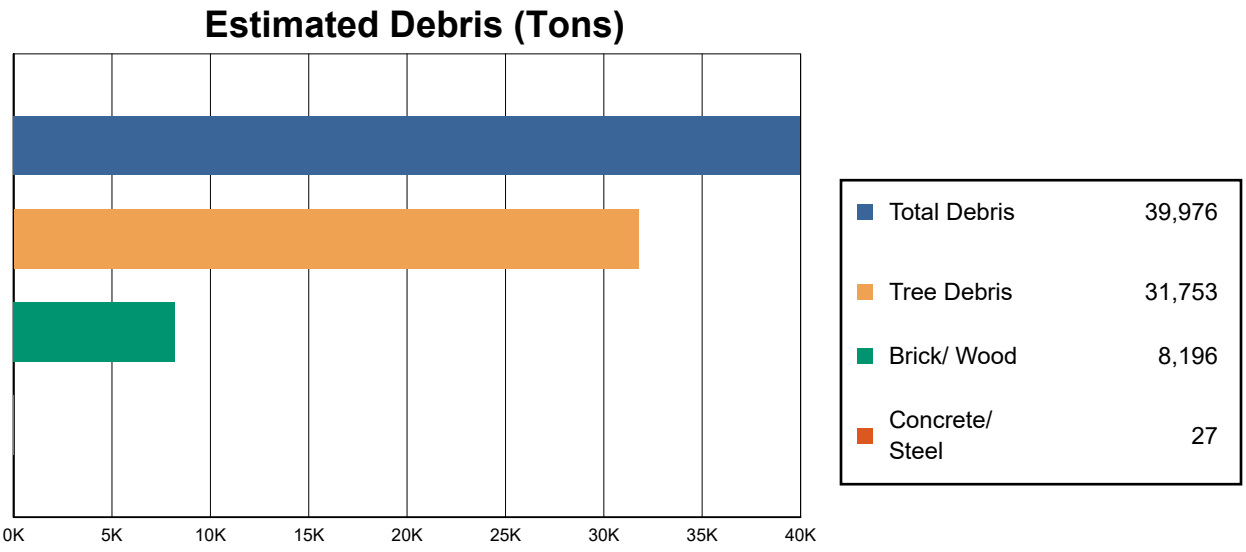
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

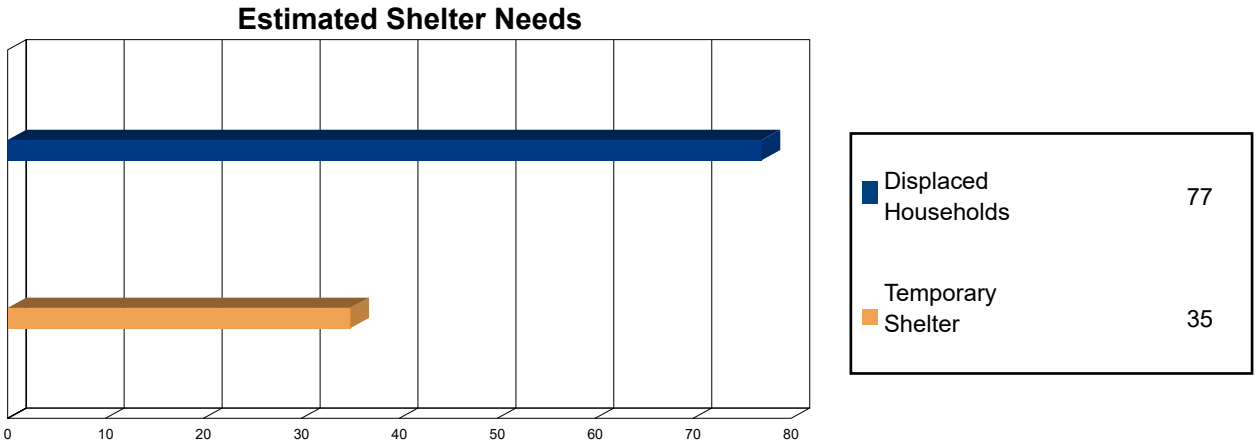


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 39,976 tons of debris will be generated. Of the total amount, 16,035 tons (40%) is Other Tree Debris. Of the remaining 23,941 tons, Brick/Wood comprises 34% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 329 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 15,718 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 77 households to be displaced due to the hurricane. Of these, 35 people (out of a total population of 18,932) will seek temporary shelter in public shelters.

Economic Loss

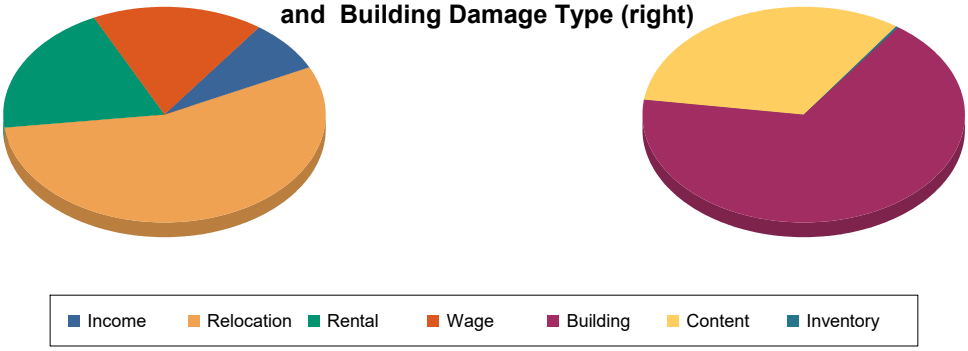
The total economic loss estimated for the hurricane is 217.8 million dollars, which represents 4.13 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 218 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

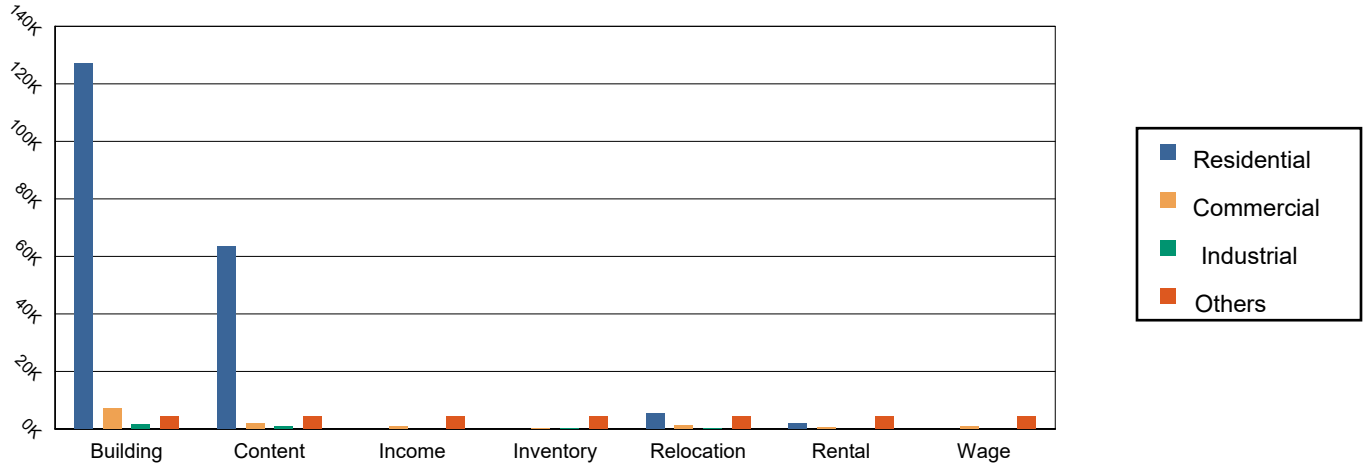


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	127,040.71	7,182.66	1,582.61	2,183.86	137,989.83
	Content	63,419.16	1,880.28	843.95	506.25	66,649.64
	Inventory	0.00	247.26	101.01	26.39	374.66
	Subtotal	**190,459.87**	**9,310.19**	**2,527.57**	**2,716.50**	**205,014.13**
Business Interruption Loss						
	Income	0.00	815.65	15.89	176.86	1,008.40
	Relocation	5,501.19	1,067.85	119.14	375.05	7,063.23
	Rental	1,876.96	573.35	14.15	40.30	2,504.78
	Wage	0.00	946.11	27.09	1,235.38	2,208.58
	Subtotal	**7,378.15**	**3,402.96**	**176.28**	**1,827.60**	**12,784.99**

Total

Total	197,838.02	12,713.15	2,703.85	4,544.10	217,799.11

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	18,932	4,026,057	1,248,182	5,274,239
Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**
Study Region Total	**18,932**	**4,026,057**	**1,248,182**	**5,274,239**

Hazus: Hurricane Global Risk Report

Region Name:	Berlin_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.99 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,175 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,043 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

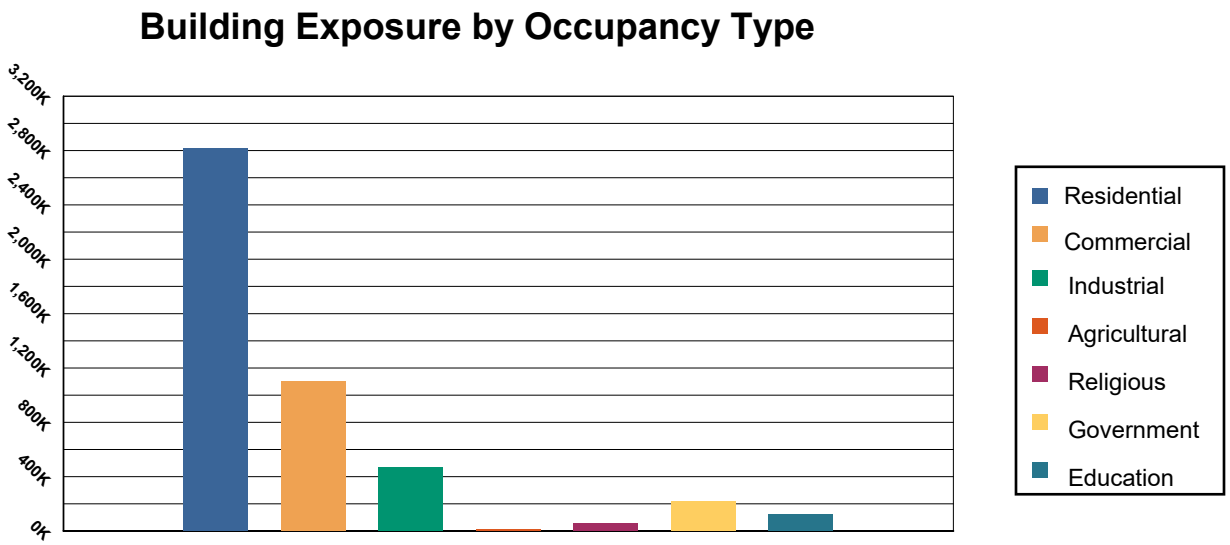


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,814,360	58.89%
Commercial	1,097,171	22.96%
Industrial	464,220	9.71%
Agricultural	9,385	0.20%
Religious	54,559	1.14%
Government	217,977	4.56%
Education	121,295	2.54%
Total	**4,778,967**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

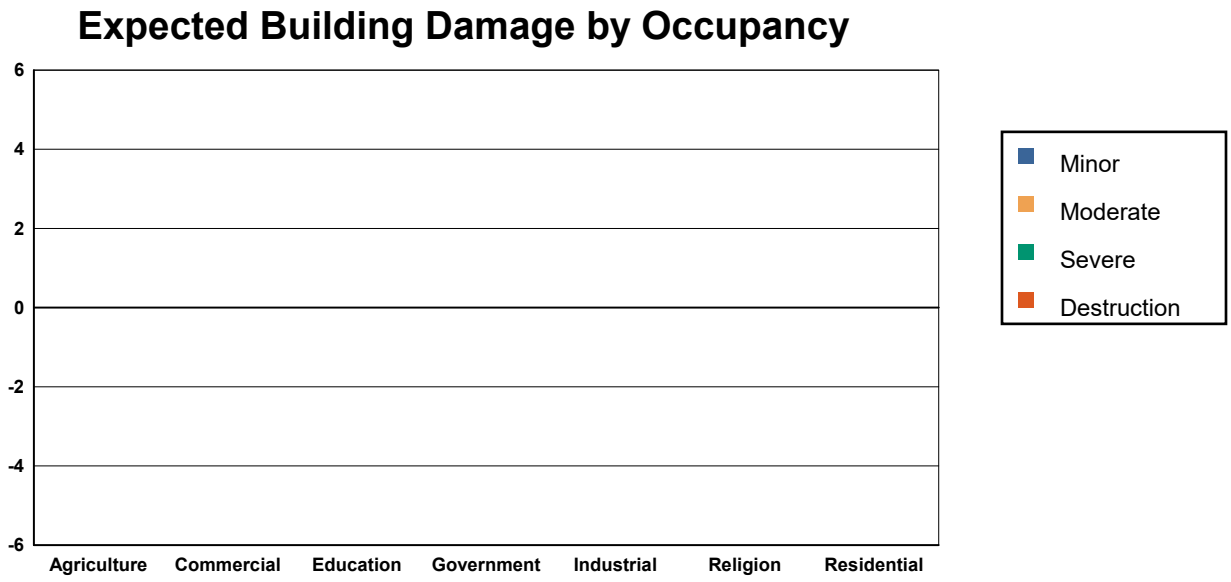


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	27.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	685.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	16.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	207.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	247.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	39.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	6,822.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**8,043.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	144	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	751	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	18	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	601	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	6,527	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

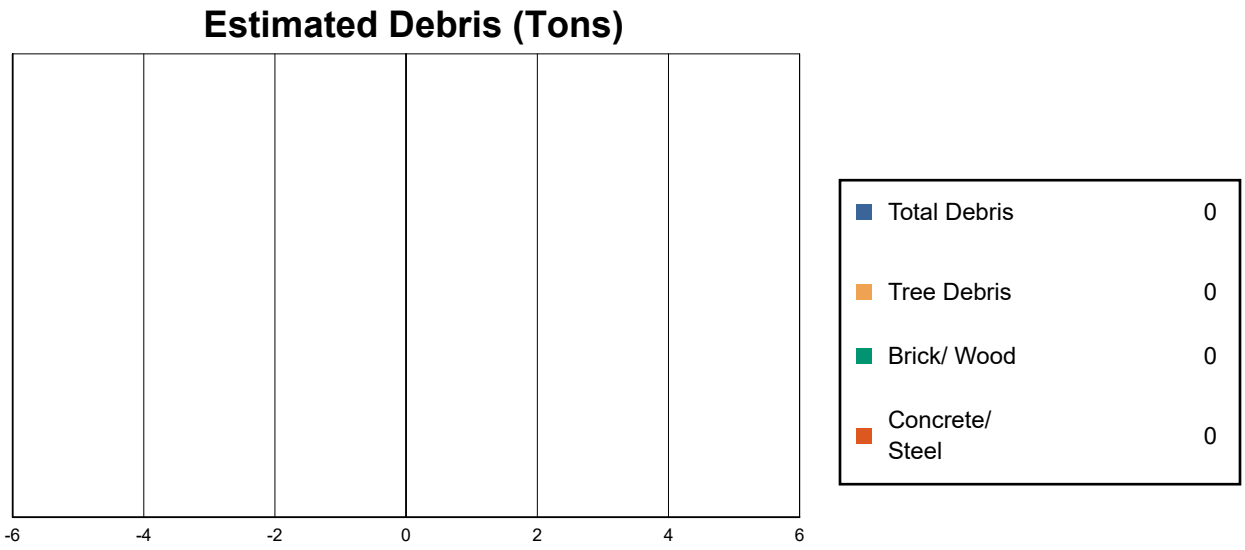
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

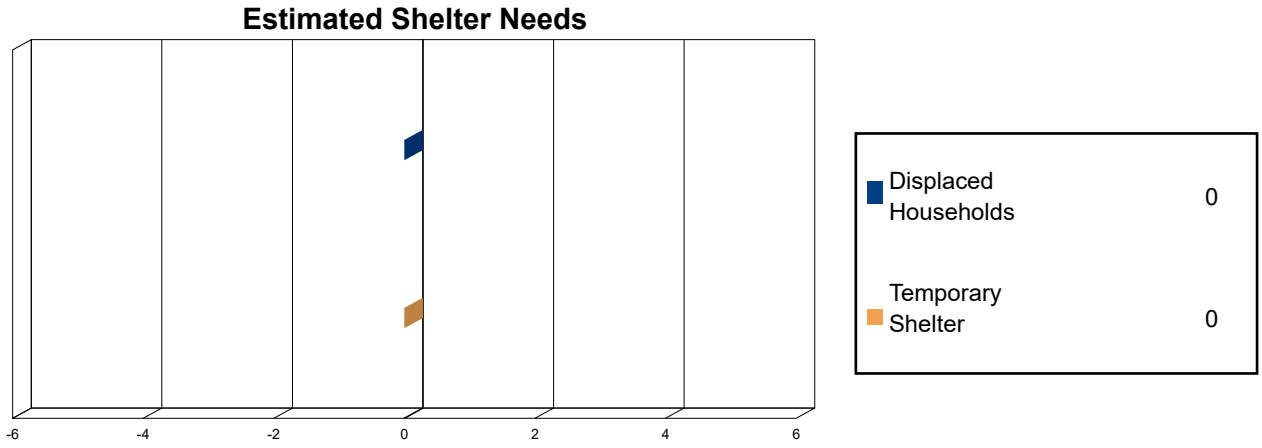


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 20,175) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

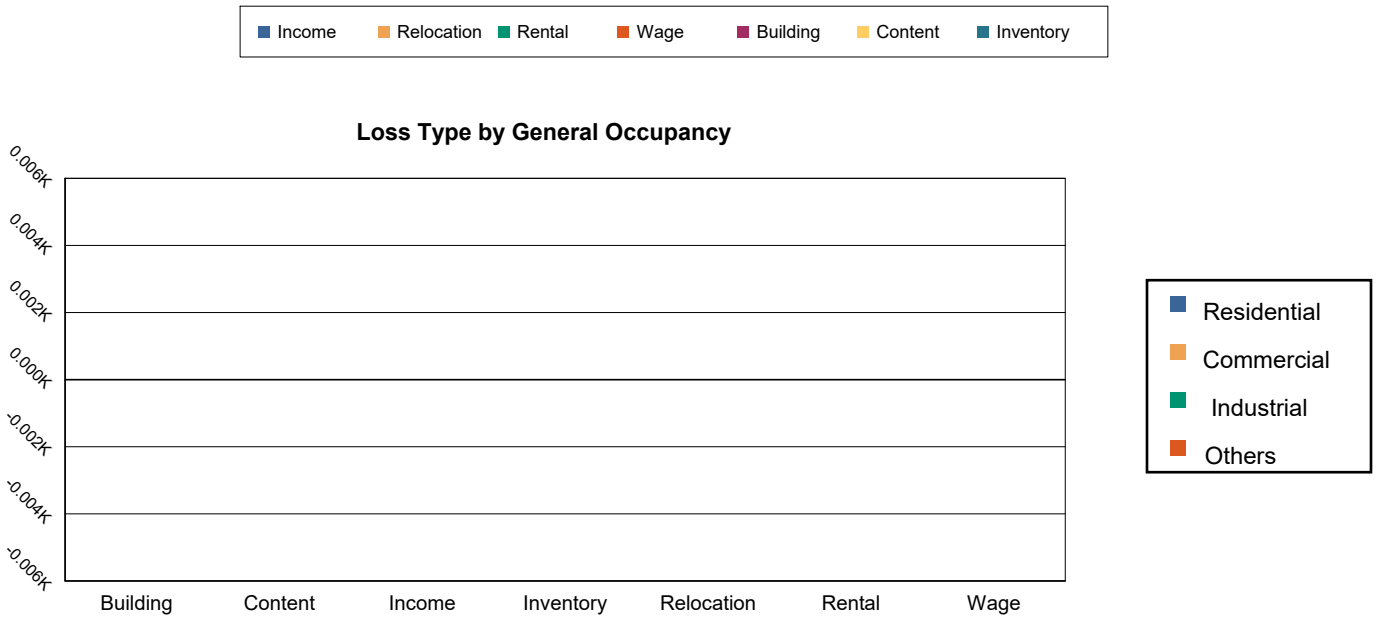


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,360	1,964,607	4,778,967
Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**
Study Region Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**

Hazus: Hurricane Global Risk Report

Region Name:	Berlin_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Saturday, May 6, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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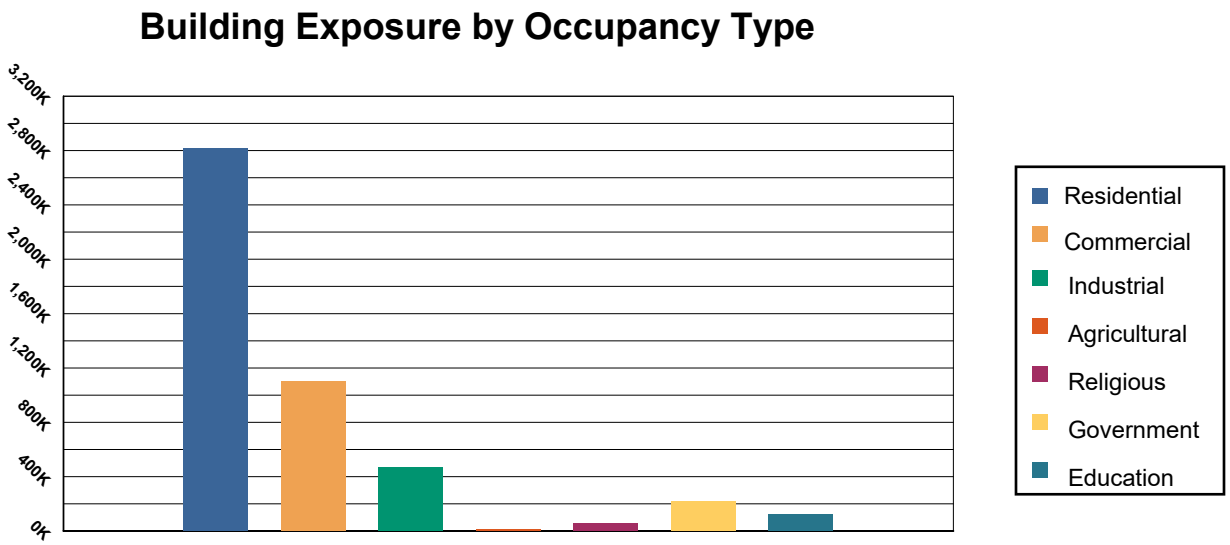

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For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

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Scenario Name:	Probabilistic
Type:	Probabilistic

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General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

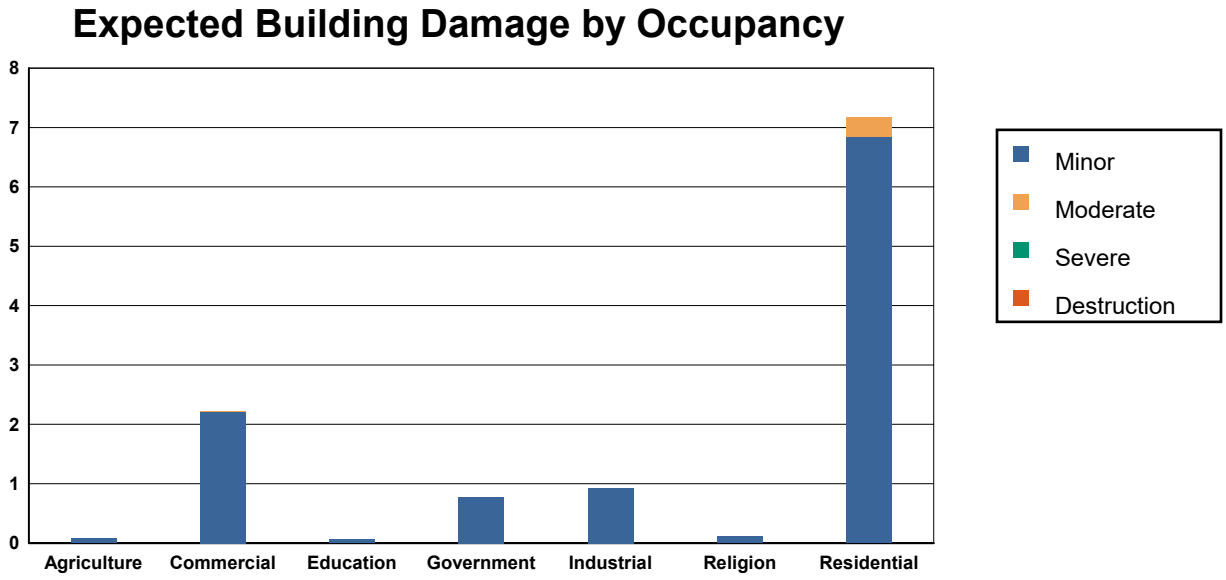


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	26.93	99.74	0.07	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	682.79	99.68	2.21	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Education	15.94	99.65	0.06	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Government	206.23	99.63	0.77	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	246.07	99.62	0.93	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Religion	38.89	99.71	0.11	0.29	0.00	0.00	0.00	0.00	0.00	0.00
Residential	6,814.83	99.89	6.84	0.10	0.33	0.00	0.00	0.00	0.00	0.00
Total	**8,031.68**		**10.99**		**0.33**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	143	99.59	1	0.41	0	0.00	0	0.00	0	0.00
Masonry	747	99.49	4	0.49	0	0.01	0	0.00	0	0.00
MH	18	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	599	99.64	2	0.36	0	0.00	0	0.00	0	0.00
Wood	6,524	99.95	3	0.05	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

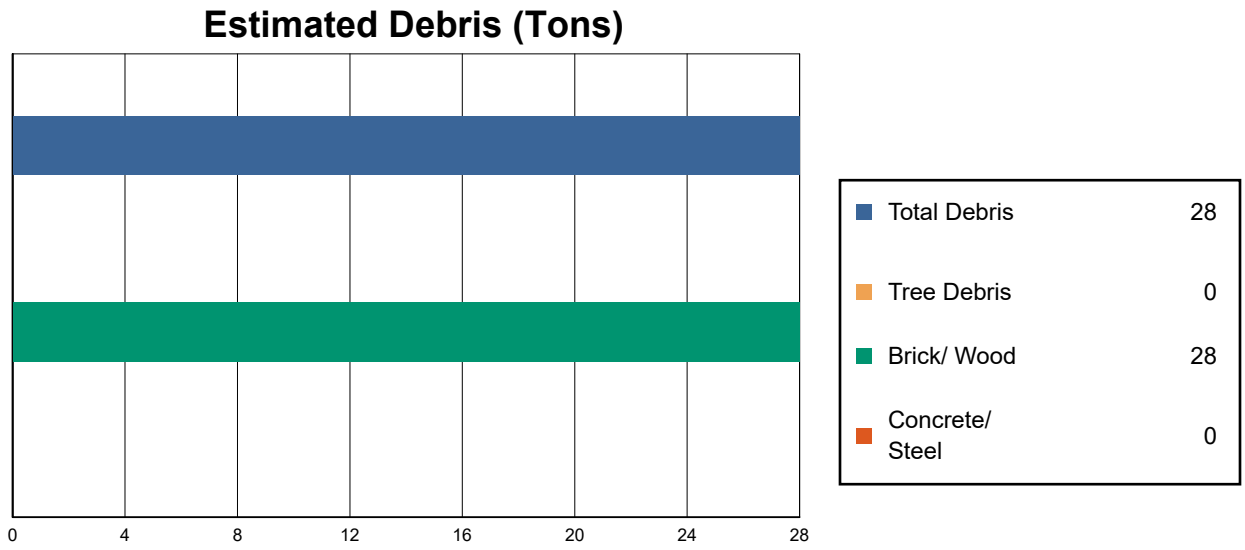
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

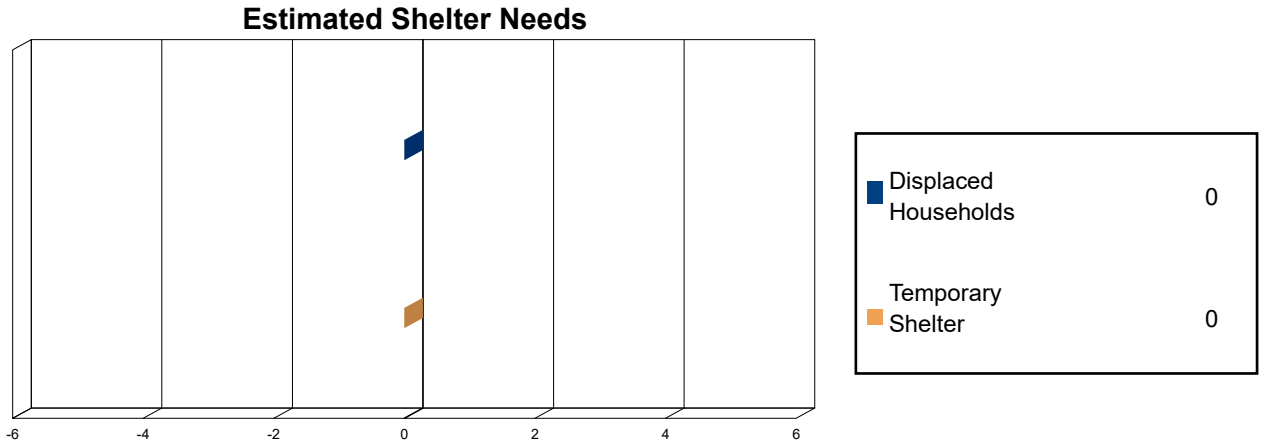


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 28 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 28 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 20,175) will seek temporary shelter in public shelters.

Economic Loss

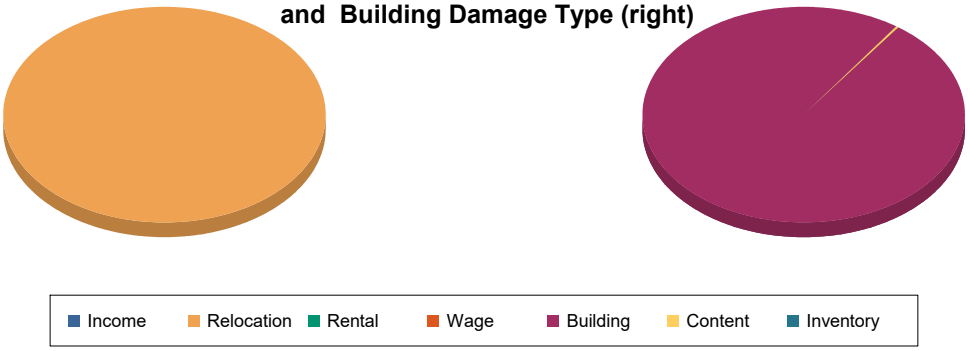
The total economic loss estimated for the hurricane is 1.1 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

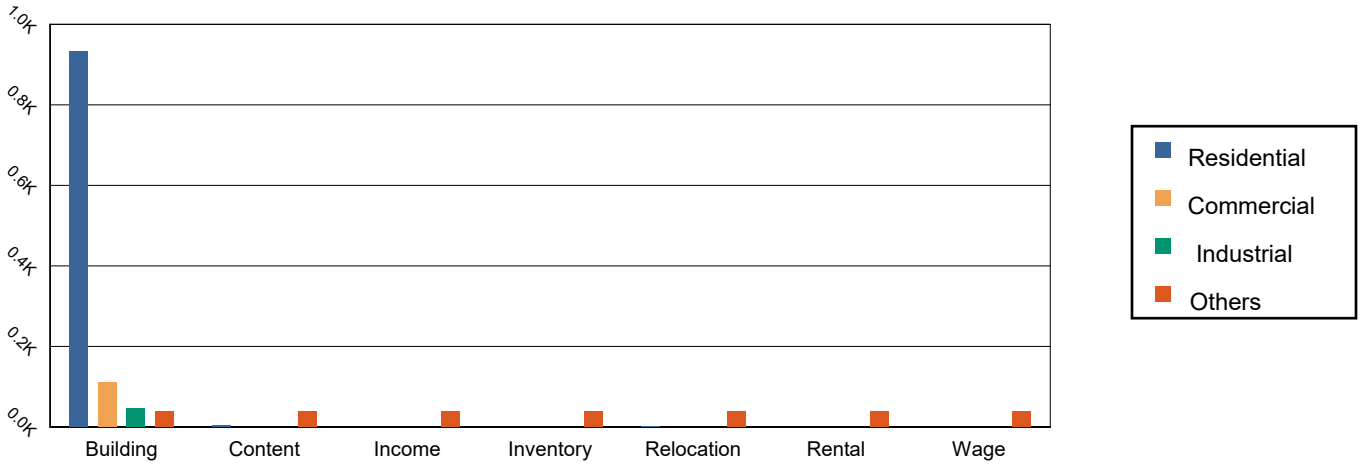


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	932.21	109.72	46.42	39.38	1,127.74
	Content	3.07	0.00	0.00	0.00	3.07
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**935.29**	**109.72**	**46.42**	**39.38**	**1,130.81**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.78	0.02	0.00	0.00	0.79
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.78**	**0.02**	**0.00**	**0.00**	**0.79**

Total

Total	**936.06**	**109.73**	**46.42**	**39.38**	**1,131.60**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,360	1,964,607	4,778,967
Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**
Study Region Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**

Hazus: Hurricane Global Risk Report

Region Name:	Berlin_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.99 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,175 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,043 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

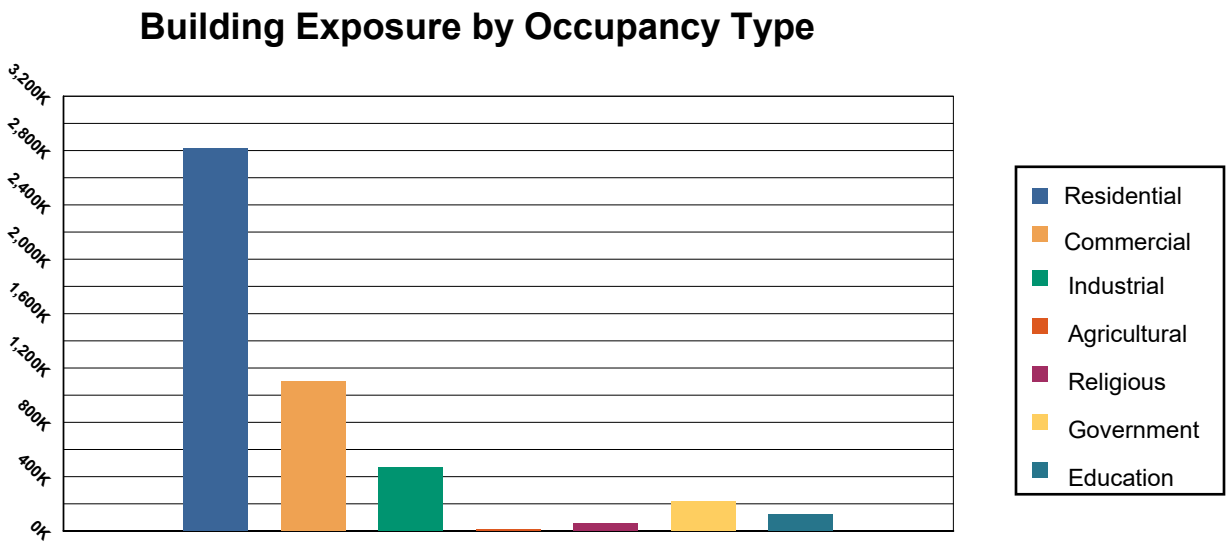


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,814,360	58.89%
Commercial	1,097,171	22.96%
Industrial	464,220	9.71%
Agricultural	9,385	0.20%
Religious	54,559	1.14%
Government	217,977	4.56%
Education	121,295	2.54%
Total	**4,778,967**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 14 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

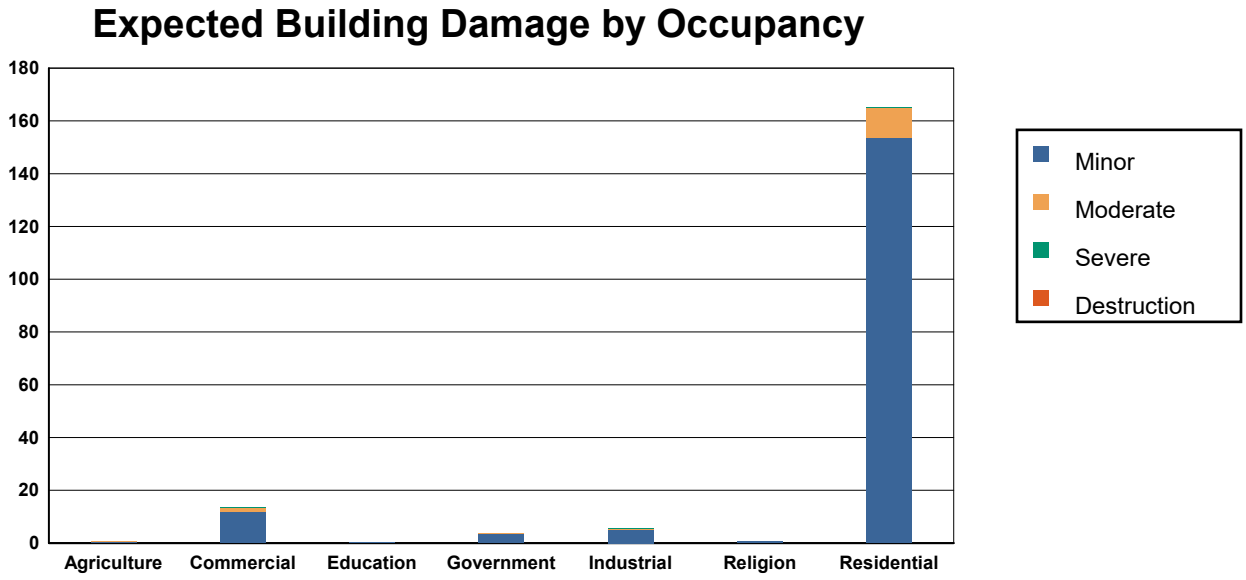


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	26.36	97.64	0.55	2.05	0.06	0.24	0.02	0.07	0.00	0.00
Commercial	671.27	98.00	11.84	1.73	1.78	0.26	0.11	0.02	0.00	0.00
Education	15.71	98.19	0.28	1.77	0.01	0.04	0.00	0.00	0.00	0.00
Government	203.41	98.27	3.52	1.70	0.07	0.03	0.00	0.00	0.00	0.00
Industrial	241.55	97.79	4.99	2.02	0.36	0.15	0.10	0.04	0.00	0.00
Religion	38.35	98.32	0.63	1.62	0.02	0.05	0.00	0.00	0.00	0.00
Residential	6,656.87	97.58	153.63	2.25	11.27	0.17	0.23	0.00	0.00	0.00
Total	**7,853.53**		**175.45**		**13.57**		**0.46**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	141	97.99	3	1.97	0	0.04	0	0.00	0	0.00
Masonry	725	96.59	21	2.82	4	0.55	0	0.03	0	0.00
MH	18	99.74	0	0.20	0	0.05	0	0.00	0	0.02
Steel	590	98.09	10	1.67	1	0.23	0	0.02	0	0.00
Wood	6,391	97.92	131	2.01	4	0.07	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

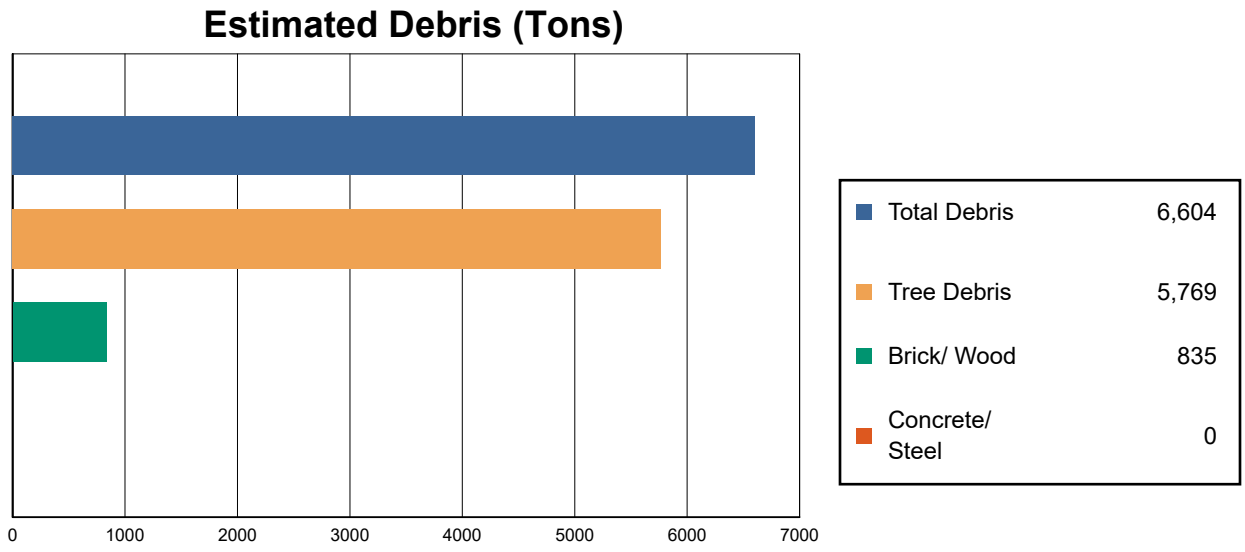
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

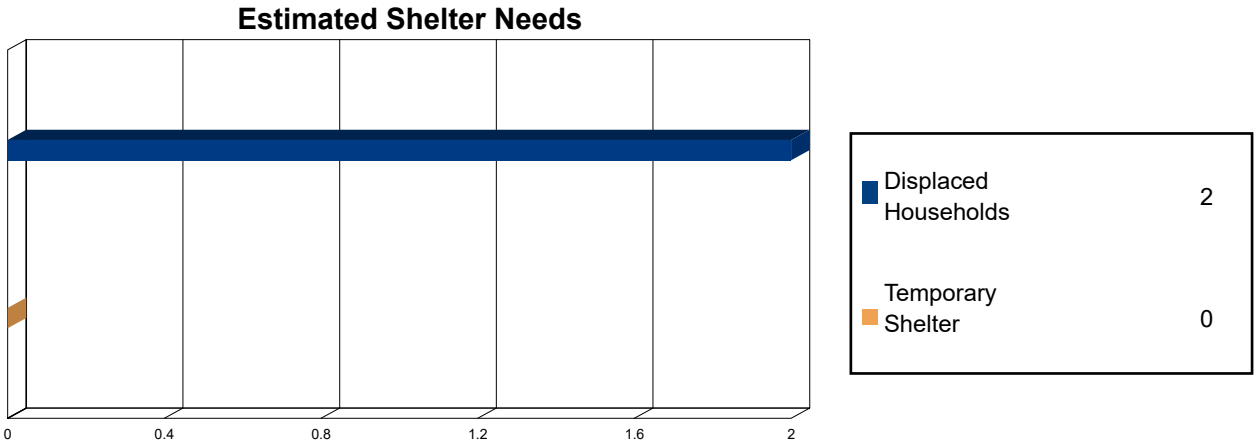


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,604 tons of debris will be generated. Of the total amount, 3,502 tons (53%) is Other Tree Debris. Of the remaining 3,102 tons, Brick/Wood comprises 27% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 33 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,267 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 20,175) will seek temporary shelter in public shelters.

Economic Loss

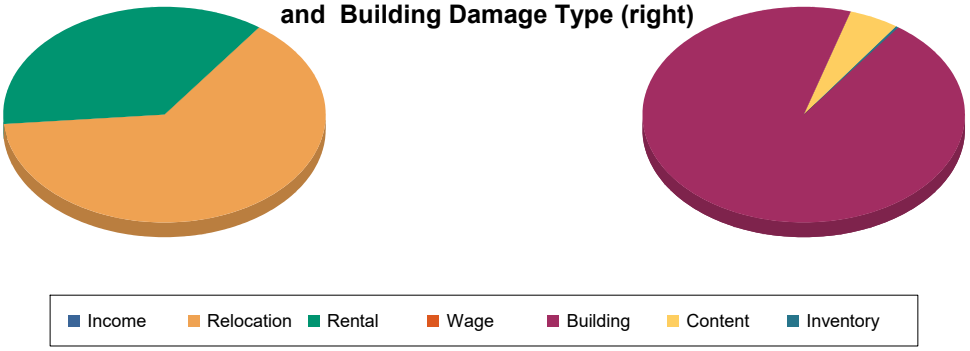
The total economic loss estimated for the hurricane is 11.1 million dollars, which represents 0.23 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 11 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

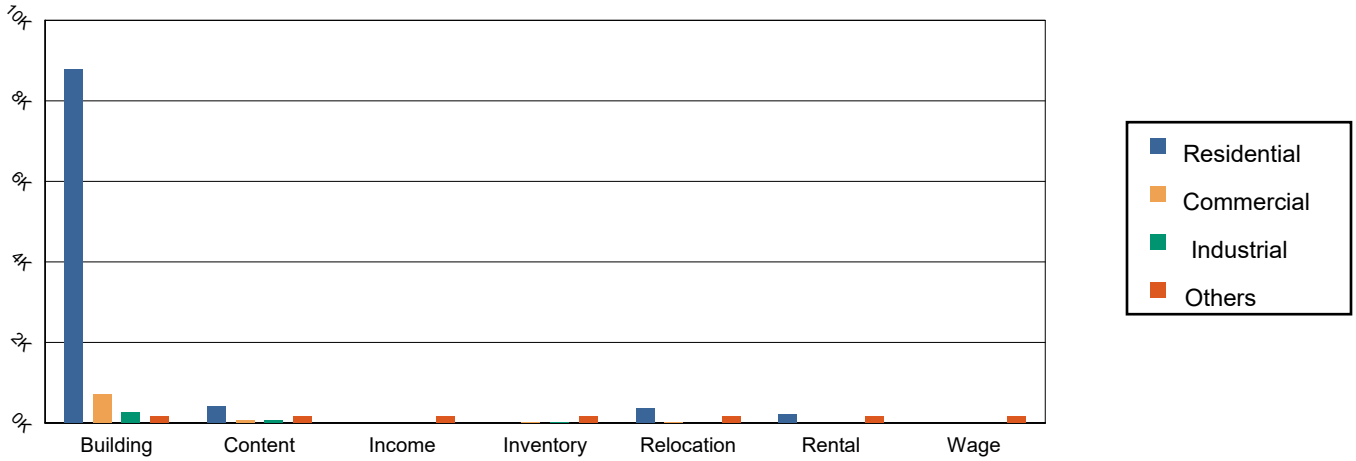


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	8,785.67	697.67	263.51	162.90	9,909.75
	Content	401.38	61.47	60.23	1.79	524.86
	Inventory	0.00	8.11	8.33	1.31	17.76
	Subtotal	**9,187.05**	**767.25**	**332.07**	**166.00**	**10,452.37**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	359.12	23.10	1.48	1.14	384.85
	Rental	220.44	0.00	0.00	0.00	220.44
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**579.56**	**23.10**	**1.48**	**1.14**	**605.29**

Total

Total	9,766.61	790.35	333.55	167.14	11,057.66

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,360	1,964,607	4,778,967
Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**
Study Region Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**

Hazus: Hurricane Global Risk Report

Region Name:	Berlin_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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Appendix B: Regional Population and Building Value Data	11

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- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.99 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,175 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

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General Building Stock

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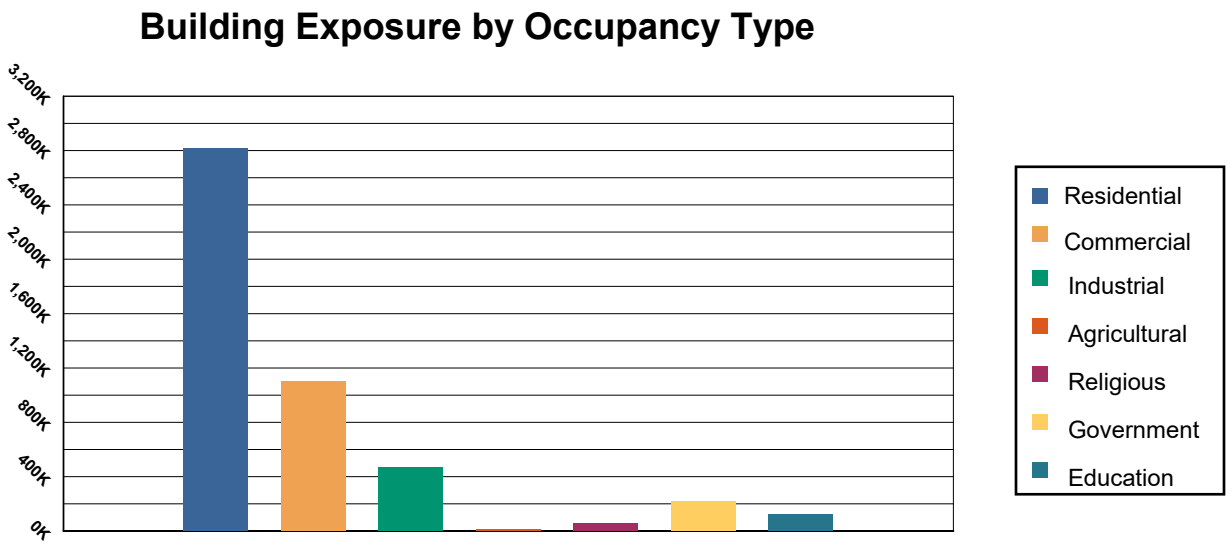

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Agricultural	9,385	0.20%
Religious	54,559	1.14%
Government	217,977	4.56%
Education	121,295	2.54%
Total	**4,778,967**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 73 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

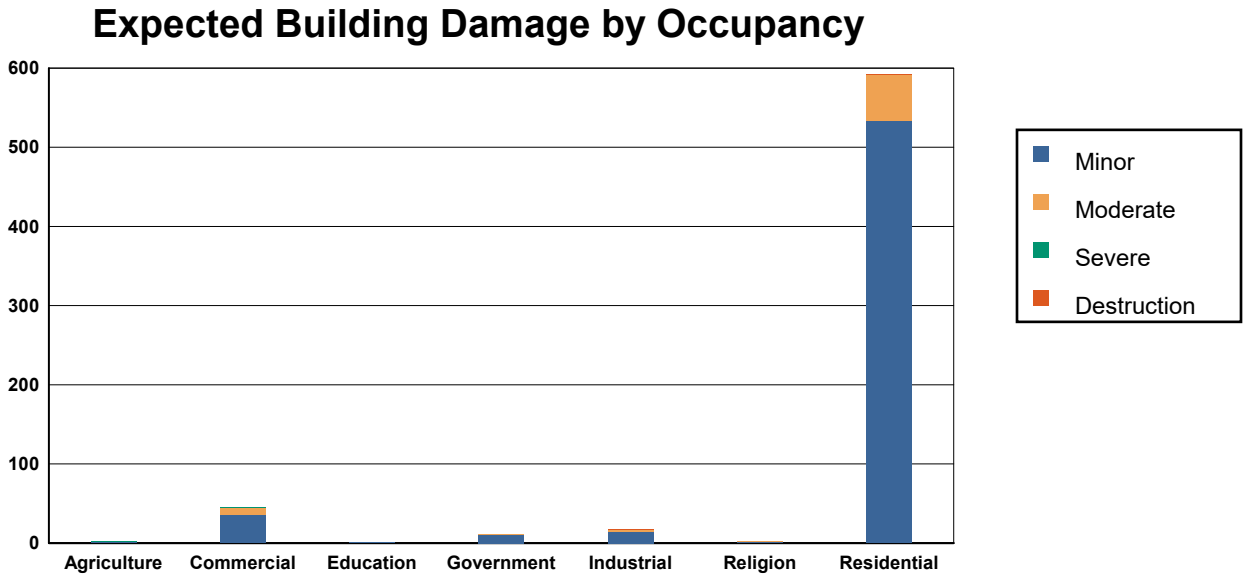


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	24.69	91.44	1.81	6.72	0.34	1.28	0.15	0.54	0.01	0.04
Commercial	639.59	93.37	36.13	5.27	7.94	1.16	1.33	0.19	0.00	0.00
Education	15.07	94.19	0.85	5.34	0.07	0.46	0.00	0.01	0.00	0.00
Government	195.83	94.61	10.30	4.98	0.85	0.41	0.02	0.01	0.00	0.00
Industrial	229.61	92.96	14.08	5.70	2.52	1.02	0.76	0.31	0.04	0.02
Religion	36.68	94.06	2.16	5.53	0.15	0.40	0.01	0.02	0.00	0.00
Residential	6,229.30	91.31	533.87	7.83	57.22	0.84	1.03	0.02	0.58	0.01
Total	**7,370.78**		**599.20**		**69.10**		**3.29**		**0.63**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	135	93.91	8	5.53	1	0.55	0	0.01	0	0.00
Masonry	679	90.44	53	7.08	17	2.26	2	0.21	0	0.01
MH	18	97.91	0	1.47	0	0.45	0	0.00	0	0.18
Steel	565	93.95	28	4.73	7	1.11	1	0.21	0	0.00
Wood	6,000	91.92	494	7.58	31	0.48	1	0.02	0	0.01

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

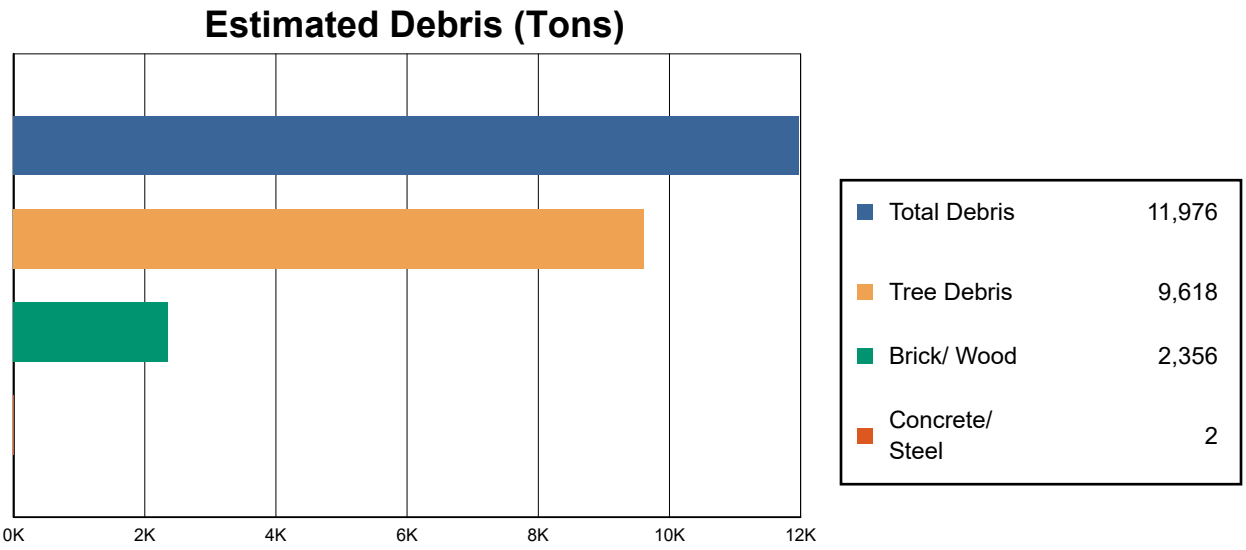
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

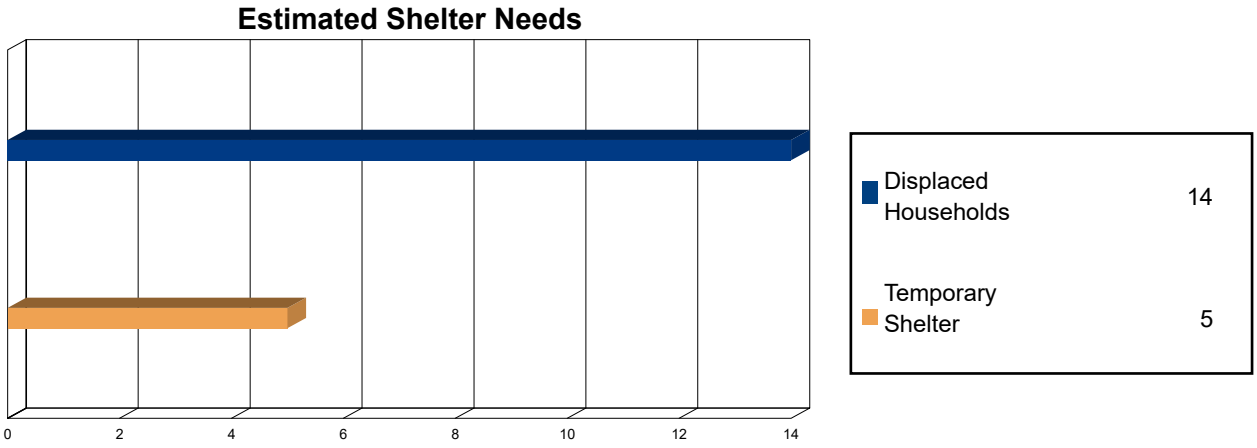


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 11,976 tons of debris will be generated. Of the total amount, 5,698 tons (48%) is Other Tree Debris. Of the remaining 6,278 tons, Brick/Wood comprises 38% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 94 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,920 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 14 households to be displaced due to the hurricane. Of these, 5 people (out of a total population of 20,175) will seek temporary shelter in public shelters.

Economic Loss

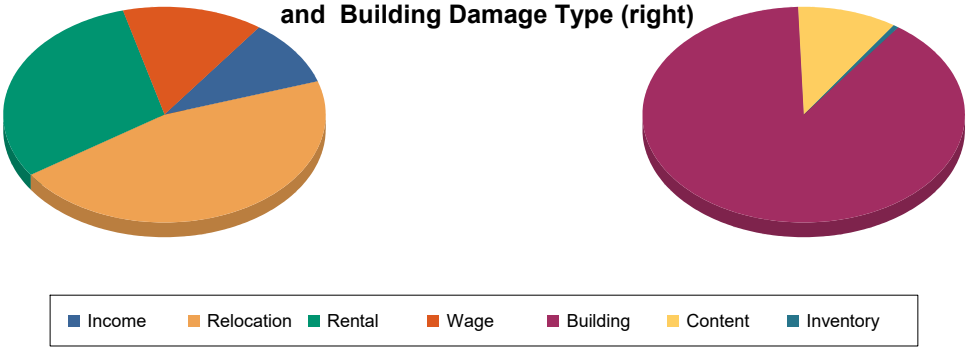
The total economic loss estimated for the hurricane is 28.7 million dollars, which represents 0.60 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 29 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 78% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

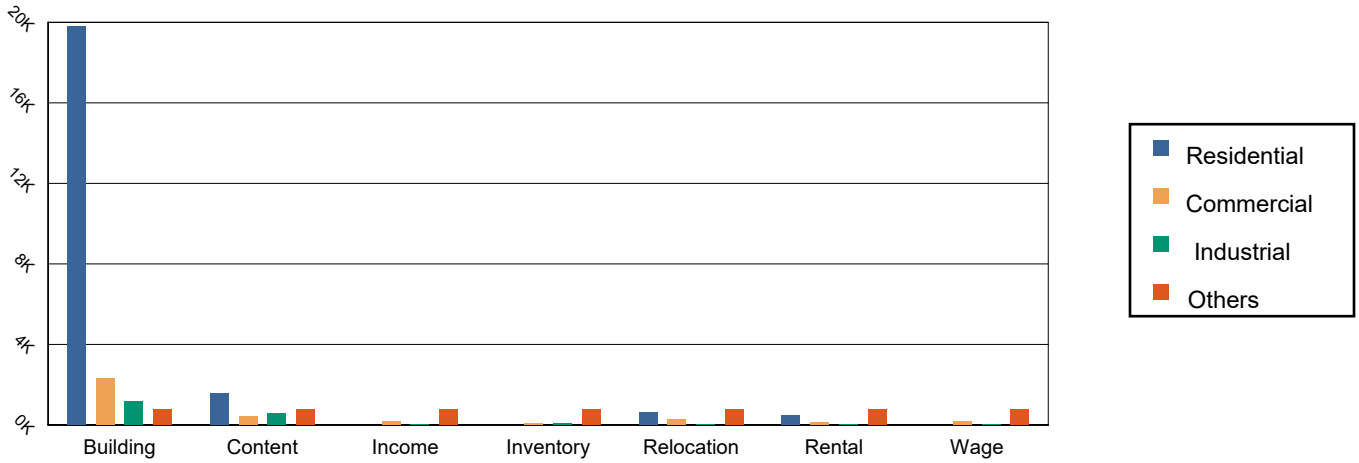


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	19,775.47	2,323.65	1,172.75	559.36	23,831.23
	Content	1,576.75	446.22	585.10	74.20	2,682.27
	Inventory	0.00	76.78	76.85	8.47	162.10
	Subtotal	**21,352.22**	**2,846.65**	**1,834.70**	**642.03**	**26,675.60**
Business Interruption Loss						
	Income	0.00	162.02	10.42	29.95	202.40
	Relocation	604.40	252.80	38.23	34.88	930.31
	Rental	495.93	109.50	7.75	2.33	615.52
	Wage	0.00	199.76	17.24	70.63	287.63
	Subtotal	**1,100.33**	**724.08**	**73.64**	**137.80**	**2,035.86**

Total

Total	**22,452.55**	**3,570.74**	**1,908.34**	**779.83**	**28,711.46**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,360	1,964,607	4,778,967
Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**
Study Region Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**

Hazus: Hurricane Global Risk Report

Region Name:	Berlin_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.99 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,175 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,043 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

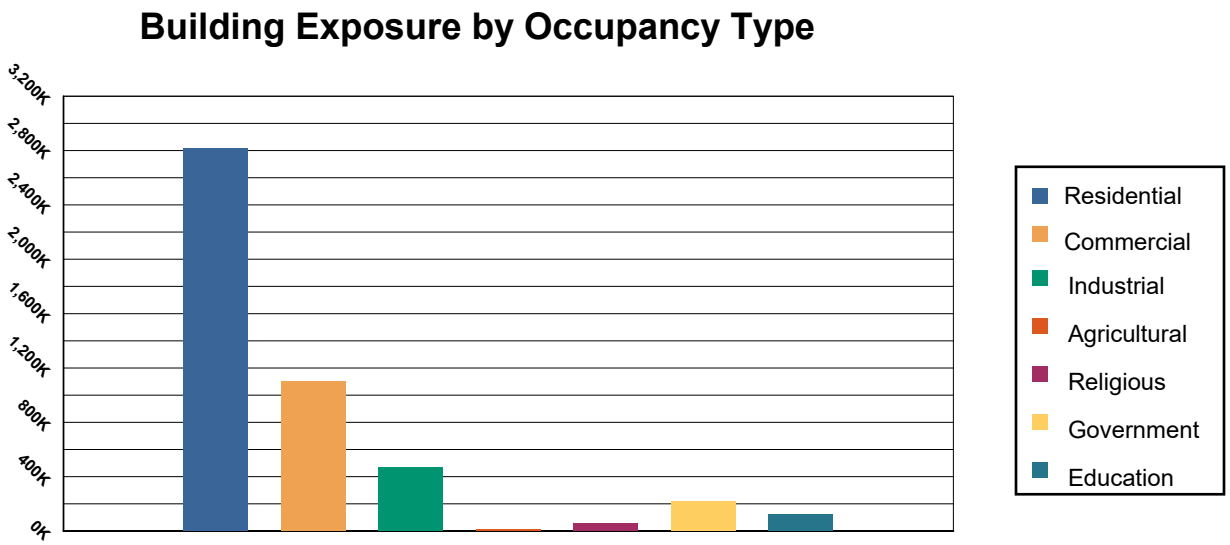


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,814,360	58.89%
Commercial	1,097,171	22.96%
Industrial	464,220	9.71%
Agricultural	9,385	0.20%
Religious	54,559	1.14%
Government	217,977	4.56%
Education	121,295	2.54%
Total	**4,778,967**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 221 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

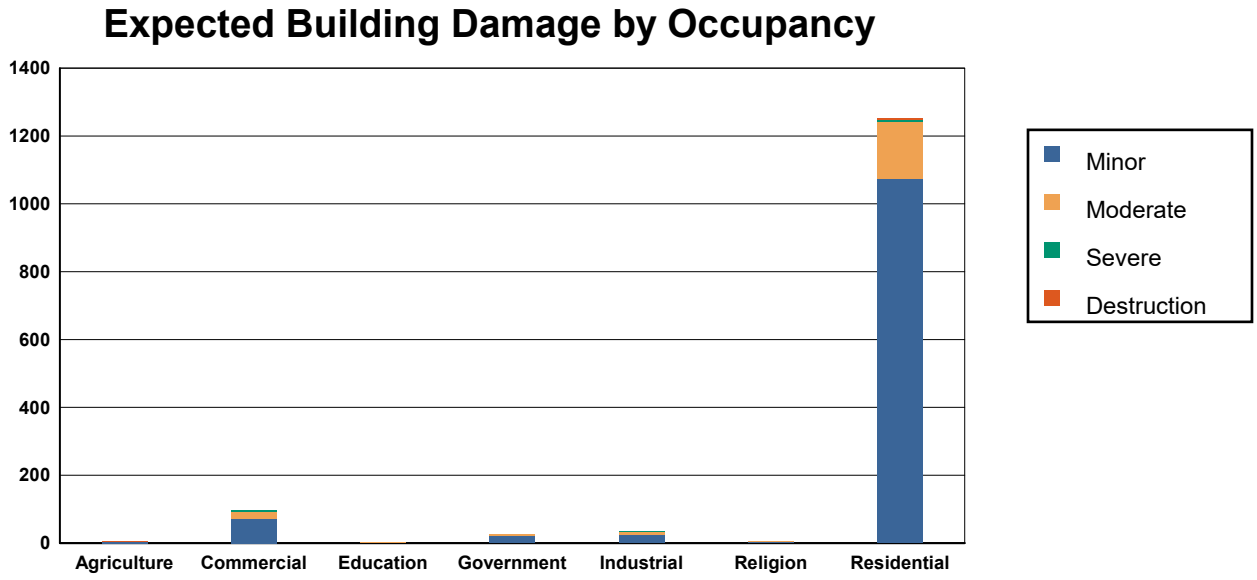


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.25	82.39	3.44	12.75	0.87	3.21	0.40	1.50	0.04	0.15
Commercial	588.23	85.87	71.19	10.39	21.07	3.08	4.51	0.66	0.01	0.00
Education	13.86	86.60	1.77	11.07	0.35	2.21	0.02	0.12	0.00	0.00
Government	179.78	86.85	22.36	10.80	4.60	2.22	0.26	0.12	0.00	0.00
Industrial	211.37	85.57	25.92	10.49	7.37	2.99	2.17	0.88	0.17	0.07
Religion	33.51	85.92	4.70	12.05	0.75	1.93	0.04	0.11	0.00	0.00
Residential	5,568.63	81.63	1,074.57	15.75	167.36	2.45	6.68	0.10	4.77	0.07
Total	**6,617.62**		**1,203.95**		**202.37**		**14.08**		**4.99**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	125	86.65	16	10.80	4	2.44	0	0.11	0	0.00
Masonry	611	81.38	95	12.63	40	5.33	5	0.60	0	0.06
MH	17	95.03	1	3.16	0	1.28	0	0.03	0	0.51
Steel	521	86.68	57	9.42	19	3.17	4	0.72	0	0.00
Wood	5,377	82.38	1,024	15.68	116	1.78	6	0.10	4	0.06

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

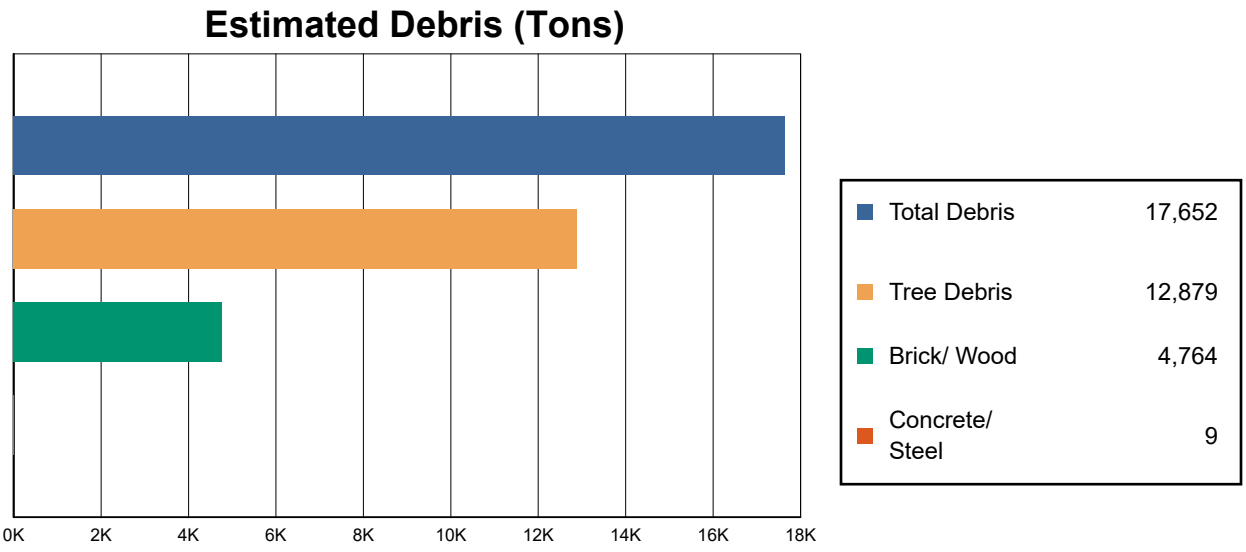
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	5

Induced Hurricane Damage

Debris Generation

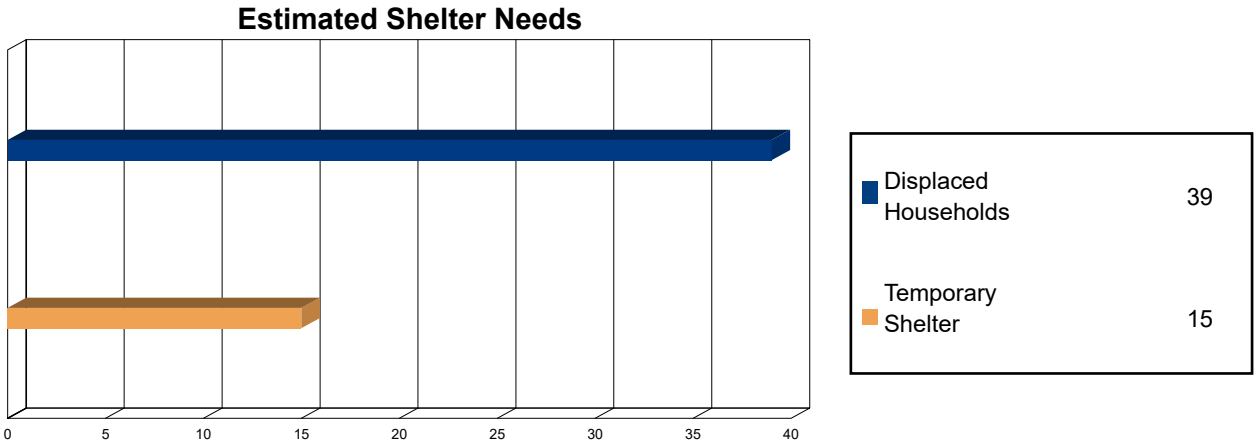


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 17,652 tons of debris will be generated. Of the total amount, 7,617 tons (43%) is Other Tree Debris. Of the remaining 10,035 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 191 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,262 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the hurricane. Of these, 15 people (out of a total population of 20,175) will seek temporary shelter in public shelters.

Economic Loss

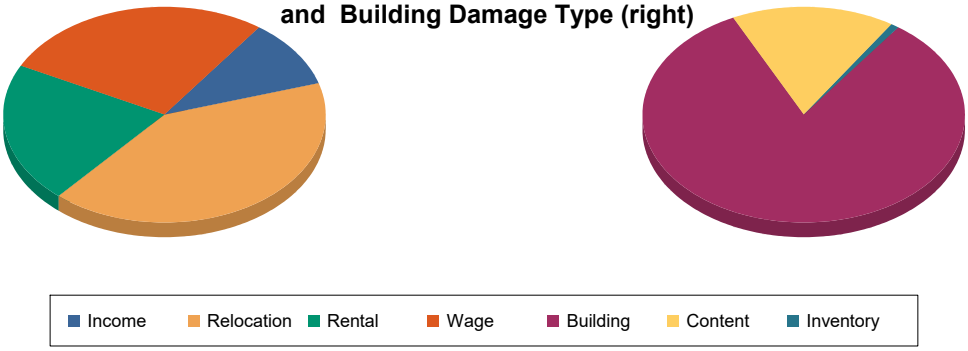
The total economic loss estimated for the hurricane is 63.9 million dollars, which represents 1.34 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 64 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 72% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

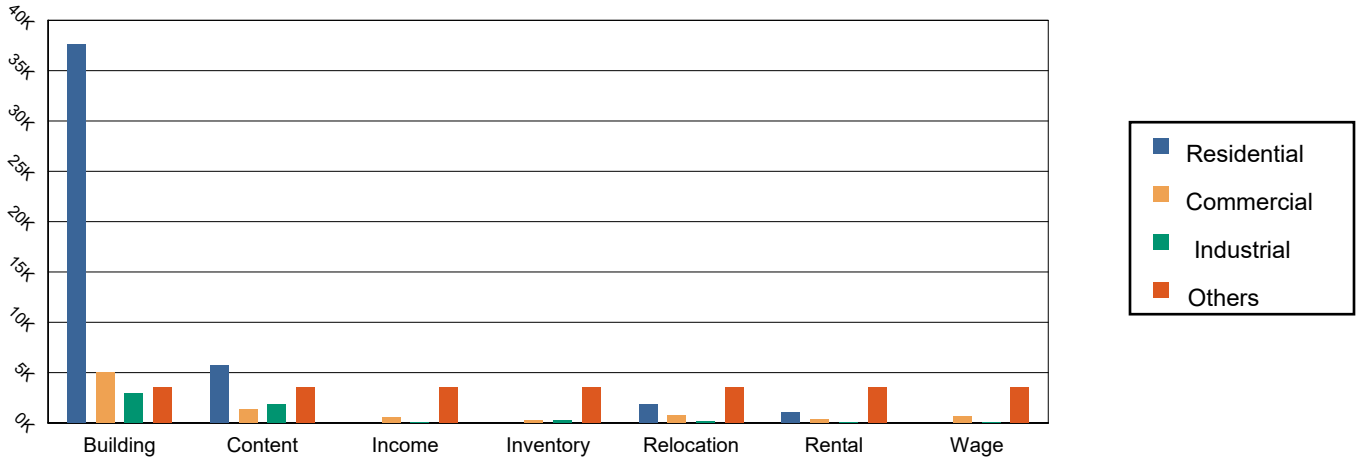


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	37,617.95	4,996.14	2,889.12	1,473.37	46,976.57
	Content	5,773.17	1,390.17	1,806.02	327.74	9,297.10
	Inventory	0.00	246.80	233.61	25.00	505.41
	Subtotal	**43,391.12**	**6,633.12**	**4,928.74**	**1,826.10**	**56,779.08**
Business Interruption Loss						
	Income	0.00	580.77	31.49	129.12	741.38
	Relocation	1,800.99	746.06	121.19	264.31	2,932.55
	Rental	1,076.71	368.89	22.85	48.01	1,516.46
	Wage	0.00	620.47	51.77	1,292.58	1,964.82
	Subtotal	**2,877.70**	**2,316.19**	**227.31**	**1,734.02**	**7,155.21**

Total

Total	**46,268.82**	**8,949.30**	**5,156.05**	**3,560.12**	**63,934.29**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,360	1,964,607	4,778,967
Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**
Study Region Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**

Hazus: Hurricane Global Risk Report

Region Name:	Berlin_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.99 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,175 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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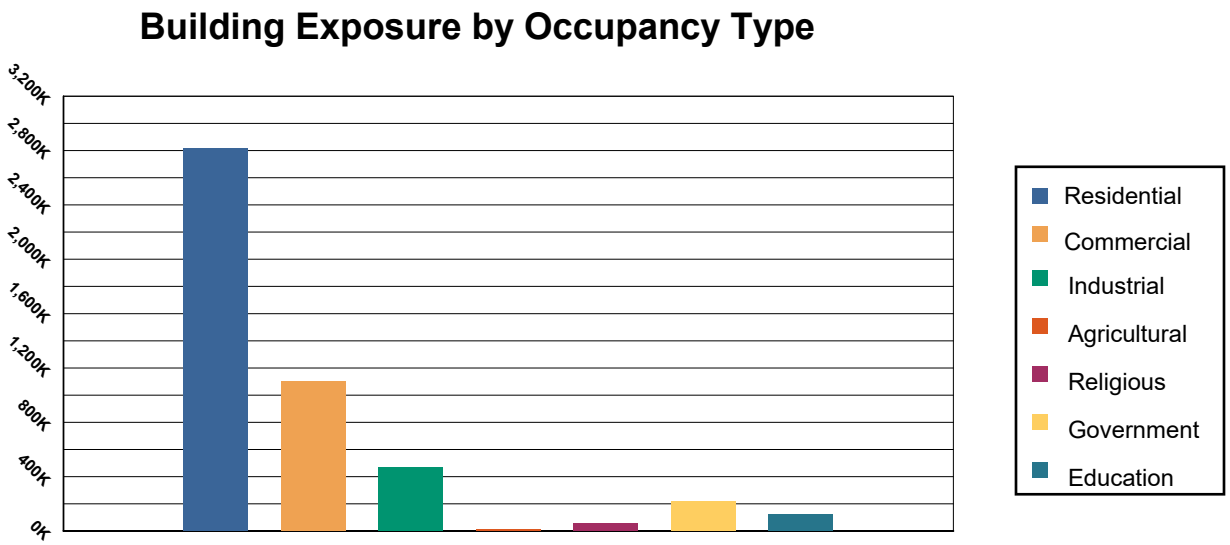

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
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Commercial	1,097,171	22.96%
Industrial	464,220	9.71%
Agricultural	9,385	0.20%
Religious	54,559	1.14%
Government	217,977	4.56%
Education	121,295	2.54%
Total	**4,778,967**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 559 buildings will be at least moderately damaged. This is over 7% of the total number of buildings in the region. There are an estimated 21 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

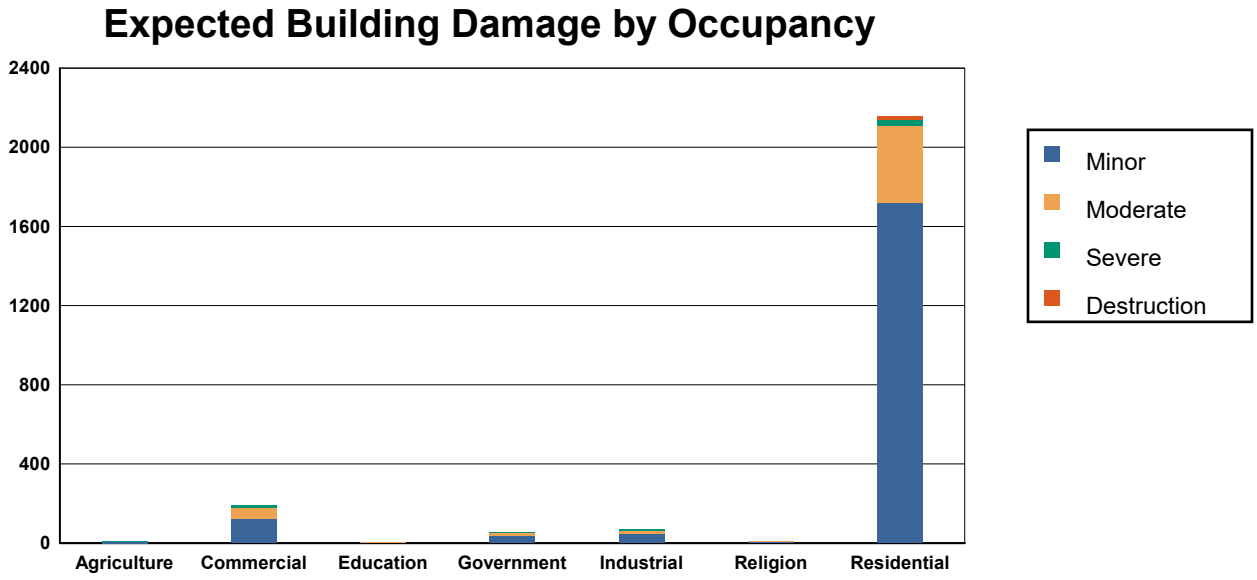


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	18.07	66.93	5.81	21.50	2.01	7.43	0.98	3.61	0.14	0.52
Commercial	491.26	71.72	123.77	18.07	55.44	8.09	14.40	2.10	0.13	0.02
Education	11.74	73.36	3.01	18.84	1.13	7.03	0.12	0.77	0.00	0.00
Government	154.66	74.72	37.06	17.90	13.84	6.69	1.43	0.69	0.00	0.00
Industrial	175.11	70.89	43.78	17.72	20.90	8.46	6.54	2.65	0.68	0.28
Religion	28.45	72.95	8.01	20.55	2.31	5.91	0.23	0.58	0.00	0.00
Residential	4,665.52	68.39	1,717.98	25.18	388.20	5.69	29.84	0.44	20.46	0.30
Total	**5,544.81**		**1,939.42**		**483.82**		**53.54**		**21.40**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	105	72.87	26	18.29	12	8.05	1	0.79	0	0.00
Masonry	506	67.35	145	19.33	85	11.35	13	1.74	2	0.23
MH	15	84.75	1	7.70	1	5.16	0	0.28	0	2.12
Steel	439	73.11	97	16.07	50	8.39	14	2.40	0	0.03
Wood	4,515	69.18	1,668	25.56	298	4.57	27	0.41	19	0.28

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

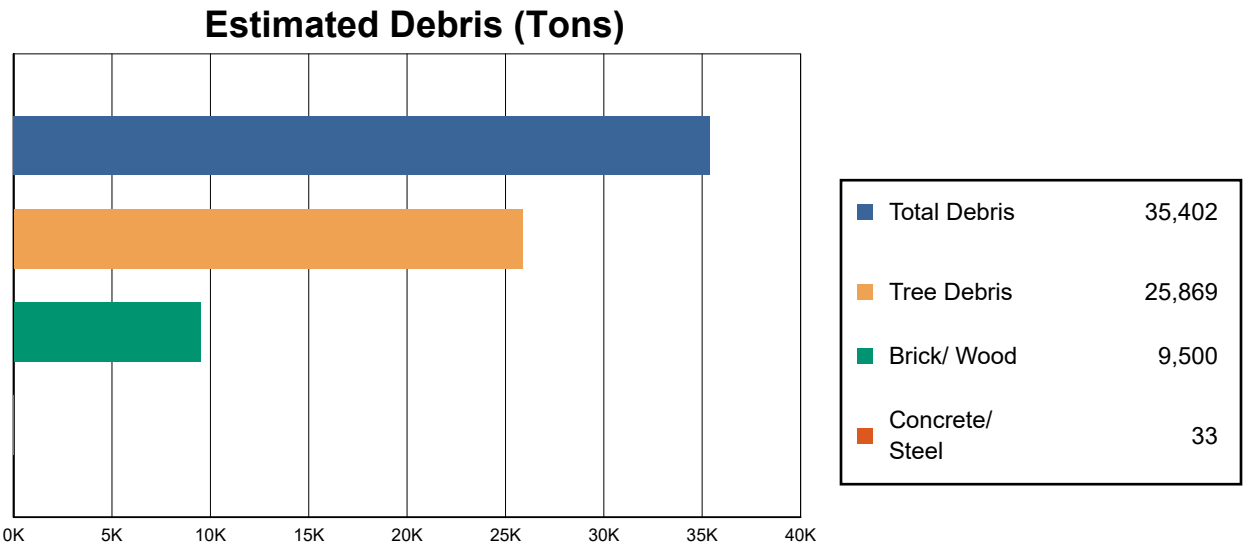
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	0

Induced Hurricane Damage

Debris Generation

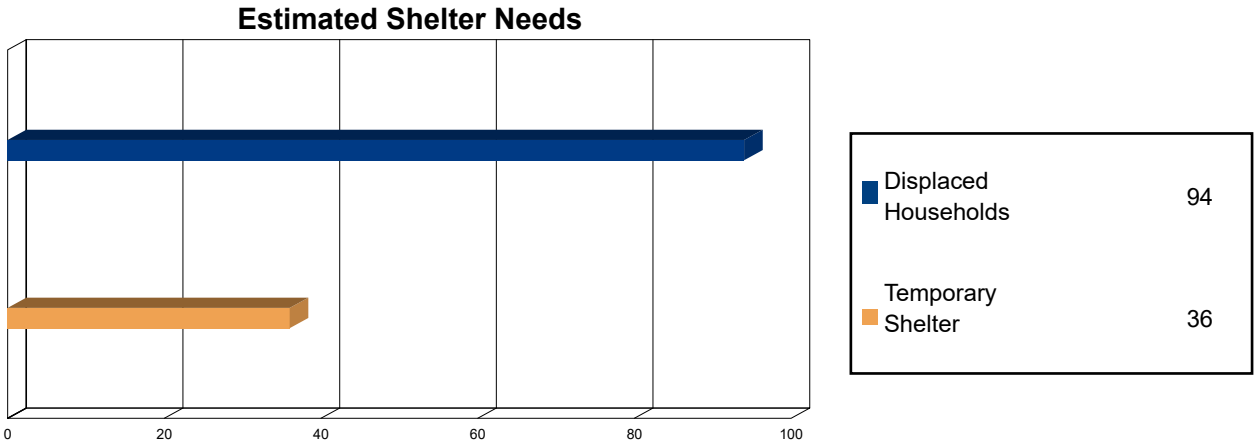


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 35,402 tons of debris will be generated. Of the total amount, 15,399 tons (43%) is Other Tree Debris. Of the remaining 20,003 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 381 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 10,470 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 94 households to be displaced due to the hurricane. Of these, 36 people (out of a total population of 20,175) will seek temporary shelter in public shelters.

Economic Loss

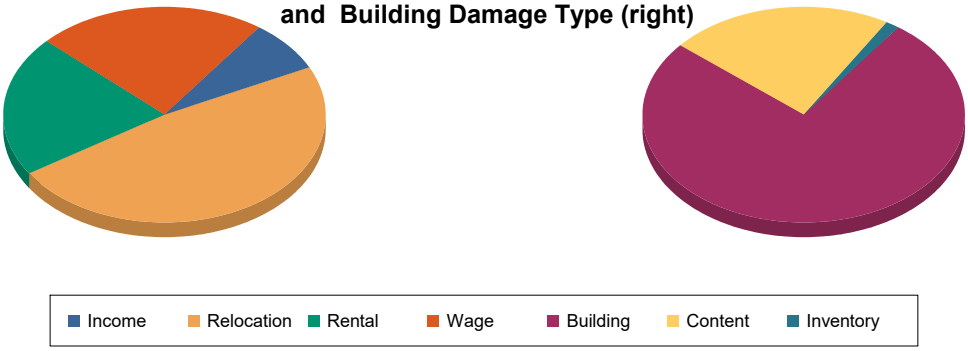
The total economic loss estimated for the hurricane is 148.1 million dollars, which represents 3.10 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 148 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 66% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

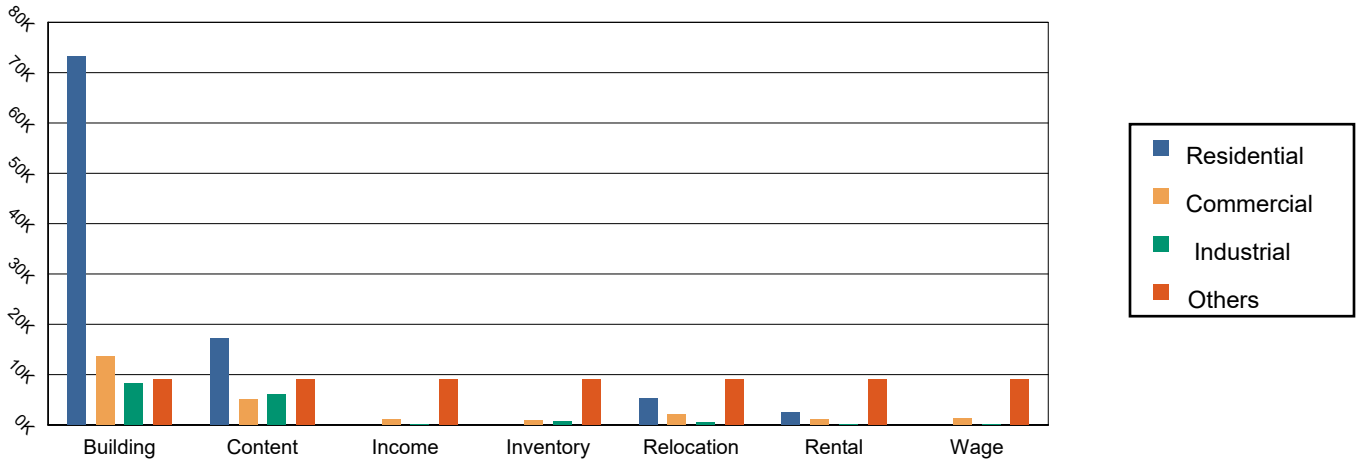


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	73,228.07	13,575.94	8,293.60	3,819.84	98,917.44
	Content	17,184.18	5,061.27	6,006.07	1,196.21	29,447.73
	Inventory	0.00	916.25	763.96	74.56	1,754.77
	Subtotal	**90,412.24**	**19,553.46**	**15,063.63**	**5,090.61**	**130,119.94**
Business Interruption Loss						
	Income	0.00	1,102.62	87.63	234.24	1,424.49
	Relocation	5,289.02	2,159.49	409.14	753.94	8,611.59
	Rental	2,500.00	1,074.36	72.10	145.09	3,791.55
	Wage	0.00	1,263.50	144.00	2,758.11	4,165.61
	Subtotal	**7,789.01**	**5,599.97**	**712.88**	**3,891.38**	**17,993.24**

Total

Total	**98,201.26**	**25,153.43**	**15,776.51**	**8,981.99**	**148,113.19**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,360	1,964,607	4,778,967
Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**
Study Region Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**

Hazus: Hurricane Global Risk Report

Region Name:	Berlin_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.99 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,175 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,779 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,043 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

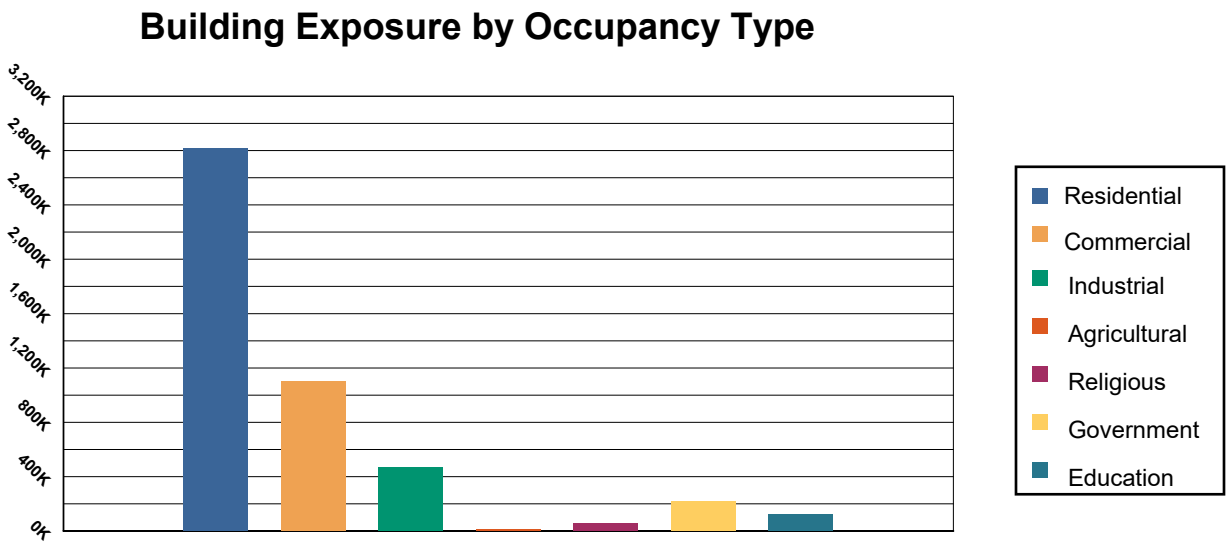


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,814,360	58.89%
Commercial	1,097,171	22.96%
Industrial	464,220	9.71%
Agricultural	9,385	0.20%
Religious	54,559	1.14%
Government	217,977	4.56%
Education	121,295	2.54%
Total	**4,778,967**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 916 buildings will be at least moderately damaged. This is over 11% of the total number of buildings in the region. There are an estimated 50 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

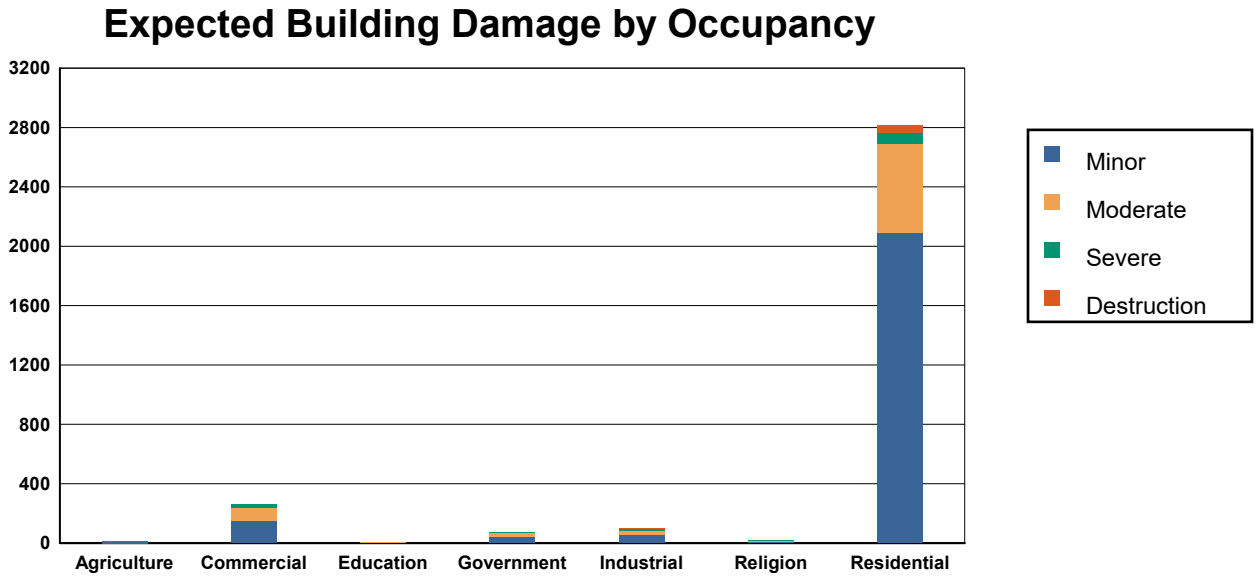


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15.29	56.62	7.05	26.12	2.94	10.87	1.48	5.48	0.25	0.91
Commercial	421.65	61.55	150.12	21.91	86.10	12.57	26.82	3.92	0.31	0.05
Education	10.06	62.88	3.68	23.01	1.91	11.95	0.35	2.17	0.00	0.00
Government	132.95	64.23	45.70	22.08	24.13	11.66	4.22	2.04	0.00	0.00
Industrial	150.03	60.74	51.87	21.00	32.32	13.08	11.60	4.69	1.19	0.48
Religion	24.37	62.48	10.00	25.63	4.01	10.27	0.63	1.62	0.00	0.00
Residential	4,010.14	58.78	2,093.66	30.69	600.80	8.81	69.40	1.02	48.00	0.70
Total	**4,764.48**		**2,362.07**		**752.20**		**114.50**		**49.75**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	90	62.43	31	21.82	19	13.48	3	2.26	0	0.00
Masonry	431	57.38	170	22.58	123	16.40	24	3.20	3	0.43
MH	14	77.13	2	10.12	1	8.29	0	0.63	1	3.83
Steel	378	62.89	116	19.35	79	13.17	27	4.54	0	0.06
Wood	3,884	59.51	2,053	31.45	485	7.43	61	0.94	44	0.67

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

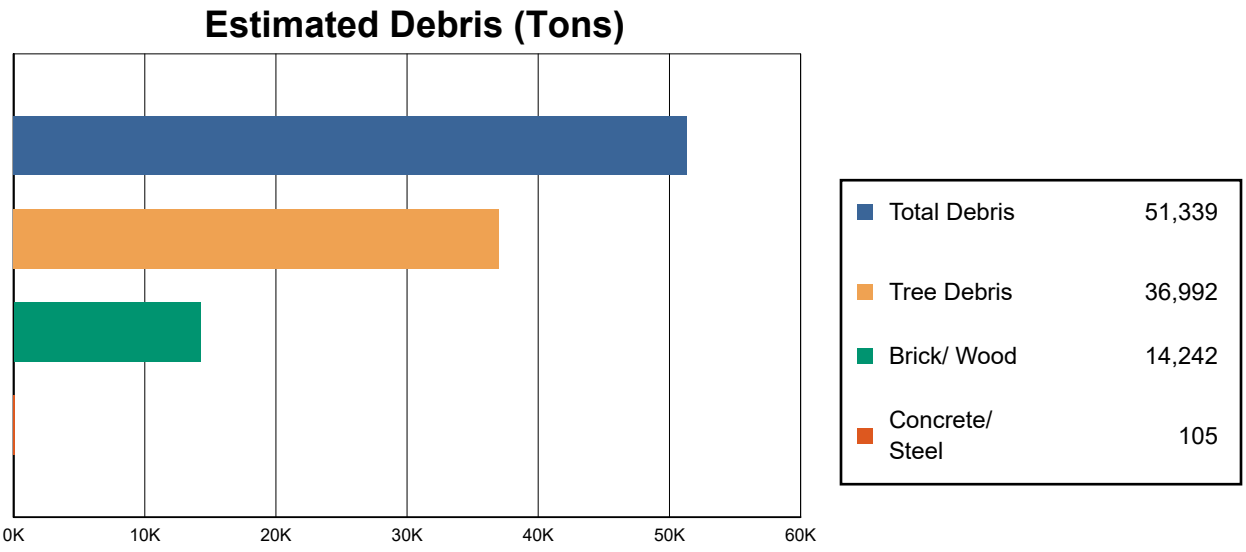
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	8	0	0	0

Induced Hurricane Damage

Debris Generation

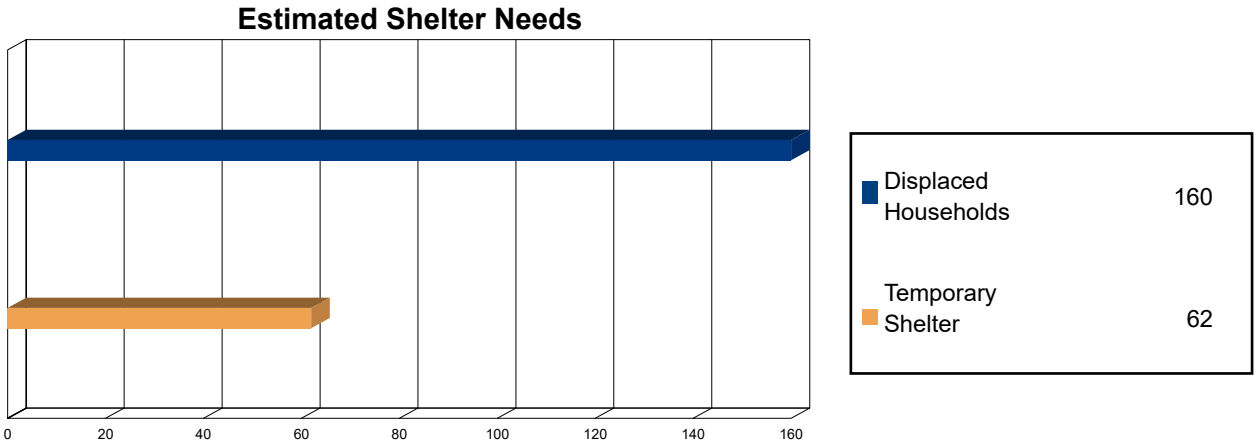


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 51,339 tons of debris will be generated. Of the total amount, 21,893 tons (43%) is Other Tree Debris. Of the remaining 29,446 tons, Brick/Wood comprises 48% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 574 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 15,099 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 160 households to be displaced due to the hurricane. Of these, 62 people (out of a total population of 20,175) will seek temporary shelter in public shelters.

Economic Loss

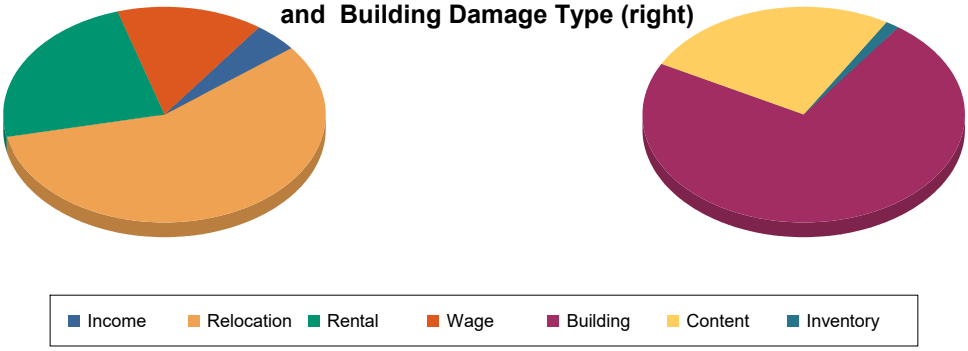
The total economic loss estimated for the hurricane is 243.8 million dollars, which represents 5.10 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 244 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 66% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

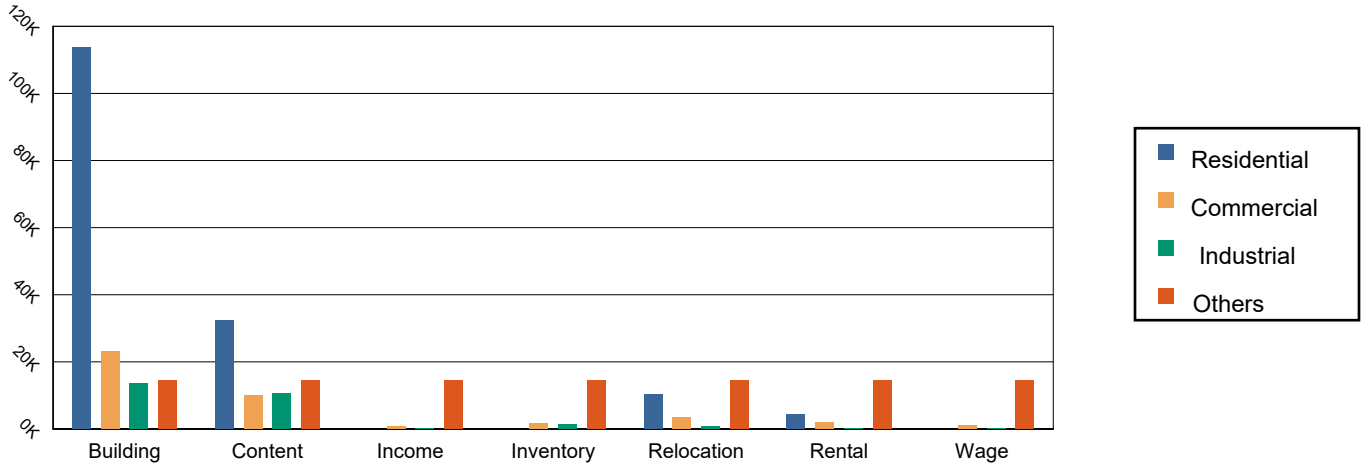


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	113,543.84	23,010.51	13,659.16	6,931.31	157,144.81
	Content	32,357.02	10,118.44	10,544.43	2,736.87	55,756.76
	Inventory	0.00	1,779.41	1,329.73	121.01	3,230.14
	Subtotal	**145,900.86**	**34,908.36**	**25,533.32**	**9,789.18**	**216,131.71**
Business Interruption Loss						
	Income	3.52	885.40	141.27	206.29	1,236.48
	Relocation	10,245.32	3,561.71	691.76	1,364.67	15,863.46
	Rental	4,317.11	1,808.08	121.16	263.77	6,510.12
	Wage	8.28	1,072.12	232.47	2,749.77	4,062.65
	Subtotal	**14,574.24**	**7,327.32**	**1,186.66**	**4,584.49**	**27,672.71**

Total

Total	**160,475.09**	**42,235.67**	**26,719.98**	**14,373.67**	**243,804.42**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,175	2,814,360	1,964,607	4,778,967
Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**
Study Region Total	**20,175**	**2,814,360**	**1,964,607**	**4,778,967**

Hazus: Hurricane Global Risk Report

Region Name:	Bloomfield_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.25 square miles and contains 5 census tracts. There are over 9 thousand households in the region and a total population of 21,535 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,732 million dollars. Approximately 86% of the buildings (and 49% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,958 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

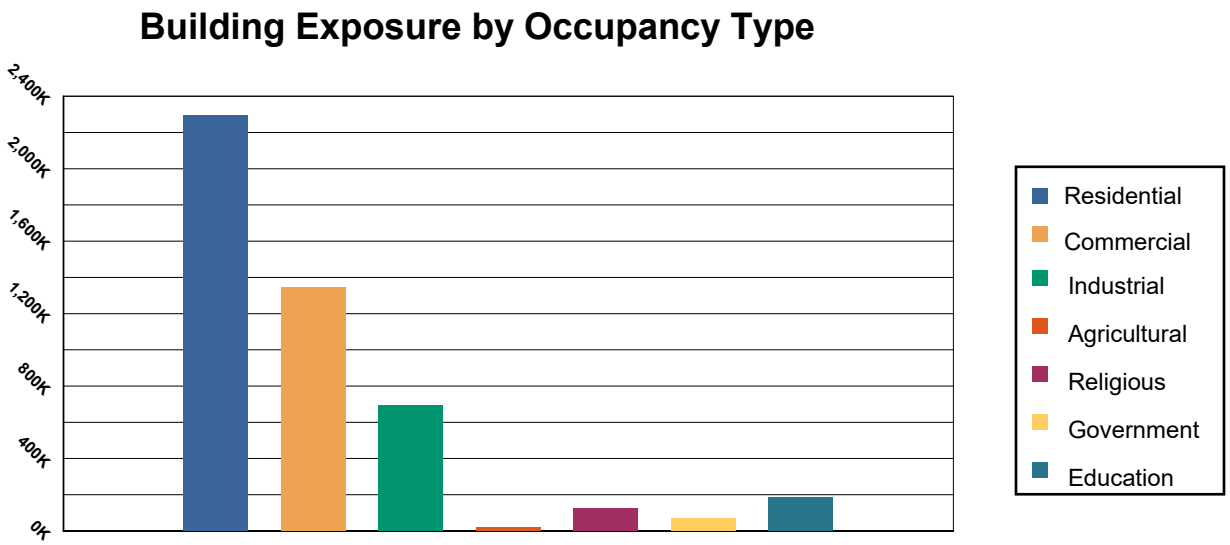


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,295,961	48.52%
Commercial	1,346,807	28.46%
Industrial	691,610	14.62%
Agricultural	18,499	0.39%
Religious	123,563	2.61%
Government	69,511	1.47%
Education	185,805	3.93%
Total	**4,731,756**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

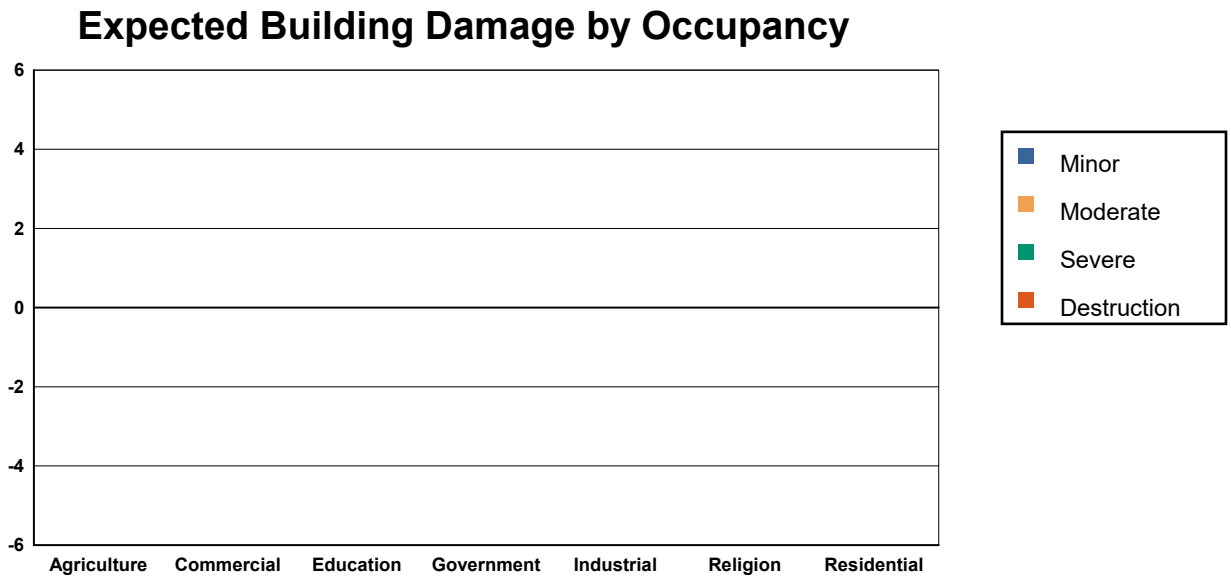


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	30.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	629.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	18.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	39.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	207.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	78.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	5,957.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**6,958.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	110	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	599	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	456	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	5,799	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

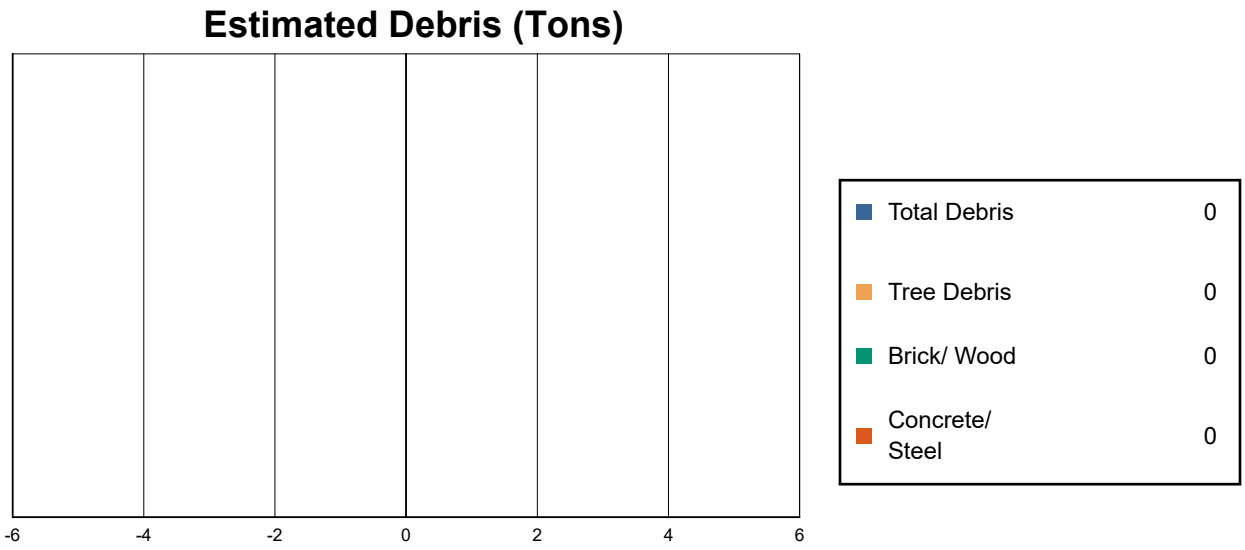
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

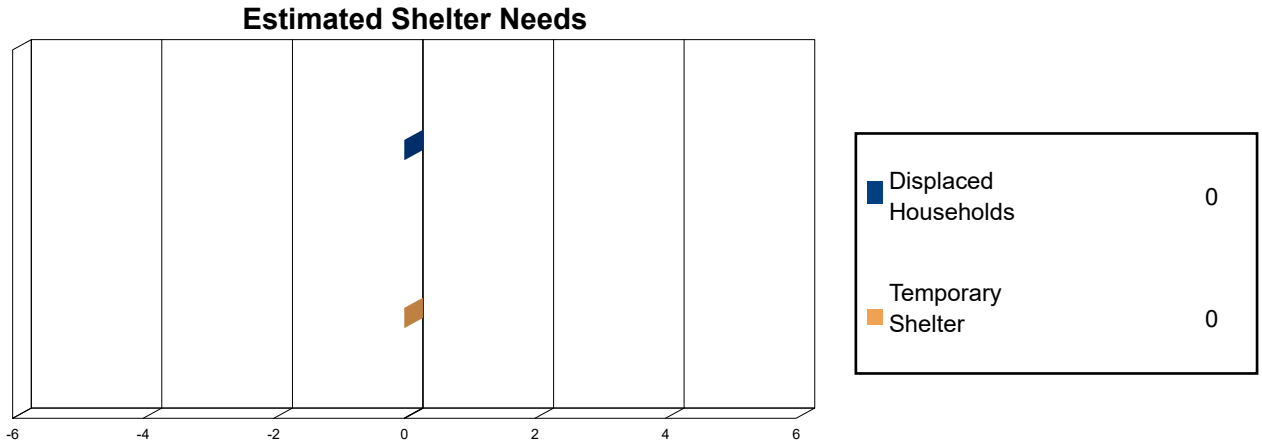


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 21,535) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

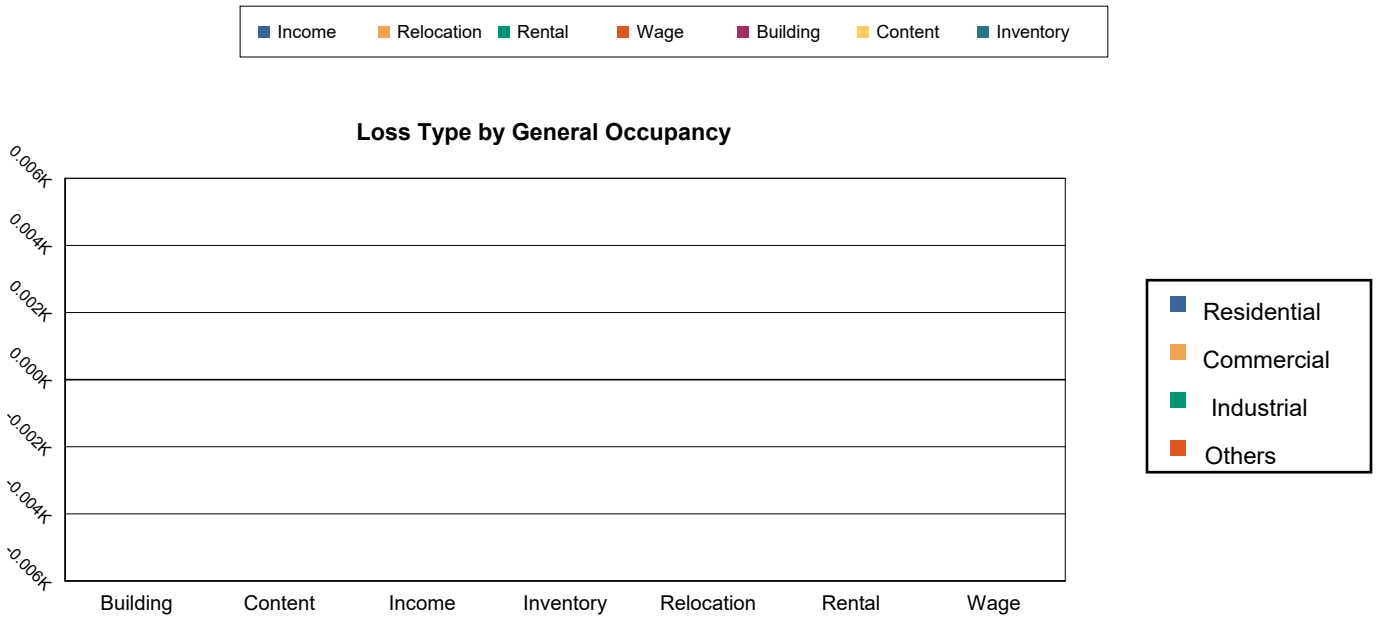


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	21,535	2,295,961	2,435,795	4,731,756
Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**
Study Region Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**

Hazus: Hurricane Global Risk Report

Region Name:	Bloomfield_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.25 square miles and contains 5 census tracts. There are over 9 thousand households in the region and a total population of 21,535 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,732 million dollars. Approximately 86% of the buildings (and 49% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,958 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

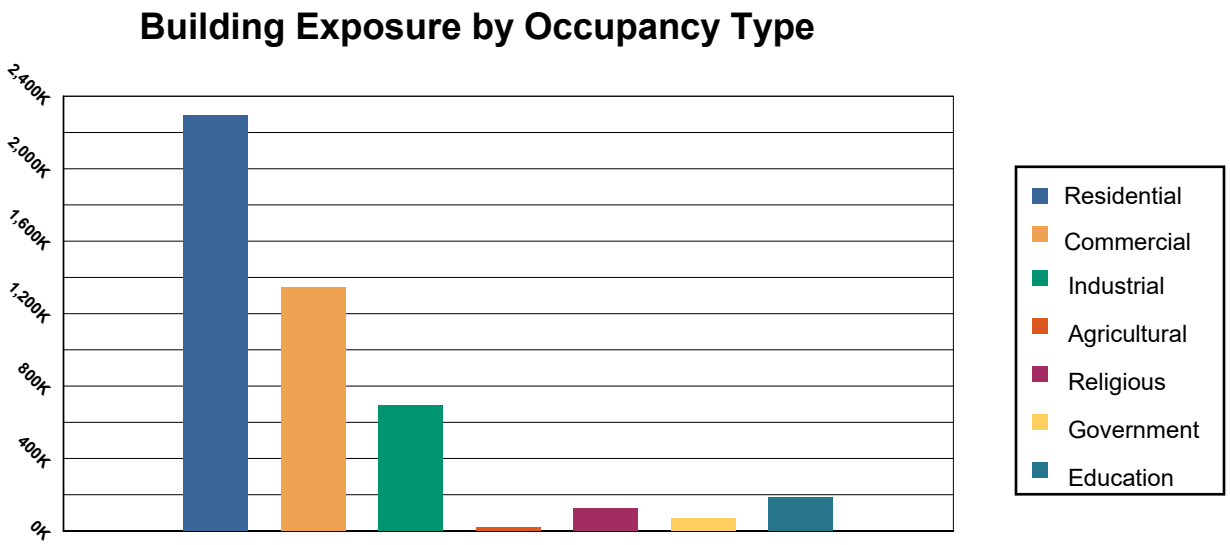


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,295,961	48.52%
Commercial	1,346,807	28.46%
Industrial	691,610	14.62%
Agricultural	18,499	0.39%
Religious	123,563	2.61%
Government	69,511	1.47%
Education	185,805	3.93%
Total	**4,731,756**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

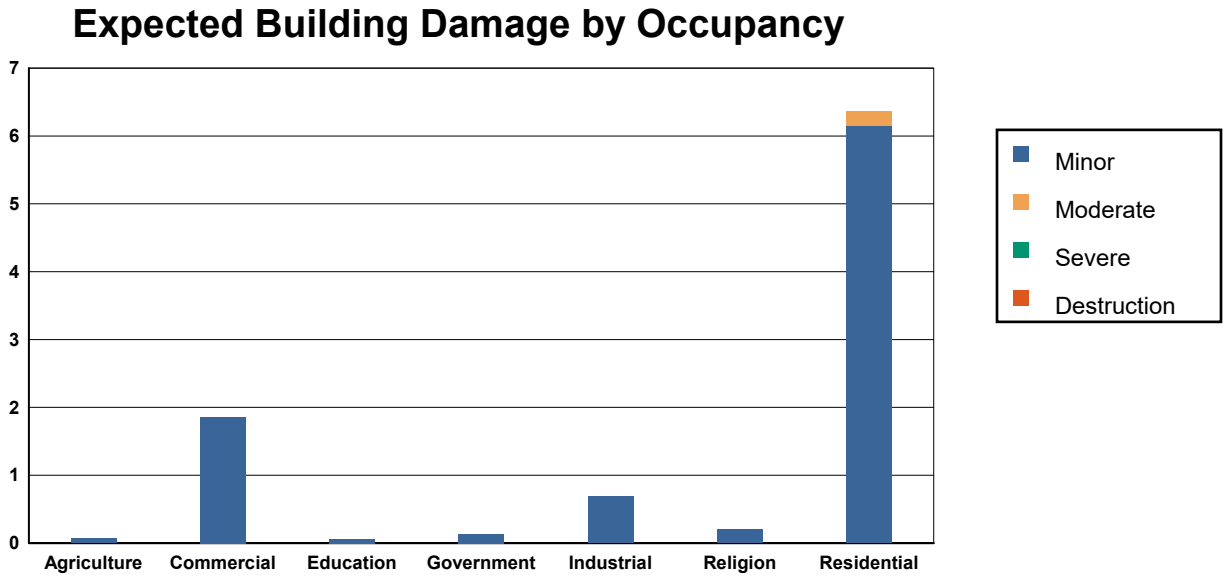


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	29.93	99.77	0.07	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	627.14	99.70	1.86	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Education	17.94	99.67	0.06	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Government	38.87	99.65	0.13	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	206.32	99.67	0.68	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Religion	77.80	99.74	0.20	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Residential	5,950.63	99.89	6.16	0.10	0.21	0.00	0.00	0.00	0.00	0.00
Total	**6,948.63**		**9.16**		**0.21**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	110	99.59	0	0.41	0	0.00	0	0.00	0	0.00
Masonry	596	99.54	3	0.46	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	455	99.68	1	0.32	0	0.00	0	0.00	0	0.00
Wood	5,797	99.96	2	0.03	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

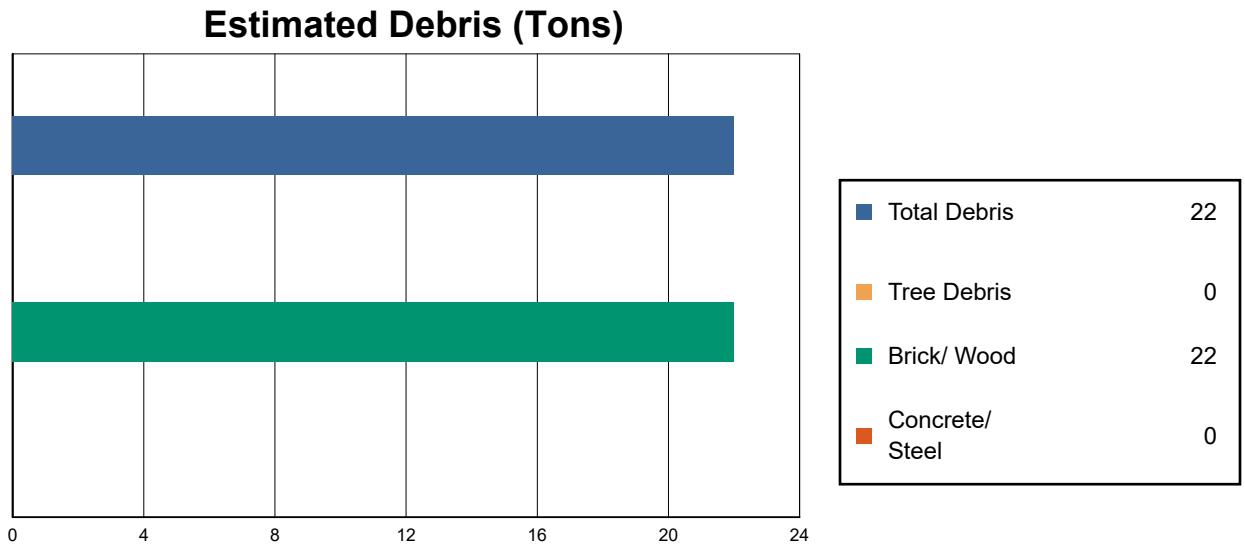
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

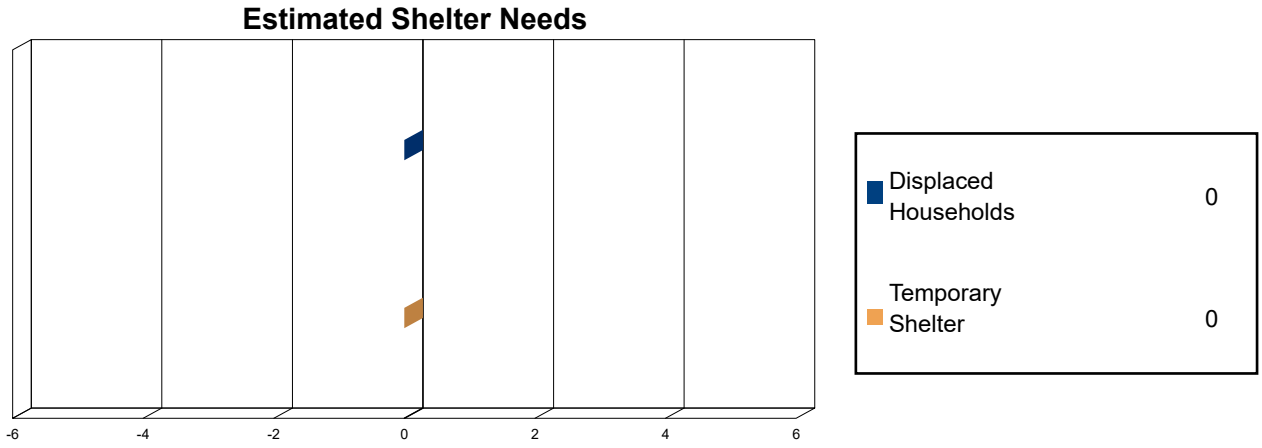


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 22 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 22 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 21,535) will seek temporary shelter in public shelters.

Economic Loss

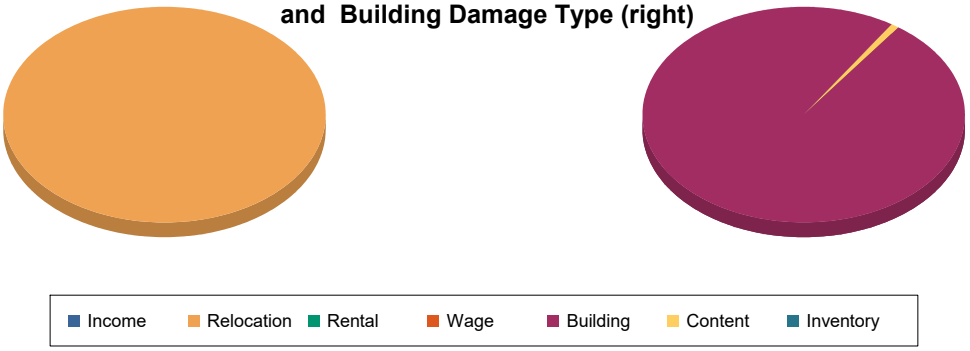
The total economic loss estimated for the hurricane is 0.7 million dollars, which represents 0.01 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 65% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

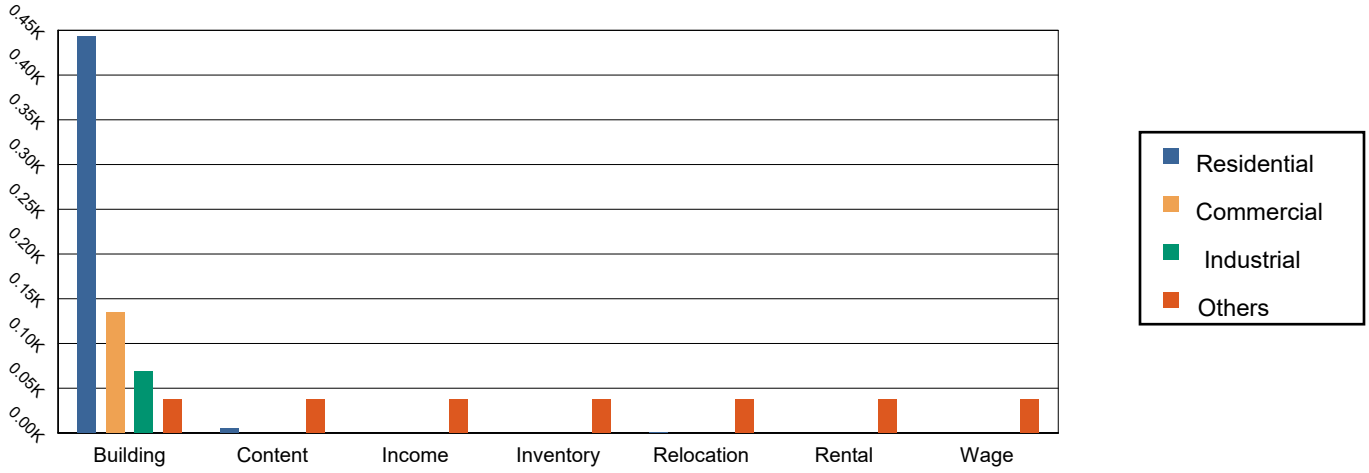


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	442.54	134.68	69.16	37.89	684.27
	Content	5.32	0.00	0.00	0.00	5.32
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**447.87**	**134.68**	**69.16**	**37.89**	**689.60**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.45	0.00	0.00	0.00	0.45
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.45**	**0.00**	**0.00**	**0.00**	**0.45**

Total

Total	**448.32**	**134.68**	**69.16**	**37.89**	**690.05**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	21,535	2,295,961	2,435,795	4,731,756
Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**
Study Region Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**

Hazus: Hurricane Global Risk Report

Region Name:	Bloomfield_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

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Building Inventory

General Building Stock

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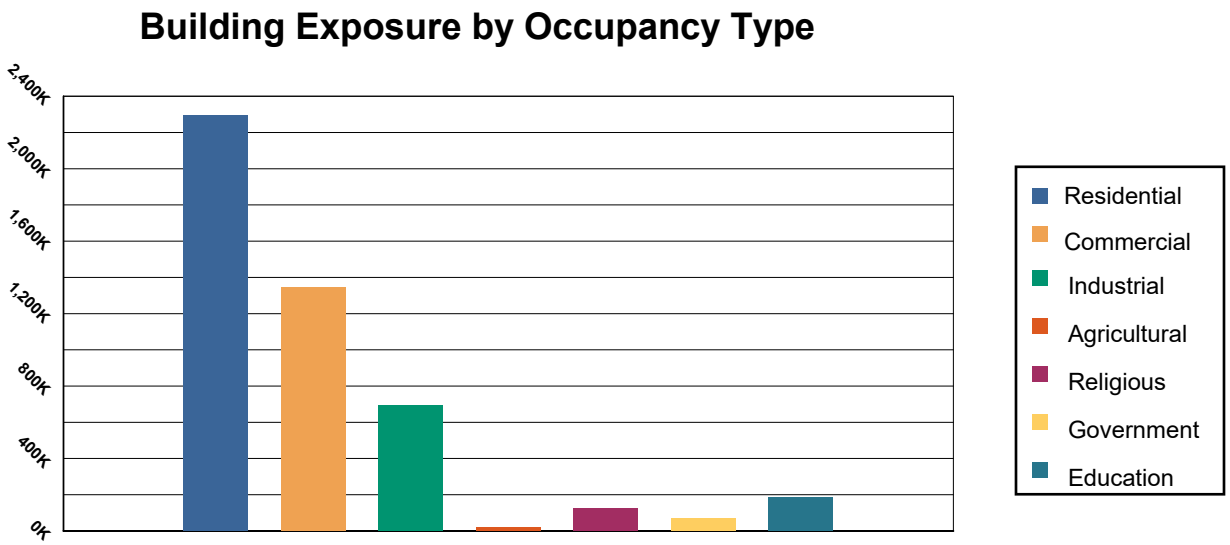

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
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Commercial	1,346,807	28.46%
Industrial	691,610	14.62%
Agricultural	18,499	0.39%
Religious	123,563	2.61%
Government	69,511	1.47%
Education	185,805	3.93%
Total	**4,731,756**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

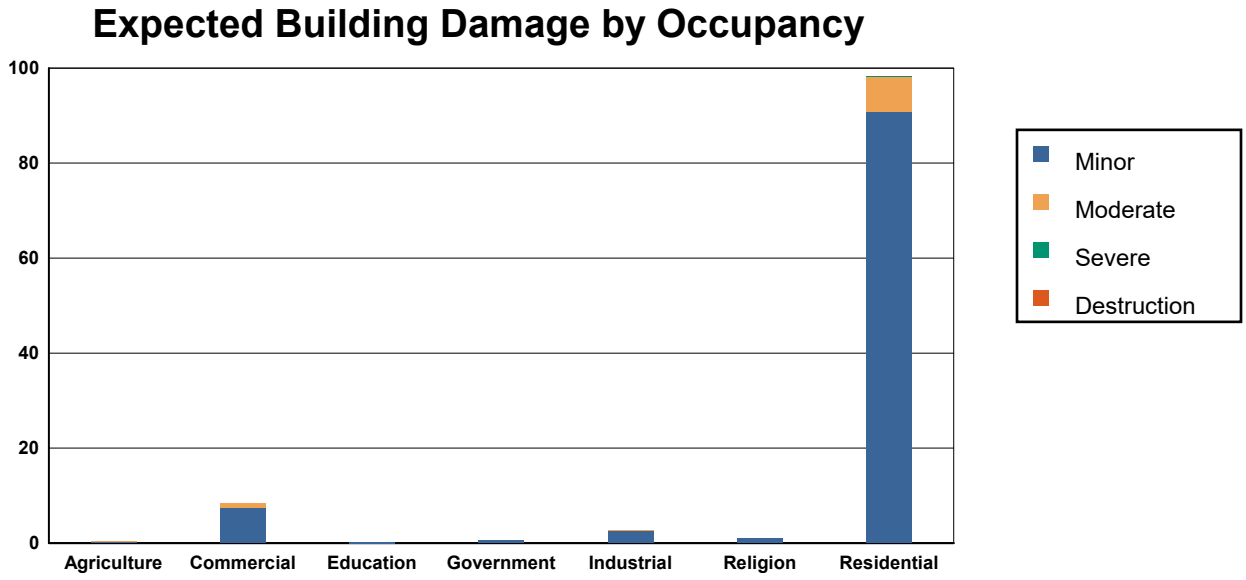


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	29.57	98.56	0.39	1.29	0.04	0.12	0.01	0.03	0.00	0.00
Commercial	620.59	98.66	7.46	1.19	0.93	0.15	0.03	0.00	0.00	0.00
Education	17.77	98.70	0.23	1.29	0.00	0.02	0.00	0.00	0.00	0.00
Government	38.50	98.73	0.49	1.26	0.00	0.01	0.00	0.00	0.00	0.00
Industrial	204.22	98.66	2.67	1.29	0.09	0.05	0.01	0.01	0.00	0.00
Religion	77.09	98.84	0.89	1.13	0.02	0.03	0.00	0.00	0.00	0.00
Residential	5,858.69	98.35	90.71	1.52	7.51	0.13	0.09	0.00	0.00	0.00
Total	**6,846.44**		**102.84**		**8.59**		**0.13**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	108	98.40	2	1.59	0	0.01	0	0.00	0	0.00
Masonry	584	97.44	13	2.18	2	0.37	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	450	98.67	5	1.17	1	0.15	0	0.01	0	0.00
Wood	5,727	98.76	70	1.21	2	0.03	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

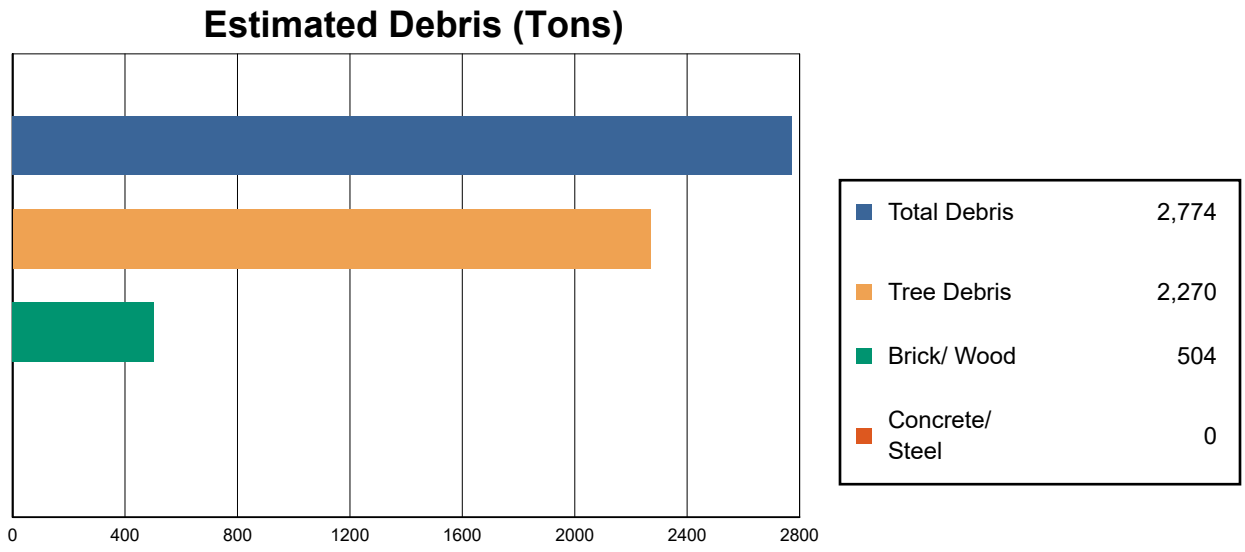
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

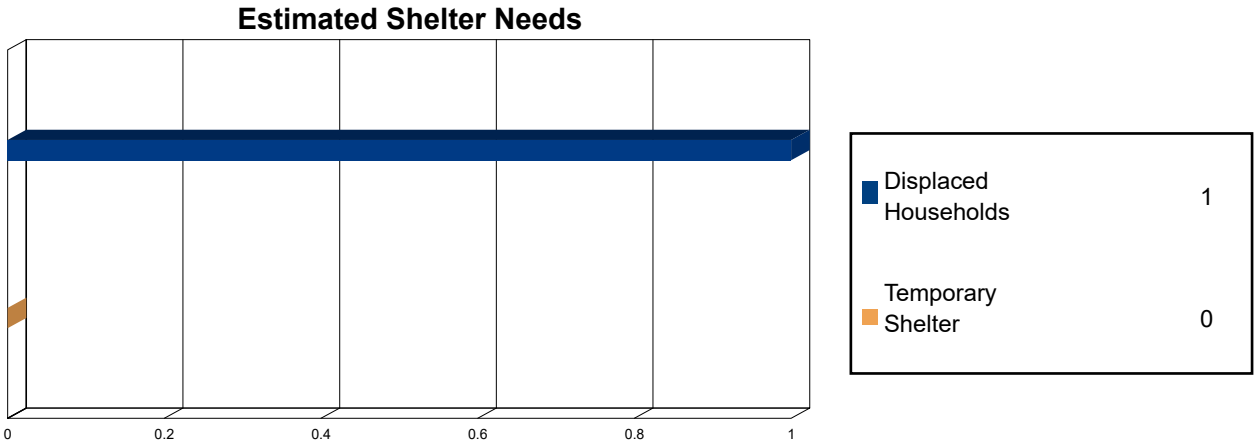


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,774 tons of debris will be generated. Of the total amount, 1,594 tons (57%) is Other Tree Debris. Of the remaining 1,180 tons, Brick/Wood comprises 43% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 20 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 676 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 21,535) will seek temporary shelter in public shelters.

Economic Loss

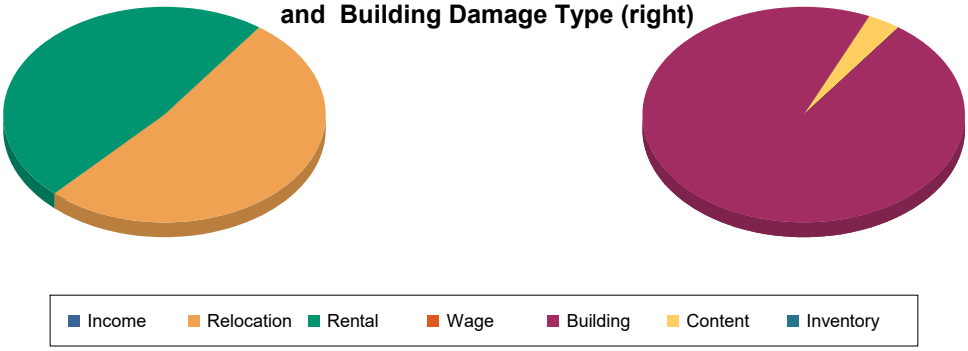
The total economic loss estimated for the hurricane is 6.4 million dollars, which represents 0.14 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 6 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

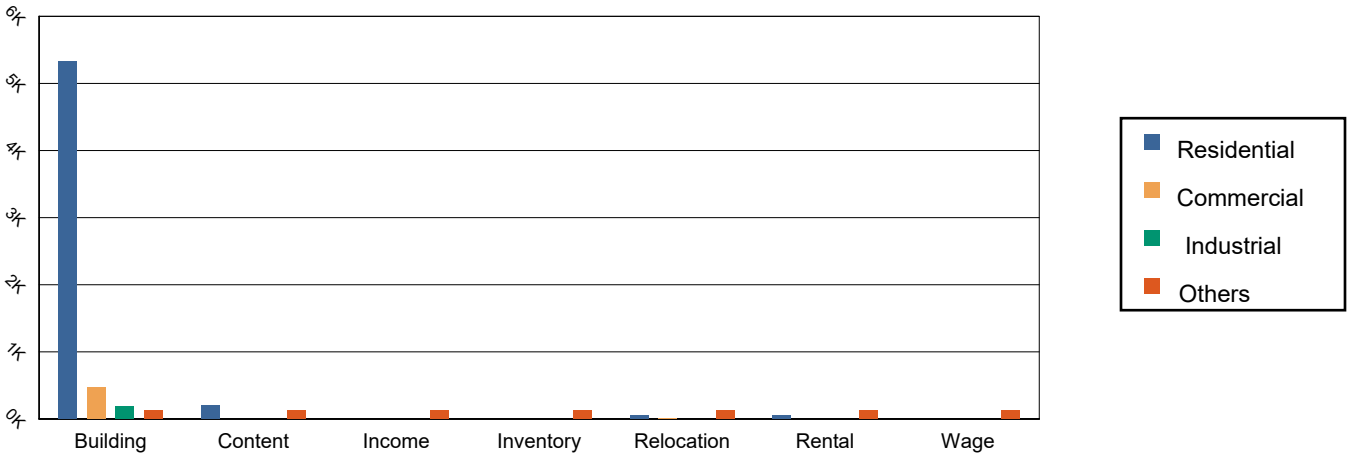


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,333.27	469.44	185.92	127.57	6,116.20
	Content	201.27	0.00	1.31	0.00	202.58
	Inventory	0.00	0.00	0.18	0.00	0.18
	Subtotal	**5,534.54**	**469.44**	**187.41**	**127.57**	**6,318.96**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	49.62	13.57	0.97	0.56	64.72
	Rental	59.99	0.00	0.00	0.00	59.99
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**109.61**	**13.57**	**0.97**	**0.56**	**124.70**

Total

Total	**5,644.14**	**483.01**	**188.38**	**128.12**	**6,443.66**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	21,535	2,295,961	2,435,795	4,731,756
Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**
Study Region Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**

Hazus: Hurricane Global Risk Report

Region Name:	Bloomfield_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.25 square miles and contains 5 census tracts. There are over 9 thousand households in the region and a total population of 21,535 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,732 million dollars. Approximately 86% of the buildings (and 49% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,958 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

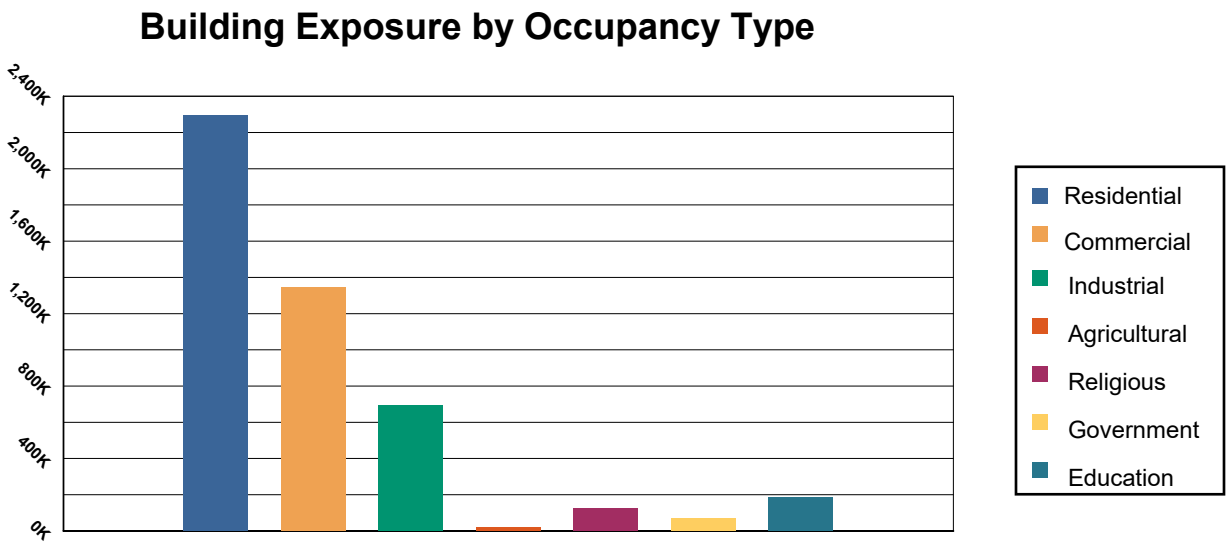


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,295,961	48.52%
Commercial	1,346,807	28.46%
Industrial	691,610	14.62%
Agricultural	18,499	0.39%
Religious	123,563	2.61%
Government	69,511	1.47%
Education	185,805	3.93%
Total	**4,731,756**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 49 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

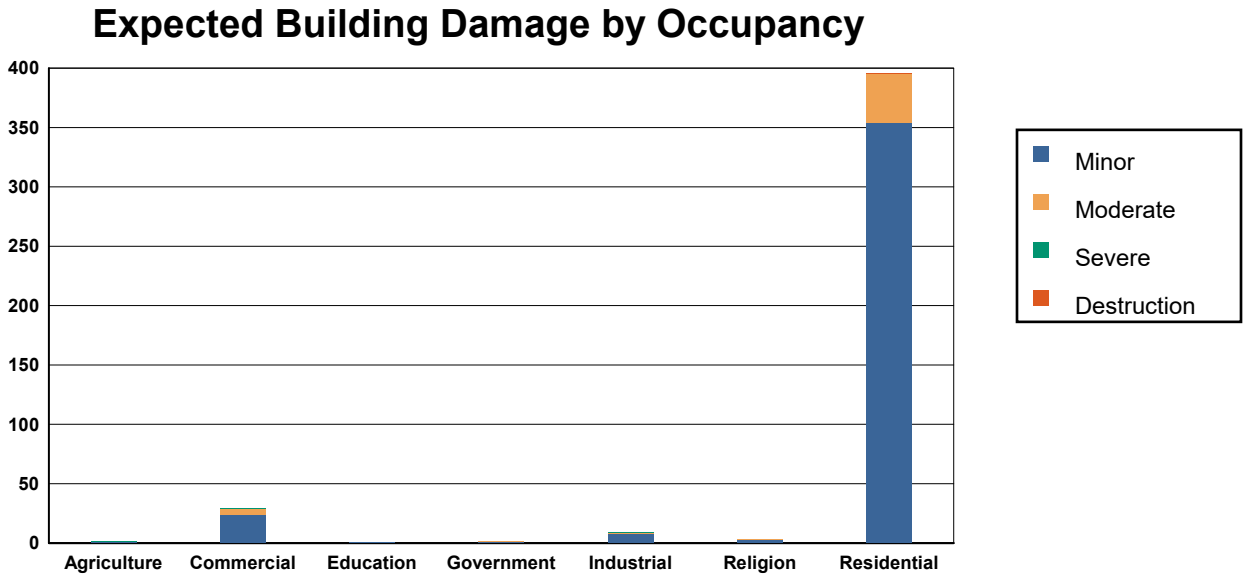


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	28.28	94.28	1.39	4.64	0.23	0.76	0.09	0.31	0.00	0.01
Commercial	599.40	95.29	23.94	3.81	4.97	0.79	0.70	0.11	0.00	0.00
Education	17.21	95.59	0.74	4.14	0.05	0.28	0.00	0.00	0.00	0.00
Government	37.32	95.69	1.57	4.03	0.11	0.27	0.00	0.00	0.00	0.00
Industrial	197.92	95.62	7.96	3.85	0.90	0.44	0.20	0.10	0.01	0.00
Religion	74.68	95.74	3.13	4.02	0.18	0.23	0.01	0.01	0.00	0.00
Residential	5,561.37	93.36	354.55	5.95	40.42	0.68	0.49	0.01	0.17	0.00
Total	**6,516.18**		**393.30**		**46.86**		**1.49**		**0.18**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	105	95.05	5	4.59	0	0.36	0	0.00	0	0.00
Masonry	555	92.69	34	5.63	10	1.61	0	0.06	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	436	95.56	16	3.47	4	0.84	1	0.13	0	0.00
Wood	5,463	94.21	318	5.48	17	0.29	1	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

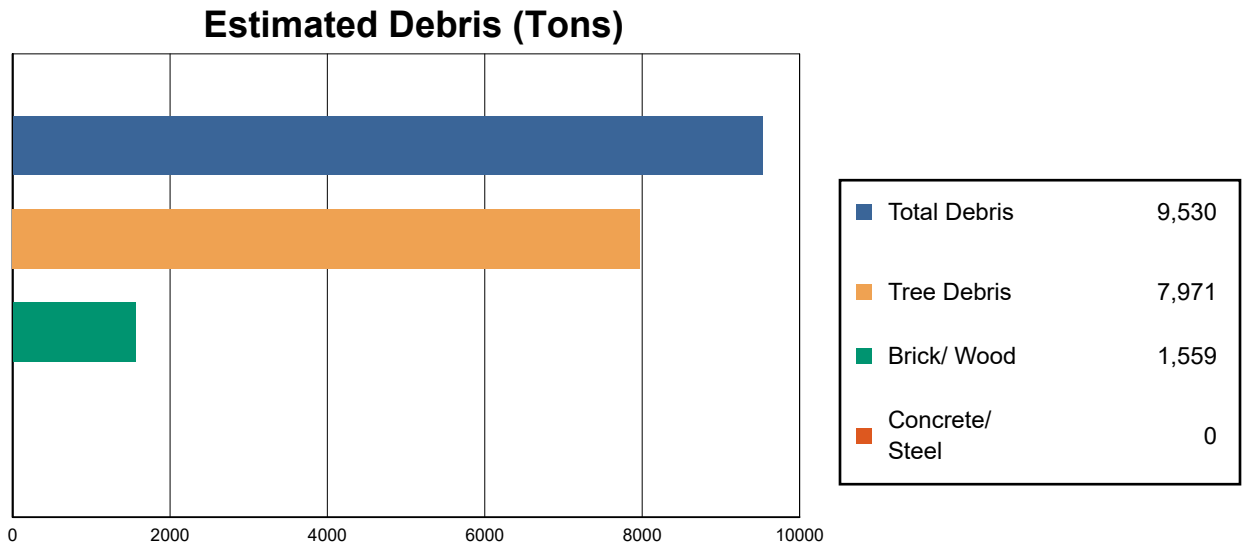
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

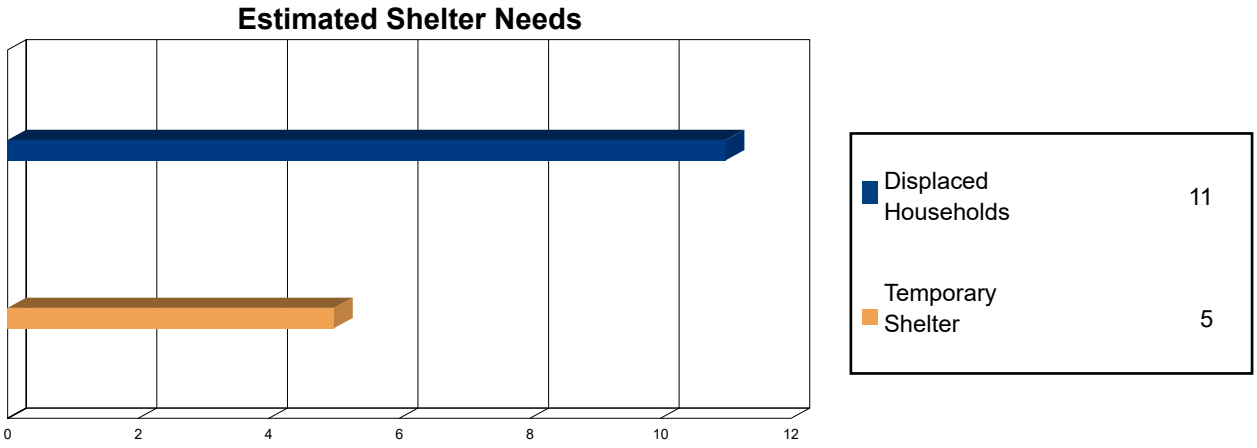


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 9,530 tons of debris will be generated. Of the total amount, 5,150 tons (54%) is Other Tree Debris. Of the remaining 4,380 tons, Brick/Wood comprises 36% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 62 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,821 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 11 households to be displaced due to the hurricane. Of these, 5 people (out of a total population of 21,535) will seek temporary shelter in public shelters.

Economic Loss

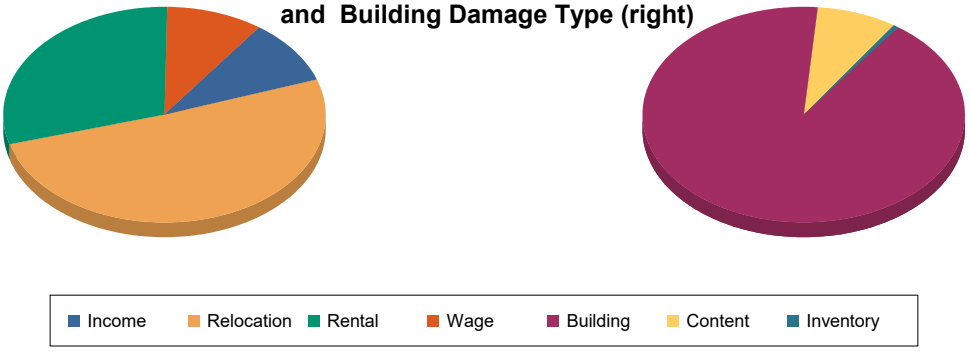
The total economic loss estimated for the hurricane is 18.5 million dollars, which represents 0.39 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 19 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 77% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

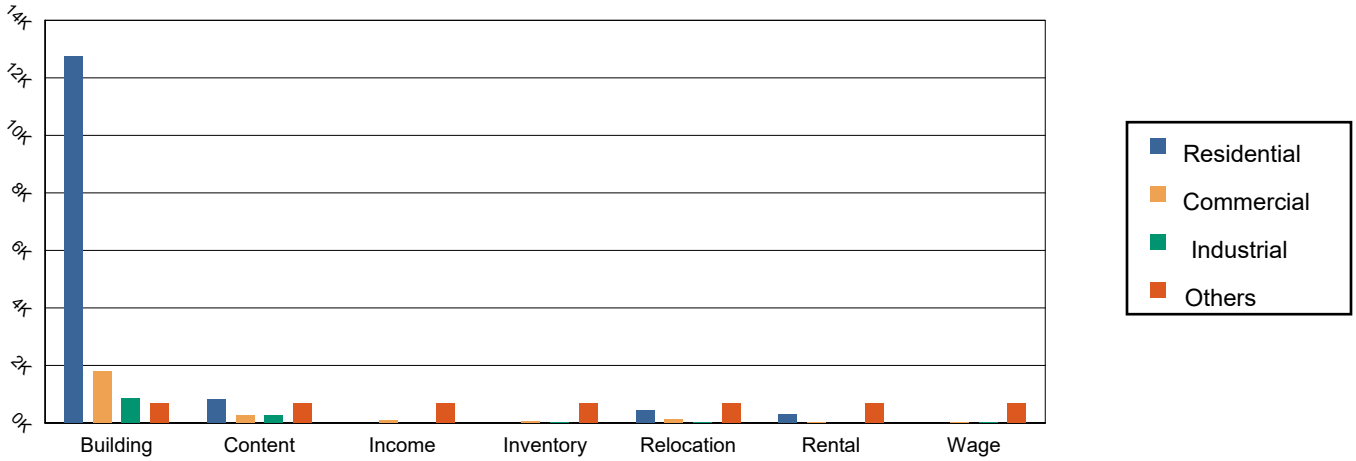


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	12,753.22	1,793.29	854.60	480.74	15,881.85
	Content	811.55	263.89	275.39	49.15	1,399.99
	Inventory	0.00	55.23	33.70	8.46	97.38
	Subtotal	**13,564.77**	**2,112.41**	**1,163.69**	**538.35**	**17,379.22**
Business Interruption Loss						
	Income	0.00	76.48	3.43	34.87	114.78
	Relocation	424.30	118.65	21.09	28.97	593.02
	Rental	308.83	32.62	2.31	2.45	346.21
	Wage	0.00	27.18	5.68	82.22	115.08
	Subtotal	**733.13**	**254.94**	**32.51**	**148.51**	**1,169.08**

Total

Total	**14,297.90**	**2,367.35**	**1,196.20**	**686.85**	**18,548.31**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	21,535	2,295,961	2,435,795	4,731,756
Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**
Study Region Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**

Hazus: Hurricane Global Risk Report

Region Name:	Bloomfield_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.25 square miles and contains 5 census tracts. There are over 9 thousand households in the region and a total population of 21,535 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,732 million dollars. Approximately 86% of the buildings (and 49% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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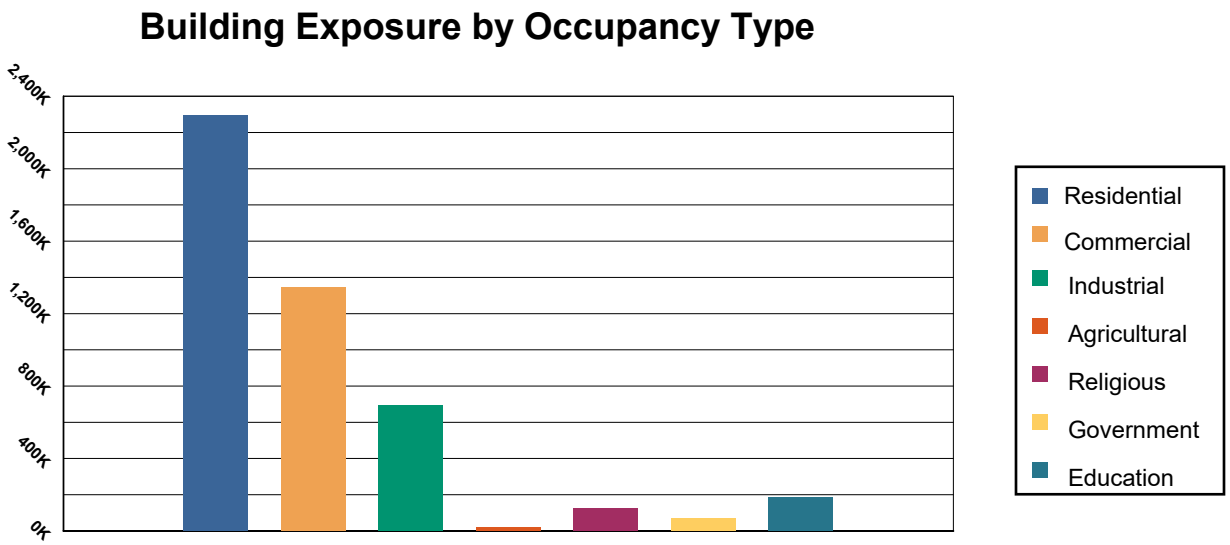


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,295,961	48.52%
Commercial	1,346,807	28.46%
Industrial	691,610	14.62%
Agricultural	18,499	0.39%
Religious	123,563	2.61%
Government	69,511	1.47%
Education	185,805	3.93%
Total	**4,731,756**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 138 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

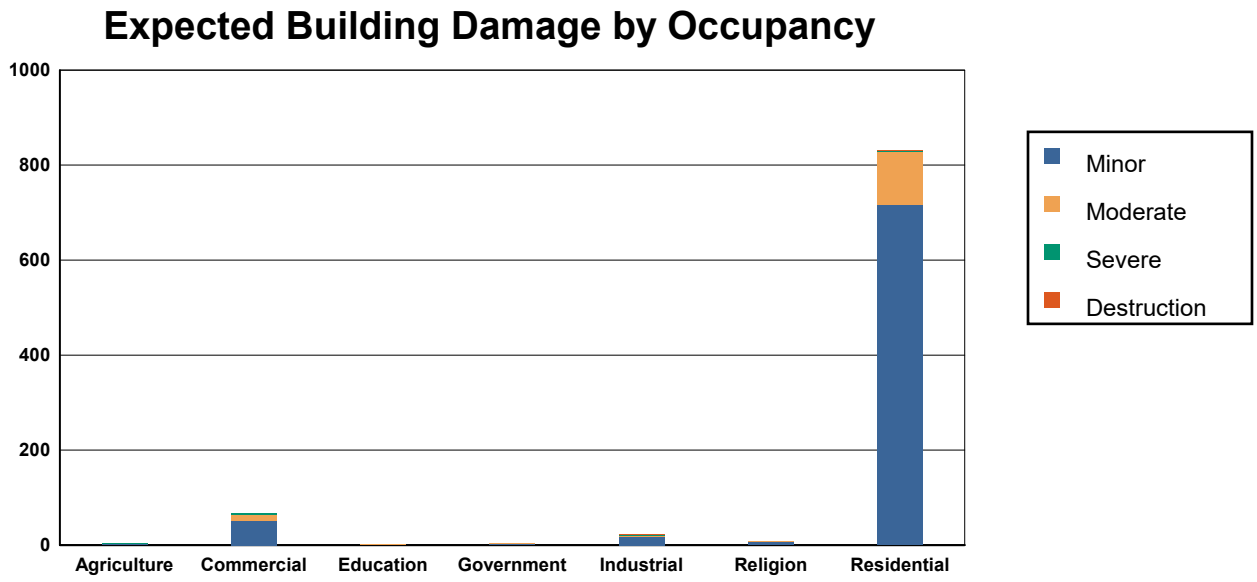


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	26.01	86.68	2.99	9.97	0.67	2.24	0.30	1.02	0.03	0.09
Commercial	561.36	89.25	50.86	8.09	13.88	2.21	2.89	0.46	0.00	0.00
Education	16.20	89.99	1.56	8.65	0.24	1.31	0.01	0.05	0.00	0.00
Government	35.29	90.50	3.21	8.22	0.48	1.24	0.02	0.04	0.00	0.00
Industrial	185.42	89.57	17.07	8.25	3.64	1.76	0.83	0.40	0.04	0.02
Religion	70.26	90.07	6.91	8.86	0.80	1.02	0.04	0.05	0.00	0.00
Residential	5,125.53	86.04	717.26	12.04	110.60	1.86	1.97	0.03	1.63	0.03
Total	**6,020.06**		**799.86**		**130.32**		**6.06**		**1.70**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	98	88.89	10	9.33	2	1.74	0	0.04	0	0.00
Masonry	512	85.56	61	10.19	24	4.01	1	0.23	0	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	409	89.78	33	7.24	11	2.41	3	0.57	0	0.00
Wood	5,060	87.25	676	11.66	59	1.02	3	0.04	1	0.02

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

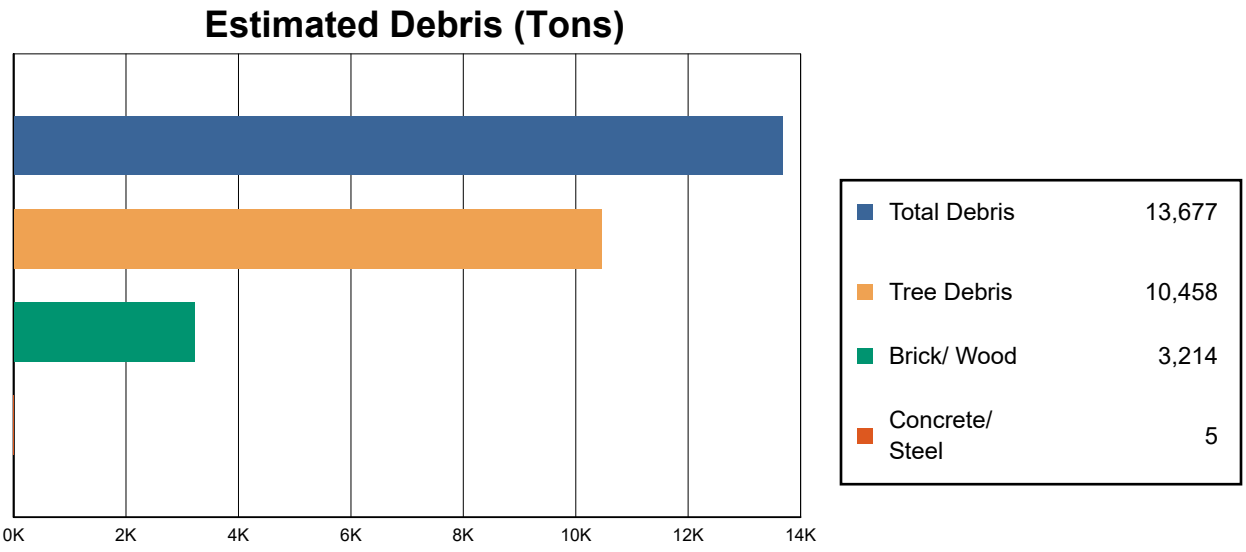
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

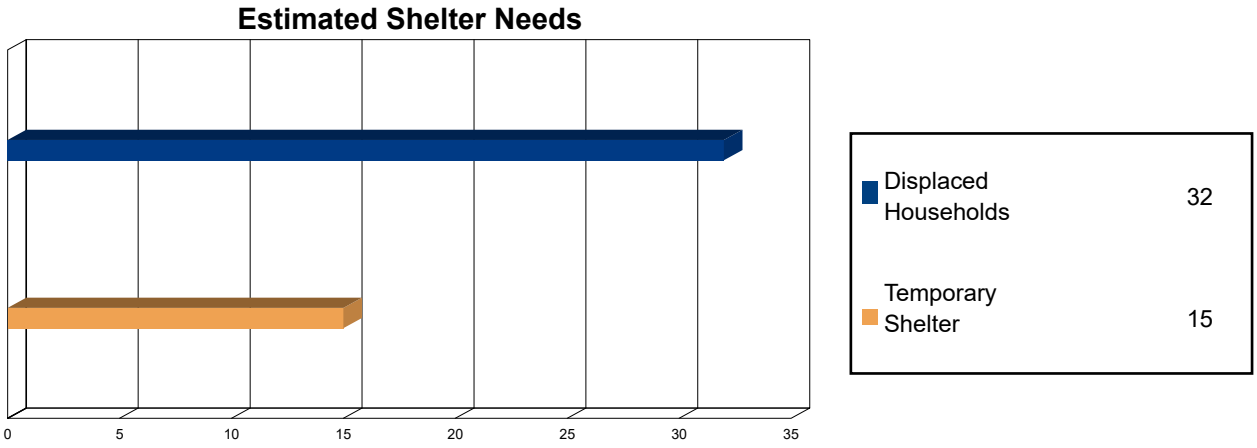


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 13,677 tons of debris will be generated. Of the total amount, 6,737 tons (49%) is Other Tree Debris. Of the remaining 6,940 tons, Brick/Wood comprises 46% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 129 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,721 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 32 households to be displaced due to the hurricane. Of these, 15 people (out of a total population of 21,535) will seek temporary shelter in public shelters.

Economic Loss

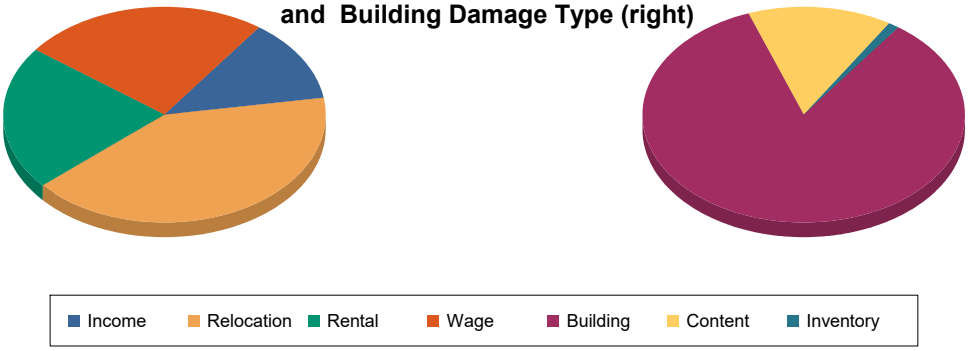
The total economic loss estimated for the hurricane is 41.3 million dollars, which represents 0.87 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 41 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 66% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

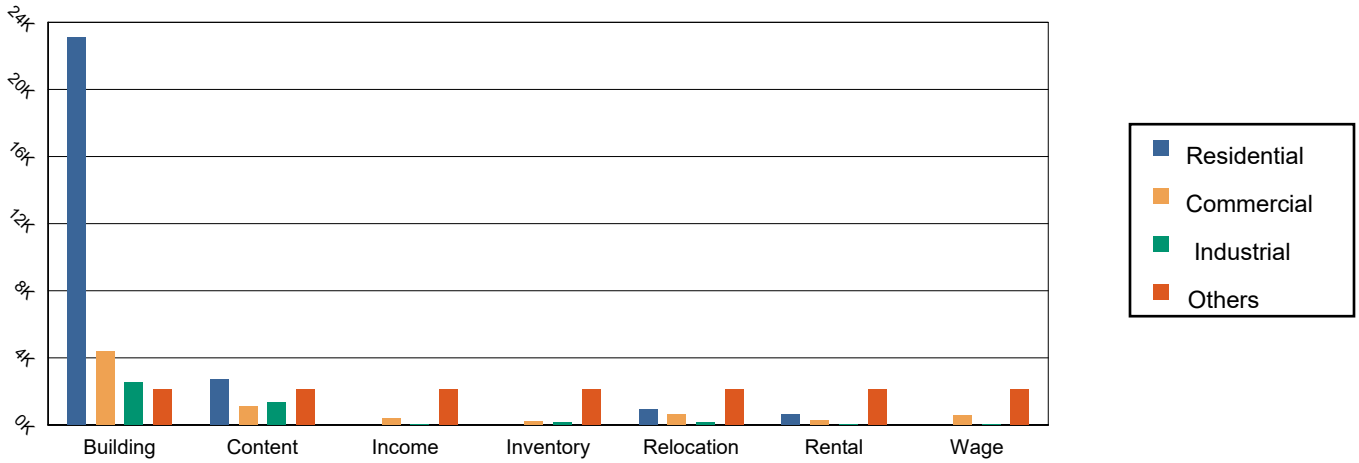


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	23,108.30	4,392.34	2,534.86	1,139.20	31,174.70
	Content	2,712.33	1,086.01	1,326.41	228.06	5,352.81
	Inventory	0.00	217.02	165.99	32.43	415.44
	Subtotal	**25,820.63**	**5,695.36**	**4,027.26**	**1,399.69**	**36,942.95**
Business Interruption Loss						
	Income	0.00	408.81	26.66	97.43	532.90
	Relocation	902.38	604.95	137.84	132.04	1,777.21
	Rental	609.09	287.16	21.09	12.57	929.91
	Wage	0.00	544.02	44.31	480.04	1,068.37
	Subtotal	**1,511.47**	**1,844.94**	**229.91**	**722.07**	**4,308.40**

Total

Total	**27,332.10**	**7,540.30**	**4,257.17**	**2,121.76**	**41,251.34**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	21,535	2,295,961	2,435,795	4,731,756
Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**
Study Region Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**

Hazus: Hurricane Global Risk Report

Region Name:	Bloomfield_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.25 square miles and contains 5 census tracts. There are over 9 thousand households in the region and a total population of 21,535 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,732 million dollars. Approximately 86% of the buildings (and 49% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,958 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

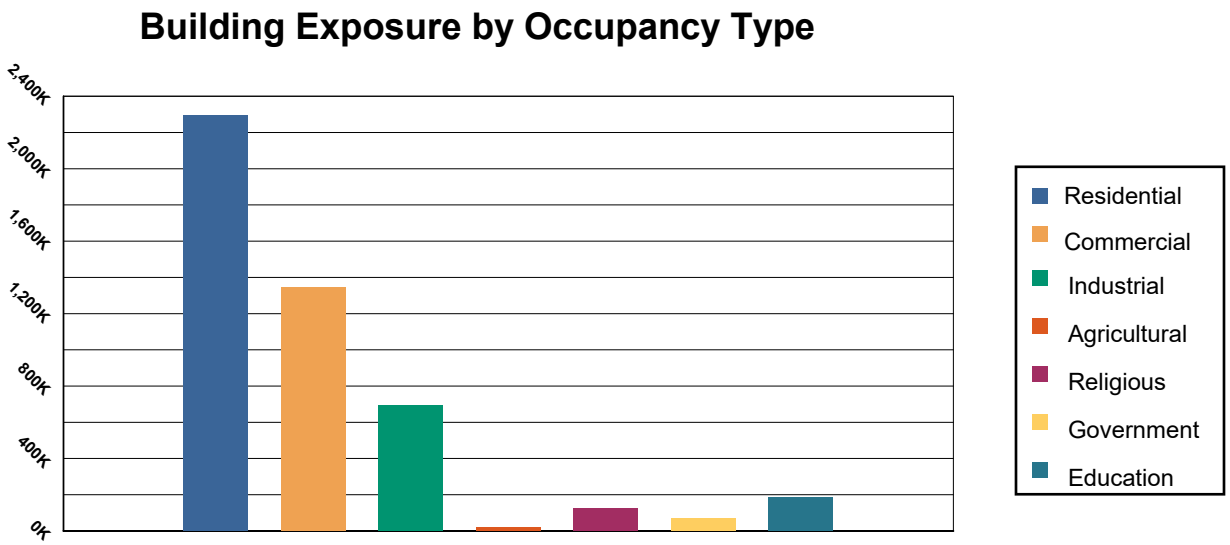


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,295,961	48.52%
Commercial	1,346,807	28.46%
Industrial	691,610	14.62%
Agricultural	18,499	0.39%
Religious	123,563	2.61%
Government	69,511	1.47%
Education	185,805	3.93%
Total	**4,731,756**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 381 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 11 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

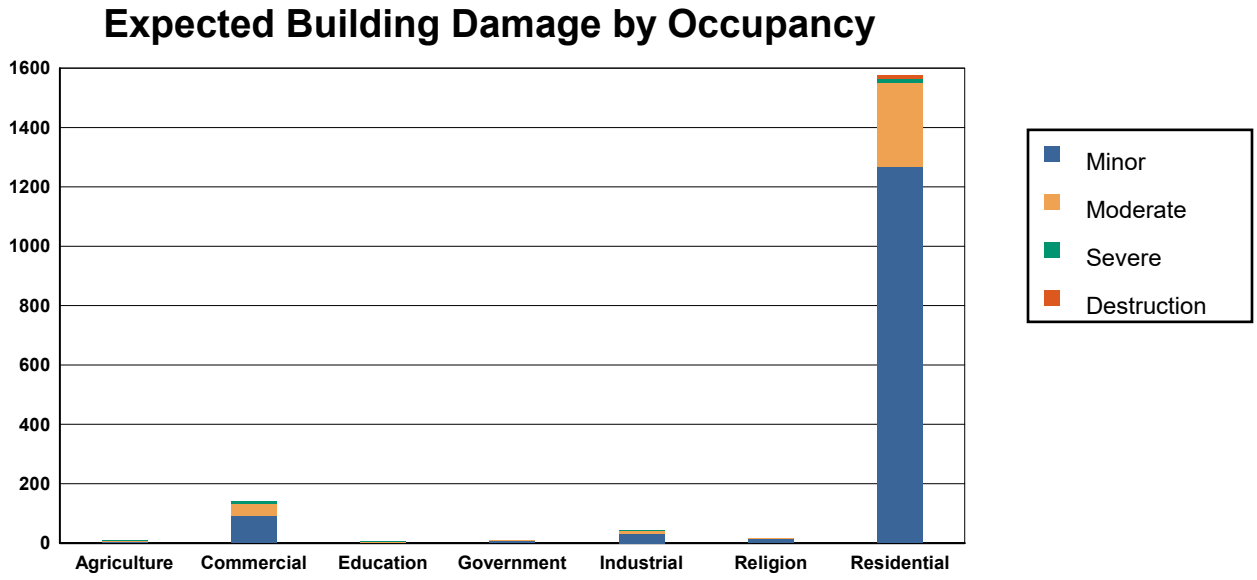


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.12	73.73	5.36	17.87	1.63	5.43	0.79	2.63	0.10	0.33
Commercial	486.88	77.41	94.25	14.98	38.03	6.05	9.77	1.55	0.07	0.01
Education	14.07	78.15	2.92	16.24	0.93	5.14	0.09	0.47	0.00	0.00
Government	30.83	79.06	6.04	15.49	1.95	5.00	0.18	0.45	0.00	0.00
Industrial	161.87	78.20	30.67	14.82	11.48	5.55	2.77	1.34	0.21	0.10
Religion	61.25	78.52	13.36	17.12	3.14	4.02	0.26	0.33	0.00	0.00
Residential	4,380.12	73.53	1,267.75	21.28	284.07	4.77	14.81	0.25	10.25	0.17
Total	**5,157.15**		**1,420.35**		**341.22**		**28.65**		**10.63**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	84	76.64	18	16.54	7	6.41	0	0.41	0	0.00
Masonry	437	73.02	101	16.85	55	9.22	5	0.81	1	0.09
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	357	78.25	60	13.24	30	6.53	9	1.95	0	0.02
Wood	4,351	75.02	1,240	21.38	186	3.20	14	0.23	9	0.16

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

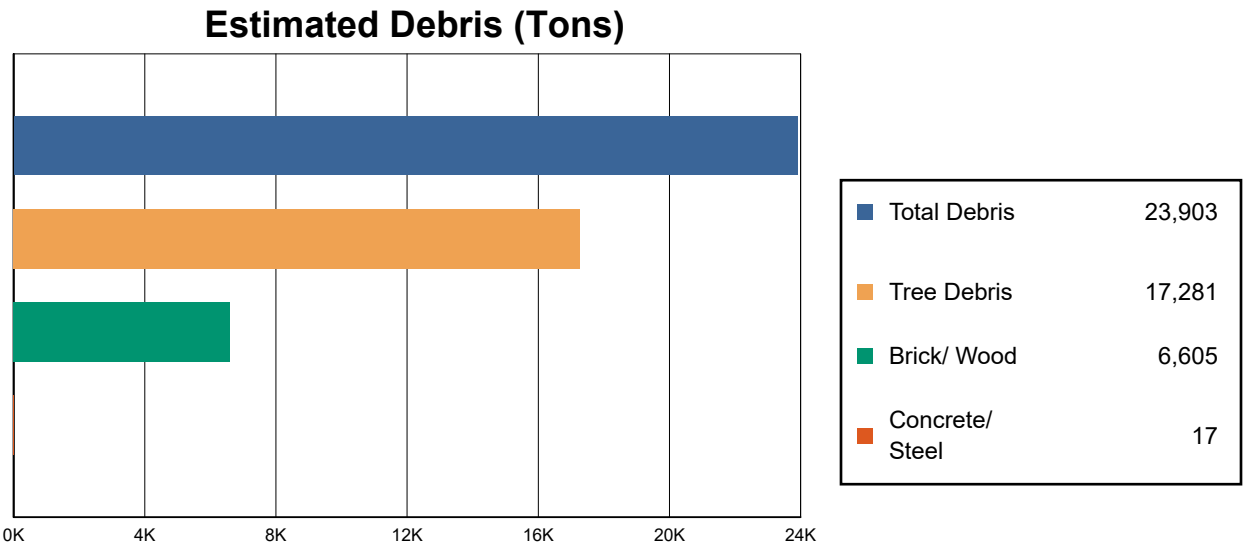
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	11	0	0	1

Induced Hurricane Damage

Debris Generation

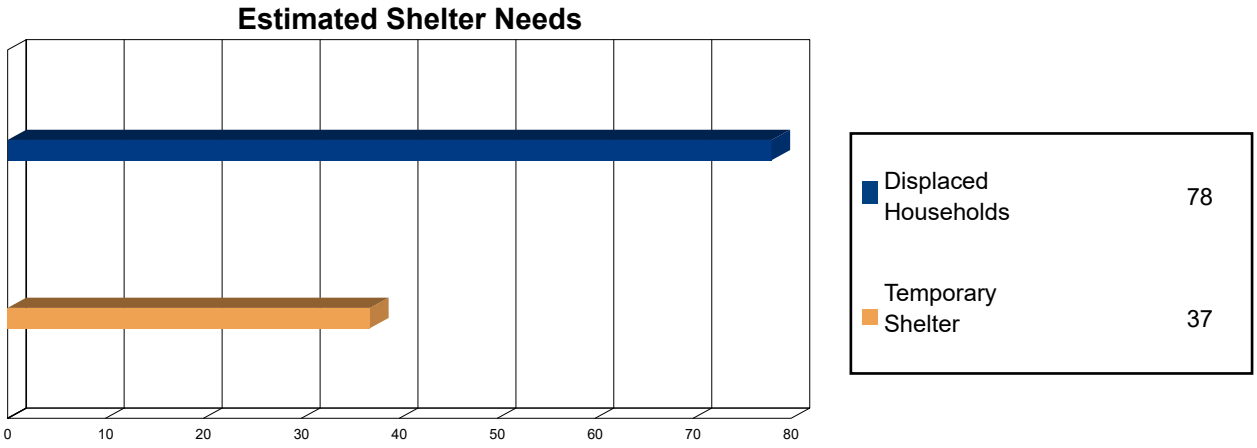


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 23,903 tons of debris will be generated. Of the total amount, 11,006 tons (46%) is Other Tree Debris. Of the remaining 12,897 tons, Brick/Wood comprises 51% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 265 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,275 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 78 households to be displaced due to the hurricane. Of these, 37 people (out of a total population of 21,535) will seek temporary shelter in public shelters.

Economic Loss

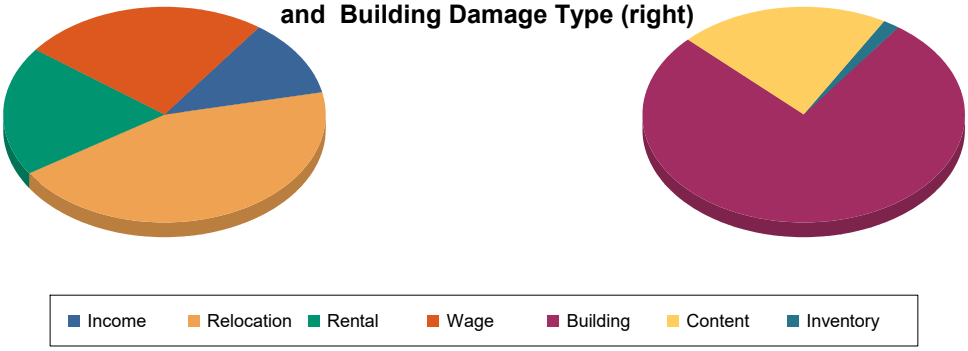
The total economic loss estimated for the hurricane is 99.4 million dollars, which represents 2.10 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 99 million dollars. 13% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 59% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

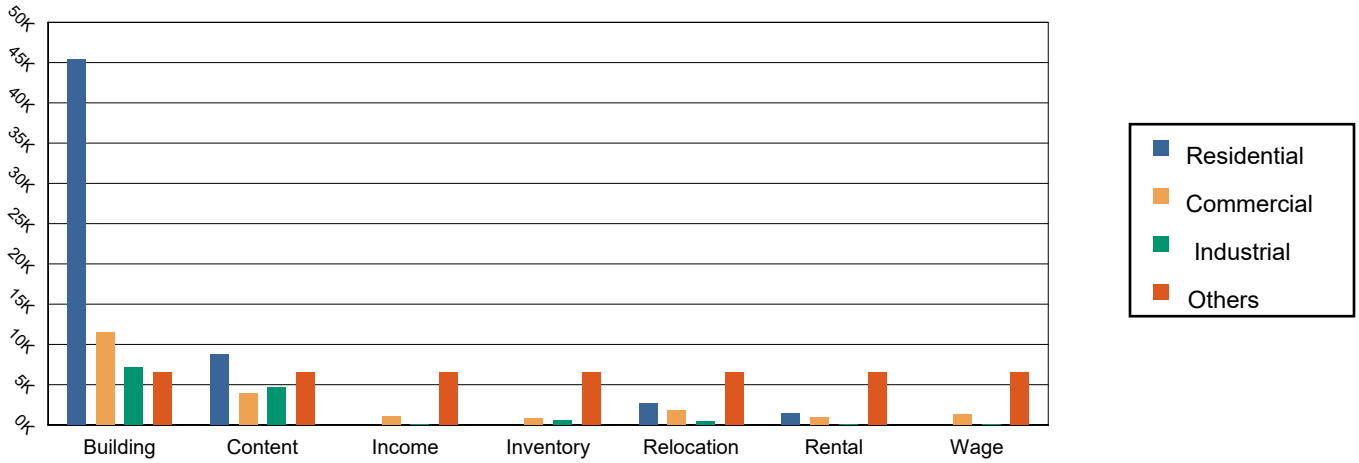


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	45,361.81	11,541.93	7,132.95	3,099.94	67,136.62
	Content	8,803.13	3,961.60	4,625.26	892.45	18,282.44
	Inventory	0.00	808.25	570.43	95.81	1,474.49
	Subtotal	**54,164.94**	**16,311.78**	**12,328.63**	**4,088.19**	**86,893.55**
Business Interruption Loss						
	Income	0.00	1,108.04	78.64	285.16	1,471.85
	Relocation	2,700.88	1,825.18	479.49	527.54	5,533.10
	Rental	1,384.91	915.69	70.69	50.39	2,421.69
	Wage	0.00	1,356.10	130.55	1,611.23	3,097.88
	Subtotal	**4,085.79**	**5,205.02**	**759.38**	**2,474.34**	**12,524.52**

Total

Total	**58,250.73**	**21,516.79**	**13,088.01**	**6,562.53**	**99,418.06**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	21,535	2,295,961	2,435,795	4,731,756
Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**
Study Region Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**

Hazus: Hurricane Global Risk Report

Region Name:	Bloomfield_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Saturday, May 6, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.25 square miles and contains 5 census tracts. There are over 9 thousand households in the region and a total population of 21,535 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,732 million dollars. Approximately 86% of the buildings (and 49% of the building value) are associated with residential housing.

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General Building Stock

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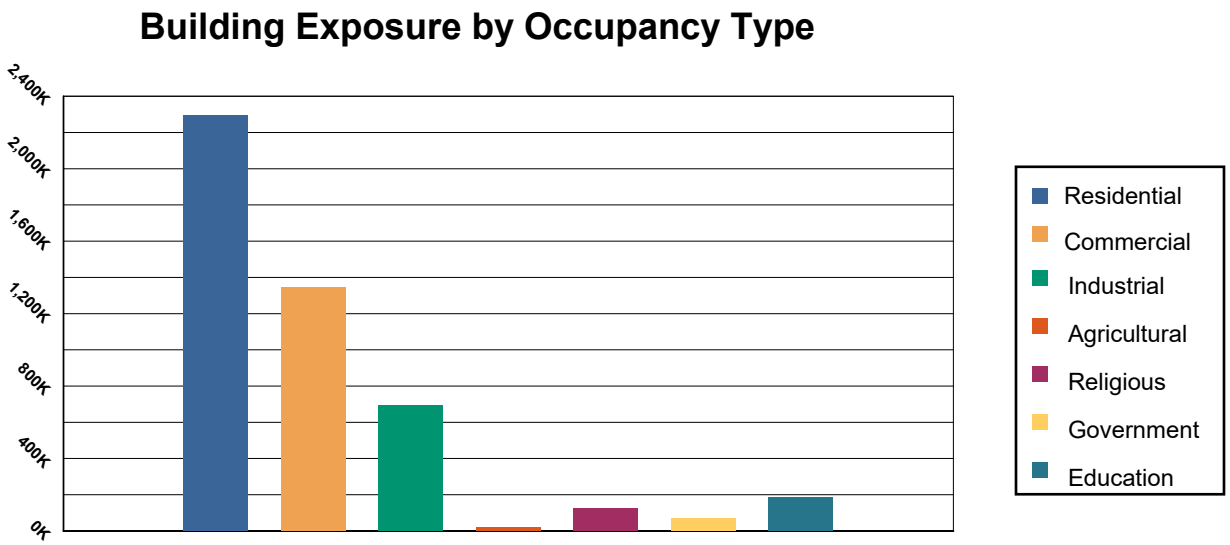


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,295,961	48.52%
Commercial	1,346,807	28.46%
Industrial	691,610	14.62%
Agricultural	18,499	0.39%
Religious	123,563	2.61%
Government	69,511	1.47%
Education	185,805	3.93%
Total	**4,731,756**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 623 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the region. There are an estimated 24 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

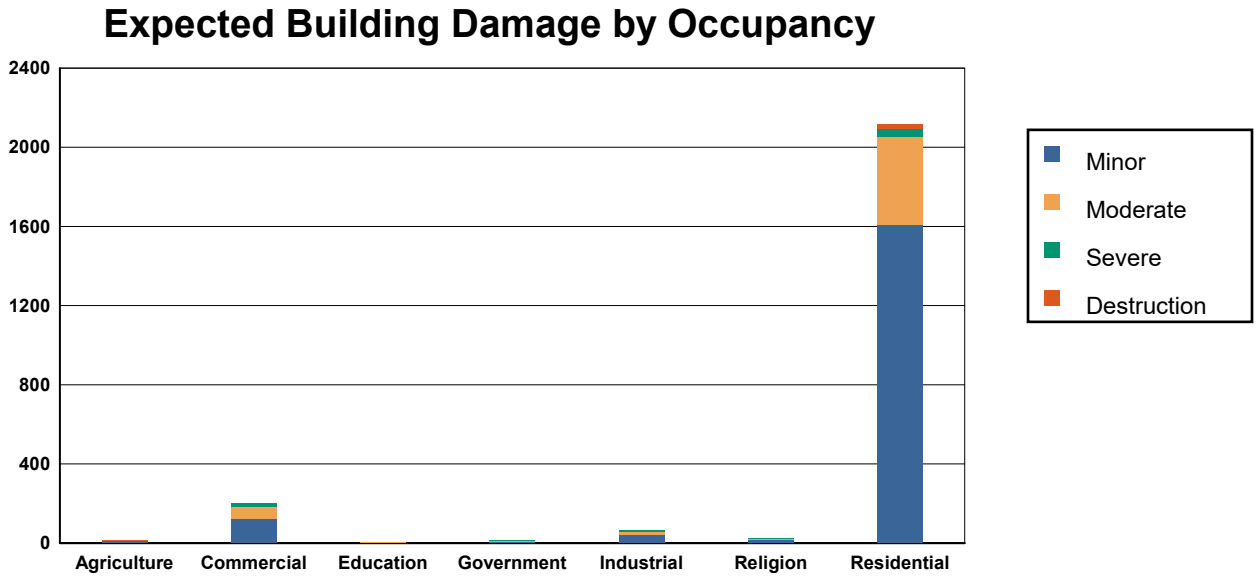


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.27	64.22	6.85	22.82	2.49	8.29	1.22	4.05	0.19	0.62
Commercial	429.94	68.35	120.45	19.15	60.80	9.67	17.63	2.80	0.18	0.03
Education	12.44	69.10	3.71	20.62	1.62	9.02	0.23	1.26	0.00	0.00
Government	27.43	70.34	7.71	19.76	3.41	8.74	0.45	1.16	0.00	0.00
Industrial	143.40	69.27	38.96	18.82	19.19	9.27	5.06	2.44	0.39	0.19
Religion	54.06	69.30	17.53	22.47	5.73	7.34	0.69	0.88	0.00	0.00
Residential	3,841.95	64.49	1,610.87	27.04	445.15	7.47	35.63	0.60	23.41	0.39
Total	**4,528.48**		**1,806.07**		**538.39**		**60.89**		**24.16**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	74	67.28	23	20.51	12	11.12	1	1.09	0	0.00
Masonry	383	63.88	123	20.58	83	13.78	9	1.58	1	0.18
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	316	69.32	77	16.78	47	10.33	16	3.52	0	0.05
Wood	3,829	66.03	1,602	27.62	315	5.43	32	0.54	22	0.37

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

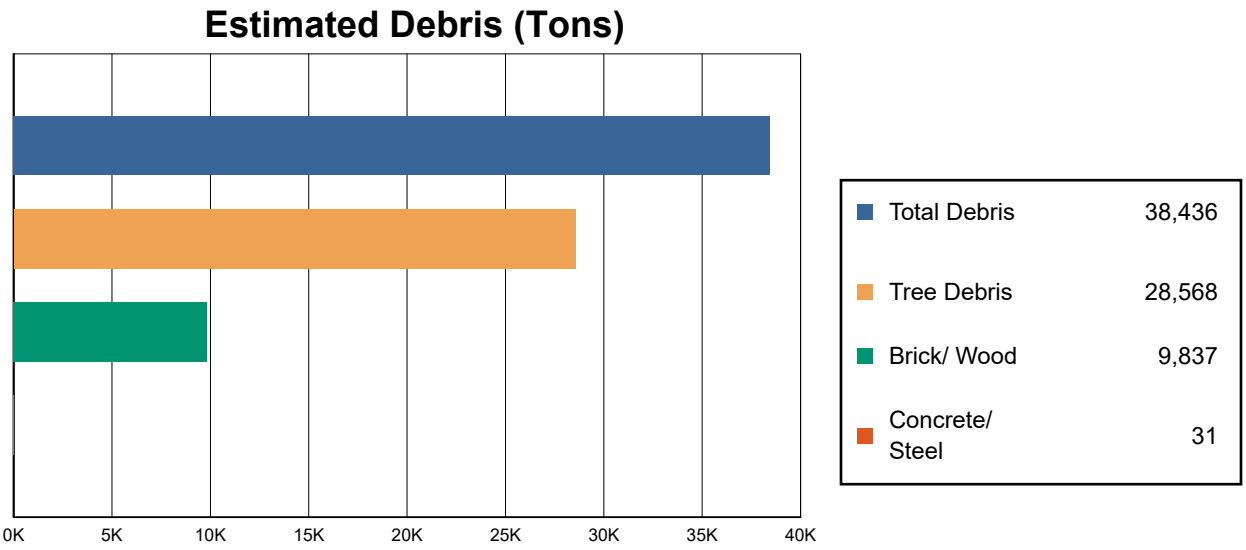
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	11	0	0	0

Induced Hurricane Damage

Debris Generation

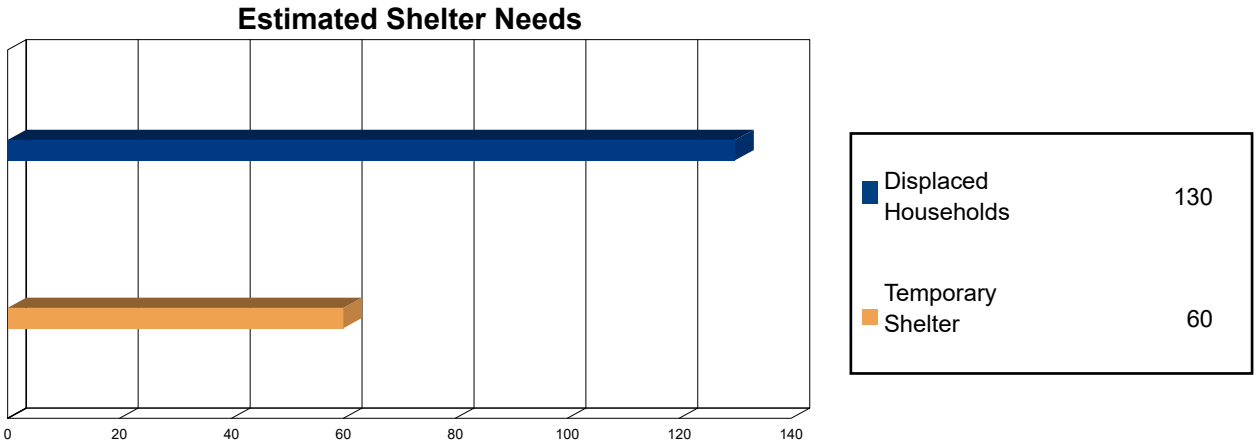


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 38,436 tons of debris will be generated. Of the total amount, 18,516 tons (48%) is Other Tree Debris. Of the remaining 19,920 tons, Brick/Wood comprises 49% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 395 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 10,052 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 130 households to be displaced due to the hurricane. Of these, 60 people (out of a total population of 21,535) will seek temporary shelter in public shelters.

Economic Loss

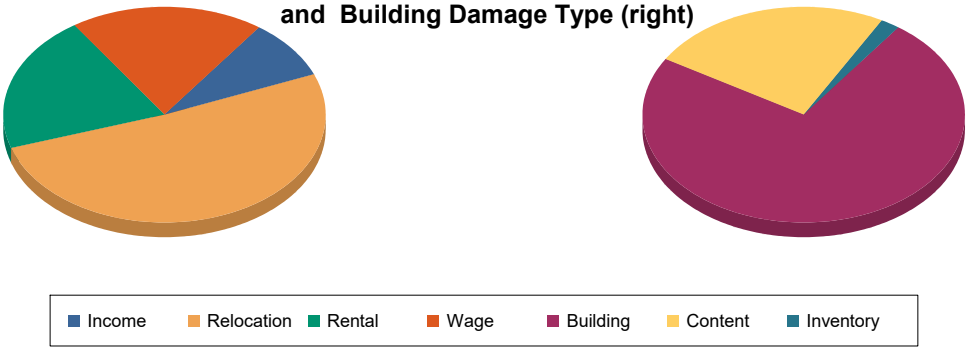
The total economic loss estimated for the hurricane is 162.7 million dollars, which represents 3.44 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 163 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 58% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

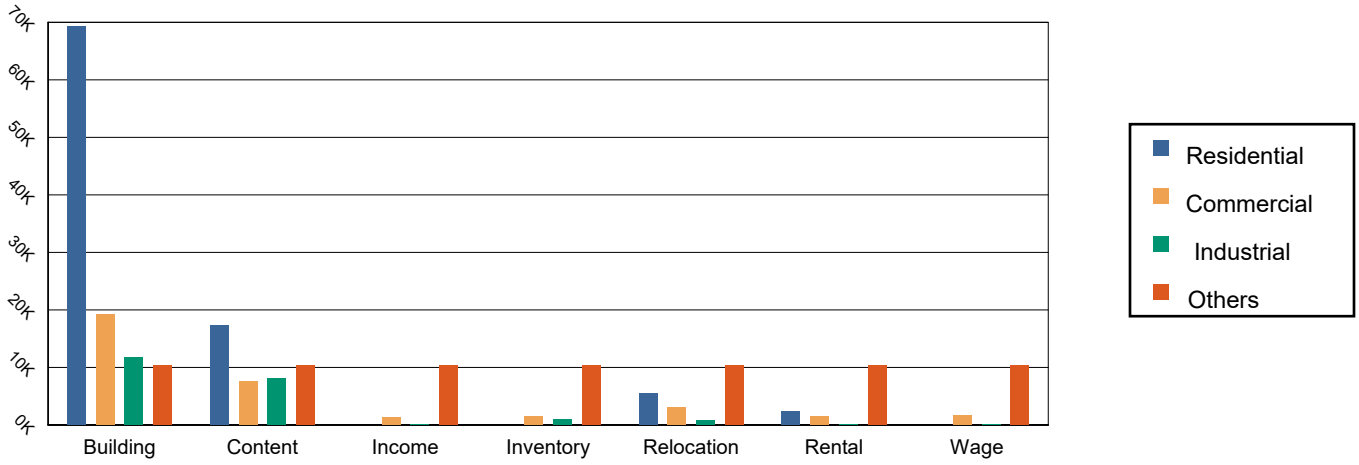


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	69,219.59	19,148.39	11,806.29	5,140.01	105,314.28
	Content	17,272.62	7,609.58	8,183.14	1,743.49	34,808.82
	Inventory	0.00	1,518.45	1,006.47	161.31	2,686.22
	Subtotal	**86,492.21**	**28,276.42**	**20,995.89**	**7,044.81**	**142,809.33**
Business Interruption Loss						
	Income	0.00	1,316.18	106.92	335.01	1,758.12
	Relocation	5,414.97	3,030.10	809.53	885.50	10,140.11
	Rental	2,392.21	1,530.32	113.35	82.90	4,118.79
	Wage	0.00	1,666.09	177.56	1,997.77	3,841.42
	Subtotal	**7,807.19**	**7,542.70**	**1,207.36**	**3,301.19**	**19,858.44**

Total

Total	**94,299.40**	**35,819.12**	**22,203.25**	**10,345.99**	**162,667.76**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	21,535	2,295,961	2,435,795	4,731,756
Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**
Study Region Total	**21,535**	**2,295,961**	**2,435,795**	**4,731,756**

Hazus: Hurricane Global Risk Report

Region Name:	Bolton_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 14.71 square miles and contains 1 census tracts. There are over 1 thousand households in the region and a total population of 4,858 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,357 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

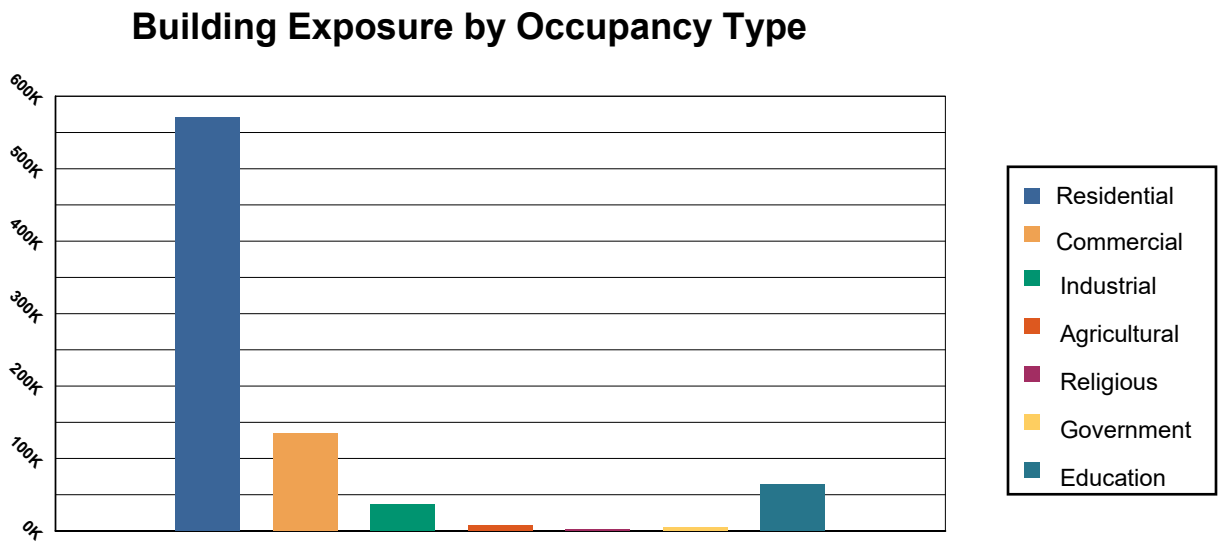


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	570,437	69.53%
Commercial	135,246	16.49%
Industrial	36,045	4.39%
Agricultural	7,143	0.87%
Religious	1,995	0.24%
Government	4,916	0.60%
Education	64,616	7.88%
Total	**820,398**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

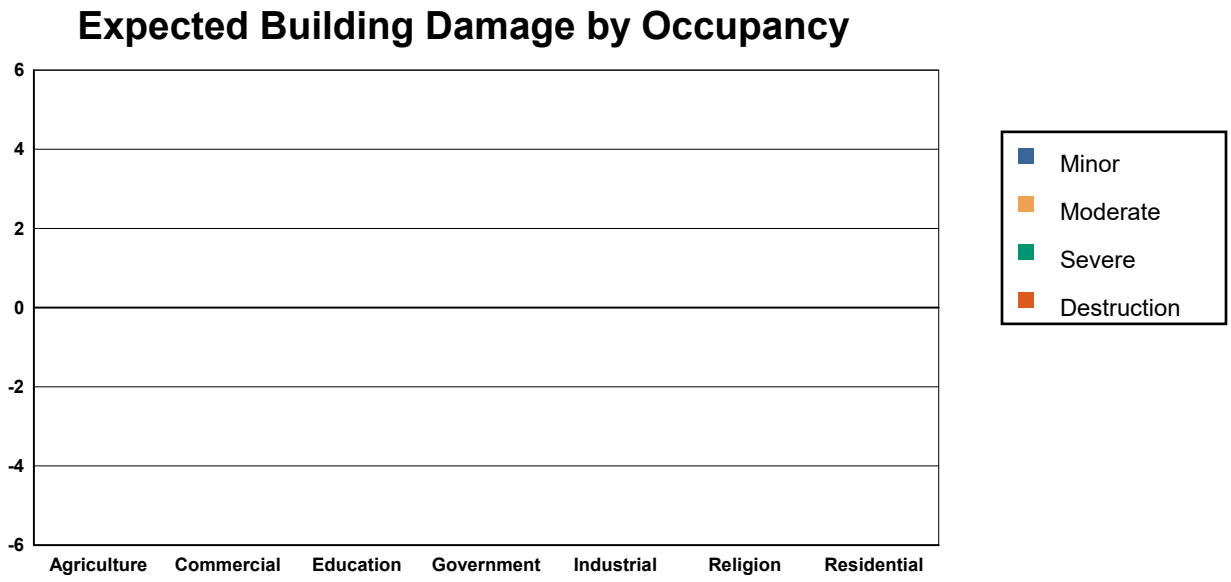


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	135.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	7.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	9.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	33.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	5.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	1,157.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1,357.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	23	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	126	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	102	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	1,106	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

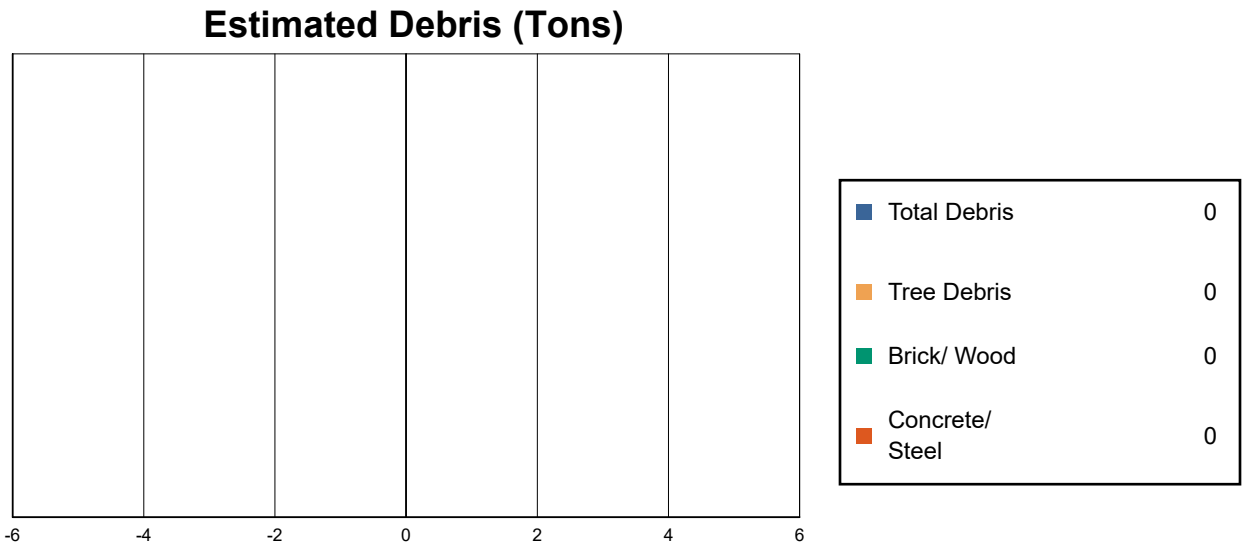
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

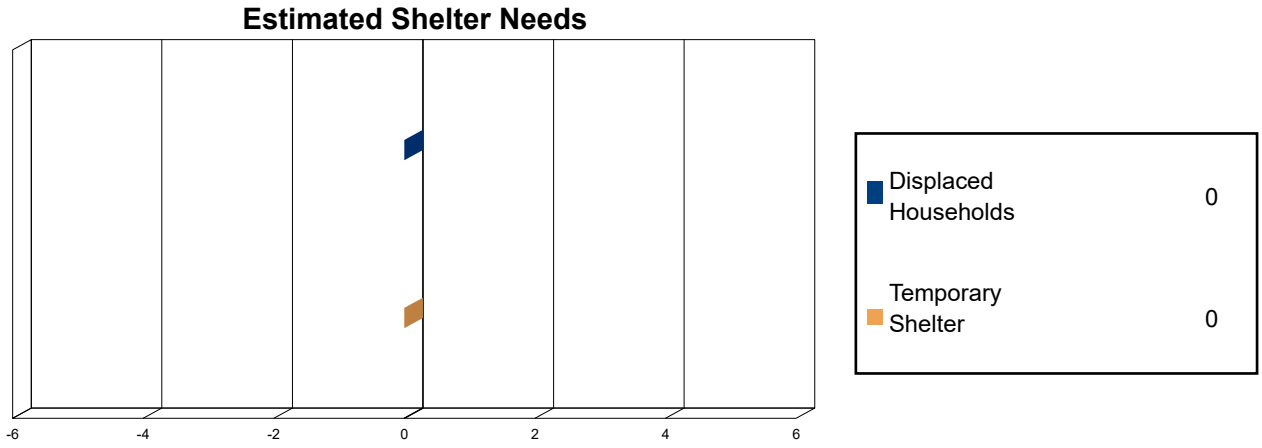


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 4,858) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

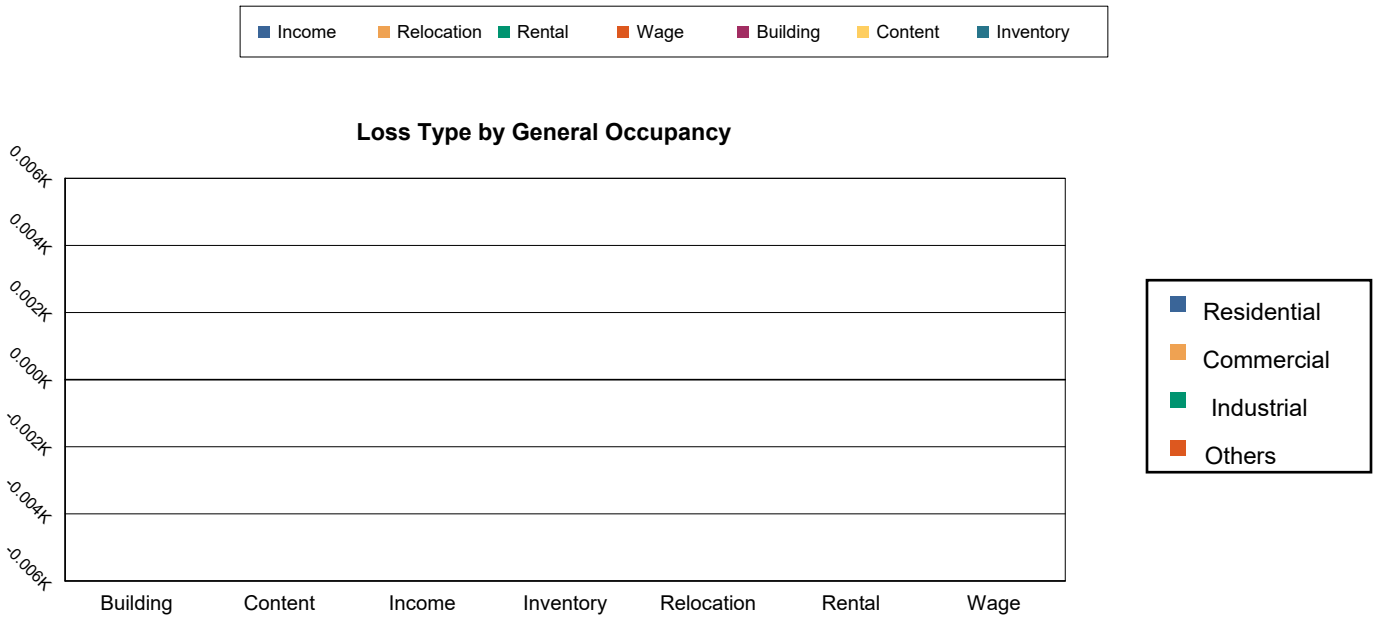


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,437	249,961	820,398
Total	**4,858**	**570,437**	**249,961**	**820,398**
Study Region Total	**4,858**	**570,437**	**249,961**	**820,398**

Hazus: Hurricane Global Risk Report

Region Name:	Bolton_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 14.71 square miles and contains 1 census tracts. There are over 1 thousand households in the region and a total population of 4,858 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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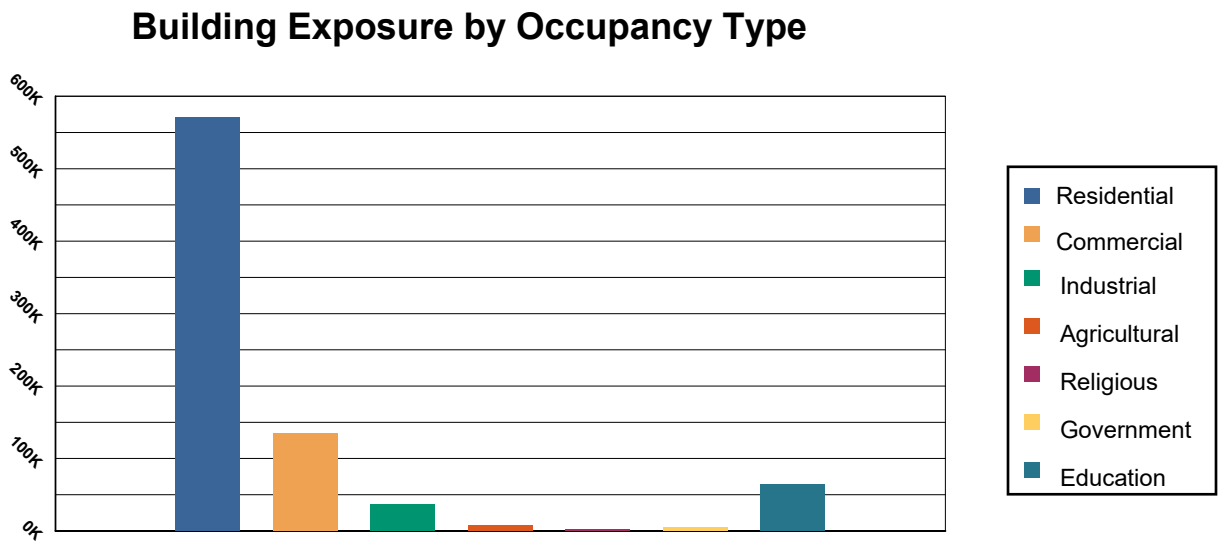

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Government	4,916	0.60%
Education	64,616	7.88%
Total	**820,398**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

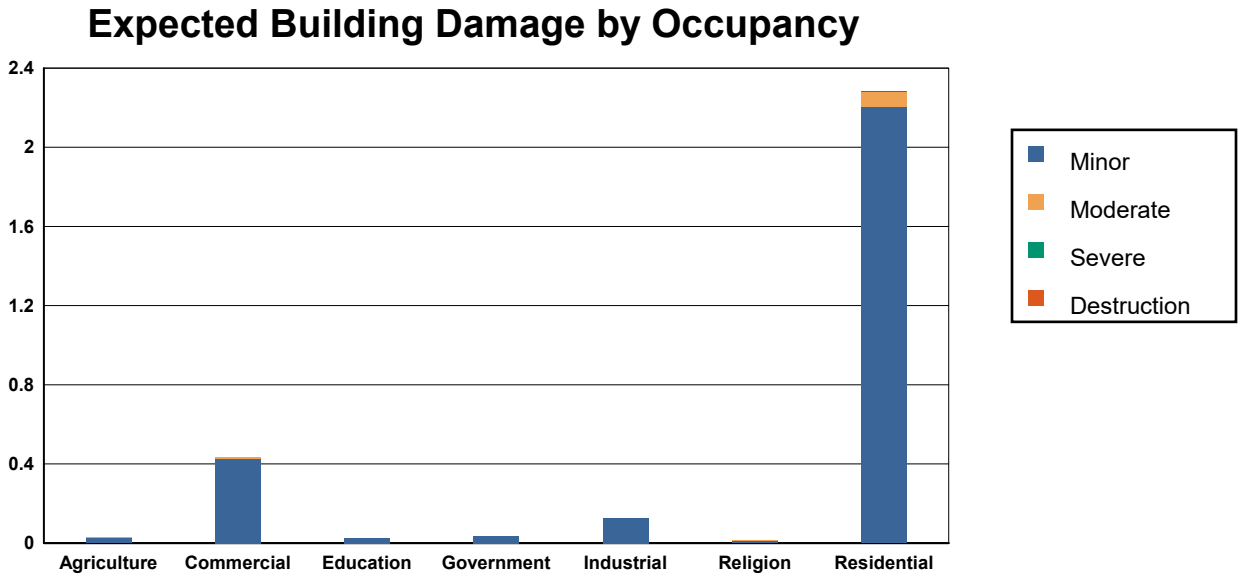


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	10.97	99.72	0.03	0.27	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	134.57	99.68	0.43	0.31	0.01	0.01	0.00	0.00	0.00	0.00
Education	6.97	99.63	0.03	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Government	8.96	99.61	0.04	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	32.87	99.62	0.13	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Religion	4.99	99.70	0.01	0.29	0.00	0.01	0.00	0.00	0.00	0.00
Residential	1,154.72	99.80	2.21	0.19	0.08	0.01	0.00	0.00	0.00	0.00
Total	**1,354.05**		**2.86**		**0.09**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	23	99.40	0	0.60	0	0.00	0	0.00	0	0.00
Masonry	125	99.34	1	0.64	0	0.02	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	102	99.62	0	0.38	0	0.00	0	0.00	0	0.00
Wood	1,105	99.94	1	0.06	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

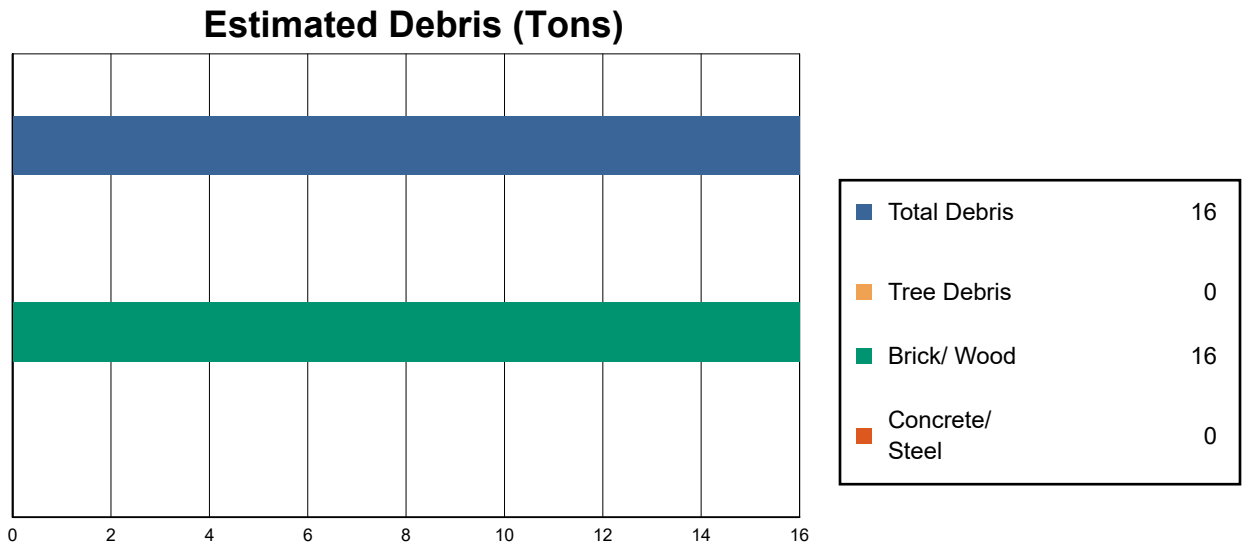
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

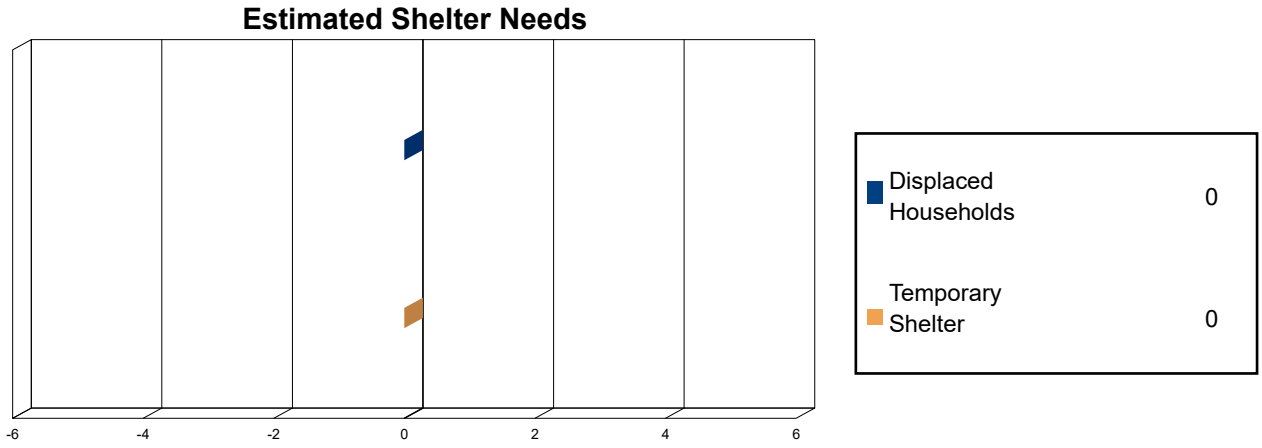


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 16 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 16 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 4,858) will seek temporary shelter in public shelters.

Economic Loss

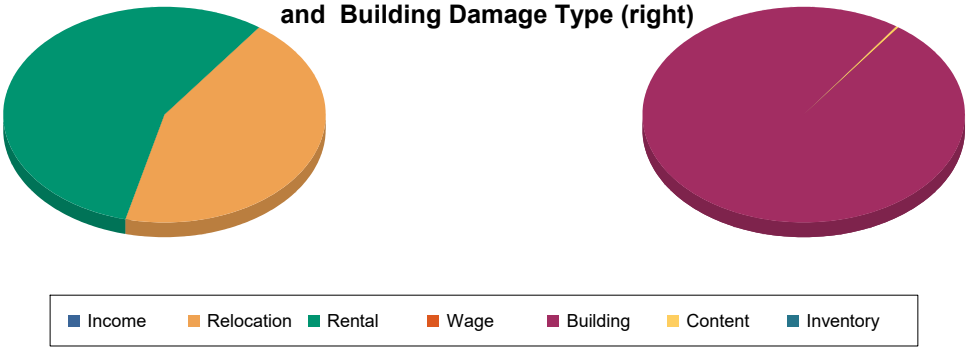
The total economic loss estimated for the hurricane is 0.2 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

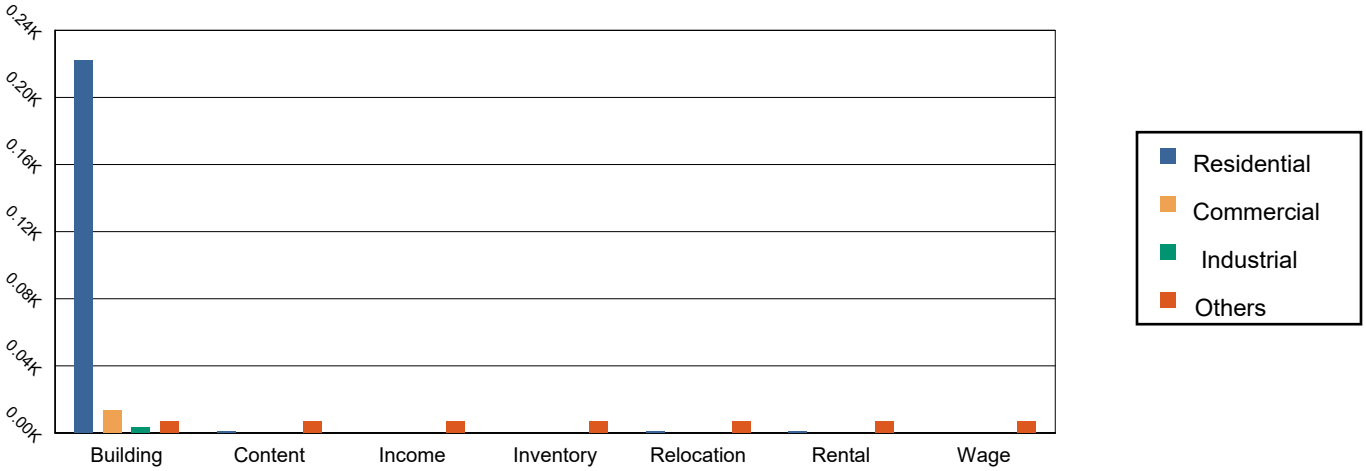


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	222.24	13.52	3.60	7.15	246.52
	Content	0.79	0.00	0.00	0.00	0.79
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**223.03**	**13.52**	**3.60**	**7.15**	**247.31**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.79	0.06	0.00	0.01	0.85
	Rental	1.09	0.00	0.00	0.00	1.09
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1.88**	**0.06**	**0.00**	**0.01**	**1.94**

Total

Total	**224.91**	**13.58**	**3.60**	**7.16**	**249.25**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,437	249,961	820,398
Total	**4,858**	**570,437**	**249,961**	**820,398**
Study Region Total	**4,858**	**570,437**	**249,961**	**820,398**

Hazus: Hurricane Global Risk Report

Region Name:	Bolton_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
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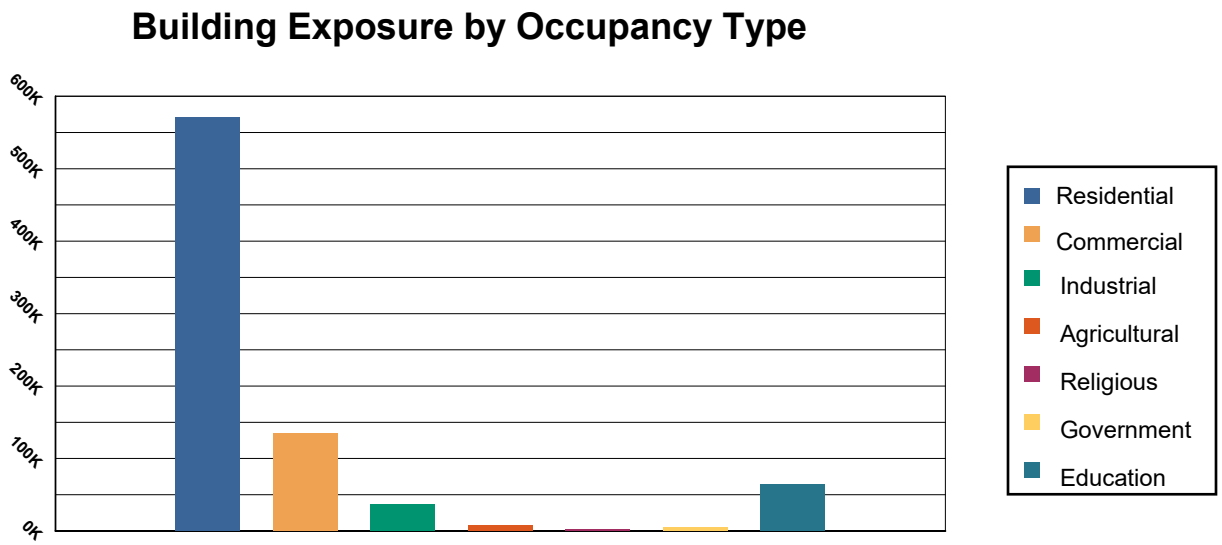

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Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

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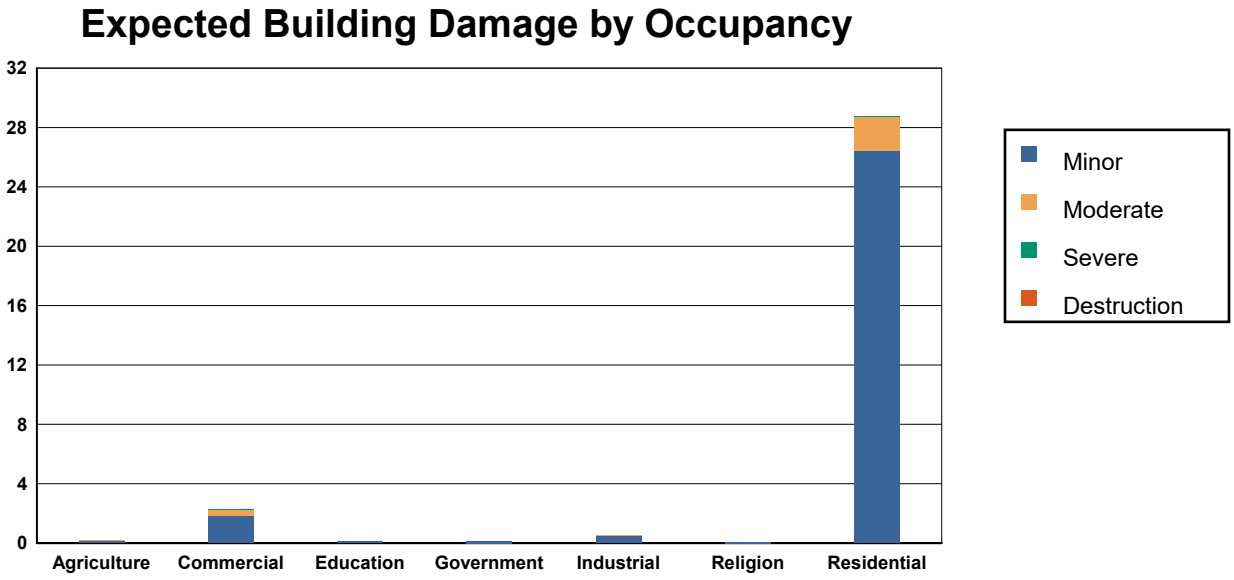


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	10.78	98.03	0.19	1.72	0.02	0.20	0.01	0.05	0.00	0.00
Commercial	132.73	98.31	1.85	1.37	0.41	0.30	0.02	0.02	0.00	0.00
Education	6.89	98.46	0.11	1.51	0.00	0.03	0.00	0.00	0.00	0.00
Government	8.86	98.44	0.14	1.54	0.00	0.02	0.00	0.00	0.00	0.00
Industrial	32.48	98.42	0.51	1.54	0.01	0.03	0.00	0.00	0.00	0.00
Religion	4.93	98.57	0.07	1.39	0.00	0.04	0.00	0.00	0.00	0.00
Residential	1,128.22	97.51	26.46	2.29	2.29	0.20	0.03	0.00	0.00	0.00
Total	**1,324.89**		**29.32**		**2.74**		**0.06**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	22	97.32	1	2.62	0	0.07	0	0.00	0	0.00
Masonry	121	96.31	4	3.02	1	0.66	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	100	98.16	2	1.53	0	0.30	0	0.02	0	0.00
Wood	1,085	98.11	20	1.83	1	0.06	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

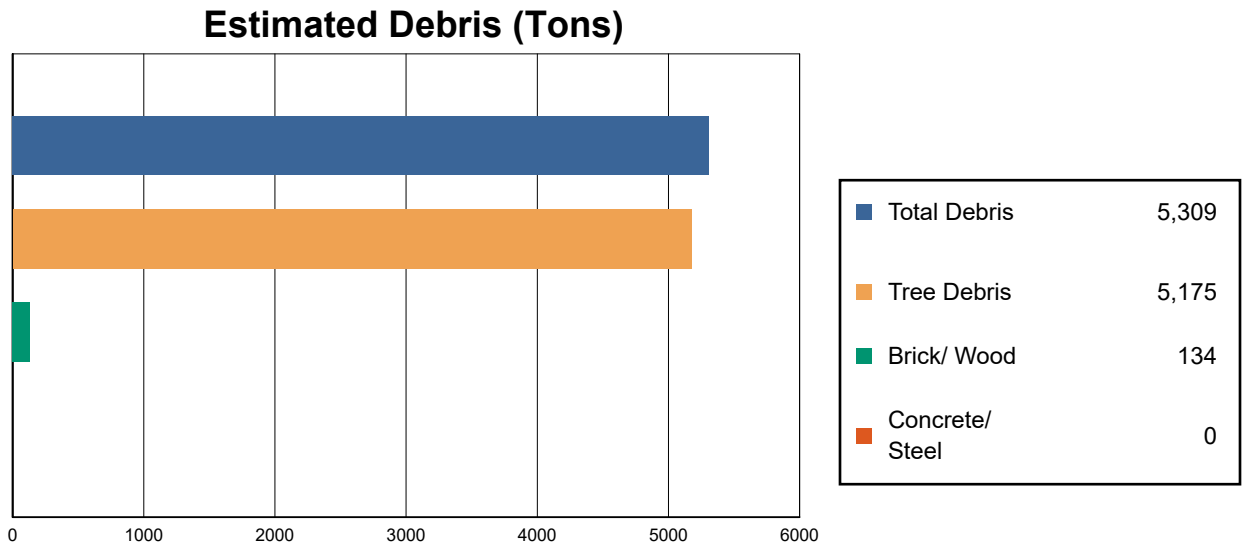
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

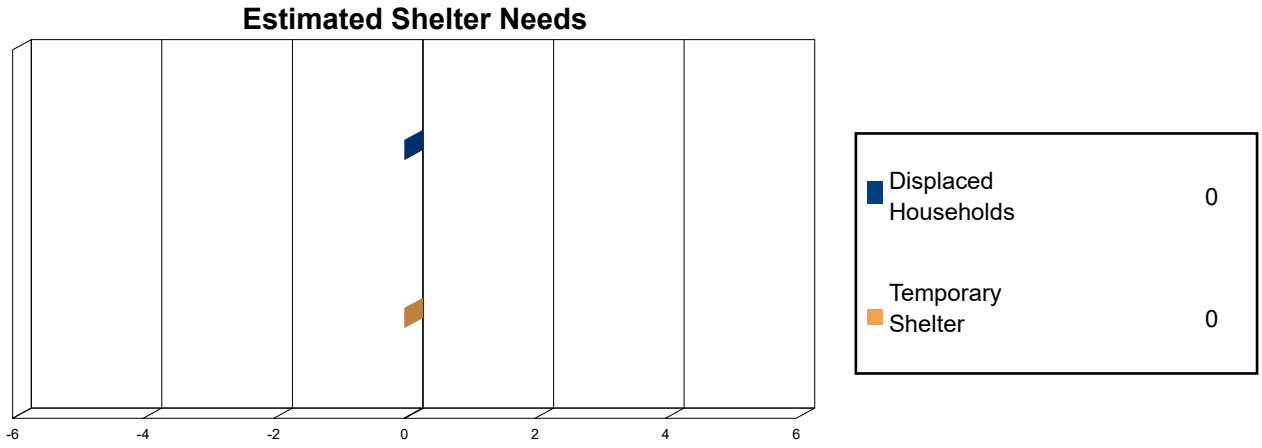


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,309 tons of debris will be generated. Of the total amount, 4,243 tons (80%) is Other Tree Debris. Of the remaining 1,066 tons, Brick/Wood comprises 13% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 5 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 932 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 4,858) will seek temporary shelter in public shelters.

Economic Loss

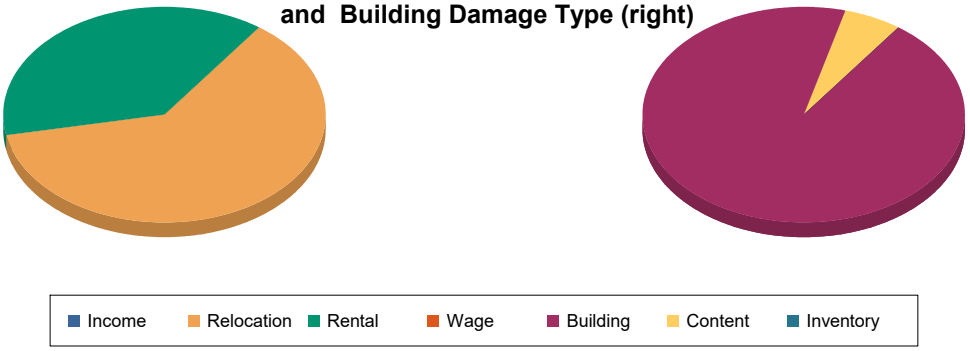
The total economic loss estimated for the hurricane is 2.1 million dollars, which represents 0.25 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

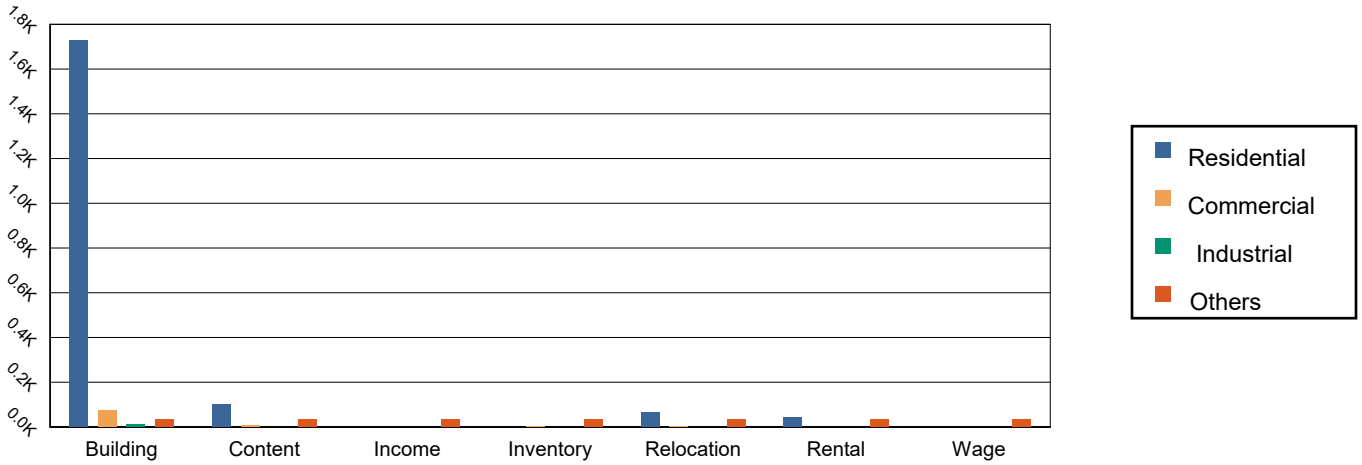


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,725.51	73.53	12.81	32.09	1,843.95
	Content	100.65	8.74	0.23	0.71	110.34
	Inventory	0.00	1.50	0.03	0.53	2.06
	Subtotal	**1,826.16**	**83.77**	**13.07**	**33.33**	**1,956.34**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	62.87	2.94	0.07	0.22	66.10
	Rental	40.59	0.00	0.00	0.00	40.59
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**103.46**	**2.94**	**0.07**	**0.22**	**106.69**

Total

Total	**1,929.62**	**86.72**	**13.14**	**33.56**	**2,063.03**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,437	249,961	820,398
Total	**4,858**	**570,437**	**249,961**	**820,398**
Study Region Total	**4,858**	**570,437**	**249,961**	**820,398**

Hazus: Hurricane Global Risk Report

Region Name:	Bolton_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 14.71 square miles and contains 1 census tracts. There are over 1 thousand households in the region and a total population of 4,858 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,357 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

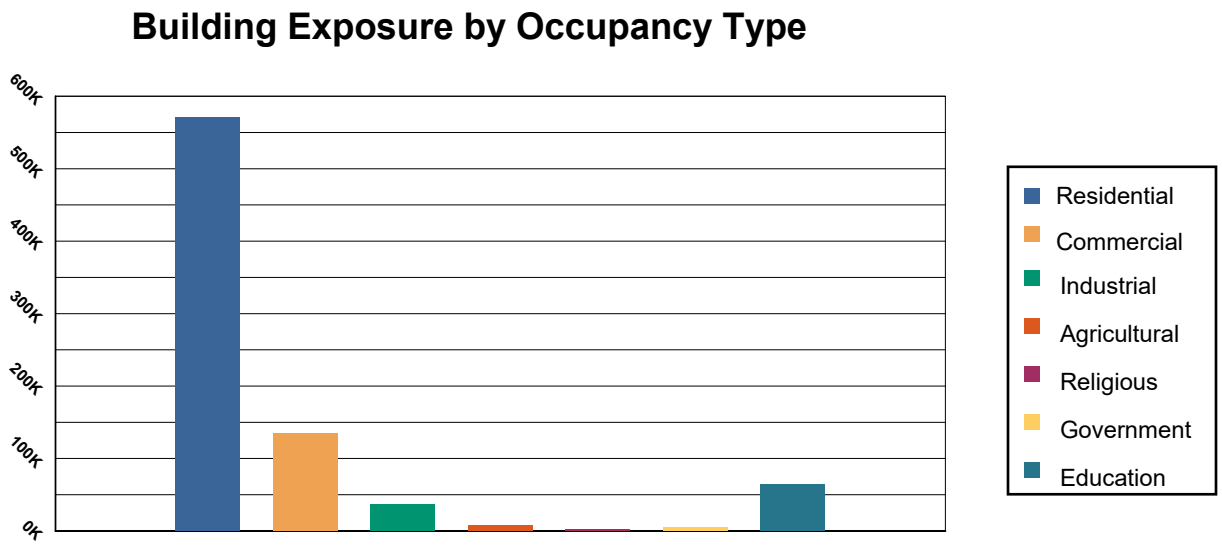


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	570,437	69.53%
Commercial	135,246	16.49%
Industrial	36,045	4.39%
Agricultural	7,143	0.87%
Religious	1,995	0.24%
Government	4,916	0.60%
Education	64,616	7.88%
Total	**820,398**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 12 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

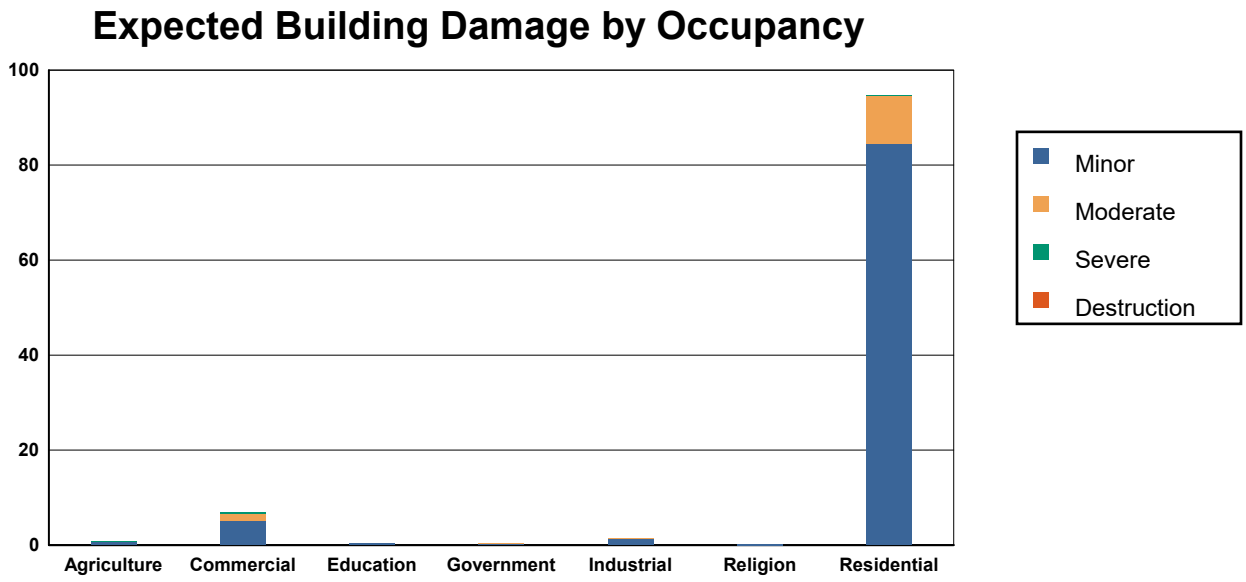


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	10.24	93.11	0.61	5.52	0.10	0.94	0.05	0.41	0.00	0.02
Commercial	128.09	94.88	5.15	3.81	1.49	1.10	0.27	0.20	0.00	0.00
Education	6.70	95.68	0.29	4.14	0.01	0.18	0.00	0.00	0.00	0.00
Government	8.62	95.78	0.36	4.05	0.02	0.17	0.00	0.00	0.00	0.00
Industrial	31.56	95.64	1.36	4.11	0.08	0.23	0.01	0.02	0.00	0.00
Religion	4.77	95.34	0.22	4.47	0.01	0.18	0.00	0.01	0.00	0.00
Residential	1,062.25	91.81	84.40	7.29	10.23	0.88	0.12	0.01	0.00	0.00
Total	**1,252.23**		**92.39**		**11.94**		**0.44**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	21	92.82	2	6.56	0	0.62	0	0.00	0	0.00
Masonry	114	90.86	9	6.78	3	2.30	0	0.05	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	97	94.79	4	3.86	1	1.14	0	0.21	0	0.00
Wood	1,027	92.88	74	6.72	4	0.38	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

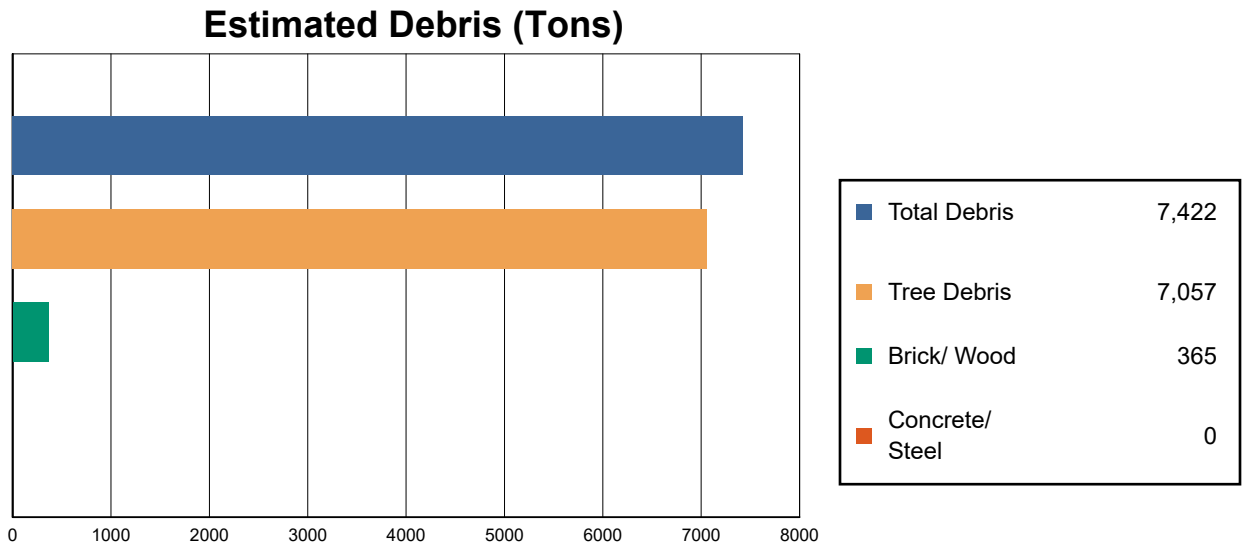
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

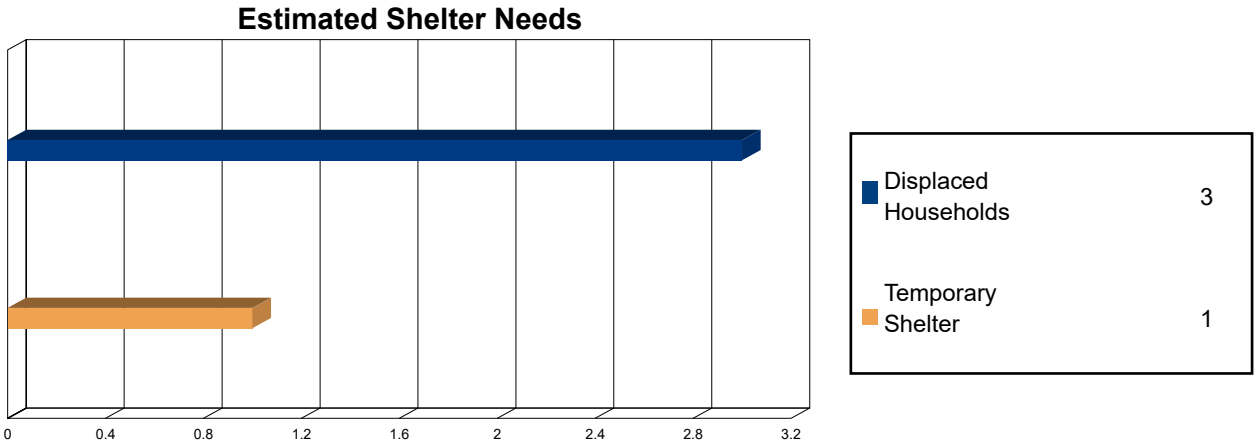


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7,422 tons of debris will be generated. Of the total amount, 5,787 tons (78%) is Other Tree Debris. Of the remaining 1,635 tons, Brick/Wood comprises 22% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 15 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,270 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 3 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 4,858) will seek temporary shelter in public shelters.

Economic Loss

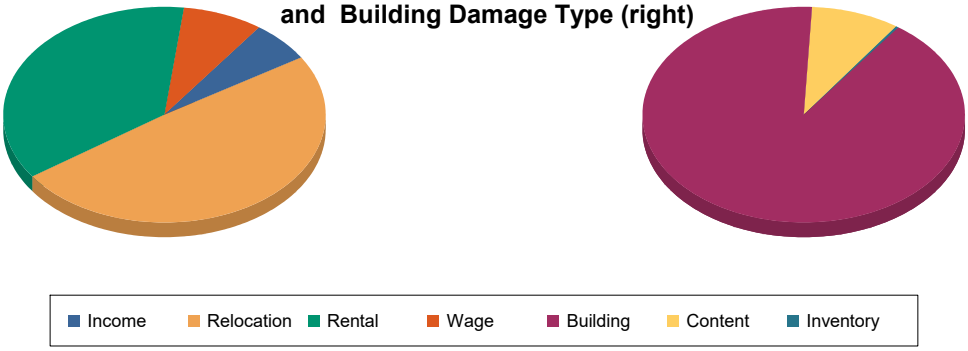
The total economic loss estimated for the hurricane is 4.7 million dollars, which represents 0.57 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 5 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

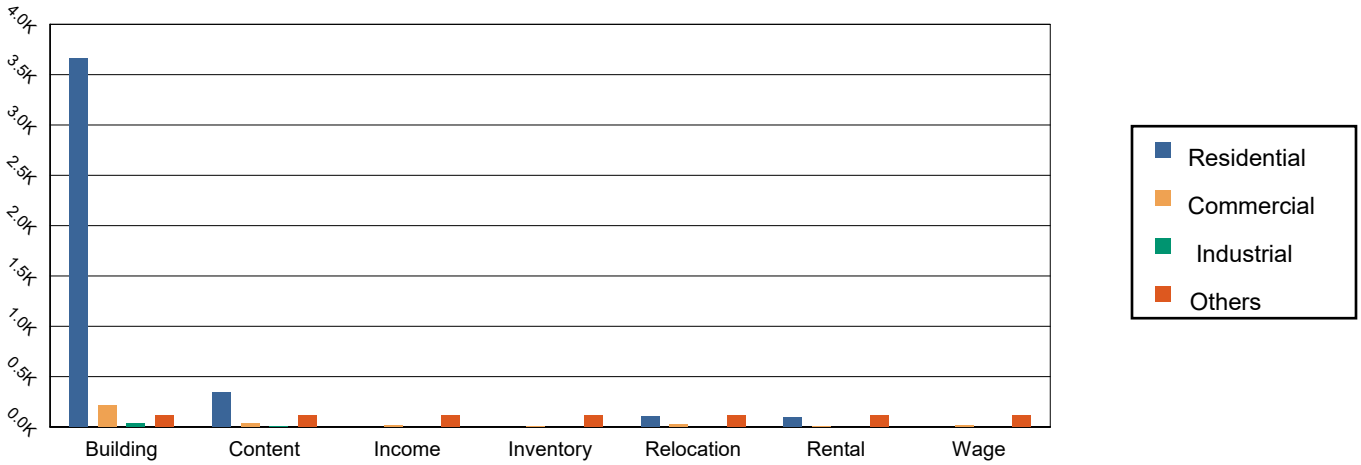


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,661.56	212.91	35.79	95.01	4,005.26
	Content	347.23	33.53	3.75	11.86	396.37
	Inventory	0.00	6.53	0.55	3.68	10.77
	Subtotal	**4,008.79**	**252.97**	**40.08**	**110.55**	**4,412.40**
Business Interruption Loss						
	Income	0.00	15.96	0.03	1.11	17.11
	Relocation	105.94	27.10	0.58	3.44	137.06
	Rental	91.28	10.65	0.02	0.15	102.11
	Wage	0.00	19.47	0.05	2.62	22.14
	Subtotal	**197.22**	**73.18**	**0.68**	**7.33**	**278.42**

Total

Total	4,206.01	326.16	40.76	117.89	4,690.82

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,437	249,961	820,398
Total	**4,858**	**570,437**	**249,961**	**820,398**
Study Region Total	**4,858**	**570,437**	**249,961**	**820,398**

Hazus: Hurricane Global Risk Report

Region Name: Bolton_HU

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

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There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

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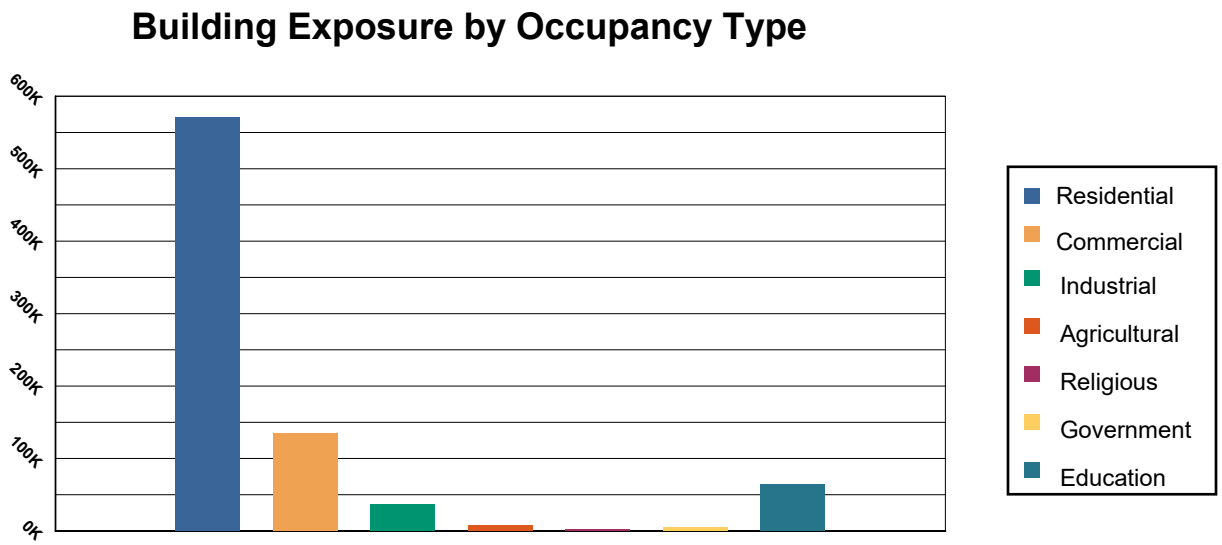


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	570,437	69.53%
Commercial	135,246	16.49%
Industrial	36,045	4.39%
Agricultural	7,143	0.87%
Religious	1,995	0.24%
Government	4,916	0.60%
Education	64,616	7.88%
Total	**820,398**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 33 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

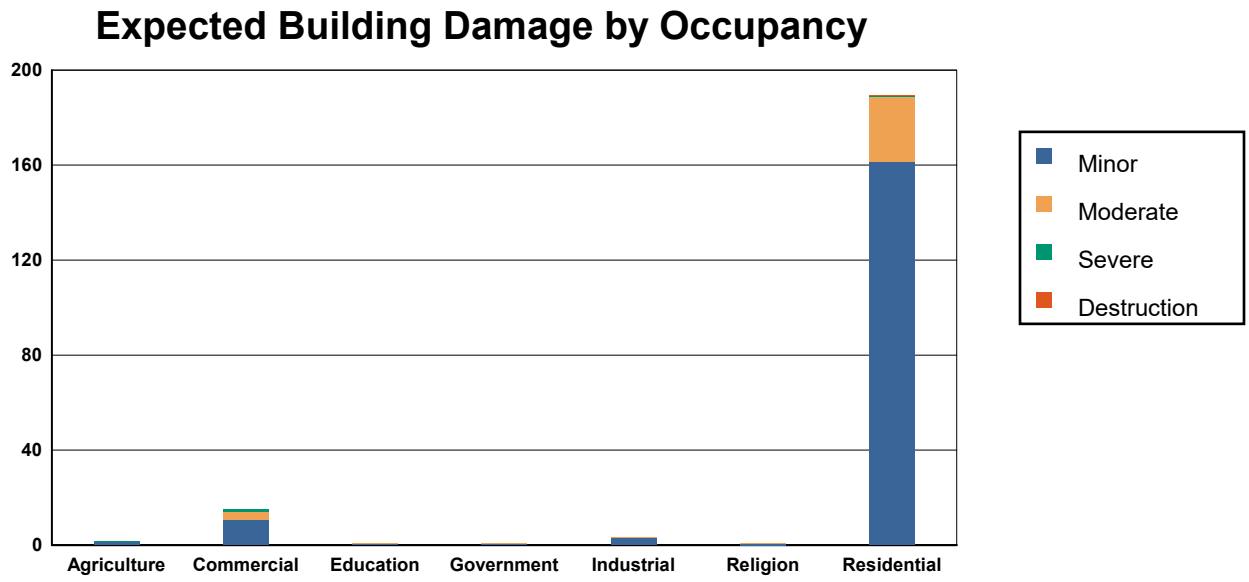


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.39	85.38	1.20	10.95	0.27	2.41	0.13	1.16	0.01	0.10
Commercial	119.92	88.83	10.69	7.92	3.36	2.49	1.02	0.76	0.00	0.00
Education	6.32	90.32	0.61	8.69	0.07	0.95	0.00	0.04	0.00	0.00
Government	8.15	90.54	0.76	8.47	0.09	0.96	0.00	0.03	0.00	0.00
Industrial	29.79	90.27	2.82	8.55	0.35	1.07	0.03	0.10	0.00	0.01
Religion	4.47	89.45	0.48	9.61	0.05	0.90	0.00	0.04	0.00	0.00
Residential	967.45	83.62	161.65	13.97	27.10	2.34	0.62	0.05	0.18	0.02
Total	**1,145.49**		**178.22**		**31.28**		**1.81**		**0.19**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	20	85.18	3	12.26	1	2.55	0	0.02	0	0.00
Masonry	105	83.16	15	11.71	6	4.96	0	0.16	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	91	88.74	8	7.77	3	2.71	1	0.78	0	0.00
Wood	942	85.15	149	13.47	15	1.31	1	0.05	0	0.02

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

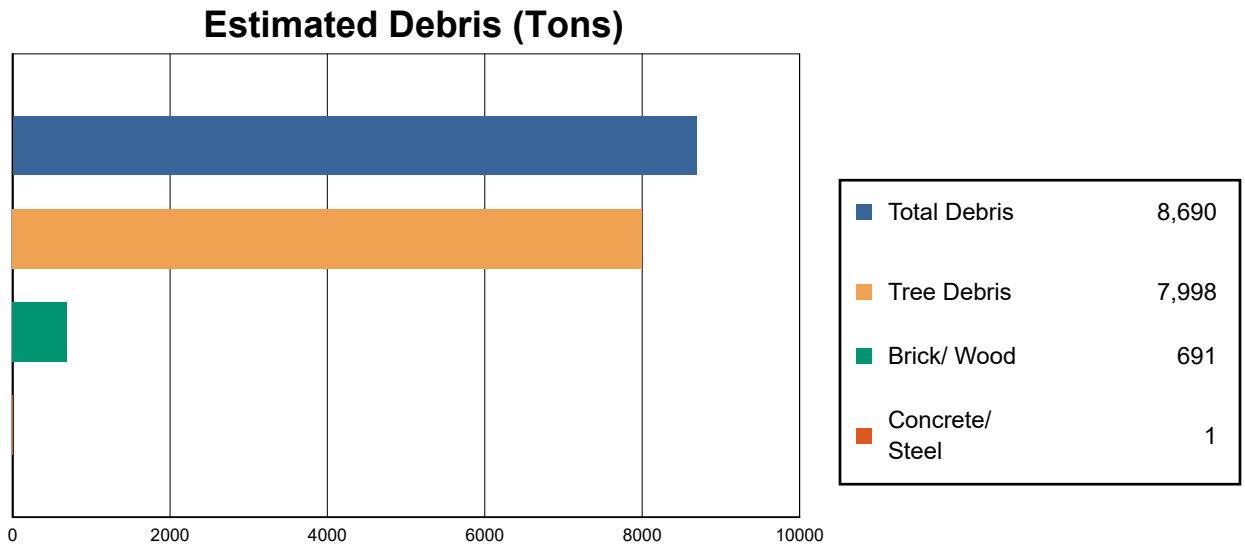
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

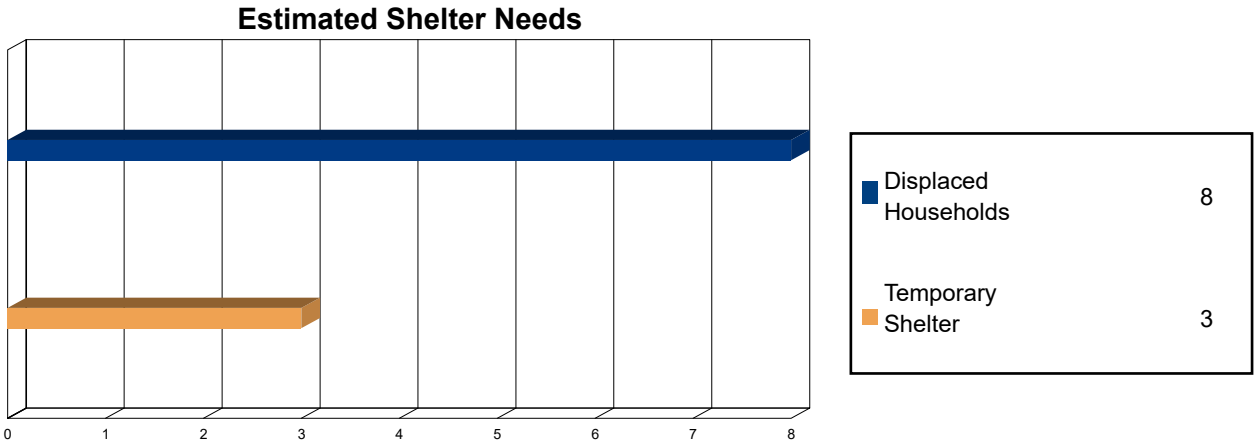


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 8,690 tons of debris will be generated. Of the total amount, 6,558 tons (75%) is Other Tree Debris. Of the remaining 2,132 tons, Brick/Wood comprises 32% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 28 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,440 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 8 households to be displaced due to the hurricane. Of these, 3 people (out of a total population of 4,858) will seek temporary shelter in public shelters.

Economic Loss

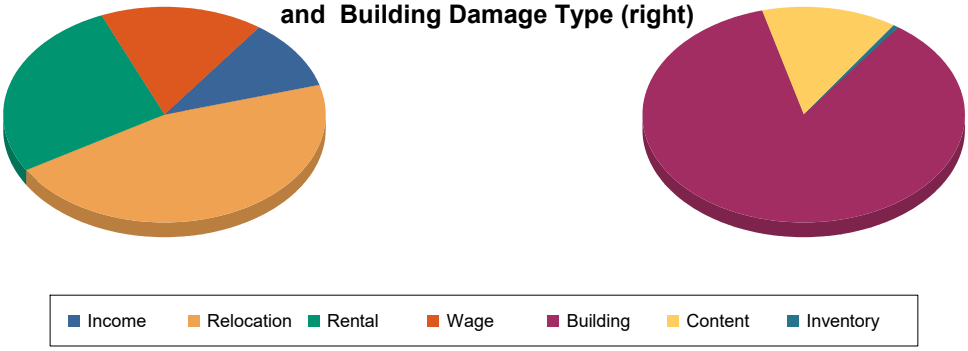
The total economic loss estimated for the hurricane is 9.2 million dollars, which represents 1.12 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 9 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 85% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

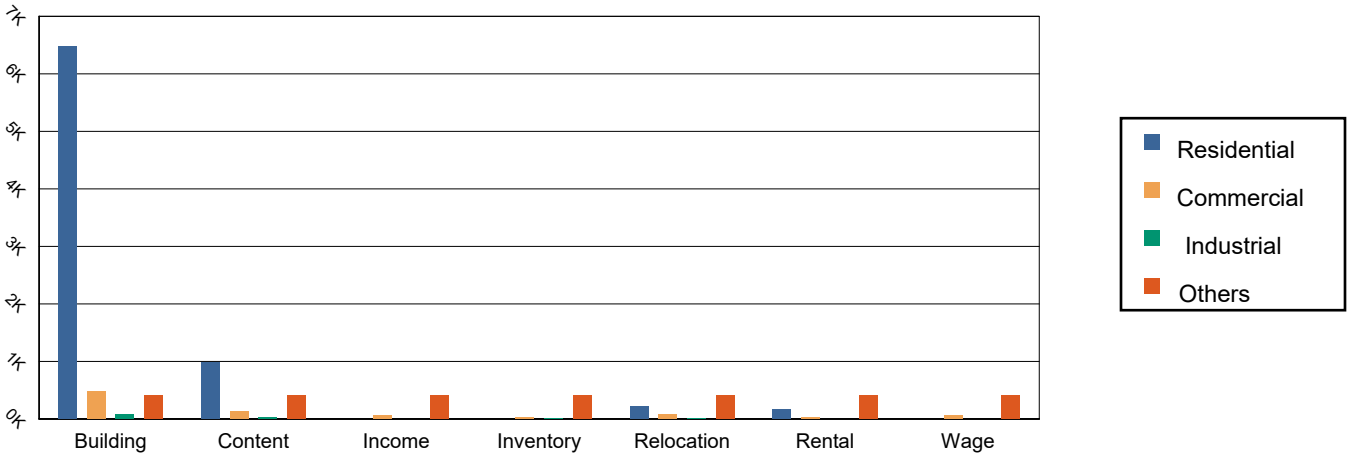


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	6,467.80	486.49	85.94	225.78	7,266.02
	Content	977.16	121.96	20.32	39.22	1,158.65
	Inventory	0.00	24.63	2.79	13.16	40.58
	Subtotal	**7,444.96**	**633.08**	**109.04**	**278.16**	**8,465.25**
Business Interruption Loss						
	Income	0.00	53.25	1.02	22.47	76.74
	Relocation	218.72	72.80	4.75	35.96	332.23
	Rental	161.48	32.13	0.64	2.10	196.35
	Wage	0.00	55.04	1.77	61.79	118.61
	Subtotal	**380.20**	**213.22**	**8.19**	**122.33**	**723.94**

Total

Total	**7,825.16**	**846.30**	**117.23**	**400.49**	**9,189.19**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,437	249,961	820,398
Total	**4,858**	**570,437**	**249,961**	**820,398**
Study Region Total	**4,858**	**570,437**	**249,961**	**820,398**

Hazus: Hurricane Global Risk Report

Region Name:	Bolton_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 14.71 square miles and contains 1 census tracts. There are over 1 thousand households in the region and a total population of 4,858 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,357 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

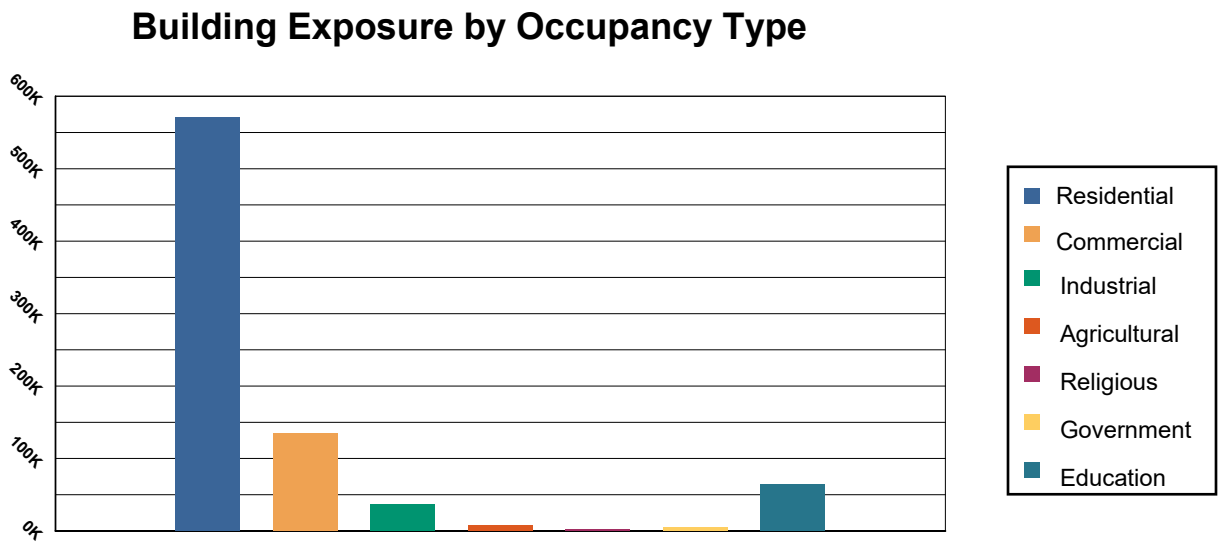


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	570,437	69.53%
Commercial	135,246	16.49%
Industrial	36,045	4.39%
Agricultural	7,143	0.87%
Religious	1,995	0.24%
Government	4,916	0.60%
Education	64,616	7.88%
Total	**820,398**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 82 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

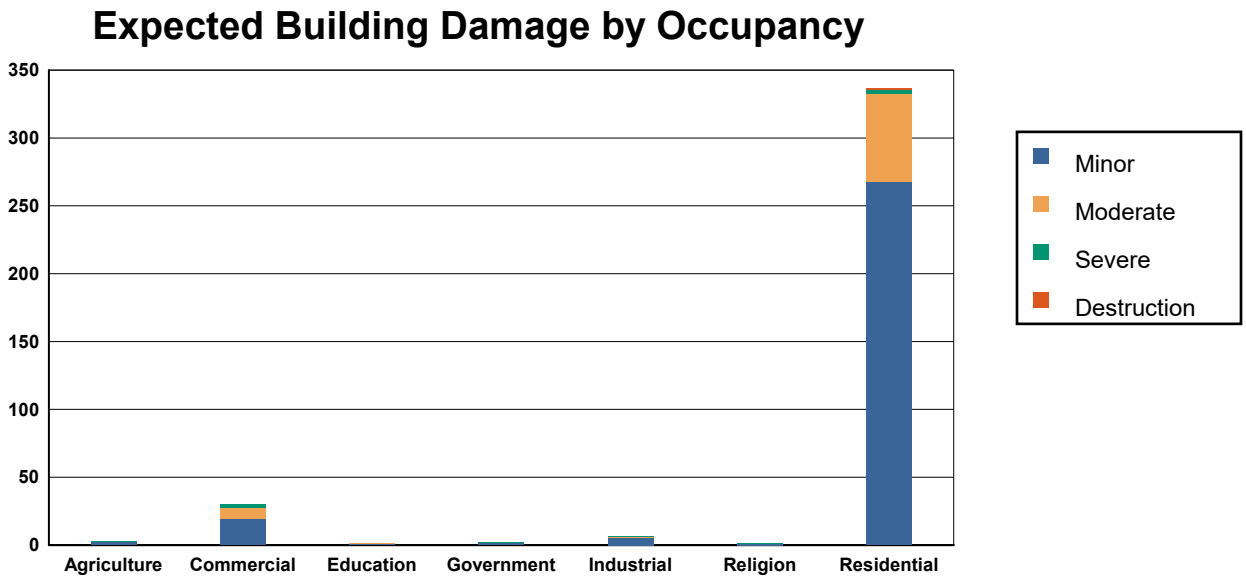


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.99	72.67	2.08	18.89	0.60	5.47	0.29	2.62	0.04	0.35
Commercial	104.90	77.71	19.75	14.63	7.66	5.67	2.67	1.97	0.02	0.02
Education	5.58	79.70	1.14	16.31	0.27	3.82	0.01	0.17	0.00	0.00
Government	7.20	80.02	1.43	15.91	0.35	3.90	0.02	0.17	0.00	0.00
Industrial	26.28	79.63	5.26	15.95	1.34	4.05	0.12	0.35	0.01	0.02
Religion	3.92	78.37	0.90	17.98	0.17	3.48	0.01	0.17	0.00	0.00
Residential	820.57	70.92	268.16	23.18	64.15	5.54	2.87	0.25	1.25	0.11
Total	**976.45**		**298.72**		**74.54**		**5.97**		**1.31**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	16	71.70	5	20.21	2	7.98	0	0.11	0	0.00
Masonry	89	70.66	24	18.66	13	10.19	1	0.44	0	0.05
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	79	77.47	14	14.06	7	6.38	2	2.07	0	0.02
Wood	807	72.98	255	23.06	40	3.59	3	0.25	1	0.12

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

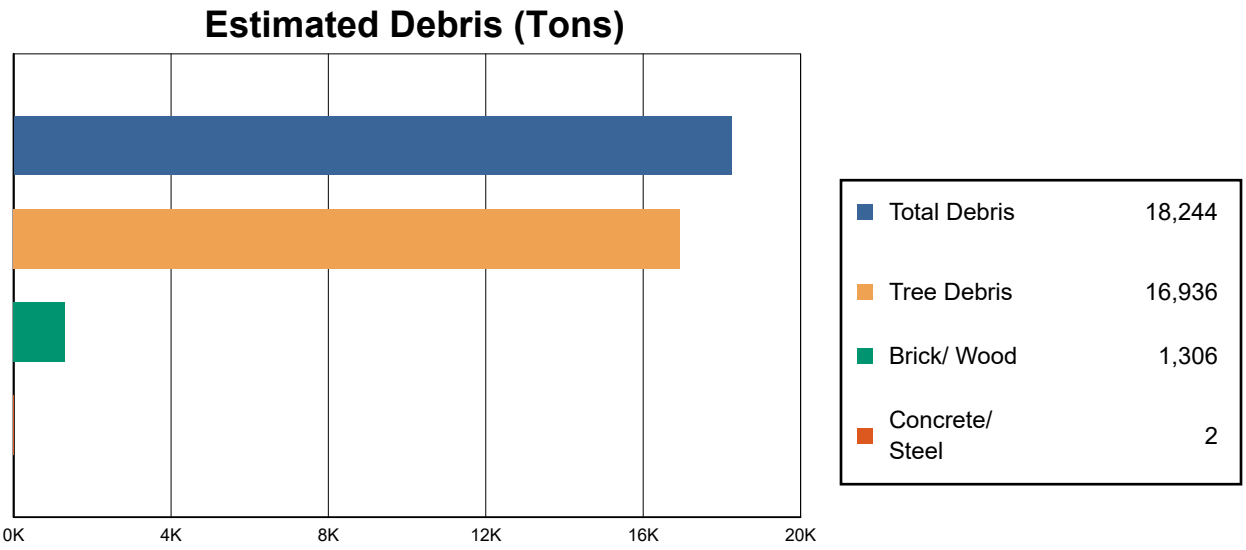
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

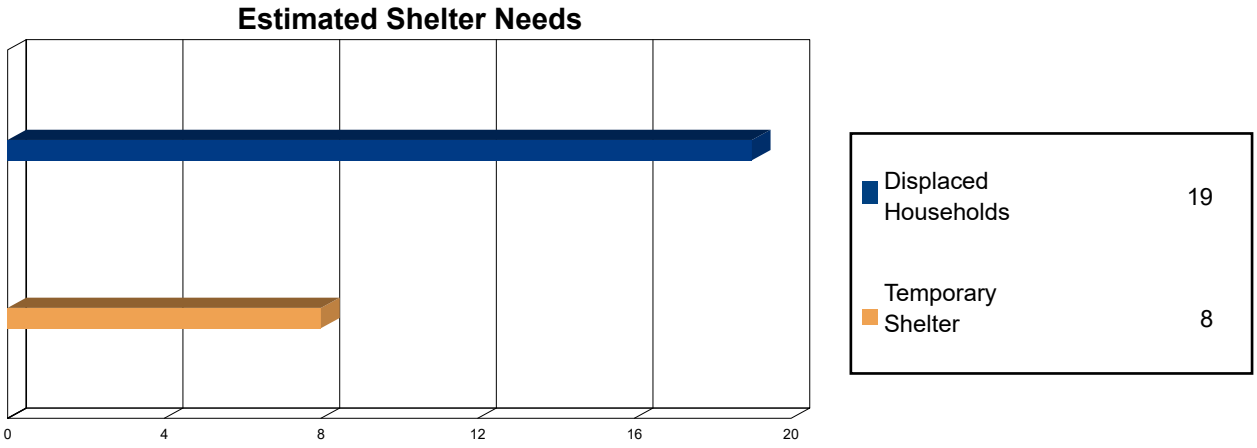


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 18,244 tons of debris will be generated. Of the total amount, 13,888 tons (76%) is Other Tree Debris. Of the remaining 4,356 tons, Brick/Wood comprises 30% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 52 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,048 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 19 households to be displaced due to the hurricane. Of these, 8 people (out of a total population of 4,858) will seek temporary shelter in public shelters.

Economic Loss

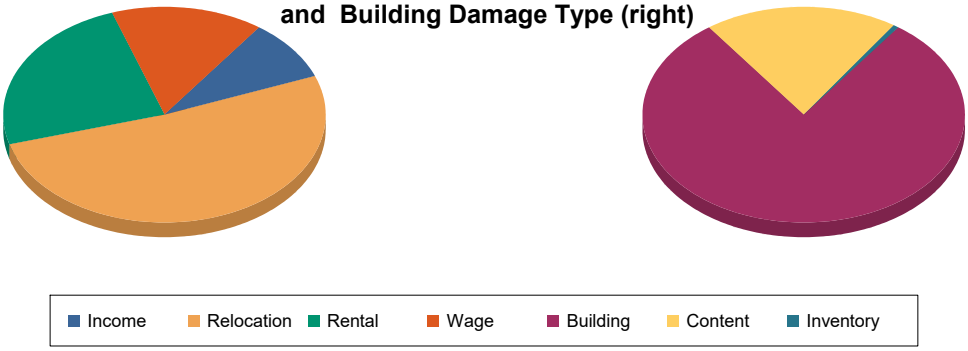
The total economic loss estimated for the hurricane is 19.4 million dollars, which represents 2.36 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 19 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 82% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

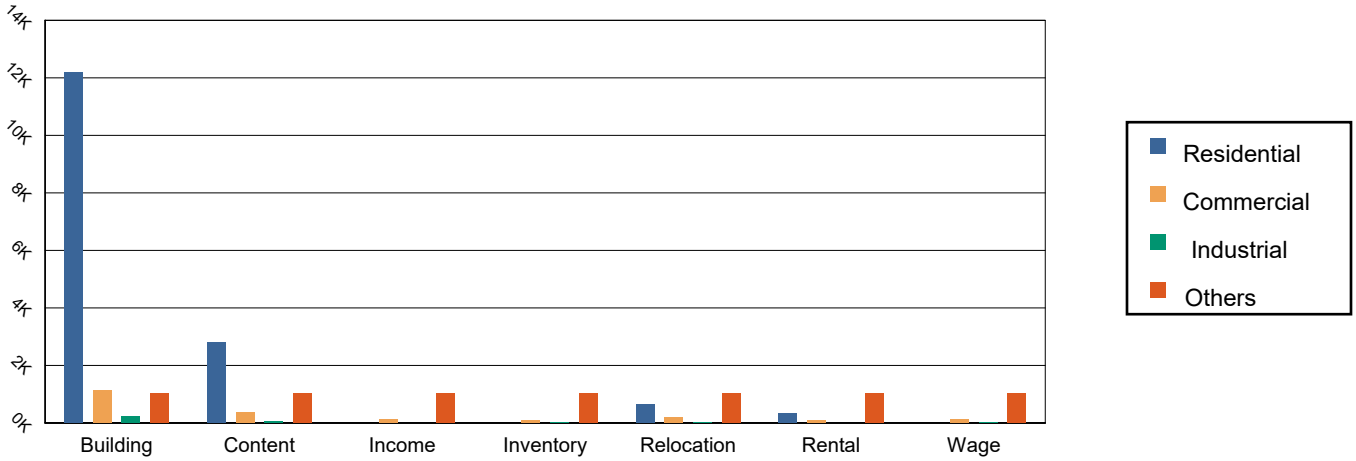


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	12,176.69	1,133.60	217.87	549.54	14,077.70
	Content	2,813.46	364.79	70.15	134.73	3,383.14
	Inventory	0.00	75.48	9.80	36.32	121.60
	Subtotal	**14,990.15**	**1,573.87**	**297.82**	**720.59**	**17,582.43**
Business Interruption Loss						
	Income	0.00	112.21	2.96	47.27	162.44
	Relocation	629.56	179.37	17.33	95.39	921.65
	Rental	342.45	81.18	2.03	5.90	431.56
	Wage	0.00	123.45	5.17	142.04	270.66
	Subtotal	**972.01**	**496.22**	**27.49**	**290.59**	**1,786.31**

Total

Total	**15,962.17**	**2,070.09**	**325.31**	**1,011.18**	**19,368.75**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,437	249,961	820,398
Total	**4,858**	**570,437**	**249,961**	**820,398**
Study Region Total	**4,858**	**570,437**	**249,961**	**820,398**

Hazus: Hurricane Global Risk Report

Region Name:	Bolton_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 14.71 square miles and contains 1 census tracts. There are over 1 thousand households in the region and a total population of 4,858 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 820 million dollars. Approximately 85% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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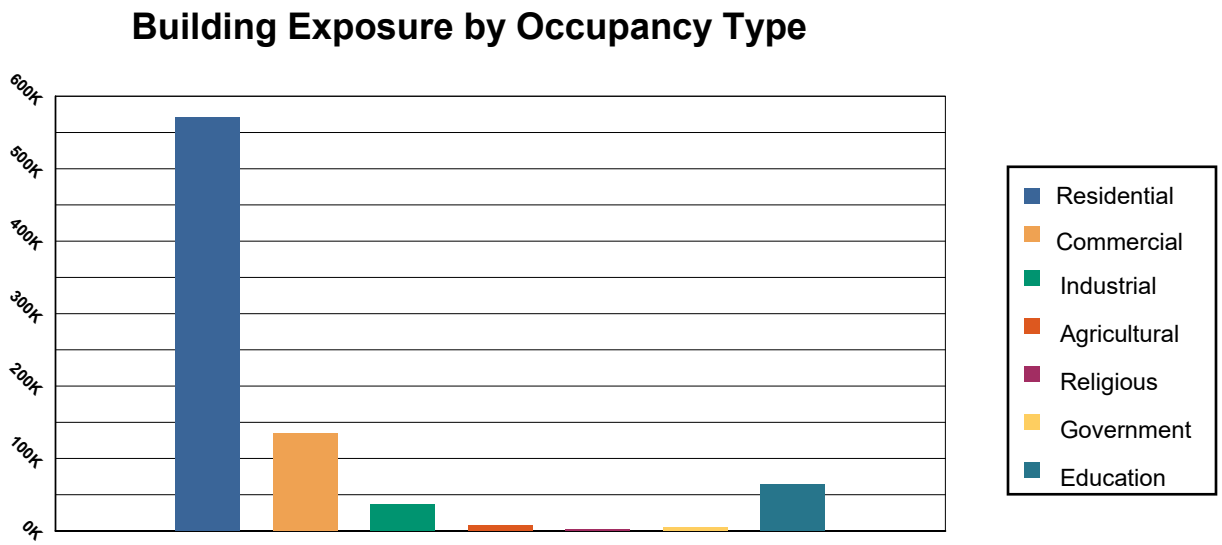


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	570,437	69.53%
Commercial	135,246	16.49%
Industrial	36,045	4.39%
Agricultural	7,143	0.87%
Religious	1,995	0.24%
Government	4,916	0.60%
Education	64,616	7.88%
Total	**820,398**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 134 buildings will be at least moderately damaged. This is over 10% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

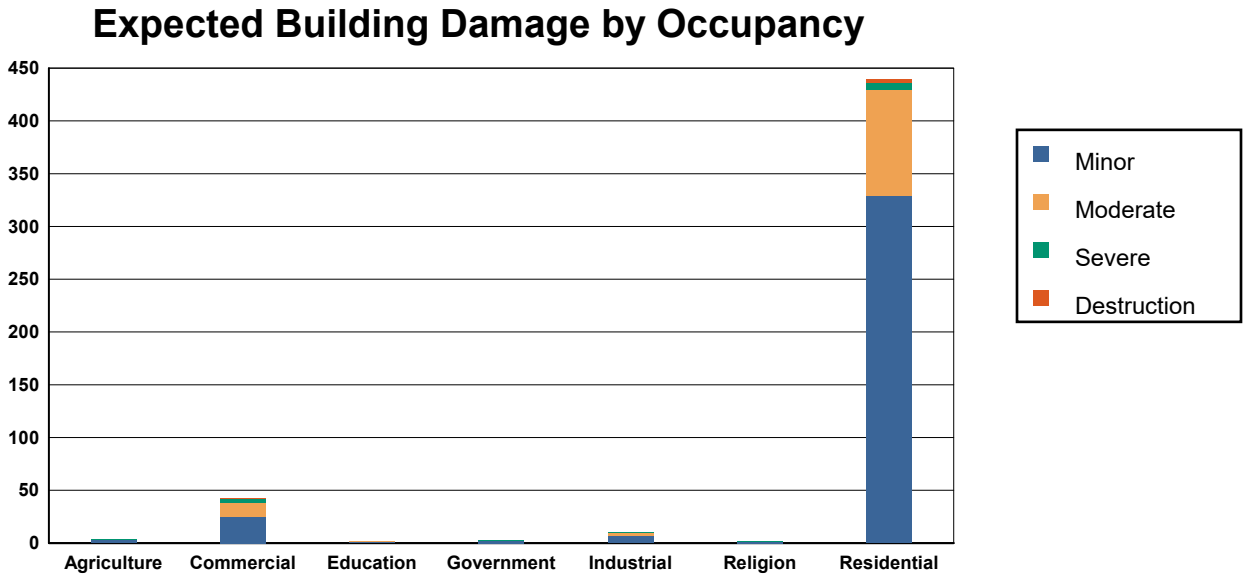


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.94	63.11	2.63	23.88	0.93	8.41	0.44	4.01	0.06	0.59
Commercial	92.44	68.47	25.57	18.94	12.46	9.23	4.48	3.32	0.05	0.04
Education	4.93	70.39	1.49	21.25	0.54	7.70	0.05	0.66	0.00	0.00
Government	6.36	70.70	1.86	20.70	0.71	7.91	0.06	0.69	0.00	0.00
Industrial	23.20	70.30	6.83	20.71	2.64	8.01	0.31	0.94	0.01	0.03
Religion	3.45	69.09	1.17	23.45	0.35	6.91	0.03	0.55	0.00	0.00
Residential	717.00	61.97	329.28	28.46	100.36	8.67	6.80	0.59	3.56	0.31
Total	**854.32**		**368.84**		**117.99**		**12.17**		**3.68**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	14	61.13	6	24.07	3	14.35	0	0.45	0	0.00
Masonry	77	61.18	28	22.42	19	15.34	1	0.94	0	0.11
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	69	68.03	18	17.89	11	10.52	4	3.52	0	0.04
Wood	711	64.27	320	28.90	65	5.90	7	0.60	4	0.33

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

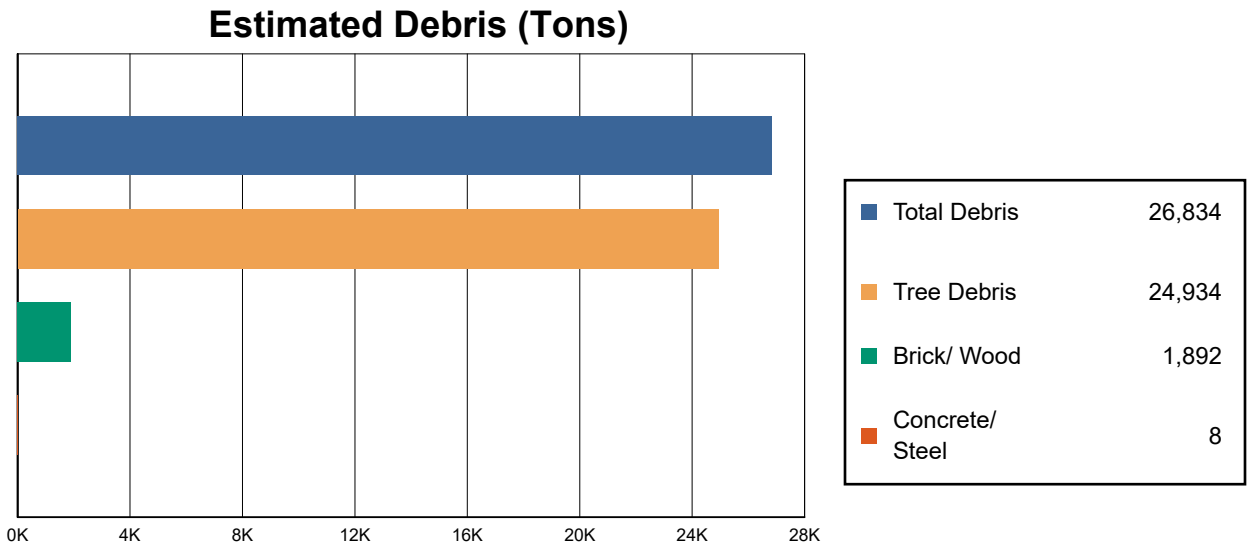
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	2	0	0	0

Induced Hurricane Damage

Debris Generation

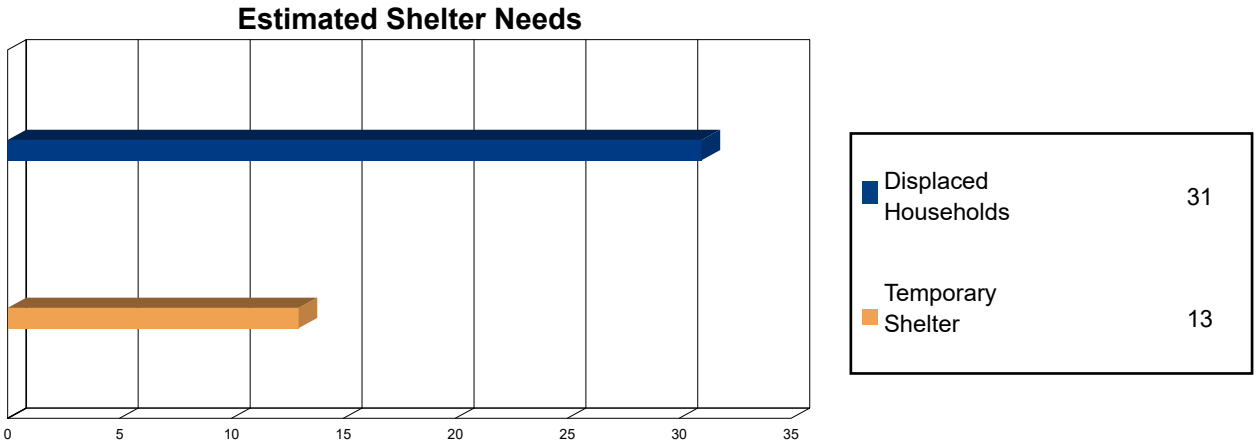


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 26,834 tons of debris will be generated. Of the total amount, 20,446 tons (76%) is Other Tree Debris. Of the remaining 6,388 tons, Brick/Wood comprises 30% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 76 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,488 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 31 households to be displaced due to the hurricane. Of these, 13 people (out of a total population of 4,858) will seek temporary shelter in public shelters.

Economic Loss

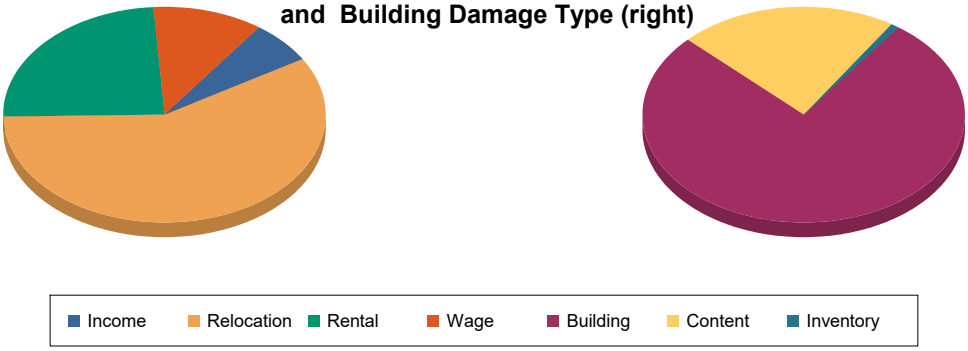
The total economic loss estimated for the hurricane is 30.6 million dollars, which represents 3.73 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 31 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 81% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

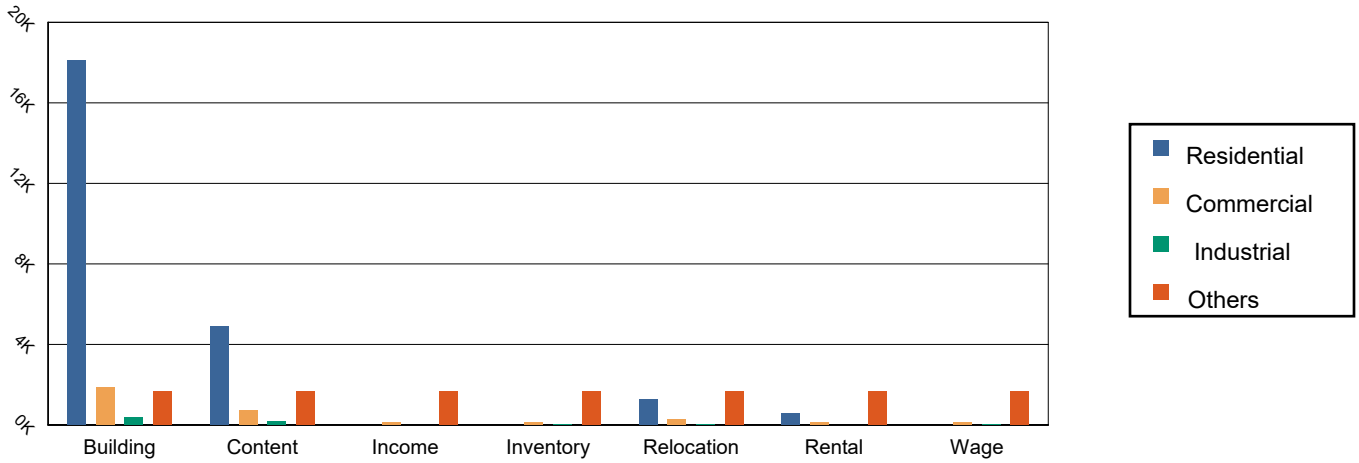


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	18,114.95	1,883.31	388.73	936.23	21,323.22
	Content	4,890.32	719.42	159.84	287.88	6,057.46
	Inventory	0.00	143.01	22.61	60.00	225.62
	Subtotal	**23,005.27**	**2,745.75**	**571.18**	**1,284.10**	**27,606.30**
Business Interruption Loss						
	Income	0.00	130.06	4.14	57.37	191.57
	Relocation	1,264.61	284.78	33.61	159.53	1,742.53
	Rental	584.02	127.94	3.43	9.65	725.05
	Wage	0.01	148.28	7.22	176.93	332.43
	Subtotal	**1,848.64**	**691.06**	**48.40**	**403.48**	**2,991.58**

Total

Total	24,853.91	3,436.81	619.58	1,687.58	30,597.88

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	4,858	570,437	249,961	820,398
Total	**4,858**	**570,437**	**249,961**	**820,398**
Study Region Total	**4,858**	**570,437**	**249,961**	**820,398**

Hazus: Hurricane Global Risk Report

Region Name:	Canton_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 25.02 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 10,124 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,156 million dollars. Approximately 84% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,901 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

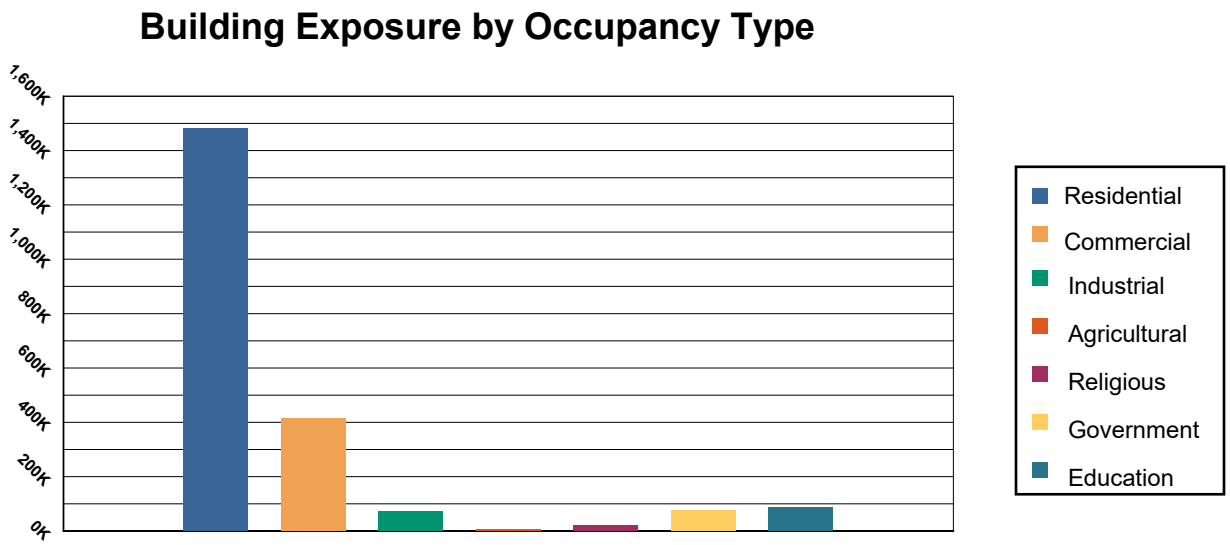


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,481,277	68.70%
Commercial	415,365	19.26%
Industrial	72,269	3.35%
Agricultural	5,107	0.24%
Religious	19,257	0.89%
Government	76,045	3.53%
Education	86,744	4.02%
Total	**2,156,064**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

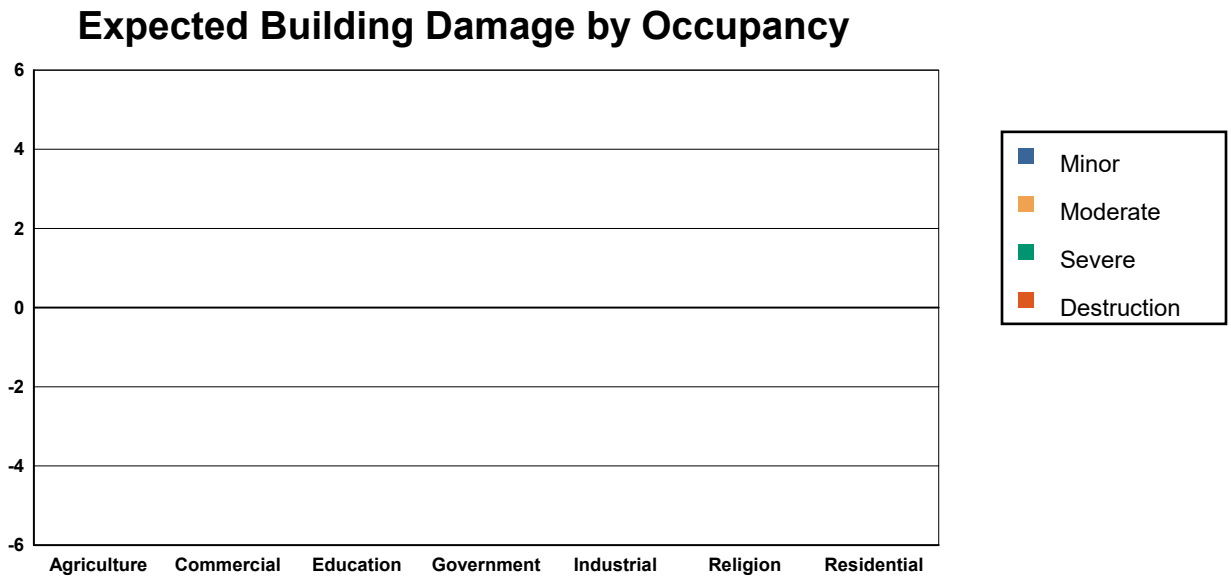


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	13.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	398.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	13.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	85.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	94.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	20.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	3,278.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**3,901.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	69	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	370	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	298	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	3,166	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

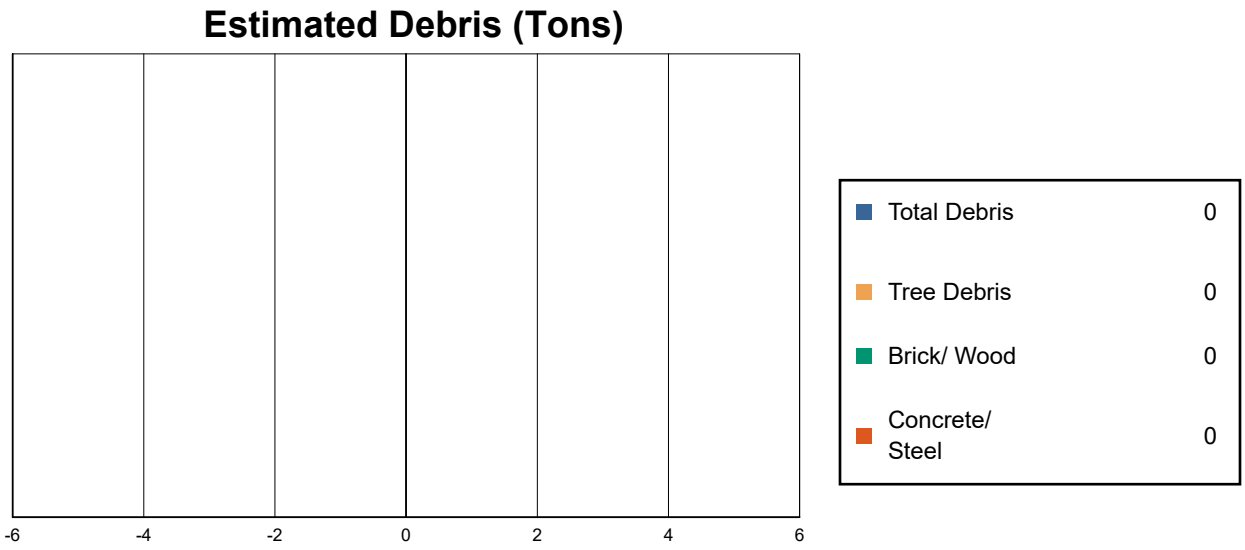
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

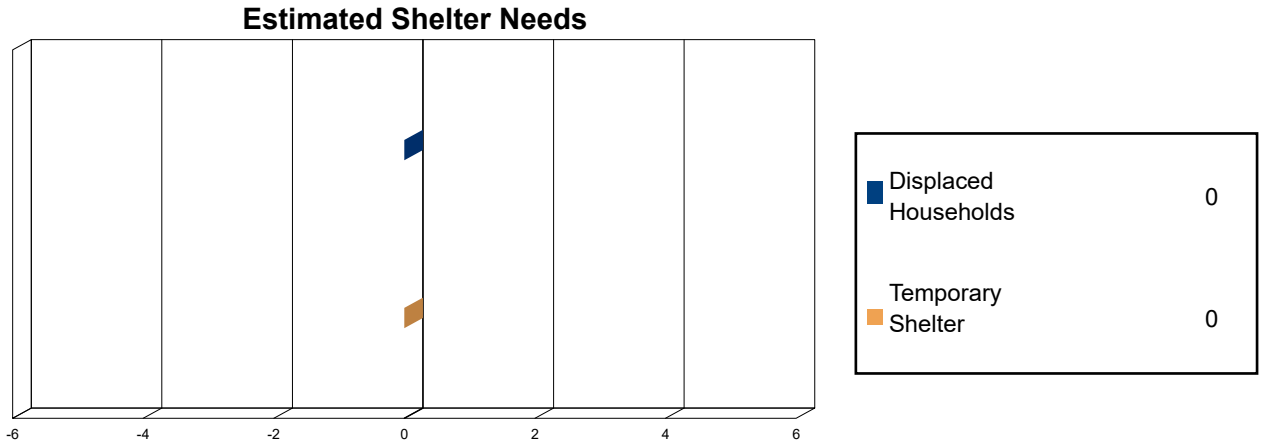


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,124) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

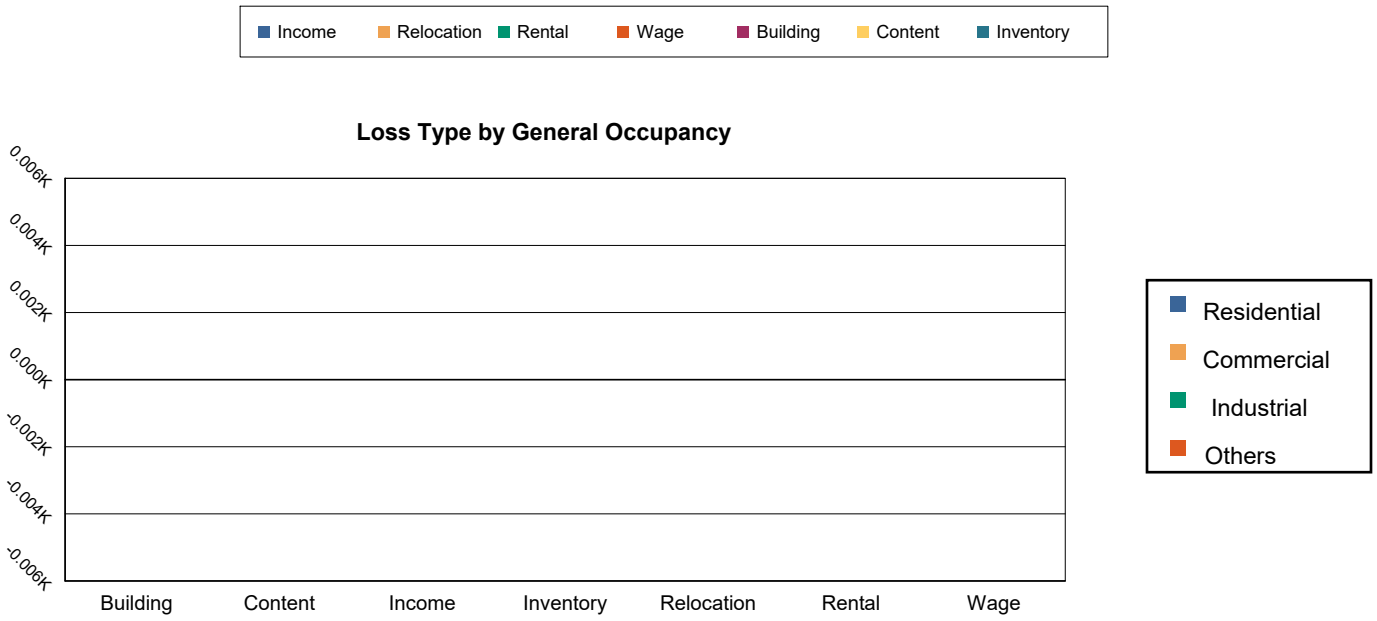


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,277	674,787	2,156,064
Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**
Study Region Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**

Hazus: Hurricane Global Risk Report

Region Name:	Canton_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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Note:
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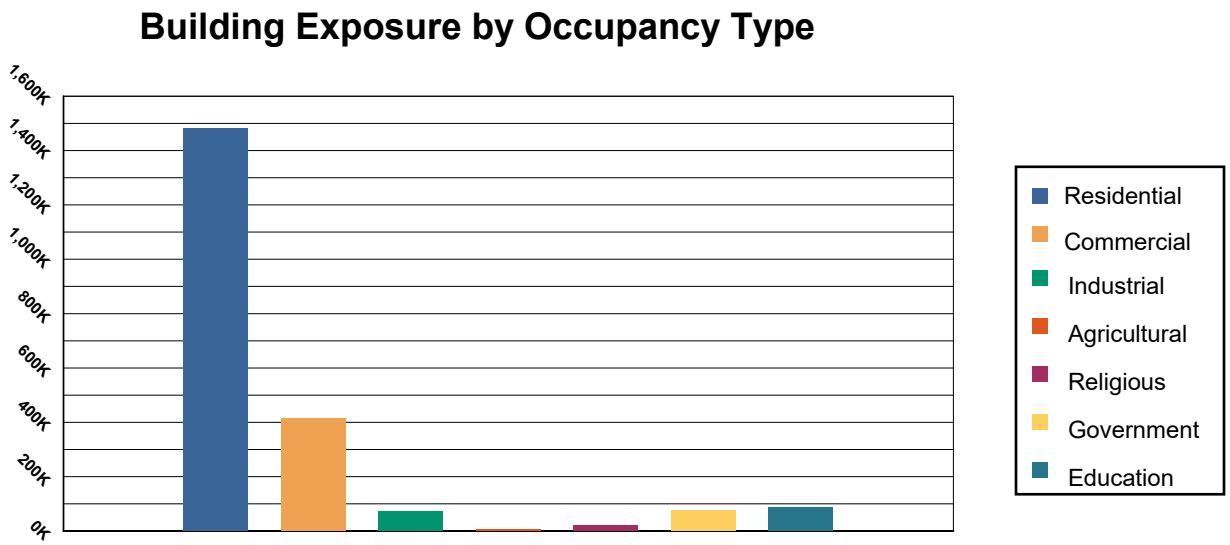

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
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Industrial	72,269	3.35%
Agricultural	5,107	0.24%
Religious	19,257	0.89%
Government	76,045	3.53%
Education	86,744	4.02%
Total	**2,156,064**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

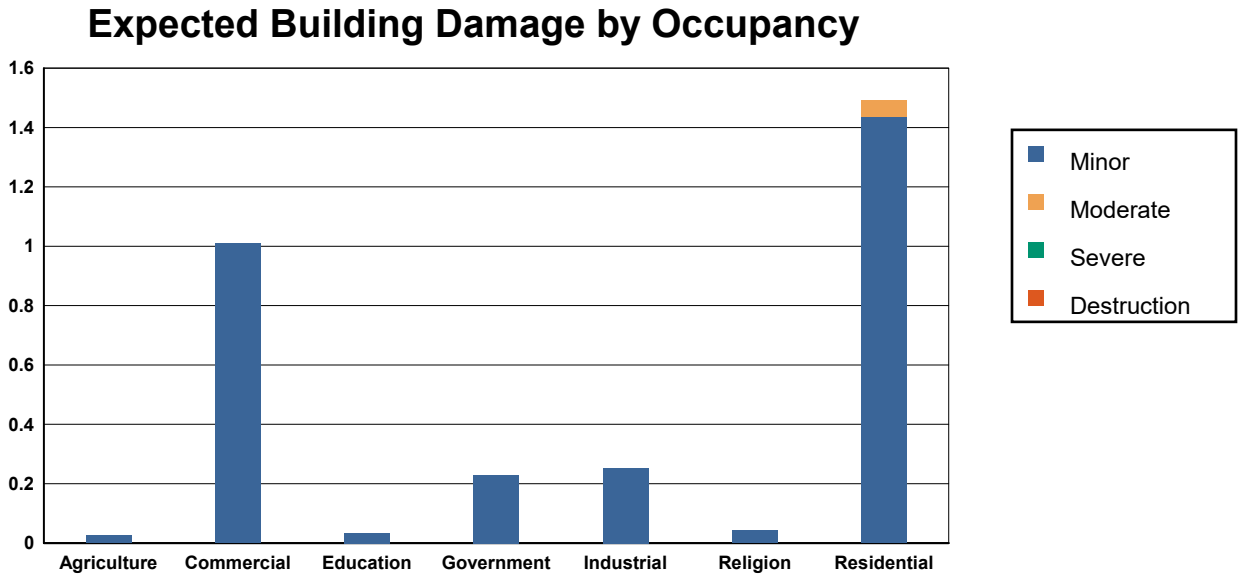


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	12.98	99.81	0.02	0.19	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	396.99	99.75	1.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Education	12.97	99.74	0.03	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Government	84.77	99.73	0.23	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	93.75	99.73	0.25	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Religion	19.96	99.79	0.04	0.21	0.00	0.00	0.00	0.00	0.00	0.00
Residential	3,276.51	99.95	1.44	0.04	0.06	0.00	0.00	0.00	0.00	0.00
Total	**3,897.92**		**3.03**		**0.06**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	69	99.68	0	0.32	0	0.00	0	0.00	0	0.00
Masonry	369	99.65	1	0.34	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	297	99.73	1	0.27	0	0.00	0	0.00	0	0.00
Wood	3,165	99.98	0	0.02	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

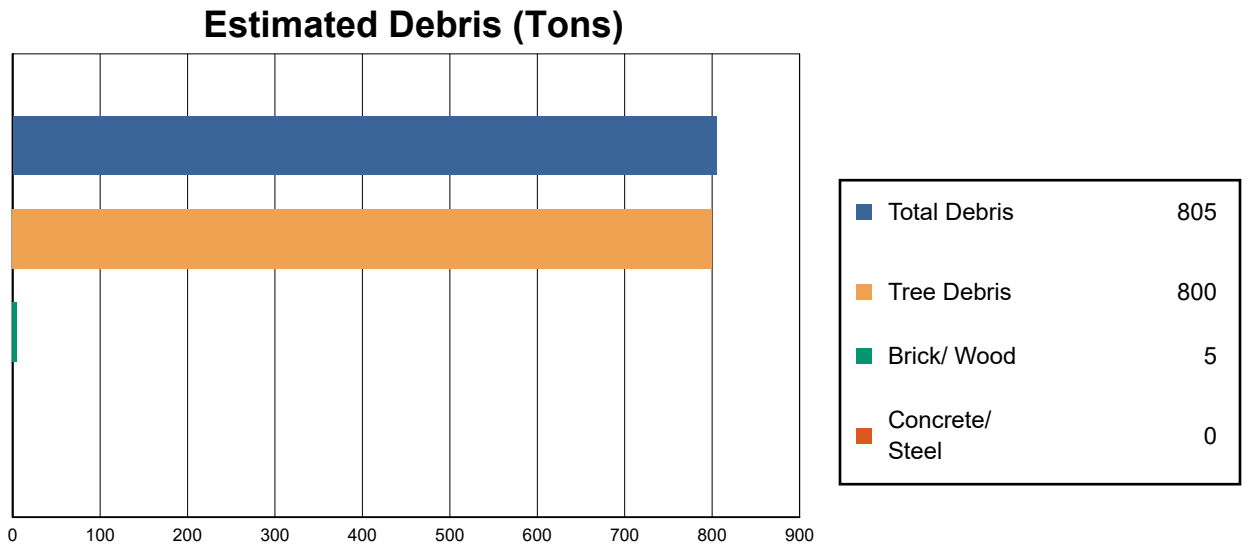
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

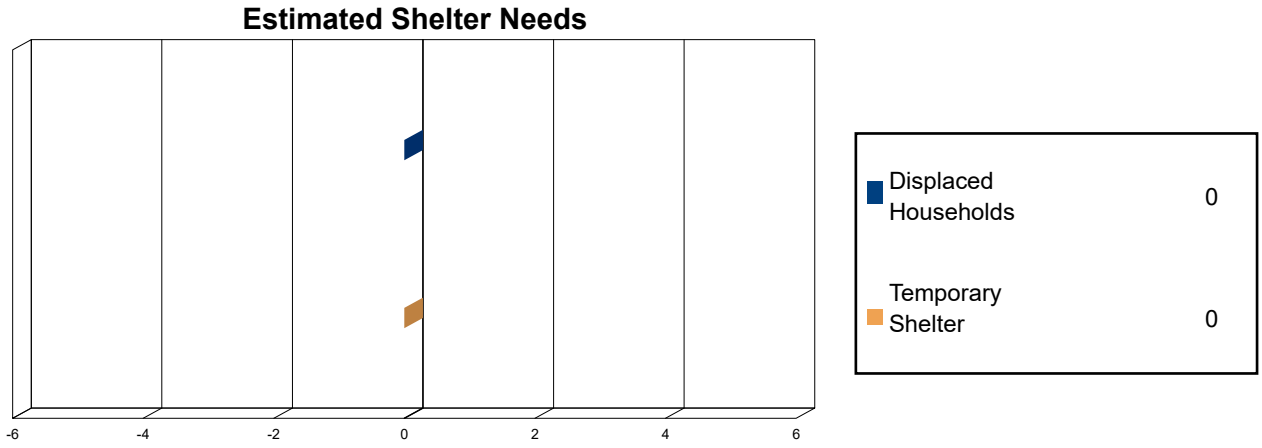


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 805 tons of debris will be generated. Of the total amount, 604 tons (75%) is Other Tree Debris. Of the remaining 201 tons, Brick/Wood comprises 2% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 196 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,124) will seek temporary shelter in public shelters.

Economic Loss

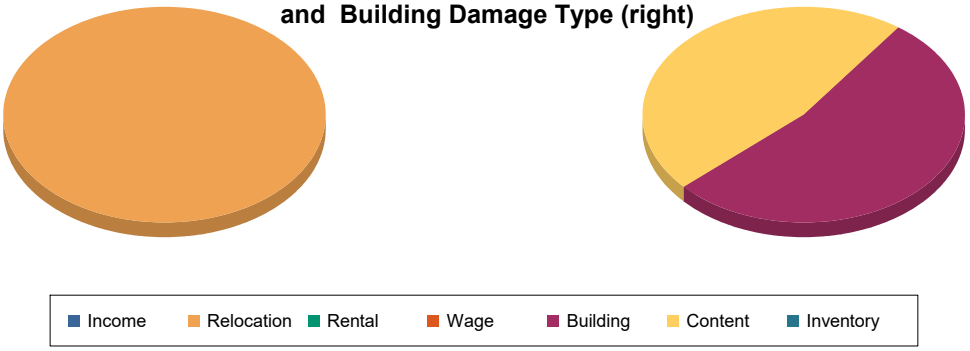
The total economic loss estimated for the hurricane is 1.0 million dollars, which represents 0.05 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	535.48	0.00	0.00	0.00	535.48
	Content	470.99	0.00	0.00	0.00	470.99
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,006.47**	**0.00**	**0.00**	**0.00**	**1,006.47**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.15	0.00	0.00	0.00	0.15
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.15**	**0.00**	**0.00**	**0.00**	**0.15**

Total

Total	**1,006.62**	**0.00**	**0.00**	**0.00**	**1,006.62**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,277	674,787	2,156,064
Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**
Study Region Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**

Hazus: Hurricane Global Risk Report

Region Name:	Canton_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 25.02 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 10,124 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,156 million dollars. Approximately 84% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,901 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

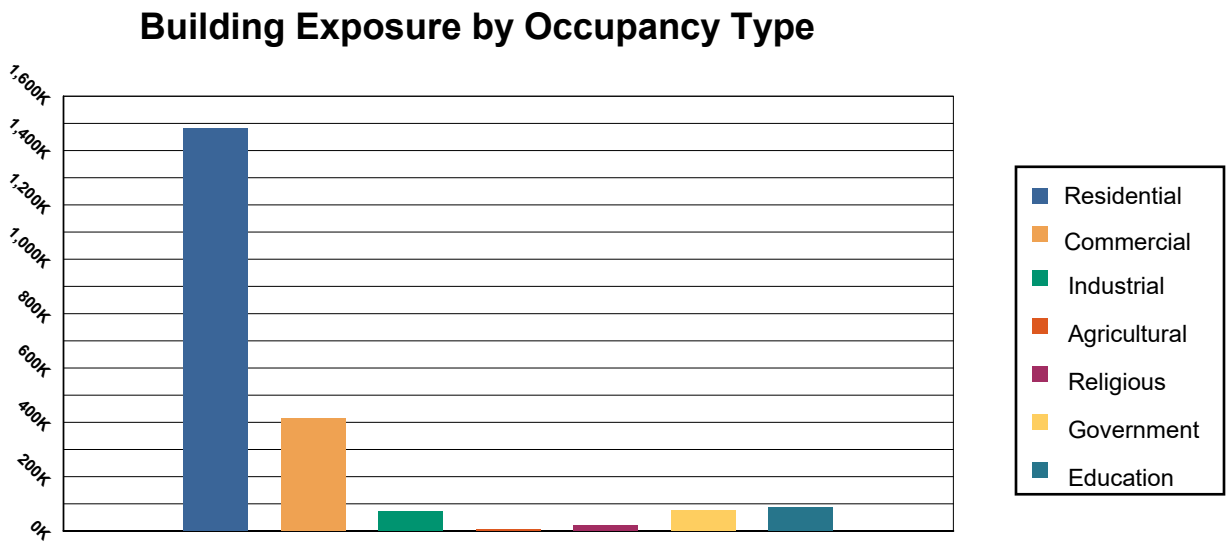


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,481,277	68.70%
Commercial	415,365	19.26%
Industrial	72,269	3.35%
Agricultural	5,107	0.24%
Religious	19,257	0.89%
Government	76,045	3.53%
Education	86,744	4.02%
Total	**2,156,064**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

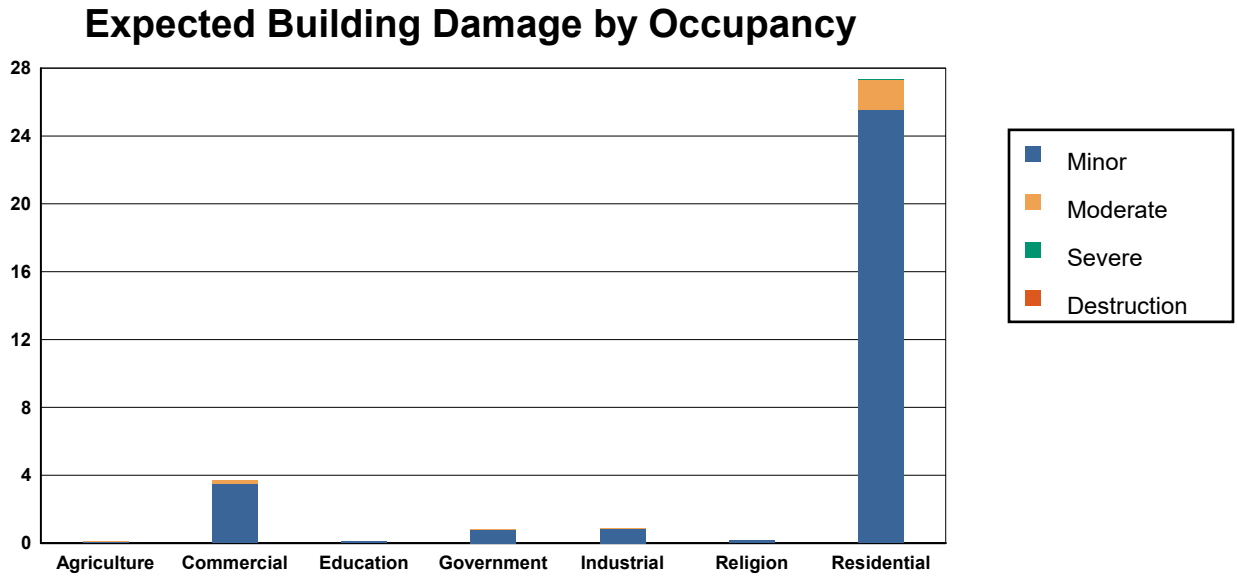


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	12.89	99.15	0.10	0.80	0.01	0.04	0.00	0.01	0.00	0.00
Commercial	394.29	99.07	3.51	0.88	0.20	0.05	0.00	0.00	0.00	0.00
Education	12.89	99.12	0.11	0.87	0.00	0.01	0.00	0.00	0.00	0.00
Government	84.21	99.07	0.78	0.92	0.01	0.01	0.00	0.00	0.00	0.00
Industrial	93.15	99.09	0.84	0.89	0.02	0.02	0.00	0.00	0.00	0.00
Religion	19.85	99.25	0.15	0.74	0.00	0.02	0.00	0.00	0.00	0.00
Residential	3,250.66	99.17	25.56	0.78	1.73	0.05	0.05	0.00	0.00	0.00
Total	**3,867.94**		**31.05**		**1.96**		**0.05**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	68	98.91	1	1.09	0	0.00	0	0.00	0	0.00
Masonry	364	98.26	6	1.52	1	0.21	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	295	99.06	3	0.90	0	0.04	0	0.00	0	0.00
Wood	3,145	99.35	20	0.63	1	0.02	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

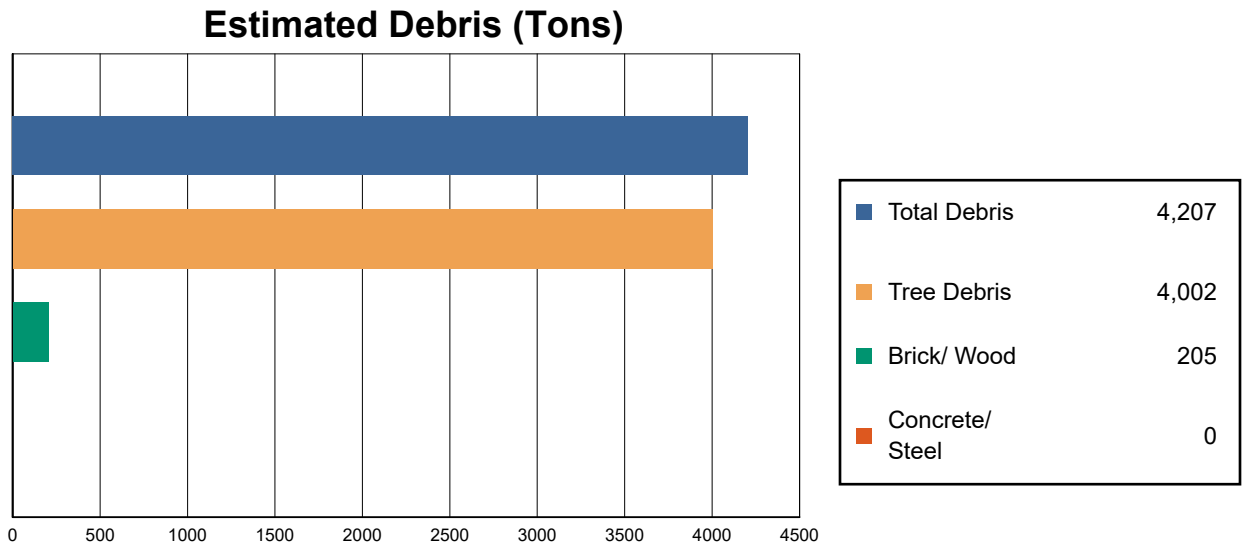
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

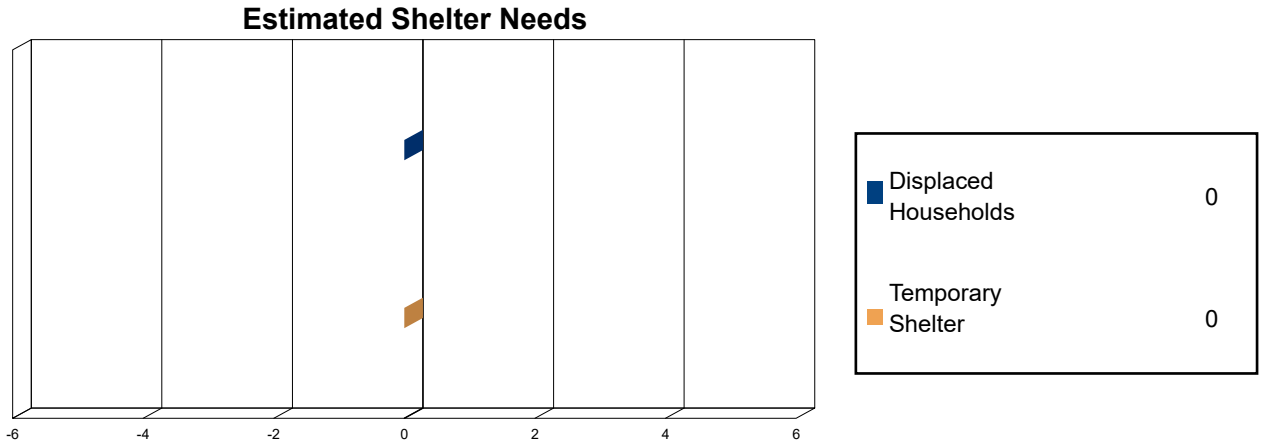


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 4,207 tons of debris will be generated. Of the total amount, 3,023 tons (72%) is Other Tree Debris. Of the remaining 1,184 tons, Brick/Wood comprises 17% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 8 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 979 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,124) will seek temporary shelter in public shelters.

Economic Loss

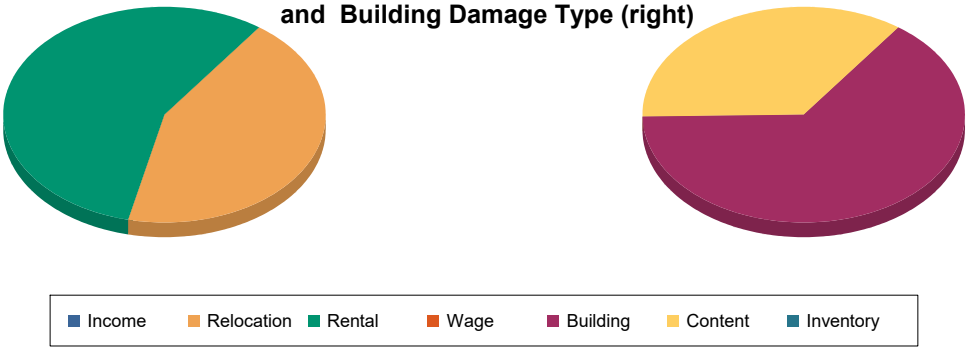
The total economic loss estimated for the hurricane is 7.5 million dollars, which represents 0.35 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 7 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

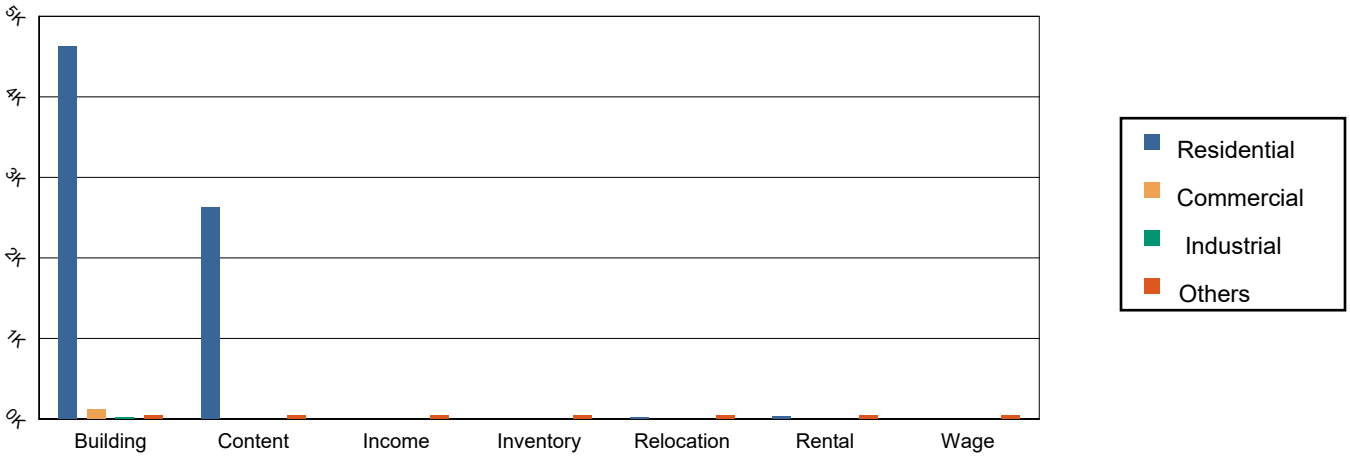


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	4,622.01	124.44	14.63	44.48	4,805.56
	Content	2,624.16	0.00	0.00	0.00	2,624.16
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**7,246.16**	**124.44**	**14.63**	**44.48**	**7,429.71**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	19.83	1.40	0.07	0.13	21.44
	Rental	27.87	0.00	0.00	0.00	27.87
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**47.71**	**1.40**	**0.07**	**0.13**	**49.31**

Total

Total	**7,293.87**	**125.84**	**14.70**	**44.61**	**7,479.03**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,277	674,787	2,156,064
Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**
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Hazus: Hurricane Global Risk Report

Region Name:	Canton_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Monday, May 8, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
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Induced Hurricane Damage	8
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Shelter Requirements	
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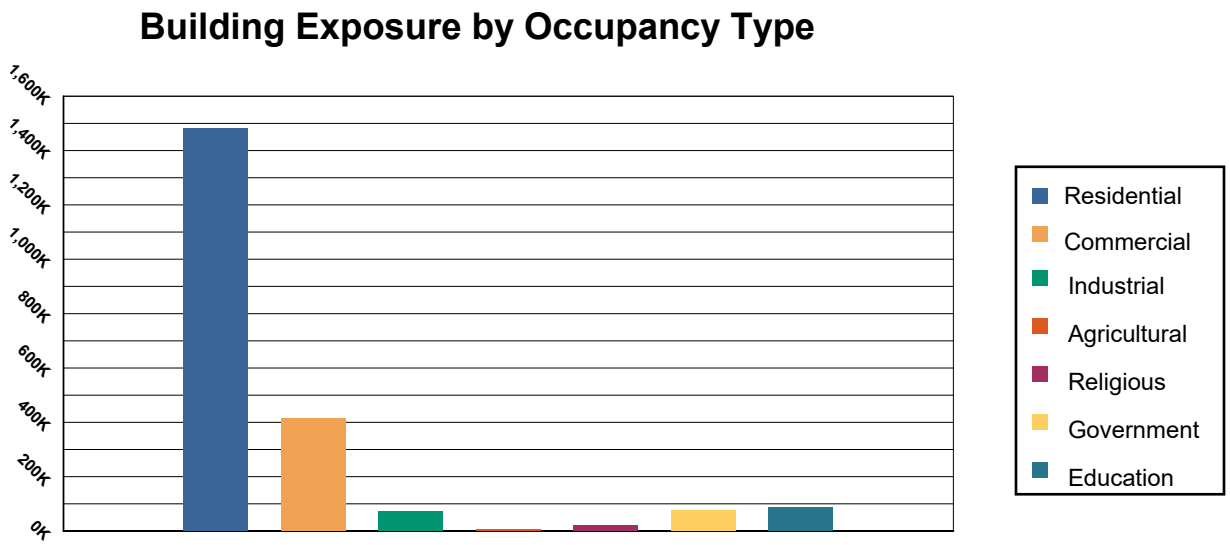

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Total	**2,156,064**	**100.00%**

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For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

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Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

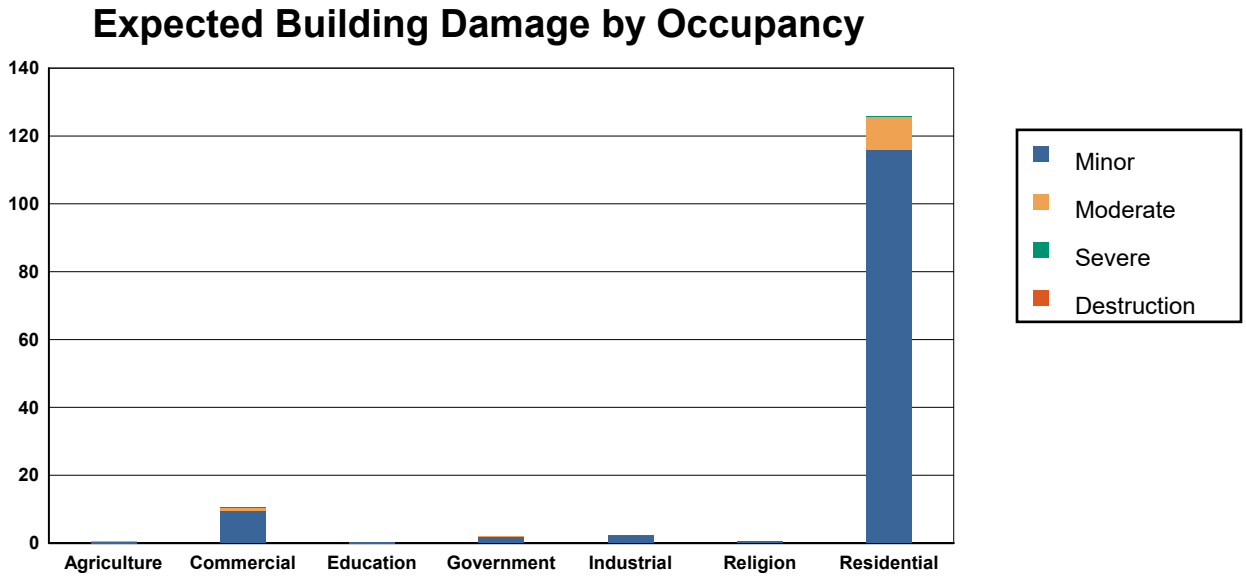


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	12.57	96.71	0.36	2.78	0.05	0.38	0.02	0.13	0.00	0.00
Commercial	387.35	97.32	9.56	2.40	1.03	0.26	0.07	0.02	0.00	0.00
Education	12.69	97.65	0.30	2.29	0.01	0.06	0.00	0.00	0.00	0.00
Government	82.98	97.63	1.97	2.32	0.05	0.06	0.00	0.00	0.00	0.00
Industrial	91.64	97.48	2.20	2.34	0.13	0.14	0.03	0.03	0.00	0.00
Religion	19.53	97.66	0.45	2.27	0.01	0.07	0.00	0.01	0.00	0.00
Residential	3,152.29	96.17	115.92	3.54	9.65	0.29	0.14	0.00	0.00	0.00
Total	**3,759.05**		**130.76**		**10.93**		**0.25**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	67	97.25	2	2.66	0	0.08	0	0.00	0	0.00
Masonry	352	95.27	14	3.74	4	0.97	0	0.02	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	291	97.54	7	2.21	1	0.23	0	0.02	0	0.00
Wood	3,057	96.56	105	3.30	4	0.13	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

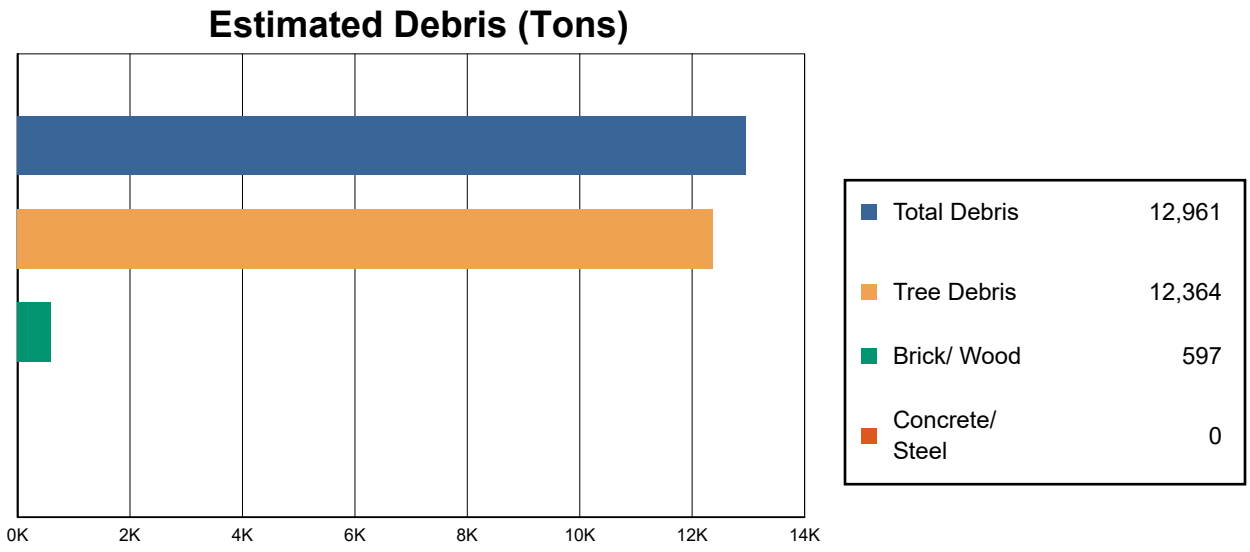
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

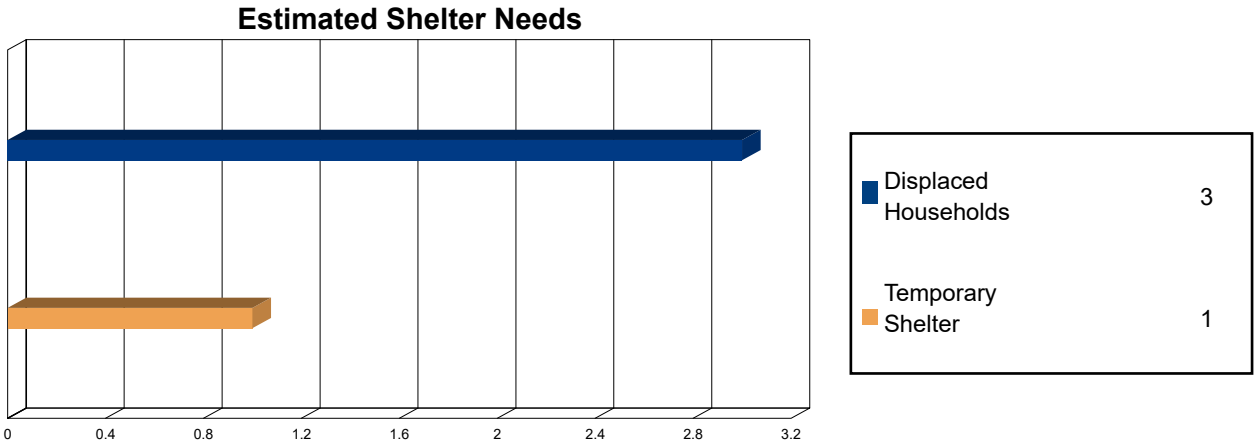


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 12,961 tons of debris will be generated. Of the total amount, 9,504 tons (73%) is Other Tree Debris. Of the remaining 3,457 tons, Brick/Wood comprises 17% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 24 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,860 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 3 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 10,124) will seek temporary shelter in public shelters.

Economic Loss

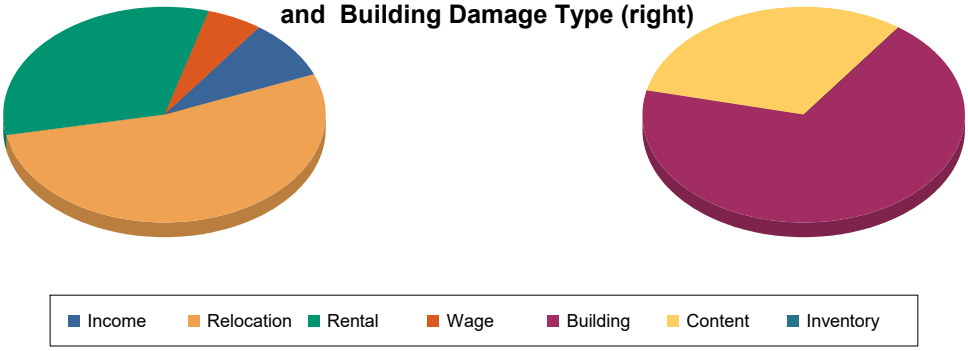
The total economic loss estimated for the hurricane is 16.3 million dollars, which represents 0.75 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 16 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

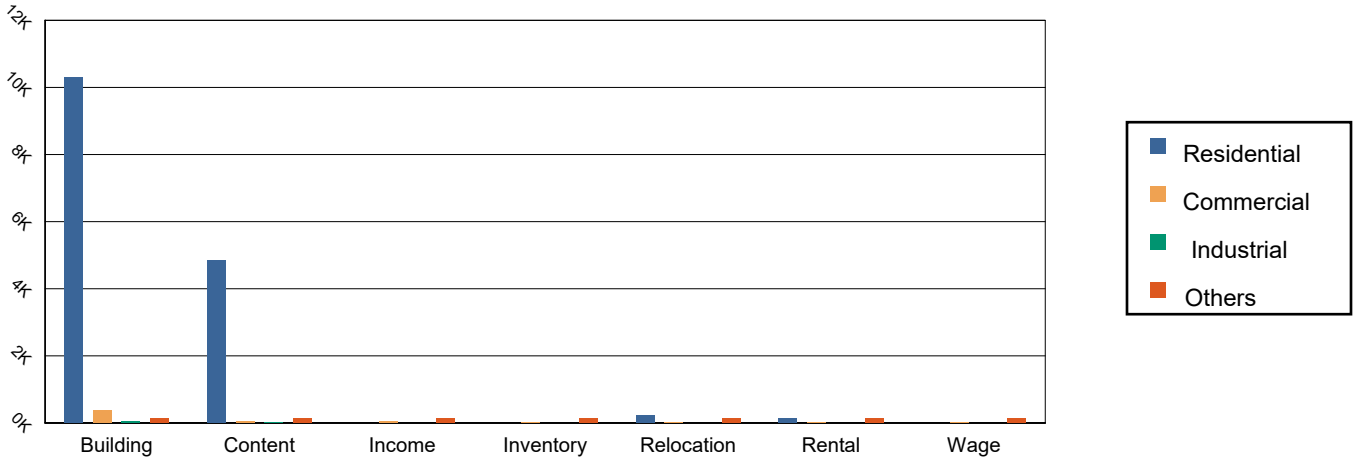


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	10,306.40	369.04	44.83	113.92	10,834.19
	Content	4,857.23	53.82	9.74	3.38	4,924.17
	Inventory	0.00	8.34	1.14	1.07	10.56
	Subtotal	**15,163.63**	**431.21**	**55.71**	**118.37**	**15,768.92**
Business Interruption Loss						
	Income	0.00	38.67	0.25	5.57	44.49
	Relocation	228.84	27.27	1.01	4.21	261.33
	Rental	143.62	16.04	0.17	0.38	160.21
	Wage	0.00	13.74	0.41	13.12	27.28
	Subtotal	**372.46**	**95.73**	**1.84**	**23.28**	**493.31**

Total

Total	**15,536.09**	**526.94**	**57.55**	**141.65**	**16,262.23**

Appendix A: County Listing for the Region

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- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,277	674,787	2,156,064
Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**
Study Region Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**

Hazus: Hurricane Global Risk Report

Region Name: Canton_HU

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Monday, May 8, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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General Building Stock

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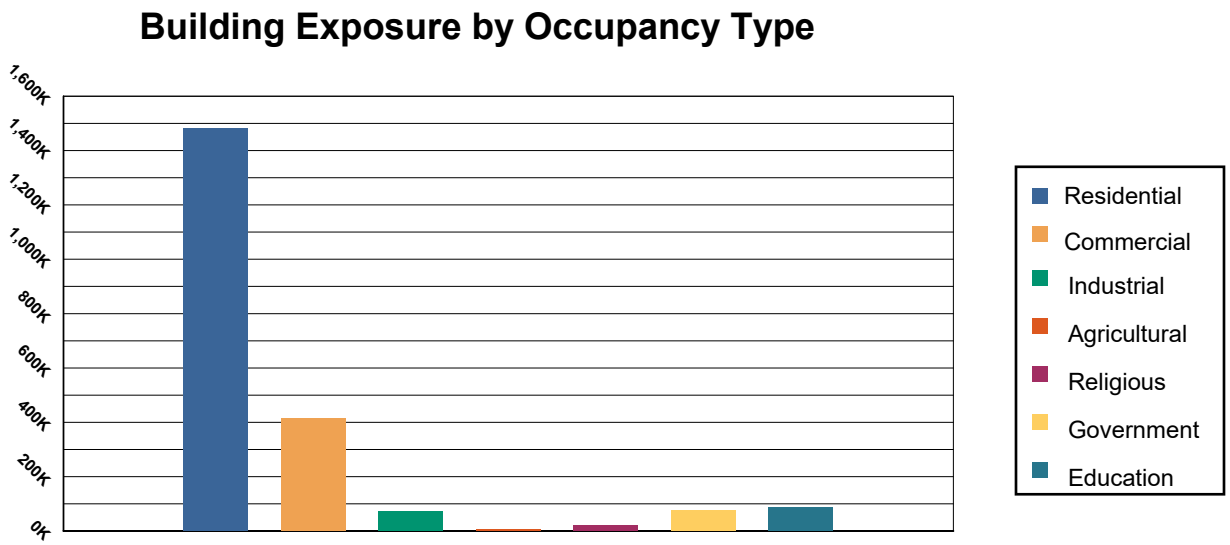


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,481,277	68.70%
Commercial	415,365	19.26%
Industrial	72,269	3.35%
Agricultural	5,107	0.24%
Religious	19,257	0.89%
Government	76,045	3.53%
Education	86,744	4.02%
Total	**2,156,064**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 36 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

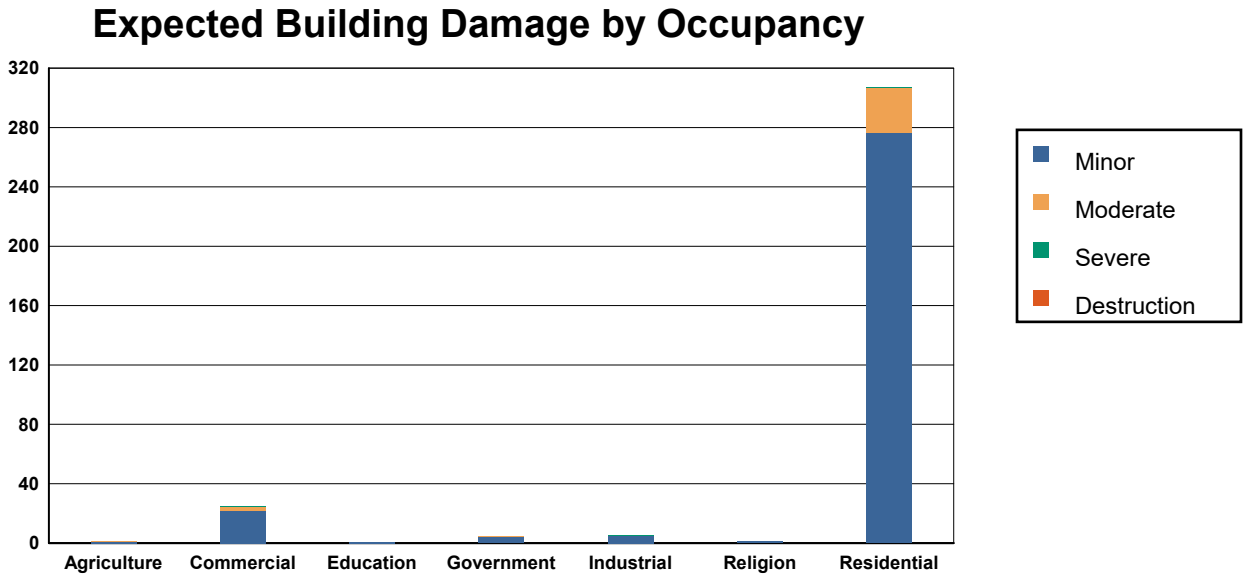


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11.93	91.73	0.84	6.50	0.16	1.21	0.07	0.53	0.00	0.03
Commercial	372.96	93.71	21.56	5.42	3.10	0.78	0.38	0.09	0.00	0.00
Education	12.29	94.51	0.67	5.15	0.04	0.33	0.00	0.01	0.00	0.00
Government	80.35	94.53	4.36	5.12	0.30	0.35	0.00	0.00	0.00	0.00
Industrial	88.52	94.17	4.77	5.08	0.56	0.60	0.14	0.15	0.01	0.01
Religion	18.81	94.03	1.13	5.64	0.06	0.32	0.00	0.02	0.00	0.00
Residential	2,970.45	90.62	276.55	8.44	30.35	0.93	0.65	0.02	0.00	0.00
Total	**3,555.30**		**309.89**		**34.57**		**1.24**		**0.01**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	65	93.87	4	5.64	0	0.50	0	0.00	0	0.00
Masonry	334	90.35	27	7.17	9	2.41	0	0.07	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	281	94.44	14	4.71	2	0.73	0	0.12	0	0.00
Wood	2,887	91.19	261	8.24	18	0.56	0	0.02	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

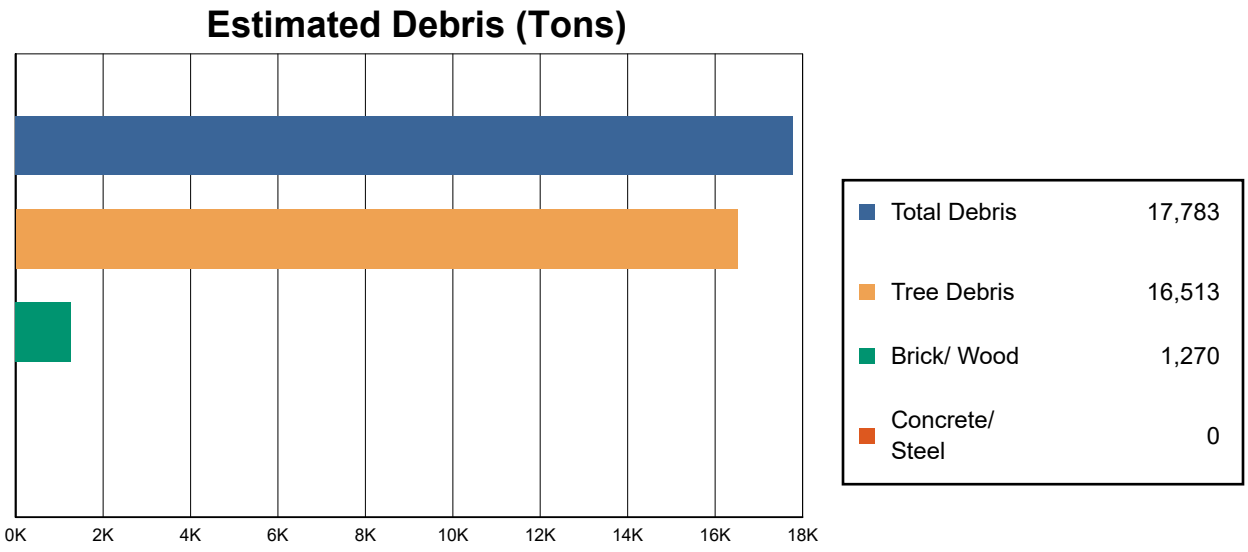
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

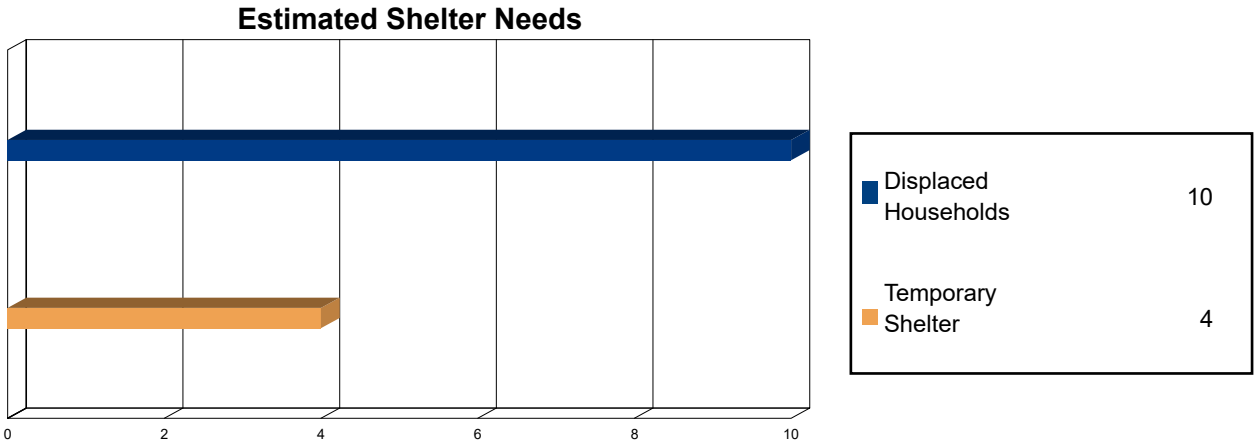


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 17,783 tons of debris will be generated. Of the total amount, 12,583 tons (71%) is Other Tree Debris. Of the remaining 5,200 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 51 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,930 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 10 households to be displaced due to the hurricane. Of these, 4 people (out of a total population of 10,124) will seek temporary shelter in public shelters.

Economic Loss

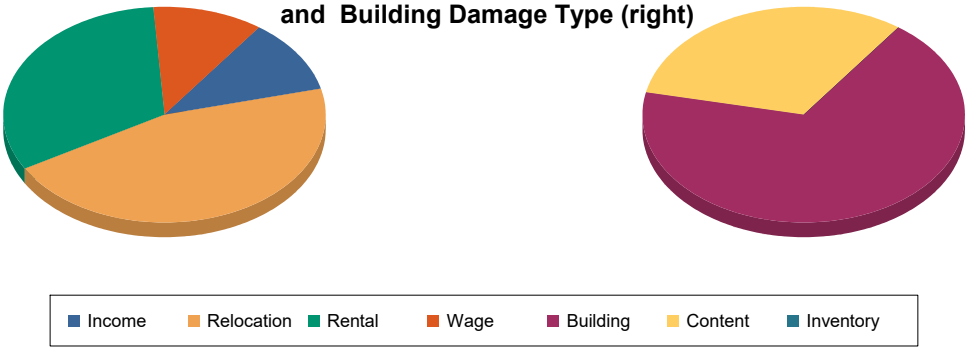
The total economic loss estimated for the hurricane is 29.4 million dollars, which represents 1.36 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 29 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

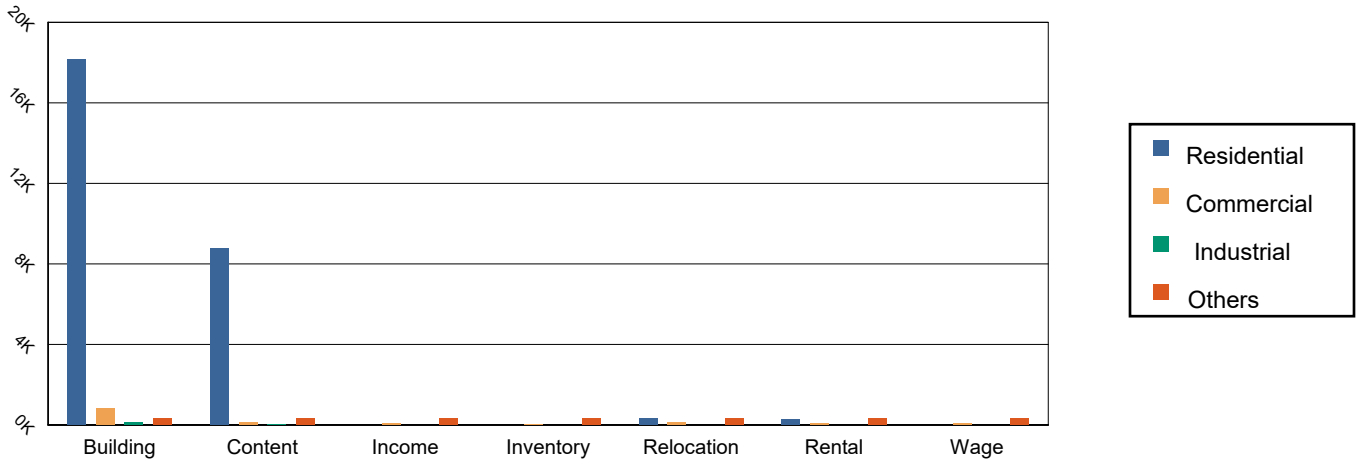


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	18,159.48	837.63	120.71	259.79	19,377.61
	Content	8,780.60	123.95	38.31	19.28	8,962.13
	Inventory	0.00	19.23	4.53	3.55	27.31
	Subtotal	**26,940.07**	**980.81**	**163.54**	**282.62**	**28,367.05**
Business Interruption Loss						
	Income	0.00	100.18	1.12	10.53	111.82
	Relocation	346.41	101.92	5.45	13.03	466.81
	Rental	262.35	61.80	0.93	0.87	325.94
	Wage	0.00	87.56	1.85	24.82	114.23
	Subtotal	**608.75**	**351.45**	**9.34**	**49.24**	**1,018.79**

Total

Total	**27,548.83**	**1,332.26**	**172.89**	**331.86**	**29,385.84**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,277	674,787	2,156,064
Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**
Study Region Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**

Hazus: Hurricane Global Risk Report

Region Name:	Canton_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 25.02 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 10,124 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,156 million dollars. Approximately 84% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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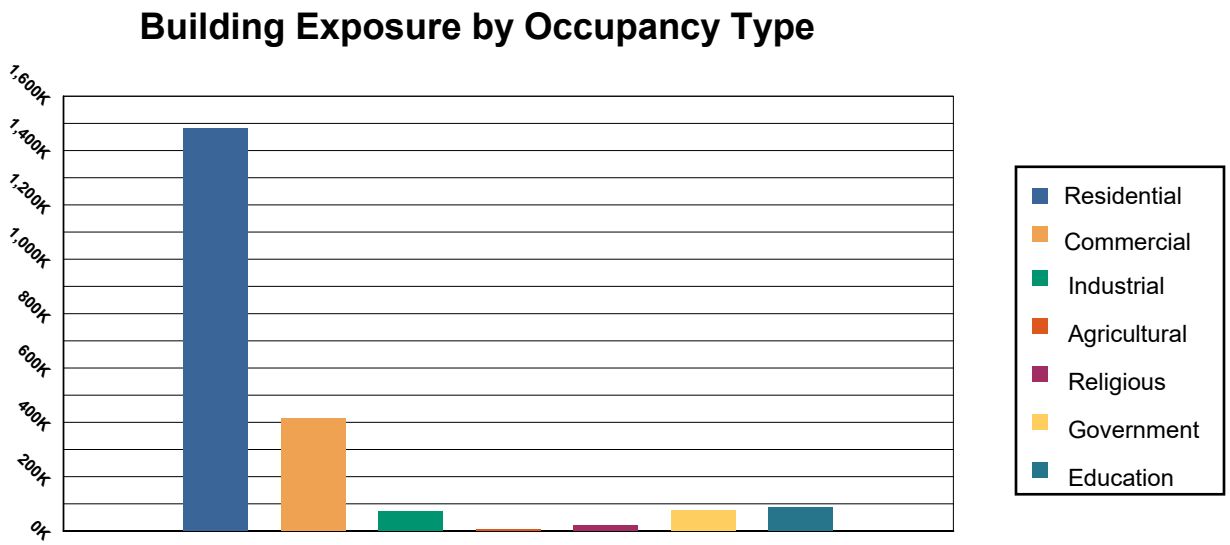

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,481,277	68.70%
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Agricultural	5,107	0.24%
Religious	19,257	0.89%
Government	76,045	3.53%
Education	86,744	4.02%
Total	**2,156,064**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 107 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

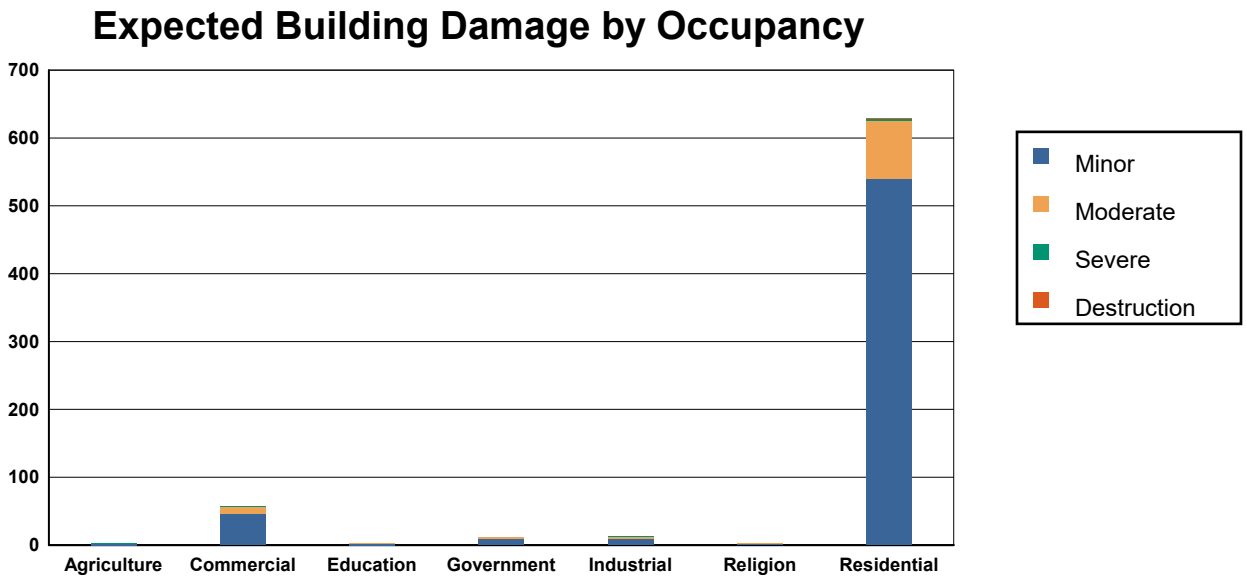


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	10.75	82.70	1.65	12.69	0.39	3.00	0.19	1.47	0.02	0.14
Commercial	340.32	85.51	46.16	11.60	10.06	2.53	1.46	0.37	0.01	0.00
Education	11.29	86.85	1.47	11.32	0.23	1.75	0.01	0.08	0.00	0.00
Government	73.59	86.57	9.71	11.43	1.63	1.92	0.07	0.08	0.00	0.00
Industrial	81.51	86.72	9.89	10.52	2.10	2.23	0.47	0.50	0.03	0.03
Religion	17.11	85.57	2.54	12.69	0.33	1.66	0.02	0.08	0.00	0.00
Residential	2,648.18	80.79	539.96	16.47	85.59	2.61	3.06	0.09	1.22	0.04
Total	**3,182.75**		**611.38**		**100.33**		**5.27**		**1.27**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	59	85.74	8	11.80	2	2.40	0	0.07	0	0.00
Masonry	300	80.99	49	13.18	21	5.58	1	0.22	0	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	259	86.88	30	10.12	7	2.50	1	0.50	0	0.00
Wood	2,580	81.51	522	16.48	60	1.90	3	0.09	1	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

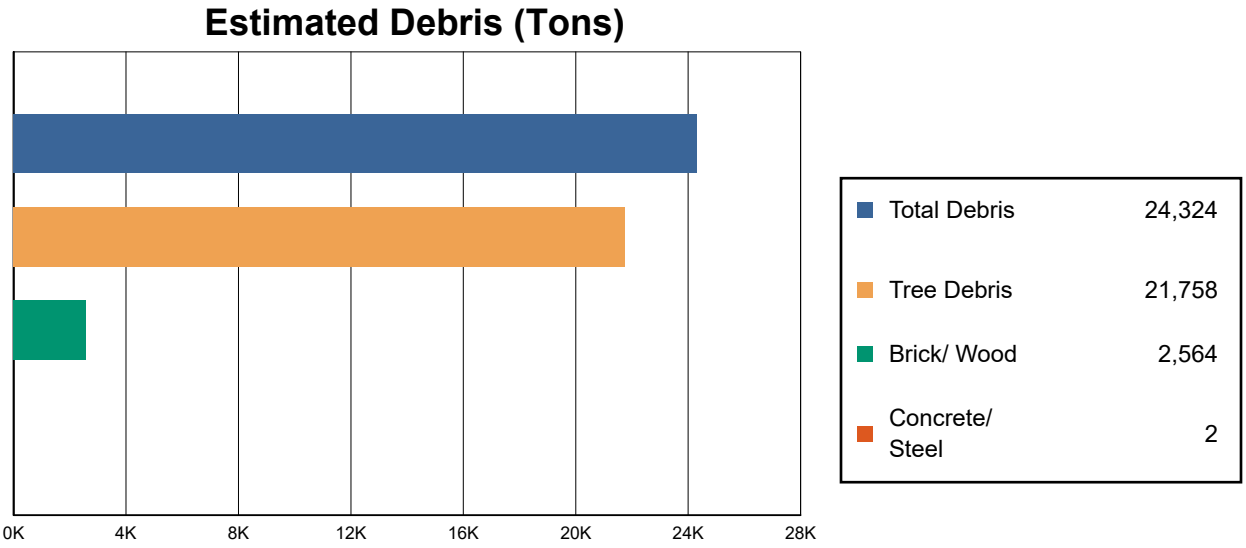
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

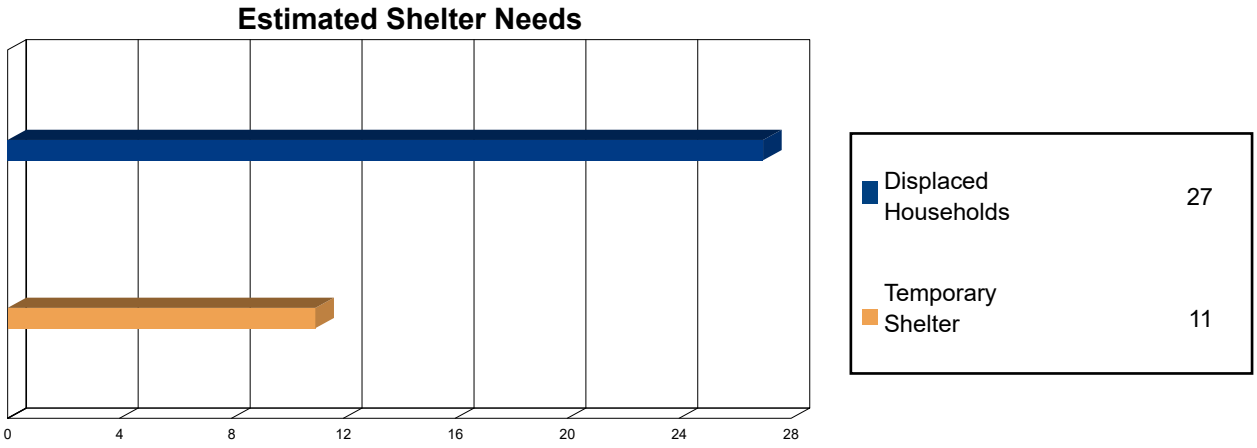


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 24,324 tons of debris will be generated. Of the total amount, 16,378 tons (67%) is Other Tree Debris. Of the remaining 7,946 tons, Brick/Wood comprises 32% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 103 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,380 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 27 households to be displaced due to the hurricane. Of these, 11 people (out of a total population of 10,124) will seek temporary shelter in public shelters.

Economic Loss

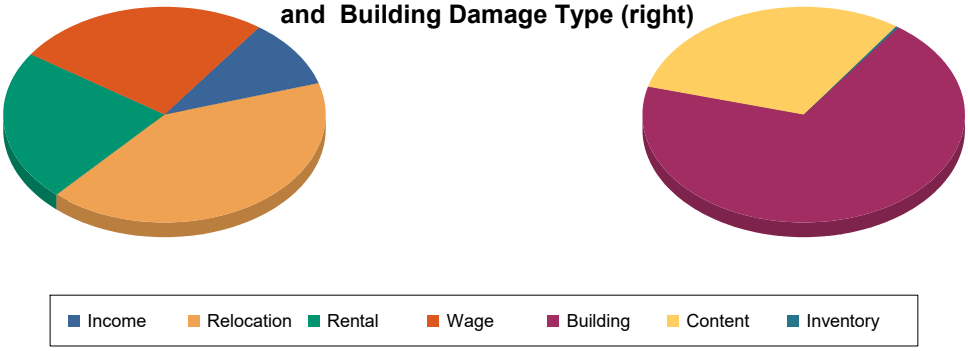
The total economic loss estimated for the hurricane is 51.8 million dollars, which represents 2.40 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 52 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 89% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

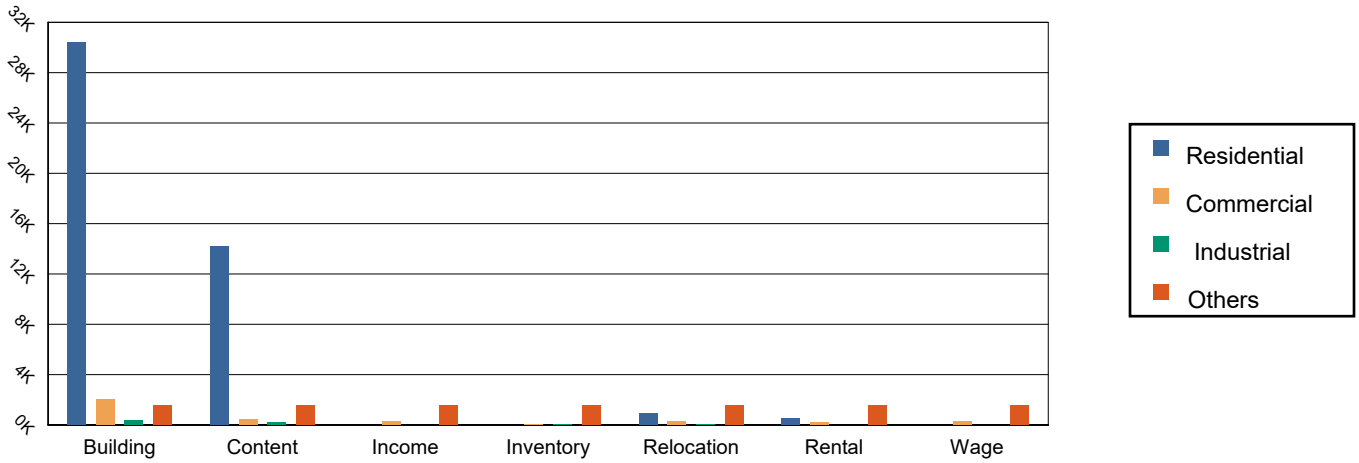


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	30,433.10	2,057.62	344.81	712.39	33,547.92
	Content	14,215.64	423.91	164.06	127.67	14,931.28
	Inventory	0.00	72.83	18.94	12.38	104.16
	Subtotal	**44,648.74**	**2,554.36**	**527.82**	**852.45**	**48,583.36**
Business Interruption Loss						
	Income	0.00	269.84	4.23	58.55	332.62
	Relocation	907.74	297.26	22.33	112.49	1,339.82
	Rental	551.44	172.71	3.18	16.89	744.22
	Wage	0.00	267.42	7.03	552.68	827.14
	Subtotal	**1,459.18**	**1,007.24**	**36.77**	**740.61**	**3,243.80**

Total

Total	**46,107.92**	**3,561.60**	**564.59**	**1,593.05**	**51,827.16**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,277	674,787	2,156,064
Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**
Study Region Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**

Hazus: Hurricane Global Risk Report

Region Name:	Canton_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 25.02 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 10,124 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,156 million dollars. Approximately 84% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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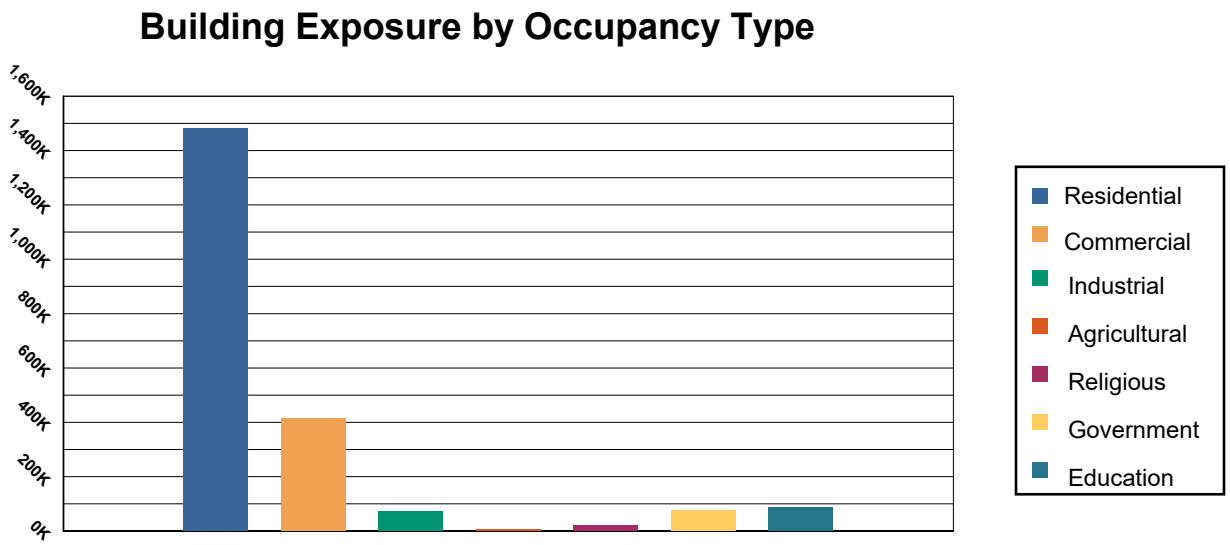

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Religious	19,257	0.89%
Government	76,045	3.53%
Education	86,744	4.02%
Total	**2,156,064**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 197 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

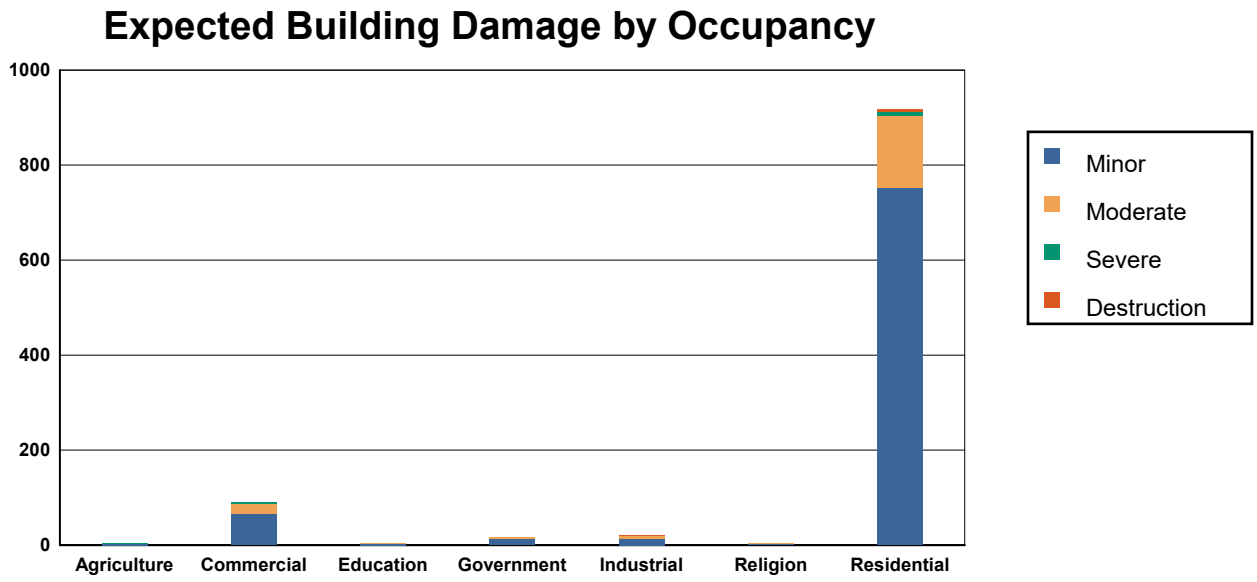


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.53	73.31	2.40	18.49	0.69	5.31	0.33	2.55	0.04	0.34
Commercial	308.71	77.57	66.75	16.77	19.70	4.95	2.82	0.71	0.02	0.00
Education	10.30	79.20	2.15	16.57	0.52	4.03	0.03	0.21	0.00	0.00
Government	67.20	79.05	13.98	16.44	3.64	4.28	0.19	0.22	0.00	0.00
Industrial	74.05	78.78	14.56	15.49	4.40	4.68	0.91	0.97	0.07	0.08
Religion	15.55	77.73	3.67	18.37	0.74	3.69	0.04	0.21	0.00	0.00
Residential	2,361.88	72.05	753.42	22.98	150.06	4.58	8.49	0.26	4.14	0.13
Total	**2,847.22**		**856.94**		**179.75**		**12.82**		**4.28**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	54	77.69	12	16.86	4	5.25	0	0.20	0	0.00
Masonry	269	72.81	66	17.96	32	8.73	2	0.46	0	0.05
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	236	79.21	44	14.81	15	4.99	3	0.98	0	0.01
Wood	2,304	72.79	734	23.19	115	3.65	8	0.25	4	0.12

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

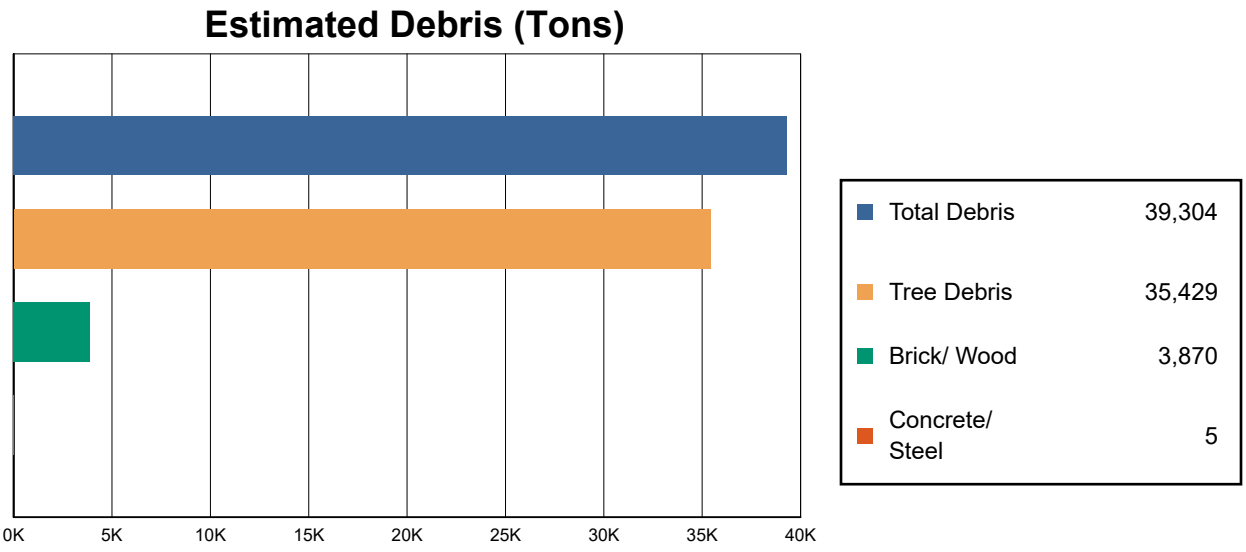
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

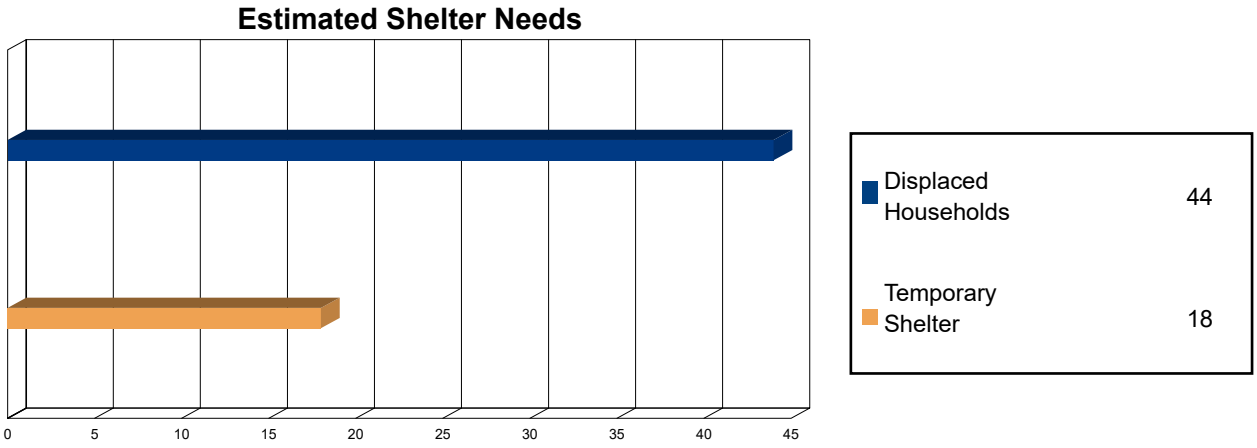


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 39,304 tons of debris will be generated. Of the total amount, 26,981 tons (69%) is Other Tree Debris. Of the remaining 12,323 tons, Brick/Wood comprises 31% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 155 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 8,448 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 44 households to be displaced due to the hurricane. Of these, 18 people (out of a total population of 10,124) will seek temporary shelter in public shelters.

Economic Loss

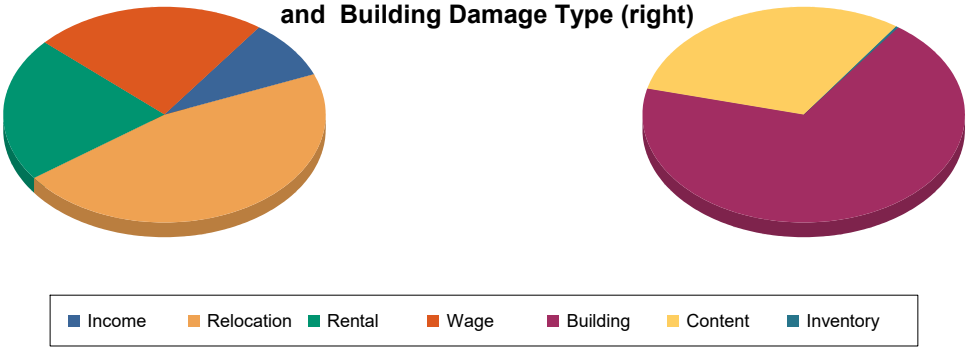
The total economic loss estimated for the hurricane is 77.2 million dollars, which represents 3.58 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 77 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

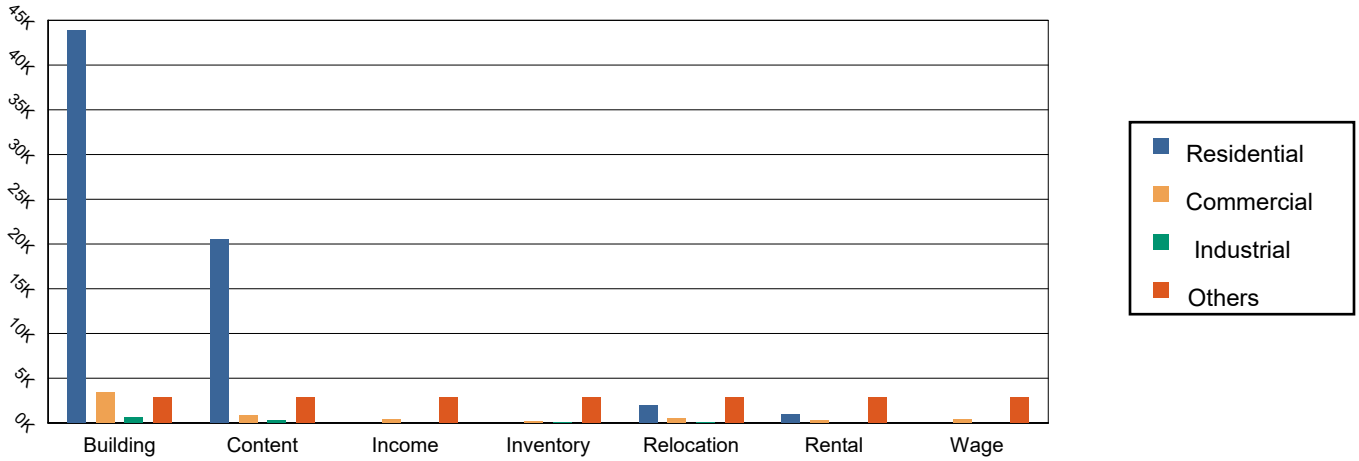


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	43,904.79	3,391.45	627.39	1,232.06	49,155.69
	Content	20,473.14	805.29	333.83	281.05	21,893.31
	Inventory	0.00	147.89	38.61	25.09	211.59
	Subtotal	**64,377.94**	**4,344.63**	**999.84**	**1,538.19**	**71,260.60**
Business Interruption Loss						
	Income	0.00	419.96	7.32	97.55	524.84
	Relocation	1,933.85	556.51	45.93	224.48	2,760.77
	Rental	939.24	318.27	6.18	33.38	1,297.07
	Wage	0.00	424.02	12.11	965.50	1,401.63
	Subtotal	**2,873.08**	**1,718.76**	**71.55**	**1,320.92**	**5,984.31**

Total

Total	**67,251.02**	**6,063.40**	**1,071.39**	**2,859.11**	**77,244.91**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,124	1,481,277	674,787	2,156,064
Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**
Study Region Total	**10,124**	**1,481,277**	**674,787**	**2,156,064**

Hazus: Hurricane Global Risk Report

Region Name:	Columbia_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.00 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 5,272 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,082 million dollars. Approximately 92% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,447 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

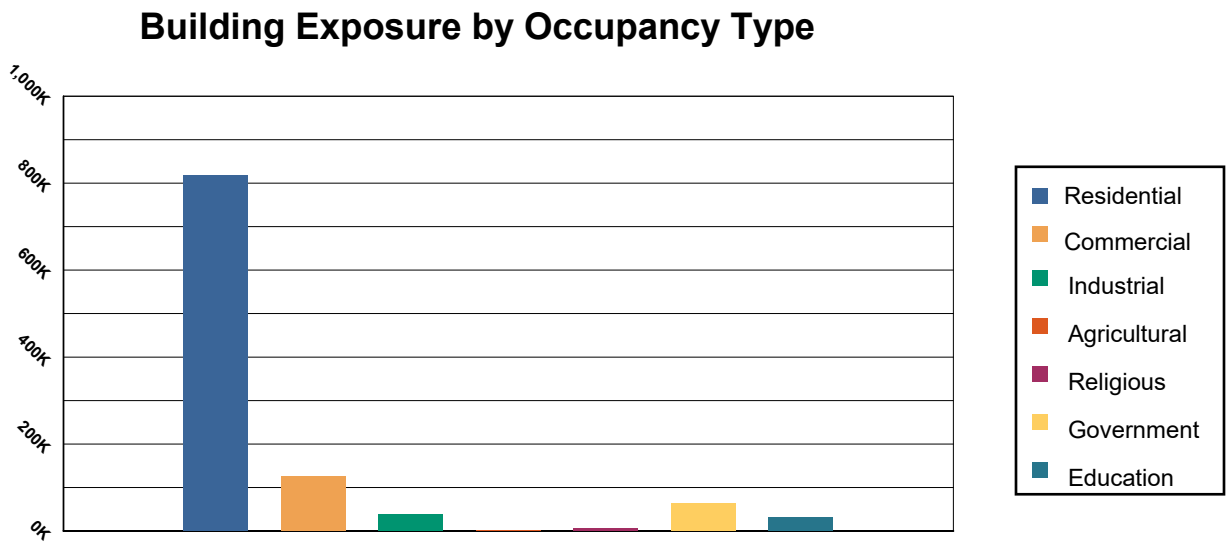


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	817,794	75.59%
Commercial	124,737	11.53%
Industrial	38,537	3.56%
Agricultural	1,480	0.14%
Religious	6,002	0.55%
Government	63,227	5.84%
Education	30,145	2.79%
Total	**1,081,922**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

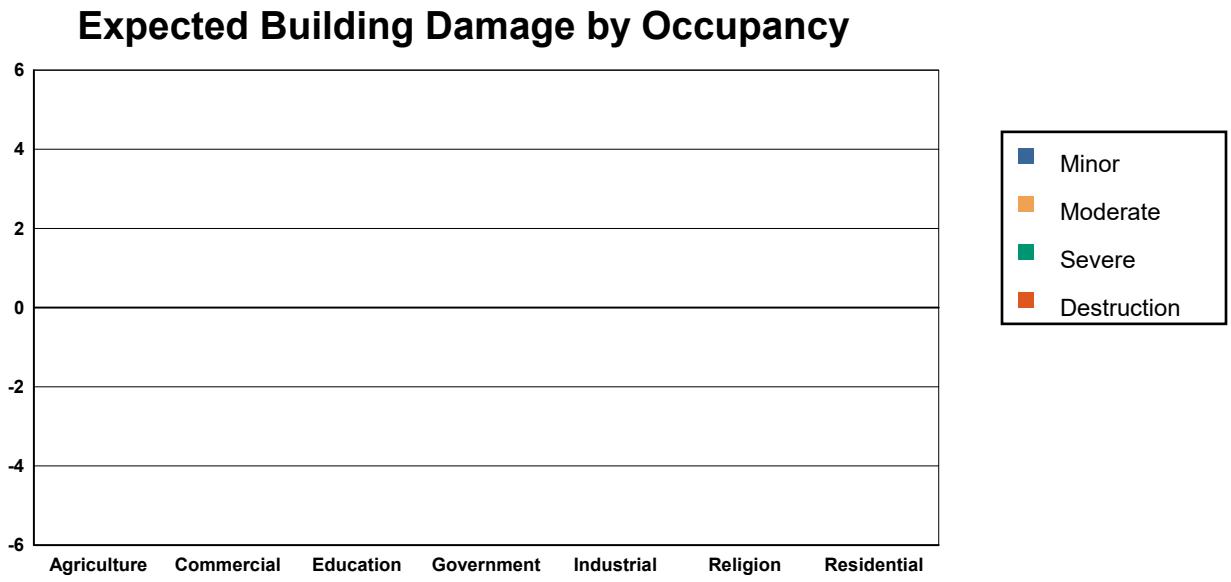


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	107.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	4.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	40.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	35.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	6.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	2,248.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**2,447.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	26	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	182	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	99	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	2,139	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

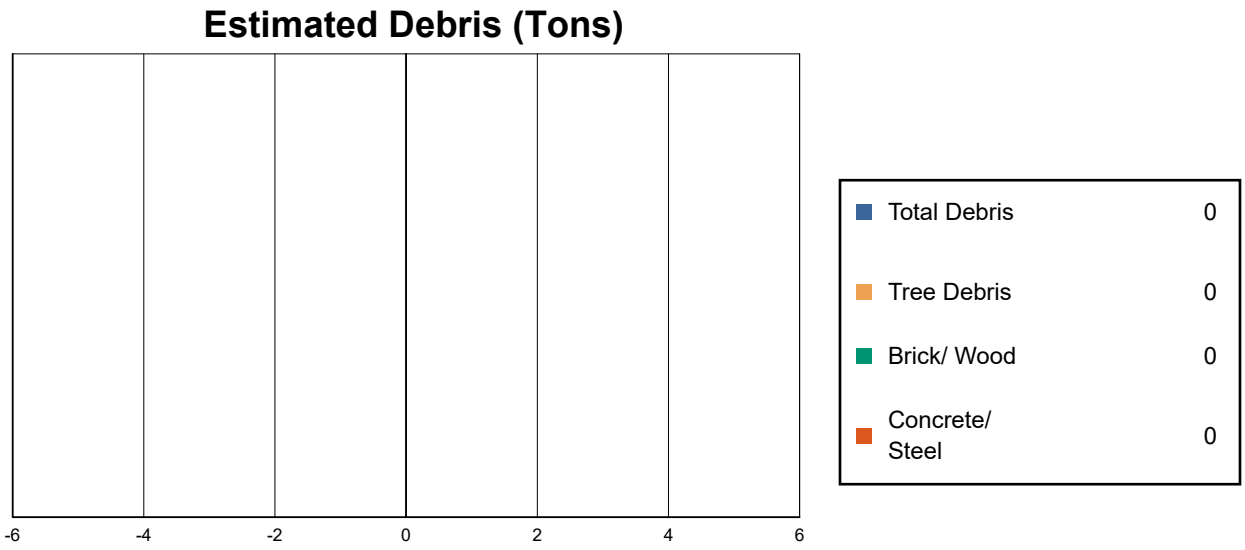
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

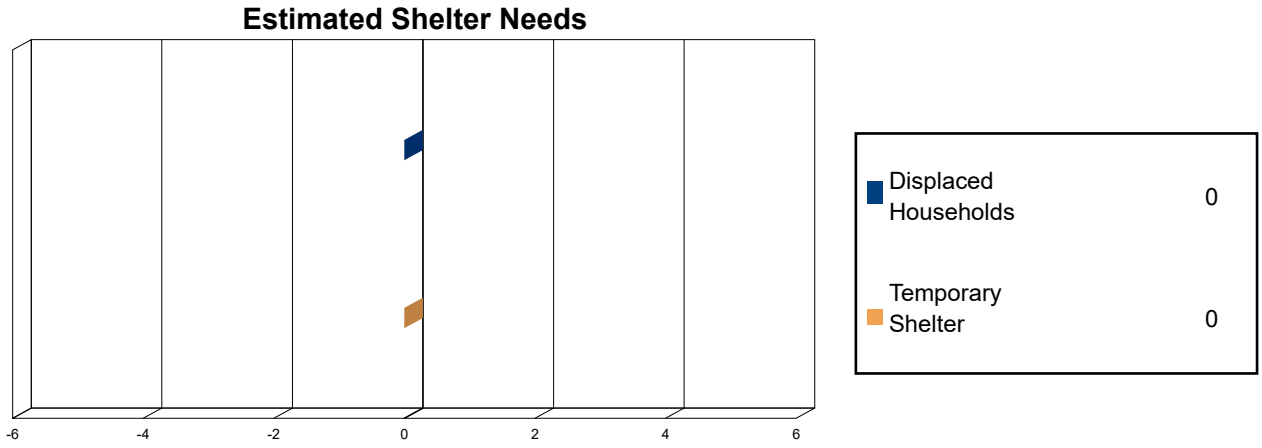


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,272) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

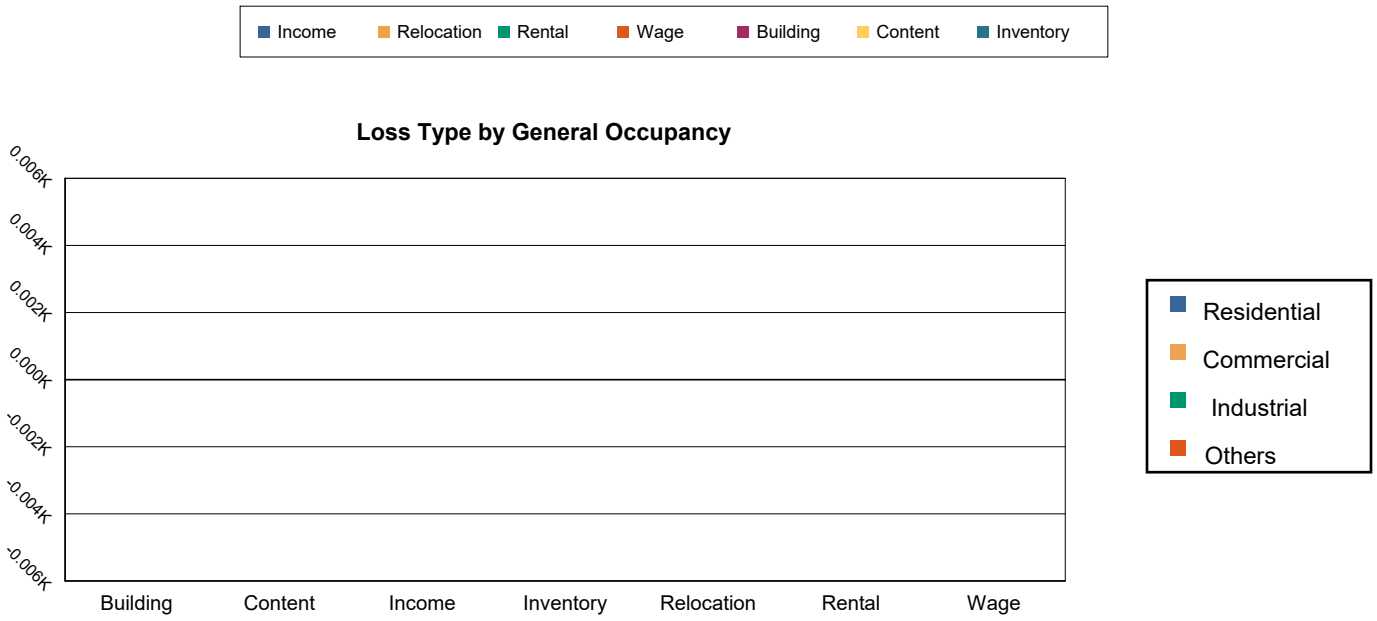


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,794	264,128	1,081,922
Total	**5,272**	**817,794**	**264,128**	**1,081,922**
Study Region Total	**5,272**	**817,794**	**264,128**	**1,081,922**

Hazus: Hurricane Global Risk Report

Region Name:	Columbia_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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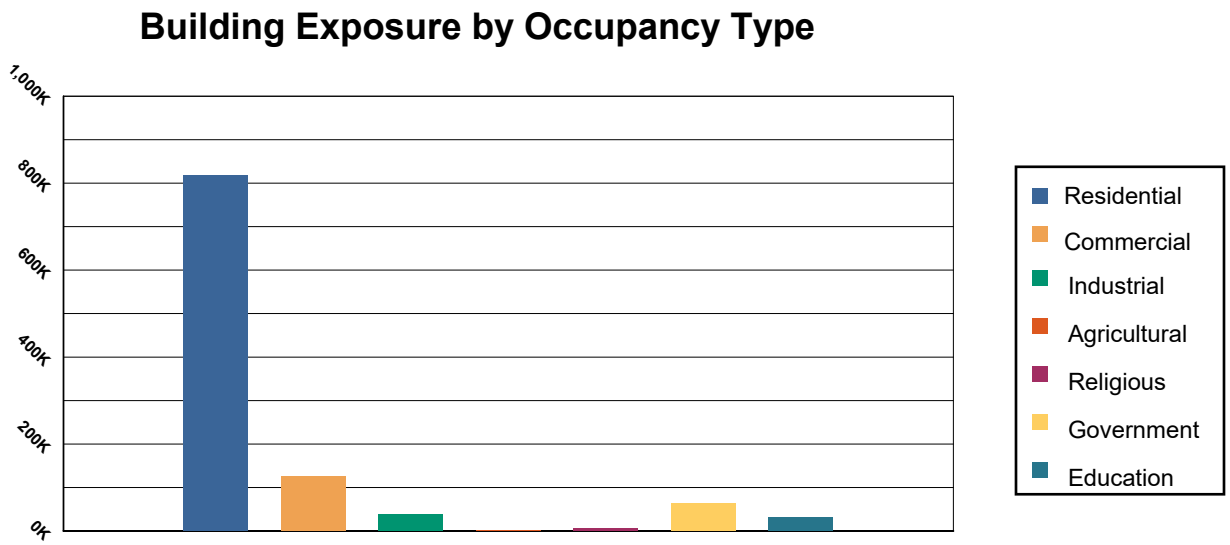

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Agricultural	1,480	0.14%
Religious	6,002	0.55%
Government	63,227	5.84%
Education	30,145	2.79%
Total	**1,081,922**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

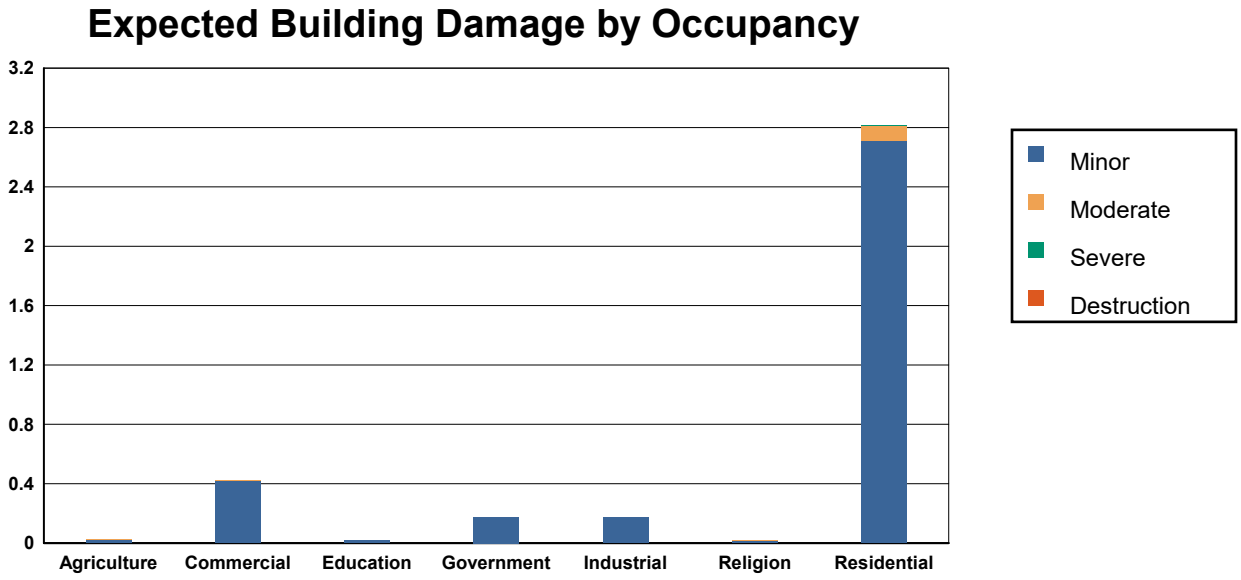


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.98	99.67	0.02	0.32	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	106.58	99.61	0.42	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Education	3.98	99.58	0.02	0.42	0.00	0.00	0.00	0.00	0.00	0.00
Government	39.82	99.56	0.18	0.44	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	34.83	99.51	0.17	0.49	0.00	0.00	0.00	0.00	0.00	0.00
Religion	5.98	99.67	0.02	0.32	0.00	0.01	0.00	0.00	0.00	0.00
Residential	2,245.19	99.87	2.71	0.12	0.09	0.00	0.00	0.00	0.00	0.00
Total	**2,443.36**		**3.54**		**0.10**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	26	99.38	0	0.62	0	0.00	0	0.00	0	0.00
Masonry	181	99.52	1	0.46	0	0.02	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	99	99.52	0	0.48	0	0.00	0	0.00	0	0.00
Wood	2,137	99.92	2	0.08	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

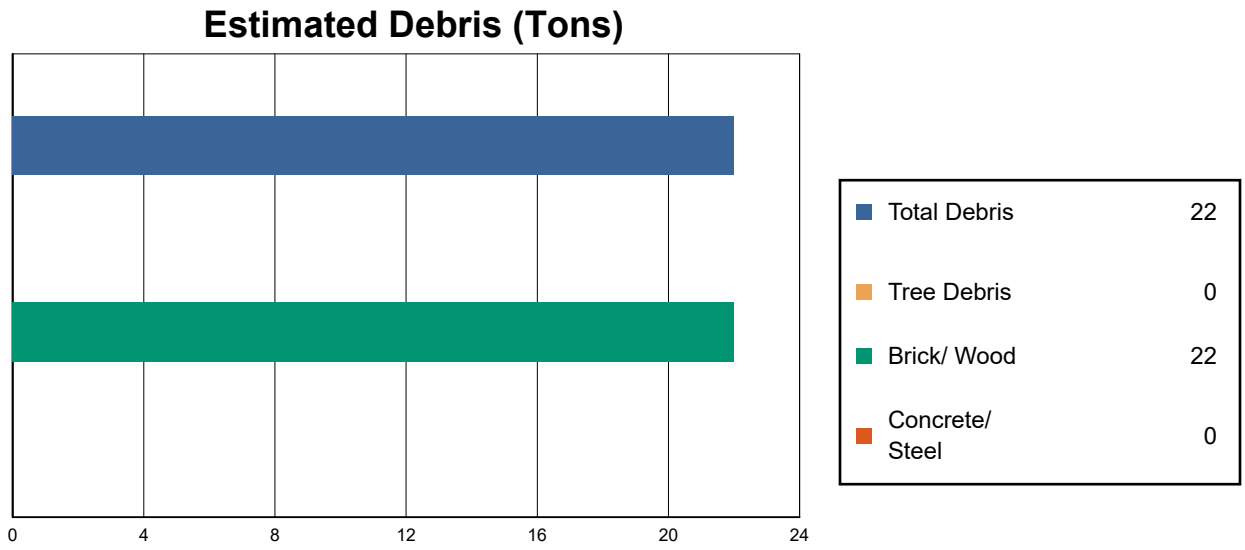
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

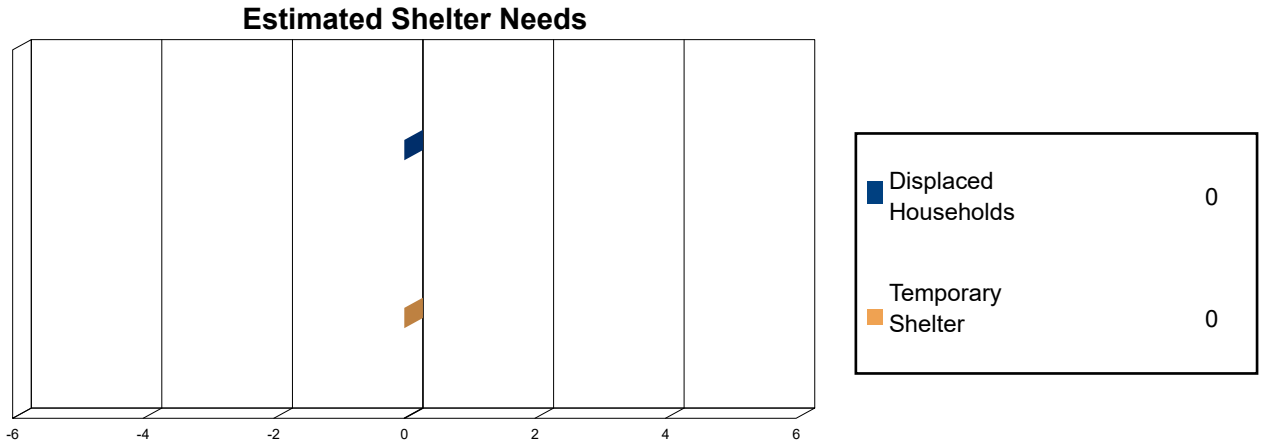


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 22 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 22 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,272) will seek temporary shelter in public shelters.

Economic Loss

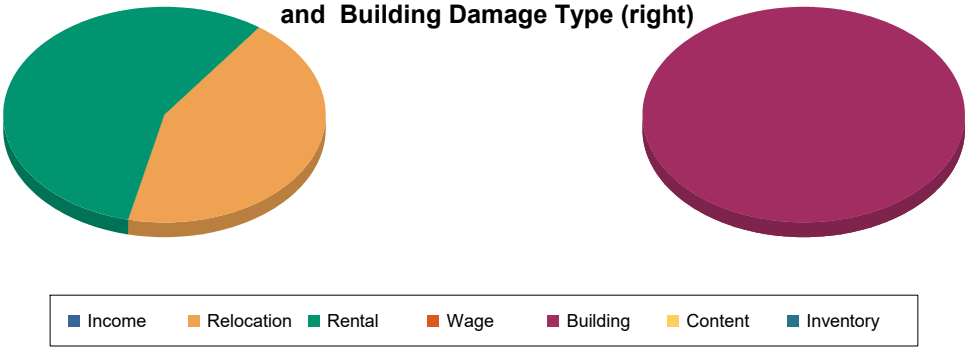
The total economic loss estimated for the hurricane is 0.4 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

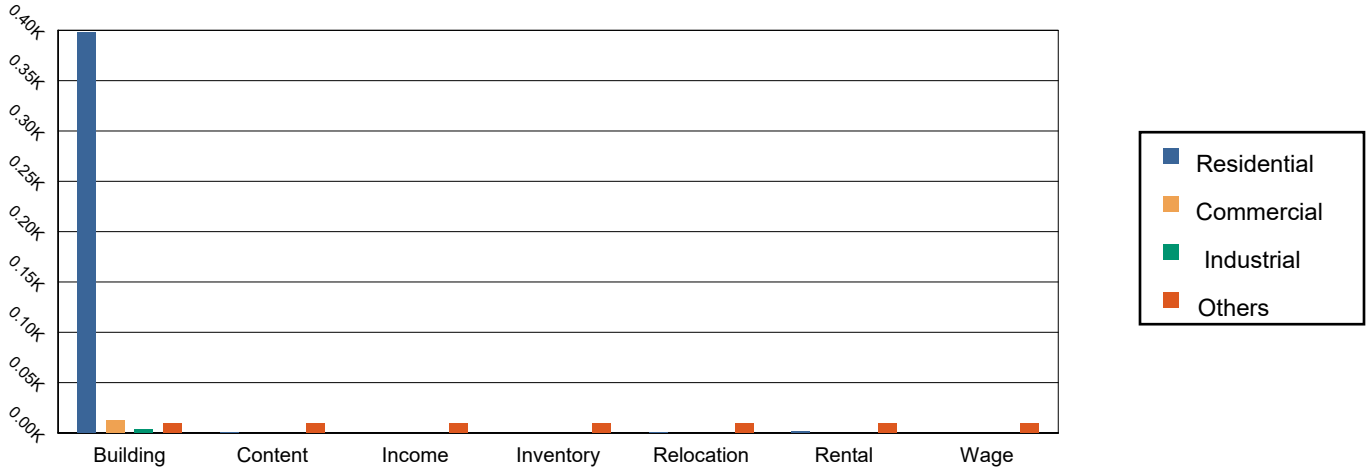


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	397.52	12.47	3.85	9.94	423.79
	Content	0.39	0.00	0.00	0.00	0.39
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**397.92**	**12.47**	**3.85**	**9.94**	**424.18**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.80	0.04	0.00	0.00	0.84
	Rental	1.09	0.00	0.00	0.00	1.09
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1.89**	**0.04**	**0.00**	**0.00**	**1.93**

Total

Total	**399.81**	**12.51**	**3.85**	**9.94**	**426.11**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,794	264,128	1,081,922
Total	**5,272**	**817,794**	**264,128**	**1,081,922**
Study Region Total	**5,272**	**817,794**	**264,128**	**1,081,922**

Hazus: Hurricane Global Risk Report

Region Name:	Columbia_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.00 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 5,272 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,082 million dollars. Approximately 92% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,447 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

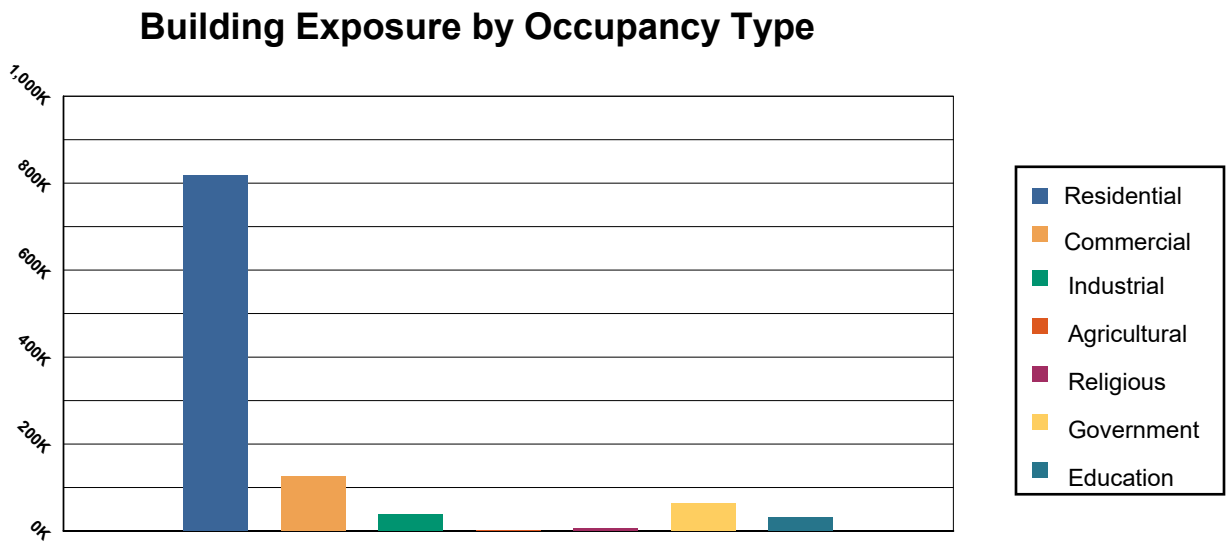


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	817,794	75.59%
Commercial	124,737	11.53%
Industrial	38,537	3.56%
Agricultural	1,480	0.14%
Religious	6,002	0.55%
Government	63,227	5.84%
Education	30,145	2.79%
Total	**1,081,922**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

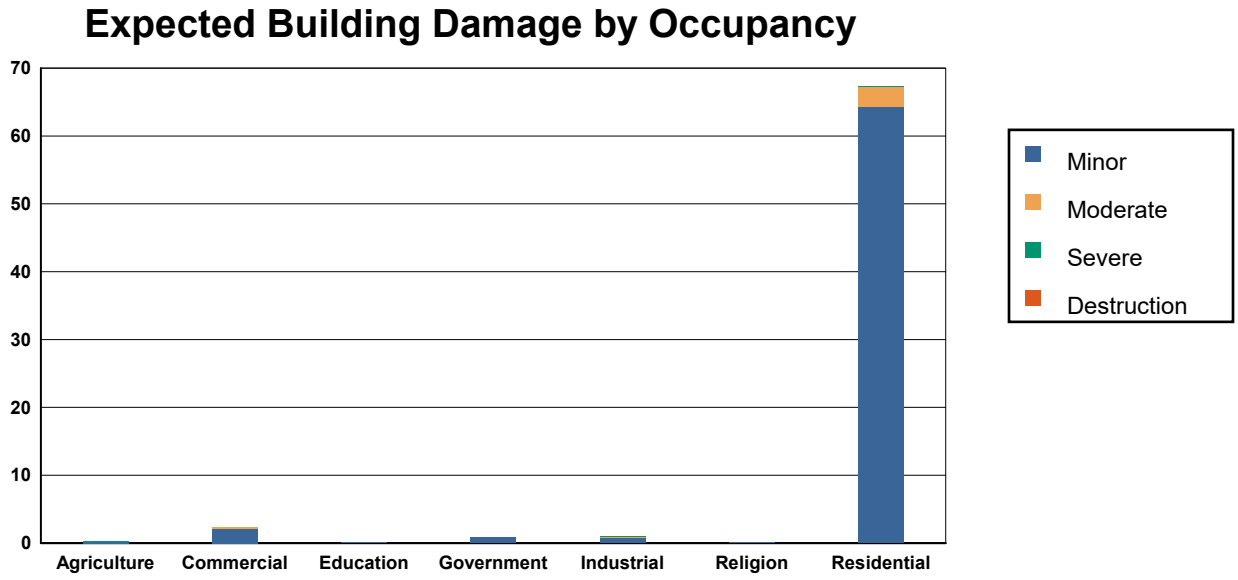


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.80	97.20	0.17	2.38	0.02	0.31	0.01	0.11	0.00	0.00
Commercial	104.70	97.85	2.09	1.95	0.20	0.19	0.01	0.01	0.00	0.00
Education	3.92	98.00	0.08	1.95	0.00	0.05	0.00	0.00	0.00	0.00
Government	39.20	98.00	0.78	1.96	0.02	0.04	0.00	0.00	0.00	0.00
Industrial	34.09	97.41	0.81	2.31	0.08	0.21	0.02	0.07	0.00	0.00
Religion	5.88	98.05	0.11	1.89	0.00	0.06	0.00	0.00	0.00	0.00
Residential	2,180.64	97.00	64.30	2.86	2.98	0.13	0.08	0.00	0.00	0.00
Total	**2,375.23**		**68.34**		**3.30**		**0.12**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	25	97.03	1	2.87	0	0.10	0	0.00	0	0.00
Masonry	176	96.92	5	2.72	1	0.32	0	0.04	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	97	97.77	2	2.06	0	0.16	0	0.01	0	0.00
Wood	2,078	97.15	59	2.75	2	0.10	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

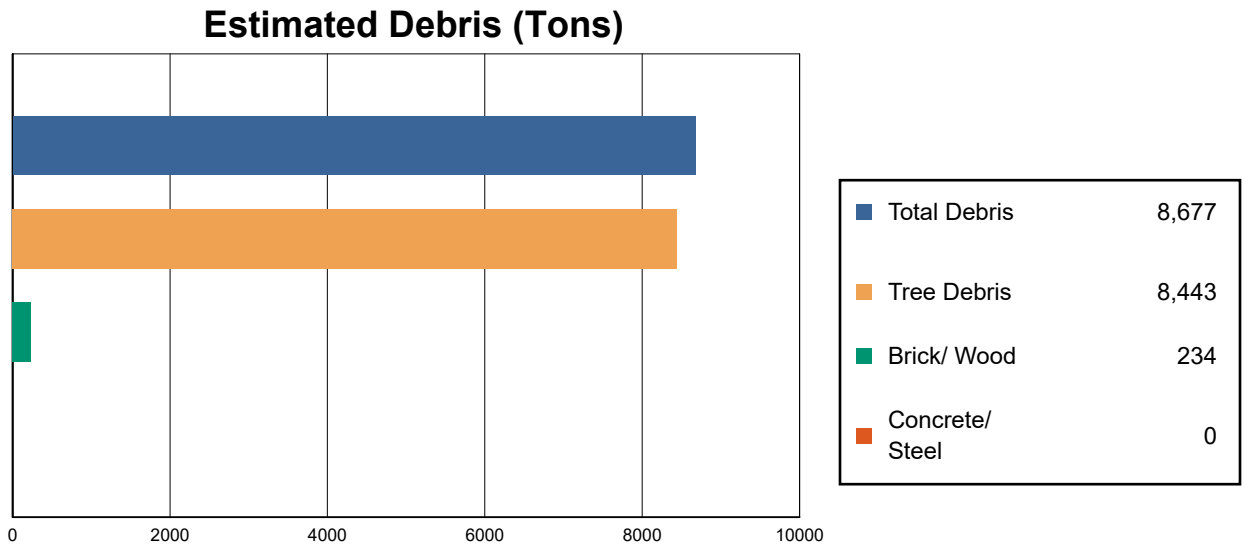
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

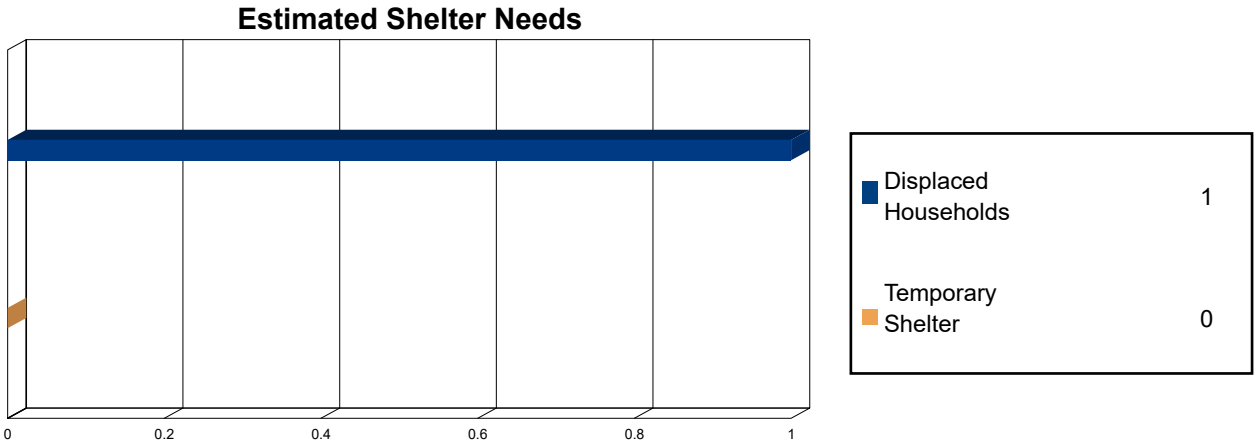


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 8,677 tons of debris will be generated. Of the total amount, 7,008 tons (81%) is Other Tree Debris. Of the remaining 1,669 tons, Brick/Wood comprises 14% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 9 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,435 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,272) will seek temporary shelter in public shelters.

Economic Loss

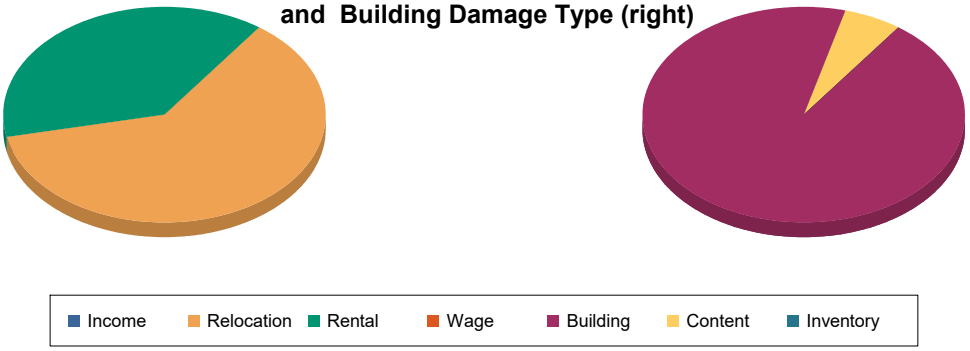
The total economic loss estimated for the hurricane is 3.4 million dollars, which represents 0.31 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 3 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

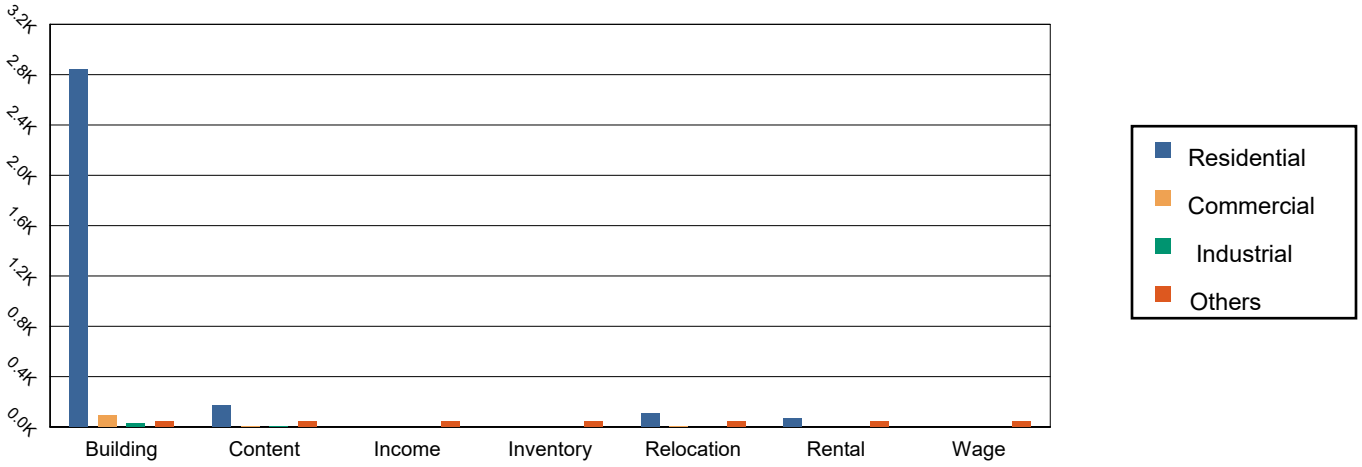


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,842.35	89.23	27.76	46.35	3,005.68
	Content	170.34	4.00	7.18	0.30	181.82
	Inventory	0.00	0.39	1.00	0.22	1.61
	Subtotal	**3,012.69**	**93.62**	**35.94**	**46.86**	**3,189.11**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	106.62	1.68	0.07	0.29	108.65
	Rental	67.48	0.00	0.00	0.00	67.48
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**174.10**	**1.68**	**0.07**	**0.29**	**176.13**

Total

Total	**3,186.79**	**95.30**	**36.00**	**47.15**	**3,365.24**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,794	264,128	1,081,922
Total	**5,272**	**817,794**	**264,128**	**1,081,922**
Study Region Total	**5,272**	**817,794**	**264,128**	**1,081,922**

Hazus: Hurricane Global Risk Report

Region Name: Columbia_HU

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Building Inventory

General Building Stock

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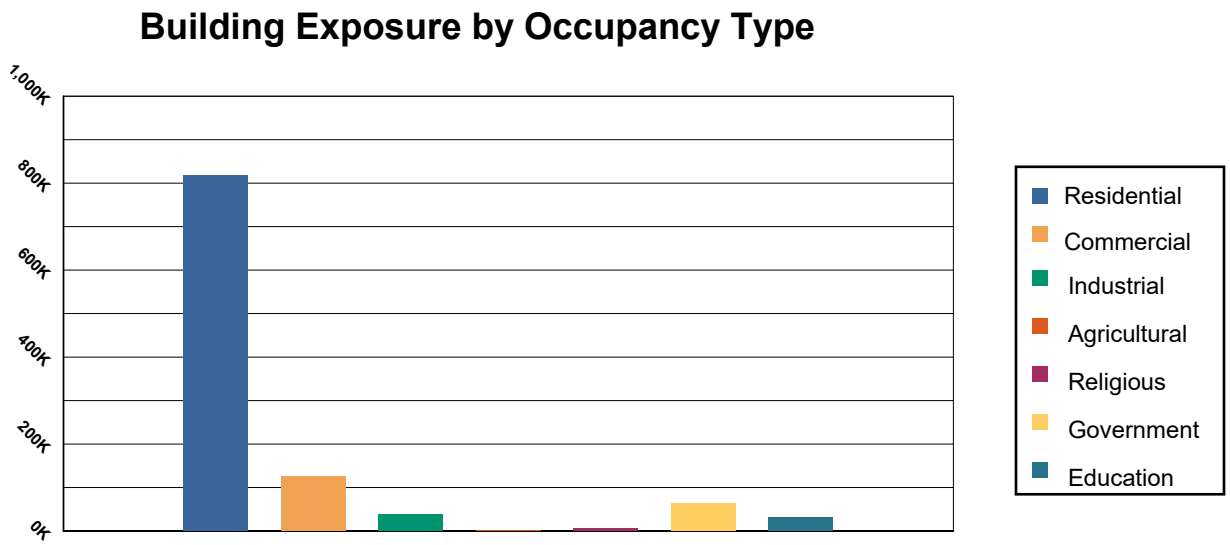

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Occupancy	Exposure ($1000)	Percent of Tot
Residential	817,794	75.59%
Commercial	124,737	11.53%
Industrial	38,537	3.56%
Agricultural	1,480	0.14%
Religious	6,002	0.55%
Government	63,227	5.84%
Education	30,145	2.79%
Total	**1,081,922**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 16 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

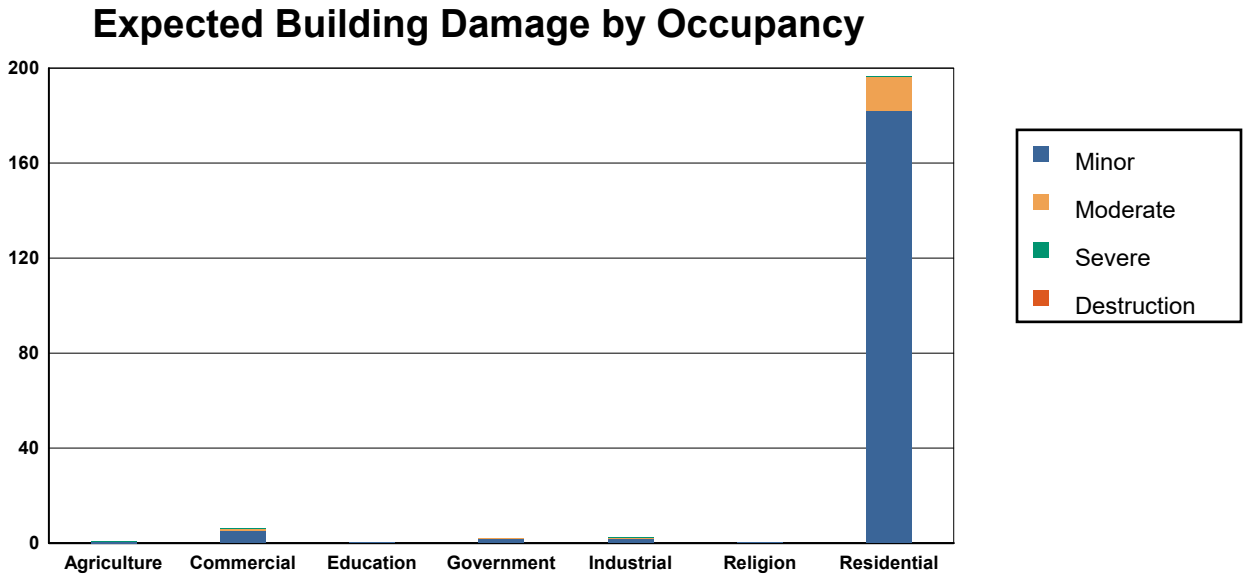


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.43	91.86	0.45	6.43	0.08	1.16	0.04	0.52	0.00	0.03
Commercial	100.91	94.31	5.31	4.96	0.68	0.64	0.09	0.09	0.00	0.00
Education	3.80	94.89	0.19	4.84	0.01	0.27	0.00	0.00	0.00	0.00
Government	38.00	95.00	1.89	4.74	0.10	0.26	0.00	0.00	0.00	0.00
Industrial	32.69	93.41	1.86	5.32	0.32	0.90	0.12	0.35	0.01	0.02
Religion	5.67	94.45	0.32	5.27	0.02	0.27	0.00	0.01	0.00	0.00
Residential	2,051.57	91.26	182.11	8.10	14.09	0.63	0.23	0.01	0.00	0.00
Total	**2,239.08**		**192.14**		**15.30**		**0.48**		**0.01**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	24	92.75	2	6.57	0	0.68	0	0.00	0	0.00
Masonry	168	92.30	12	6.42	2	1.11	0	0.16	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	94	94.52	5	4.78	1	0.62	0	0.08	0	0.00
Wood	1,957	91.47	171	8.00	11	0.51	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

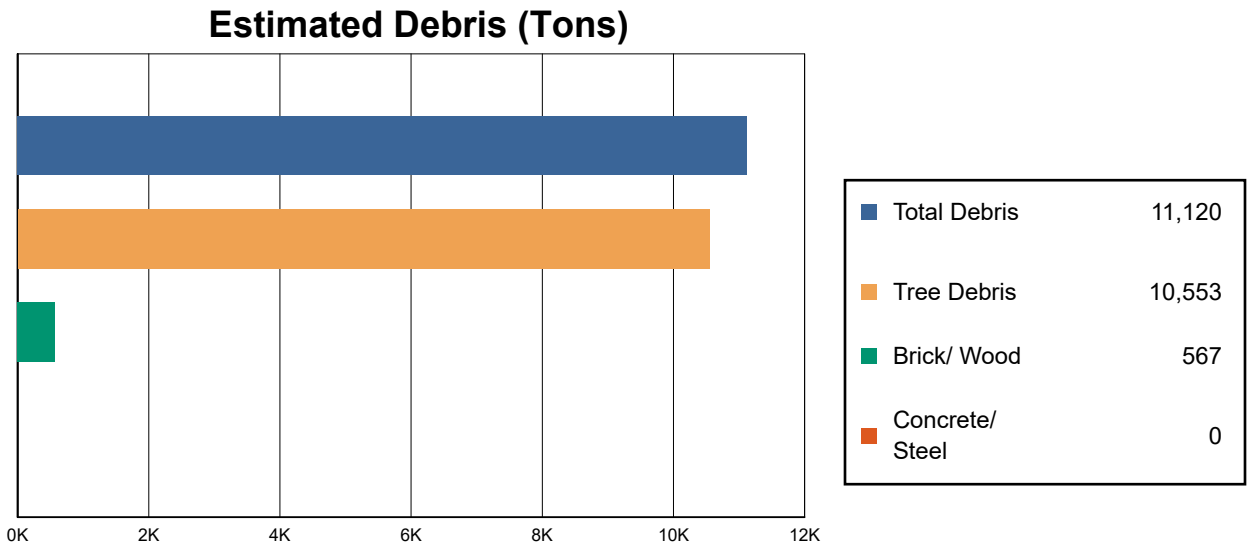
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

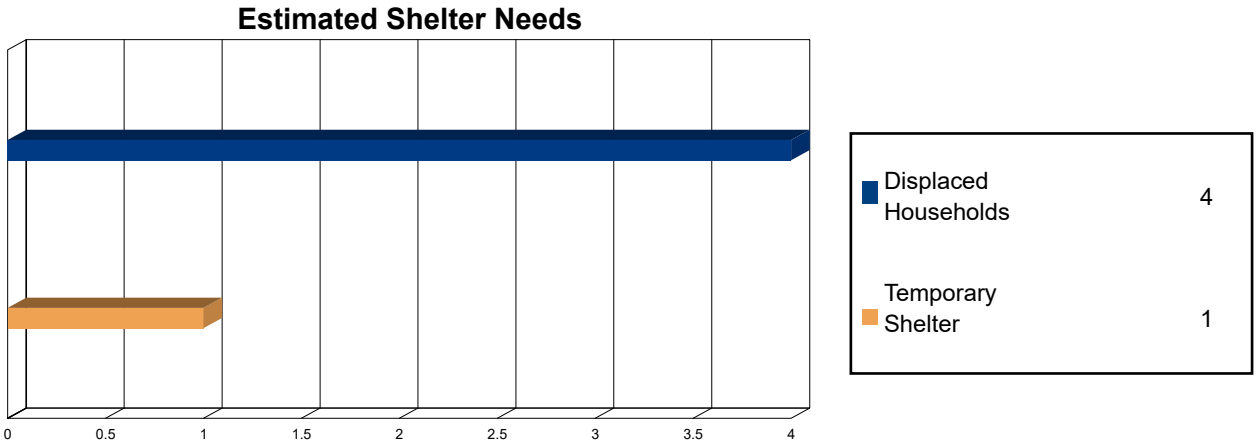


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 11,120 tons of debris will be generated. Of the total amount, 8,759 tons (79%) is Other Tree Debris. Of the remaining 2,361 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 23 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,794 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 4 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 5,272) will seek temporary shelter in public shelters.

Economic Loss

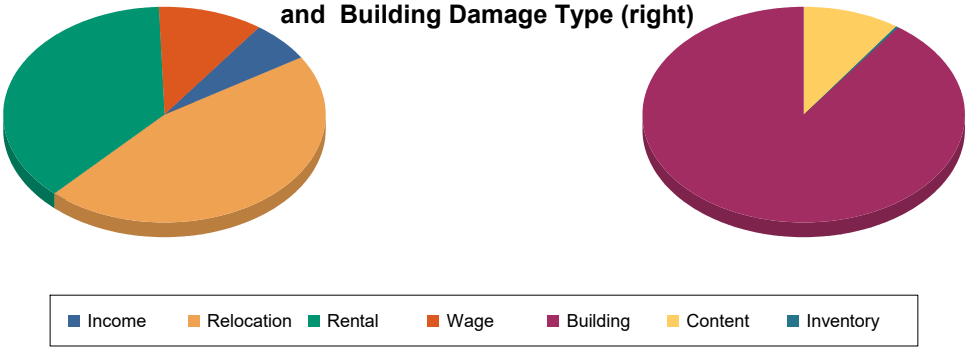
The total economic loss estimated for the hurricane is 6.9 million dollars, which represents 0.64 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 7 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

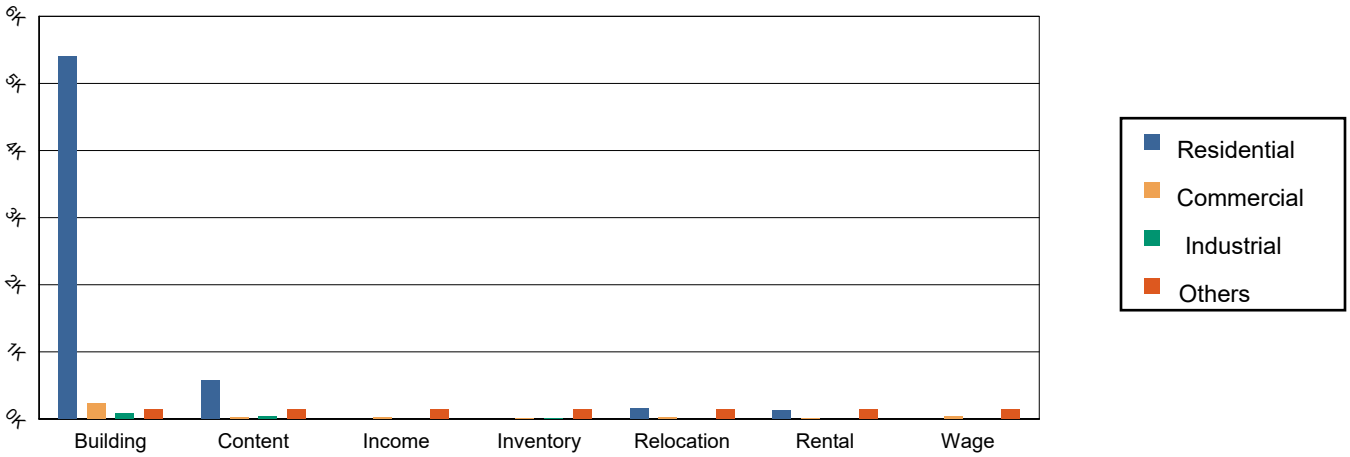


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,401.89	226.90	89.12	122.78	5,840.69
	Content	574.56	23.83	40.65	5.55	644.59
	Inventory	0.00	3.14	5.59	0.98	9.71
	Subtotal	**5,976.45**	**253.87**	**135.36**	**129.31**	**6,494.99**
Business Interruption Loss						
	Income	0.00	20.18	0.47	3.31	23.95
	Relocation	151.85	24.01	1.36	4.07	181.30
	Rental	132.46	14.05	0.32	0.25	147.08
	Wage	0.00	33.46	0.78	7.79	42.03
	Subtotal	**284.31**	**91.70**	**2.92**	**15.42**	**394.36**

Total

Total	**6,260.76**	**345.57**	**138.28**	**144.73**	**6,889.35**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,794	264,128	1,081,922
Total	**5,272**	**817,794**	**264,128**	**1,081,922**
Study Region Total	**5,272**	**817,794**	**264,128**	**1,081,922**

Hazus: Hurricane Global Risk Report

Region Name:	Columbia_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.00 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 5,272 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,082 million dollars. Approximately 92% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,447 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

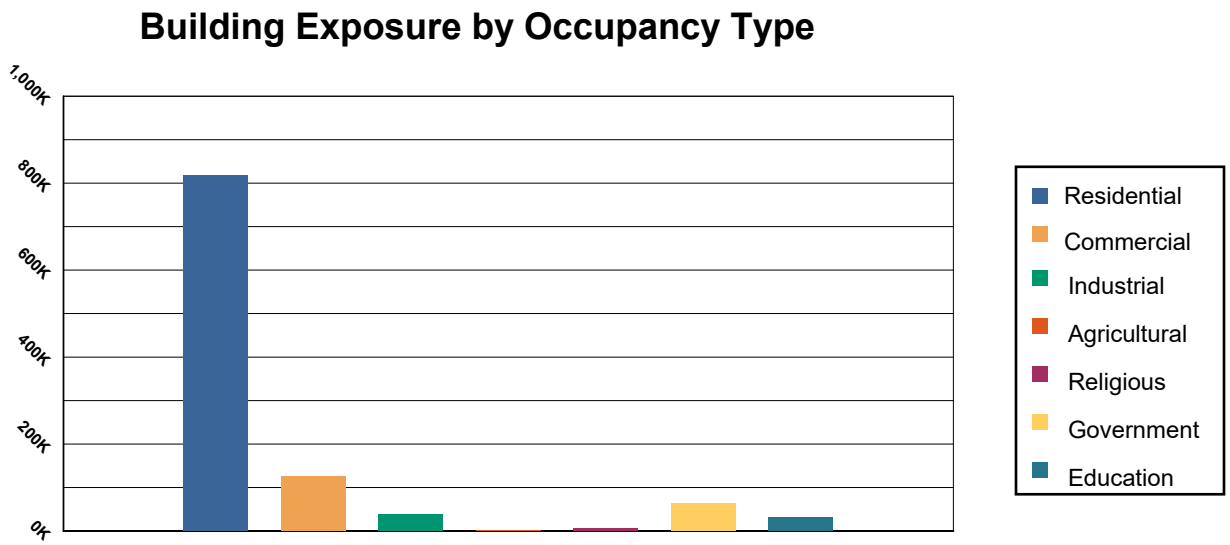


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	817,794	75.59%
Commercial	124,737	11.53%
Industrial	38,537	3.56%
Agricultural	1,480	0.14%
Religious	6,002	0.55%
Government	63,227	5.84%
Education	30,145	2.79%
Total	**1,081,922**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 50 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

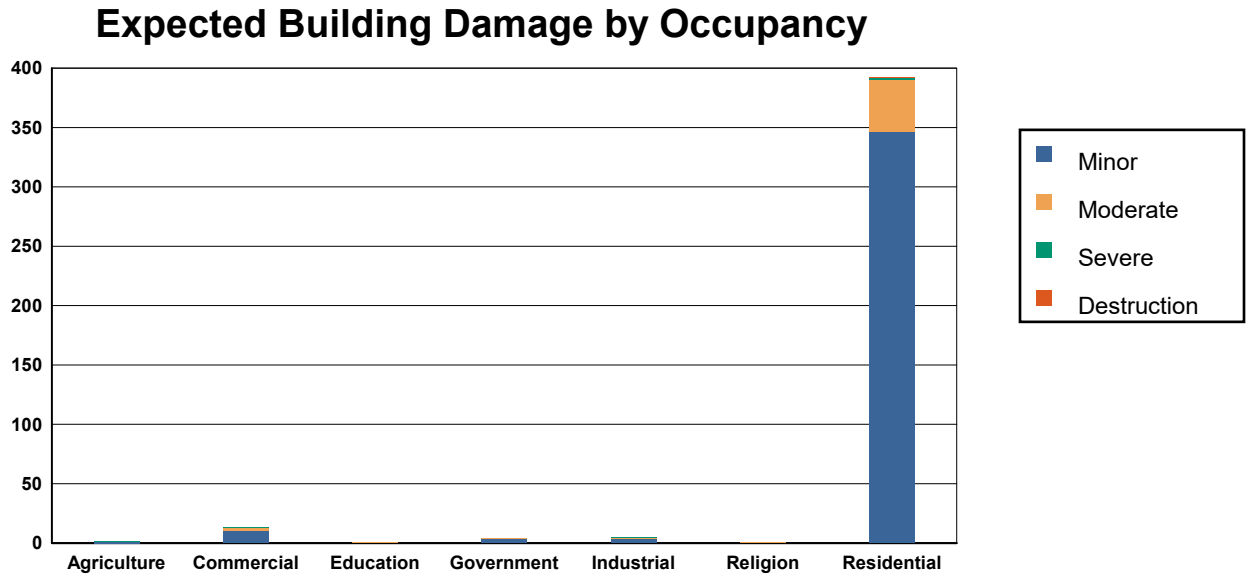


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	5.82	83.17	0.87	12.41	0.20	2.89	0.10	1.39	0.01	0.14
Commercial	93.80	87.66	10.86	10.15	2.01	1.88	0.33	0.31	0.00	0.00
Education	3.55	88.71	0.40	9.96	0.05	1.28	0.00	0.05	0.00	0.00
Government	35.59	88.97	3.88	9.69	0.52	1.30	0.02	0.04	0.00	0.00
Industrial	30.21	86.30	3.54	10.12	0.88	2.53	0.34	0.96	0.03	0.09
Religion	5.26	87.67	0.66	11.08	0.07	1.19	0.00	0.06	0.00	0.00
Residential	1,855.57	82.54	346.85	15.43	43.31	1.93	1.49	0.07	0.77	0.03
Total	**2,029.80**		**367.06**		**47.05**		**2.28**		**0.82**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	22	84.98	3	12.33	1	2.67	0	0.03	0	0.00
Masonry	154	84.68	22	11.95	5	2.89	1	0.44	0	0.04
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	87	88.16	9	9.54	2	2.00	0	0.30	0	0.00
Wood	1,772	82.82	329	15.40	36	1.68	1	0.06	1	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

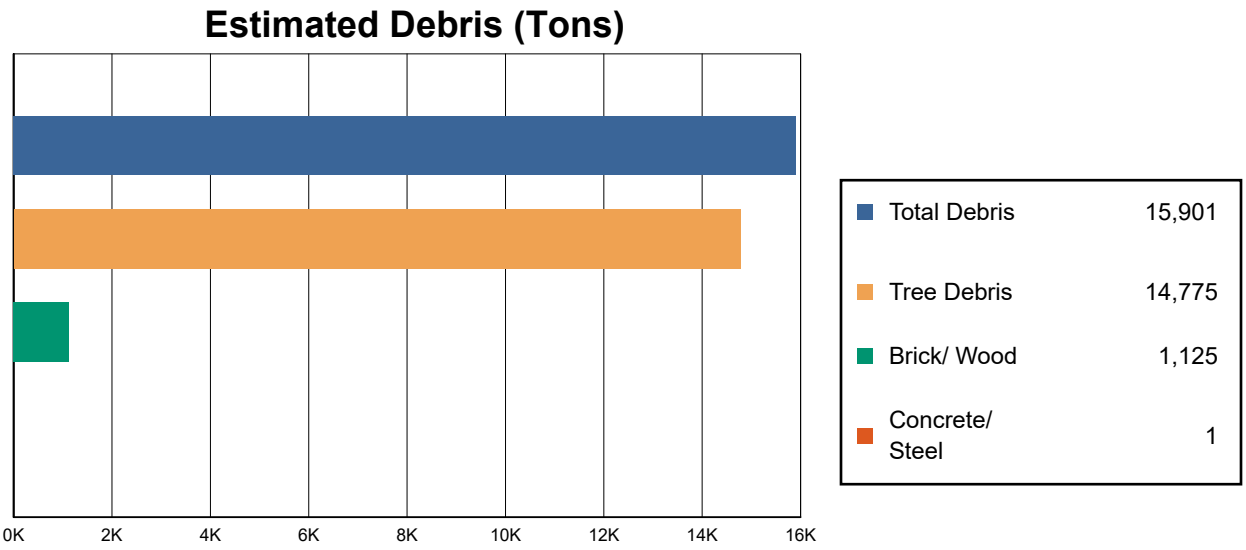
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

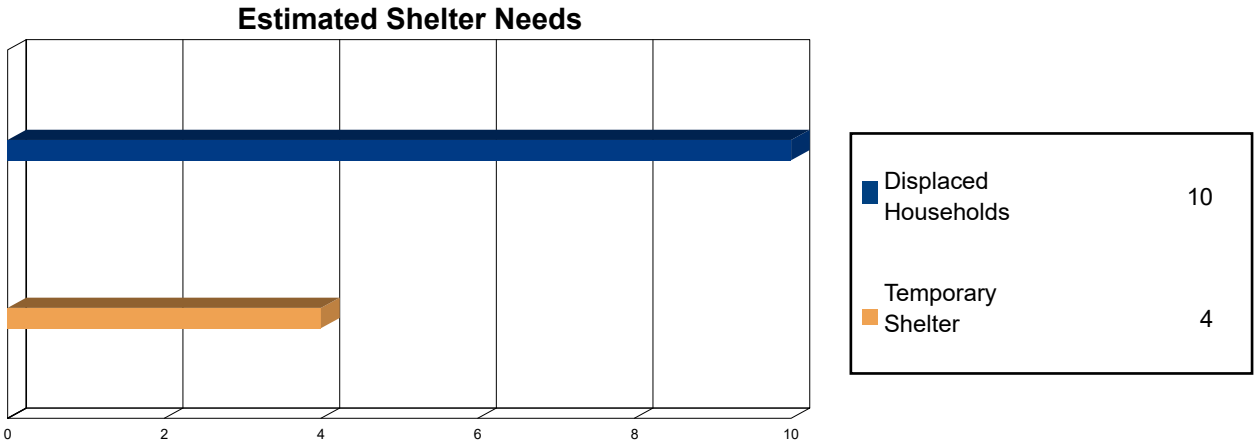


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15,901 tons of debris will be generated. Of the total amount, 12,263 tons (77%) is Other Tree Debris. Of the remaining 3,638 tons, Brick/Wood comprises 31% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 45 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,512 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 10 households to be displaced due to the hurricane. Of these, 4 people (out of a total population of 5,272) will seek temporary shelter in public shelters.

Economic Loss

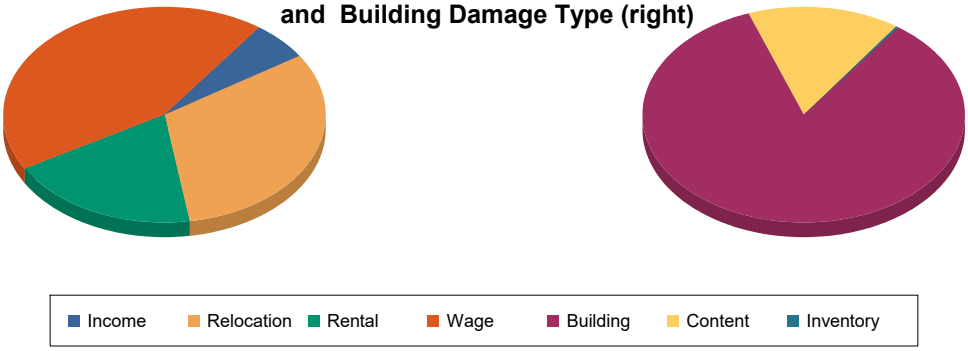
The total economic loss estimated for the hurricane is 14.6 million dollars, which represents 1.35 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 15 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 84% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

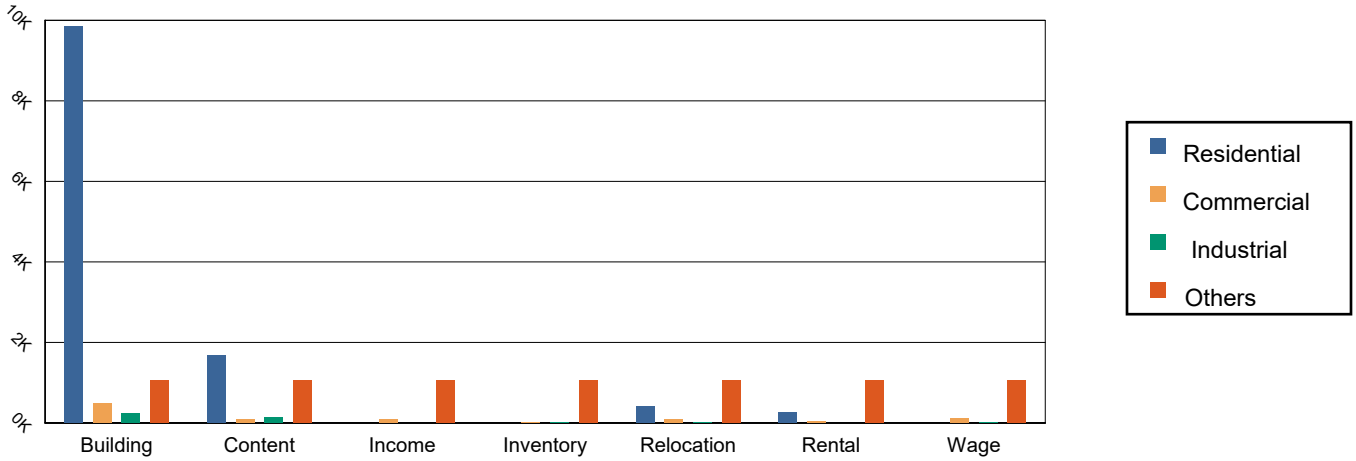


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	9,836.66	493.05	242.02	282.08	10,853.81
	Content	1,683.35	94.83	142.21	43.57	1,963.96
	Inventory	0.00	14.52	19.46	3.38	37.36
	Subtotal	**11,520.01**	**602.40**	**403.69**	**329.04**	**12,855.13**
Business Interruption Loss						
	Income	0.00	80.23	3.01	19.28	102.52
	Relocation	413.74	81.17	7.98	50.67	553.56
	Rental	271.03	49.79	1.94	9.13	331.89
	Wage	0.00	109.62	5.06	642.21	756.90
	Subtotal	**684.77**	**320.81**	**18.00**	**721.29**	**1,744.87**

Total

Total	**12,204.78**	**923.21**	**421.69**	**1,050.33**	**14,600.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,794	264,128	1,081,922
Total	**5,272**	**817,794**	**264,128**	**1,081,922**
Study Region Total	**5,272**	**817,794**	**264,128**	**1,081,922**

Hazus: Hurricane Global Risk Report

Region Name:	Columbia_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Building Inventory

General Building Stock

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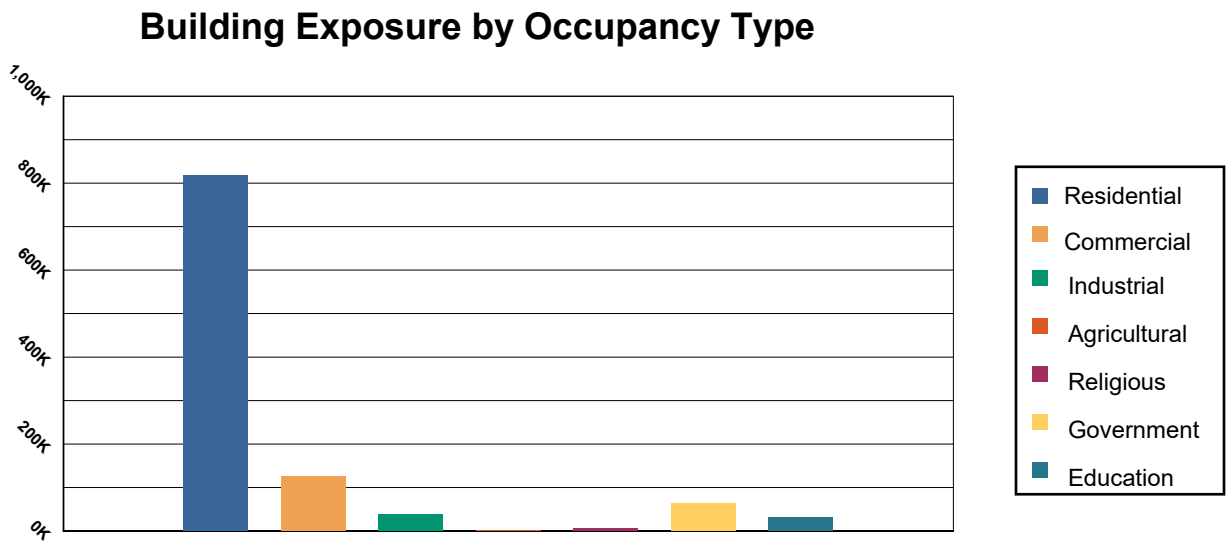

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
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Commercial	124,737	11.53%
Industrial	38,537	3.56%
Agricultural	1,480	0.14%
Religious	6,002	0.55%
Government	63,227	5.84%
Education	30,145	2.79%
Total	**1,081,922**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 129 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

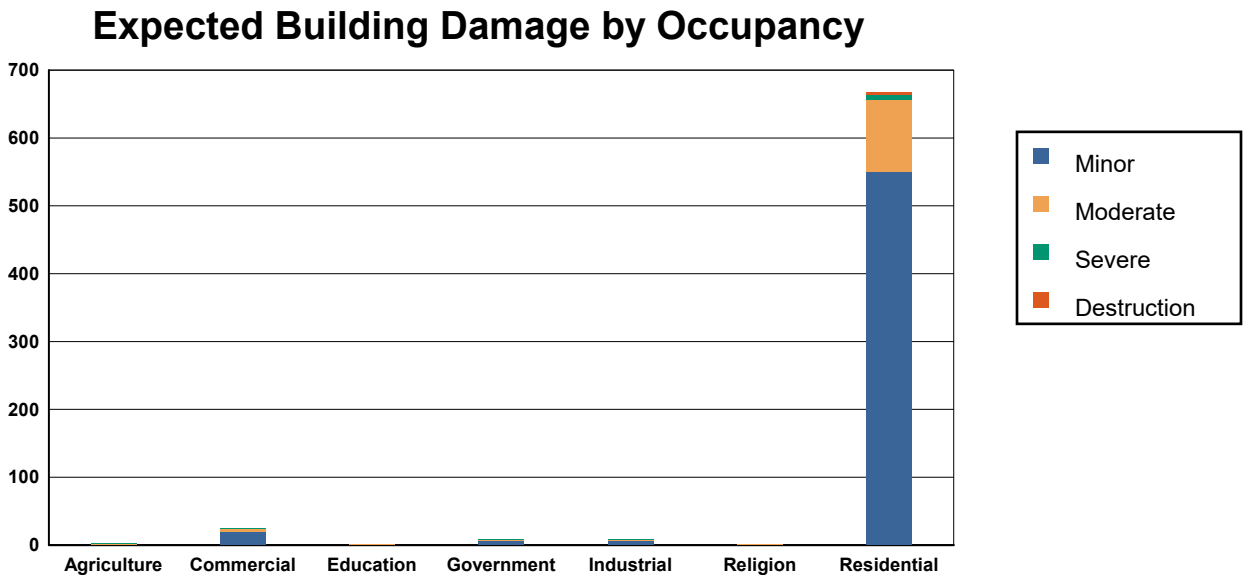


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4.93	70.49	1.41	20.08	0.43	6.10	0.21	2.93	0.03	0.40
Commercial	81.80	76.45	18.76	17.54	5.55	5.19	0.88	0.82	0.01	0.01
Education	3.11	77.76	0.70	17.43	0.18	4.55	0.01	0.26	0.00	0.00
Government	31.23	78.08	6.81	17.01	1.86	4.64	0.10	0.26	0.00	0.00
Industrial	26.12	74.64	5.84	16.69	2.20	6.28	0.74	2.12	0.09	0.27
Religion	4.58	76.37	1.16	19.25	0.25	4.14	0.01	0.24	0.00	0.00
Residential	1,581.31	70.34	550.42	24.48	105.18	4.68	7.42	0.33	3.67	0.16
Total	**1,733.09**		**585.08**		**115.65**		**9.38**		**3.80**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	19	72.31	5	19.65	2	7.83	0	0.21	0	0.00
Masonry	133	73.00	35	19.12	12	6.72	2	1.02	0	0.14
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	76	76.97	16	16.38	6	5.80	1	0.84	0	0.01
Wood	1,513	70.72	527	24.64	89	4.16	7	0.32	4	0.17

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

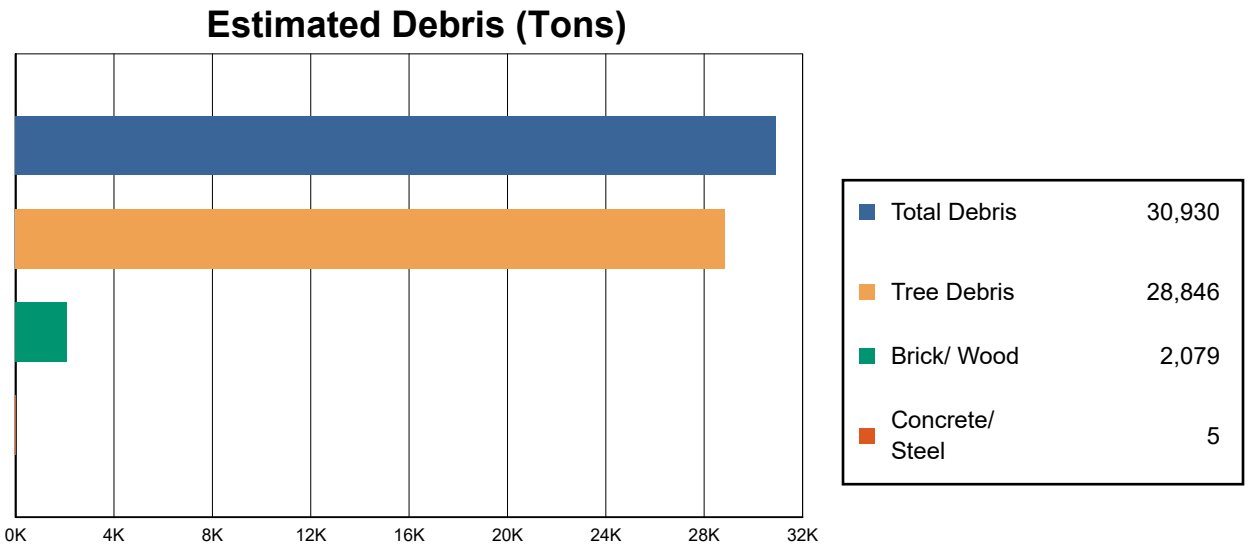
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

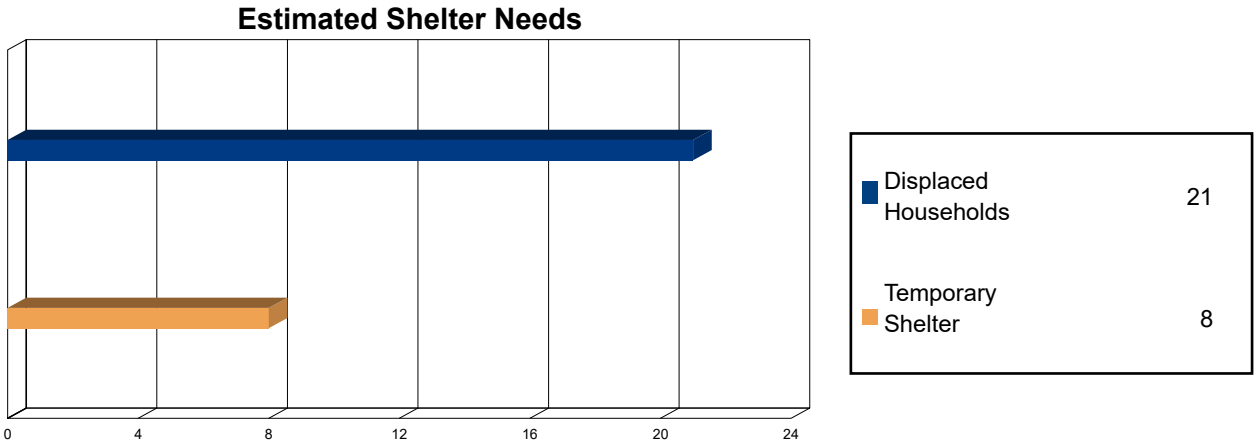


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 30,930 tons of debris will be generated. Of the total amount, 23,942 tons (77%) is Other Tree Debris. Of the remaining 6,988 tons, Brick/Wood comprises 30% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 83 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,904 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 21 households to be displaced due to the hurricane. Of these, 8 people (out of a total population of 5,272) will seek temporary shelter in public shelters.

Economic Loss

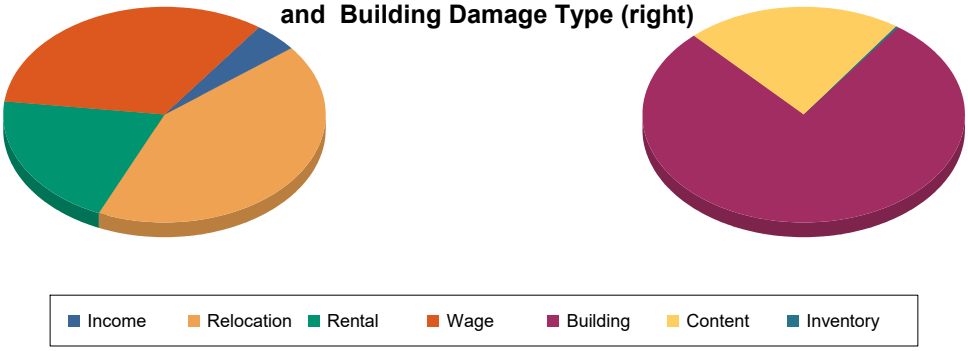
The total economic loss estimated for the hurricane is 30.5 million dollars, which represents 2.81 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 30 million dollars. 13% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

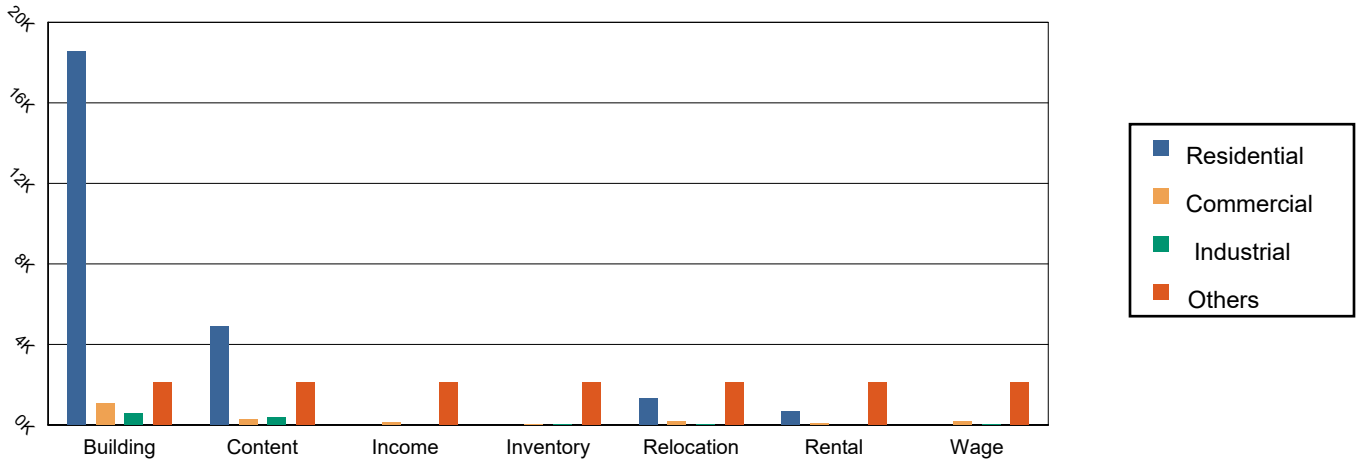


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	18,533.34	1,061.75	552.87	673.59	20,821.56
	Content	4,915.20	266.99	361.26	166.04	5,709.49
	Inventory	0.00	41.97	49.33	8.51	99.82
	Subtotal	**23,448.53**	**1,370.72**	**963.46**	**848.14**	**26,630.86**
Business Interruption Loss						
	Income	0.00	128.24	6.29	36.27	170.81
	Relocation	1,296.93	172.57	19.85	120.30	1,609.65
	Rental	653.72	97.25	4.26	18.68	773.91
	Wage	0.00	166.92	10.55	1,088.90	1,266.37
	Subtotal	**1,950.65**	**564.98**	**40.94**	**1,264.15**	**3,820.73**

Total

Total	**25,399.18**	**1,935.70**	**1,004.41**	**2,112.29**	**30,451.59**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,794	264,128	1,081,922
Total	**5,272**	**817,794**	**264,128**	**1,081,922**
Study Region Total	**5,272**	**817,794**	**264,128**	**1,081,922**

Hazus: Hurricane Global Risk Report

Region Name:	Columbia_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.00 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 5,272 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,082 million dollars. Approximately 92% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,447 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

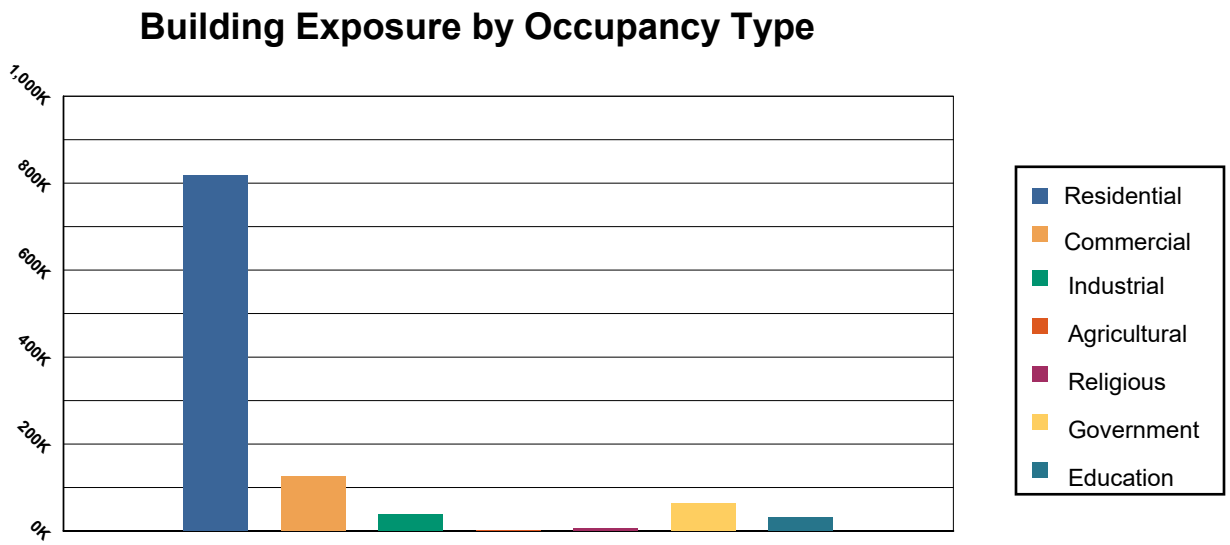


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	817,794	75.59%
Commercial	124,737	11.53%
Industrial	38,537	3.56%
Agricultural	1,480	0.14%
Religious	6,002	0.55%
Government	63,227	5.84%
Education	30,145	2.79%
Total	**1,081,922**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 219 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the region. There are an estimated 10 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

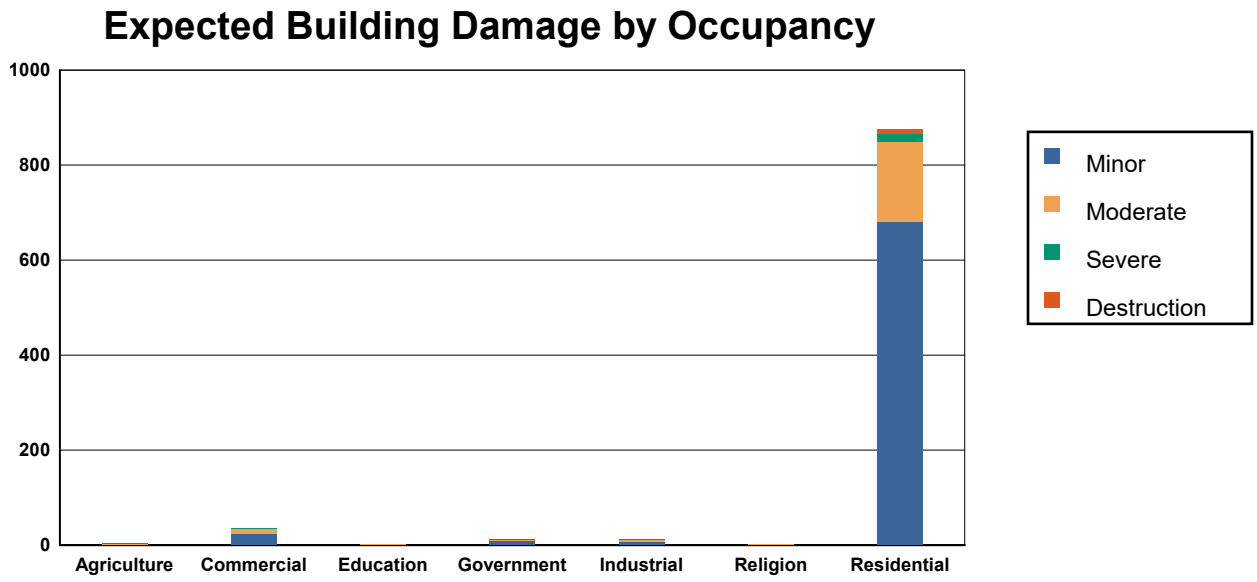


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4.22	60.28	1.77	25.30	0.65	9.31	0.31	4.44	0.05	0.67
Commercial	71.11	66.46	24.17	22.59	9.97	9.32	1.73	1.61	0.02	0.01
Education	2.71	67.71	0.90	22.56	0.36	8.88	0.03	0.85	0.00	0.00
Government	27.21	68.01	8.79	21.98	3.65	9.14	0.35	0.87	0.00	0.00
Industrial	22.56	64.46	7.33	20.95	3.71	10.61	1.23	3.53	0.16	0.45
Religion	3.98	66.39	1.50	24.96	0.48	7.95	0.04	0.70	0.00	0.00
Residential	1,372.06	61.03	679.73	30.24	169.53	7.54	17.20	0.77	9.48	0.42
Total	**1,503.85**		**724.20**		**188.36**		**20.90**		**9.70**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	16	61.40	6	23.79	4	14.12	0	0.69	0	0.00
Masonry	115	63.32	43	23.63	20	10.97	3	1.82	0	0.27
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	66	66.76	21	20.83	11	10.65	2	1.74	0	0.01
Wood	1,315	61.46	656	30.65	143	6.71	16	0.75	9	0.43

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

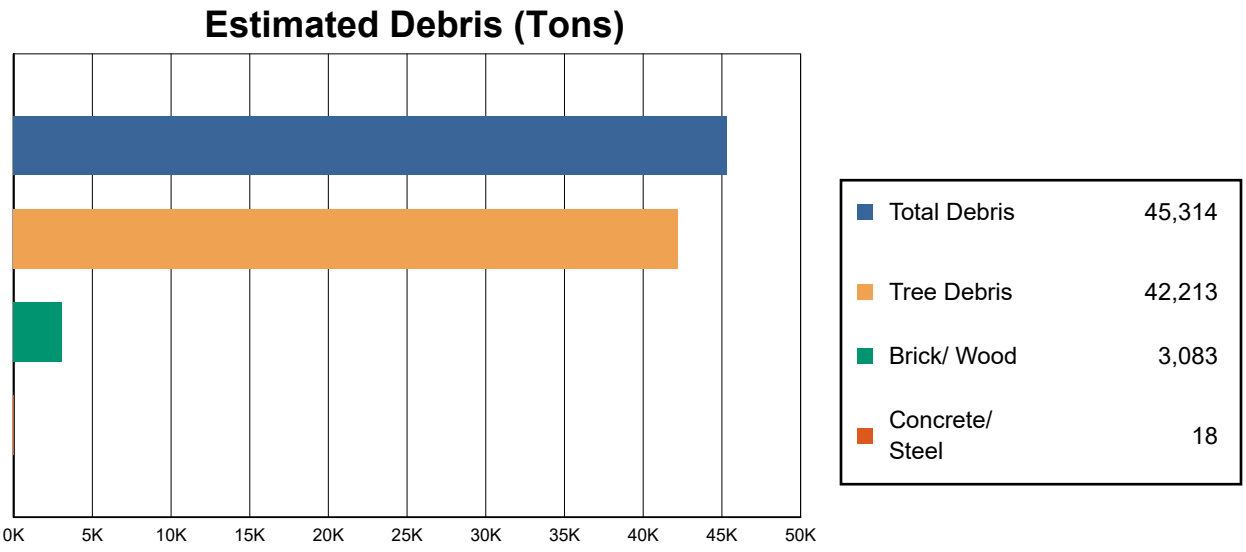
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Schools	1	0	0	0

Induced Hurricane Damage

Debris Generation

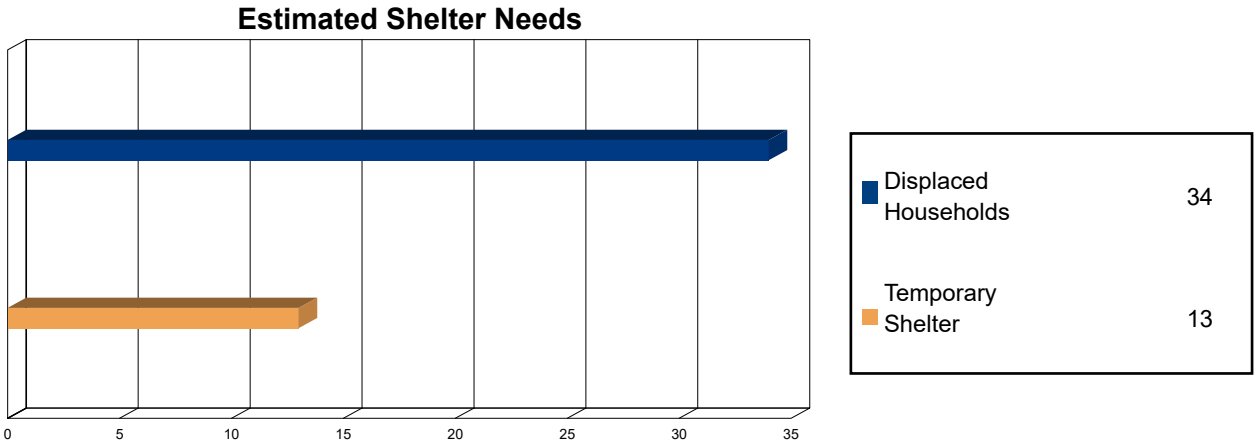


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 45,314 tons of debris will be generated. Of the total amount, 35,037 tons (77%) is Other Tree Debris. Of the remaining 10,277 tons, Brick/Wood comprises 30% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 124 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,176 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 13 people (out of a total population of 5,272) will seek temporary shelter in public shelters.

Economic Loss

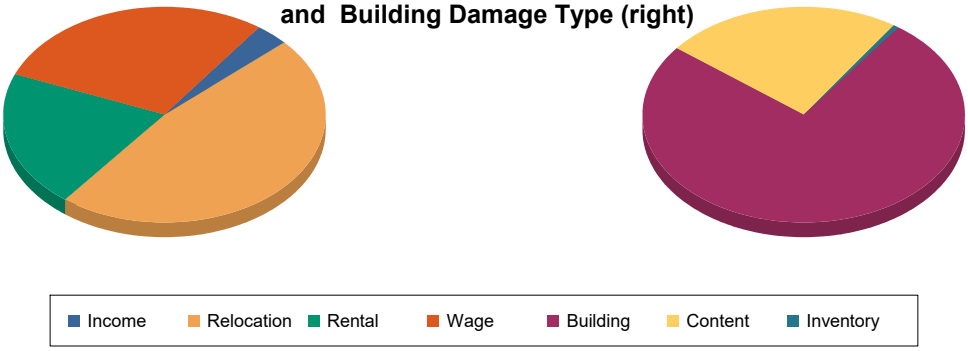
The total economic loss estimated for the hurricane is 48.5 million dollars, which represents 4.48 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 48 million dollars. 13% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

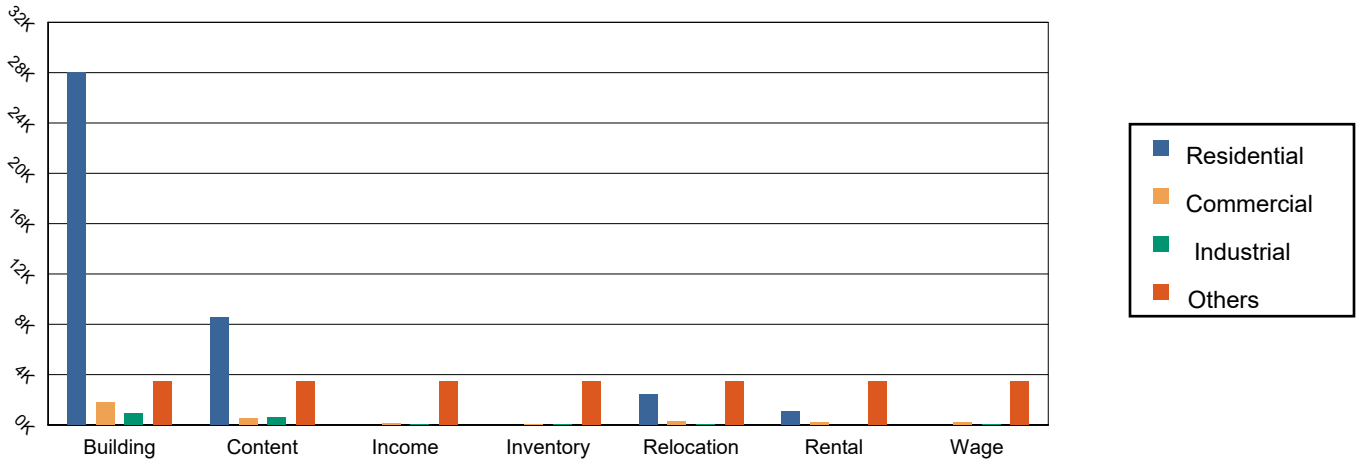


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	28,025.60	1,762.61	894.80	1,181.85	31,864.86
	Content	8,548.10	547.56	617.45	384.25	10,097.36
	Inventory	0.00	82.36	84.11	13.96	180.43
	Subtotal	**36,573.70**	**2,392.53**	**1,596.37**	**1,580.06**	**42,142.65**
Business Interruption Loss						
	Income	1.60	148.59	10.54	46.55	207.27
	Relocation	2,448.89	295.59	34.38	230.78	3,009.65
	Rental	1,090.95	162.76	6.77	36.63	1,297.11
	Wage	3.76	203.75	17.64	1,607.02	1,832.17
	Subtotal	**3,545.20**	**810.69**	**69.33**	**1,920.98**	**6,346.20**

Total

Total	**40,118.90**	**3,203.22**	**1,665.70**	**3,501.04**	**48,488.86**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,272	817,794	264,128	1,081,922
Total	**5,272**	**817,794**	**264,128**	**1,081,922**
Study Region Total	**5,272**	**817,794**	**264,128**	**1,081,922**

Hazus: Hurricane Global Risk Report

Region Name:	Coventry_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 38.26 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 12,235 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 2,161 million dollars. Approximately 91% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,181 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

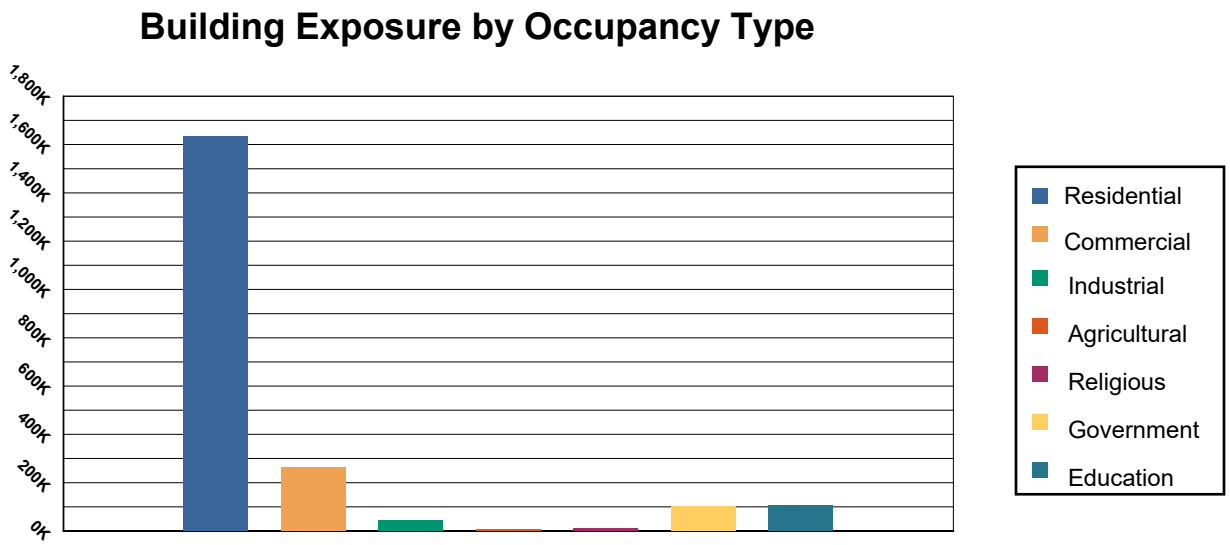


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,633,662	75.61%
Commercial	263,635	12.20%
Industrial	42,304	1.96%
Agricultural	5,273	0.24%
Religious	10,402	0.48%
Government	100,012	4.63%
Education	105,243	4.87%
Total	**2,160,531**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

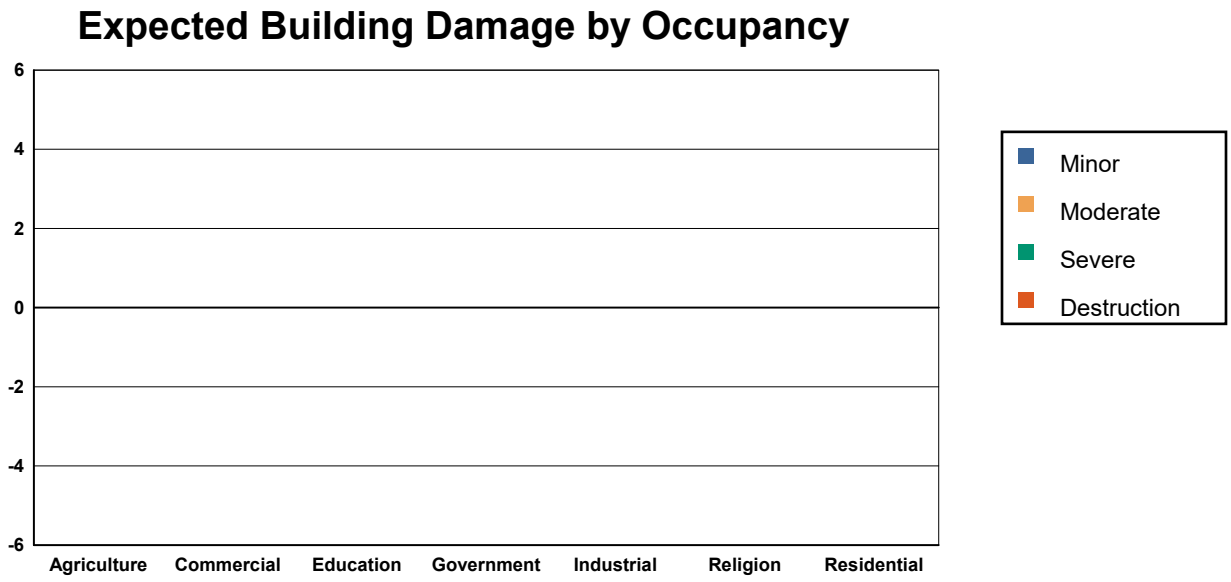


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	238.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	5.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	135.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	44.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	16.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	4,736.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**5,181.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	56	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	380	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	234	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	4,510	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

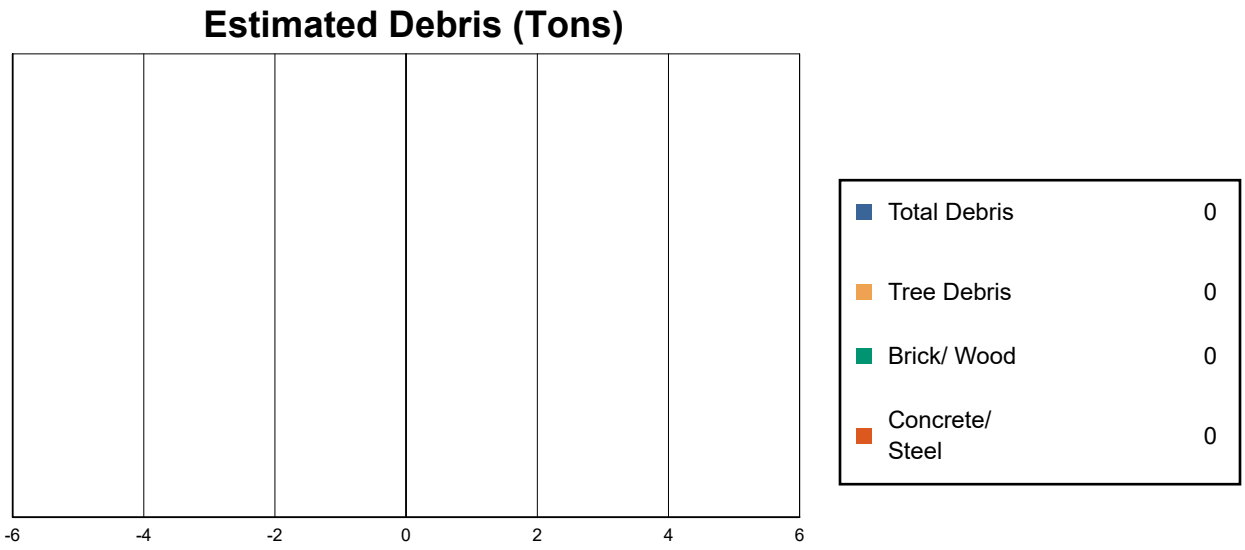
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

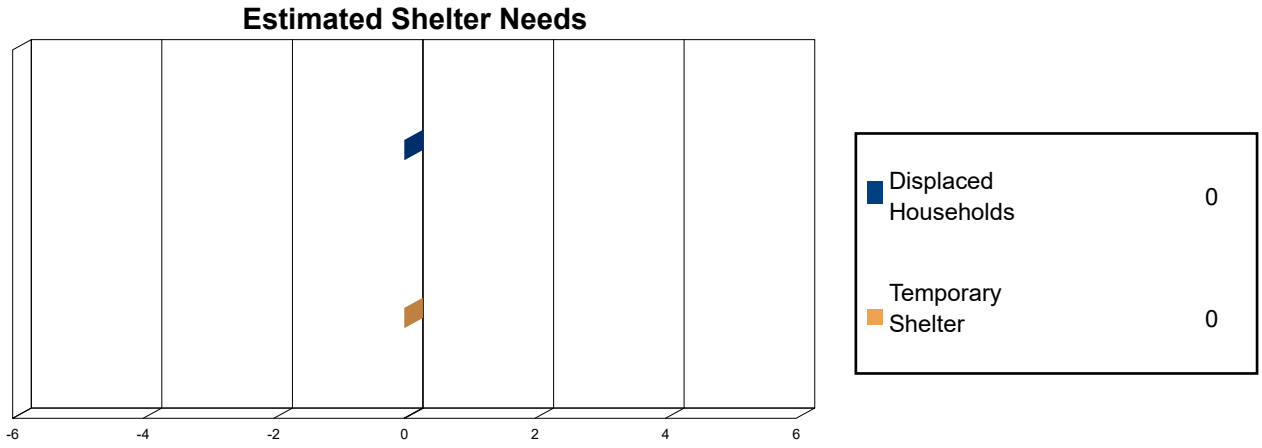


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 12,235) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

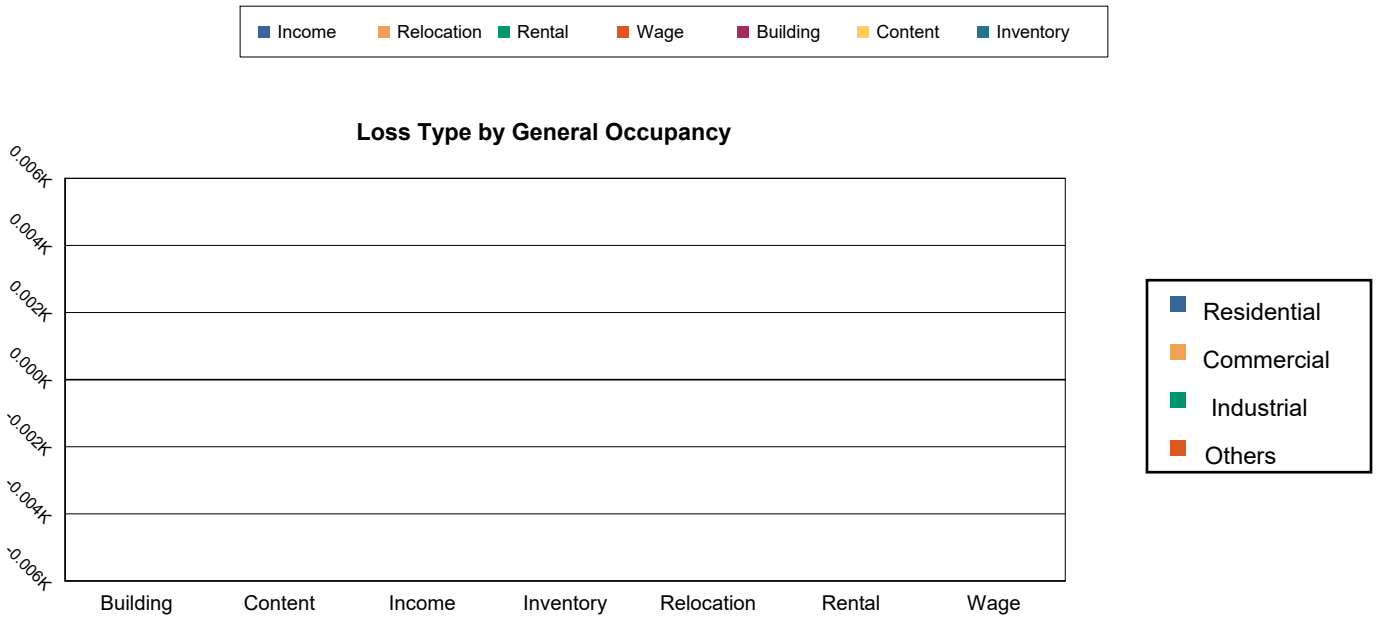


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,662	526,869	2,160,531
Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**
Study Region Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**

Hazus: Hurricane Global Risk Report

Region Name:	Coventry_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 38.26 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 12,235 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 2,161 million dollars. Approximately 91% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,181 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

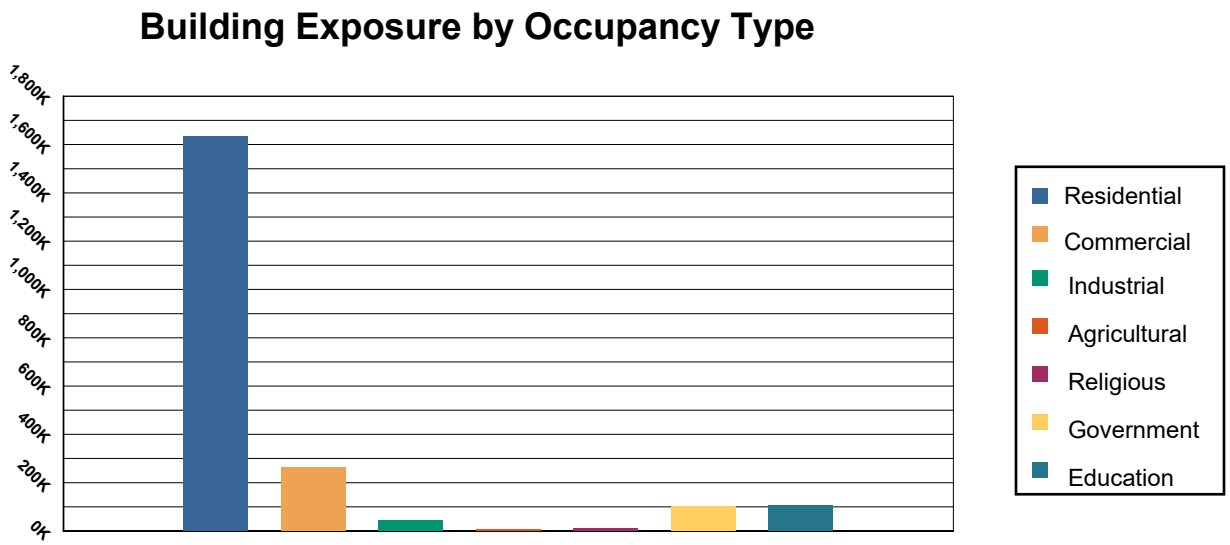


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,633,662	75.61%
Commercial	263,635	12.20%
Industrial	42,304	1.96%
Agricultural	5,273	0.24%
Religious	10,402	0.48%
Government	100,012	4.63%
Education	105,243	4.87%
Total	**2,160,531**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

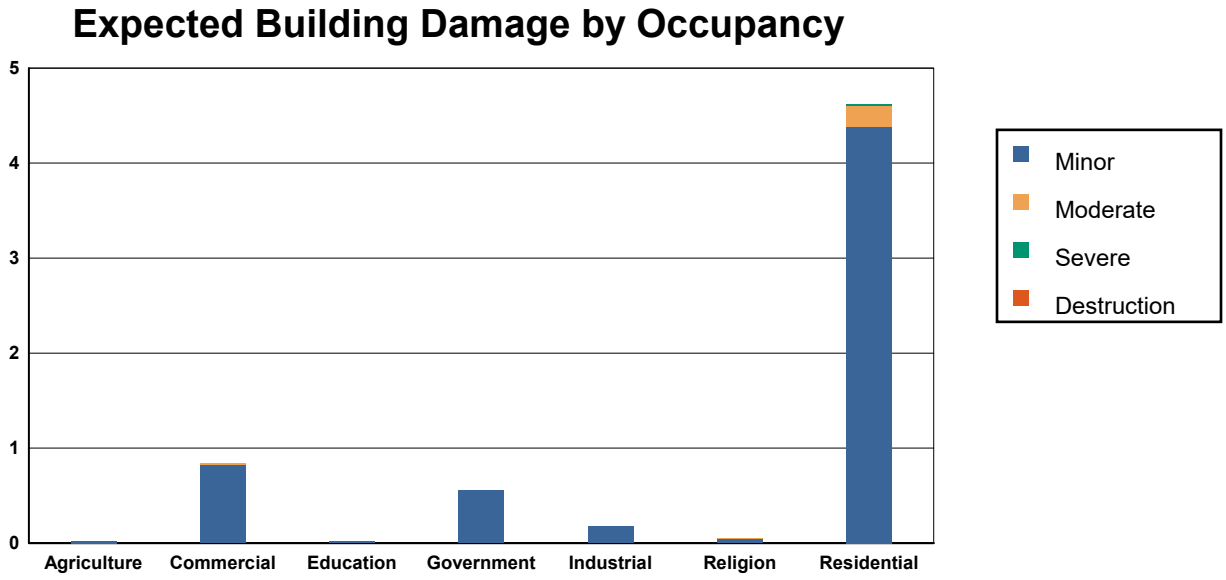


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.98	99.69	0.02	0.30	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	237.16	99.64	0.83	0.35	0.01	0.01	0.00	0.00	0.00	0.00
Education	4.98	99.62	0.02	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Government	134.45	99.59	0.55	0.41	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	43.82	99.60	0.18	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Religion	15.95	99.69	0.05	0.30	0.00	0.01	0.00	0.00	0.00	0.00
Residential	4,731.38	99.90	4.38	0.09	0.22	0.00	0.02	0.00	0.00	0.00
Total	**5,174.72**		**6.03**		**0.24**		**0.02**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	56	99.55	0	0.45	0	0.00	0	0.00	0	0.00
Masonry	378	99.53	2	0.44	0	0.02	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	233	99.60	1	0.40	0	0.00	0	0.00	0	0.00
Wood	4,507	99.94	3	0.06	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

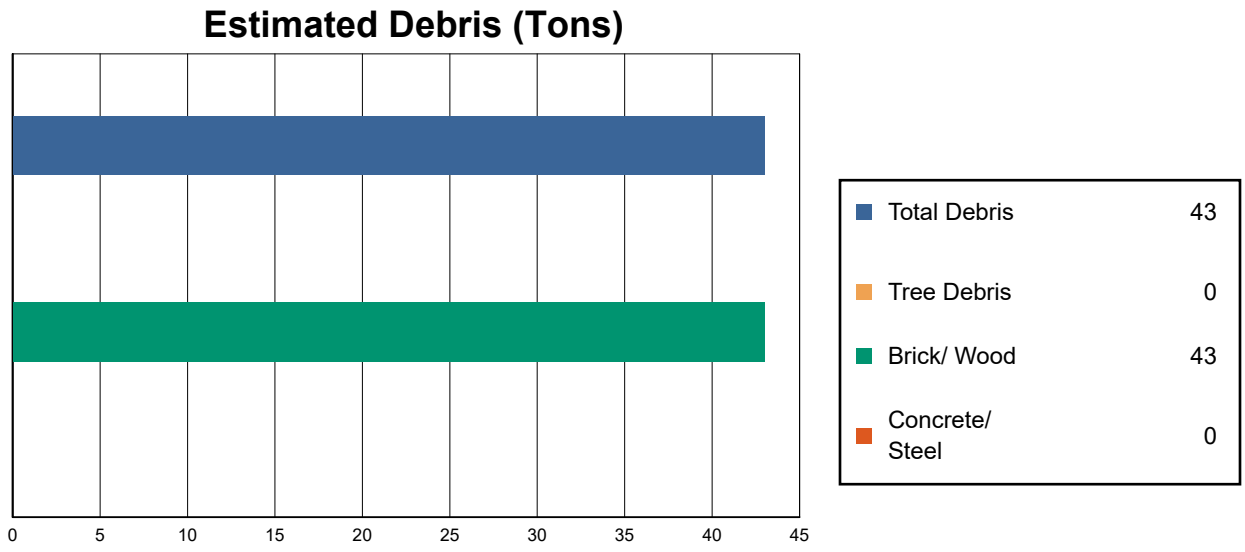
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

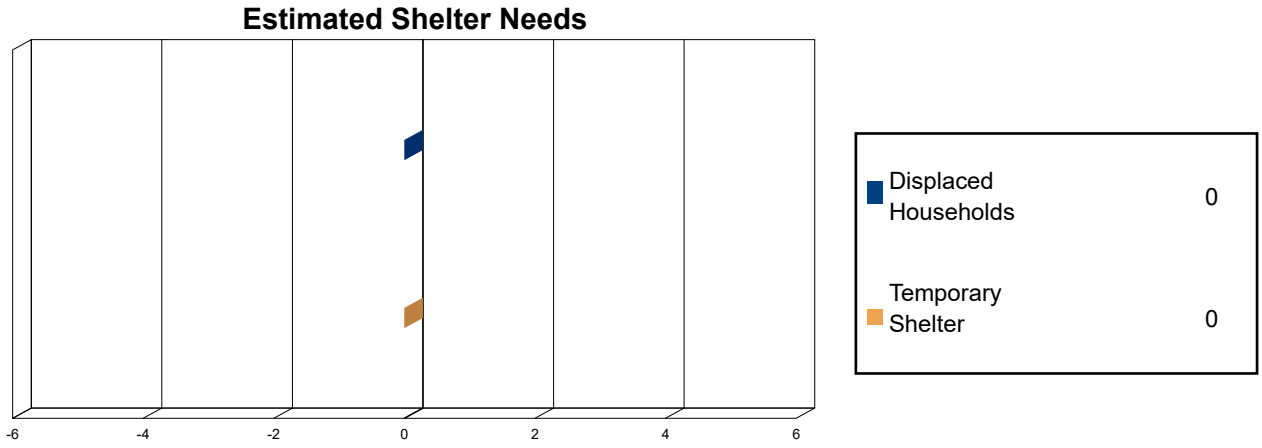


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 43 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 43 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 12,235) will seek temporary shelter in public shelters.

Economic Loss

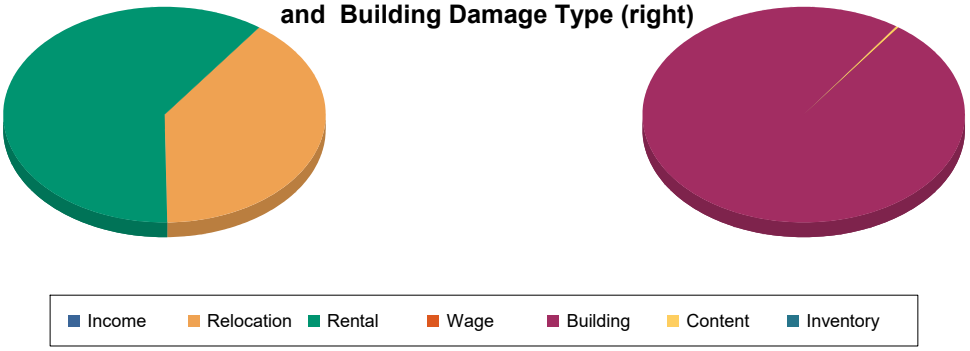
The total economic loss estimated for the hurricane is 0.7 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 93% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

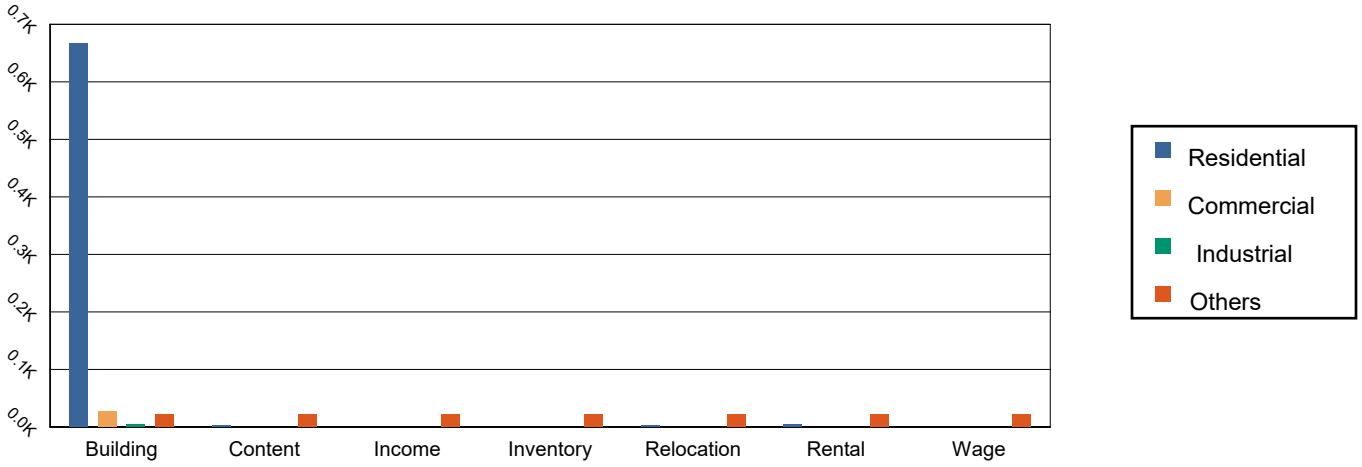


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	666.48	26.36	4.23	21.57	718.64
	Content	2.06	0.00	0.00	0.00	2.06
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**668.54**	**26.36**	**4.23**	**21.57**	**720.70**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	2.93	0.10	0.00	0.01	3.04
	Rental	4.60	0.00	0.00	0.00	4.60
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**7.53**	**0.10**	**0.00**	**0.01**	**7.64**

Total

Total	**676.07**	**26.47**	**4.23**	**21.57**	**728.34**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,662	526,869	2,160,531
Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**
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Hazus: Hurricane Global Risk Report

Region Name:	Coventry_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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Appendix B: Regional Population and Building Value Data	11

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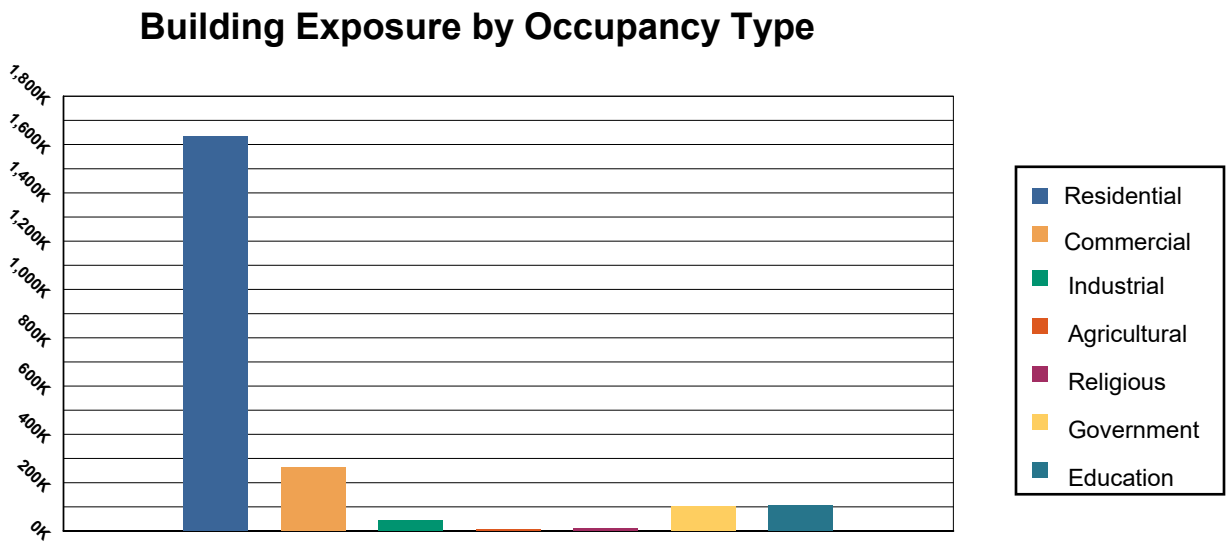

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Religious	10,402	0.48%
Government	100,012	4.63%
Education	105,243	4.87%
Total	**2,160,531**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

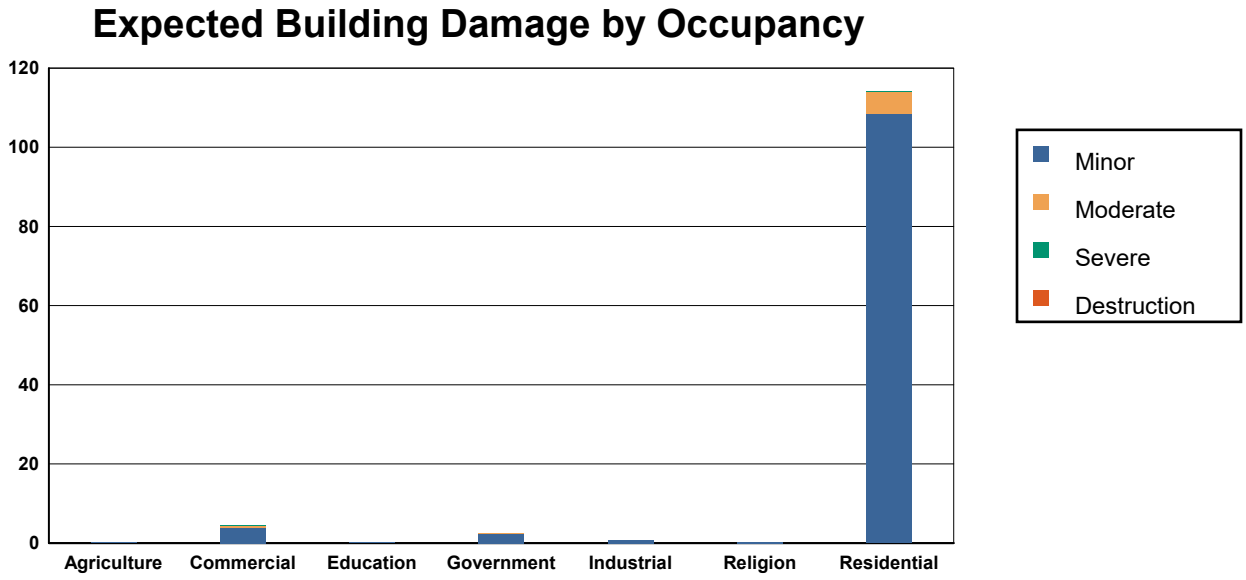


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.84	97.66	0.14	2.02	0.02	0.24	0.01	0.07	0.00	0.00
Commercial	233.55	98.13	3.83	1.61	0.58	0.25	0.04	0.01	0.00	0.00
Education	4.92	98.33	0.08	1.64	0.00	0.03	0.00	0.00	0.00	0.00
Government	132.67	98.28	2.29	1.70	0.03	0.02	0.00	0.00	0.00	0.00
Industrial	43.24	98.27	0.75	1.70	0.02	0.04	0.00	0.00	0.00	0.00
Religion	15.74	98.38	0.25	1.57	0.01	0.04	0.00	0.00	0.00	0.00
Residential	4,621.77	97.59	108.49	2.29	5.57	0.12	0.17	0.00	0.00	0.00
Total	**5,058.72**		**115.84**		**6.23**		**0.21**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	55	98.17	1	1.81	0	0.02	0	0.00	0	0.00
Masonry	369	97.18	9	2.41	1	0.39	0	0.02	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	230	98.18	4	1.60	0	0.21	0	0.01	0	0.00
Wood	4,408	97.73	99	2.20	3	0.07	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

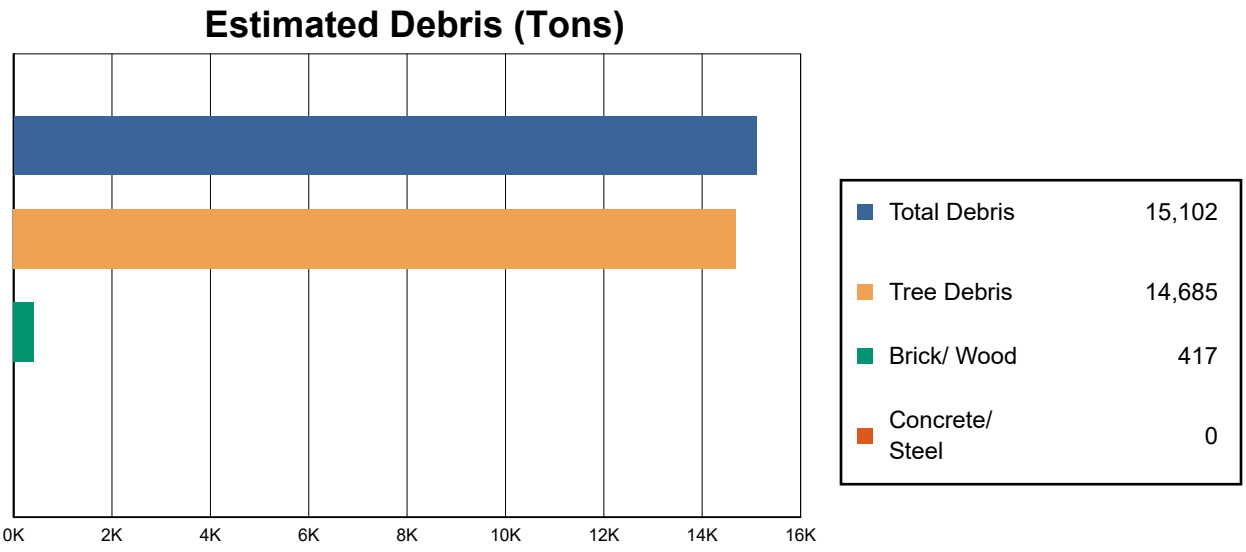
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

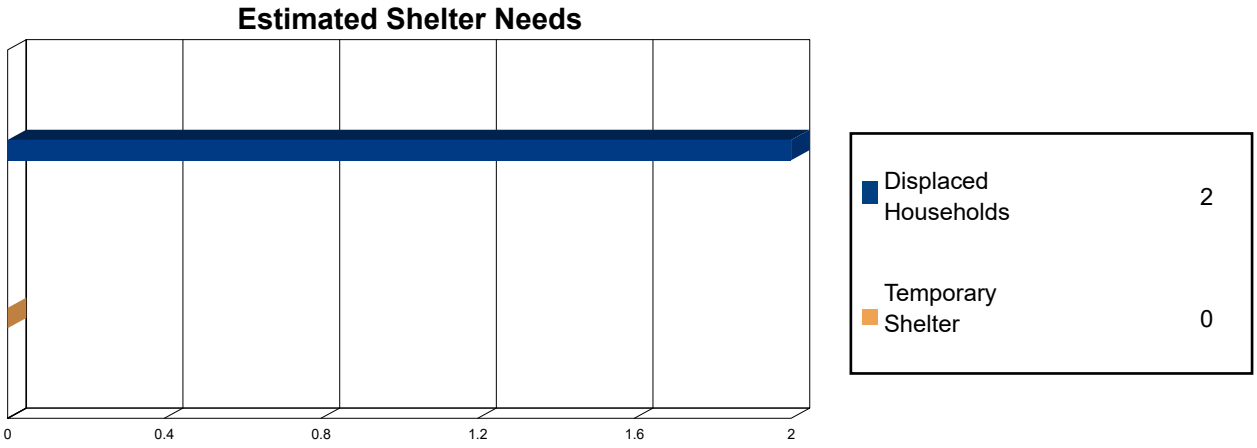


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15,102 tons of debris will be generated. Of the total amount, 11,898 tons (79%) is Other Tree Debris. Of the remaining 3,204 tons, Brick/Wood comprises 13% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 17 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,787 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 12,235) will seek temporary shelter in public shelters.

Economic Loss

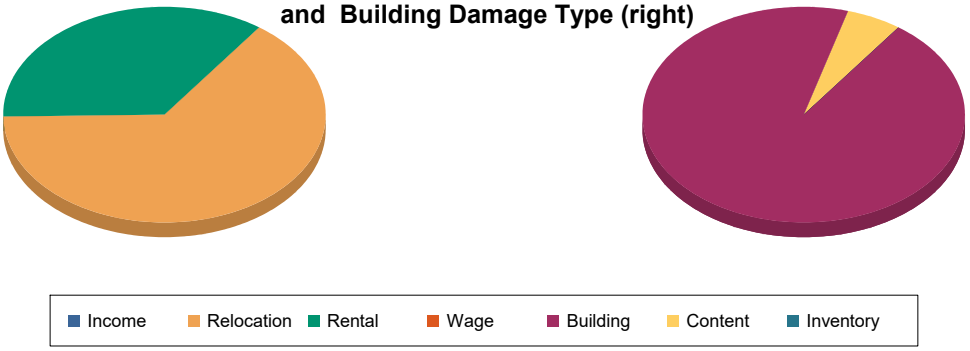
The total economic loss estimated for the hurricane is 6.3 million dollars, which represents 0.29 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 6 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

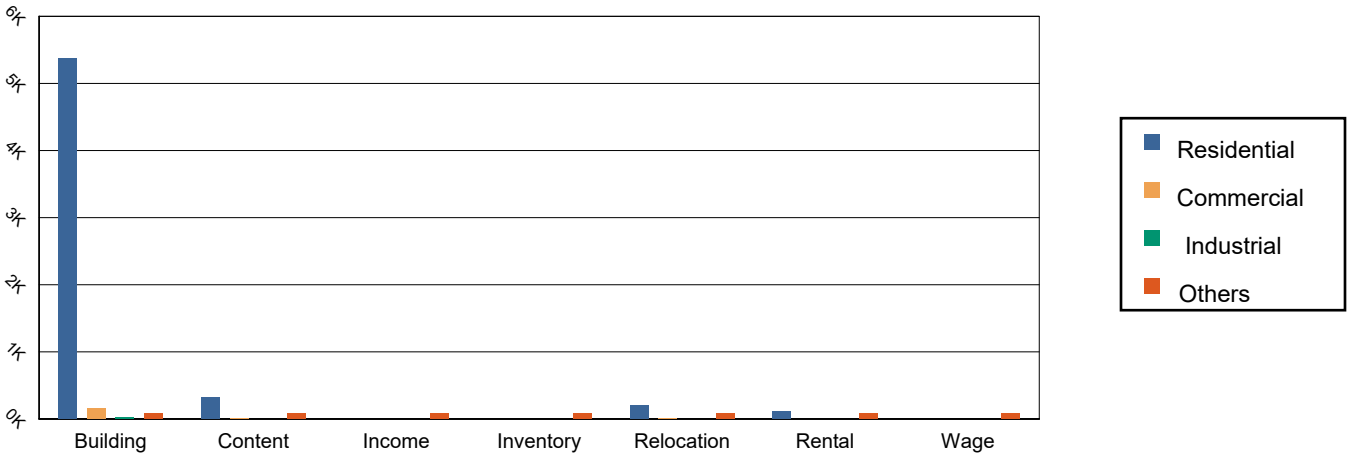


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,368.26	162.40	16.78	87.23	5,634.68
	Content	318.43	12.06	0.48	0.87	331.85
	Inventory	0.00	1.79	0.07	0.64	2.50
	Subtotal	**5,686.69**	**176.24**	**17.34**	**88.75**	**5,969.02**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	206.30	4.67	0.08	0.46	211.51
	Rental	115.78	0.00	0.00	0.00	115.78
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**322.08**	**4.67**	**0.08**	**0.46**	**327.29**

Total

Total	**6,008.77**	**180.92**	**17.42**	**89.21**	**6,296.31**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,662	526,869	2,160,531
Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**
Study Region Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**

Hazus: Hurricane Global Risk Report

Region Name:	Coventry_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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General Building Stock

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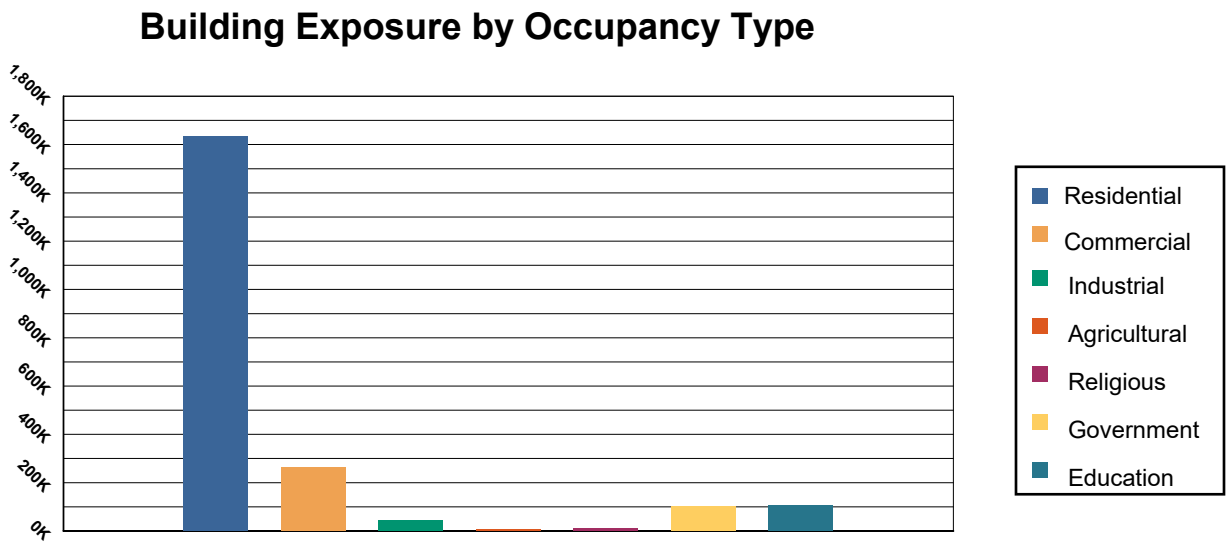


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,633,662	75.61%
Commercial	263,635	12.20%
Industrial	42,304	1.96%
Agricultural	5,273	0.24%
Religious	10,402	0.48%
Government	100,012	4.63%
Education	105,243	4.87%
Total	**2,160,531**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 30 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

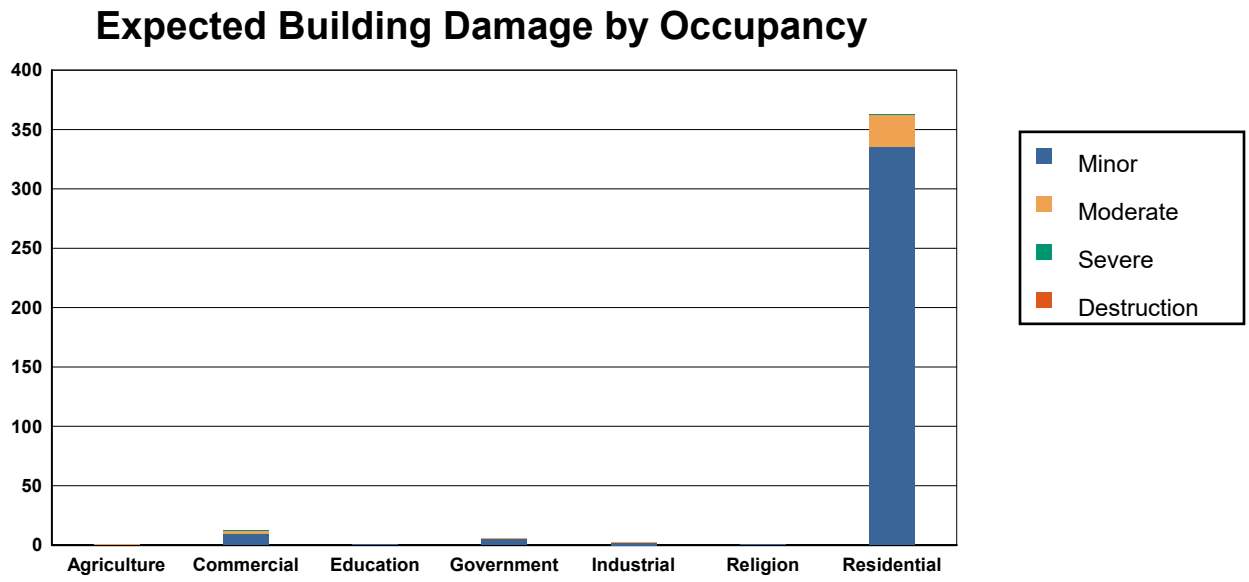


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.54	93.41	0.37	5.28	0.06	0.90	0.03	0.39	0.00	0.02
Commercial	225.69	94.83	9.99	4.20	1.99	0.84	0.33	0.14	0.00	0.00
Education	4.76	95.26	0.23	4.50	0.01	0.24	0.00	0.00	0.00	0.00
Government	129.18	95.69	5.55	4.11	0.26	0.20	0.00	0.00	0.00	0.00
Industrial	42.00	95.45	1.89	4.30	0.11	0.24	0.01	0.02	0.00	0.00
Religion	15.23	95.18	0.74	4.60	0.03	0.21	0.00	0.01	0.00	0.00
Residential	4,373.17	92.34	335.55	7.09	26.78	0.57	0.50	0.01	0.00	0.00
Total	**4,796.57**		**354.31**		**29.24**		**0.87**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	53	95.51	2	4.26	0	0.23	0	0.00	0	0.00
Masonry	353	93.02	22	5.69	5	1.24	0	0.05	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	223	95.32	9	3.80	2	0.75	0	0.13	0	0.00
Wood	4,173	92.53	317	7.04	19	0.42	1	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

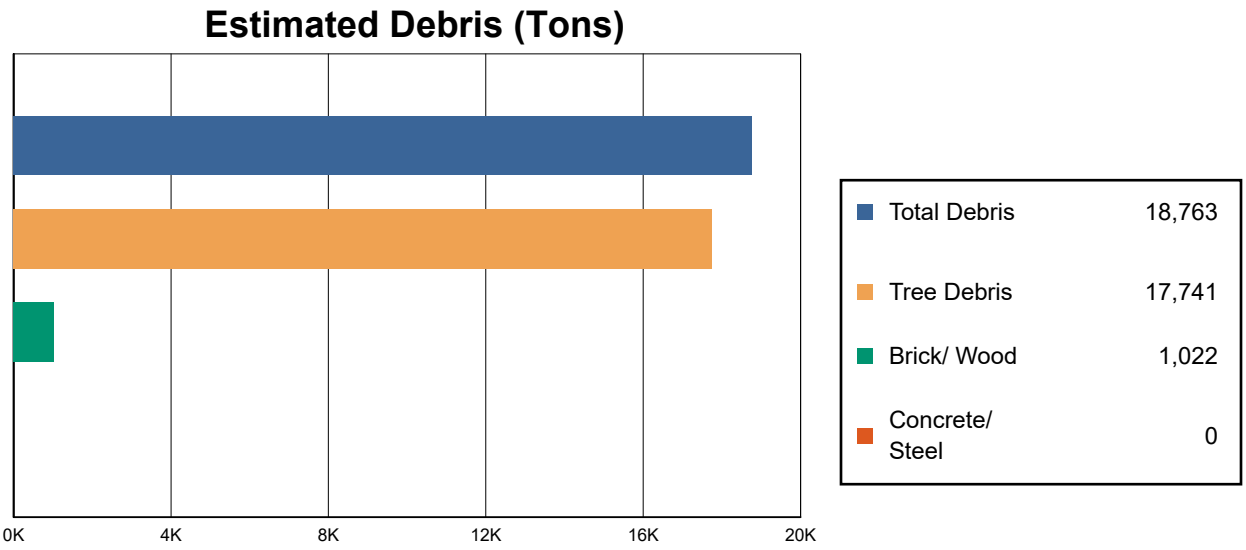
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

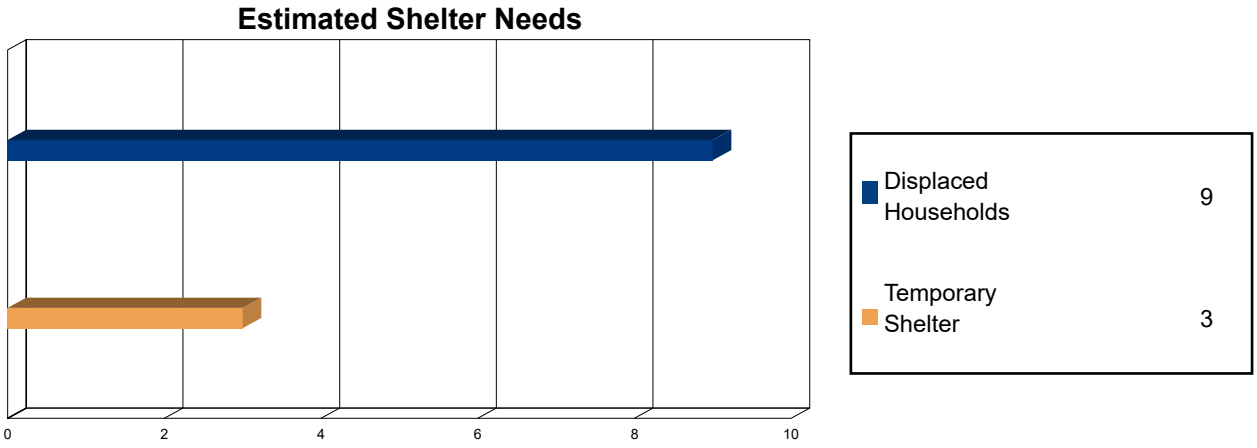


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 18,763 tons of debris will be generated. Of the total amount, 14,350 tons (76%) is Other Tree Debris. Of the remaining 4,413 tons, Brick/Wood comprises 23% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 41 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,391 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 9 households to be displaced due to the hurricane. Of these, 3 people (out of a total population of 12,235) will seek temporary shelter in public shelters.

Economic Loss

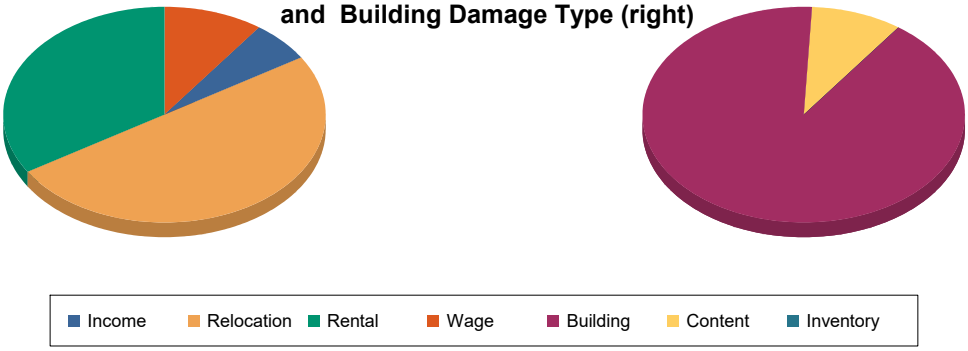
The total economic loss estimated for the hurricane is 13.1 million dollars, which represents 0.60 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 13 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 92% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

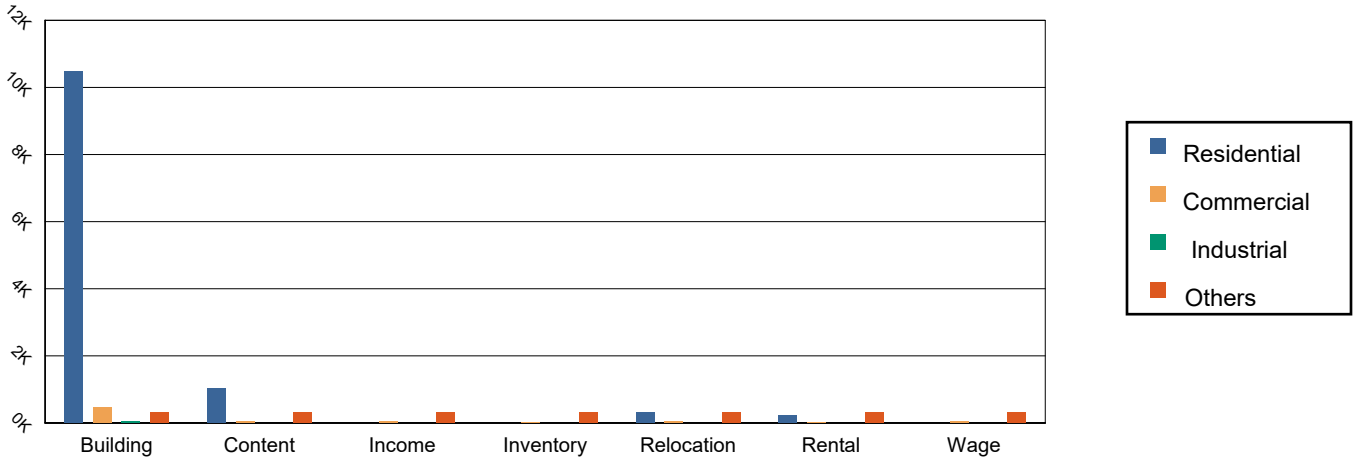


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	10,458.81	453.54	43.00	260.50	11,215.85
	Content	1,032.23	58.11	3.30	16.31	1,109.94
	Inventory	0.00	10.80	0.38	2.73	13.91
	Subtotal	**11,491.04**	**522.45**	**46.68**	**279.54**	**12,339.71**
Business Interruption Loss						
	Income	0.00	37.95	0.03	5.78	43.76
	Relocation	299.60	52.30	0.71	8.15	360.75
	Rental	217.00	25.21	0.02	0.47	242.70
	Wage	0.00	59.28	0.05	13.63	72.96
	Subtotal	**516.60**	**174.73**	**0.82**	**28.02**	**720.18**

Total

Total	**12,007.64**	**697.19**	**47.50**	**307.56**	**13,059.88**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,662	526,869	2,160,531
Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**
Study Region Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**

Hazus: Hurricane Global Risk Report

Region Name:	Coventry_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

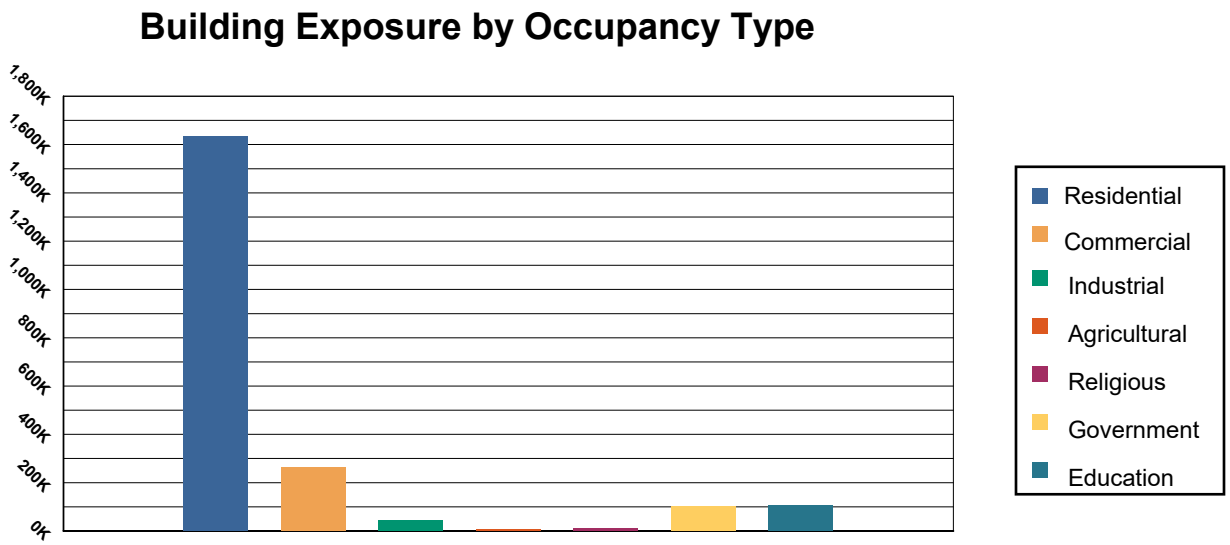
The geographical size of the region is 38.26 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 12,235 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 2,161 million dollars. Approximately 91% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,181 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.



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Residential	1,633,662	75.61%
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Agricultural	5,273	0.24%
Religious	10,402	0.48%
Government	100,012	4.63%
Education	105,243	4.87%
Total	**2,160,531**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 90 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

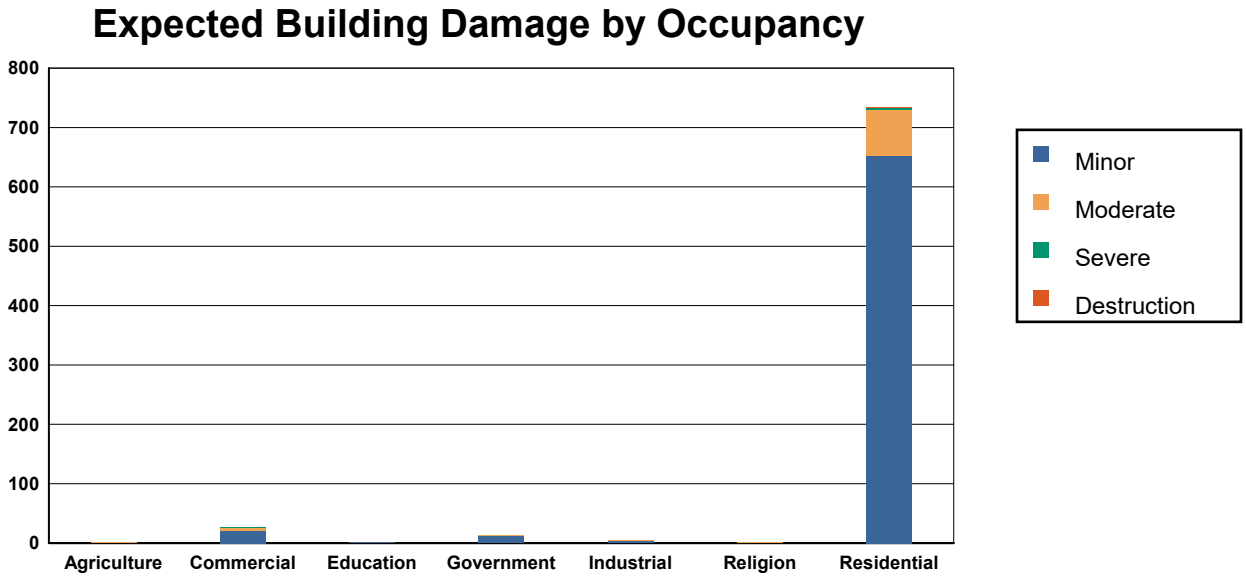


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.05	86.49	0.71	10.18	0.15	2.20	0.07	1.05	0.01	0.09
Commercial	211.44	88.84	20.45	8.59	4.90	2.06	1.20	0.51	0.00	0.00
Education	4.47	89.30	0.47	9.49	0.06	1.17	0.00	0.04	0.00	0.00
Government	122.30	90.59	11.36	8.41	1.31	0.97	0.03	0.03	0.00	0.00
Industrial	39.57	89.93	3.90	8.87	0.49	1.12	0.03	0.07	0.00	0.00
Religion	14.29	89.28	1.56	9.74	0.15	0.93	0.01	0.05	0.00	0.00
Residential	4,002.56	84.51	651.98	13.77	77.87	1.64	2.47	0.05	1.12	0.02
Total	**4,400.68**		**690.43**		**84.94**		**3.82**		**1.13**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	51	90.28	5	8.56	1	1.14	0	0.03	0	0.00
Masonry	328	86.44	40	10.58	11	2.83	1	0.14	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	210	89.87	18	7.70	5	1.94	1	0.49	0	0.00
Wood	3,820	84.71	624	13.83	63	1.39	2	0.05	1	0.02

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

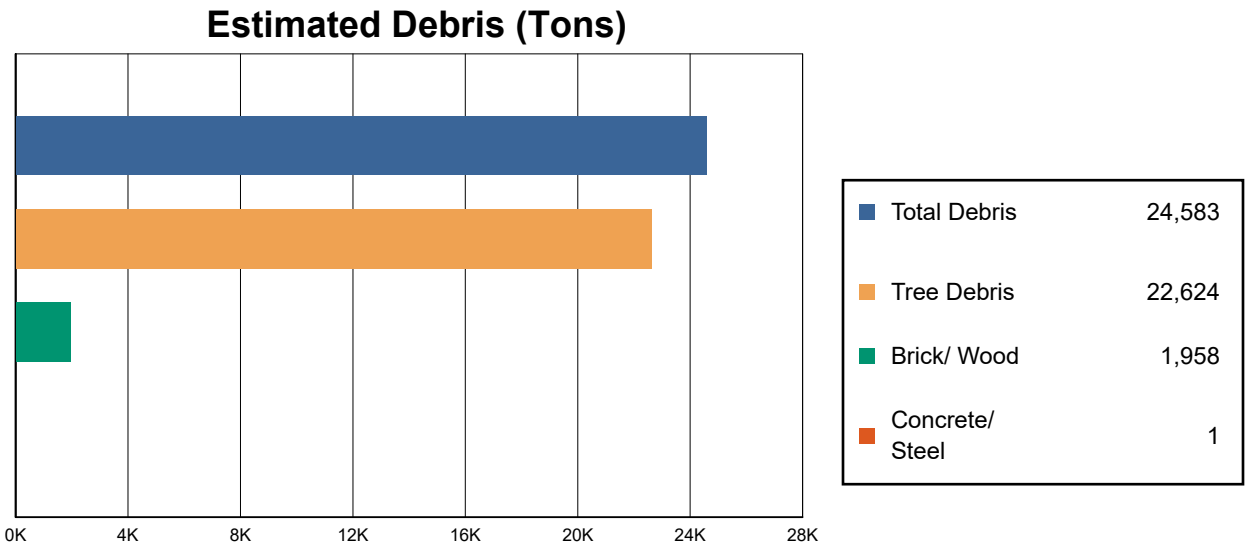
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

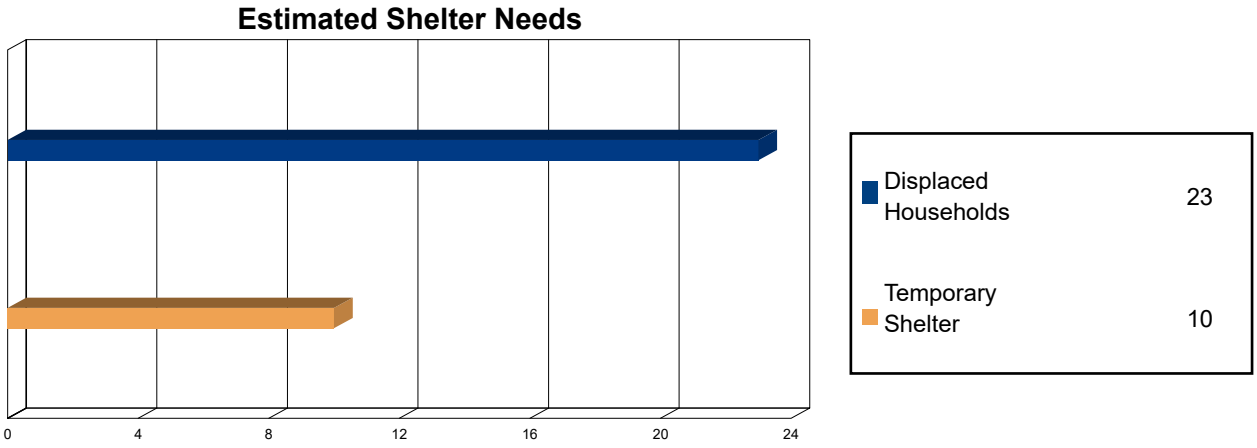


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 24,583 tons of debris will be generated. Of the total amount, 18,208 tons (74%) is Other Tree Debris. Of the remaining 6,375 tons, Brick/Wood comprises 31% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 78 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,416 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 23 households to be displaced due to the hurricane. Of these, 10 people (out of a total population of 12,235) will seek temporary shelter in public shelters.

Economic Loss

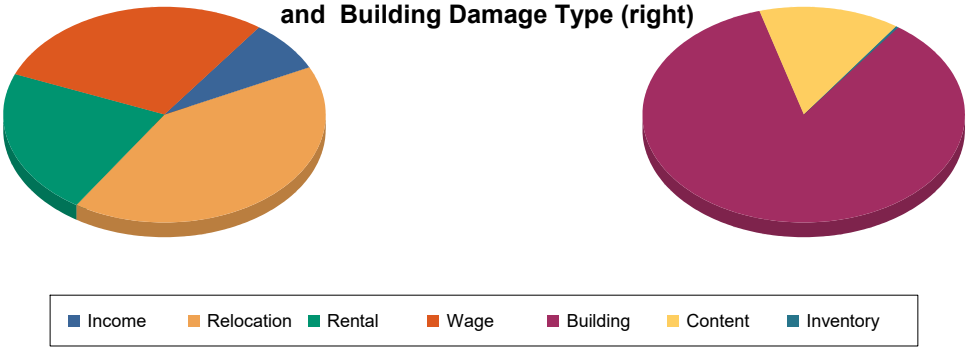
The total economic loss estimated for the hurricane is 25.7 million dollars, which represents 1.19 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 26 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

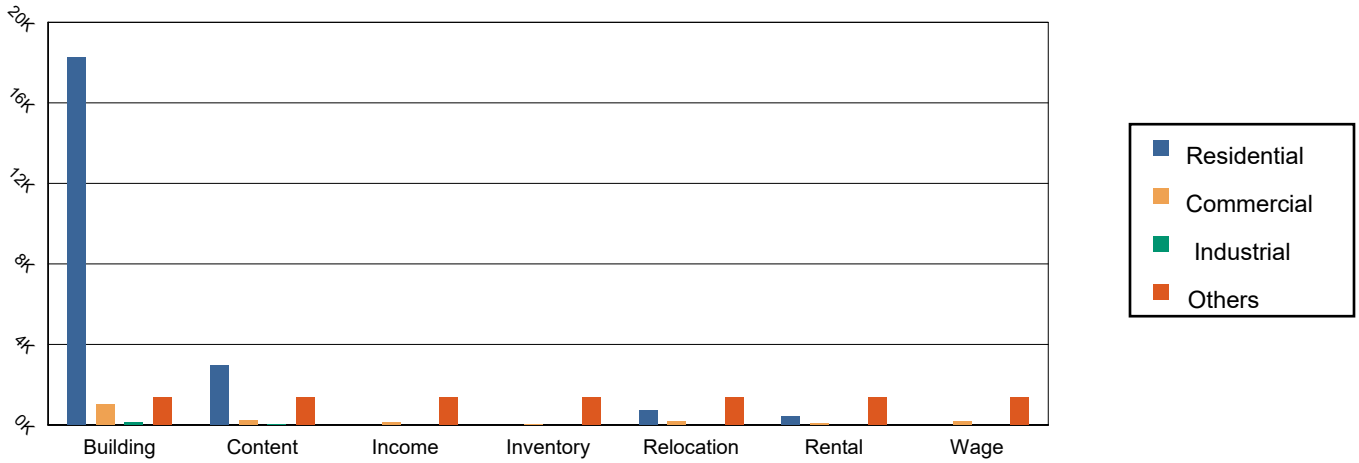


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	18,268.12	1,019.17	102.76	609.96	20,000.01
	Content	2,948.97	231.51	21.39	82.66	3,284.53
	Inventory	0.00	46.18	2.55	9.12	57.84
	Subtotal	**21,217.09**	**1,296.86**	**126.70**	**701.73**	**23,342.38**
Business Interruption Loss						
	Income	0.00	126.90	1.83	48.87	177.60
	Relocation	706.84	154.44	5.88	99.11	966.27
	Rental	410.94	79.58	0.87	18.91	510.30
	Wage	0.00	168.61	2.55	497.06	668.23
	Subtotal	**1,117.78**	**529.53**	**11.14**	**663.95**	**2,322.40**

Total

Total	**22,334.88**	**1,826.38**	**137.83**	**1,365.68**	**25,664.77**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,662	526,869	2,160,531
Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**
Study Region Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**

Hazus: Hurricane Global Risk Report

Region Name:	Coventry_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 2,161 million dollars. Approximately 91% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

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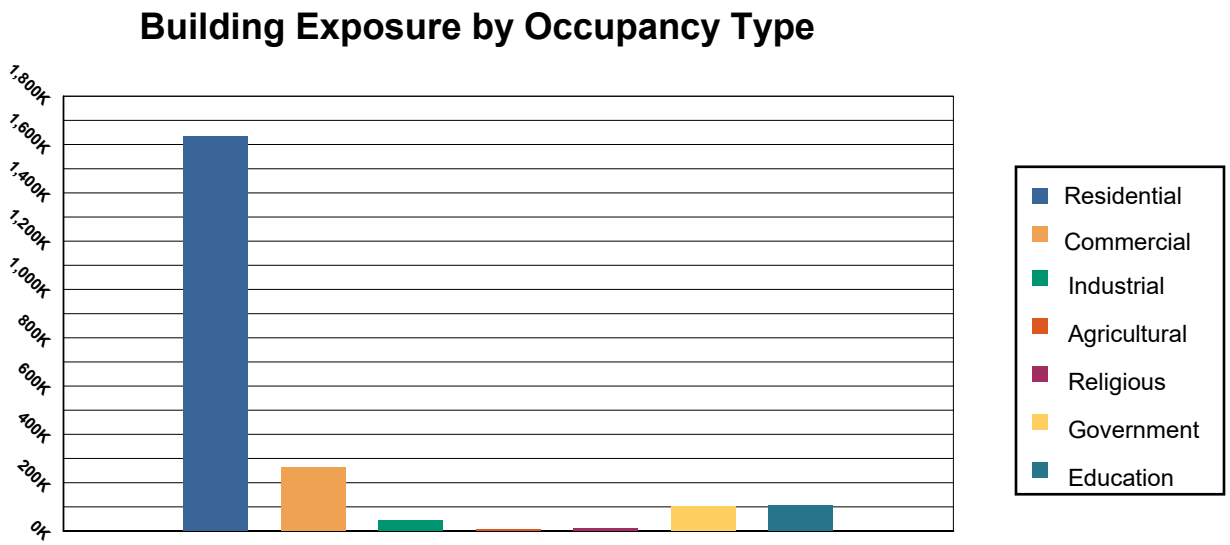

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Government	100,012	4.63%
Education	105,243	4.87%
Total	**2,160,531**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 240 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 6 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

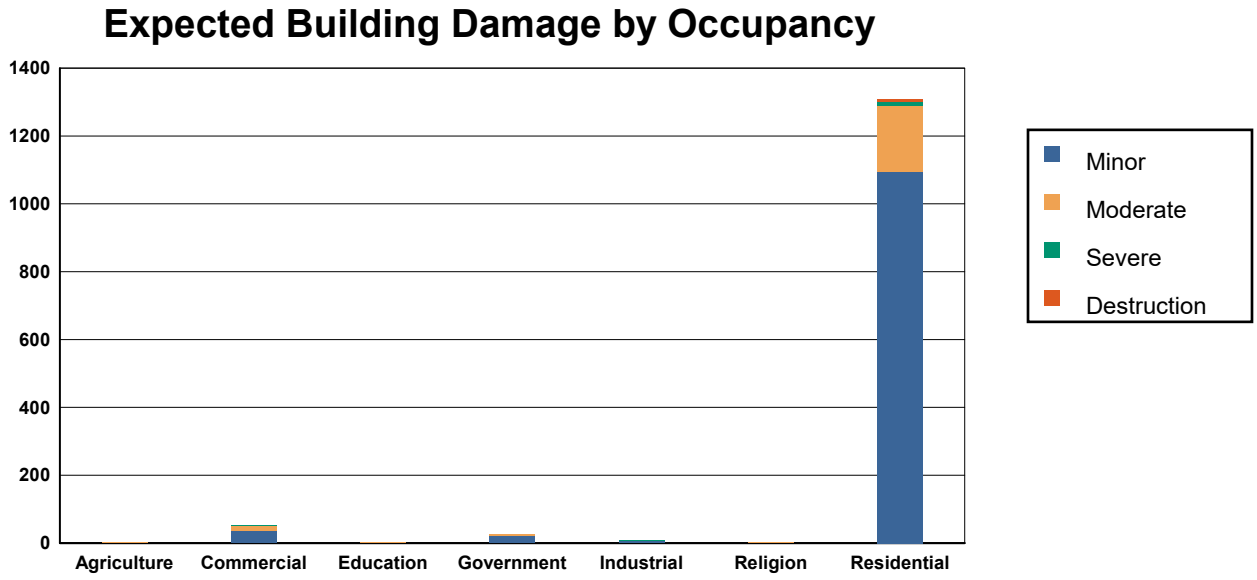


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	5.14	73.38	1.29	18.44	0.37	5.31	0.18	2.54	0.02	0.33
Commercial	185.23	77.83	37.24	15.65	12.35	5.19	3.16	1.33	0.02	0.01
Education	3.94	78.81	0.84	16.83	0.21	4.15	0.01	0.21	0.00	0.00
Government	108.09	80.07	21.36	15.83	5.29	3.92	0.25	0.19	0.00	0.00
Industrial	34.91	79.35	7.12	16.18	1.82	4.14	0.14	0.31	0.01	0.01
Religion	12.51	78.20	2.89	18.06	0.57	3.55	0.03	0.19	0.00	0.00
Residential	3,427.06	72.36	1,093.80	23.10	195.40	4.13	13.35	0.28	6.39	0.13
Total	**3,776.89**		**1,164.54**		**216.01**		**17.12**		**6.44**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	45	79.63	9	15.79	2	4.40	0	0.19	0	0.00
Masonry	286	75.20	68	17.93	24	6.40	2	0.42	0	0.05
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	185	79.21	33	14.25	12	5.19	3	1.35	0	0.01
Wood	3,270	72.51	1,053	23.35	169	3.74	12	0.26	6	0.13

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

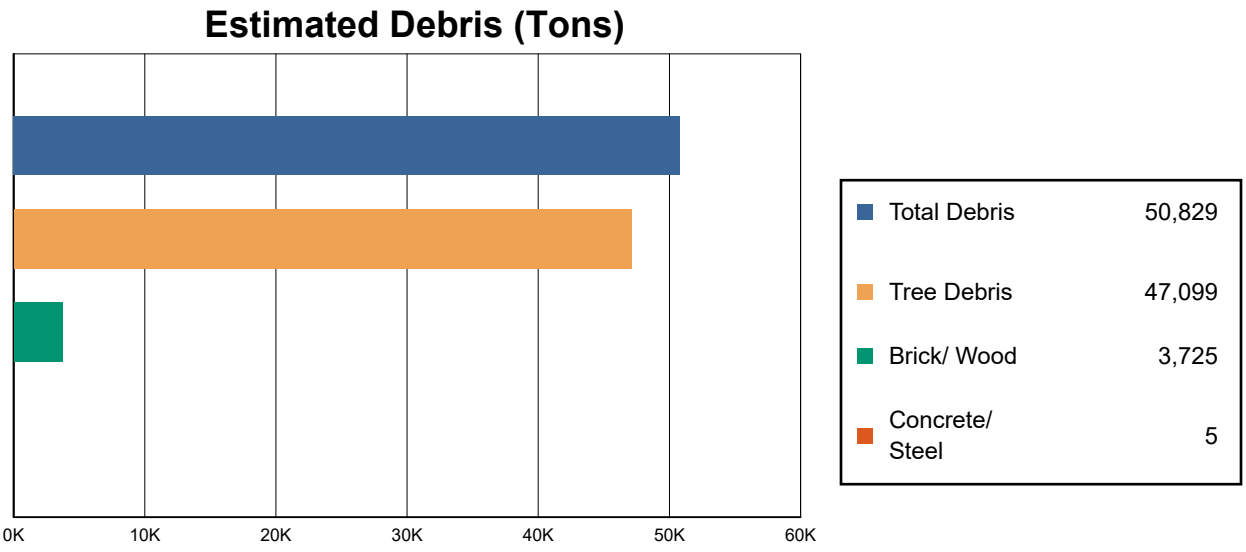
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

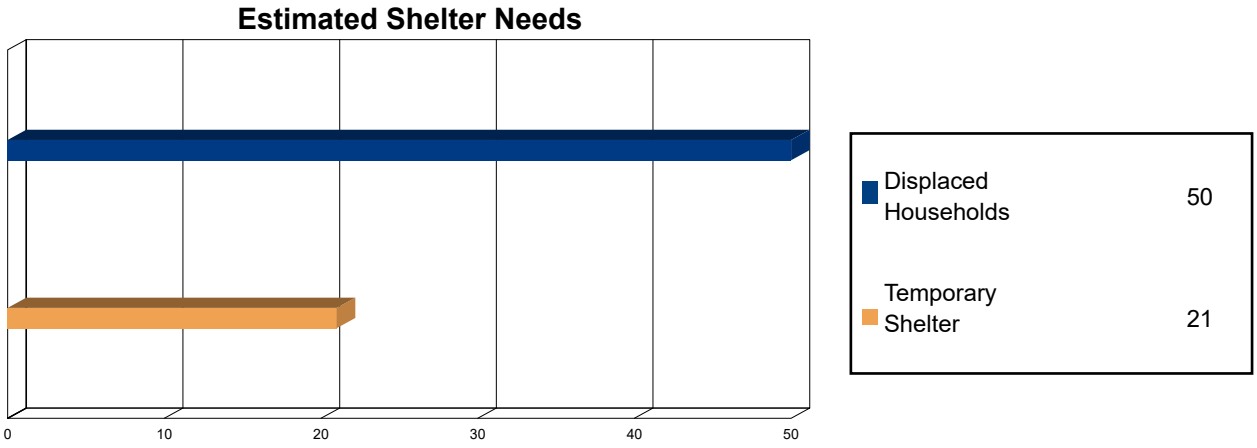


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 50,829 tons of debris will be generated. Of the total amount, 38,038 tons (75%) is Other Tree Debris. Of the remaining 12,791 tons, Brick/Wood comprises 29% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 149 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,061 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 50 households to be displaced due to the hurricane. Of these, 21 people (out of a total population of 12,235) will seek temporary shelter in public shelters.

Economic Loss

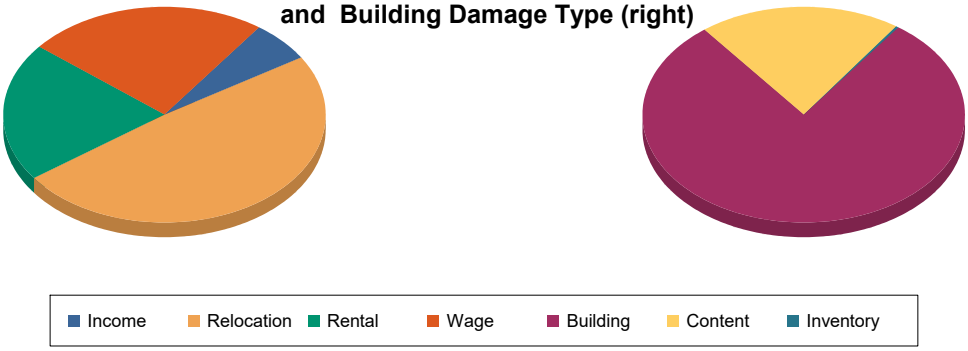
The total economic loss estimated for the hurricane is 54.6 million dollars, which represents 2.52 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 55 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 86% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

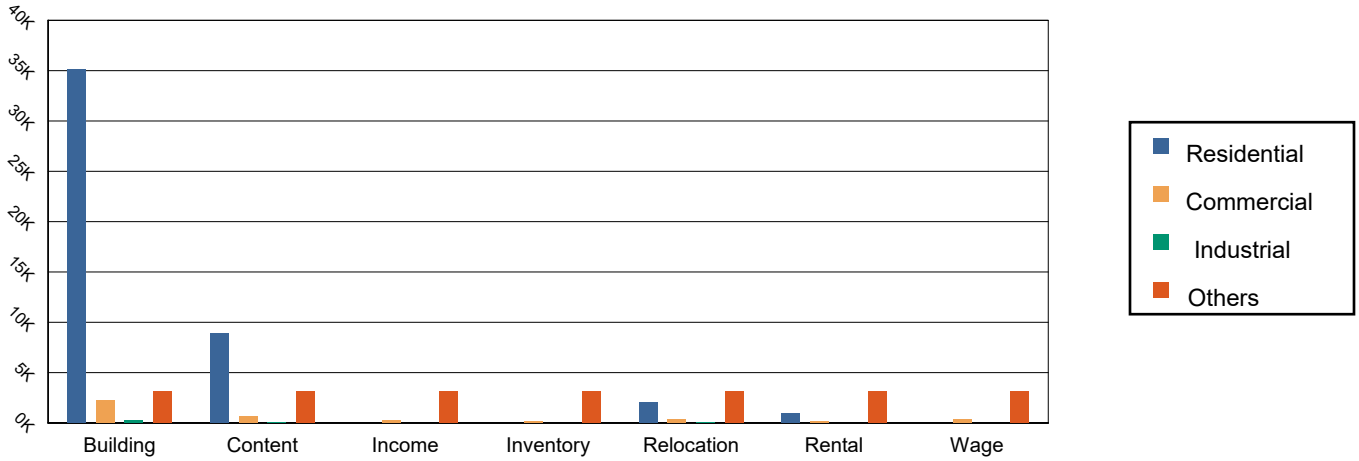


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	35,077.58	2,222.17	252.33	1,412.80	38,964.89
	Content	8,901.33	644.59	76.00	304.87	9,926.79
	Inventory	0.00	131.06	9.31	26.21	166.58
	Subtotal	**43,978.92**	**2,997.82**	**337.63**	**1,743.89**	**49,058.26**
Business Interruption Loss						
	Income	0.00	227.49	4.15	105.57	337.21
	Relocation	2,049.00	346.64	19.39	265.33	2,680.35
	Rental	935.08	169.70	2.29	44.66	1,151.73
	Wage	0.00	302.17	5.81	1,016.09	1,324.07
	Subtotal	**2,984.08**	**1,046.00**	**31.64**	**1,431.65**	**5,493.37**

Total

Total	**46,962.99**	**4,043.82**	**369.27**	**3,175.53**	**54,551.62**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,662	526,869	2,160,531
Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**
Study Region Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**

Hazus: Hurricane Global Risk Report

Region Name:	Coventry_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 38.26 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 12,235 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 2,161 million dollars. Approximately 91% of the buildings (and 76% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,181 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

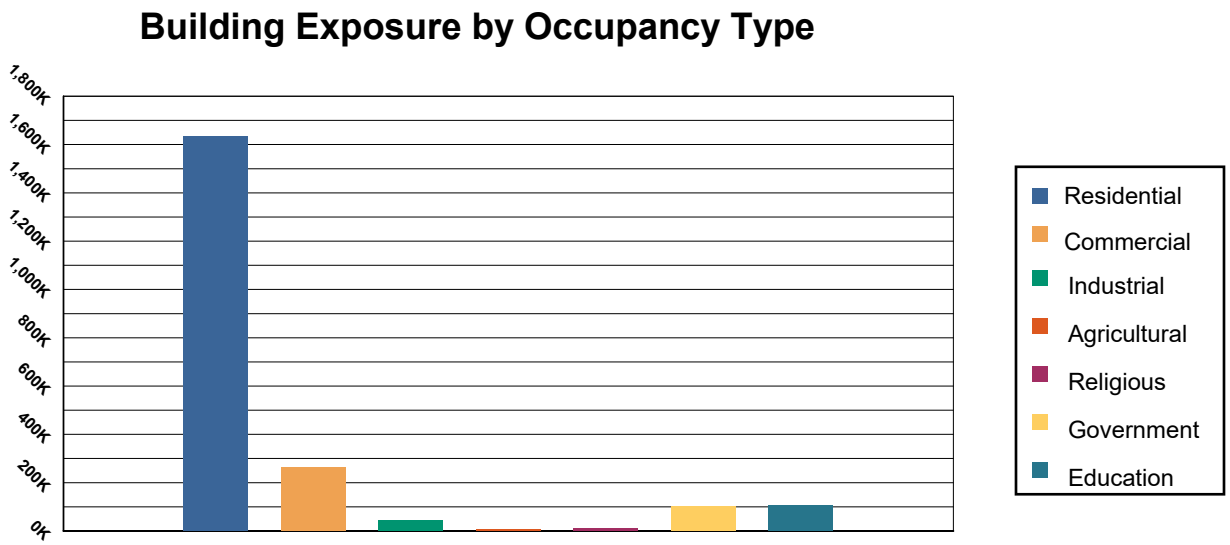


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,633,662	75.61%
Commercial	263,635	12.20%
Industrial	42,304	1.96%
Agricultural	5,273	0.24%
Religious	10,402	0.48%
Government	100,012	4.63%
Education	105,243	4.87%
Total	**2,160,531**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 400 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. There are an estimated 17 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

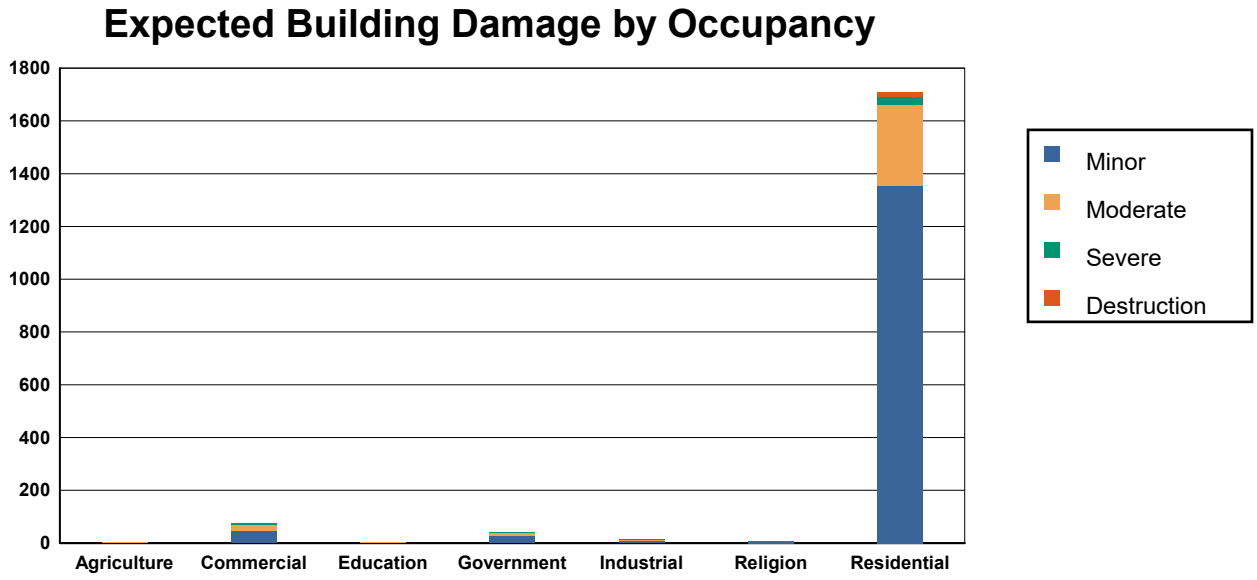


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4.47	63.92	1.64	23.47	0.57	8.15	0.27	3.88	0.04	0.57
Commercial	163.81	68.83	47.87	20.11	20.82	8.75	5.45	2.29	0.06	0.02
Education	3.49	69.78	1.08	21.56	0.40	7.96	0.03	0.70	0.00	0.00
Government	95.85	71.00	27.74	20.55	10.51	7.78	0.91	0.67	0.00	0.00
Industrial	30.93	70.28	9.16	20.83	3.52	8.01	0.38	0.86	0.01	0.02
Religion	11.06	69.15	3.75	23.43	1.10	6.87	0.09	0.55	0.00	0.00
Residential	3,026.55	63.91	1,353.38	28.58	308.30	6.51	31.15	0.66	16.64	0.35
Total	**3,336.16**		**1,444.61**		**345.21**		**38.27**		**16.74**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	39	70.46	11	20.26	5	8.58	0	0.70	0	0.00
Masonry	253	66.61	85	22.33	38	10.05	3	0.90	0	0.11
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	164	70.17	43	18.36	21	9.04	6	2.41	0	0.02
Wood	2,887	64.02	1,308	29.00	271	6.00	28	0.62	16	0.35

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

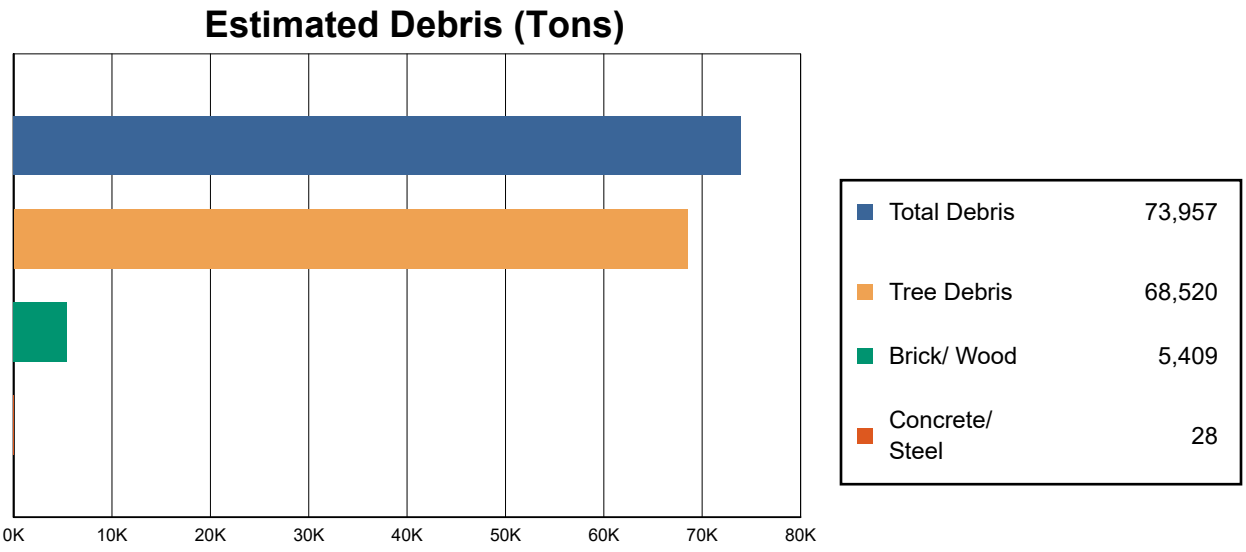
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

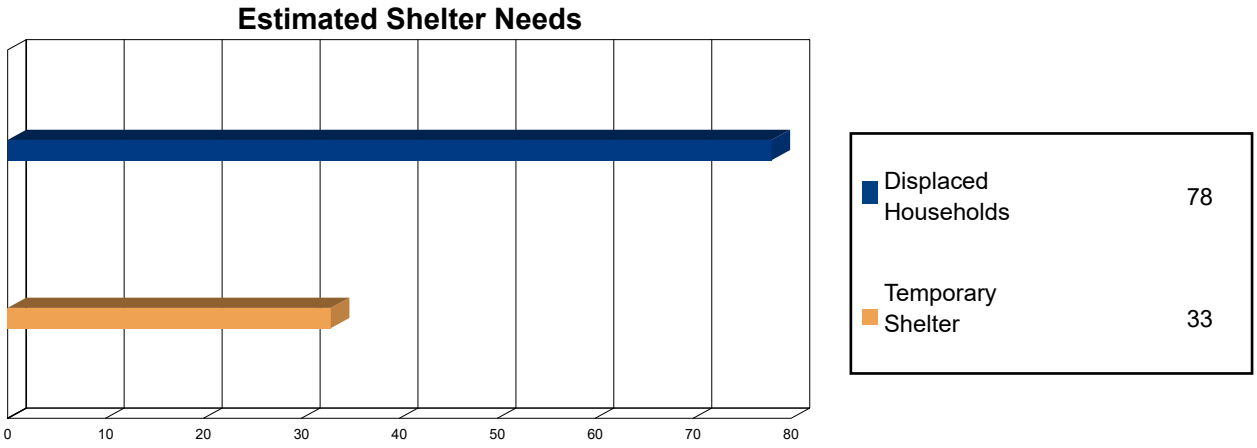


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 73,957 tons of debris will be generated. Of the total amount, 55,418 tons (75%) is Other Tree Debris. Of the remaining 18,539 tons, Brick/Wood comprises 29% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 217 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 13,102 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 78 households to be displaced due to the hurricane. Of these, 33 people (out of a total population of 12,235) will seek temporary shelter in public shelters.

Economic Loss

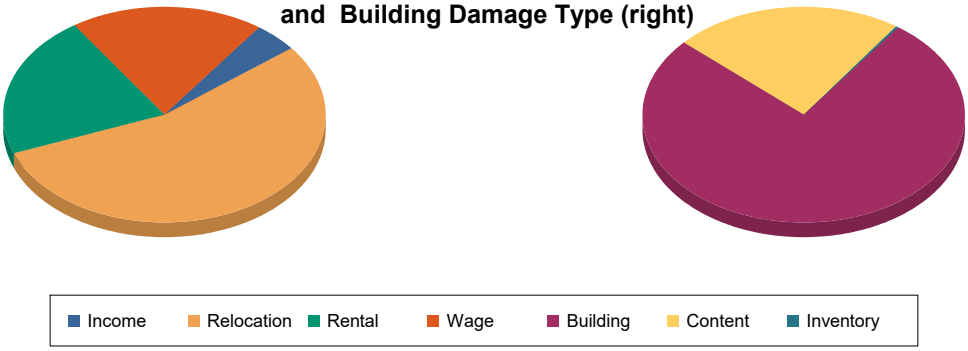
The total economic loss estimated for the hurricane is 85.6 million dollars, which represents 3.96 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 86 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 85% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

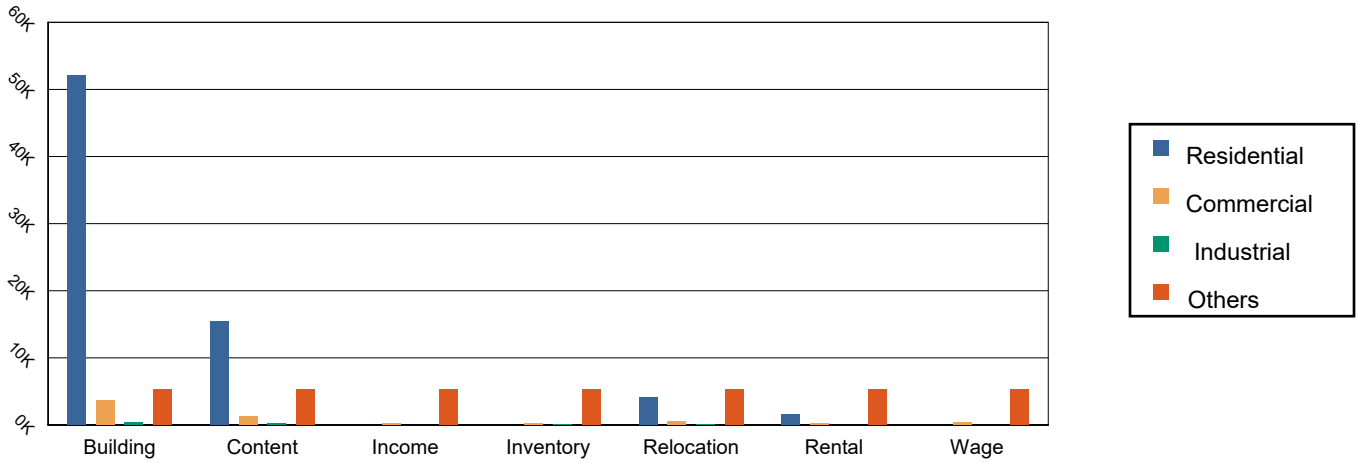


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	52,008.26	3,600.54	446.14	2,412.63	58,467.57
	Content	15,357.56	1,261.86	171.01	671.36	17,461.78
	Inventory	0.00	249.27	20.97	43.19	313.43
	Subtotal	**67,365.82**	**5,111.67**	**638.12**	**3,127.18**	**76,242.79**
Business Interruption Loss						
	Income	0.03	268.93	6.03	139.09	414.09
	Relocation	4,022.67	573.50	37.49	482.32	5,115.98
	Rental	1,621.70	277.38	3.98	82.04	1,985.12
	Wage	0.08	370.73	8.40	1,435.76	1,814.96
	Subtotal	**5,644.48**	**1,490.55**	**55.91**	**2,139.22**	**9,330.15**

Total

Total	**73,010.30**	**6,602.22**	**694.03**	**5,266.39**	**85,572.94**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	12,235	1,633,662	526,869	2,160,531
Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**
Study Region Total	**12,235**	**1,633,662**	**526,869**	**2,160,531**

Hazus: Hurricane Global Risk Report

Region Name:	East_Windsor_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.82 square miles and contains 2 census tracts. There are over 5 thousand households in the region and a total population of 11,190 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 82% of the buildings (and 48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,216 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

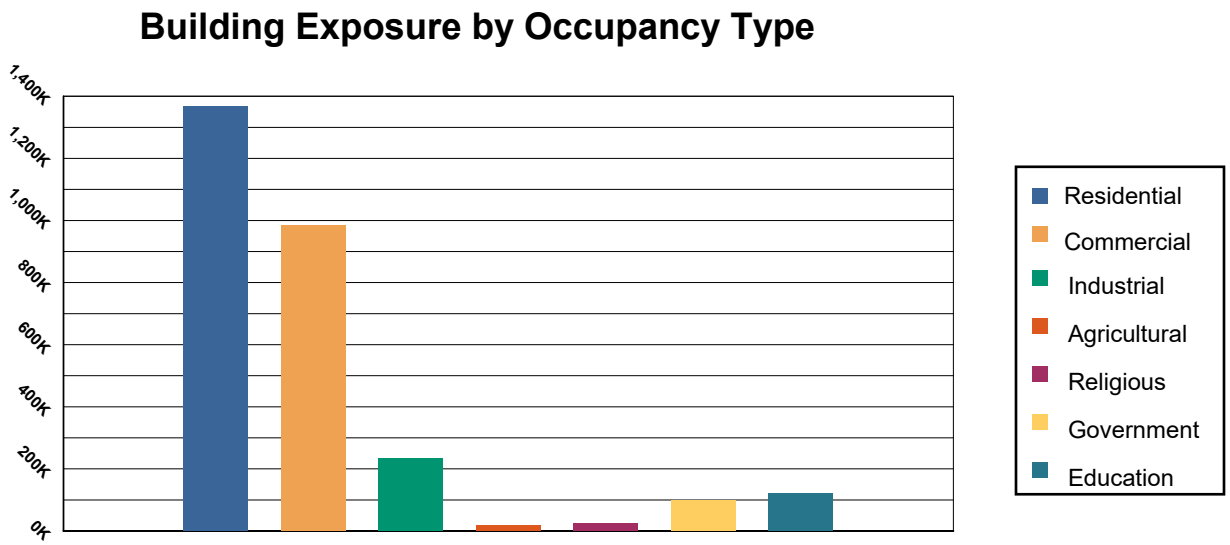


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,367,721	48.11%
Commercial	982,408	34.55%
Industrial	234,465	8.25%
Agricultural	17,128	0.60%
Religious	22,927	0.81%
Government	97,627	3.43%
Education	120,916	4.25%
Total	**2,843,192**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

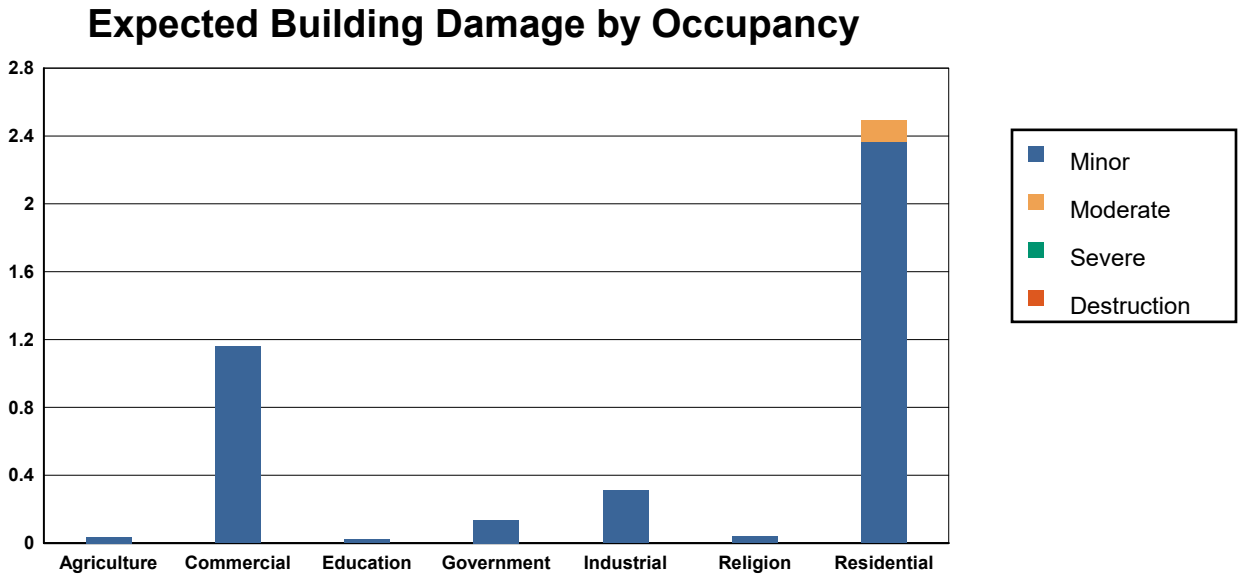


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.96	99.84	0.04	0.16	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	527.84	99.78	1.16	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Education	8.98	99.76	0.02	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Government	55.86	99.76	0.14	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	126.69	99.76	0.31	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Religion	20.96	99.82	0.04	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Residential	3,448.51	99.93	2.37	0.07	0.13	0.00	0.00	0.00	0.00	0.00
Total	**4,211.80**		**4.07**		**0.13**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	108	99.70	0	0.30	0	0.00	0	0.00	0	0.00
Masonry	490	99.70	1	0.29	0	0.01	0	0.00	0	0.00
MH	188	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	366	99.77	1	0.23	0	0.00	0	0.00	0	0.00
Wood	3,060	99.97	1	0.02	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

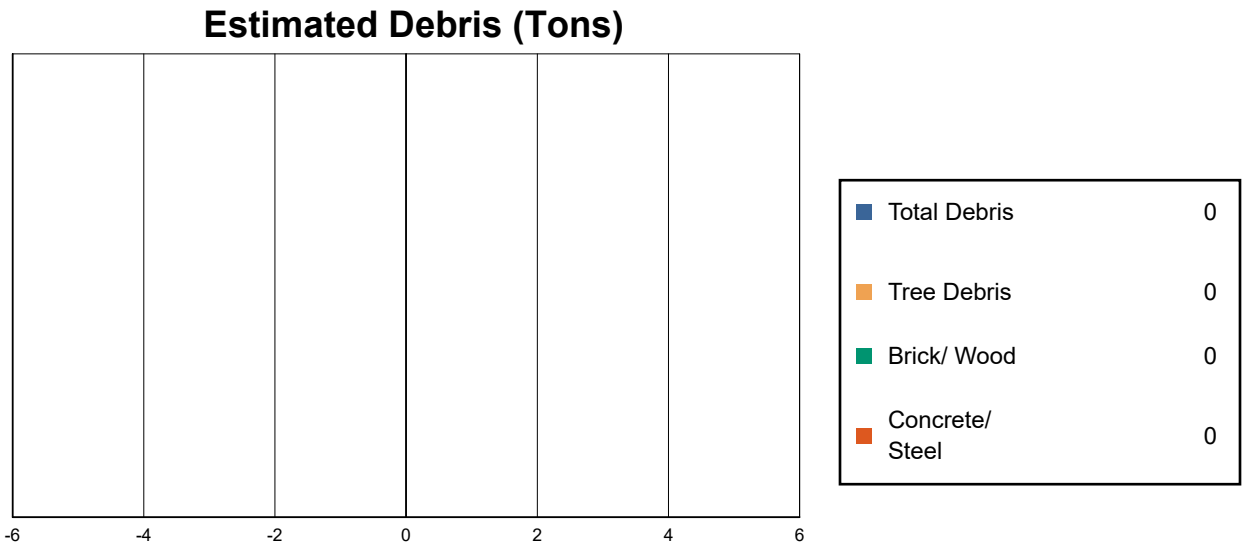
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

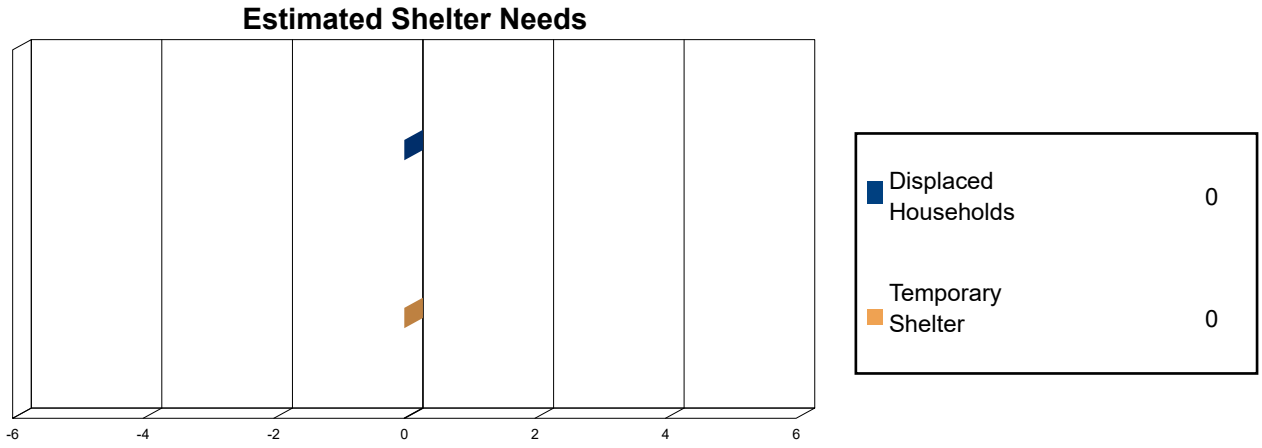


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 11,190) will seek temporary shelter in public shelters.

Economic Loss

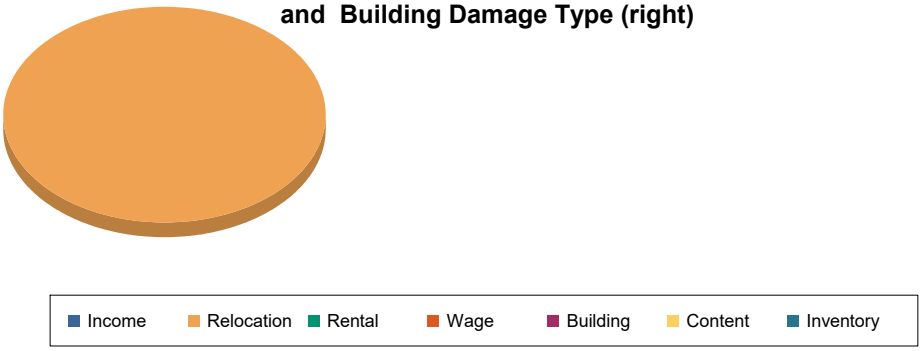
The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 100% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

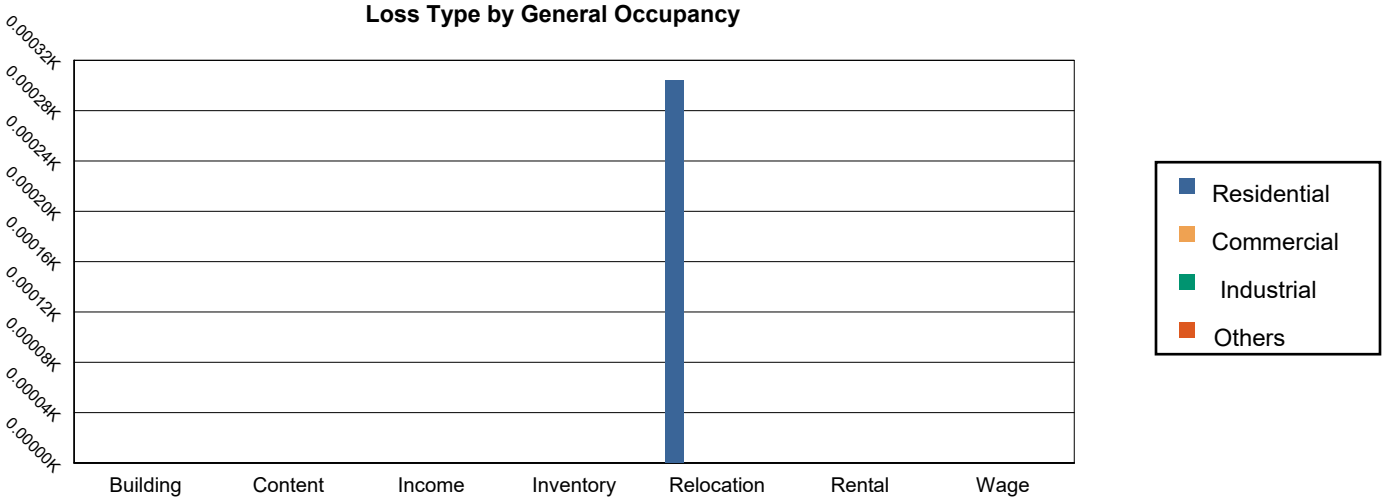


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.30	0.00	0.00	0.00	0.30
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.30**	**0.00**	**0.00**	**0.00**	**0.30**

Total

Total	**0.30**	**0.00**	**0.00**	**0.00**	**0.30**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,721	1,475,471	2,843,192
Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**
Study Region Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**

Hazus: Hurricane Global Risk Report

Region Name:	East_Windsor_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.82 square miles and contains 2 census tracts. There are over 5 thousand households in the region and a total population of 11,190 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 82% of the buildings (and 48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,216 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

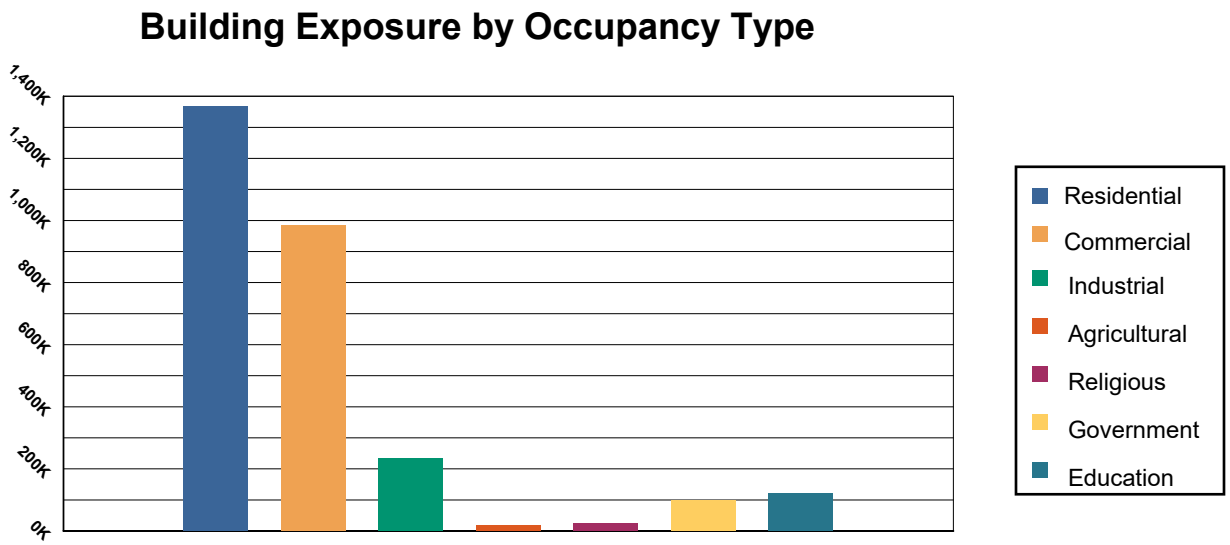


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,367,721	48.11%
Commercial	982,408	34.55%
Industrial	234,465	8.25%
Agricultural	17,128	0.60%
Religious	22,927	0.81%
Government	97,627	3.43%
Education	120,916	4.25%
Total	**2,843,192**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

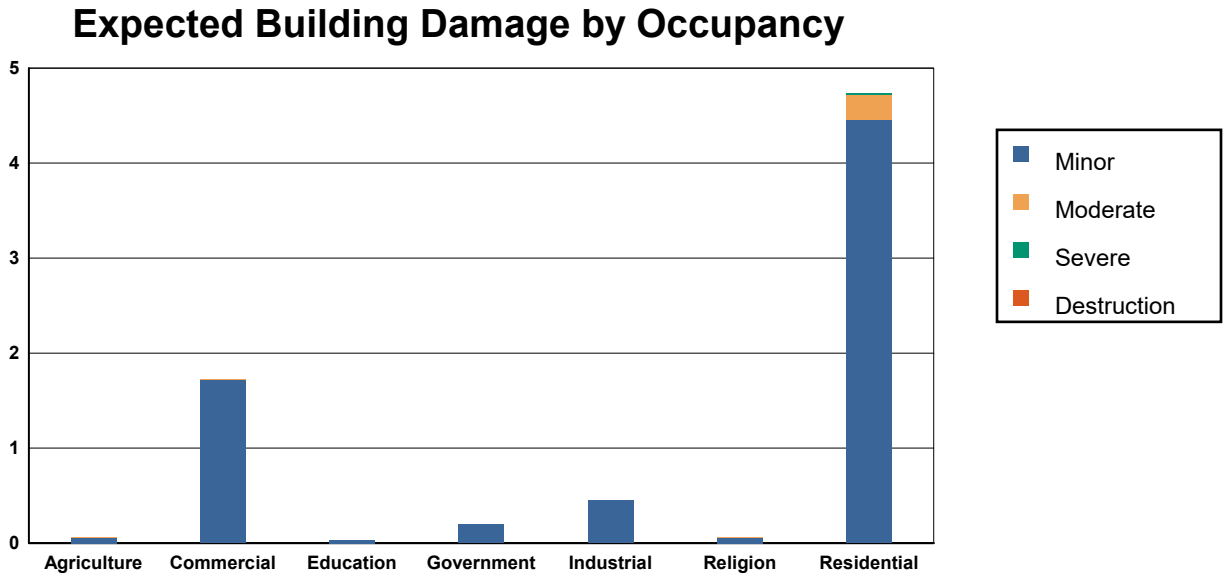


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.94	99.76	0.06	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	527.27	99.67	1.72	0.33	0.01	0.00	0.00	0.00	0.00	0.00
Education	8.97	99.66	0.03	0.34	0.00	0.00	0.00	0.00	0.00	0.00
Government	55.80	99.65	0.20	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	126.55	99.64	0.45	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Religion	20.94	99.73	0.06	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Residential	3,446.27	99.86	4.46	0.13	0.26	0.01	0.01	0.00	0.00	0.00
Total	**4,208.75**		**6.97**		**0.27**		**0.01**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	108	99.55	0	0.45	0	0.00	0	0.00	0	0.00
Masonry	489	99.52	2	0.47	0	0.01	0	0.00	0	0.00
MH	188	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	366	99.67	1	0.33	0	0.00	0	0.00	0	0.00
Wood	3,059	99.95	1	0.05	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

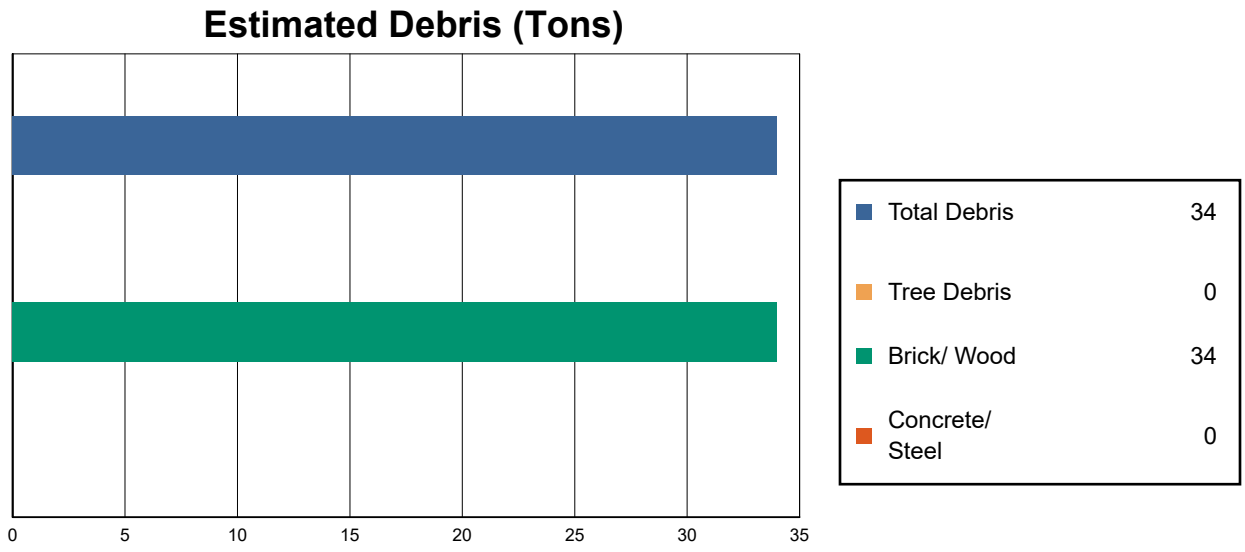
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

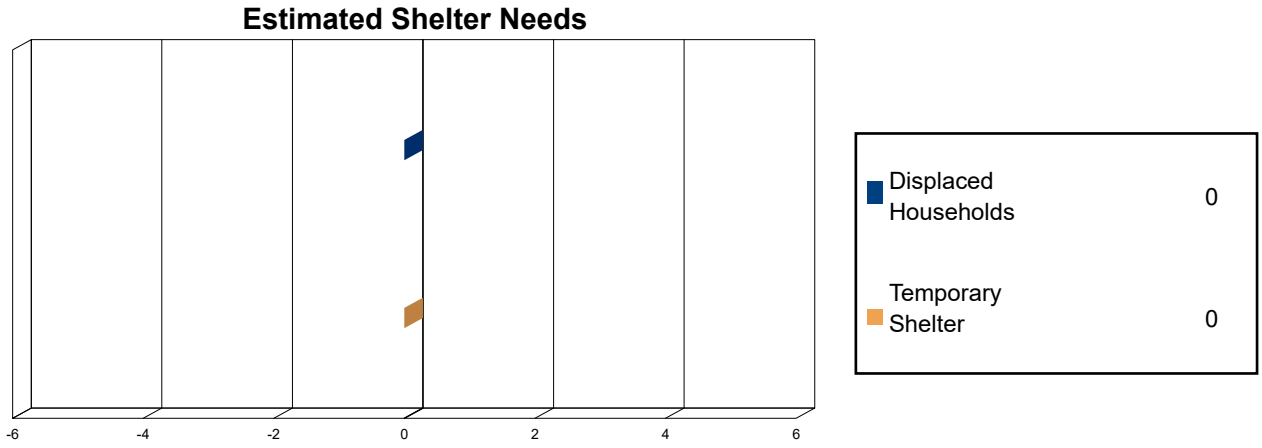


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 34 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 34 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 11,190) will seek temporary shelter in public shelters.

Economic Loss

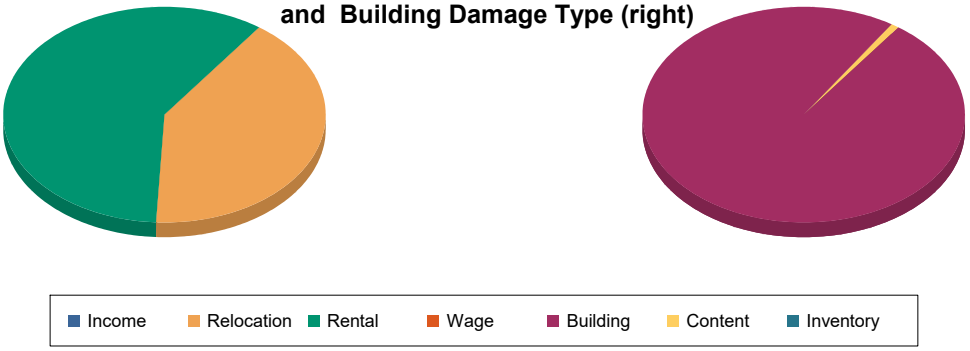
The total economic loss estimated for the hurricane is 0.5 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 72% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

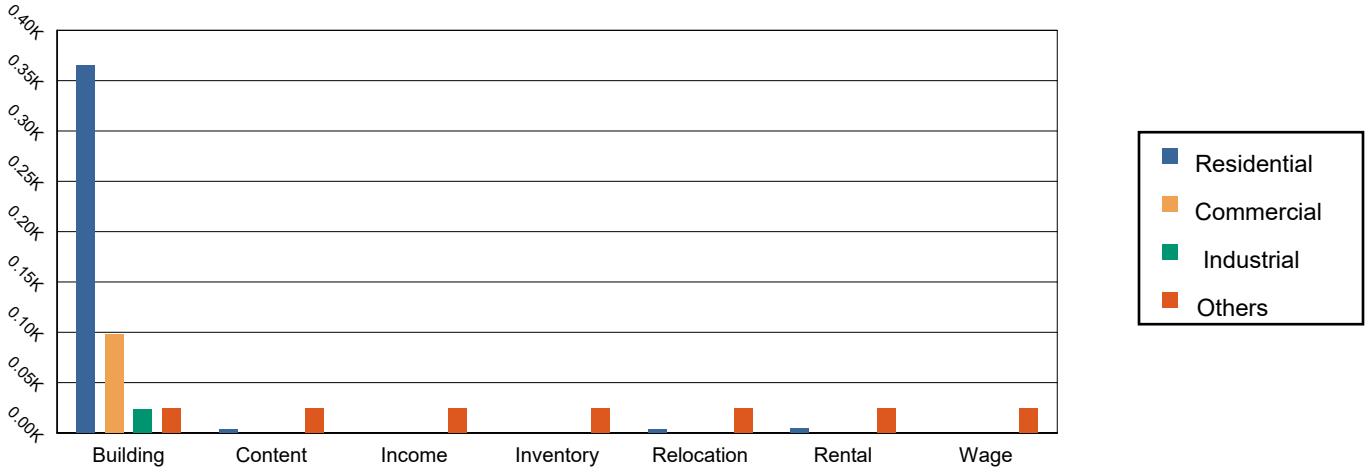


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	365.29	98.24	23.45	24.15	511.12
	Content	3.95	0.00	0.00	0.00	3.95
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**369.24**	**98.24**	**23.45**	**24.15**	**515.07**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	3.34	0.09	0.00	0.01	3.43
	Rental	5.00	0.00	0.00	0.00	5.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**8.34**	**0.09**	**0.00**	**0.01**	**8.44**

Total

Total	**377.58**	**98.33**	**23.45**	**24.16**	**523.51**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,721	1,475,471	2,843,192
Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**
Study Region Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**

Hazus: Hurricane Global Risk Report

Region Name:	East_Windsor_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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Appendix B: Regional Population and Building Value Data	11

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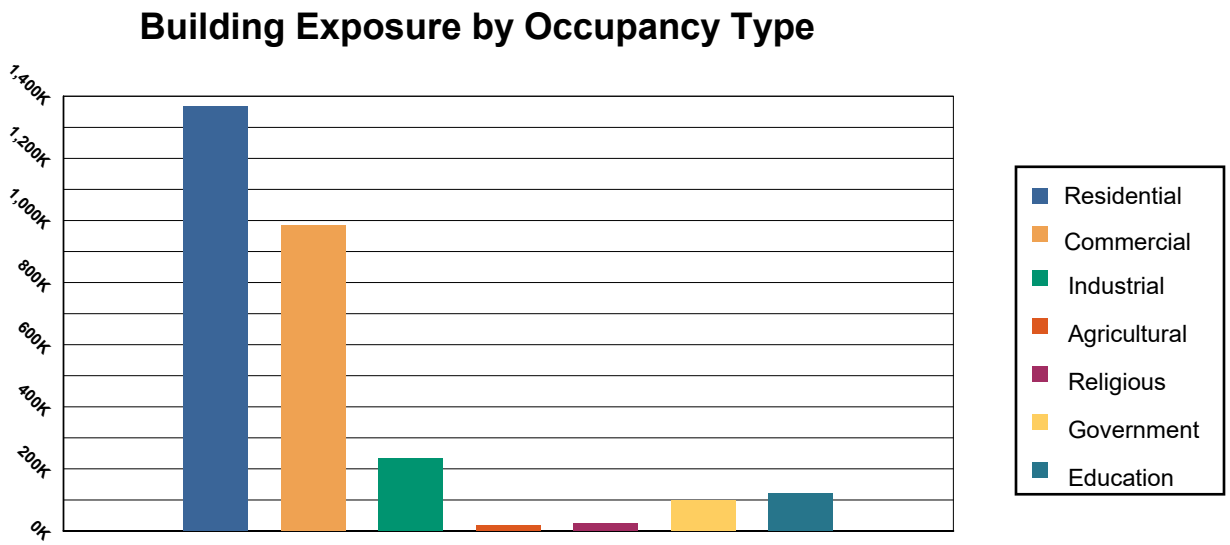

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Education	120,916	4.25%
Total	**2,843,192**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

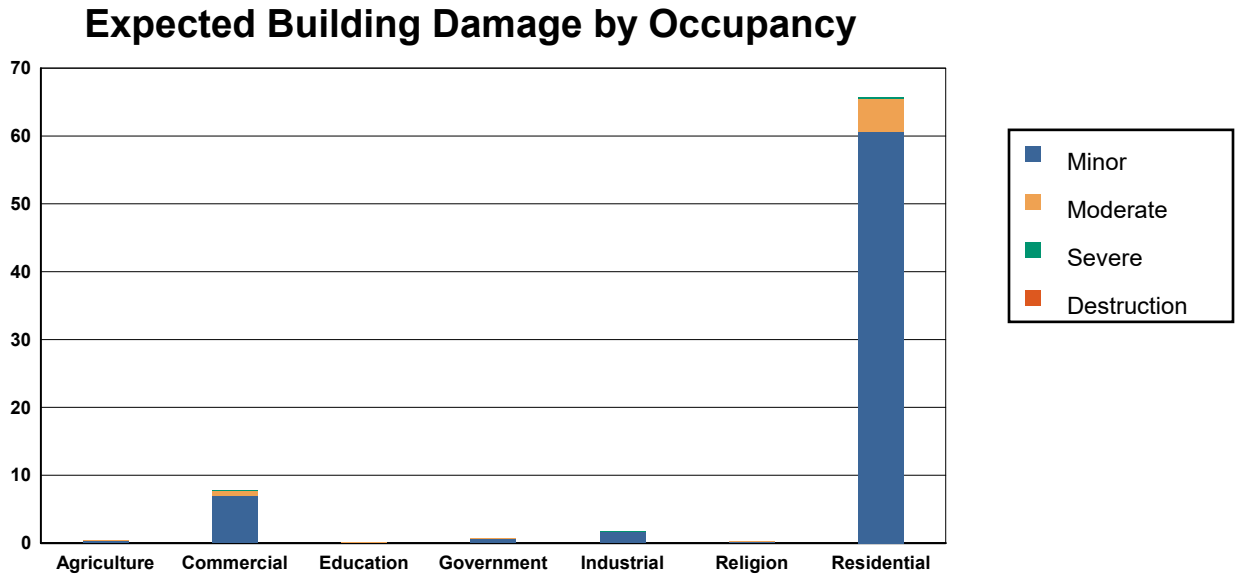


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.62	98.37	0.33	1.45	0.03	0.14	0.01	0.04	0.00	0.00
Commercial	521.23	98.53	6.99	1.32	0.75	0.14	0.03	0.01	0.00	0.00
Education	8.88	98.65	0.12	1.33	0.00	0.02	0.00	0.00	0.00	0.00
Government	55.26	98.68	0.73	1.30	0.01	0.02	0.00	0.00	0.00	0.00
Industrial	125.25	98.62	1.68	1.32	0.06	0.05	0.01	0.01	0.00	0.00
Religion	20.73	98.73	0.26	1.24	0.01	0.03	0.00	0.00	0.00	0.00
Residential	3,385.28	98.10	60.58	1.76	4.95	0.14	0.19	0.01	0.00	0.00
Total	**4,139.26**		**70.69**		**5.81**		**0.25**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	106	98.09	2	1.87	0	0.04	0	0.00	0	0.00
Masonry	479	97.50	10	2.14	2	0.34	0	0.01	0	0.00
MH	188	99.95	0	0.03	0	0.02	0	0.00	0	0.00
Steel	362	98.63	4	1.22	1	0.14	0	0.01	0	0.00
Wood	3,012	98.40	47	1.54	2	0.06	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

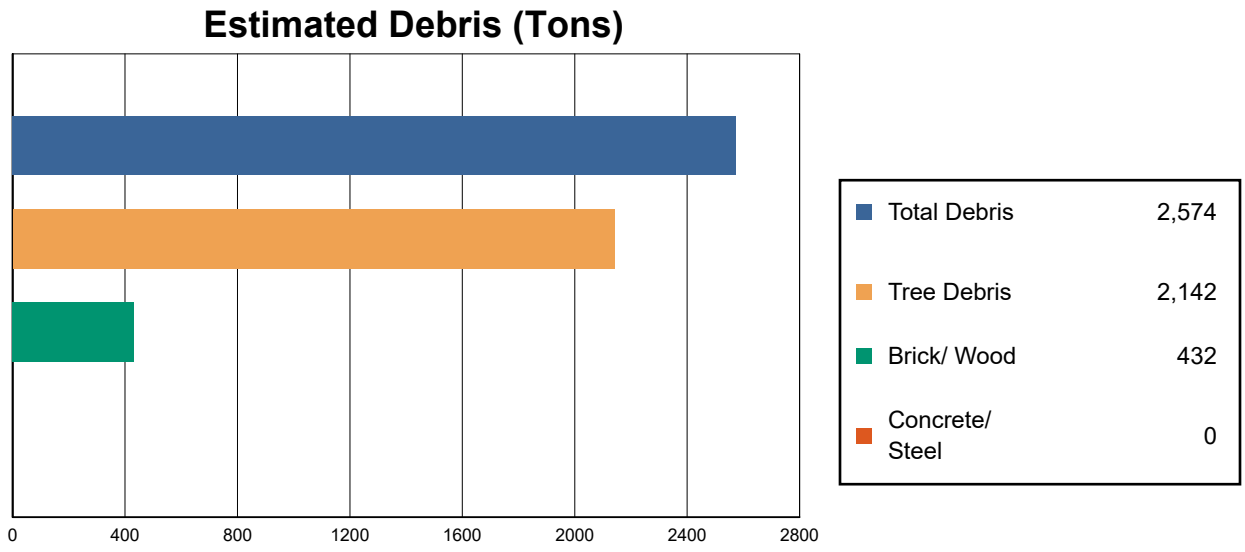
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

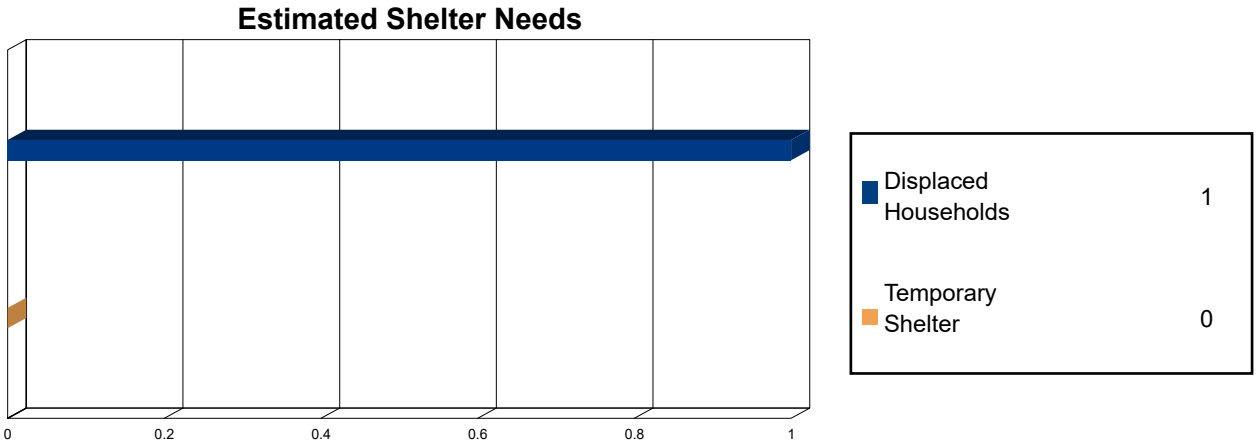


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,574 tons of debris will be generated. Of the total amount, 1,594 tons (62%) is Other Tree Debris. Of the remaining 980 tons, Brick/Wood comprises 44% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 17 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 548 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 11,190) will seek temporary shelter in public shelters.

Economic Loss

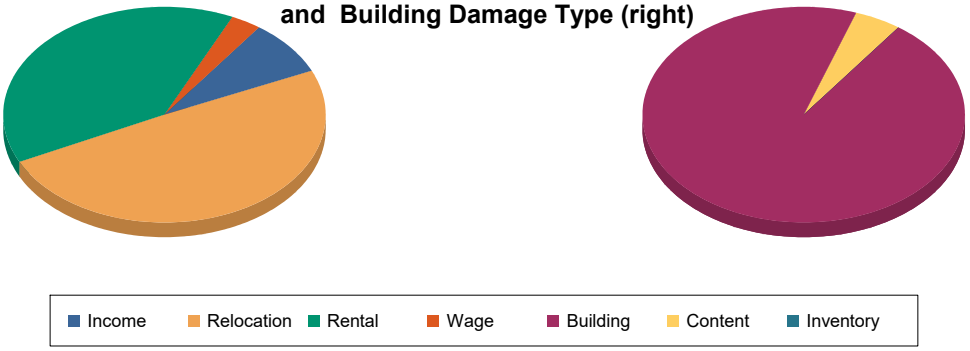
The total economic loss estimated for the hurricane is 4.6 million dollars, which represents 0.16 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 5 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

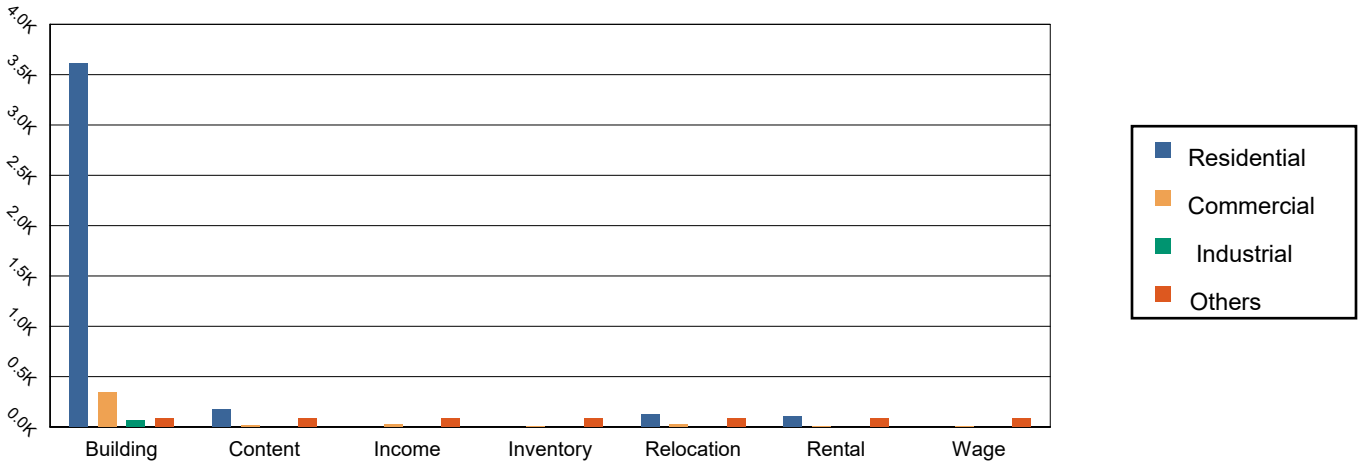


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,615.70	347.98	67.18	78.32	4,109.18
	Content	177.91	18.88	0.68	2.29	199.75
	Inventory	0.00	2.78	0.08	1.15	4.01
	Subtotal	**3,793.61**	**369.64**	**67.94**	**81.76**	**4,312.95**
Business Interruption Loss						
	Income	0.00	25.01	0.00	0.00	25.01
	Relocation	124.49	20.87	0.25	0.53	146.14
	Rental	105.57	10.25	0.00	0.00	115.81
	Wage	0.00	8.89	0.00	0.00	8.89
	Subtotal	**230.05**	**65.02**	**0.25**	**0.53**	**295.85**

Total

Total	**4,023.66**	**434.65**	**68.19**	**82.29**	**4,608.80**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,721	1,475,471	2,843,192
Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**
Study Region Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**

Hazus: Hurricane Global Risk Report

Region Name:	East_Windsor_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.82 square miles and contains 2 census tracts. There are over 5 thousand households in the region and a total population of 11,190 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 82% of the buildings (and 48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,216 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

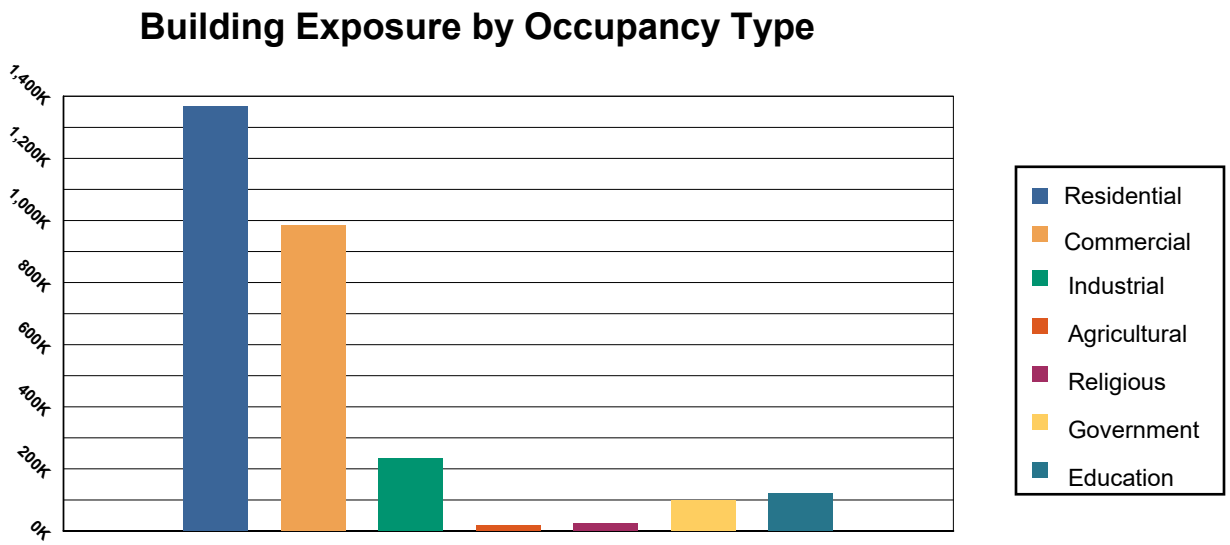


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,367,721	48.11%
Commercial	982,408	34.55%
Industrial	234,465	8.25%
Agricultural	17,128	0.60%
Religious	22,927	0.81%
Government	97,627	3.43%
Education	120,916	4.25%
Total	**2,843,192**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 31 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

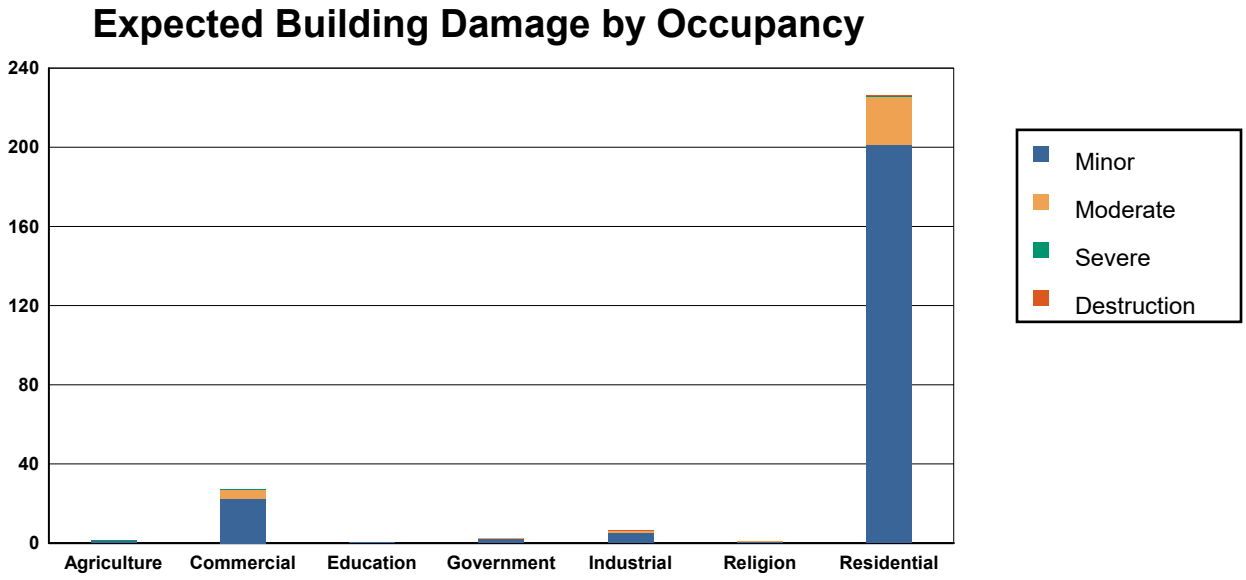


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.58	93.82	1.15	4.99	0.19	0.84	0.08	0.33	0.00	0.01
Commercial	501.87	94.87	22.37	4.23	4.23	0.80	0.53	0.10	0.00	0.00
Education	8.61	95.65	0.37	4.08	0.02	0.27	0.00	0.00	0.00	0.00
Government	53.58	95.69	2.27	4.05	0.15	0.27	0.00	0.00	0.00	0.00
Industrial	120.61	94.97	5.47	4.30	0.72	0.56	0.20	0.16	0.00	0.00
Religion	20.05	95.49	0.89	4.25	0.05	0.25	0.00	0.01	0.00	0.00
Residential	3,224.55	93.44	201.41	5.84	24.06	0.70	0.77	0.02	0.21	0.01
Total	**3,950.86**		**233.92**		**29.43**		**1.58**		**0.22**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	102	94.31	6	5.24	0	0.46	0	0.00	0	0.00
Masonry	456	92.85	27	5.54	7	1.51	0	0.10	0	0.00
MH	186	98.88	2	0.84	0	0.21	0	0.00	0	0.08
Steel	350	95.29	14	3.73	3	0.85	0	0.13	0	0.00
Wood	2,879	94.05	172	5.62	10	0.31	0	0.02	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

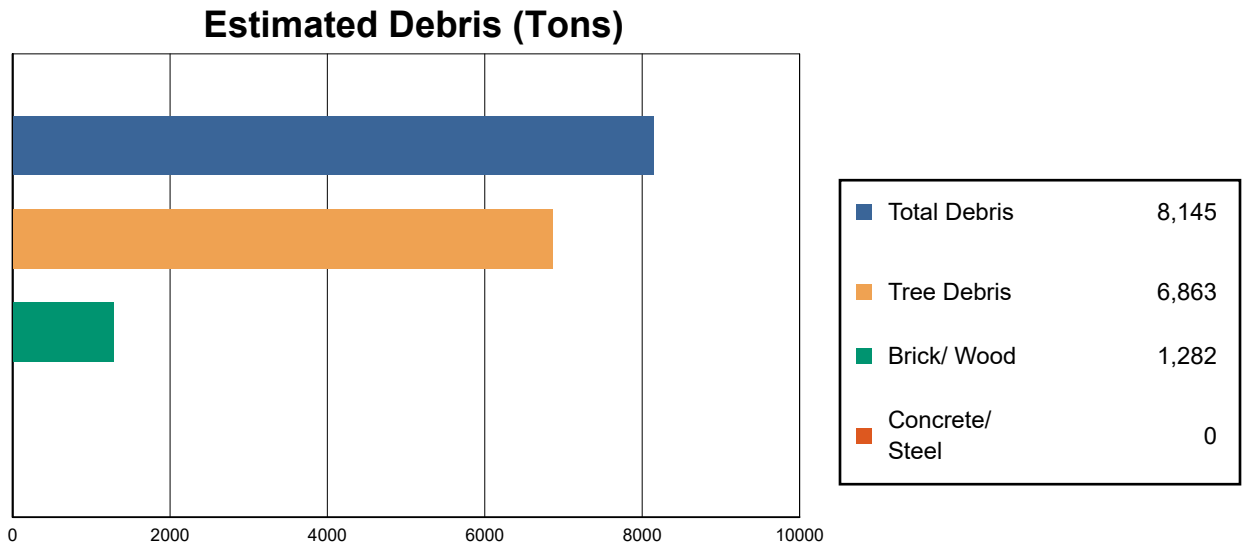
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

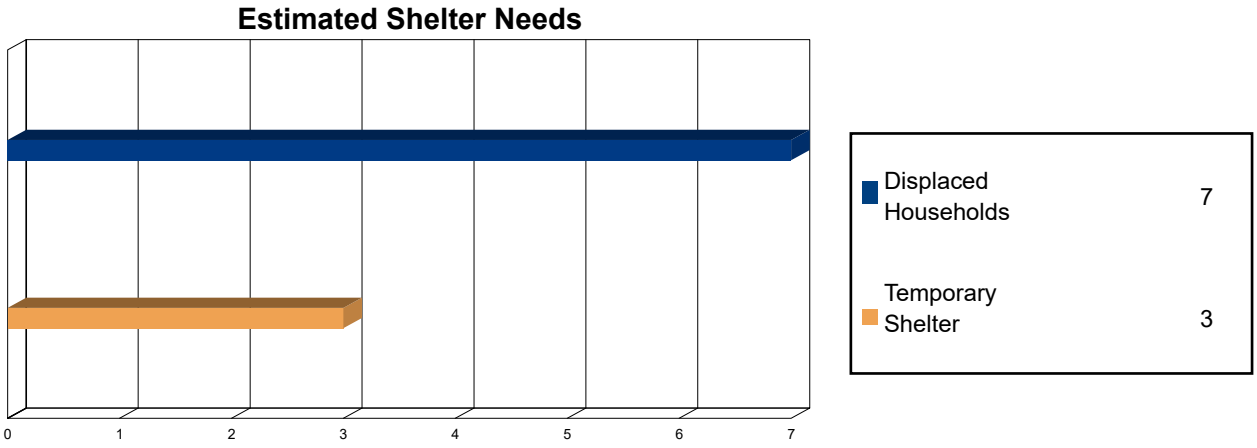


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 8,145 tons of debris will be generated. Of the total amount, 5,147 tons (63%) is Other Tree Debris. Of the remaining 2,998 tons, Brick/Wood comprises 43% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 51 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,716 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 7 households to be displaced due to the hurricane. Of these, 3 people (out of a total population of 11,190) will seek temporary shelter in public shelters.

Economic Loss

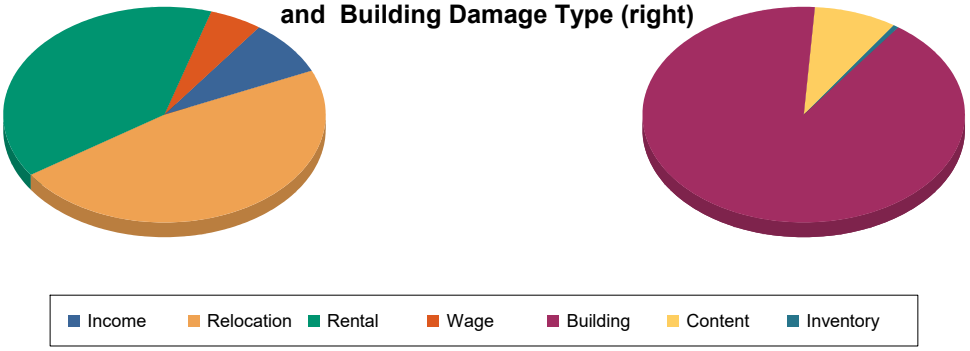
The total economic loss estimated for the hurricane is 12.6 million dollars, which represents 0.44 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 13 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 78% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

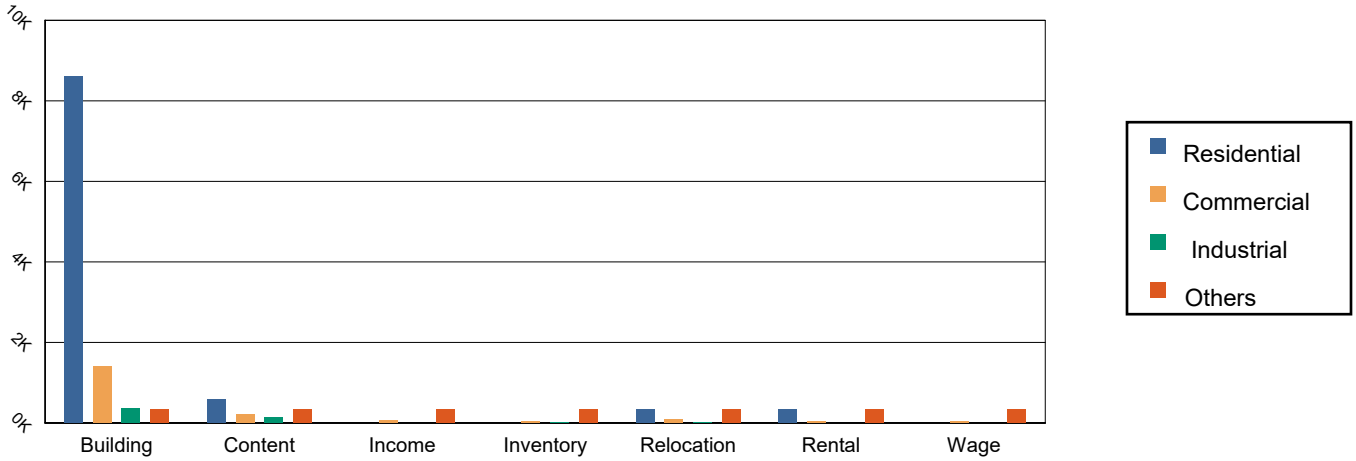


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	8,605.59	1,397.67	359.60	272.26	10,635.12
	Content	593.92	204.27	137.43	22.72	958.33
	Inventory	0.00	44.03	18.11	9.38	71.51
	Subtotal	**9,199.51**	**1,645.96**	**515.13**	**304.36**	**11,664.97**
Business Interruption Loss						
	Income	0.00	68.95	1.92	6.48	77.35
	Relocation	328.25	101.60	7.46	10.74	448.05
	Rental	332.74	33.23	1.29	0.53	367.79
	Wage	0.00	32.06	3.17	15.28	50.51
	Subtotal	**661.00**	**235.83**	**13.84**	**33.03**	**943.70**

Total

Total	**9,860.50**	**1,881.80**	**528.98**	**337.39**	**12,608.67**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,721	1,475,471	2,843,192
Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**
Study Region Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**

Hazus: Hurricane Global Risk Report

Region Name:	East_Windsor_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 82% of the buildings (and 48% of the building value) are associated with residential housing.

Building Inventory

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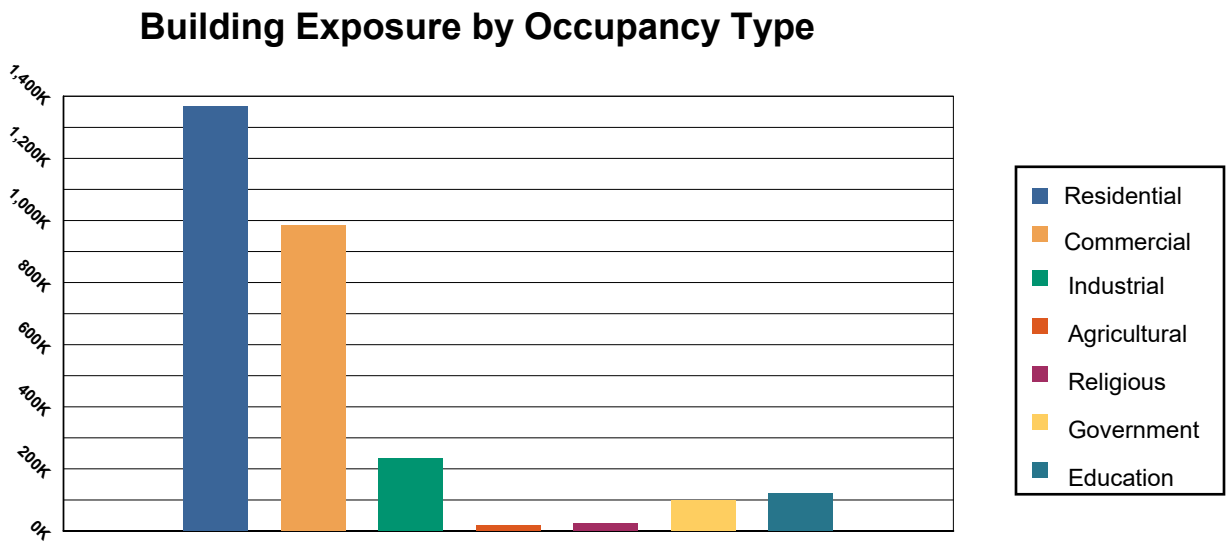

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Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,367,721	48.11%
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Agricultural	17,128	0.60%
Religious	22,927	0.81%
Government	97,627	3.43%
Education	120,916	4.25%
Total	**2,843,192**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 91 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

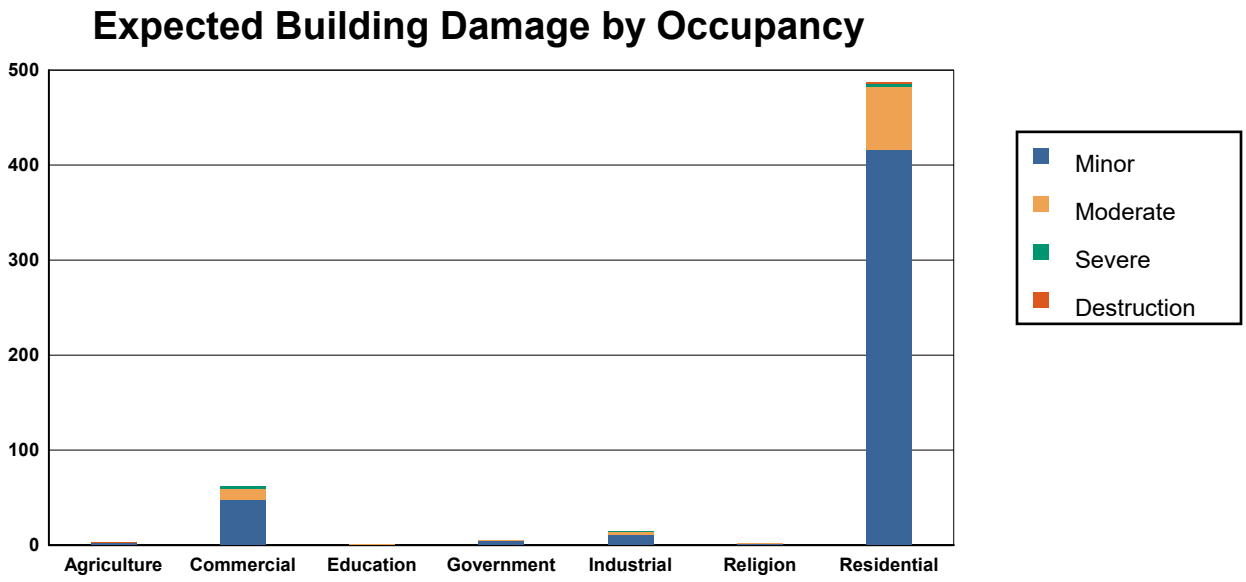


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.76	85.93	2.41	10.47	0.56	2.42	0.25	1.09	0.02	0.09
Commercial	466.89	88.26	47.13	8.91	12.75	2.41	2.22	0.42	0.00	0.00
Education	8.08	89.80	0.79	8.74	0.13	1.41	0.00	0.05	0.00	0.00
Government	50.33	89.88	4.85	8.66	0.79	1.41	0.03	0.05	0.00	0.00
Industrial	112.43	88.53	11.19	8.81	2.65	2.08	0.69	0.54	0.05	0.04
Religion	18.75	89.27	1.99	9.47	0.25	1.21	0.01	0.05	0.00	0.00
Residential	2,964.17	85.89	416.47	12.07	66.63	1.93	2.31	0.07	1.42	0.04
Total	**3,640.42**		**484.82**		**83.75**		**5.51**		**1.50**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	94	87.21	11	10.53	2	2.22	0	0.04	0	0.00
Masonry	420	85.53	50	10.28	19	3.84	2	0.33	0	0.02
MH	181	96.03	5	2.58	2	0.98	0	0.02	1	0.39
Steel	327	89.13	29	7.80	9	2.51	2	0.55	0	0.00
Wood	2,650	86.57	374	12.23	34	1.10	2	0.06	1	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

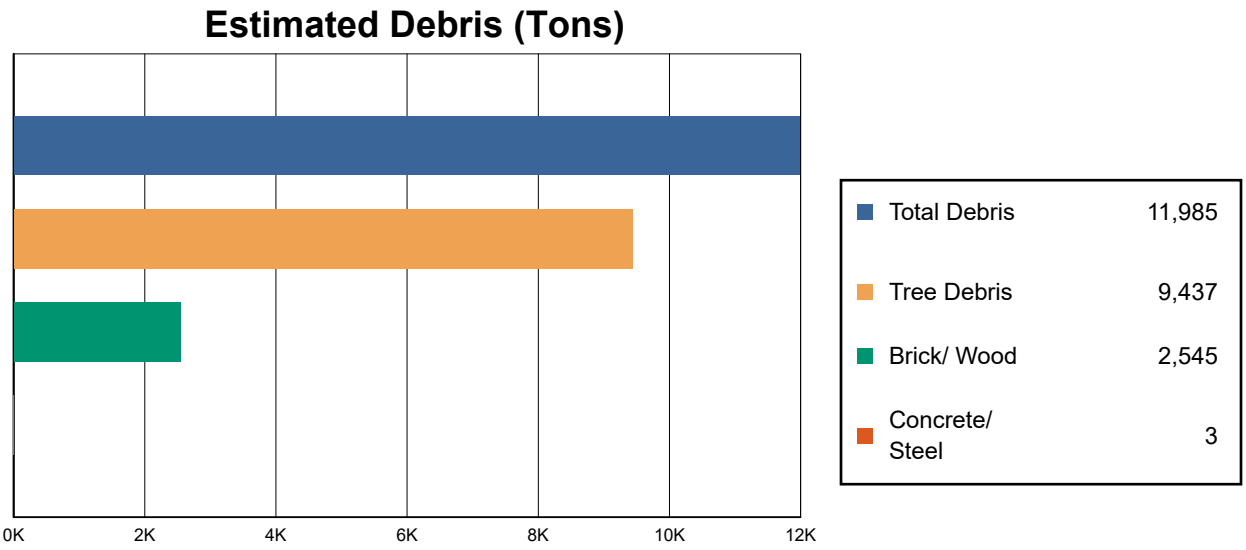
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

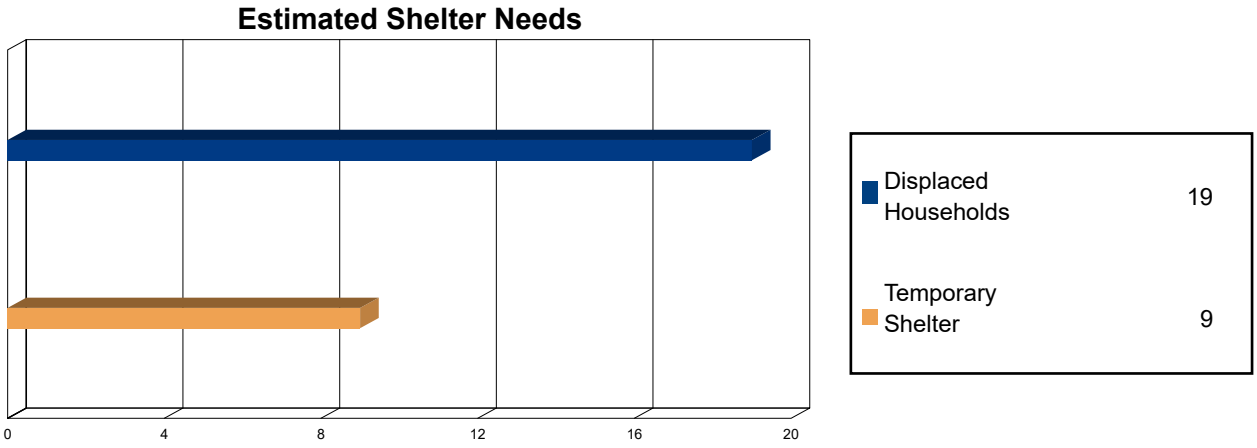


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 11,985 tons of debris will be generated. Of the total amount, 7,078 tons (59%) is Other Tree Debris. Of the remaining 4,907 tons, Brick/Wood comprises 52% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 102 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,359 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 19 households to be displaced due to the hurricane. Of these, 9 people (out of a total population of 11,190) will seek temporary shelter in public shelters.

Economic Loss

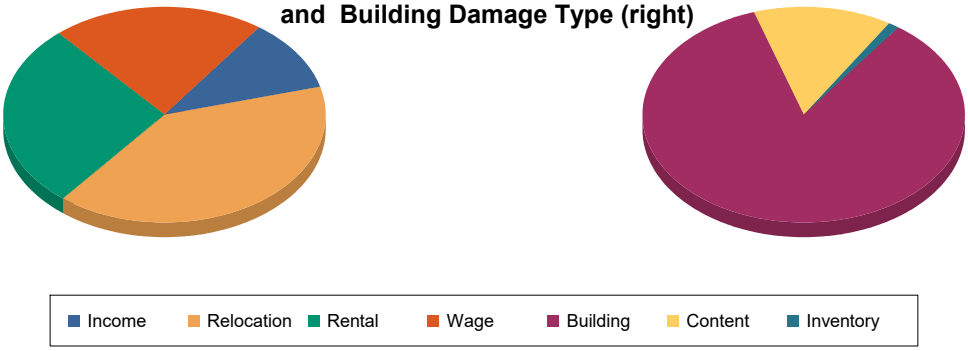
The total economic loss estimated for the hurricane is 28.1 million dollars, which represents 0.99 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 28 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 68% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

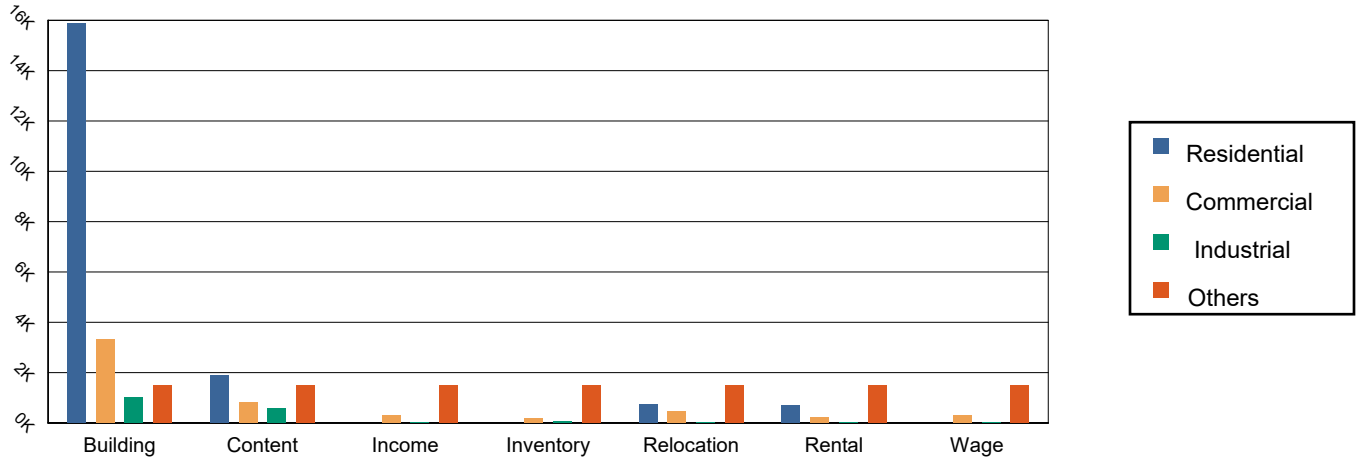


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	15,879.66	3,333.51	1,013.45	683.17	20,909.79
	Content	1,887.99	800.66	571.64	164.45	3,424.73
	Inventory	0.00	185.69	74.87	33.86	294.43
	Subtotal	**17,767.65**	**4,319.86**	**1,659.96**	**881.48**	**24,628.94**
Business Interruption Loss						
	Income	0.00	302.67	11.34	56.41	370.41
	Relocation	752.28	481.20	39.43	106.13	1,379.04
	Rental	699.28	237.15	6.93	15.41	958.79
	Wage	0.00	309.63	16.58	413.59	739.80
	Subtotal	**1,451.56**	**1,330.65**	**74.28**	**591.54**	**3,448.04**

Total

Total	**19,219.21**	**5,650.51**	**1,734.24**	**1,473.02**	**28,076.98**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,721	1,475,471	2,843,192
Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**
Study Region Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**

Hazus: Hurricane Global Risk Report

Region Name:	East_Windsor_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.82 square miles and contains 2 census tracts. There are over 5 thousand households in the region and a total population of 11,190 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 82% of the buildings (and 48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,216 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

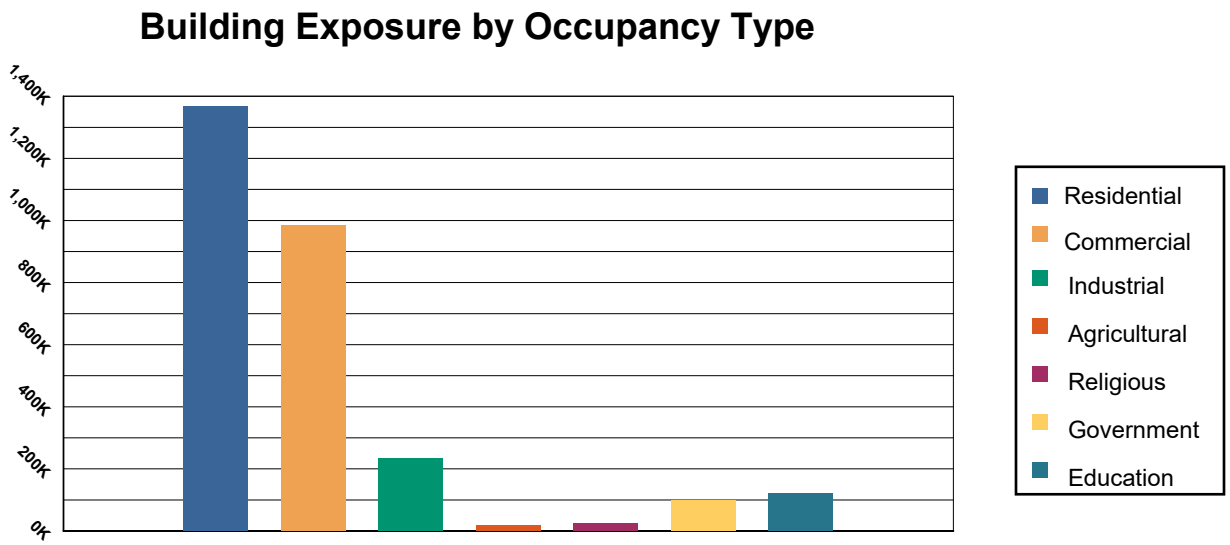


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,367,721	48.11%
Commercial	982,408	34.55%
Industrial	234,465	8.25%
Agricultural	17,128	0.60%
Religious	22,927	0.81%
Government	97,627	3.43%
Education	120,916	4.25%
Total	**2,843,192**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 234 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 7 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

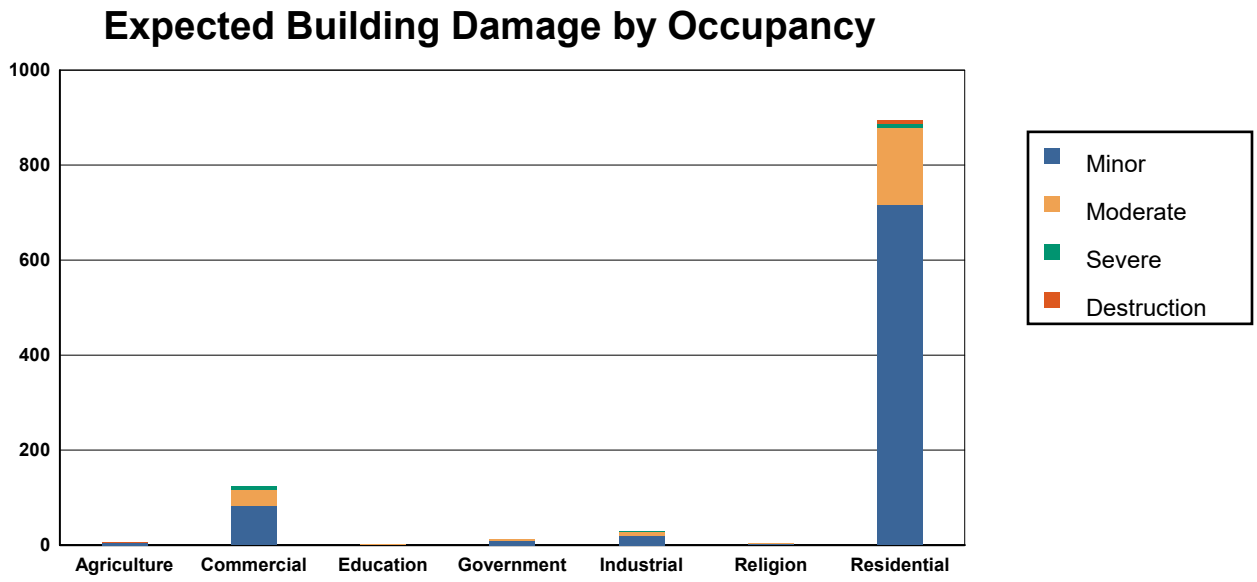


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16.84	73.23	4.17	18.14	1.29	5.61	0.62	2.69	0.08	0.33
Commercial	405.76	76.70	82.53	15.60	33.62	6.36	7.04	1.33	0.05	0.01
Education	7.10	78.94	1.41	15.68	0.45	4.96	0.04	0.42	0.00	0.00
Government	44.29	79.09	8.67	15.48	2.80	5.01	0.24	0.43	0.00	0.00
Industrial	98.02	77.18	19.25	15.16	7.52	5.92	2.02	1.59	0.19	0.15
Religion	16.39	78.07	3.65	17.37	0.89	4.22	0.07	0.34	0.00	0.00
Residential	2,556.94	74.09	716.68	20.77	160.72	4.66	9.88	0.29	6.79	0.20
Total	**3,145.35**		**836.36**		**207.29**		**19.90**		**7.10**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	81	74.77	19	17.59	8	7.28	0	0.36	0	0.00
Masonry	362	73.74	81	16.60	42	8.60	5	0.97	0	0.09
MH	168	89.61	11	5.70	6	3.25	0	0.13	2	1.32
Steel	286	78.01	50	13.70	24	6.53	6	1.75	0	0.01
Wood	2,287	74.71	664	21.69	98	3.19	8	0.25	5	0.16

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

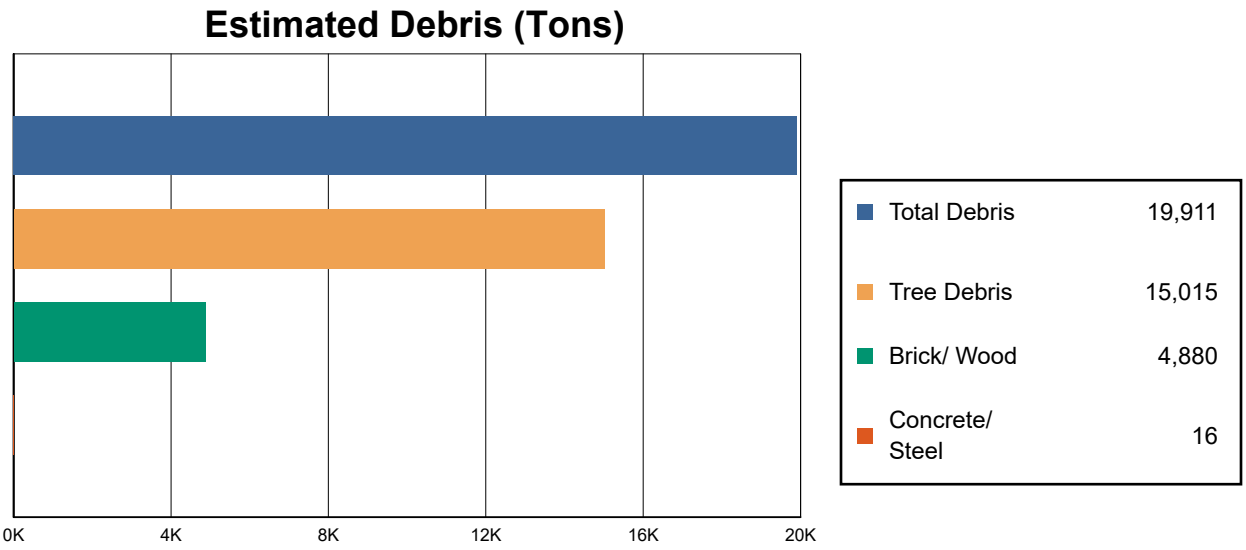
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

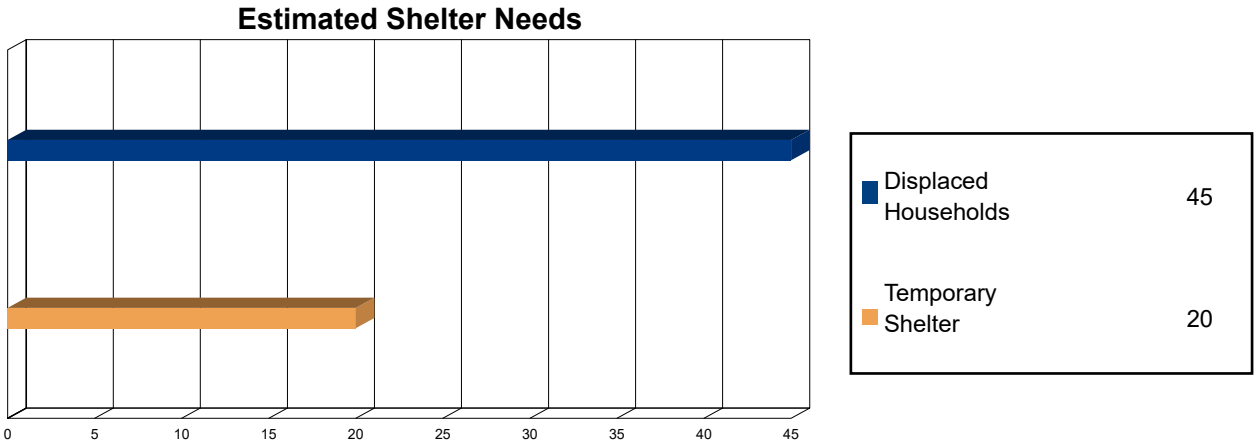


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 19,911 tons of debris will be generated. Of the total amount, 11,266 tons (57%) is Other Tree Debris. Of the remaining 8,645 tons, Brick/Wood comprises 56% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 196 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,749 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 45 households to be displaced due to the hurricane. Of these, 20 people (out of a total population of 11,190) will seek temporary shelter in public shelters.

Economic Loss

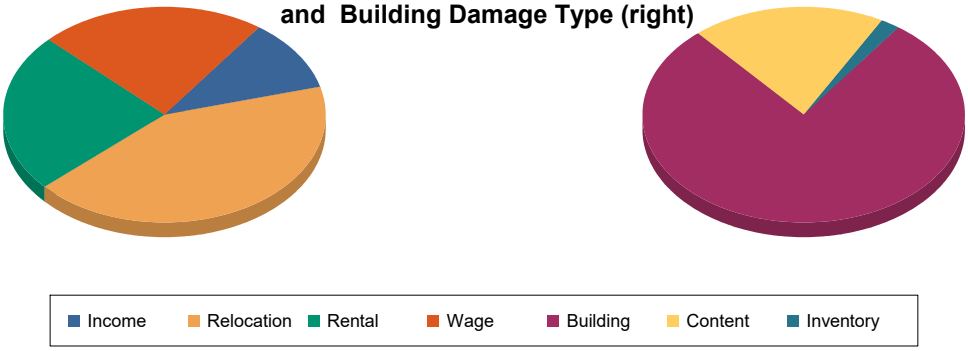
The total economic loss estimated for the hurricane is 62.9 million dollars, which represents 2.21 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 63 million dollars. 14% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 61% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

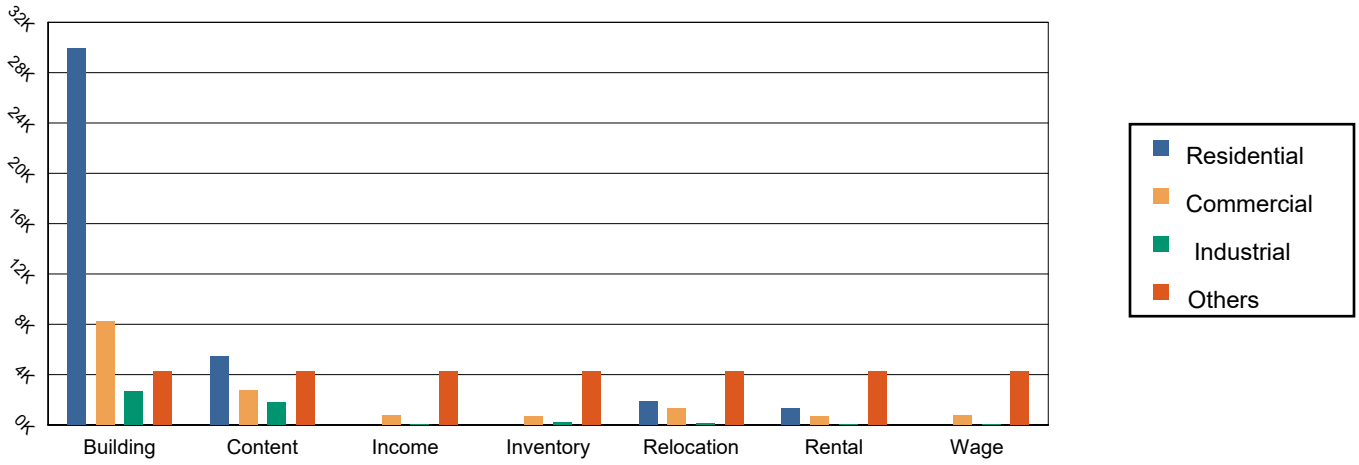


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	29,928.12	8,227.97	2,667.13	1,834.37	42,657.58
	Content	5,448.15	2,760.55	1,779.85	620.64	10,609.19
	Inventory	0.00	668.66	230.59	94.04	993.30
	Subtotal	**35,376.27**	**11,657.18**	**4,677.58**	**2,549.05**	**54,260.07**
Business Interruption Loss						
	Income	0.00	763.08	31.83	152.02	946.94
	Relocation	1,864.32	1,335.92	128.58	348.93	3,677.75
	Rental	1,341.11	671.65	21.39	51.10	2,085.25
	Wage	0.00	742.23	46.92	1,175.54	1,964.70
	Subtotal	**3,205.43**	**3,512.89**	**228.72**	**1,727.59**	**8,674.63**

Total

Total	**38,581.69**	**15,170.07**	**4,906.30**	**4,276.64**	**62,934.71**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,721	1,475,471	2,843,192
Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**
Study Region Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**

Hazus: Hurricane Global Risk Report

Region Name:	East_Windsor_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

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There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,843 million dollars. Approximately 82% of the buildings (and 48% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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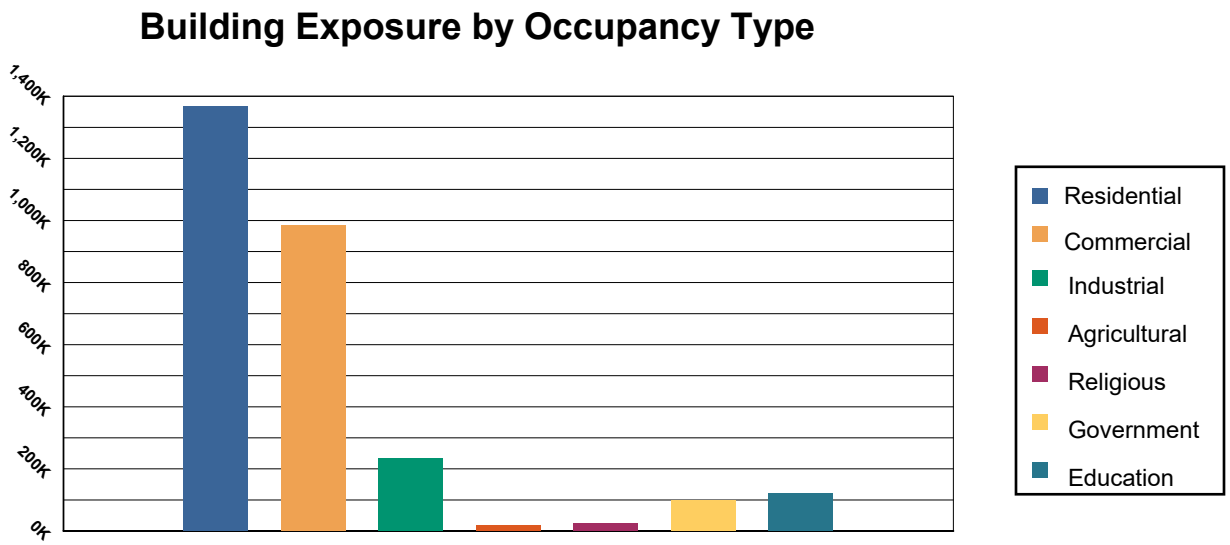


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,367,721	48.11%
Commercial	982,408	34.55%
Industrial	234,465	8.25%
Agricultural	17,128	0.60%
Religious	22,927	0.81%
Government	97,627	3.43%
Education	120,916	4.25%
Total	**2,843,192**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 395 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the region. There are an estimated 16 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

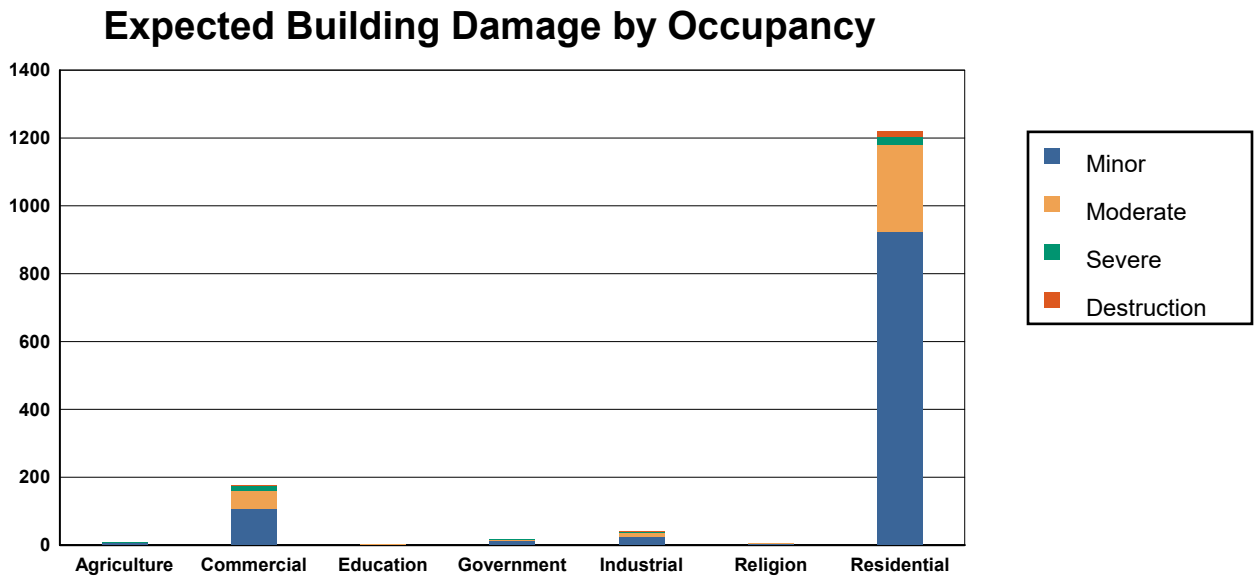


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	14.52	63.13	5.35	23.27	2.00	8.69	0.98	4.26	0.15	0.65
Commercial	354.57	67.03	105.17	19.88	55.76	10.54	13.36	2.53	0.13	0.03
Education	6.25	69.43	1.82	20.25	0.82	9.11	0.11	1.20	0.00	0.00
Government	39.00	69.64	11.17	19.94	5.15	9.19	0.69	1.22	0.00	0.00
Industrial	85.85	67.60	24.37	19.19	12.73	10.02	3.70	2.92	0.35	0.28
Religion	14.38	68.49	4.78	22.78	1.64	7.80	0.20	0.94	0.00	0.00
Residential	2,231.49	64.66	922.56	26.73	258.95	7.50	22.31	0.65	15.69	0.45
Total	**2,746.07**		**1,075.22**		**337.04**		**41.35**		**16.32**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	70	64.45	23	21.57	14	12.94	1	1.05	0	0.00
Masonry	315	64.23	101	20.48	65	13.25	9	1.85	1	0.19
MH	157	83.36	15	8.18	11	5.71	1	0.34	5	2.42
Steel	251	68.48	64	17.44	39	10.75	12	3.29	0	0.03
Wood	1,994	65.13	867	28.34	171	5.57	17	0.57	12	0.39

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

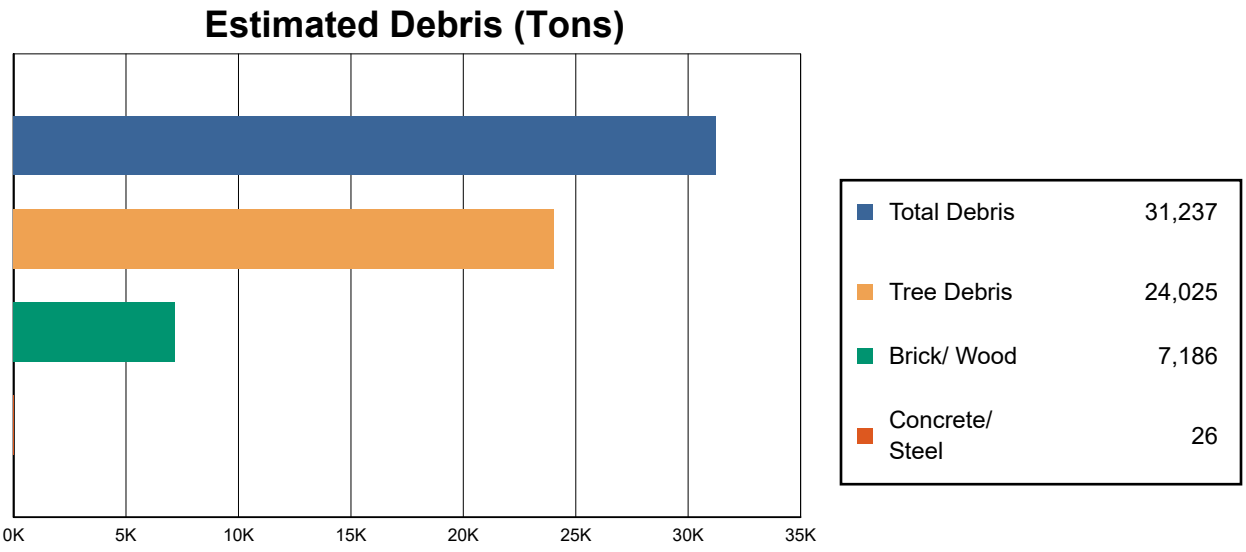
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

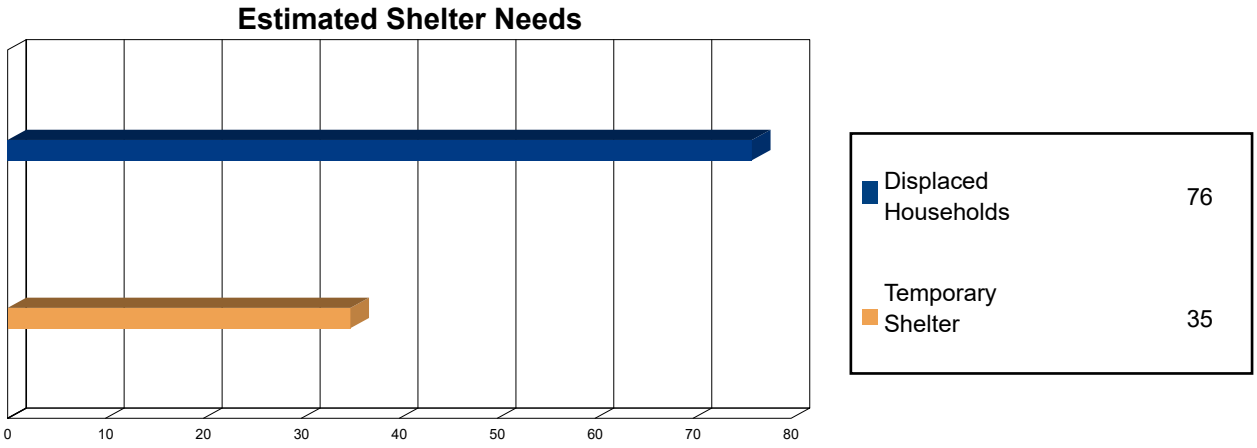


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 31,237 tons of debris will be generated. Of the total amount, 18,028 tons (58%) is Other Tree Debris. Of the remaining 13,209 tons, Brick/Wood comprises 54% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 288 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,997 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 76 households to be displaced due to the hurricane. Of these, 35 people (out of a total population of 11,190) will seek temporary shelter in public shelters.

Economic Loss

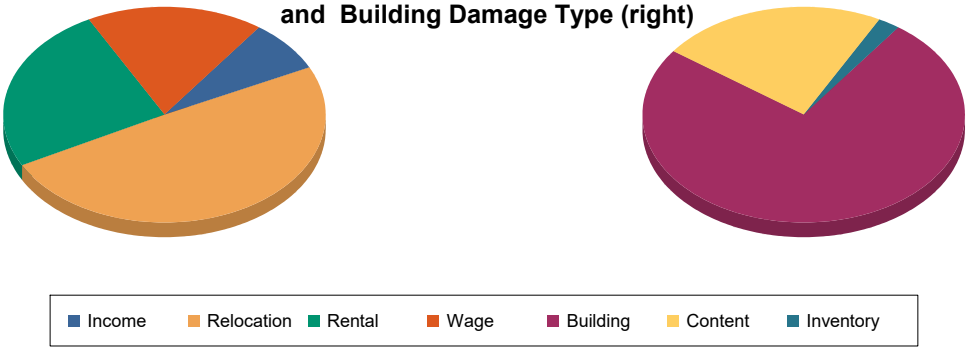
The total economic loss estimated for the hurricane is 103.4 million dollars, which represents 3.64 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 103 million dollars. 13% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 60% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

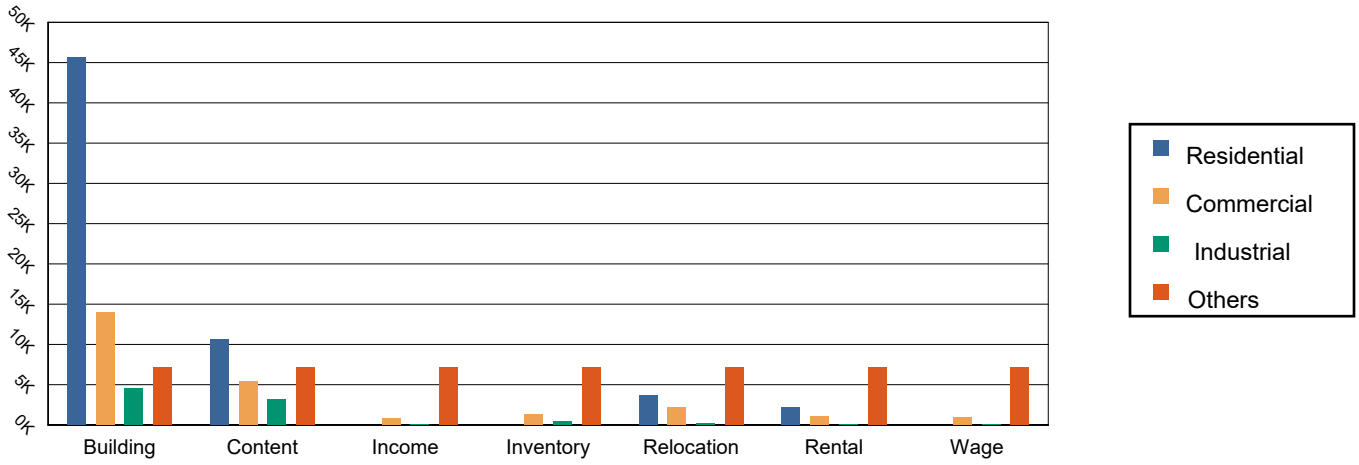


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	45,622.99	13,974.37	4,524.72	3,265.55	67,387.64
	Content	10,612.04	5,358.25	3,212.76	1,291.53	20,474.58
	Inventory	0.00	1,305.20	412.72	162.11	1,880.03
	Subtotal	**56,235.03**	**20,637.82**	**8,150.20**	**4,719.20**	**89,742.25**
Business Interruption Loss						
	Income	0.01	843.94	48.24	186.84	1,079.03
	Relocation	3,667.15	2,229.26	225.92	609.22	6,731.55
	Rental	2,186.47	1,110.84	35.40	87.04	3,419.73
	Wage	0.03	884.84	73.24	1,476.34	2,434.44
	Subtotal	**5,853.66**	**5,068.87**	**382.80**	**2,359.42**	**13,664.75**

Total

Total	**62,088.69**	**25,706.69**	**8,533.00**	**7,078.62**	**103,406.99**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	11,190	1,367,721	1,475,471	2,843,192
Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**
Study Region Total	**11,190**	**1,367,721**	**1,475,471**	**2,843,192**

Hazus: Hurricane Global Risk Report

Region Name:	East_Granby_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 17.67 square miles and contains 2 census tracts. There are over 2 thousand households in the region and a total population of 5,214 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,623 million dollars. Approximately 85% of the buildings (and 49% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,335 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

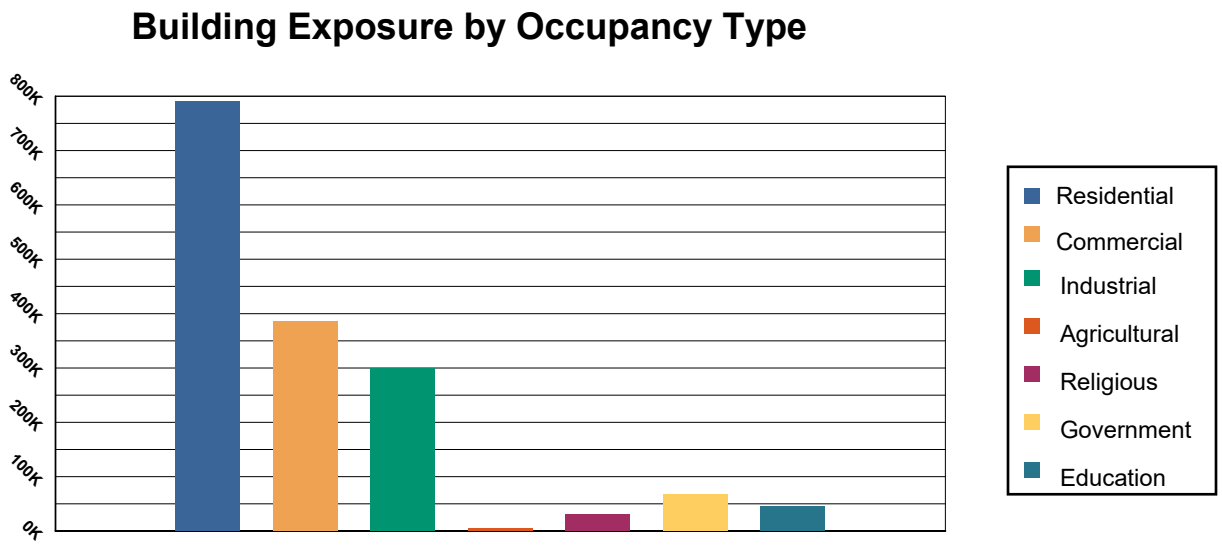


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	790,517	48.71%
Commercial	386,242	23.80%
Industrial	299,865	18.48%
Agricultural	5,272	0.32%
Religious	29,628	1.83%
Government	66,698	4.11%
Education	44,591	2.75%
Total	**1,622,813**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

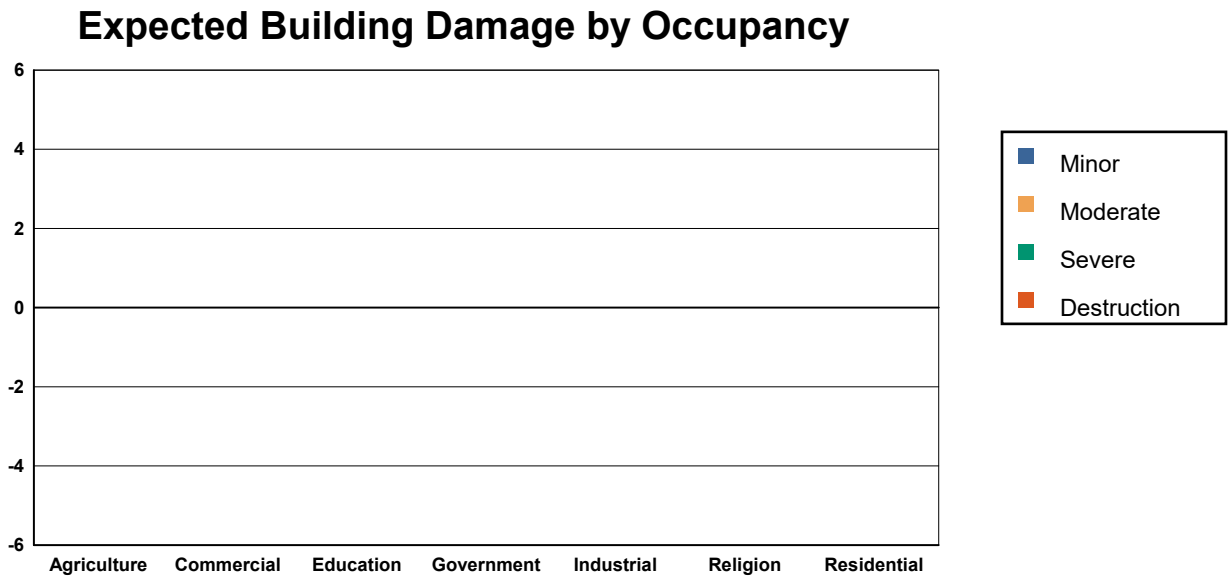


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	10.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	213.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	10.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	29.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	84.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	6.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	1,983.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**2,335.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	35	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	195	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	167	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	1,932	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

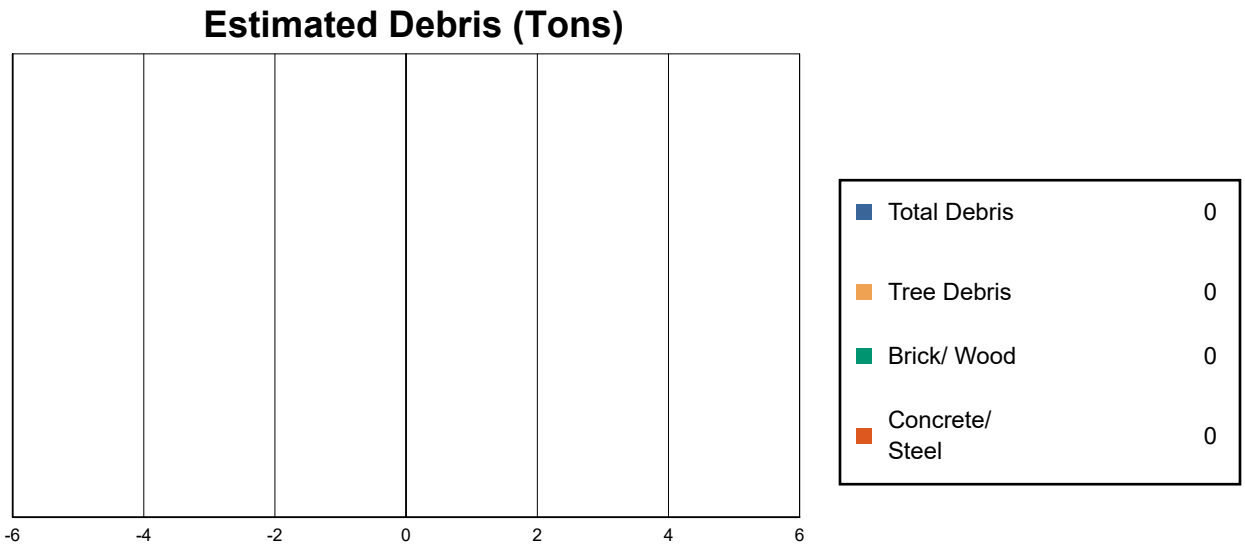
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

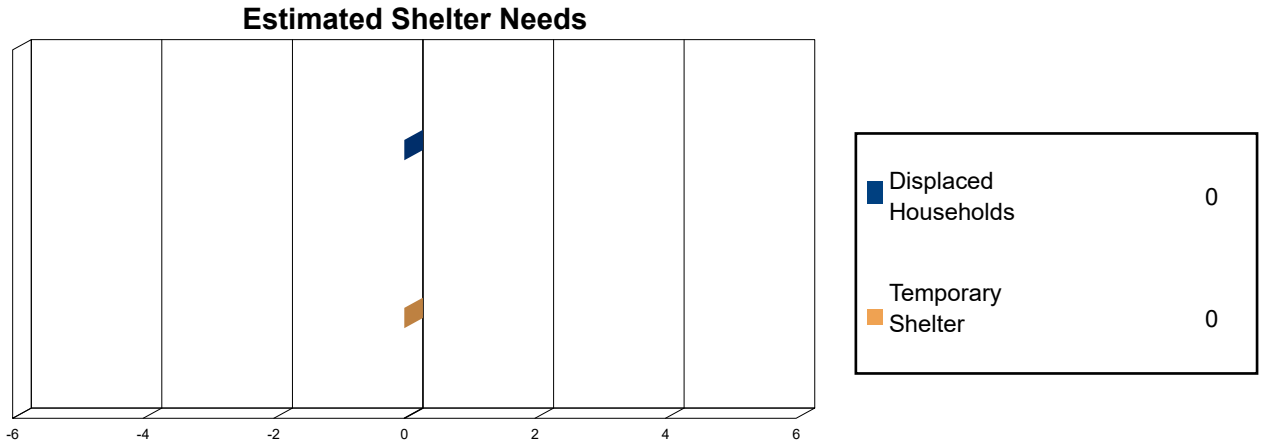


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,214) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

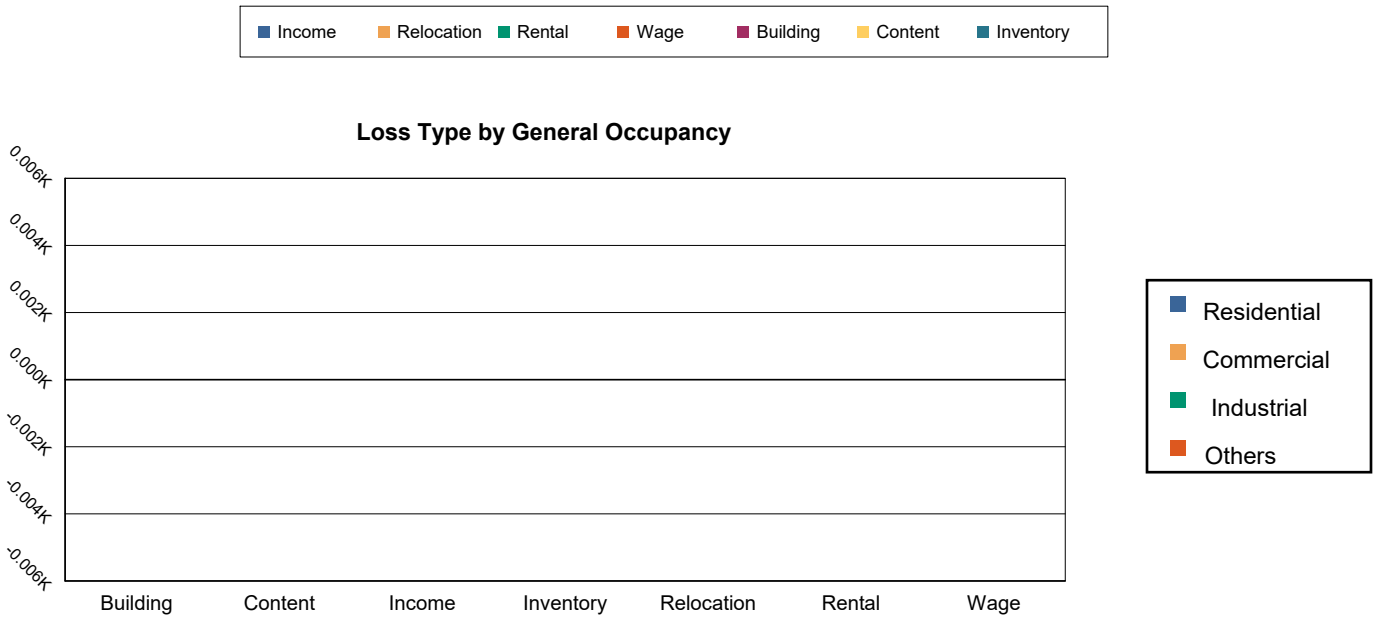


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,517	832,296	1,622,813
Total	**5,214**	**790,517**	**832,296**	**1,622,813**
Study Region Total	**5,214**	**790,517**	**832,296**	**1,622,813**

Hazus: Hurricane Global Risk Report

Region Name:	East_Granby_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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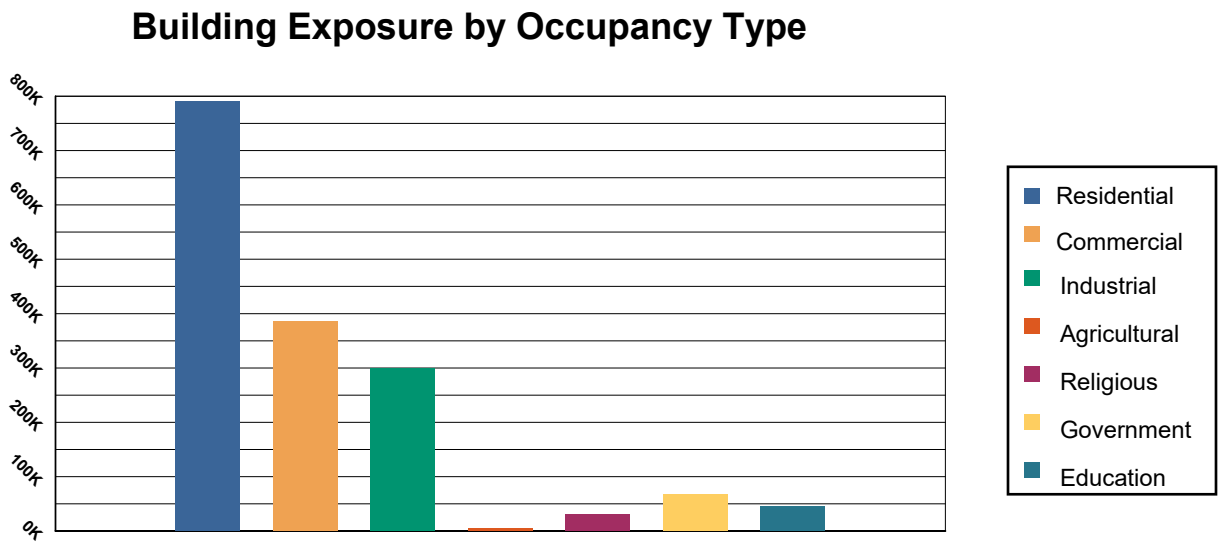

Table 1: Building Exposure by Occupancy Type

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Total	**1,622,813**	**100.00%**

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For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

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Scenario Name:	Probabilistic
Type:	Probabilistic

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General Building Stock Damage

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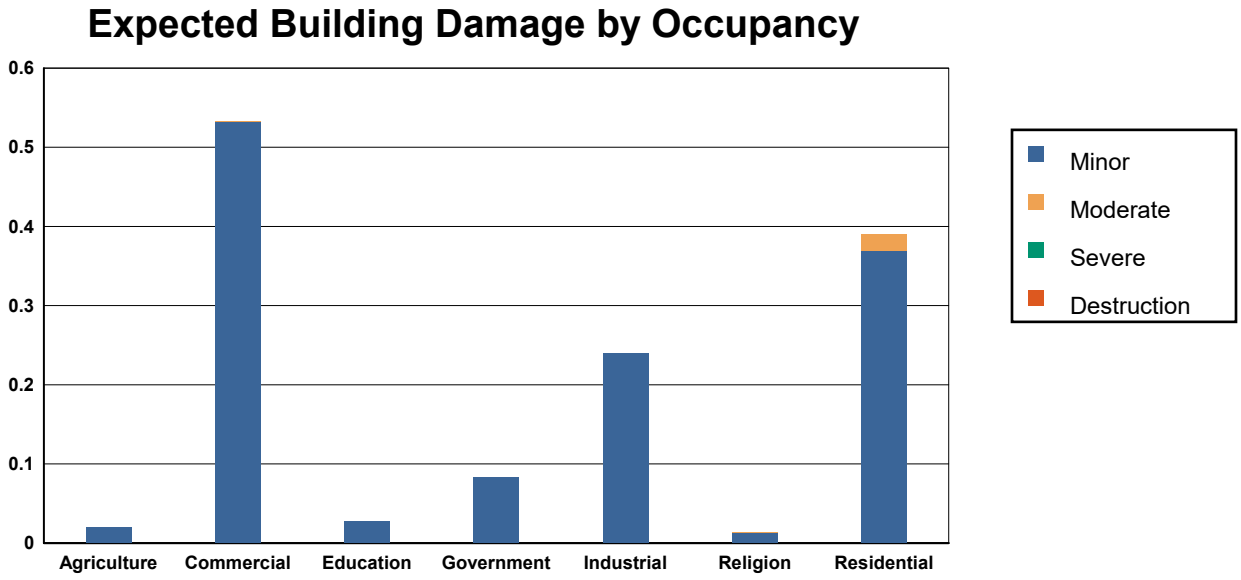


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.98	99.80	0.02	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	212.47	99.75	0.53	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Education	9.97	99.73	0.03	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Government	28.92	99.72	0.08	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	83.76	99.72	0.24	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Religion	5.99	99.77	0.01	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Residential	1,982.61	99.98	0.37	0.02	0.02	0.00	0.00	0.00	0.00	0.00
Total	**2,333.69**		**1.28**		**0.02**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	35	99.69	0	0.31	0	0.00	0	0.00	0	0.00
Masonry	194	99.68	1	0.32	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	167	99.72	0	0.28	0	0.00	0	0.00	0	0.00
Wood	1,932	99.98	0	0.02	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

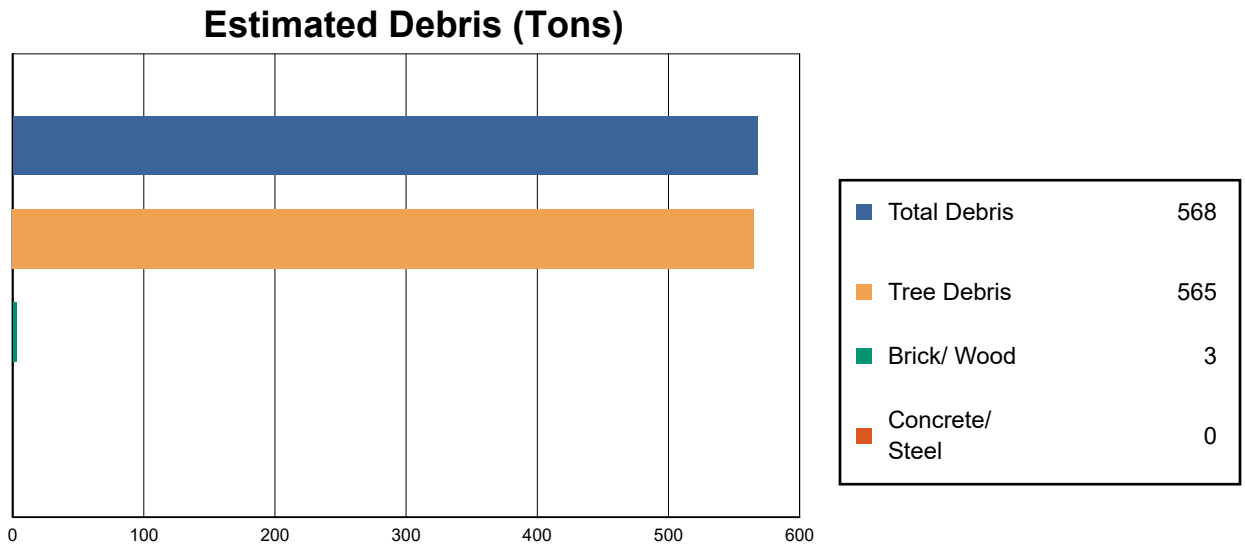
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

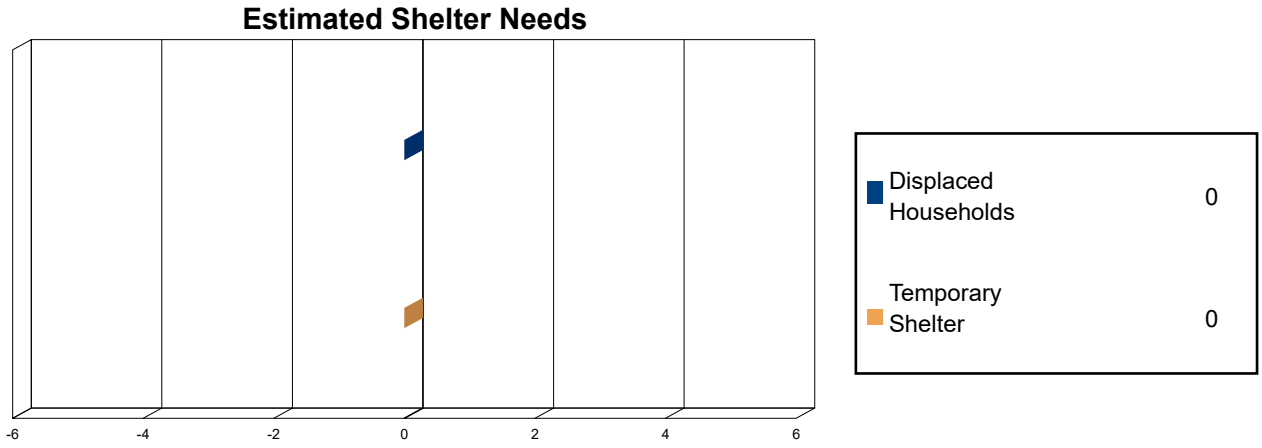


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 568 tons of debris will be generated. Of the total amount, 456 tons (80%) is Other Tree Debris. Of the remaining 112 tons, Brick/Wood comprises 3% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 109 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,214) will seek temporary shelter in public shelters.

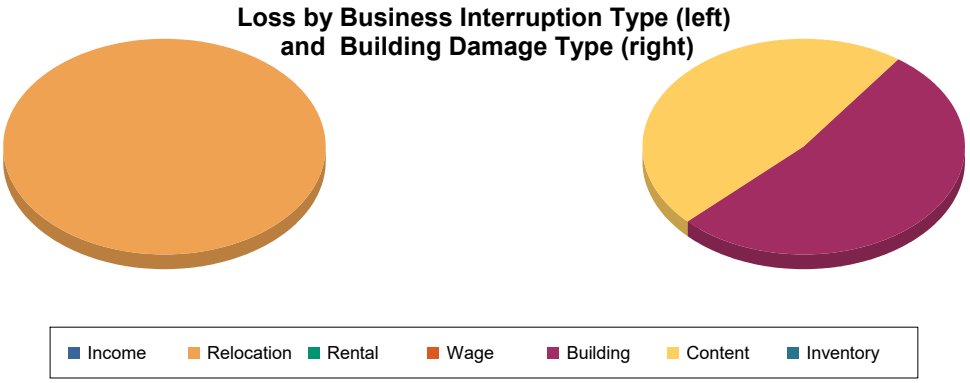
Economic Loss

The total economic loss estimated for the hurricane is 0.5 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.



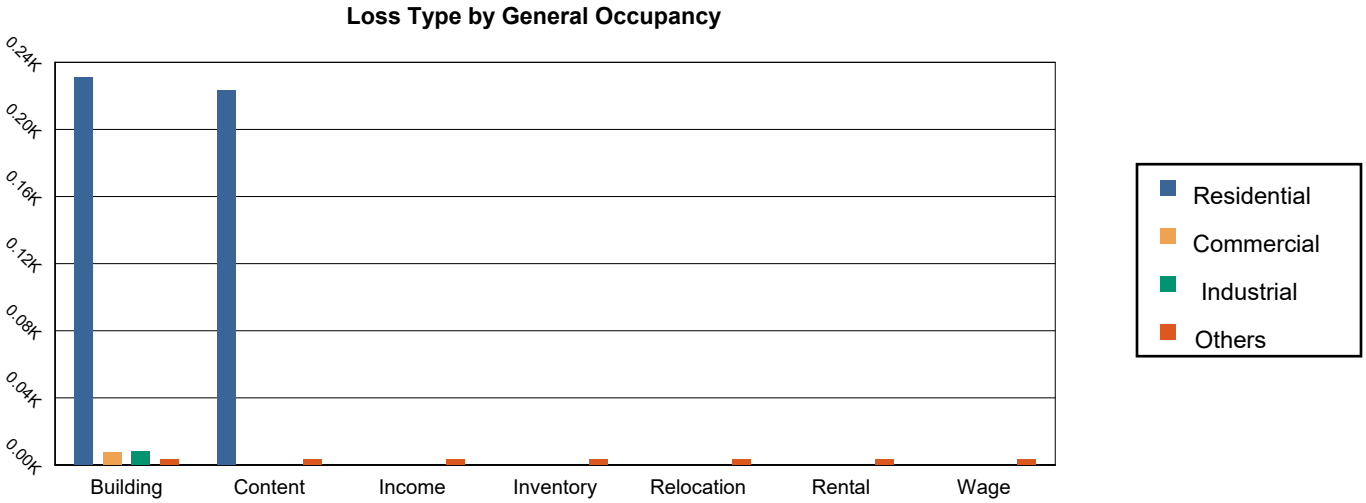


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	230.85	7.26	7.83	3.13	249.06
	Content	223.18	0.00	0.00	0.00	223.18
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**454.03**	**7.26**	**7.83**	**3.13**	**472.24**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.04	0.03	0.00	0.01	0.09
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.04**	**0.03**	**0.00**	**0.01**	**0.09**

Total

Total	**454.07**	**7.29**	**7.83**	**3.14**	**472.33**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,517	832,296	1,622,813
Total	**5,214**	**790,517**	**832,296**	**1,622,813**
Study Region Total	**5,214**	**790,517**	**832,296**	**1,622,813**

Hazus: Hurricane Global Risk Report

Region Name:	East_Granby_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 17.67 square miles and contains 2 census tracts. There are over 2 thousand households in the region and a total population of 5,214 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,623 million dollars. Approximately 85% of the buildings (and 49% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,335 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

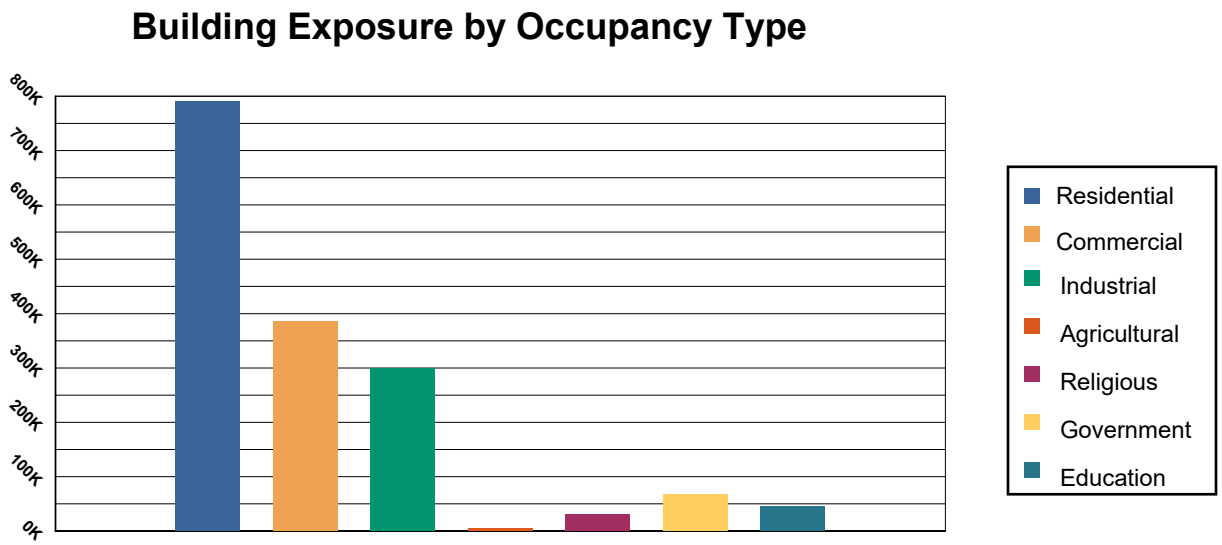


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	790,517	48.71%
Commercial	386,242	23.80%
Industrial	299,865	18.48%
Agricultural	5,272	0.32%
Religious	29,628	1.83%
Government	66,698	4.11%
Education	44,591	2.75%
Total	**1,622,813**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

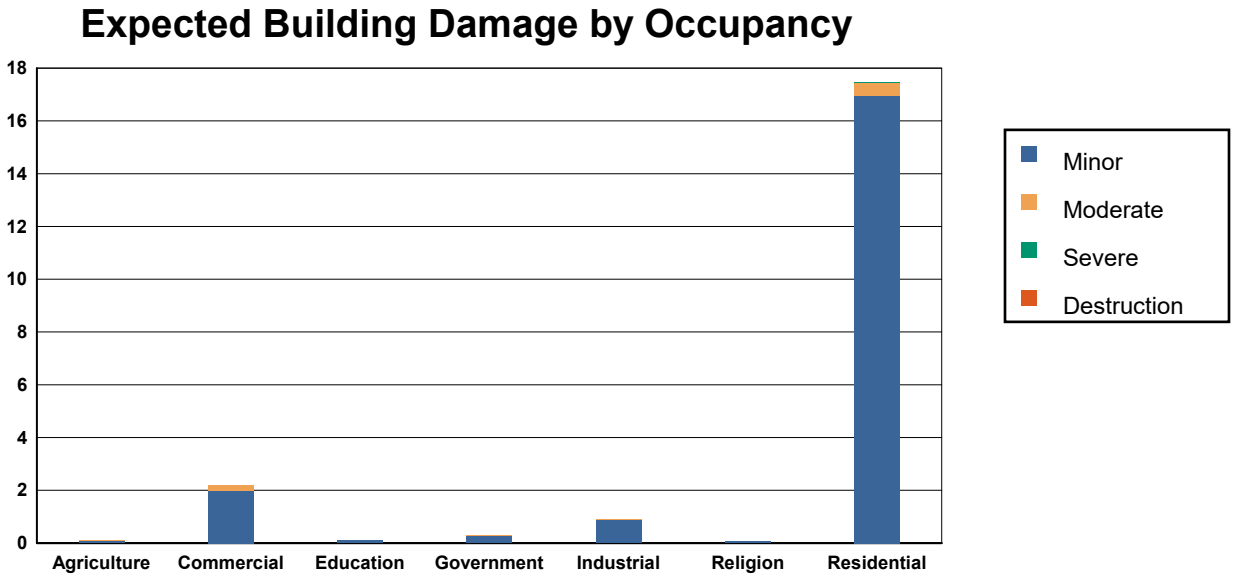


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.90	98.97	0.10	0.95	0.01	0.07	0.00	0.01	0.00	0.00
Commercial	210.82	98.98	1.97	0.93	0.20	0.10	0.00	0.00	0.00	0.00
Education	9.90	99.03	0.10	0.96	0.00	0.01	0.00	0.00	0.00	0.00
Government	28.70	98.97	0.30	1.02	0.00	0.01	0.00	0.00	0.00	0.00
Industrial	83.11	98.94	0.86	1.03	0.02	0.03	0.00	0.00	0.00	0.00
Religion	5.95	99.09	0.05	0.89	0.00	0.02	0.00	0.00	0.00	0.00
Residential	1,965.53	99.12	16.95	0.85	0.50	0.03	0.02	0.00	0.00	0.00
Total	**2,313.91**		**20.32**		**0.75**		**0.02**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	35	98.94	0	1.05	0	0.00	0	0.00	0	0.00
Masonry	192	98.60	3	1.31	0	0.09	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	165	98.99	2	0.94	0	0.07	0	0.00	0	0.00
Wood	1,917	99.21	15	0.77	0	0.02	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

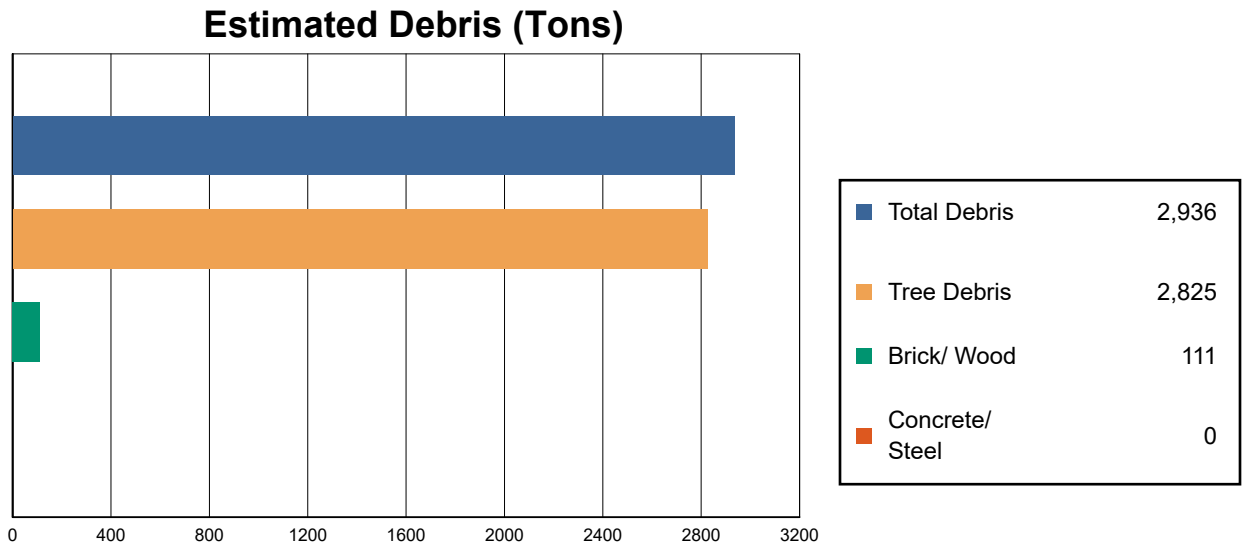
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

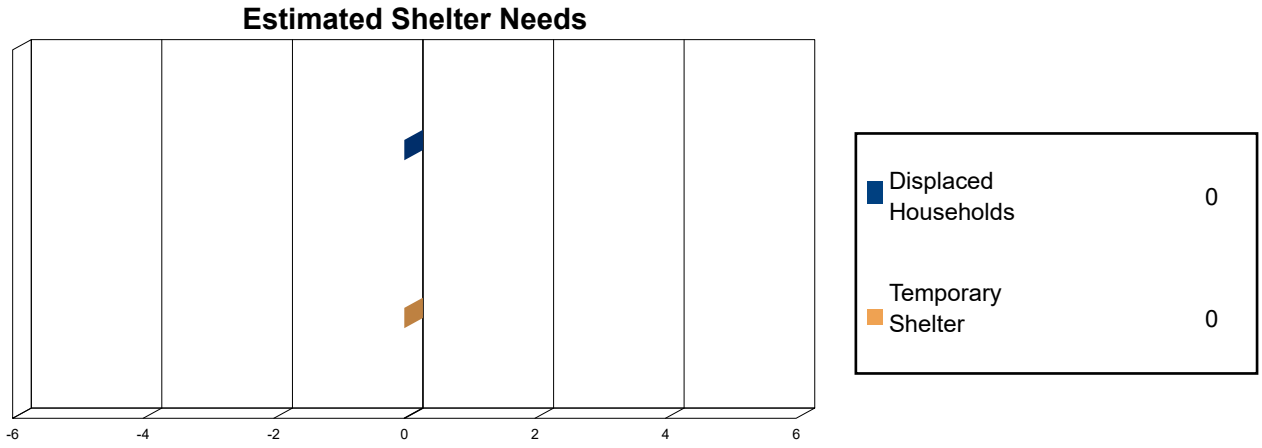


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,936 tons of debris will be generated. Of the total amount, 2,279 tons (78%) is Other Tree Debris. Of the remaining 657 tons, Brick/Wood comprises 17% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 546 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,214) will seek temporary shelter in public shelters.

Economic Loss

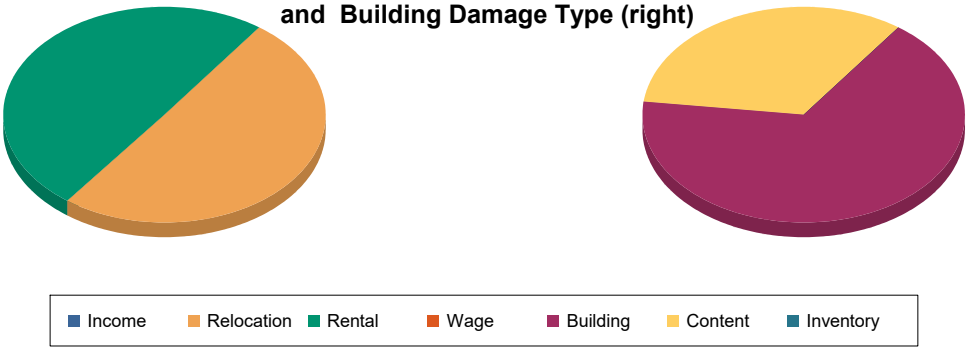
The total economic loss estimated for the hurricane is 4.0 million dollars, which represents 0.25 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 4 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

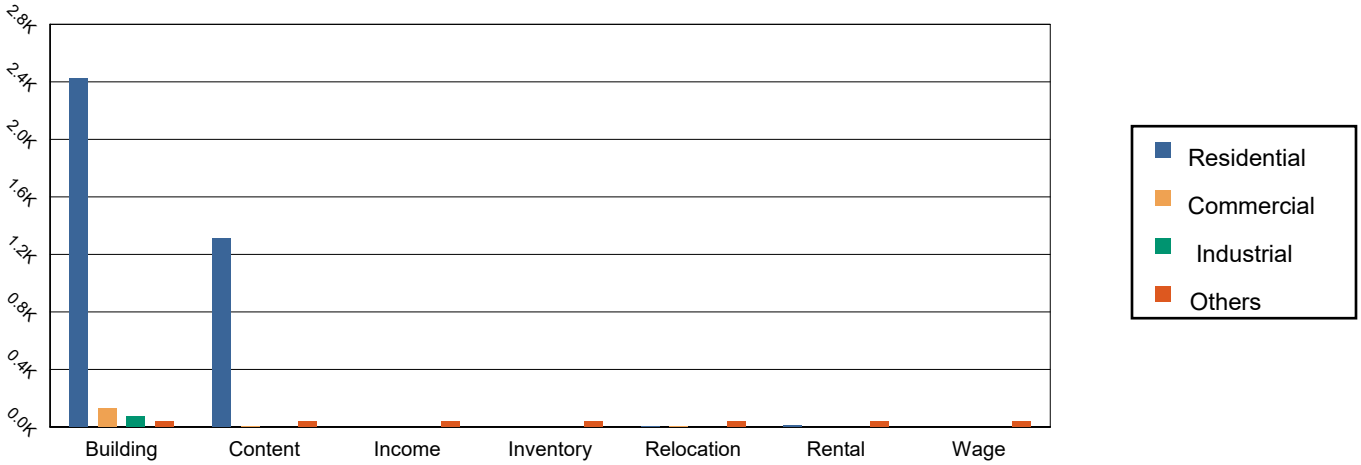


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,422.50	131.34	73.99	41.72	2,669.54
	Content	1,311.22	4.25	0.00	0.00	1,315.47
	Inventory	0.00	0.62	0.00	0.00	0.62
	Subtotal	**3,733.71**	**136.21**	**73.99**	**41.72**	**3,985.63**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	6.02	2.81	0.28	0.16	9.27
	Rental	9.14	0.00	0.00	0.00	9.14
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**15.16**	**2.81**	**0.28**	**0.16**	**18.41**

Total

Total	**3,748.87**	**139.02**	**74.27**	**41.88**	**4,004.04**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
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Hartford	5,214	790,517	832,296	1,622,813
Total	**5,214**	**790,517**	**832,296**	**1,622,813**
Study Region Total	**5,214**	**790,517**	**832,296**	**1,622,813**

Hazus: Hurricane Global Risk Report

Region Name:	East_Granby_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
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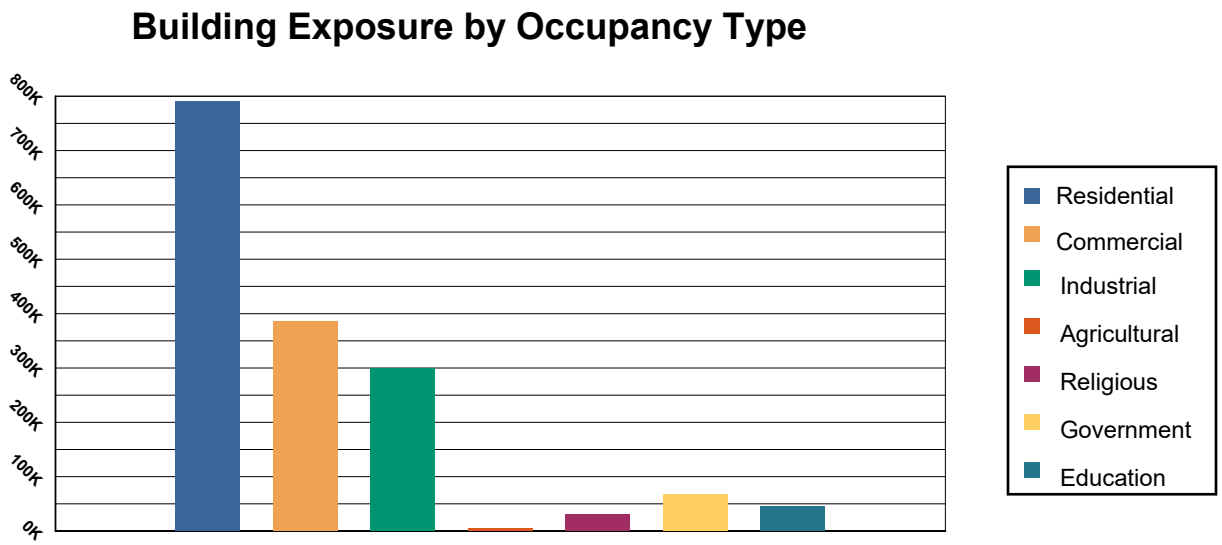

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Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

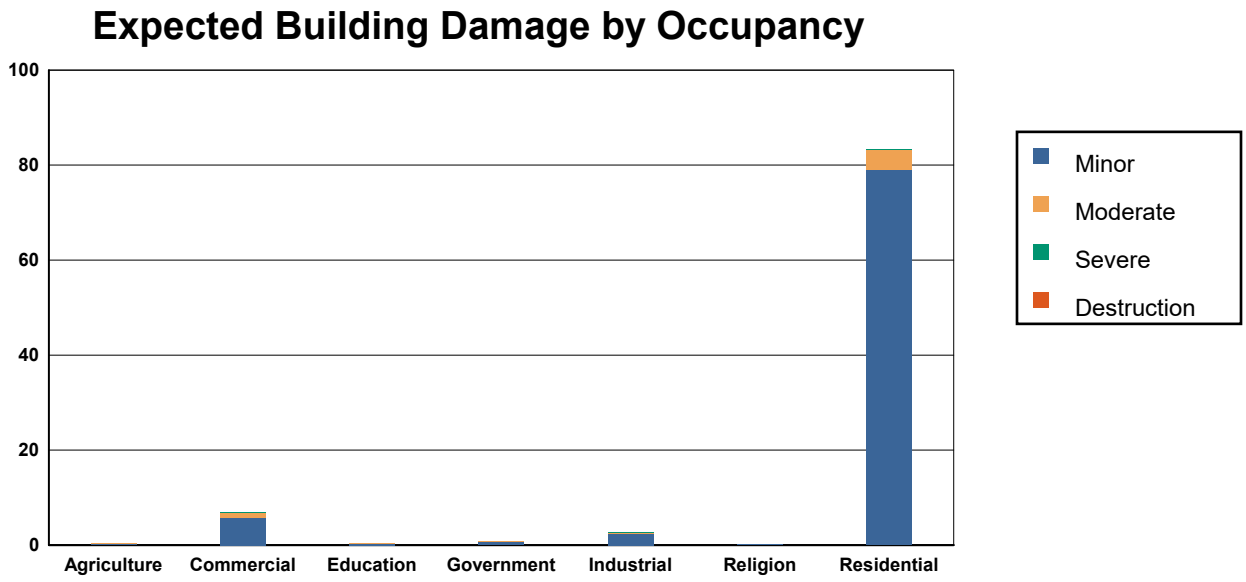


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.61	96.07	0.33	3.27	0.05	0.48	0.02	0.18	0.00	0.00
Commercial	206.16	96.79	5.69	2.67	1.04	0.49	0.11	0.05	0.00	0.00
Education	9.72	97.24	0.27	2.66	0.01	0.10	0.00	0.00	0.00	0.00
Government	28.17	97.14	0.80	2.76	0.03	0.10	0.00	0.00	0.00	0.00
Industrial	81.41	96.92	2.36	2.80	0.19	0.22	0.04	0.05	0.00	0.00
Religion	5.82	96.94	0.18	2.93	0.01	0.13	0.00	0.01	0.00	0.00
Residential	1,899.70	95.80	79.01	3.98	4.22	0.21	0.07	0.00	0.00	0.00
Total	**2,240.59**		**88.62**		**5.55**		**0.24**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	34	97.21	1	2.70	0	0.09	0	0.00	0	0.00
Masonry	187	95.89	7	3.53	1	0.52	0	0.06	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	162	97.09	4	2.46	1	0.40	0	0.05	0	0.00
Wood	1,855	96.02	74	3.82	3	0.16	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

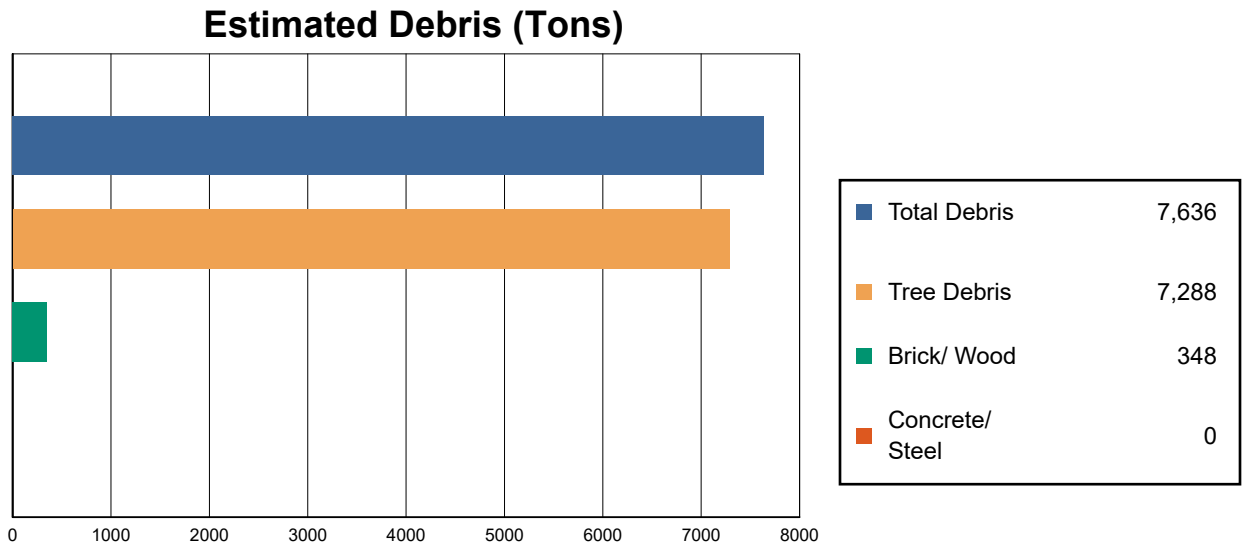
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

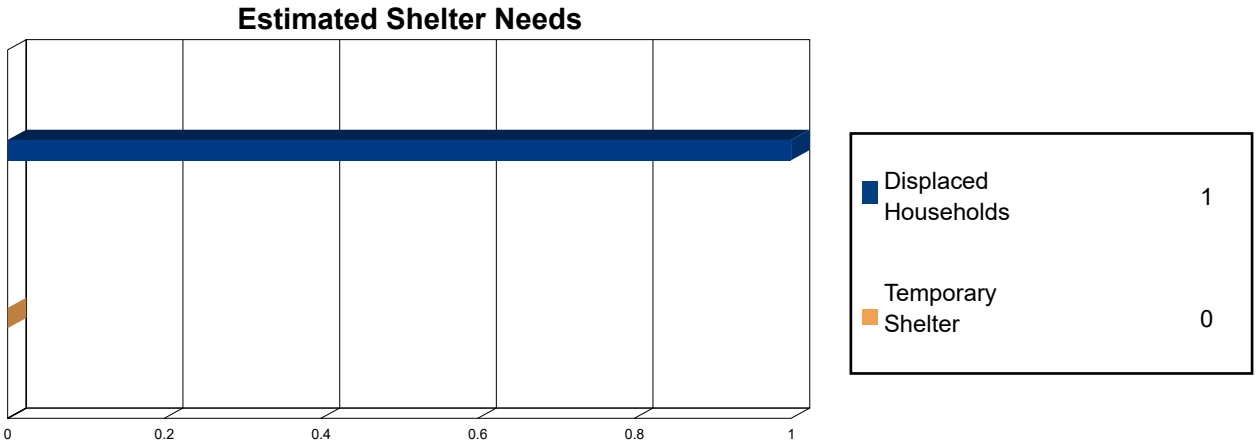


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7,636 tons of debris will be generated. Of the total amount, 5,872 tons (77%) is Other Tree Debris. Of the remaining 1,764 tons, Brick/Wood comprises 20% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 14 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,416 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,214) will seek temporary shelter in public shelters.

Economic Loss

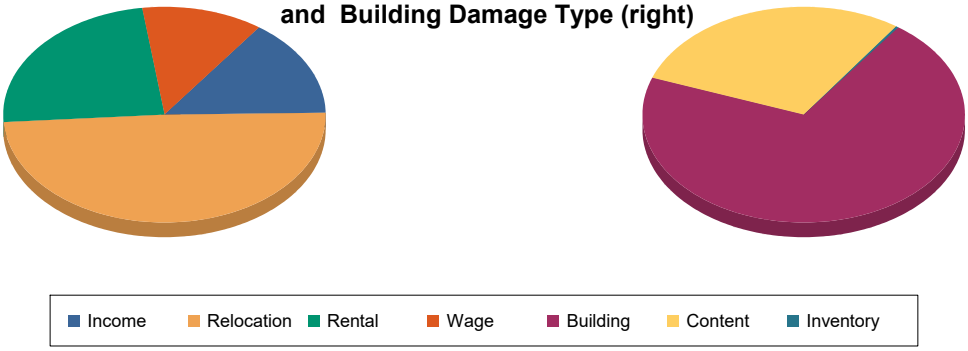
The total economic loss estimated for the hurricane is 9.3 million dollars, which represents 0.57 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 9 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

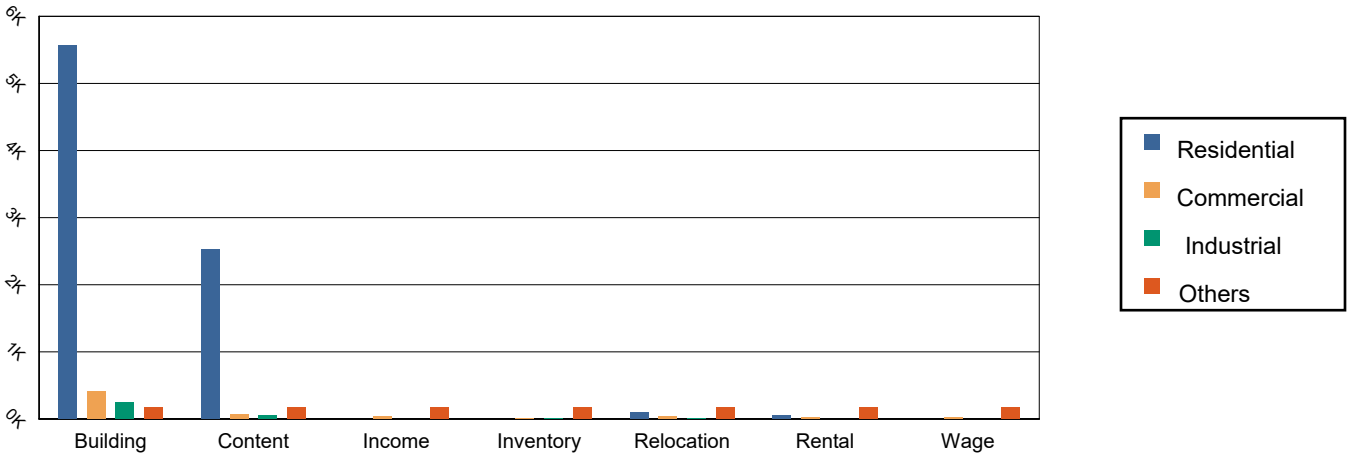


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,565.12	414.81	251.44	122.87	6,354.24
	Content	2,525.71	65.96	45.69	7.67	2,645.04
	Inventory	0.00	10.00	5.10	1.16	16.26
	Subtotal	**8,090.83**	**490.77**	**302.24**	**131.71**	**9,015.54**
Business Interruption Loss						
	Income	0.00	36.38	0.99	8.37	45.74
	Relocation	102.85	37.94	5.00	6.55	152.34
	Rental	54.78	18.38	0.67	0.58	74.41
	Wage	0.00	16.38	1.64	19.75	37.76
	Subtotal	**157.63**	**109.08**	**8.29**	**35.25**	**310.26**

Total

Total	**8,248.46**	**599.85**	**310.53**	**166.96**	**9,325.80**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
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Total	**5,214**	**790,517**	**832,296**	**1,622,813**
Study Region Total	**5,214**	**790,517**	**832,296**	**1,622,813**

Hazus: Hurricane Global Risk Report

Region Name:	East_Granby_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Monday, May 8, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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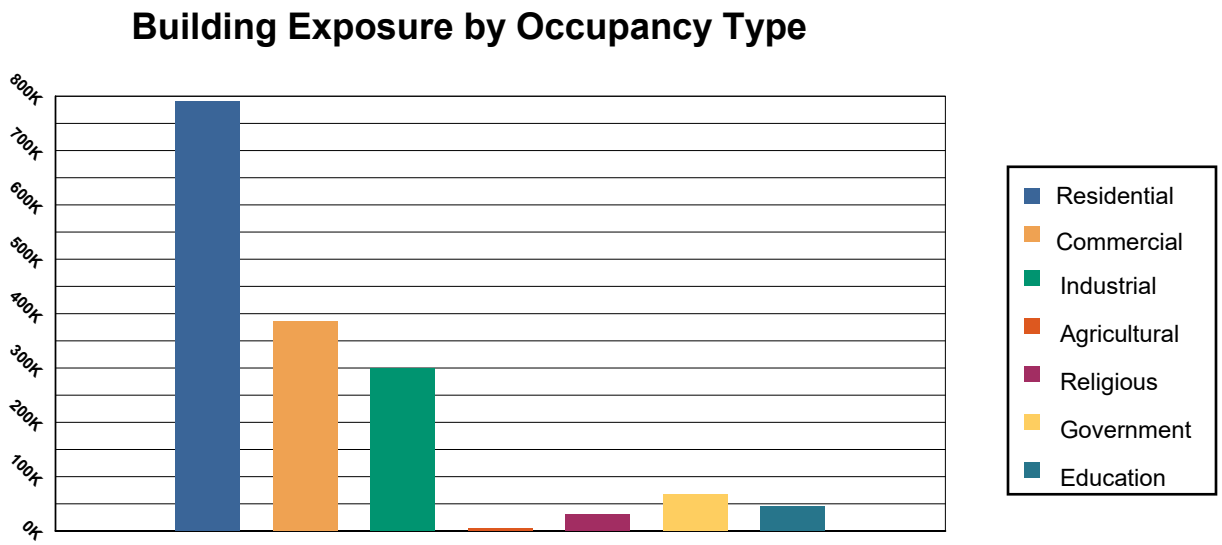

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Total	**1,622,813**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 21 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

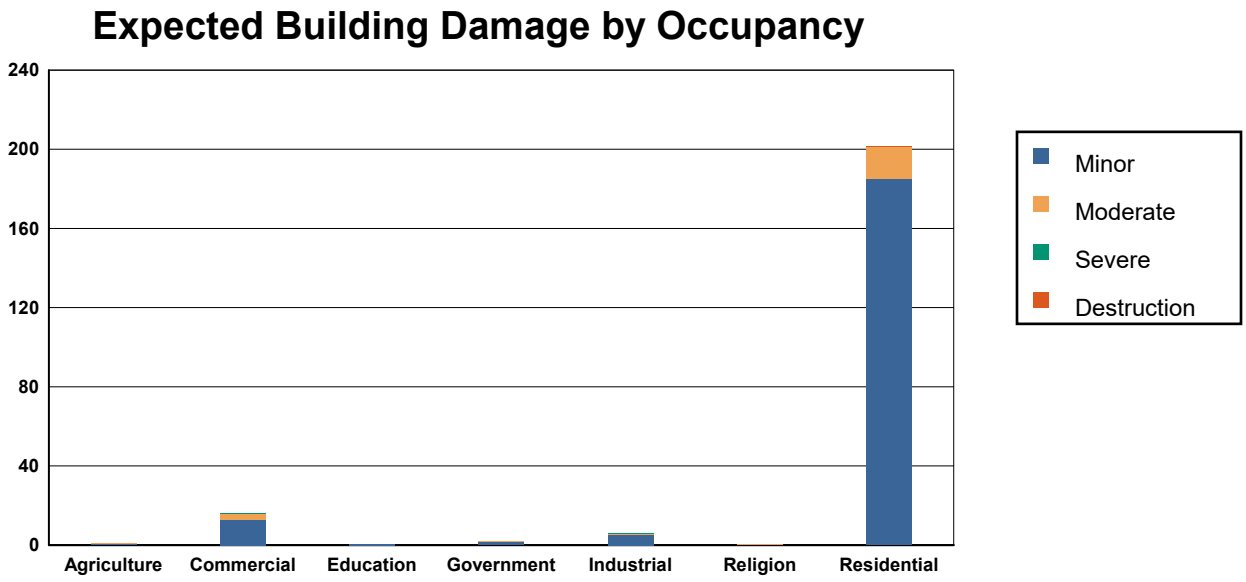


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.03	90.27	0.75	7.53	0.15	1.50	0.07	0.66	0.00	0.04
Commercial	196.86	92.42	12.69	5.96	2.91	1.37	0.53	0.25	0.00	0.00
Education	9.35	93.48	0.60	5.96	0.05	0.54	0.00	0.02	0.00	0.00
Government	27.08	93.38	1.74	6.01	0.17	0.60	0.00	0.01	0.00	0.00
Industrial	77.95	92.80	5.06	6.02	0.80	0.95	0.18	0.22	0.01	0.01
Religion	5.55	92.53	0.41	6.86	0.03	0.58	0.00	0.03	0.00	0.00
Residential	1,781.24	89.83	185.19	9.34	16.02	0.81	0.36	0.02	0.18	0.01
Total	**2,107.06**		**206.45**		**20.14**		**1.15**		**0.19**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	33	93.62	2	5.79	0	0.58	0	0.01	0	0.00
Masonry	177	90.98	14	7.18	3	1.58	0	0.24	0	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	156	93.25	9	5.26	2	1.24	0	0.25	0	0.00
Wood	1,741	90.13	177	9.18	13	0.66	0	0.02	0	0.01

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

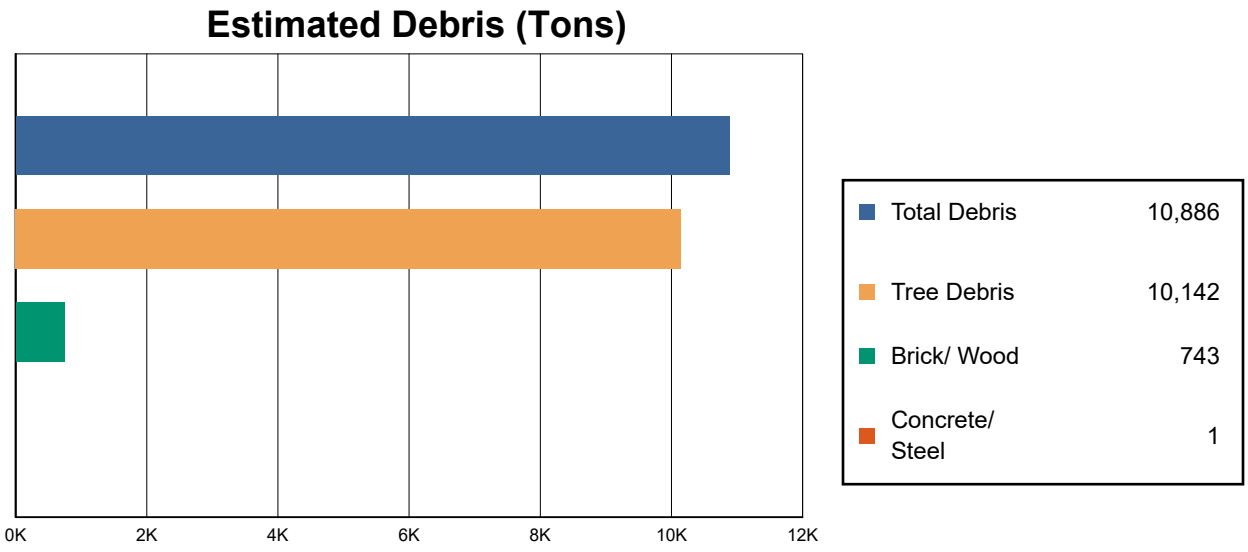
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

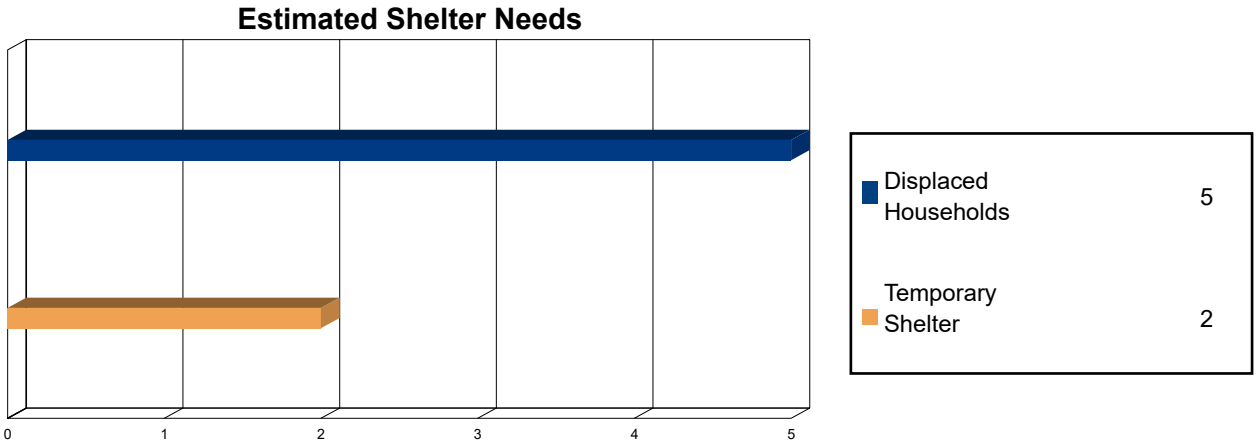


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 10,886 tons of debris will be generated. Of the total amount, 8,178 tons (75%) is Other Tree Debris. Of the remaining 2,708 tons, Brick/Wood comprises 27% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 30 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,964 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the hurricane. Of these, 2 people (out of a total population of 5,214) will seek temporary shelter in public shelters.

Economic Loss

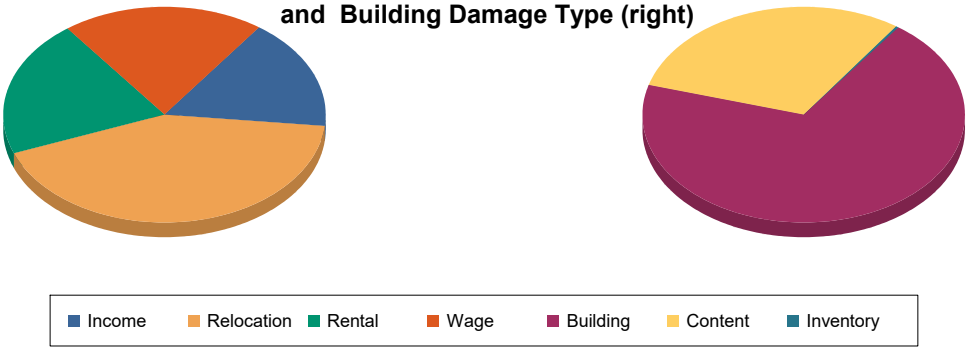
The total economic loss estimated for the hurricane is 17.2 million dollars, which represents 1.06 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 17 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

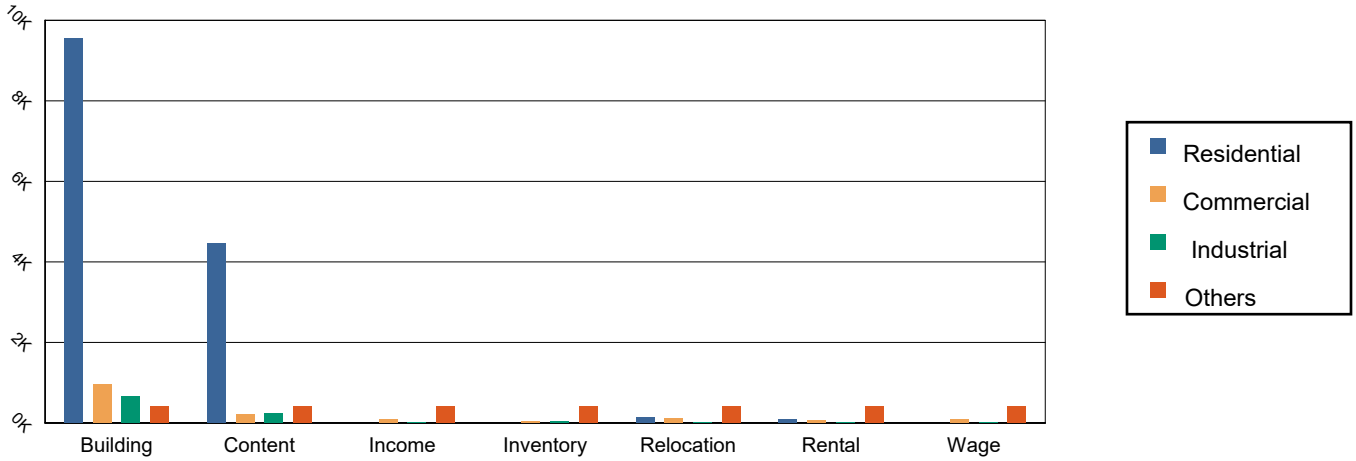


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	9,556.63	971.21	658.84	275.82	11,462.50
	Content	4,460.35	206.62	245.66	38.82	4,951.45
	Inventory	0.00	33.85	28.33	5.42	67.61
	Subtotal	**14,016.98**	**1,211.68**	**932.84**	**320.06**	**16,481.56**
Business Interruption Loss						
	Income	0.00	99.37	6.65	15.99	122.01
	Relocation	146.30	116.95	26.53	20.43	310.21
	Rental	87.83	56.36	3.62	1.87	149.68
	Wage	0.00	91.55	7.67	48.68	147.89
	Subtotal	**234.13**	**364.24**	**44.46**	**86.97**	**729.79**

Total

Total	14,251.10	1,575.92	977.30	407.03	17,211.35

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,517	832,296	1,622,813
Total	**5,214**	**790,517**	**832,296**	**1,622,813**
Study Region Total	**5,214**	**790,517**	**832,296**	**1,622,813**

Hazus: Hurricane Global Risk Report

Region Name:	East_Granby_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 17.67 square miles and contains 2 census tracts. There are over 2 thousand households in the region and a total population of 5,214 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,623 million dollars. Approximately 85% of the buildings (and 49% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,335 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

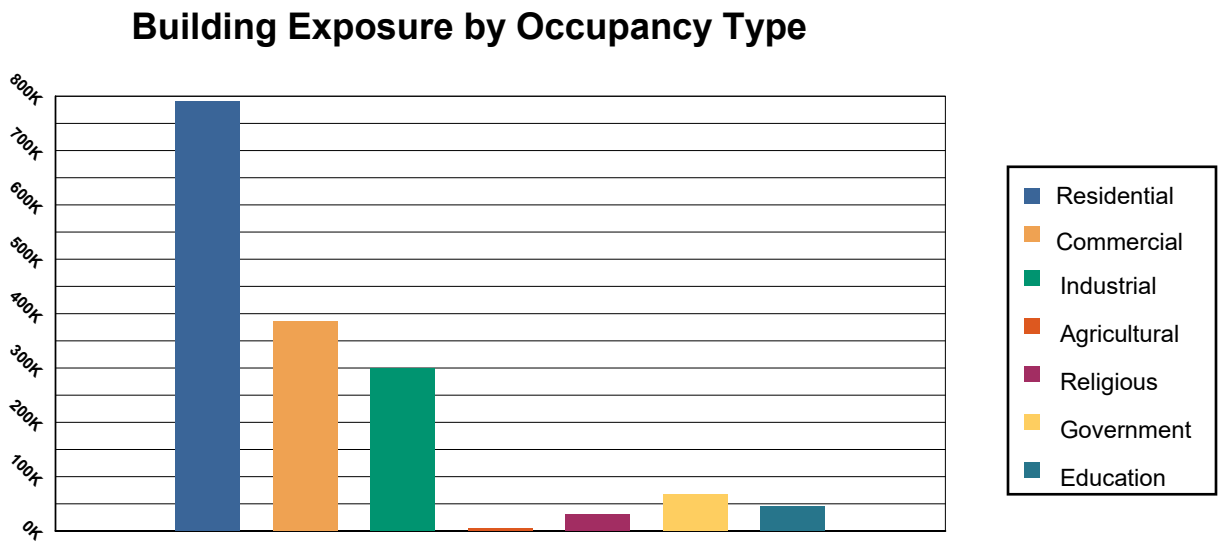


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	790,517	48.71%
Commercial	386,242	23.80%
Industrial	299,865	18.48%
Agricultural	5,272	0.32%
Religious	29,628	1.83%
Government	66,698	4.11%
Education	44,591	2.75%
Total	**1,622,813**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 69 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

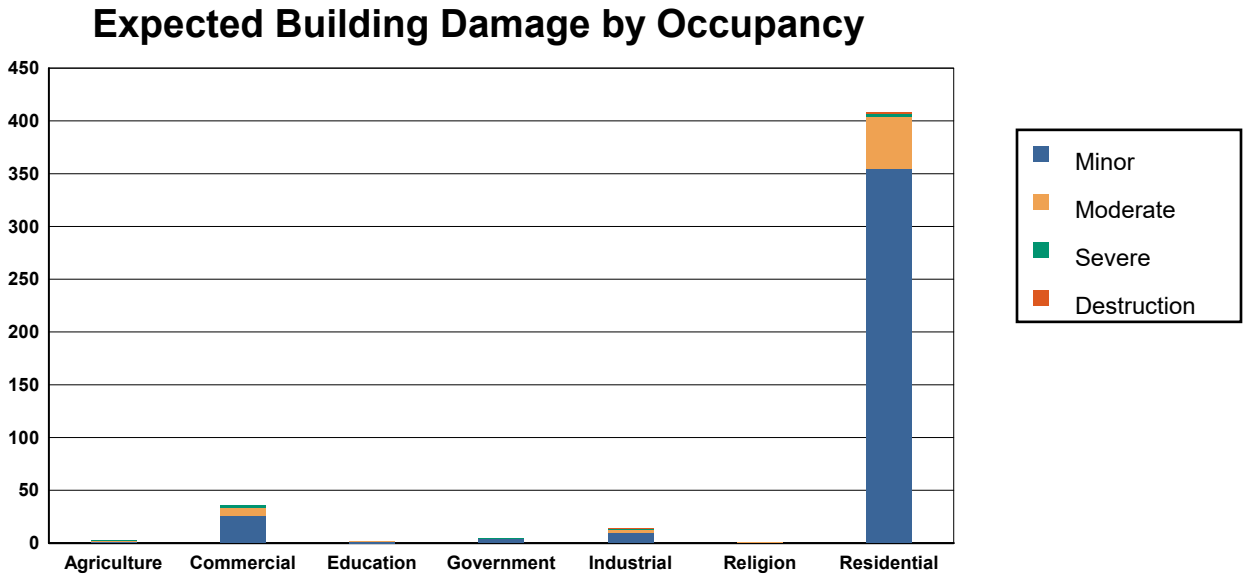


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.95	79.49	1.47	14.65	0.38	3.81	0.19	1.86	0.02	0.19
Commercial	177.16	83.18	25.83	12.13	8.10	3.80	1.89	0.89	0.01	0.01
Education	8.52	85.15	1.23	12.27	0.24	2.43	0.02	0.15	0.00	0.00
Government	24.57	84.72	3.58	12.34	0.81	2.78	0.05	0.17	0.00	0.00
Industrial	70.49	83.92	10.04	11.96	2.78	3.32	0.63	0.75	0.05	0.06
Religion	4.96	82.70	0.87	14.44	0.16	2.68	0.01	0.18	0.00	0.00
Residential	1,574.69	79.41	354.66	17.89	49.56	2.50	2.44	0.12	1.65	0.08
Total	**1,868.34**		**397.67**		**62.03**		**5.22**		**1.73**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	30	85.36	4	11.77	1	2.71	0	0.16	0	0.00
Masonry	159	81.38	26	13.39	9	4.41	1	0.74	0	0.08
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	141	84.61	18	10.69	6	3.72	2	0.96	0	0.01
Wood	1,541	79.74	345	17.85	43	2.21	2	0.12	1	0.08

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

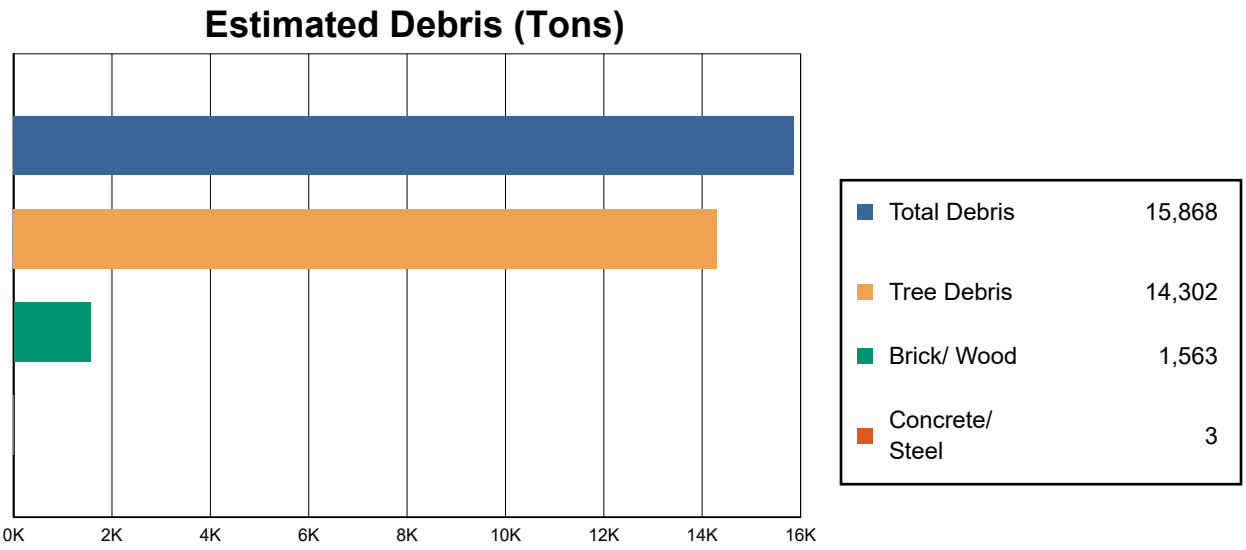
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

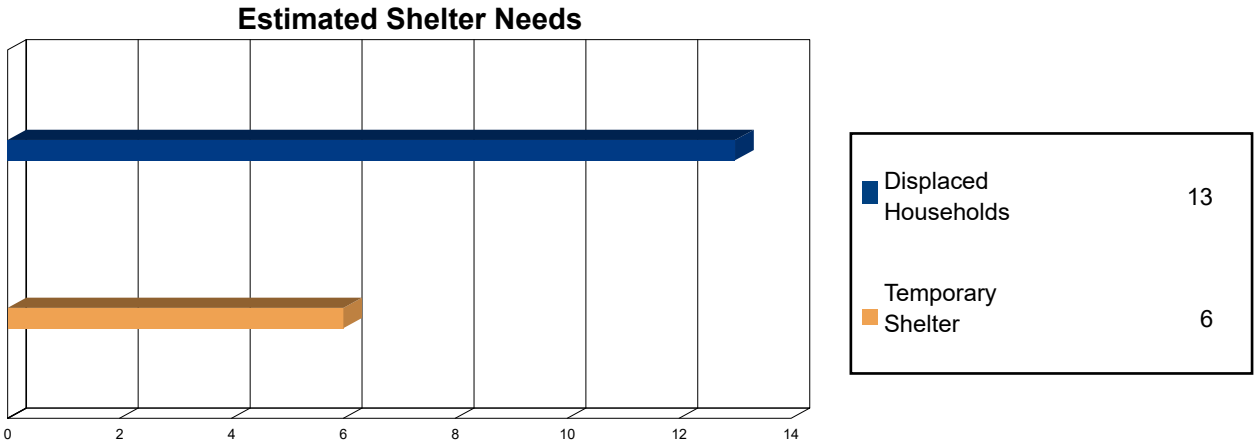


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15,868 tons of debris will be generated. Of the total amount, 11,559 tons (73%) is Other Tree Debris. Of the remaining 4,309 tons, Brick/Wood comprises 36% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 63 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,743 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 13 households to be displaced due to the hurricane. Of these, 6 people (out of a total population of 5,214) will seek temporary shelter in public shelters.

Economic Loss

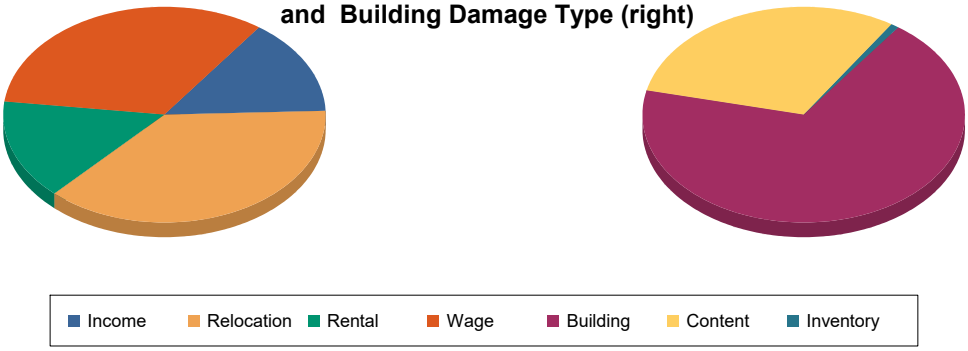
The total economic loss estimated for the hurricane is 34.9 million dollars, which represents 2.15 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 35 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 71% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

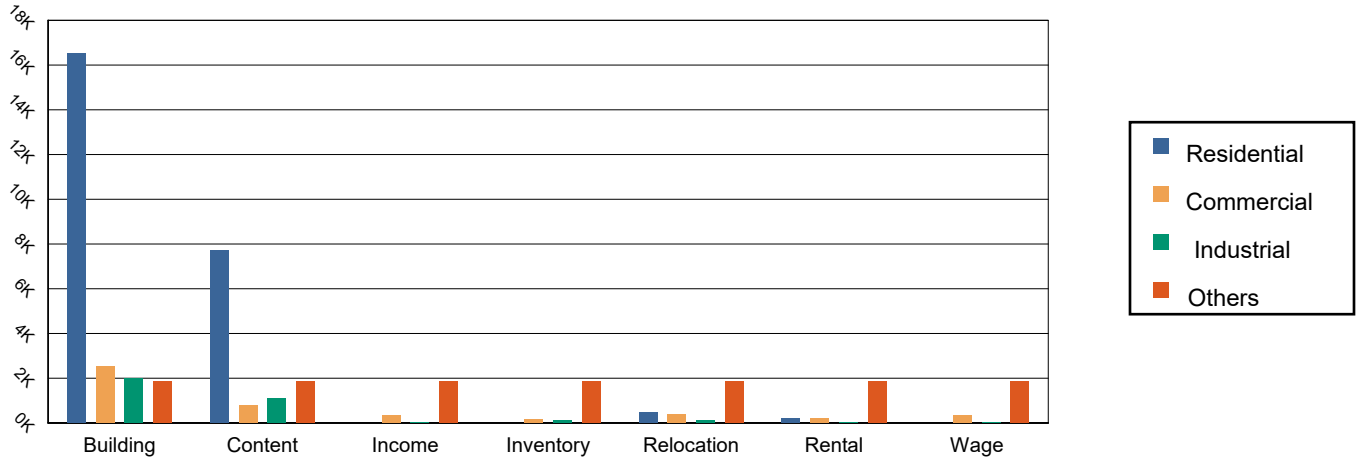


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	16,511.07	2,534.19	1,998.50	762.30	21,806.05
	Content	7,693.89	768.34	1,082.21	189.53	9,733.97
	Inventory	0.00	136.02	118.32	17.82	272.16
	Subtotal	**24,204.96**	**3,438.55**	**3,199.03**	**969.64**	**31,812.18**
Business Interruption Loss						
	Income	0.00	338.52	34.48	72.90	445.91
	Relocation	482.16	403.96	127.32	147.80	1,161.24
	Rental	208.90	210.34	20.38	25.06	464.68
	Wage	0.00	346.13	39.65	641.35	1,027.12
	Subtotal	**691.06**	**1,298.95**	**221.83**	**887.11**	**3,098.96**

Total

Total	24,896.02	4,737.50	3,420.86	1,856.75	34,911.13

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,517	832,296	1,622,813
Total	**5,214**	**790,517**	**832,296**	**1,622,813**
Study Region Total	**5,214**	**790,517**	**832,296**	**1,622,813**

Hazus: Hurricane Global Risk Report

Region Name:	East_Granby_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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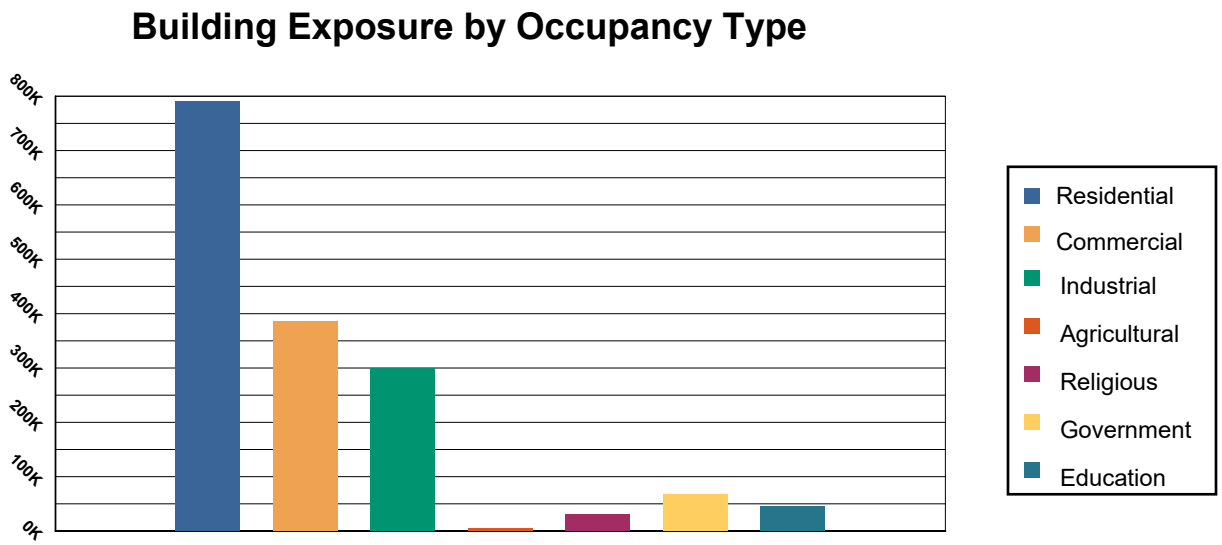

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Religious	29,628	1.83%
Government	66,698	4.11%
Education	44,591	2.75%
Total	**1,622,813**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 126 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

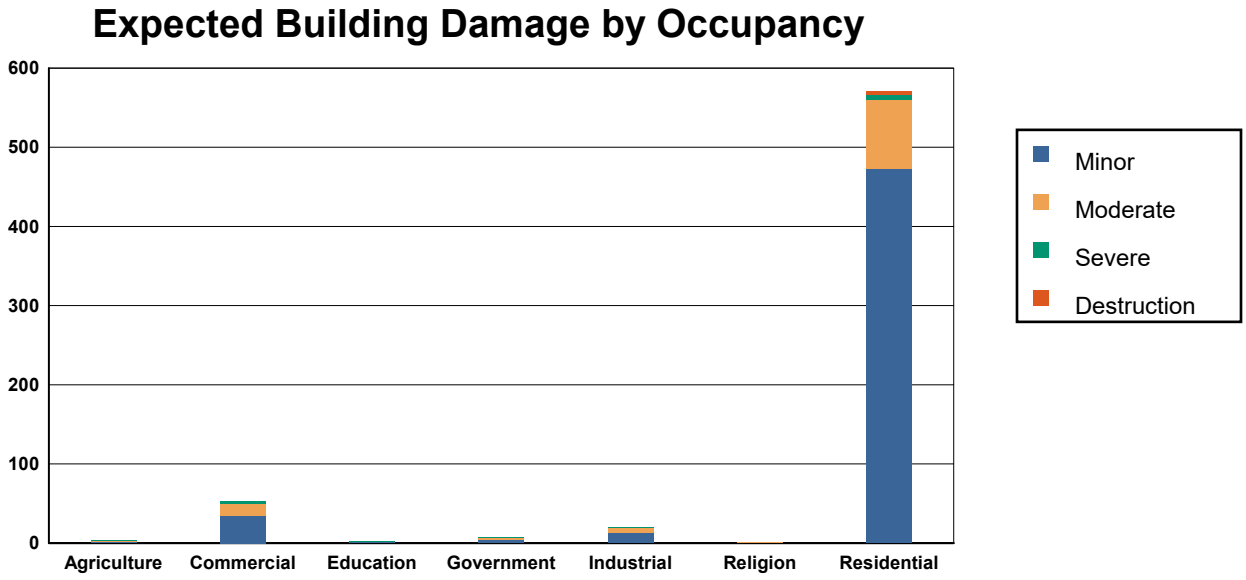


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.08	70.83	1.96	19.64	0.62	6.15	0.30	2.97	0.04	0.41
Commercial	160.03	75.13	35.43	16.63	13.97	6.56	3.53	1.66	0.03	0.01
Education	7.74	77.41	1.71	17.08	0.51	5.09	0.04	0.42	0.00	0.00
Government	22.28	76.83	4.93	16.99	1.64	5.67	0.15	0.52	0.00	0.00
Industrial	63.80	75.95	13.69	16.30	5.20	6.20	1.21	1.44	0.10	0.12
Religion	4.47	74.43	1.18	19.75	0.32	5.33	0.03	0.50	0.00	0.00
Residential	1,411.93	71.20	473.26	23.87	86.51	4.36	6.72	0.34	4.59	0.23
Total	**1,677.33**		**532.16**		**108.77**		**11.99**		**4.76**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	27	77.60	6	16.28	2	5.61	0	0.50	0	0.00
Masonry	143	73.19	35	17.75	15	7.55	3	1.35	0	0.17
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	128	76.78	25	14.72	11	6.63	3	1.85	0	0.02
Wood	1,382	71.51	463	23.99	77	3.98	6	0.31	4	0.21

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

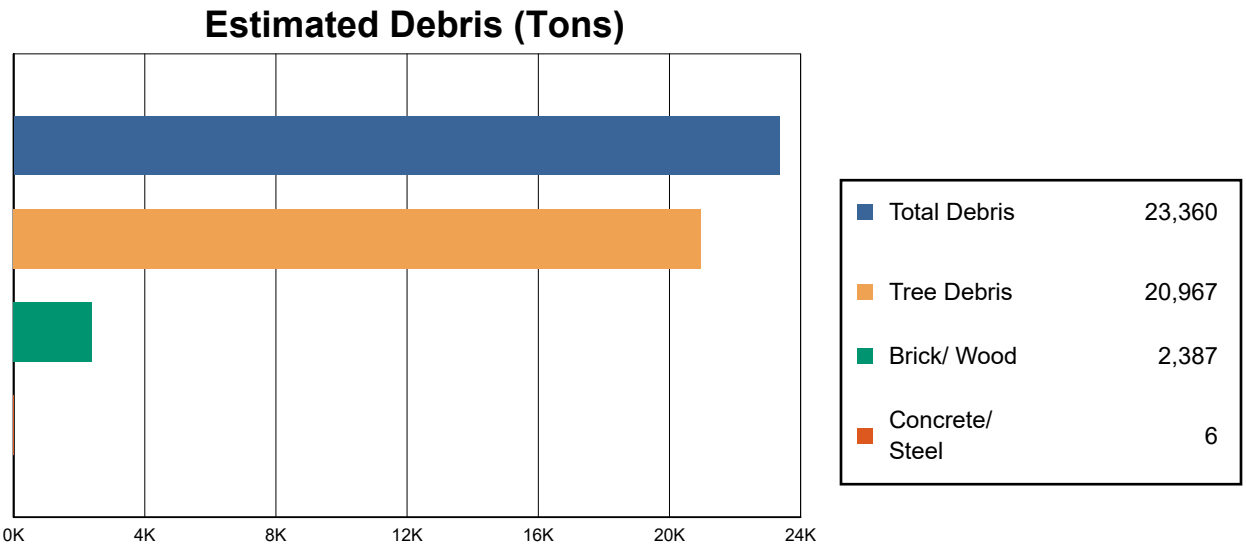
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

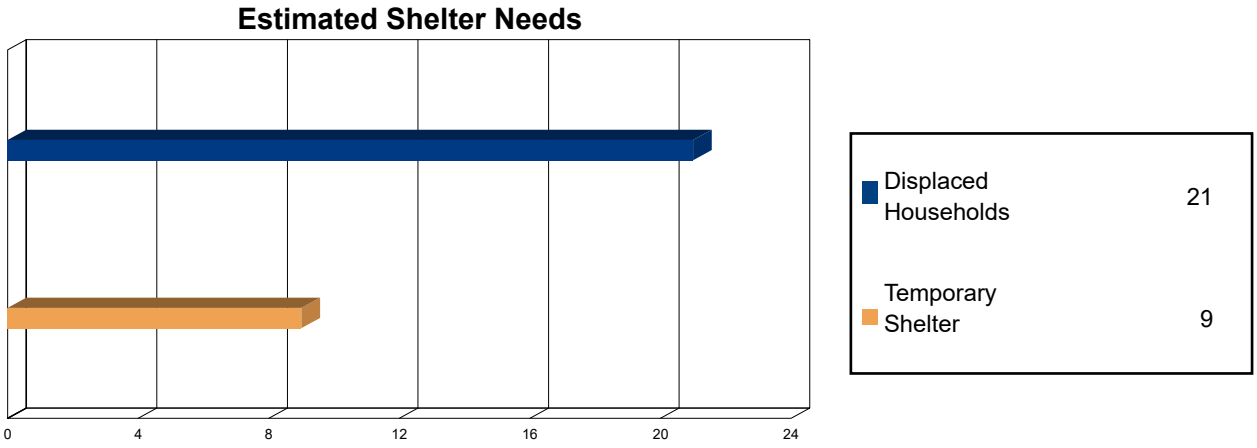


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 23,360 tons of debris will be generated. Of the total amount, 16,922 tons (72%) is Other Tree Debris. Of the remaining 6,438 tons, Brick/Wood comprises 37% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 96 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,045 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 21 households to be displaced due to the hurricane. Of these, 9 people (out of a total population of 5,214) will seek temporary shelter in public shelters.

Economic Loss

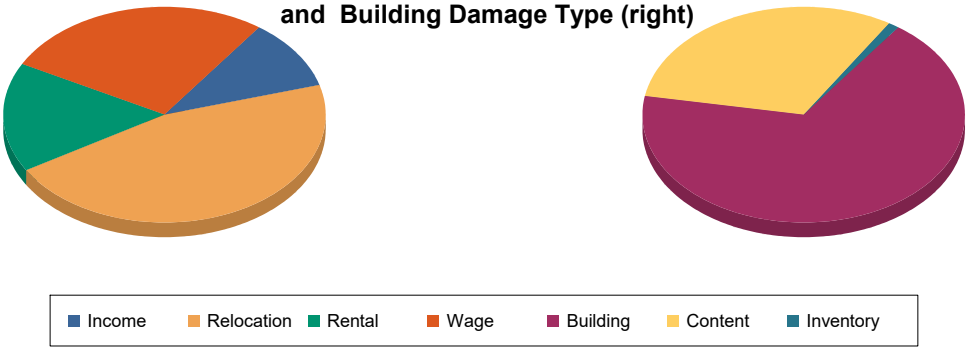
The total economic loss estimated for the hurricane is 53.7 million dollars, which represents 3.31 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 54 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 68% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

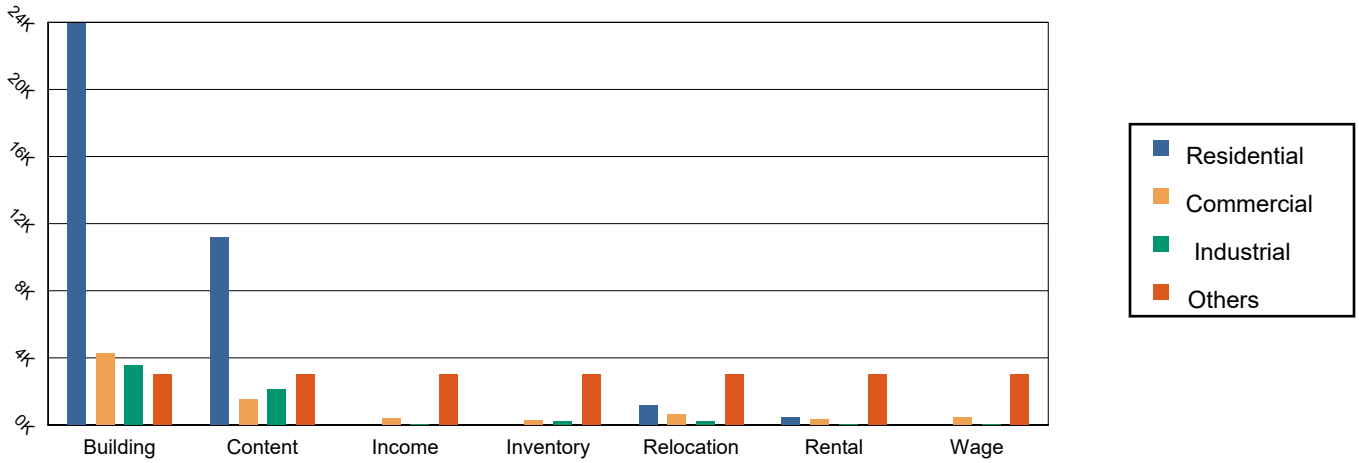


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	23,945.08	4,262.18	3,526.51	1,328.28	33,062.05
	Content	11,184.02	1,503.78	2,137.96	384.44	15,210.20
	Inventory	0.00	266.13	230.73	31.76	528.62
	Subtotal	**35,129.10**	**6,032.10**	**5,895.20**	**1,744.49**	**48,800.88**
Business Interruption Loss						
	Income	0.00	392.04	46.05	87.18	525.28
	Relocation	1,144.01	634.56	228.75	249.69	2,257.01
	Rental	429.65	314.00	32.41	41.68	817.73
	Wage	0.00	420.69	54.58	869.13	1,344.40
	Subtotal	**1,573.66**	**1,761.29**	**361.79**	**1,247.68**	**4,944.42**

Total

Total	36,702.76	7,793.39	6,256.99	2,992.17	53,745.30

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	5,214	790,517	832,296	1,622,813
Total	**5,214**	**790,517**	**832,296**	**1,622,813**
Study Region Total	**5,214**	**790,517**	**832,296**	**1,622,813**

Hazus: Hurricane Global Risk Report

Region Name:	East_Hartford_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.75 square miles and contains 14 census tracts. There are over 20 thousand households in the region and a total population of 51,045 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 13 thousand buildings in the region with a total building replacement value (excluding contents) of 8,591 million dollars. Approximately 89% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

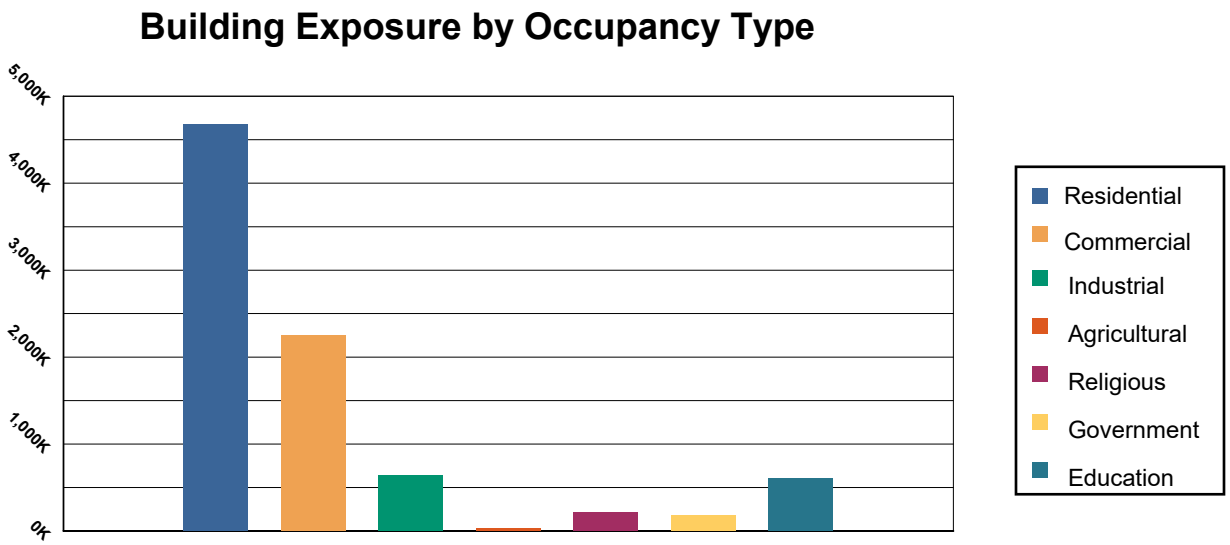


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,680,267	54.48%
Commercial	2,245,908	26.14%
Industrial	643,311	7.49%
Agricultural	22,926	0.27%
Religious	217,146	2.53%
Government	180,308	2.10%
Education	601,182	7.00%
Total	**8,591,048**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 20 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

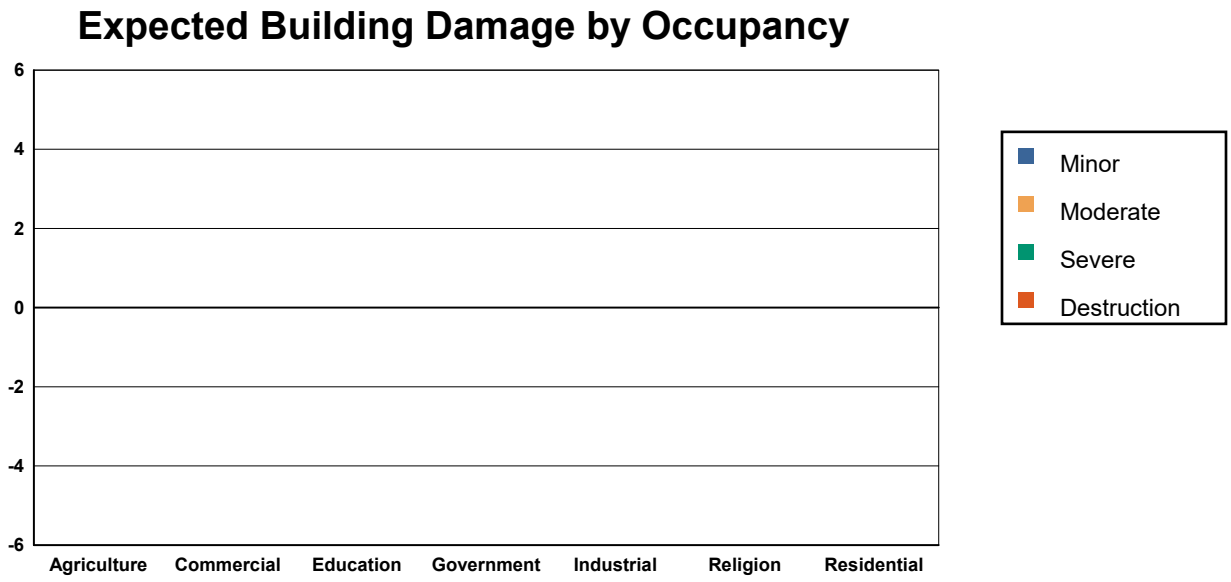


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	33.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	941.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	49.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	48.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	273.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	69.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	11,808.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**13,221.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	227	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	1,467	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	193	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	703	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	10,626	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

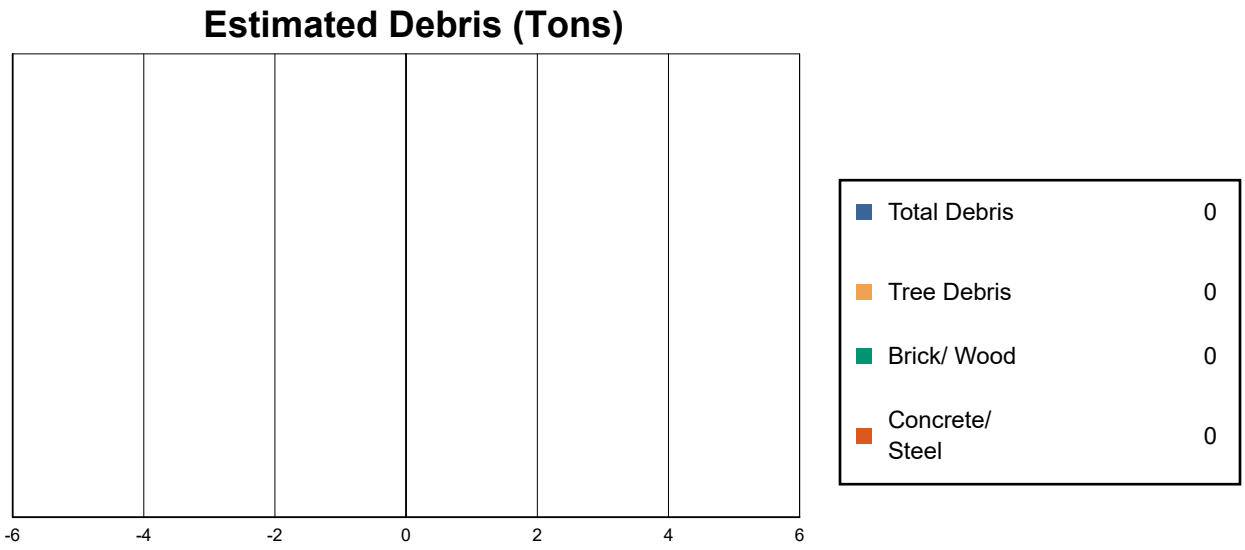
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Police Stations	1	0	0	1
Schools	20	0	0	20

Induced Hurricane Damage

Debris Generation

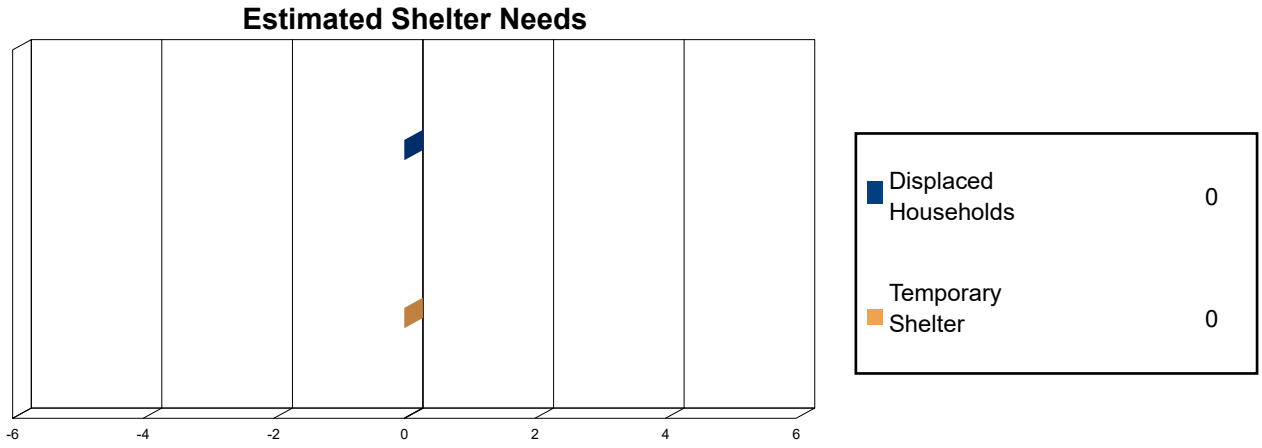


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 51,045) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

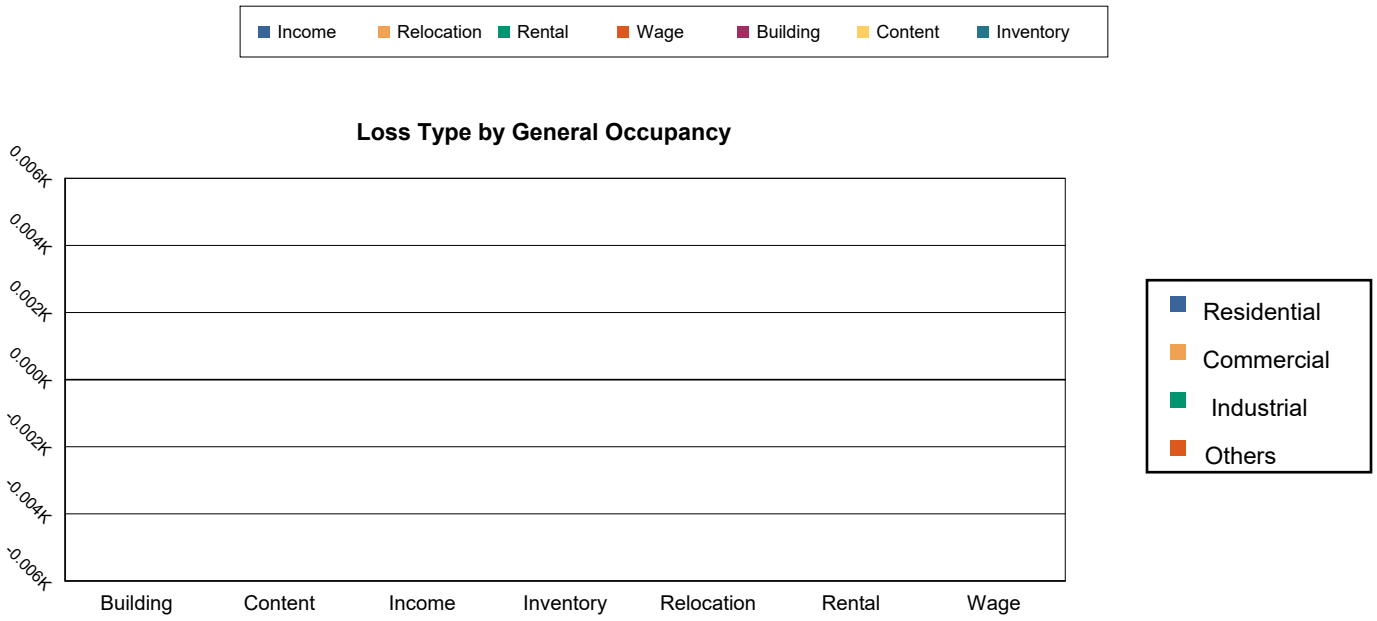


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,680,267	3,910,781	8,591,048
Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**
Study Region Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**

Hazus: Hurricane Global Risk Report

Region Name:	East_Hartford_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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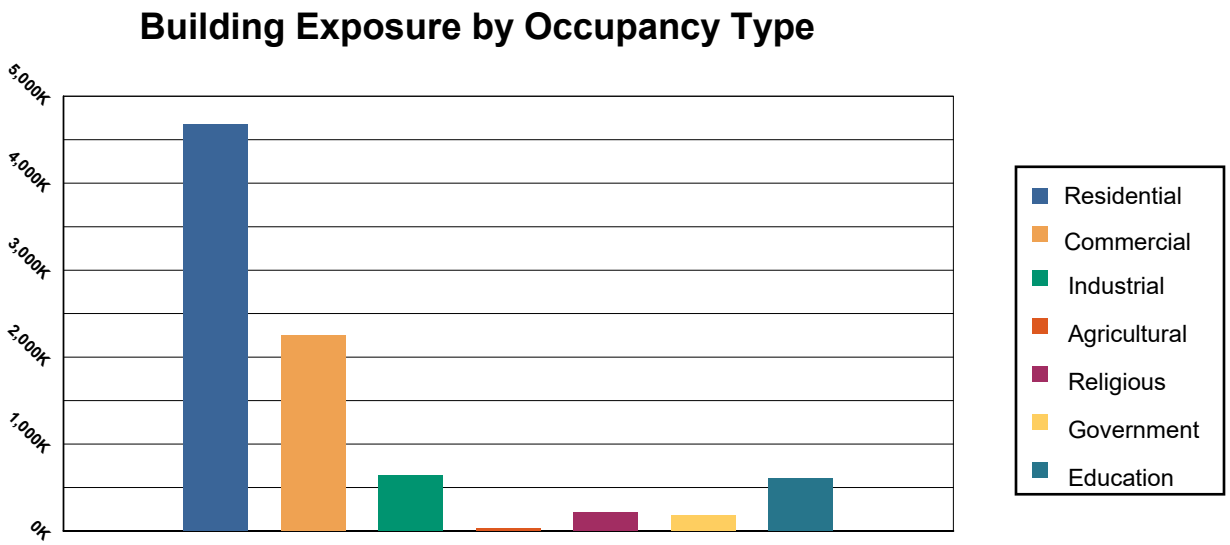

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Occupancy	Exposure ($1000)	Percent of Tot
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Industrial	643,311	7.49%
Agricultural	22,926	0.27%
Religious	217,146	2.53%
Government	180,308	2.10%
Education	601,182	7.00%
Total	**8,591,048**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 20 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

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Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

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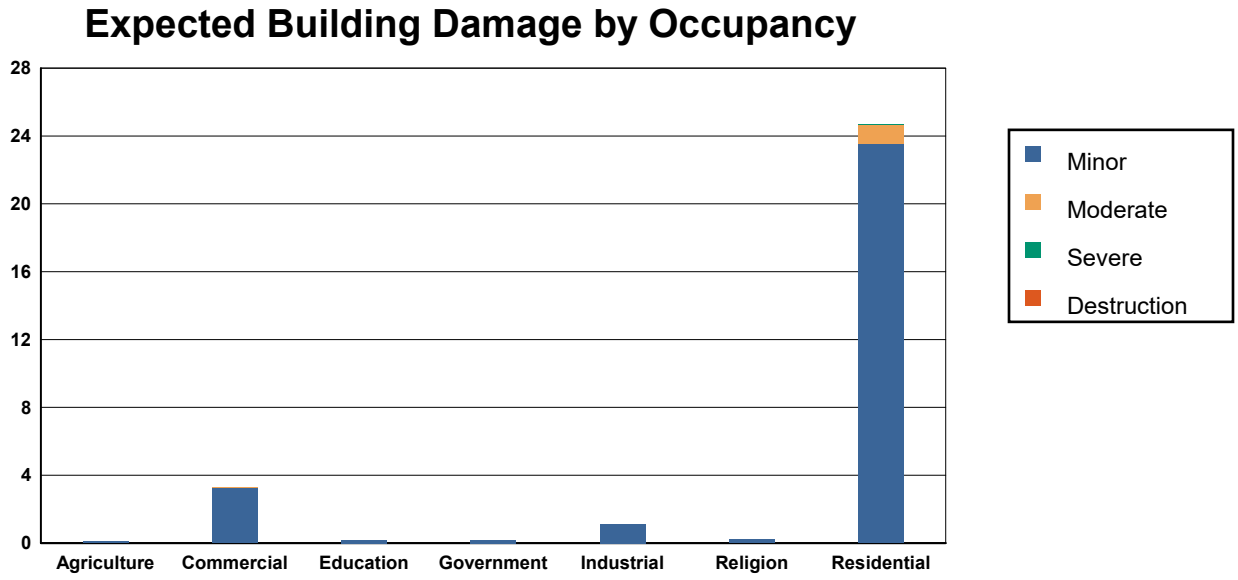


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	32.91	99.72	0.09	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	937.73	99.65	3.24	0.34	0.03	0.00	0.00	0.00	0.00	0.00
Education	48.81	99.62	0.19	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Government	47.81	99.61	0.19	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	271.88	99.59	1.12	0.41	0.00	0.00	0.00	0.00	0.00	0.00
Religion	68.79	99.70	0.20	0.29	0.00	0.01	0.00	0.00	0.00	0.00
Residential	11,783.28	99.79	23.51	0.20	1.16	0.01	0.05	0.00	0.00	0.00
Total	**13,191.22**		**28.53**		**1.20**		**0.05**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	226	99.50	1	0.50	0	0.00	0	0.00	0	0.00
Masonry	1,457	99.34	9	0.64	0	0.02	0	0.00	0	0.00
MH	193	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	700	99.60	3	0.40	0	0.00	0	0.00	0	0.00
Wood	10,618	99.93	7	0.07	1	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

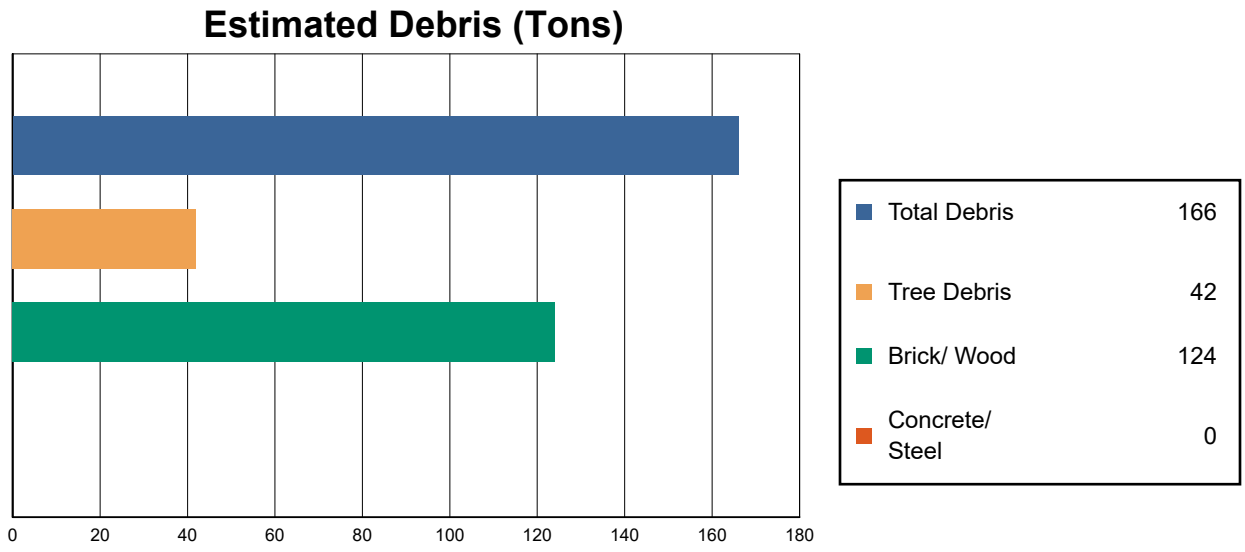
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Police Stations	1	0	0	1
Schools	20	0	0	20

Induced Hurricane Damage

Debris Generation

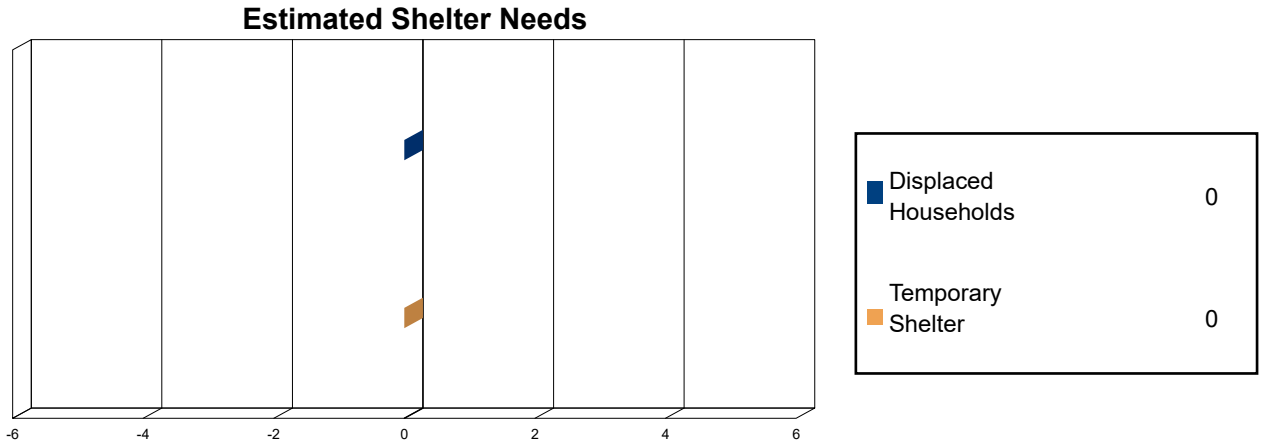


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 166 tons of debris will be generated. Of the total amount, 1 tons (1%) is Other Tree Debris. Of the remaining 165 tons, Brick/Wood comprises 75% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 5 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 41 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 51,045) will seek temporary shelter in public shelters.

Economic Loss

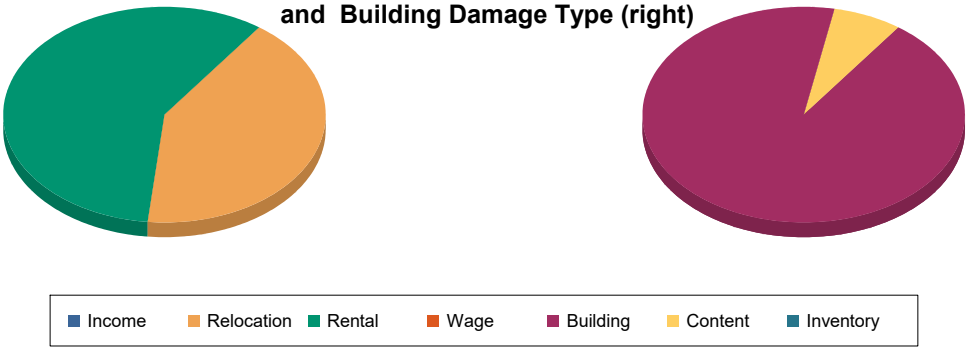
The total economic loss estimated for the hurricane is 2.5 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 84% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

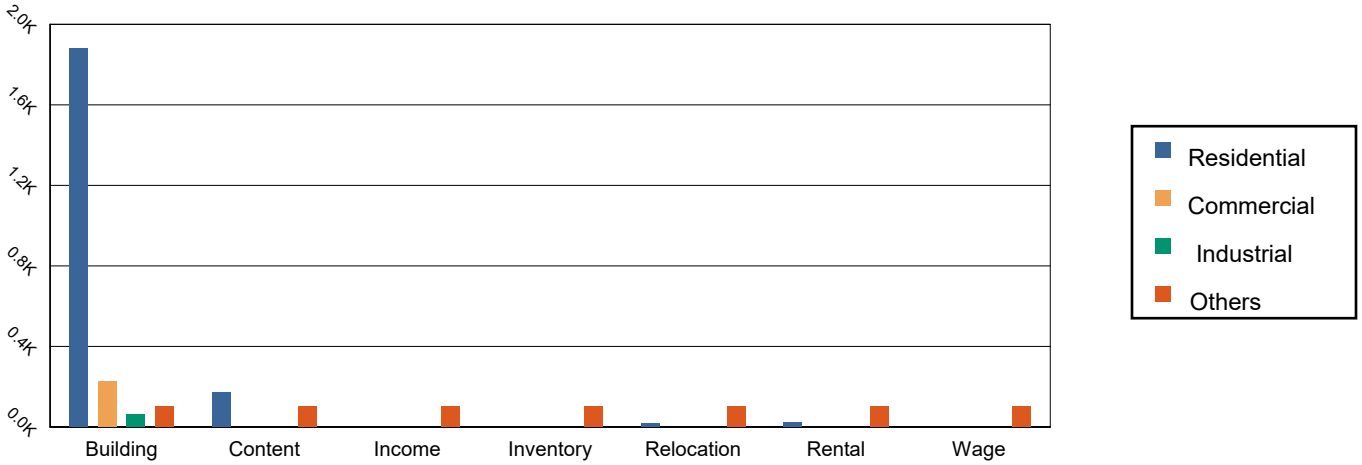


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,878.23	224.59	64.33	99.86	2,267.01
	Content	170.15	0.00	0.00	0.00	170.15
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2,048.38**	**224.59**	**64.33**	**99.86**	**2,437.16**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	14.96	0.62	0.00	0.07	15.65
	Rental	21.79	0.00	0.00	0.00	21.79
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**36.75**	**0.62**	**0.00**	**0.07**	**37.44**

Total

Total	2,085.13	225.21	64.33	99.94	2,474.60

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,680,267	3,910,781	8,591,048
Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**
Study Region Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**

Hazus: Hurricane Global Risk Report

Region Name:	East_Hartford_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.75 square miles and contains 14 census tracts. There are over 20 thousand households in the region and a total population of 51,045 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 13 thousand buildings in the region with a total building replacement value (excluding contents) of 8,591 million dollars. Approximately 89% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

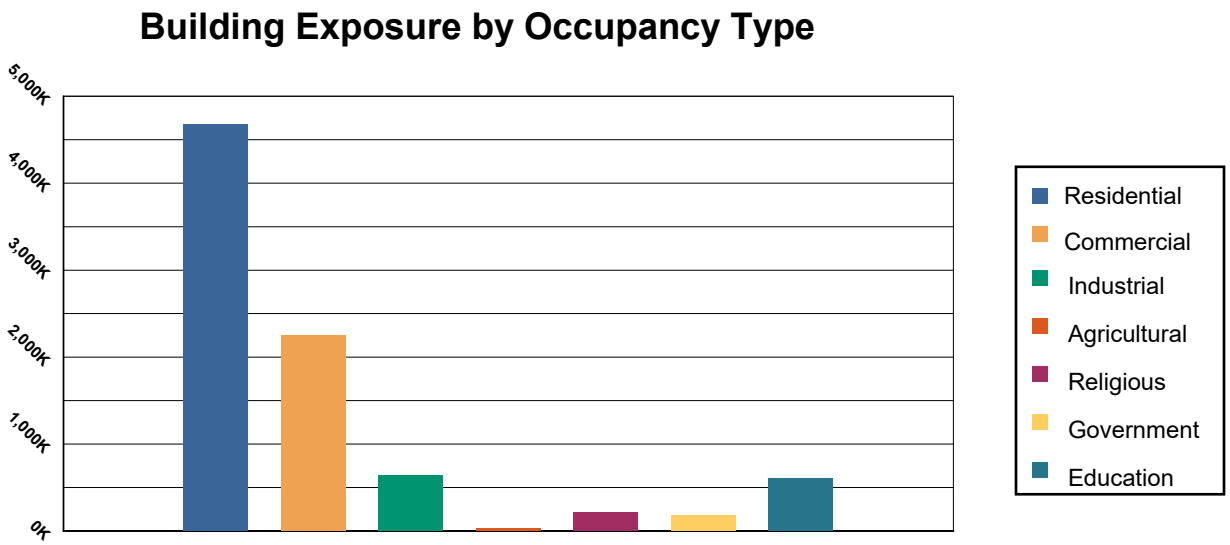


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,680,267	54.48%
Commercial	2,245,908	26.14%
Industrial	643,311	7.49%
Agricultural	22,926	0.27%
Religious	217,146	2.53%
Government	180,308	2.10%
Education	601,182	7.00%
Total	**8,591,048**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 20 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 39 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

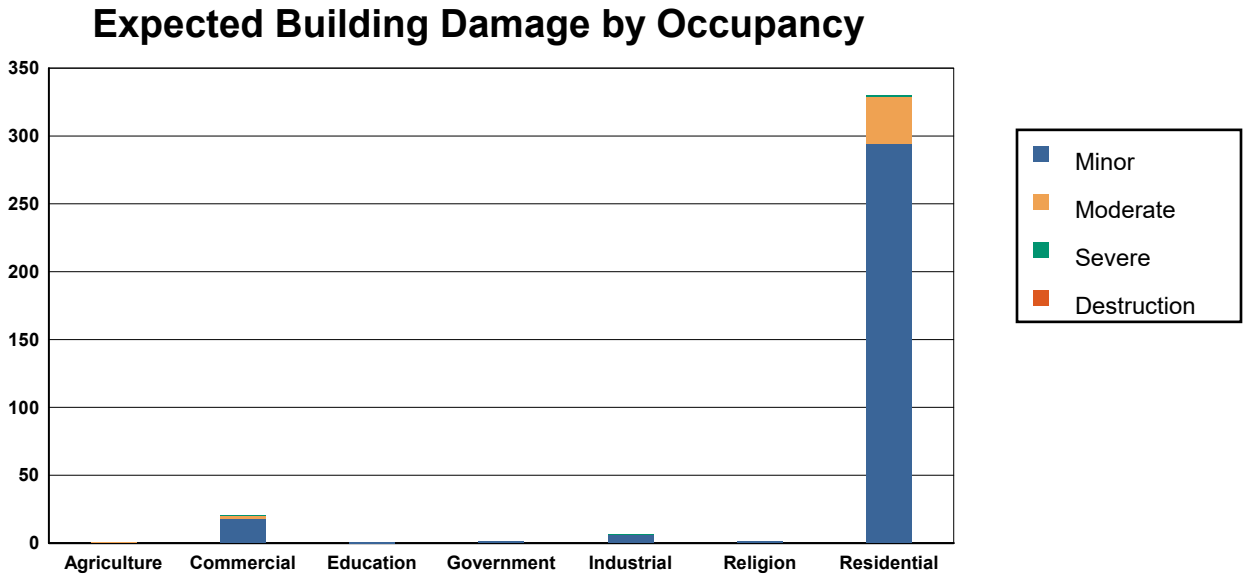


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	32.19	97.54	0.70	2.13	0.08	0.25	0.02	0.07	0.00	0.00
Commercial	920.61	97.83	17.98	1.91	2.25	0.24	0.17	0.02	0.00	0.00
Education	48.07	98.09	0.91	1.86	0.02	0.05	0.00	0.00	0.00	0.00
Government	46.99	97.90	0.98	2.05	0.02	0.05	0.00	0.00	0.00	0.00
Industrial	266.69	97.69	5.79	2.12	0.41	0.15	0.10	0.04	0.01	0.00
Religion	67.73	98.15	1.23	1.79	0.04	0.05	0.00	0.01	0.00	0.00
Residential	11,478.05	97.21	294.41	2.49	34.71	0.29	0.81	0.01	0.02	0.00
Total	**12,860.32**		**322.02**		**37.53**		**1.10**		**0.03**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	221	97.44	6	2.48	0	0.07	0	0.00	0	0.00
Masonry	1,403	95.67	51	3.46	12	0.84	0	0.03	0	0.00
MH	192	99.71	0	0.22	0	0.05	0	0.00	0	0.02
Steel	688	97.83	13	1.91	2	0.24	0	0.02	0	0.00
Wood	10,405	97.92	212	2.00	8	0.08	1	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

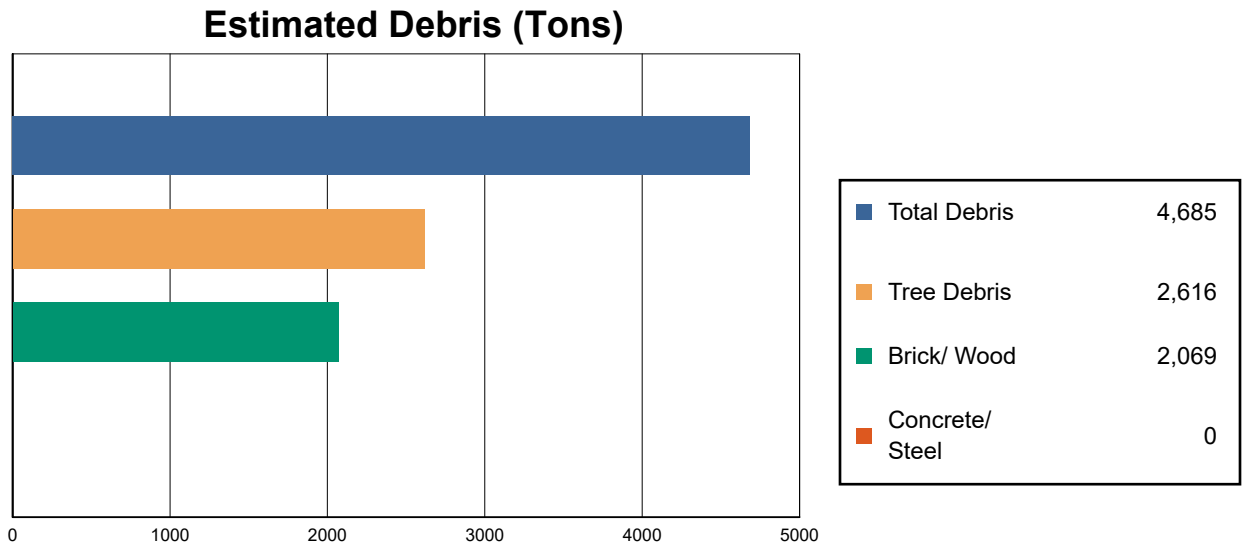
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Police Stations	1	0	0	1
Schools	20	0	0	20

Induced Hurricane Damage

Debris Generation

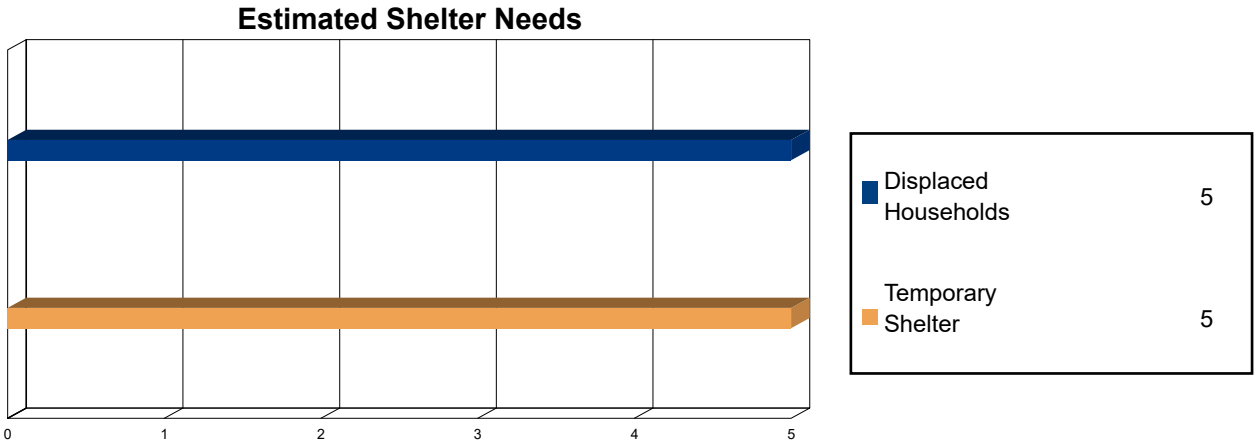


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 4,685 tons of debris will be generated. Of the total amount, 694 tons (15%) is Other Tree Debris. Of the remaining 3,991 tons, Brick/Wood comprises 52% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 83 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,922 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the hurricane. Of these, 5 people (out of a total population of 51,045) will seek temporary shelter in public shelters.

Economic Loss

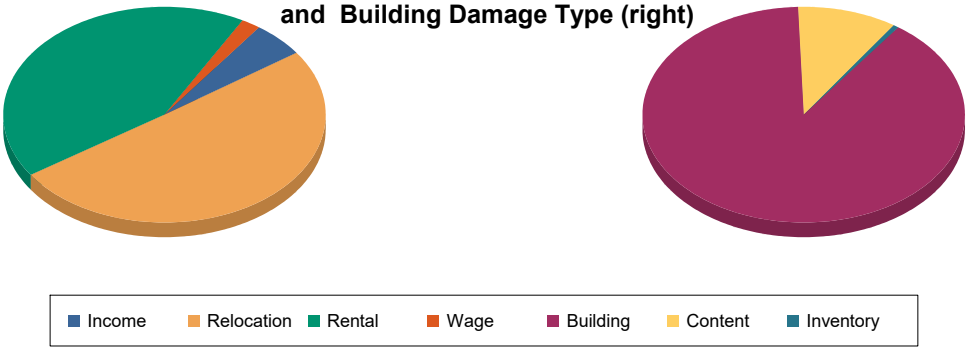
The total economic loss estimated for the hurricane is 22.8 million dollars, which represents 0.27 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 23 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

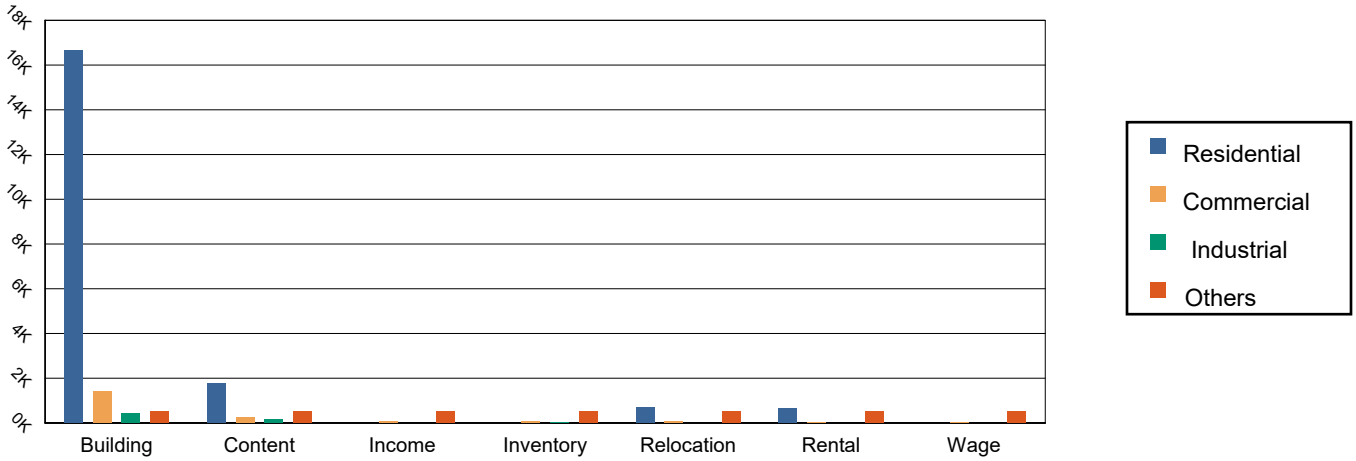


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	16,649.72	1,420.23	418.50	500.02	18,988.47
	Content	1,752.53	228.76	156.90	15.64	2,153.84
	Inventory	0.00	66.28	21.26	2.90	90.45
	Subtotal	**18,402.25**	**1,715.28**	**596.67**	**518.56**	**21,232.75**
Business Interruption Loss						
	Income	0.00	85.72	0.00	0.00	85.72
	Relocation	713.34	88.78	1.44	3.37	806.92
	Rental	652.01	35.11	0.00	0.00	687.12
	Wage	0.00	30.46	0.00	0.00	30.46
	Subtotal	**1,365.35**	**240.07**	**1.44**	**3.37**	**1,610.22**

Total

Total	**19,767.60**	**1,955.35**	**598.11**	**521.92**	**22,842.97**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,680,267	3,910,781	8,591,048
Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**
Study Region Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**

Hazus: Hurricane Global Risk Report

Region Name:	East_Hartford_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.75 square miles and contains 14 census tracts. There are over 20 thousand households in the region and a total population of 51,045 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 13 thousand buildings in the region with a total building replacement value (excluding contents) of 8,591 million dollars. Approximately 89% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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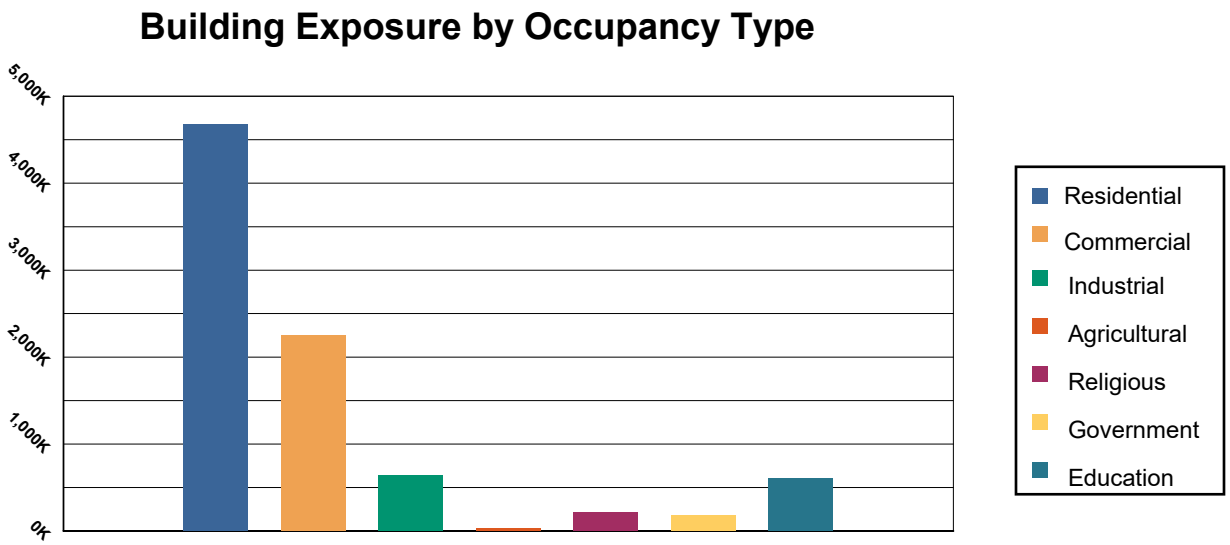


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,680,267	54.48%
Commercial	2,245,908	26.14%
Industrial	643,311	7.49%
Agricultural	22,926	0.27%
Religious	217,146	2.53%
Government	180,308	2.10%
Education	601,182	7.00%
Total	**8,591,048**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 20 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 170 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

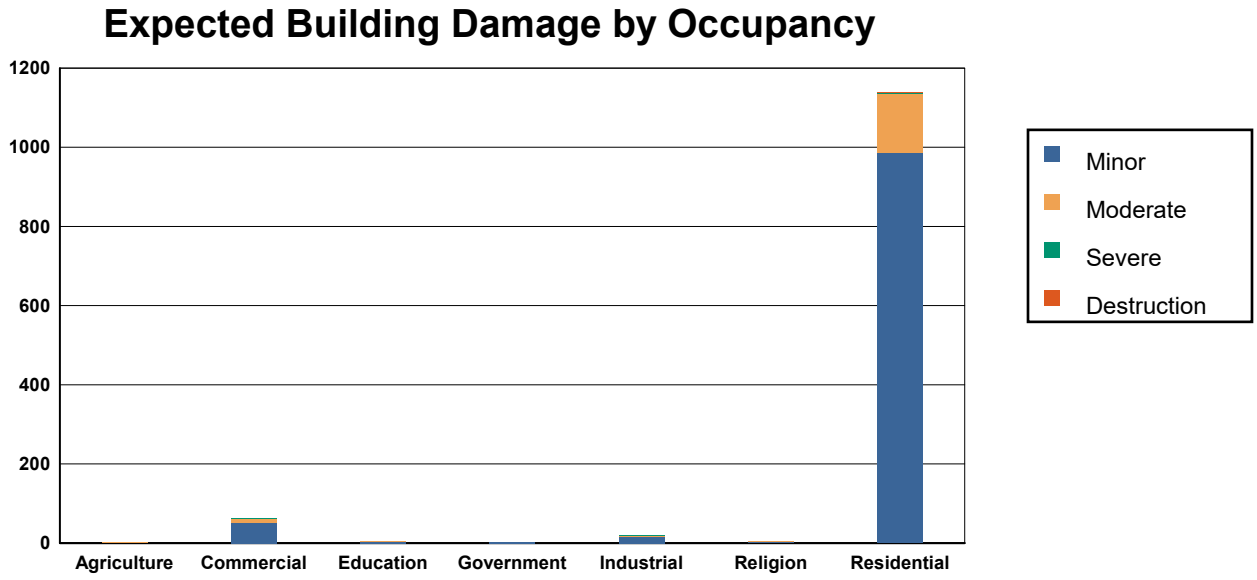


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	30.23	91.60	2.18	6.60	0.41	1.25	0.17	0.52	0.01	0.03
Commercial	878.52	93.36	51.24	5.45	9.84	1.05	1.39	0.15	0.00	0.00
Education	46.00	93.88	2.74	5.58	0.26	0.52	0.01	0.01	0.00	0.00
Government	45.10	93.96	2.64	5.50	0.25	0.53	0.01	0.01	0.00	0.00
Industrial	254.00	93.04	15.68	5.74	2.57	0.94	0.71	0.26	0.04	0.01
Religion	64.73	93.81	3.95	5.73	0.31	0.45	0.01	0.02	0.00	0.00
Residential	10,667.98	90.35	986.20	8.35	149.81	1.27	3.01	0.03	1.01	0.01
Total	**11,986.56**		**1,064.63**		**163.46**		**5.30**		**1.06**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	210	92.56	15	6.63	2	0.80	0	0.01	0	0.00
Masonry	1,301	88.69	118	8.05	45	3.09	2	0.16	0	0.01
MH	189	97.87	3	1.49	1	0.45	0	0.00	0	0.19
Steel	658	93.54	36	5.18	8	1.11	1	0.17	0	0.00
Wood	9,733	91.59	834	7.84	56	0.53	3	0.03	1	0.01

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

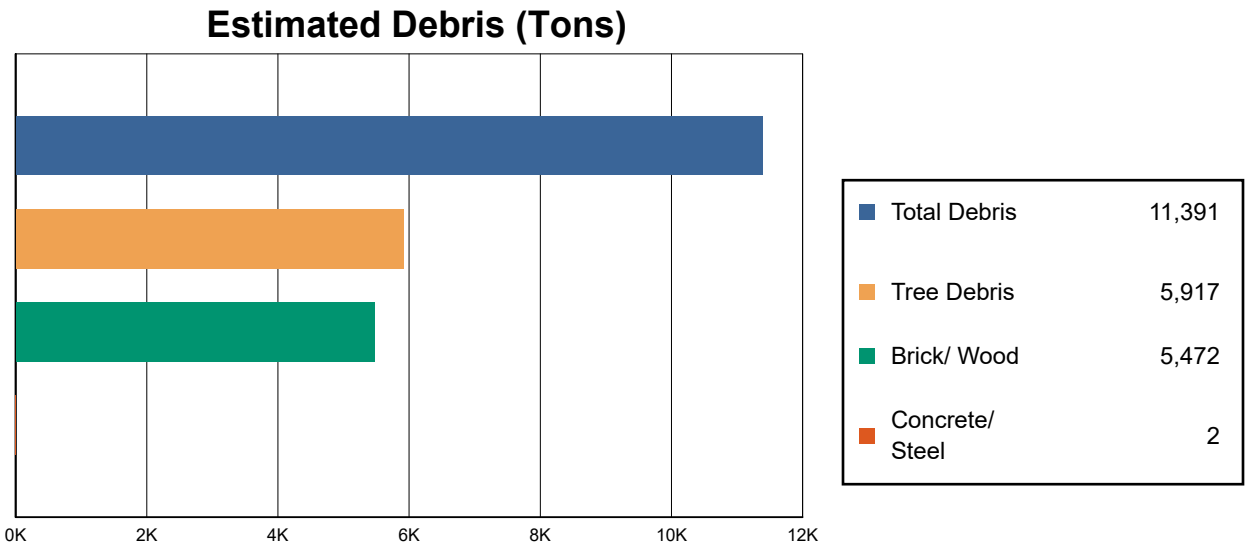
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Police Stations	1	0	0	1
Schools	20	0	0	20

Induced Hurricane Damage

Debris Generation

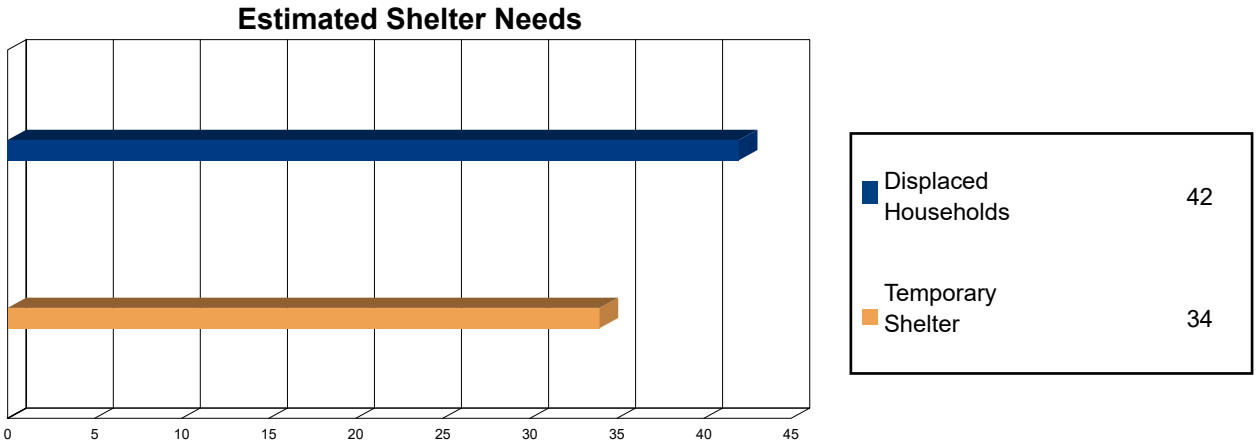


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 11,391 tons of debris will be generated. Of the total amount, 1,478 tons (13%) is Other Tree Debris. Of the remaining 9,913 tons, Brick/Wood comprises 55% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 219 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,439 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 42 households to be displaced due to the hurricane. Of these, 34 people (out of a total population of 51,045) will seek temporary shelter in public shelters.

Economic Loss

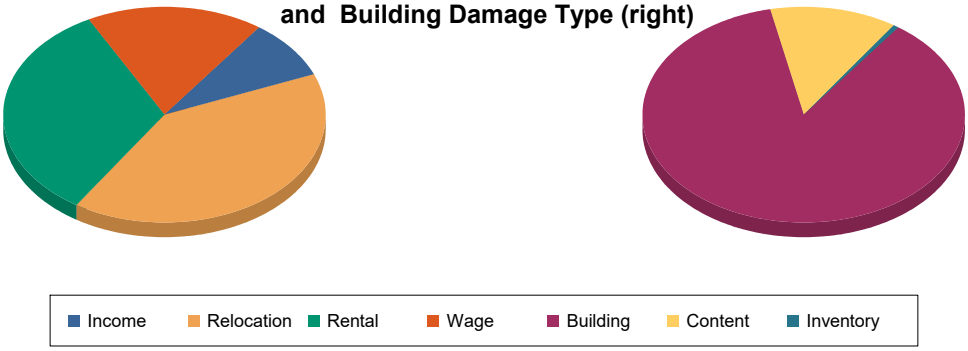
The total economic loss estimated for the hurricane is 61.1 million dollars, which represents 0.71 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 61 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 79% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

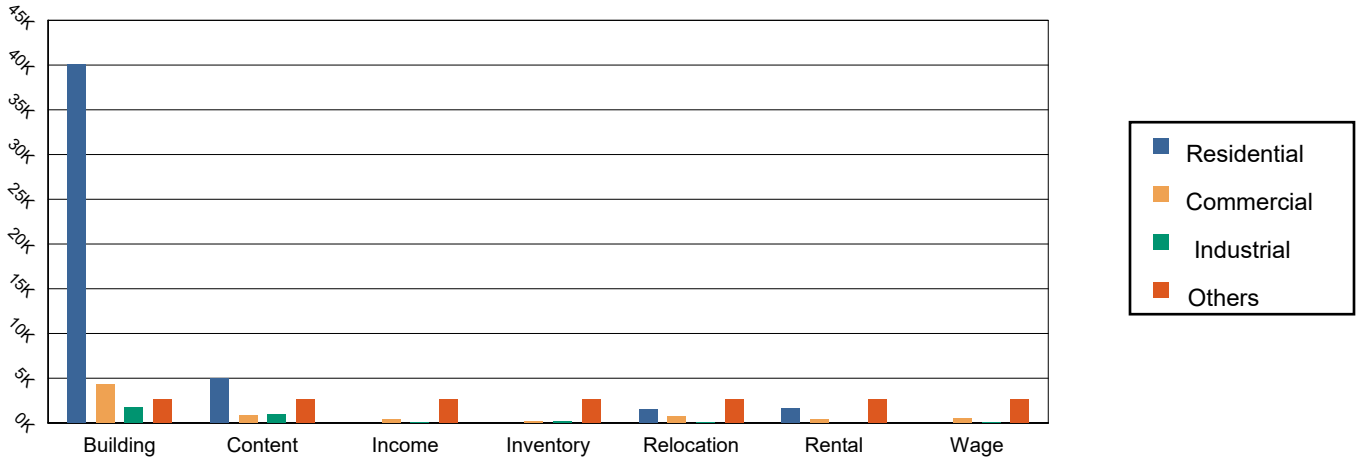


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	40,097.11	4,324.25	1,752.84	1,575.13	47,749.33
	Content	5,008.39	814.62	978.89	218.59	7,020.49
	Inventory	0.00	223.25	133.20	19.90	376.34
	Subtotal	**45,105.50**	**5,362.12**	**2,864.94**	**1,813.61**	**55,146.16**
Business Interruption Loss						
	Income	0.00	348.25	16.63	173.57	538.45
	Relocation	1,487.40	692.58	48.35	168.21	2,396.55
	Rental	1,586.65	366.38	11.30	16.17	1,980.50
	Wage	0.00	539.17	27.63	488.70	1,055.50
	Subtotal	**3,074.05**	**1,946.39**	**103.91**	**846.65**	**5,971.00**

Total

Total	**48,179.55**	**7,308.51**	**2,968.84**	**2,660.26**	**61,117.16**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,680,267	3,910,781	8,591,048
Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**
Study Region Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**

Hazus: Hurricane Global Risk Report

Region Name:	East_Hartford_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.75 square miles and contains 14 census tracts. There are over 20 thousand households in the region and a total population of 51,045 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 13 thousand buildings in the region with a total building replacement value (excluding contents) of 8,591 million dollars. Approximately 89% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

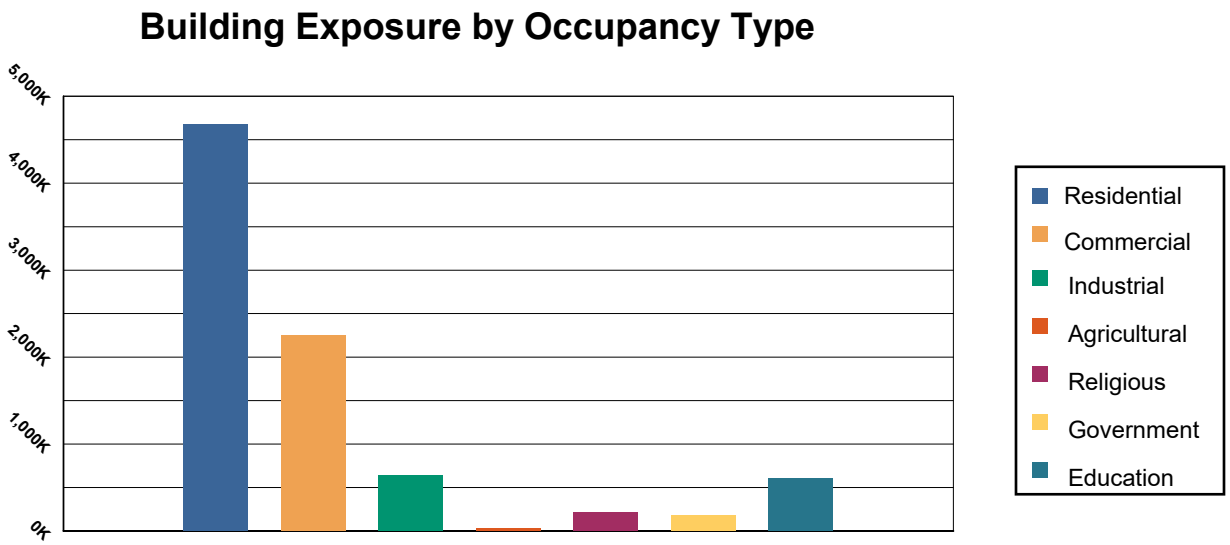


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,680,267	54.48%
Commercial	2,245,908	26.14%
Industrial	643,311	7.49%
Agricultural	22,926	0.27%
Religious	217,146	2.53%
Government	180,308	2.10%
Education	601,182	7.00%
Total	**8,591,048**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 20 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 435 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 6 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

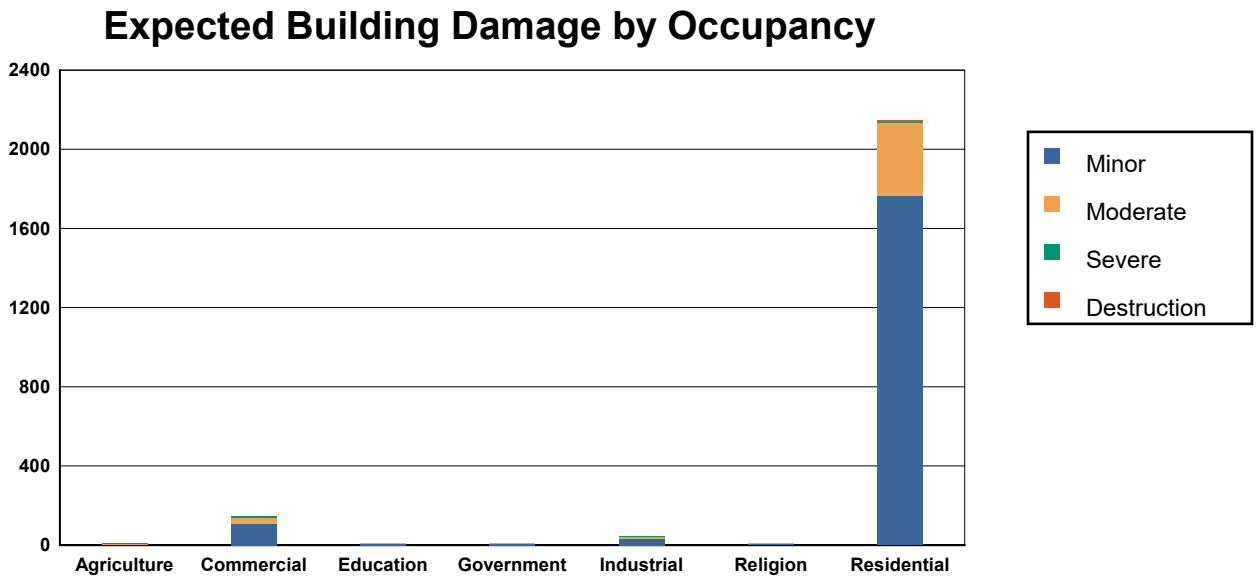


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	27.03	81.92	4.30	13.04	1.11	3.35	0.50	1.53	0.05	0.15
Commercial	796.95	84.69	106.85	11.36	31.53	3.35	5.65	0.60	0.01	0.00
Education	42.38	86.49	5.45	11.12	1.12	2.28	0.05	0.11	0.00	0.00
Government	40.86	85.13	5.72	11.91	1.35	2.81	0.07	0.15	0.00	0.00
Industrial	230.59	84.46	30.87	11.31	8.94	3.28	2.40	0.88	0.21	0.08
Religion	59.27	85.90	8.30	12.03	1.36	1.97	0.07	0.10	0.00	0.00
Residential	9,660.81	81.82	1,766.49	14.96	364.28	3.09	10.33	0.09	6.08	0.05
Total	**10,857.90**		**1,927.98**		**409.68**		**19.08**		**6.36**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	189	83.43	29	12.95	8	3.52	0	0.10	0	0.00
Masonry	1,157	78.86	198	13.52	104	7.07	7	0.50	1	0.05
MH	180	93.34	8	3.97	4	1.85	0	0.05	2	0.78
Steel	598	85.09	74	10.54	26	3.64	5	0.72	0	0.00
Wood	8,887	83.63	1,562	14.70	163	1.54	9	0.08	5	0.05

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

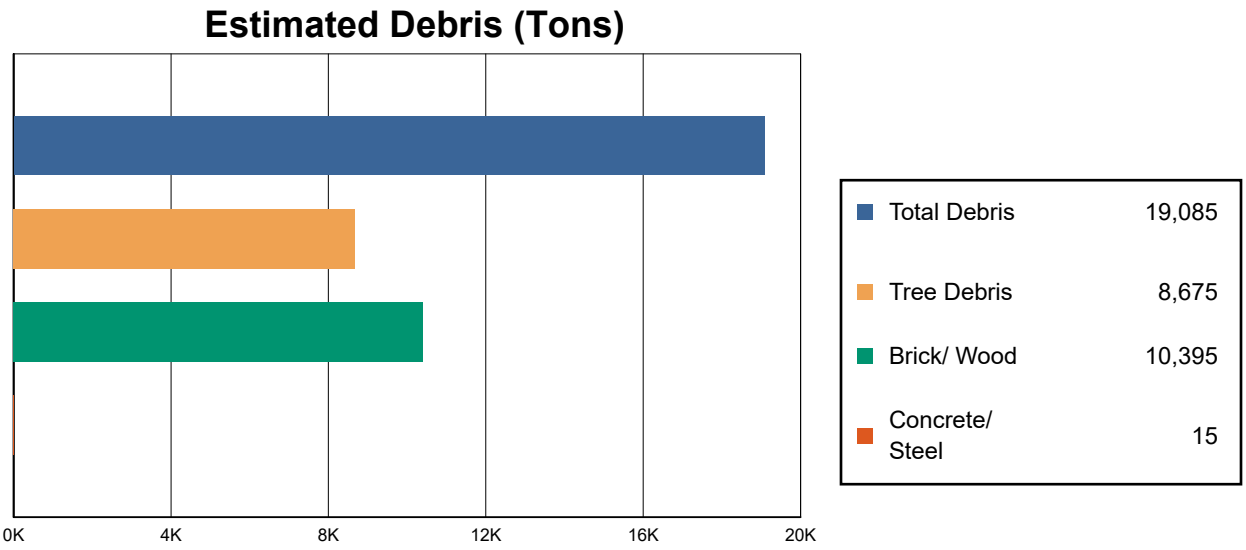
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Police Stations	1	0	0	1
Schools	20	0	0	19

Induced Hurricane Damage

Debris Generation

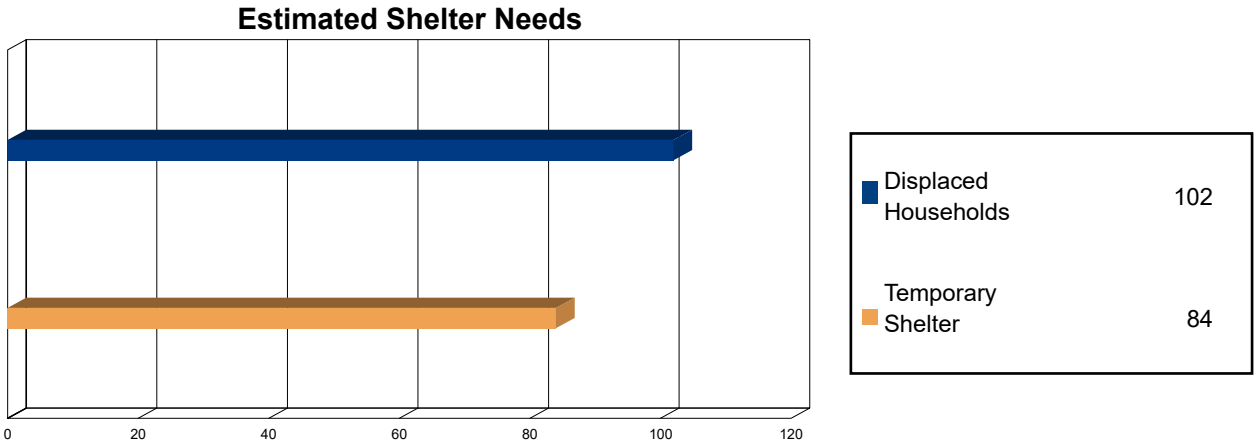


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 19,085 tons of debris will be generated. Of the total amount, 2,324 tons (12%) is Other Tree Debris. Of the remaining 16,761 tons, Brick/Wood comprises 62% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 416 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,351 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 102 households to be displaced due to the hurricane. Of these, 84 people (out of a total population of 51,045) will seek temporary shelter in public shelters.

Economic Loss

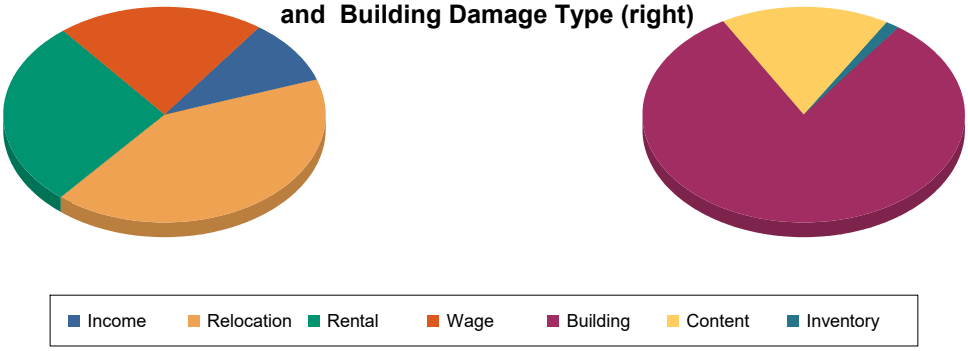
The total economic loss estimated for the hurricane is 126.4 million dollars, which represents 1.47 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 126 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 70% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

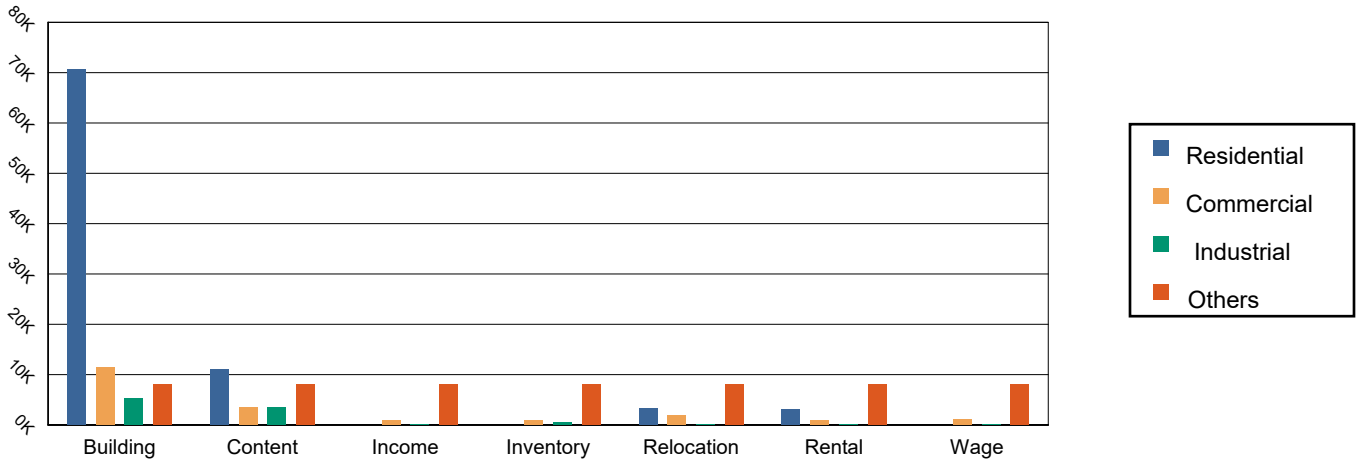


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	70,534.10	11,402.77	5,244.46	4,080.69	91,262.02
	Content	10,958.14	3,403.70	3,532.85	1,039.81	18,934.50
	Inventory	0.00	968.94	477.10	68.84	1,514.88
	Subtotal	**81,492.24**	**15,775.41**	**9,254.42**	**5,189.34**	**111,711.40**
Business Interruption Loss						
	Income	0.00	903.01	52.69	457.09	1,412.79
	Relocation	3,378.84	1,909.31	175.59	652.28	6,116.02
	Rental	3,092.09	908.42	35.28	70.03	4,105.81
	Wage	0.00	1,193.77	87.33	1,780.85	3,061.95
	Subtotal	**6,470.93**	**4,914.51**	**350.89**	**2,960.25**	**14,696.58**

Total

Total	**87,963.16**	**20,689.93**	**9,605.31**	**8,149.58**	**126,407.98**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,680,267	3,910,781	8,591,048
Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**
Study Region Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**

Hazus: Hurricane Global Risk Report

Region Name:	East_Hartford_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.75 square miles and contains 14 census tracts. There are over 20 thousand households in the region and a total population of 51,045 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 13 thousand buildings in the region with a total building replacement value (excluding contents) of 8,591 million dollars. Approximately 89% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

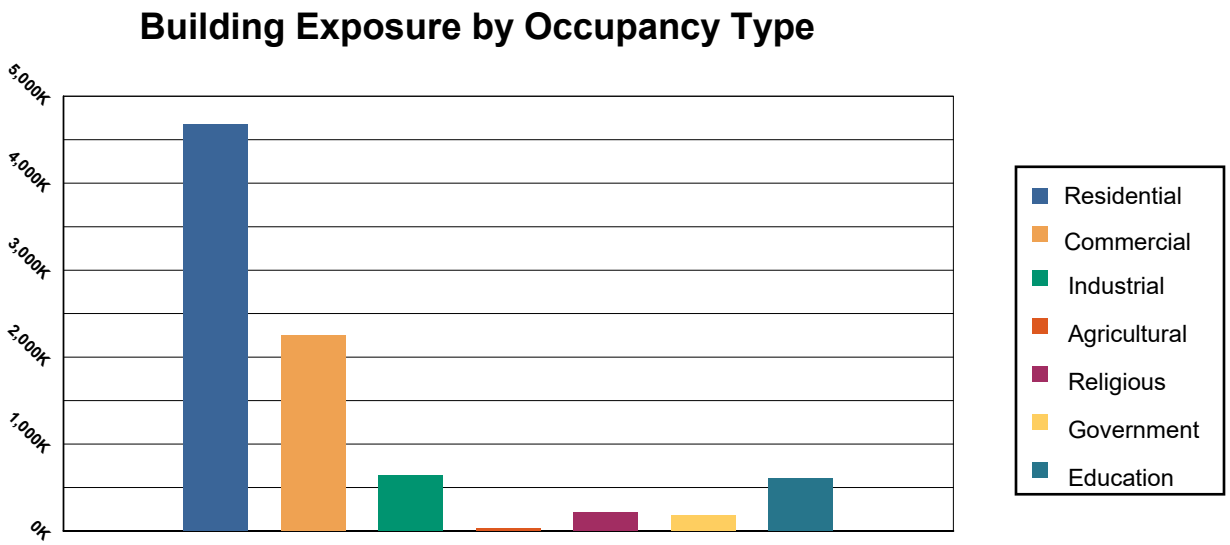


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,680,267	54.48%
Commercial	2,245,908	26.14%
Industrial	643,311	7.49%
Agricultural	22,926	0.27%
Religious	217,146	2.53%
Government	180,308	2.10%
Education	601,182	7.00%
Total	**8,591,048**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 20 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,075 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. There are an estimated 34 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

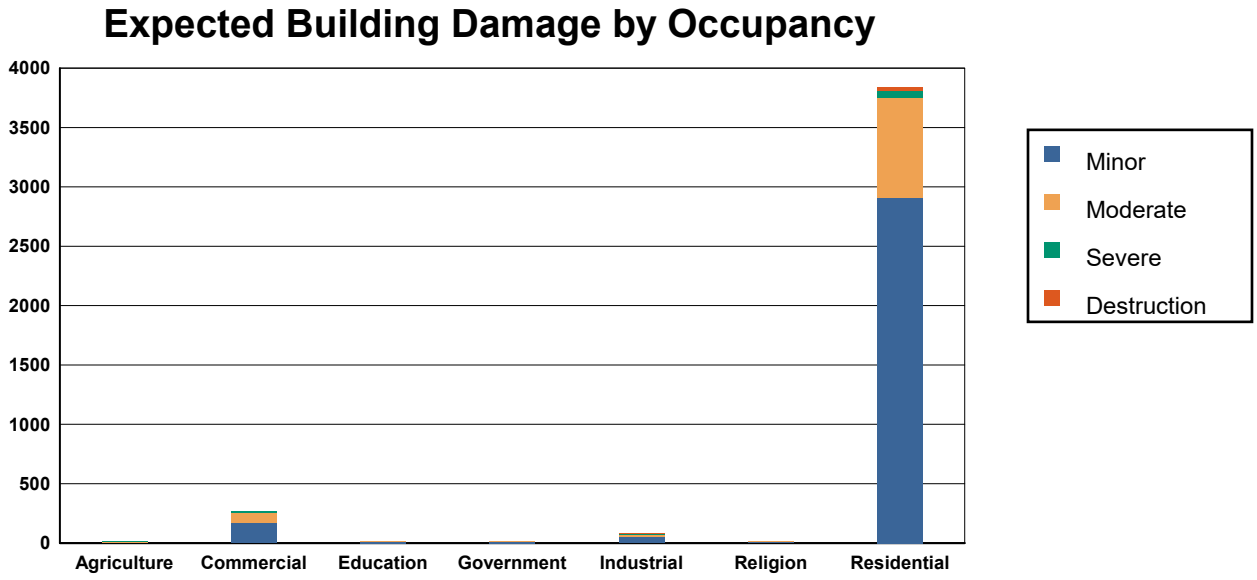


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.33	67.67	6.93	21.00	2.41	7.30	1.17	3.53	0.16	0.50
Commercial	674.34	71.66	171.46	18.22	77.88	8.28	17.17	1.82	0.15	0.02
Education	35.84	73.15	9.13	18.64	3.62	7.38	0.40	0.83	0.00	0.00
Government	34.83	72.57	8.89	18.53	3.83	7.99	0.44	0.92	0.00	0.00
Industrial	194.18	71.13	48.63	17.81	23.02	8.43	6.51	2.38	0.66	0.24
Religion	50.26	72.84	14.06	20.38	4.25	6.16	0.43	0.62	0.00	0.00
Residential	7,970.04	67.50	2,905.38	24.61	848.54	7.19	50.90	0.43	33.14	0.28
Total	**8,981.82**		**3,164.49**		**963.55**		**77.02**		**34.12**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	157	69.26	45	19.74	23	10.23	2	0.77	0	0.00
Masonry	949	64.68	288	19.63	207	14.10	21	1.43	2	0.17
MH	163	84.49	15	7.68	10	5.22	1	0.29	4	2.33
Steel	506	71.96	117	16.66	64	9.16	15	2.20	0	0.02
Wood	7,395	69.59	2,680	25.22	478	4.50	44	0.41	29	0.28

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

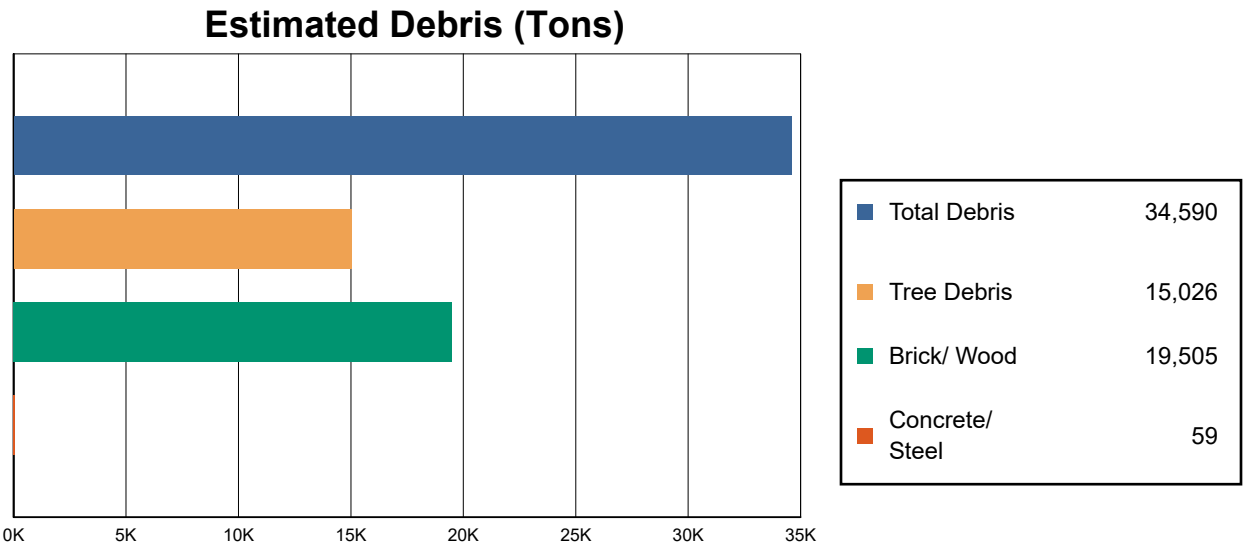
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Police Stations	1	0	0	1
Schools	20	1	0	0

Induced Hurricane Damage

Debris Generation

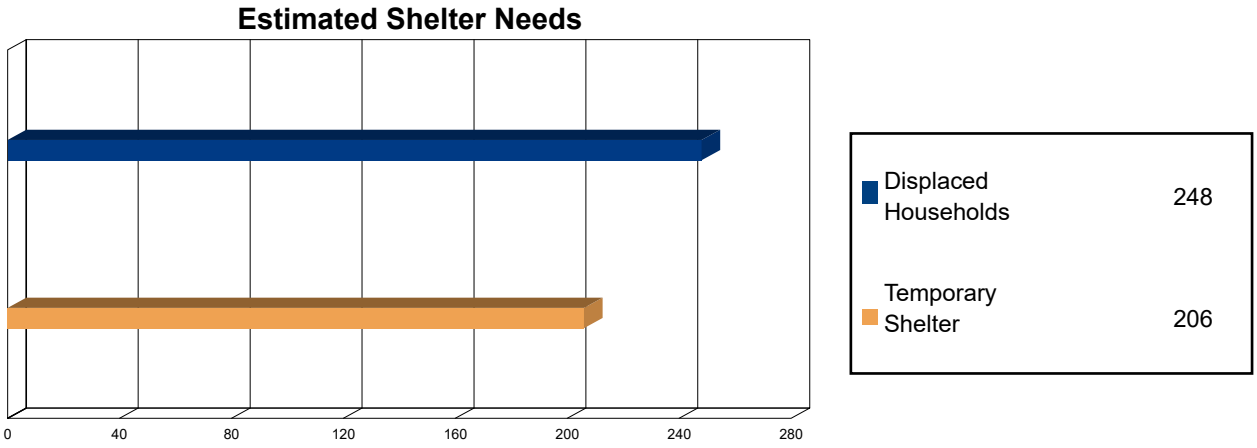


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 34,590 tons of debris will be generated. Of the total amount, 3,814 tons (11%) is Other Tree Debris. Of the remaining 30,776 tons, Brick/Wood comprises 63% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 783 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 11,212 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 248 households to be displaced due to the hurricane. Of these, 206 people (out of a total population of 51,045) will seek temporary shelter in public shelters.

Economic Loss

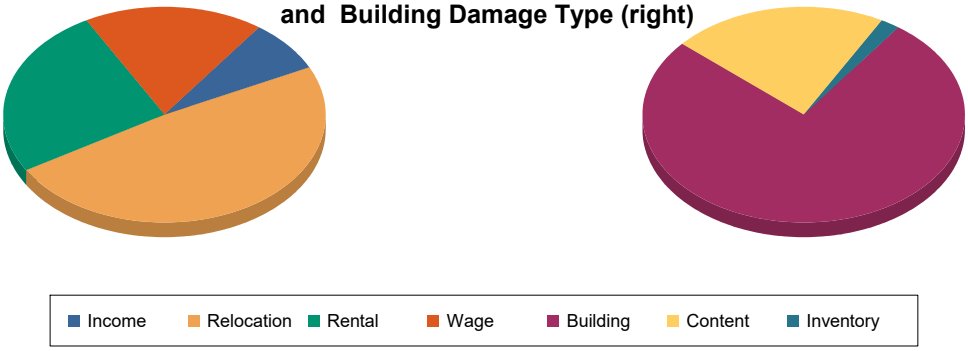
The total economic loss estimated for the hurricane is 276.9 million dollars, which represents 3.22 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 277 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 65% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

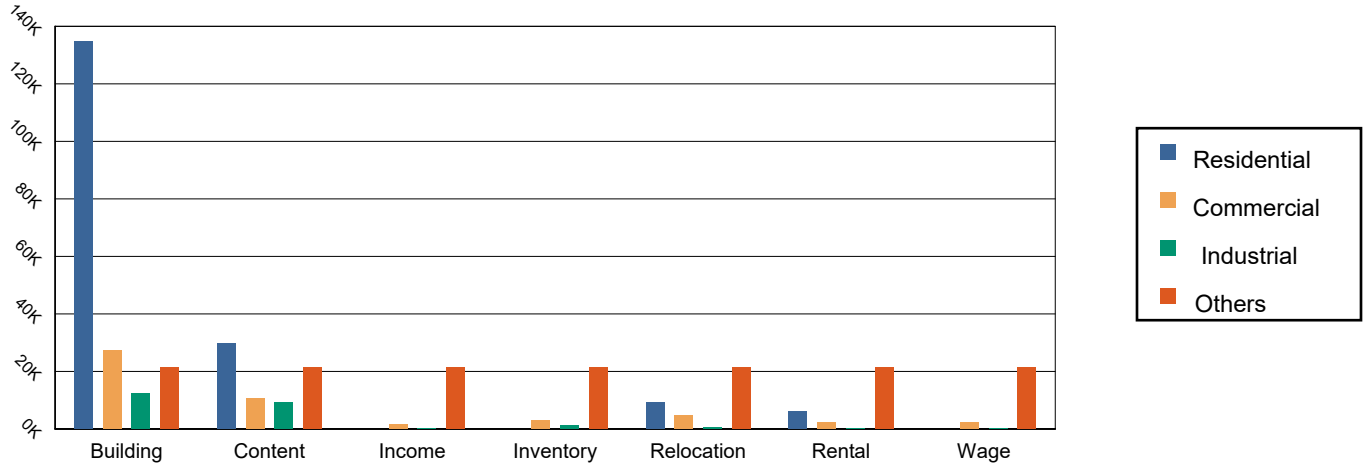


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	134,890.70	27,265.34	12,451.34	10,492.38	185,099.77
	Content	29,671.74	10,530.19	9,303.02	3,714.48	53,219.42
	Inventory	0.00	2,988.10	1,251.54	172.69	4,412.33
	Subtotal	**164,562.44**	**40,783.63**	**23,005.90**	**14,379.55**	**242,731.52**
Business Interruption Loss						
	Income	0.00	1,594.32	138.53	932.91	2,665.76
	Relocation	9,374.38	4,760.74	497.69	1,938.95	16,571.76
	Rental	6,230.12	2,242.98	92.79	206.33	8,772.23
	Wage	0.00	2,197.23	230.10	3,760.29	6,187.62
	Subtotal	**15,604.50**	**10,795.27**	**959.10**	**6,838.48**	**34,197.36**

Total

Total	**180,166.94**	**51,578.90**	**23,965.00**	**21,218.03**	**276,928.88**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,680,267	3,910,781	8,591,048
Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**
Study Region Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**

Hazus: Hurricane Global Risk Report

Region Name:	East_Hartford_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.75 square miles and contains 14 census tracts. There are over 20 thousand households in the region and a total population of 51,045 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 13 thousand buildings in the region with a total building replacement value (excluding contents) of 8,591 million dollars. Approximately 89% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 13,221 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

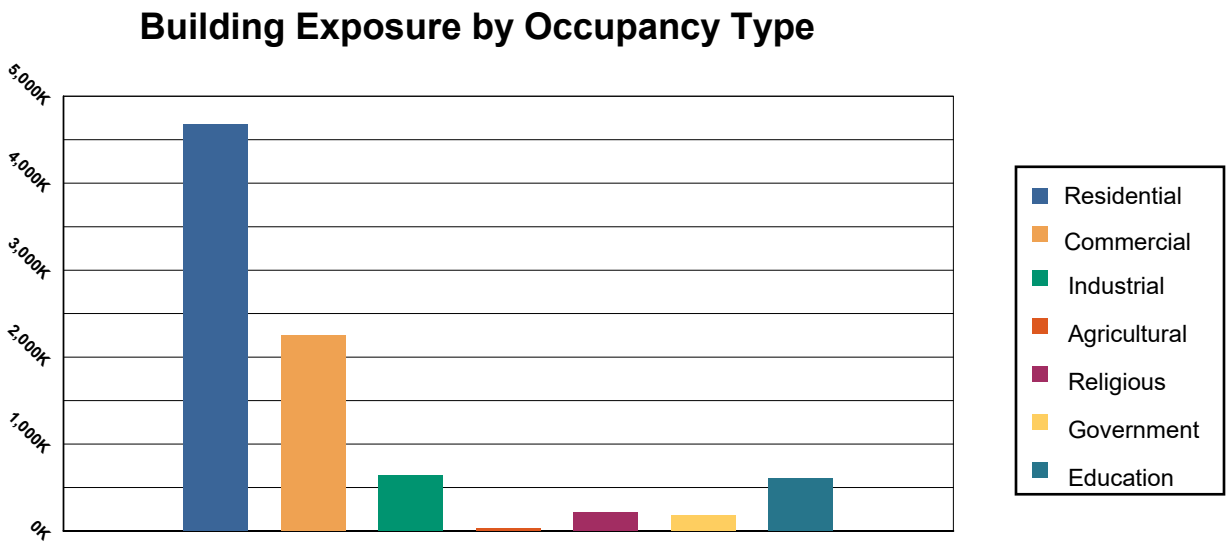


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,680,267	54.48%
Commercial	2,245,908	26.14%
Industrial	643,311	7.49%
Agricultural	22,926	0.27%
Religious	217,146	2.53%
Government	180,308	2.10%
Education	601,182	7.00%
Total	**8,591,048**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 20 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,727 buildings will be at least moderately damaged. This is over 13% of the total number of buildings in the region. There are an estimated 78 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

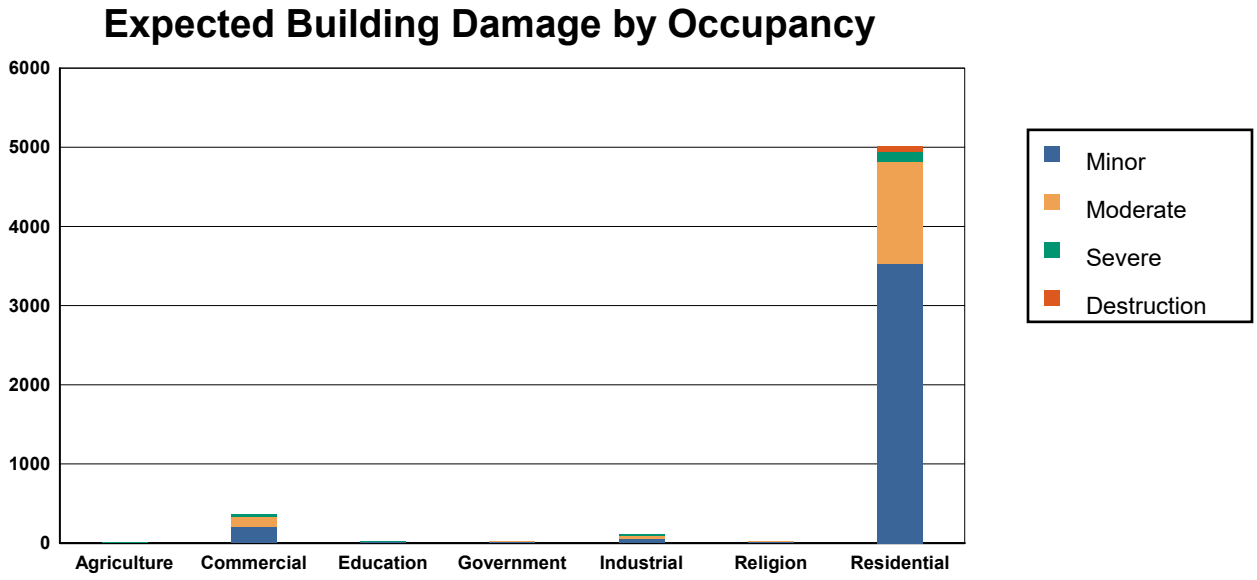


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	18.72	56.73	8.54	25.89	3.61	10.93	1.82	5.53	0.30	0.92
Commercial	571.85	60.77	208.83	22.19	124.60	13.24	35.33	3.75	0.38	0.04
Education	30.51	62.26	11.15	22.75	6.17	12.60	1.17	2.39	0.00	0.00
Government	29.53	61.51	10.73	22.35	6.47	13.48	1.28	2.66	0.00	0.00
Industrial	164.20	60.15	58.24	21.33	36.89	13.51	12.43	4.55	1.24	0.46
Religion	42.88	62.15	17.57	25.46	7.35	10.65	1.21	1.75	0.00	0.00
Residential	6,795.11	57.55	3,526.55	29.87	1,294.26	10.96	116.51	0.99	75.57	0.64
Total	**7,652.79**		**3,841.61**		**1,479.35**		**169.75**		**77.50**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	131	57.83	52	22.83	39	17.05	5	2.28	0	0.00
Masonry	795	54.21	329	22.42	297	20.22	41	2.83	5	0.33
MH	147	76.21	20	10.24	17	8.59	1	0.67	8	4.29
Steel	429	60.96	139	19.84	103	14.61	32	4.55	0	0.04
Wood	6,342	59.69	3,331	31.34	787	7.40	98	0.93	68	0.64

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

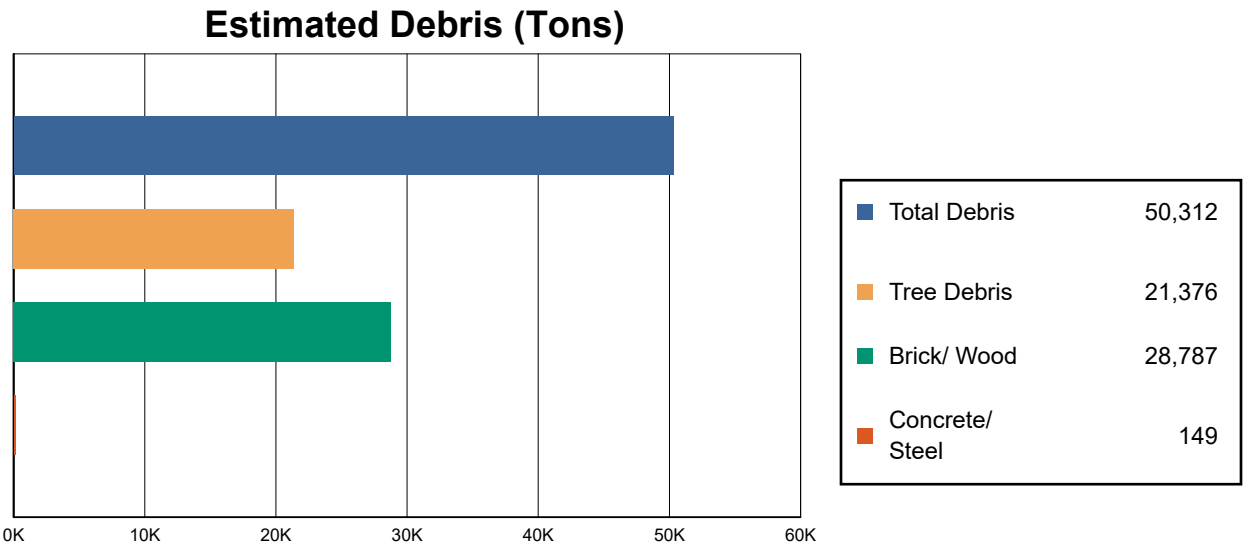
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Police Stations	1	0	0	1
Schools	20	2	0	0

Induced Hurricane Damage

Debris Generation

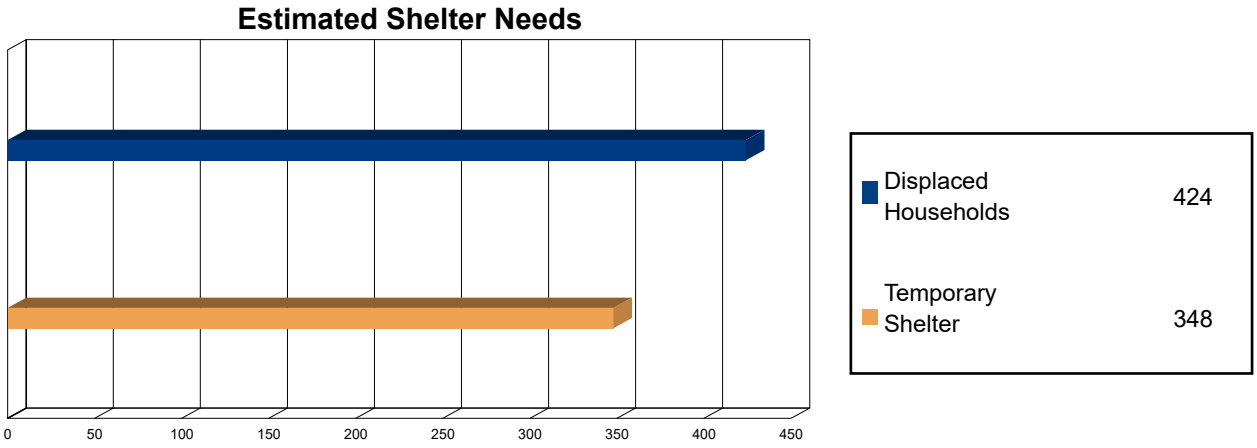


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 50,312 tons of debris will be generated. Of the total amount, 5,466 tons (11%) is Other Tree Debris. Of the remaining 44,846 tons, Brick/Wood comprises 64% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1157 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 15,910 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 424 households to be displaced due to the hurricane. Of these, 348 people (out of a total population of 51,045) will seek temporary shelter in public shelters.

Economic Loss

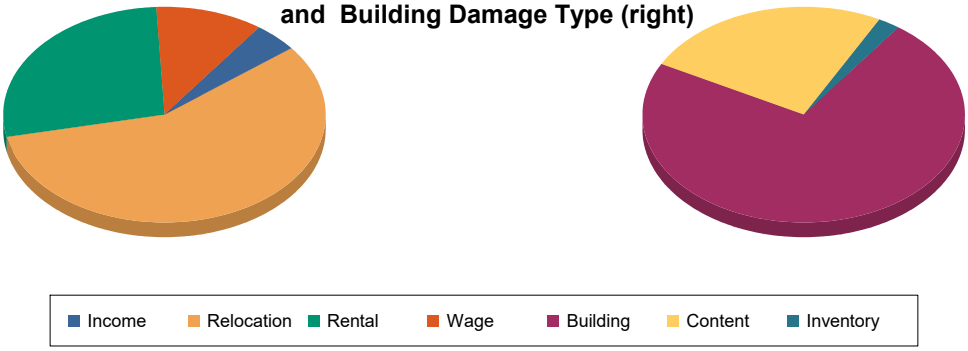
The total economic loss estimated for the hurricane is 453.9 million dollars, which represents 5.28 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 454 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 62% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

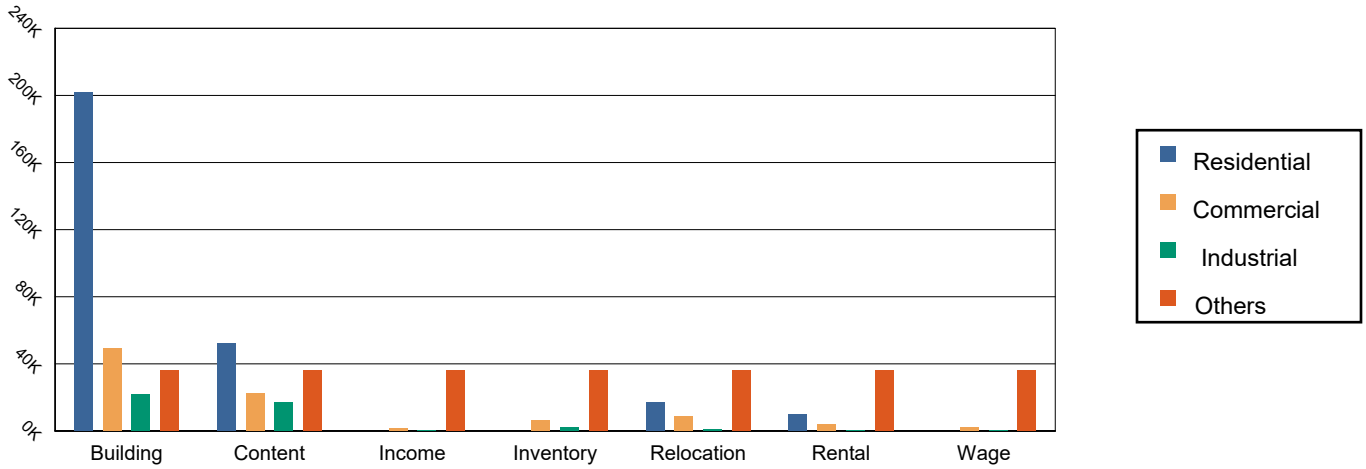


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	201,638.63	49,401.03	21,513.36	19,242.01	291,795.02
	Content	52,355.80	22,481.09	16,938.34	8,320.41	100,095.64
	Inventory	0.00	6,484.46	2,269.94	299.15	9,053.55
	Subtotal	**253,994.43**	**78,366.58**	**40,721.64**	**27,861.56**	**400,944.21**
Business Interruption Loss						
	Income	16.98	1,340.34	263.34	799.61	2,420.27
	Relocation	17,149.17	8,541.56	895.29	3,634.17	30,220.20
	Rental	9,818.25	4,161.92	165.33	406.82	14,552.33
	Wage	40.01	1,956.42	436.17	3,301.57	5,734.17
	Subtotal	**27,024.42**	**16,000.24**	**1,760.13**	**8,142.17**	**52,926.97**

Total

Total	**281,018.85**	**94,366.82**	**42,481.77**	**36,003.74**	**453,871.18**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	51,045	4,680,267	3,910,781	8,591,048
Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**
Study Region Total	**51,045**	**4,680,267**	**3,910,781**	**8,591,048**

Hazus: Hurricane Global Risk Report

Region Name:	Ellington_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.60 square miles and contains 3 census tracts. There are over 6 thousand households in the region and a total population of 16,426 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90% of the buildings (and 73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,578 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

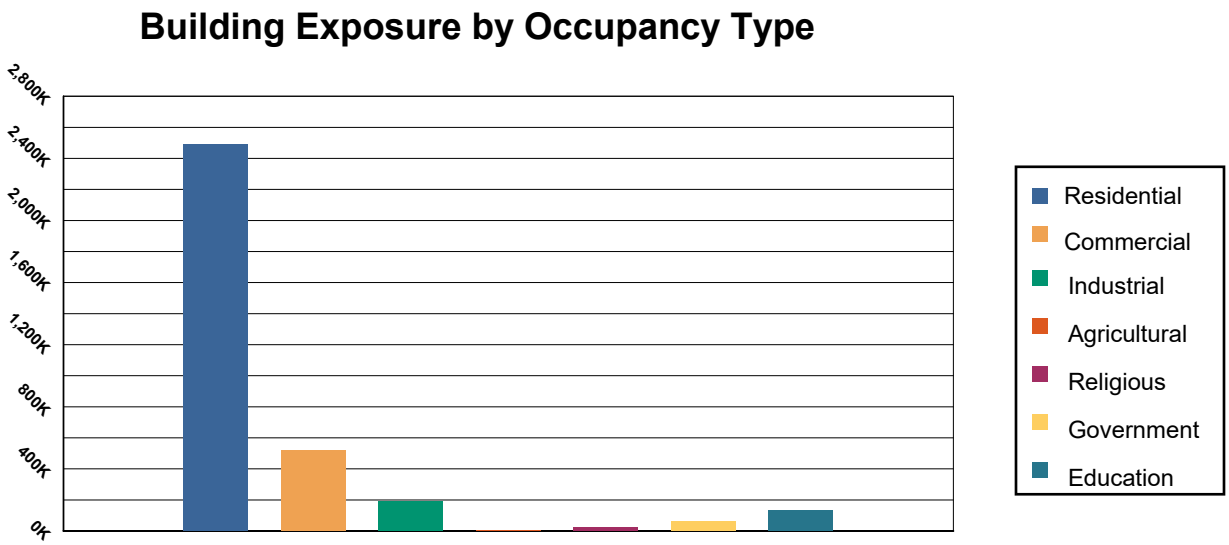


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,487,008	72.69%
Commercial	518,285	15.15%
Industrial	192,490	5.63%
Agricultural	4,980	0.15%
Religious	20,773	0.61%
Government	63,577	1.86%
Education	134,206	3.92%
Total	**3,421,319**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

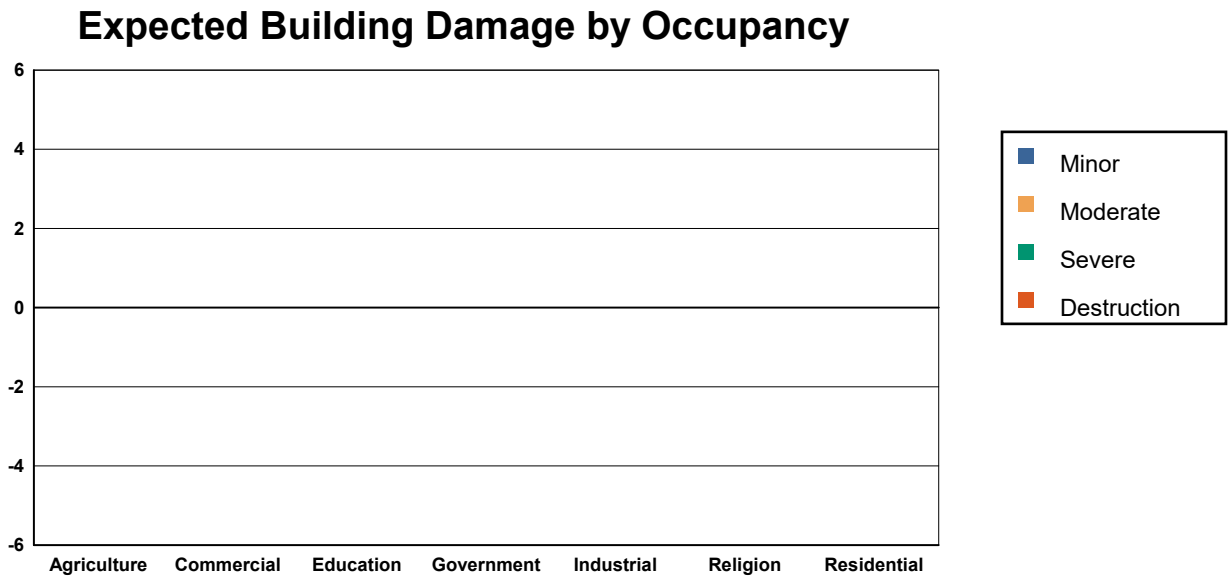


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	13.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	370.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	11.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	63.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	83.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	16.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	5,022.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**5,578.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	71	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	495	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	273	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	4,742	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

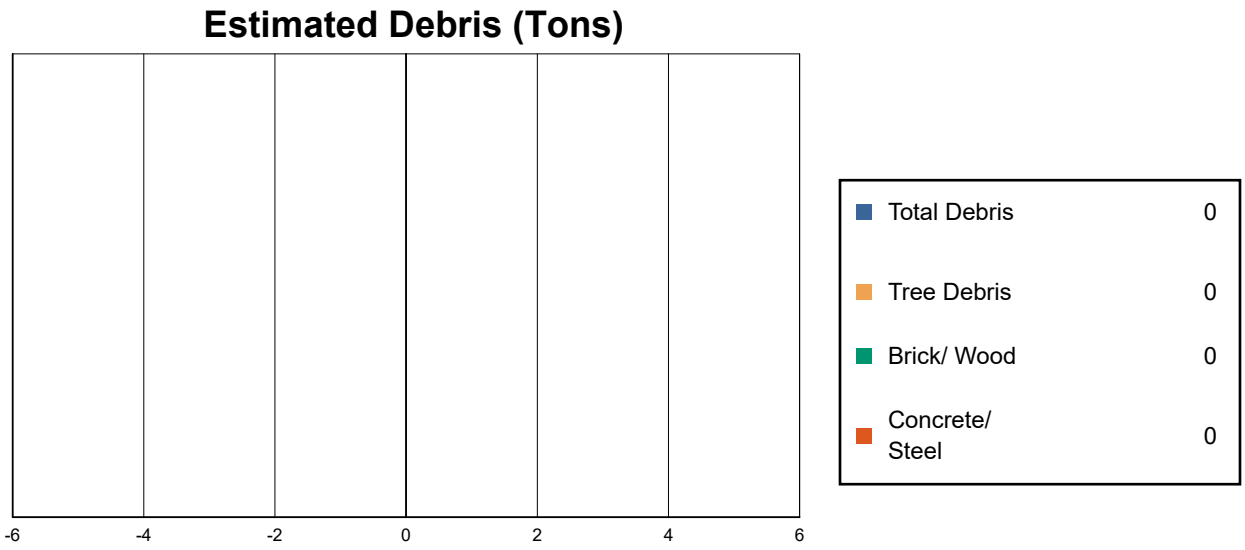
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

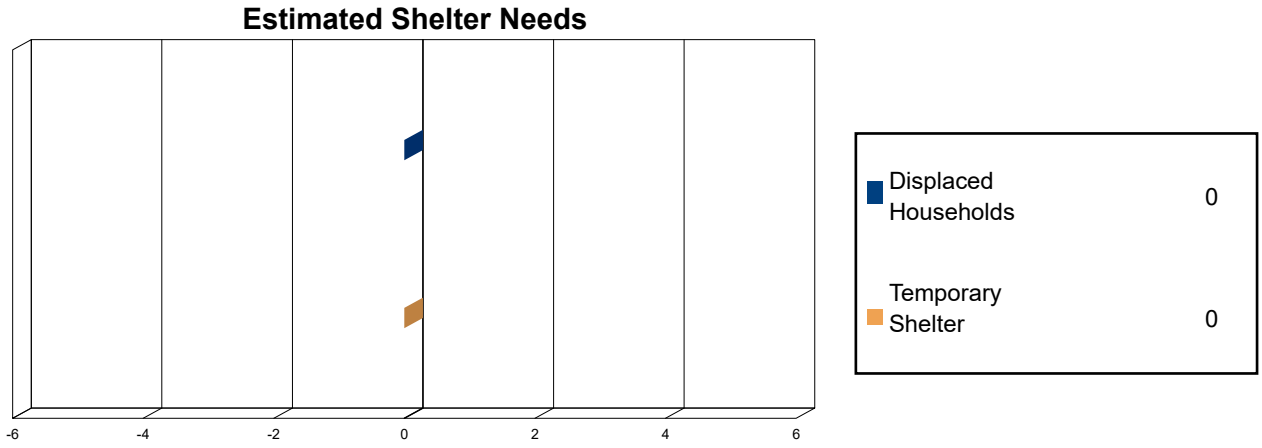


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 16,426) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

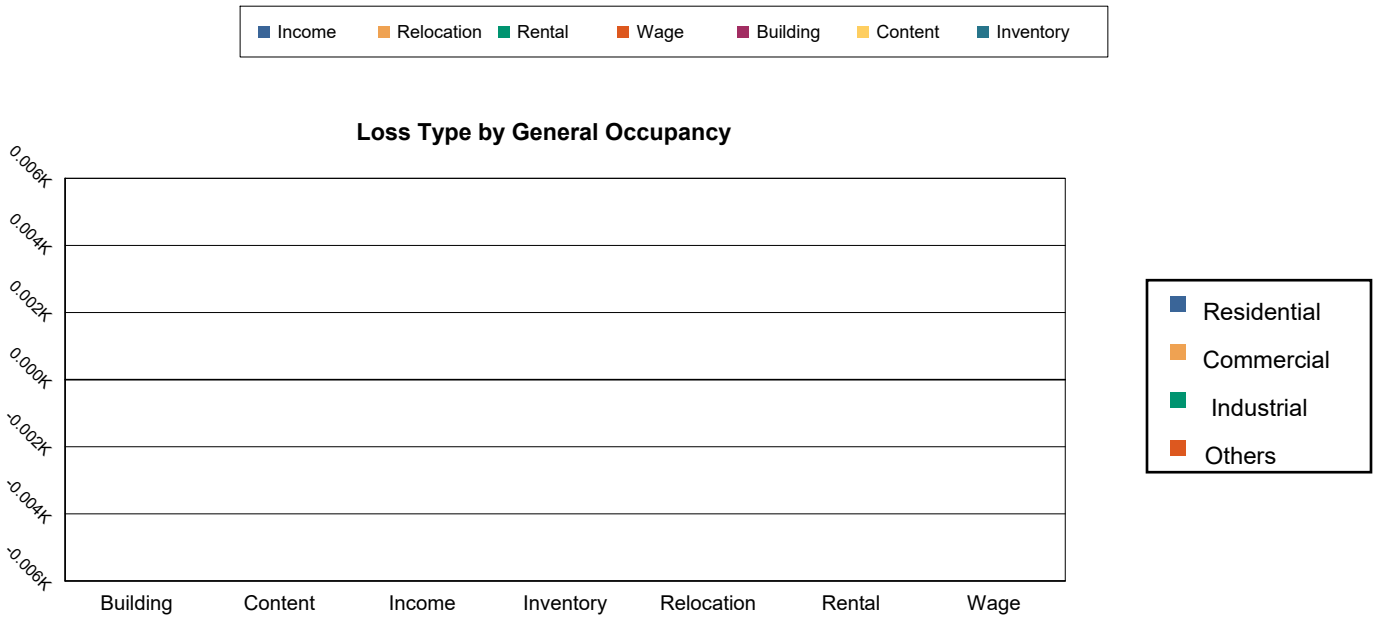


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,487,008	934,311	3,421,319
Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**
Study Region Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**

Hazus: Hurricane Global Risk Report

Region Name:	Ellington_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.60 square miles and contains 3 census tracts. There are over 6 thousand households in the region and a total population of 16,426 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90% of the buildings (and 73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,578 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

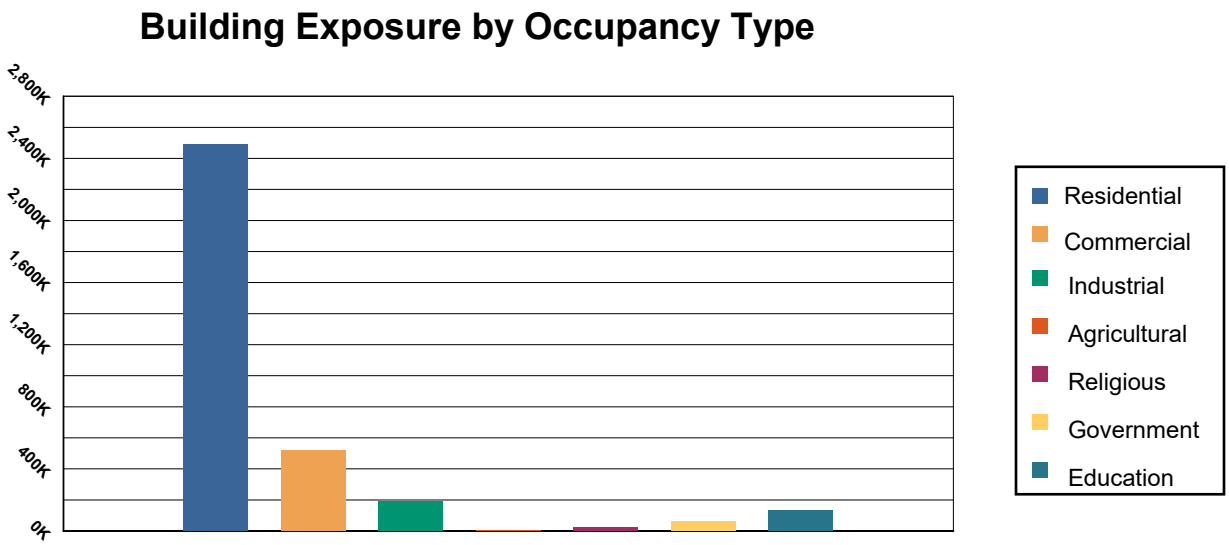


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,487,008	72.69%
Commercial	518,285	15.15%
Industrial	192,490	5.63%
Agricultural	4,980	0.15%
Religious	20,773	0.61%
Government	63,577	1.86%
Education	134,206	3.92%
Total	**3,421,319**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

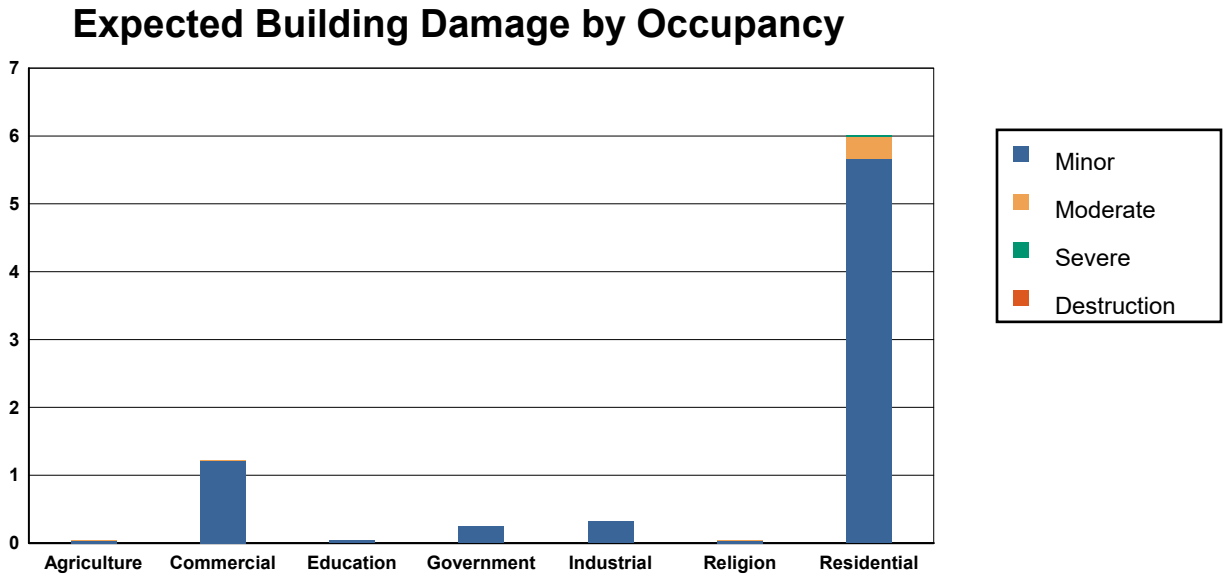


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	12.97	99.74	0.03	0.25	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	368.78	99.67	1.21	0.33	0.01	0.00	0.00	0.00	0.00	0.00
Education	10.96	99.63	0.04	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Government	62.76	99.62	0.24	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	82.68	99.62	0.32	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Religion	15.95	99.72	0.04	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Residential	5,015.99	99.88	5.67	0.11	0.32	0.01	0.02	0.00	0.00	0.00
Total	**5,570.09**		**7.55**		**0.34**		**0.02**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	71	99.57	0	0.43	0	0.00	0	0.00	0	0.00
Masonry	492	99.44	3	0.54	0	0.02	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	272	99.62	1	0.37	0	0.00	0	0.00	0	0.00
Wood	4,740	99.95	2	0.05	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

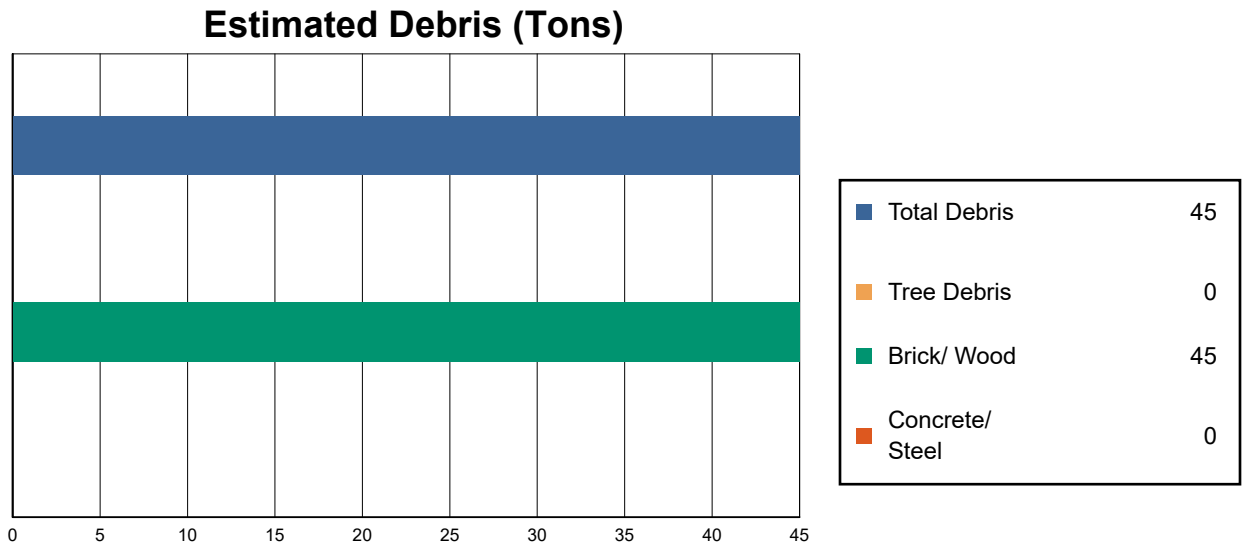
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

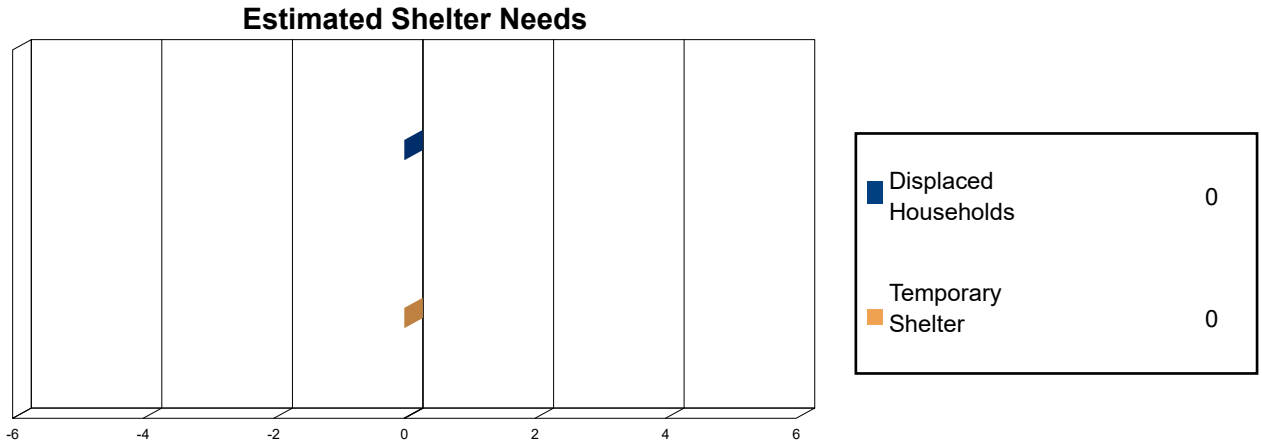


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 45 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 45 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 16,426) will seek temporary shelter in public shelters.

Economic Loss

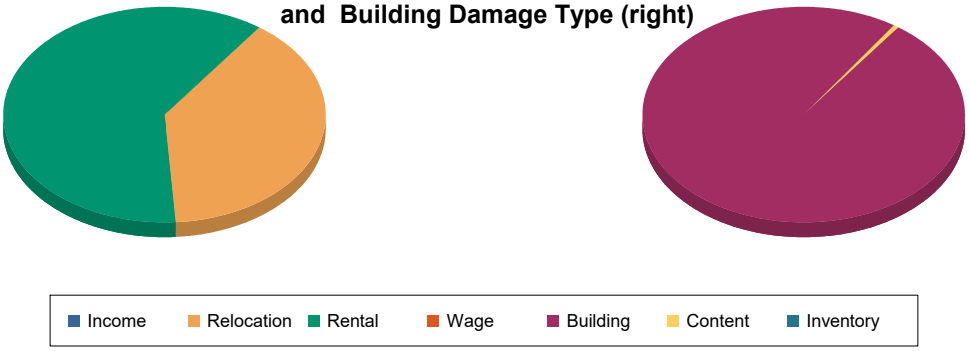
The total economic loss estimated for the hurricane is 0.9 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 89% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

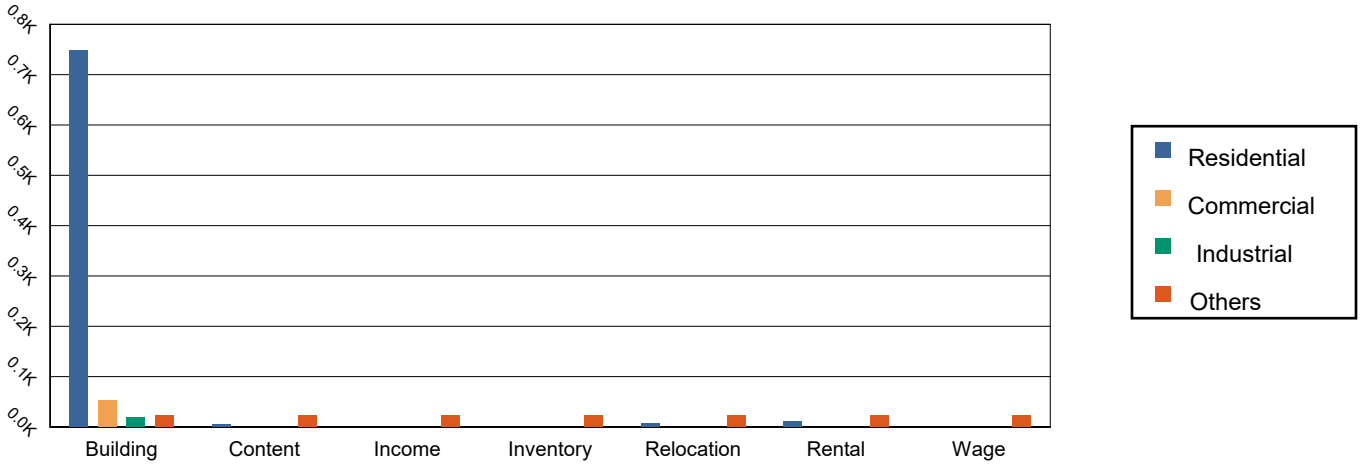


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	748.53	51.83	19.25	21.86	841.47
	Content	4.89	0.00	0.00	0.00	4.89
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**753.42**	**51.83**	**19.25**	**21.86**	**846.36**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	7.47	0.14	0.00	0.01	7.62
	Rental	11.99	0.00	0.00	0.00	11.99
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**19.46**	**0.14**	**0.00**	**0.01**	**19.61**

Total

Total	**772.89**	**51.97**	**19.25**	**21.86**	**865.97**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
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Tolland	16,426	2,487,008	934,311	3,421,319
Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**
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Hazus: Hurricane Global Risk Report

Region Name:	Ellington_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
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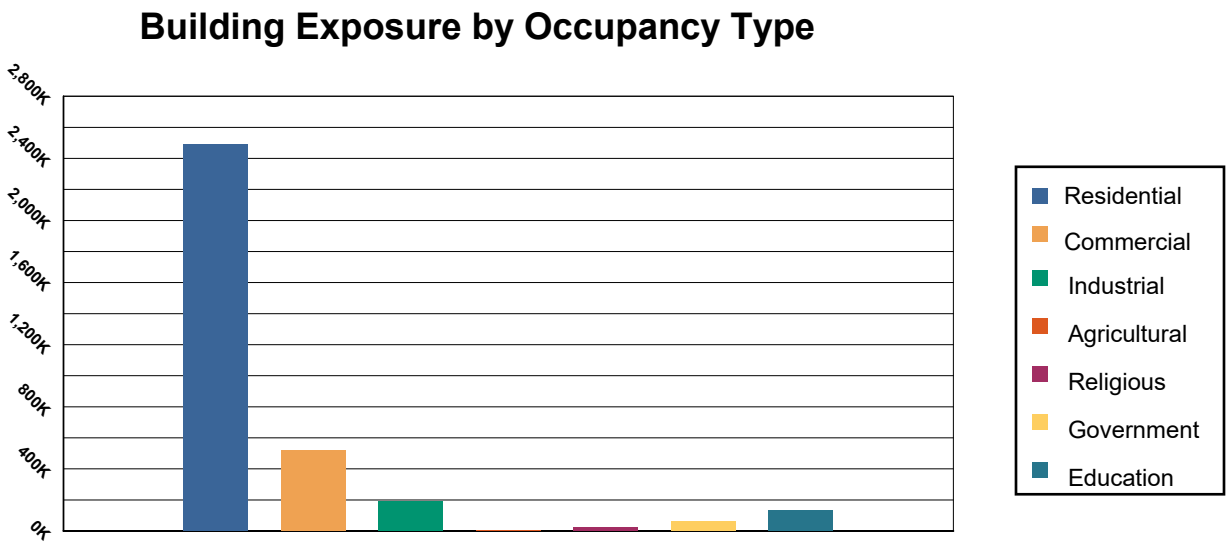

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Industrial	192,490	5.63%
Agricultural	4,980	0.15%
Religious	20,773	0.61%
Government	63,577	1.86%
Education	134,206	3.92%
Total	**3,421,319**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

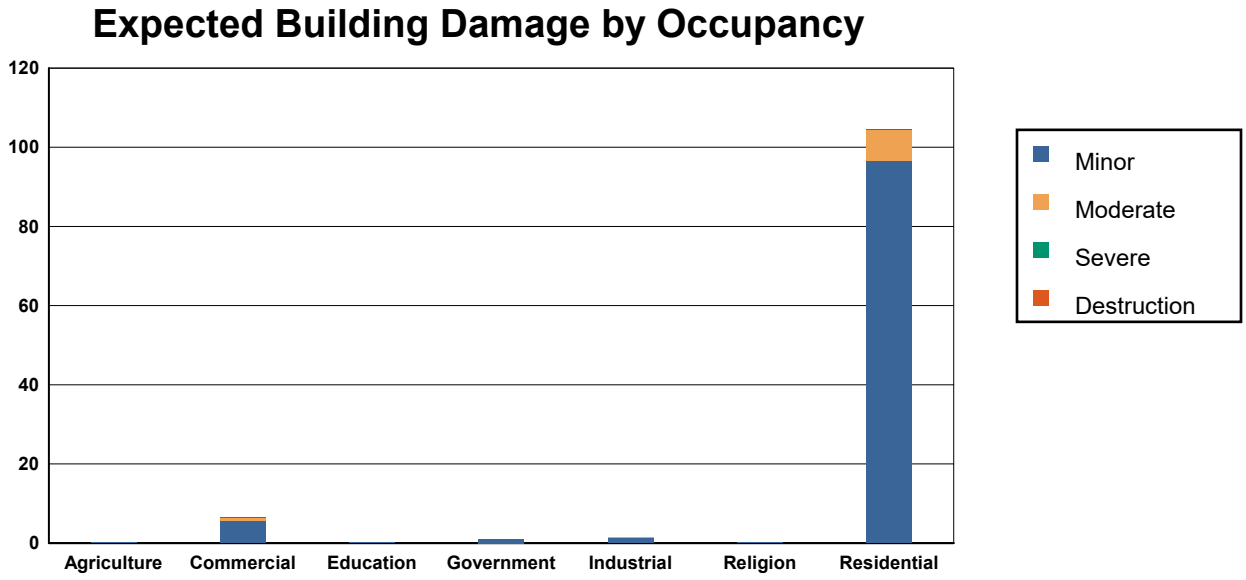


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	12.76	98.16	0.21	1.63	0.02	0.17	0.01	0.04	0.00	0.00
Commercial	363.58	98.26	5.64	1.52	0.74	0.20	0.04	0.01	0.00	0.00
Education	10.82	98.37	0.18	1.59	0.00	0.03	0.00	0.00	0.00	0.00
Government	61.96	98.35	1.02	1.62	0.02	0.03	0.00	0.00	0.00	0.00
Industrial	81.55	98.25	1.38	1.67	0.05	0.07	0.01	0.01	0.00	0.00
Religion	15.77	98.54	0.23	1.42	0.01	0.04	0.00	0.00	0.00	0.00
Residential	4,917.46	97.92	96.62	1.92	7.73	0.15	0.19	0.00	0.00	0.00
Total	**5,463.90**		**105.27**		**8.58**		**0.25**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	70	98.20	1	1.77	0	0.03	0	0.00	0	0.00
Masonry	479	96.71	13	2.70	3	0.57	0	0.02	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	268	98.29	4	1.53	0	0.17	0	0.01	0	0.00
Wood	4,658	98.24	81	1.70	3	0.06	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

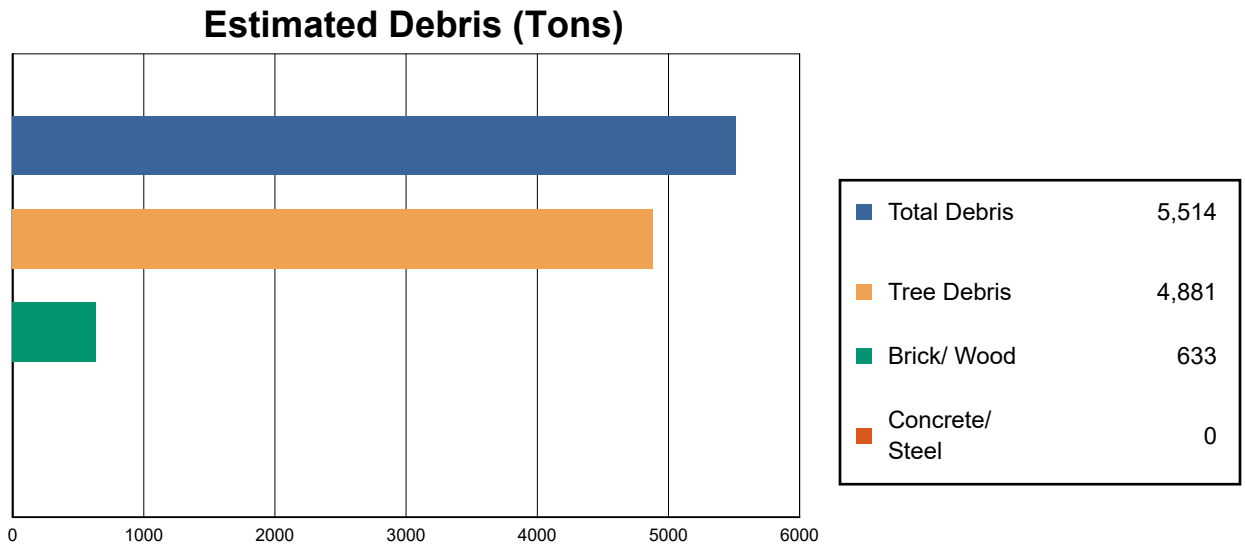
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

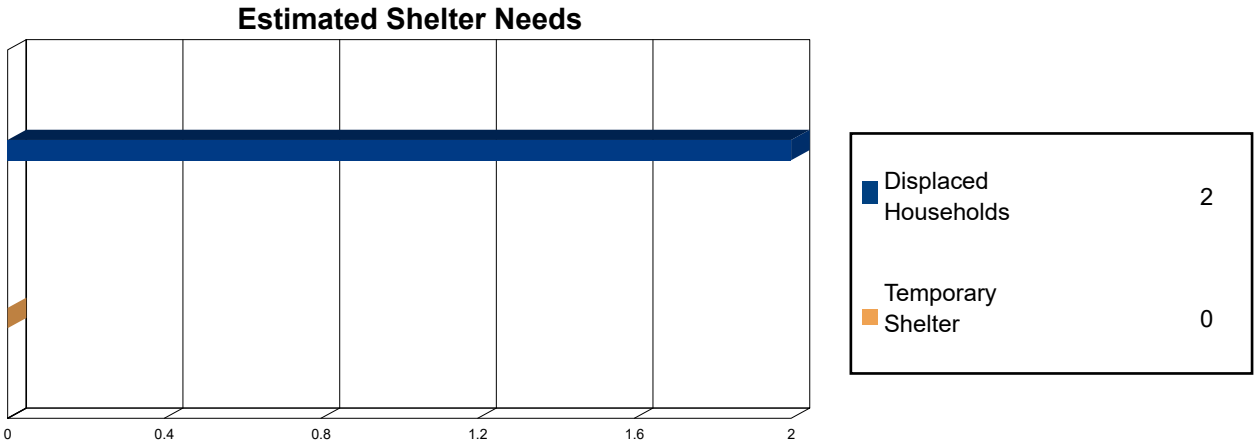


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,514 tons of debris will be generated. Of the total amount, 3,706 tons (67%) is Other Tree Debris. Of the remaining 1,808 tons, Brick/Wood comprises 35% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 25 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,175 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 16,426) will seek temporary shelter in public shelters.

Economic Loss

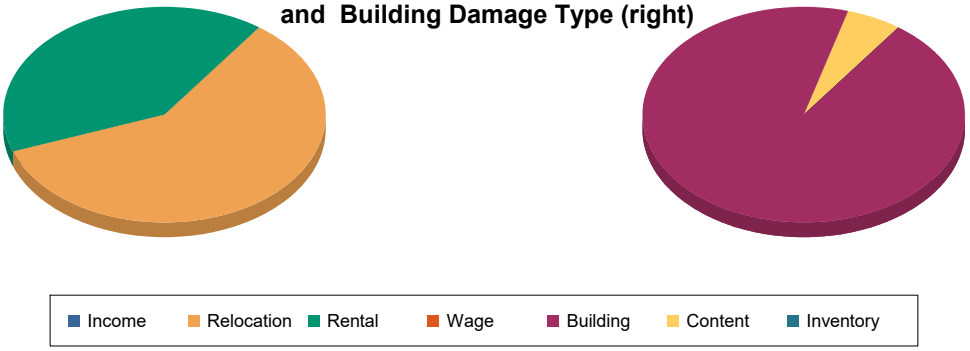
The total economic loss estimated for the hurricane is 8.7 million dollars, which represents 0.25 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 9 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

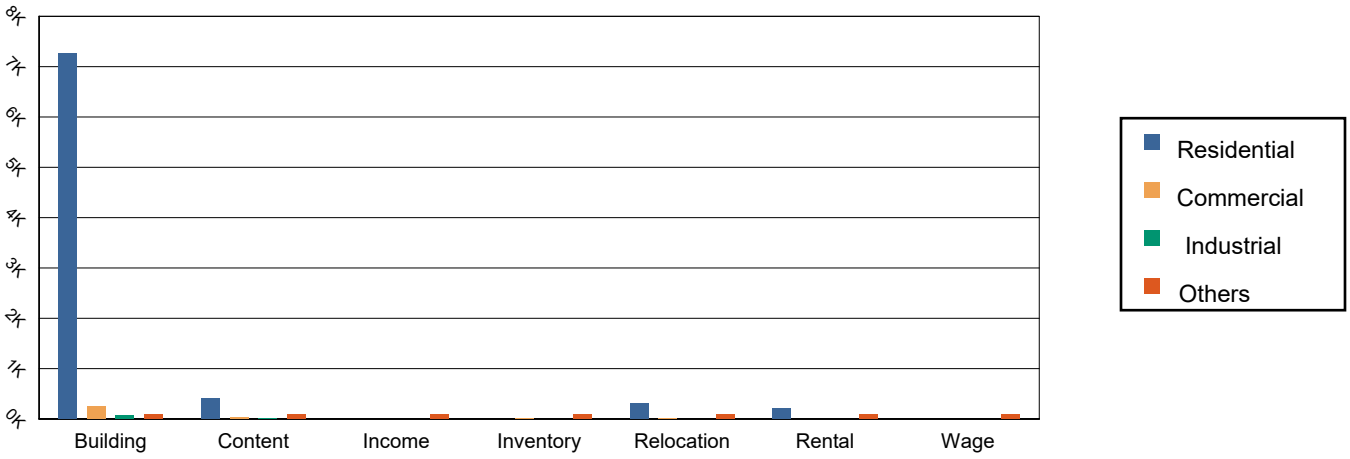


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	7,264.51	259.69	68.41	86.94	7,679.55
	Content	411.05	27.68	5.05	0.50	444.27
	Inventory	0.00	2.93	0.70	0.37	4.00
	Subtotal	**7,675.55**	**290.30**	**74.15**	**87.81**	**8,127.82**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	304.59	7.07	0.44	0.48	312.59
	Rental	213.05	0.00	0.00	0.00	213.05
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**517.64**	**7.07**	**0.44**	**0.48**	**525.63**

Total

Total	**8,193.19**	**297.38**	**74.60**	**88.28**	**8,653.45**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
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Hazus: Hurricane Global Risk Report

Region Name:	Ellington_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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General Building Stock

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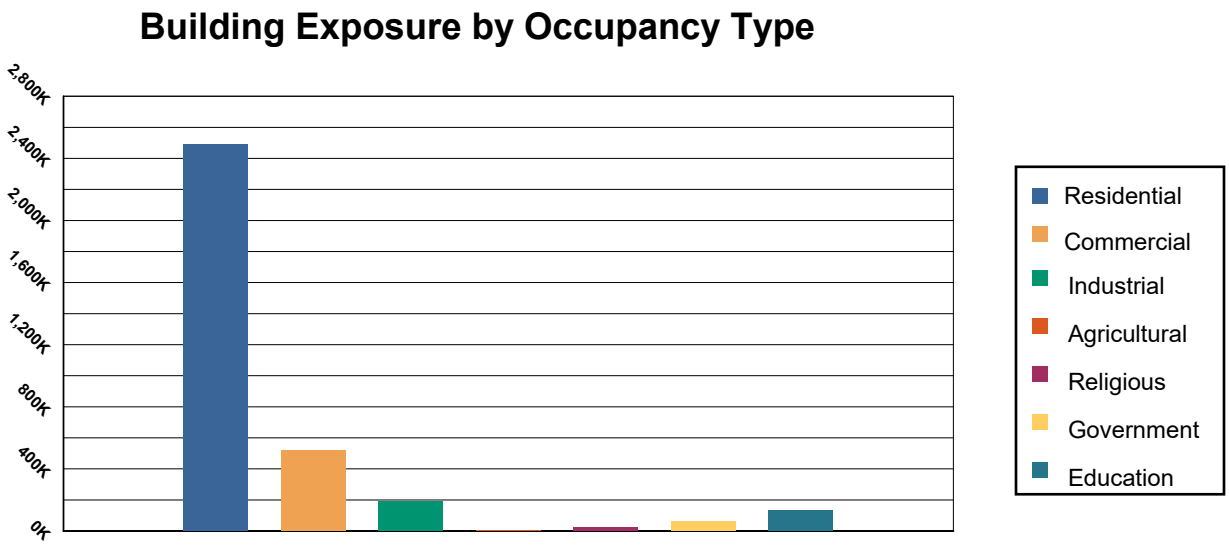


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,487,008	72.69%
Commercial	518,285	15.15%
Industrial	192,490	5.63%
Agricultural	4,980	0.15%
Religious	20,773	0.61%
Government	63,577	1.86%
Education	134,206	3.92%
Total	**3,421,319**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 41 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

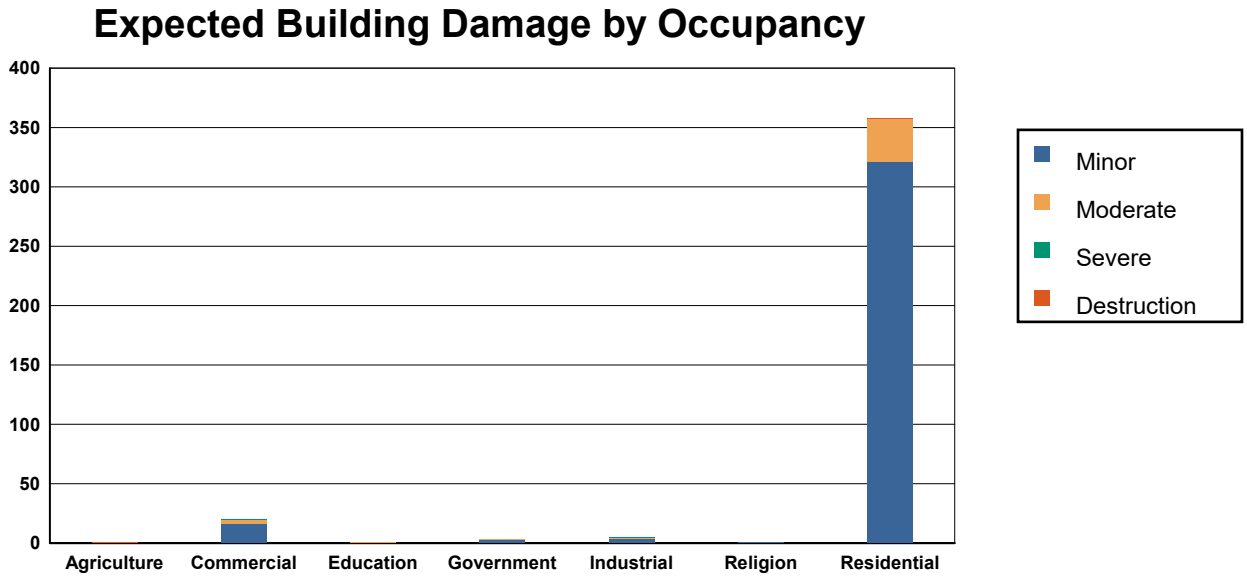


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	12.17	93.63	0.67	5.12	0.11	0.88	0.05	0.35	0.00	0.02
Commercial	349.69	94.51	16.37	4.42	3.39	0.92	0.55	0.15	0.00	0.00
Education	10.44	94.89	0.52	4.73	0.04	0.37	0.00	0.01	0.00	0.00
Government	59.86	95.02	2.90	4.60	0.23	0.37	0.00	0.01	0.00	0.00
Industrial	78.50	94.58	3.94	4.75	0.47	0.56	0.09	0.11	0.00	0.00
Religion	15.26	95.39	0.69	4.33	0.04	0.27	0.00	0.01	0.00	0.00
Residential	4,664.14	92.87	321.37	6.40	35.46	0.71	0.82	0.02	0.19	0.00
Total	**5,190.07**		**346.46**		**39.75**		**1.52**		**0.20**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	67	94.72	3	4.84	0	0.43	0	0.01	0	0.00
Masonry	452	91.30	32	6.43	11	2.19	0	0.08	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	259	94.79	11	4.18	2	0.88	0	0.16	0	0.00
Wood	4,432	93.47	292	6.16	17	0.35	1	0.01	0	0.01

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

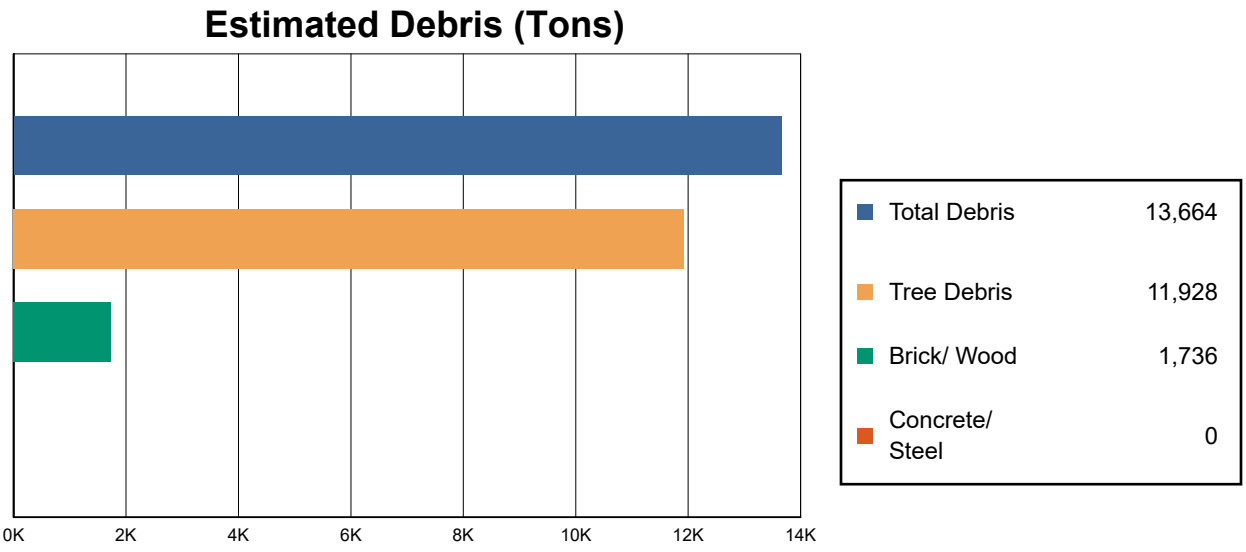
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

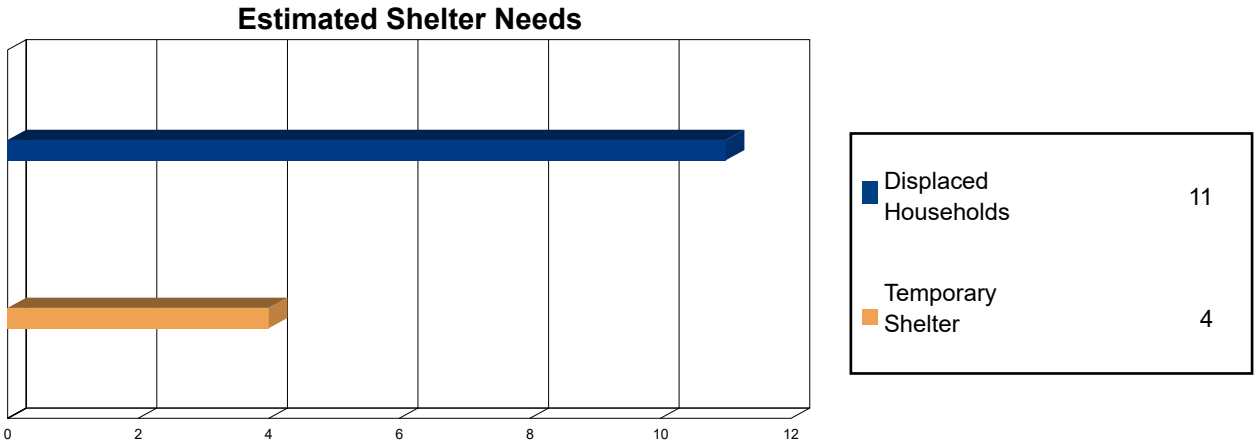


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 13,664 tons of debris will be generated. Of the total amount, 9,024 tons (66%) is Other Tree Debris. Of the remaining 4,640 tons, Brick/Wood comprises 37% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 69 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,904 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 11 households to be displaced due to the hurricane. Of these, 4 people (out of a total population of 16,426) will seek temporary shelter in public shelters.

Economic Loss

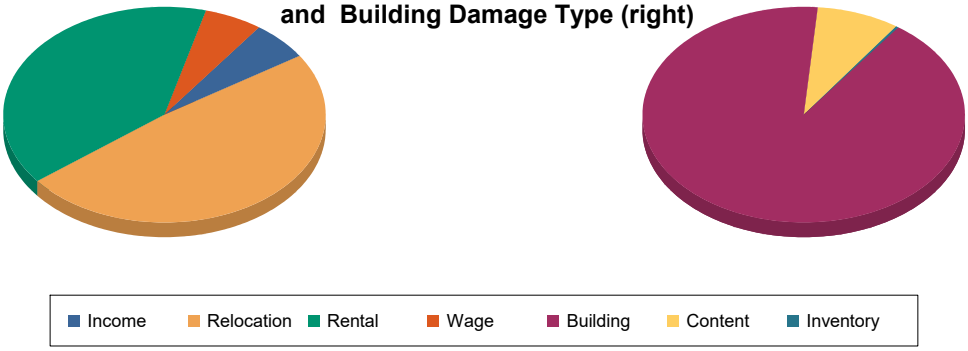
The total economic loss estimated for the hurricane is 20.8 million dollars, which represents 0.61 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 21 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

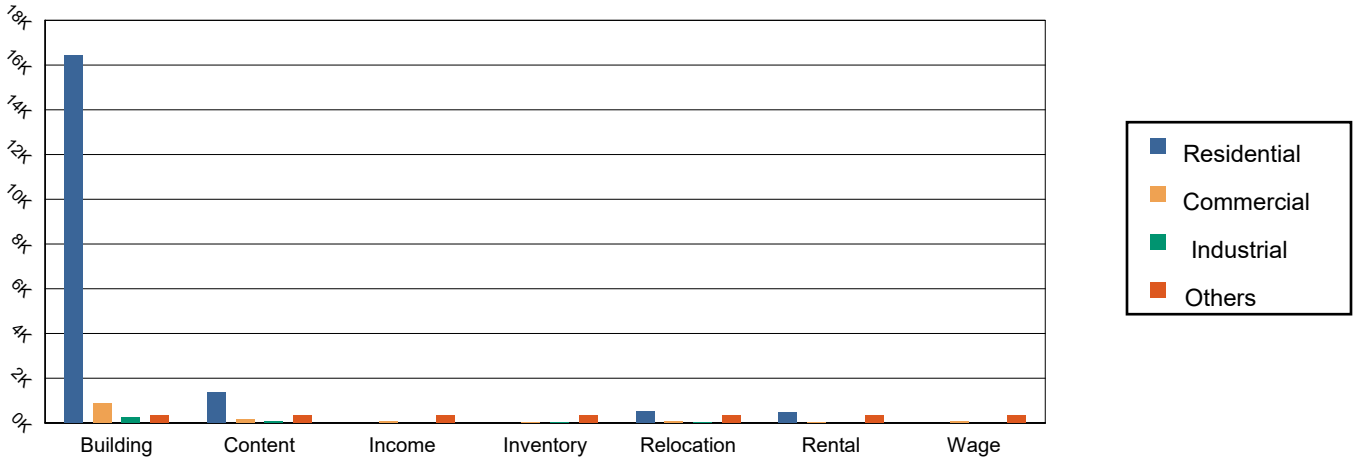


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	16,423.74	860.43	264.82	277.37	17,826.36
	Content	1,382.43	145.73	84.93	22.27	1,635.37
	Inventory	0.00	21.71	11.12	3.18	36.01
	Subtotal	**17,806.17**	**1,027.88**	**360.87**	**302.82**	**19,497.74**
Business Interruption Loss						
	Income	0.00	67.69	1.53	5.84	75.07
	Relocation	527.07	82.55	9.27	9.67	628.56
	Rental	475.58	36.99	1.18	0.45	514.20
	Wage	0.00	59.37	2.53	13.78	75.68
	Subtotal	**1,002.65**	**246.60**	**14.51**	**29.74**	**1,293.50**

Total

Total	18,808.82	1,274.48	375.38	332.57	20,791.25

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,487,008	934,311	3,421,319
Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**
Study Region Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**

Hazus: Hurricane Global Risk Report

Region Name:	Ellington_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

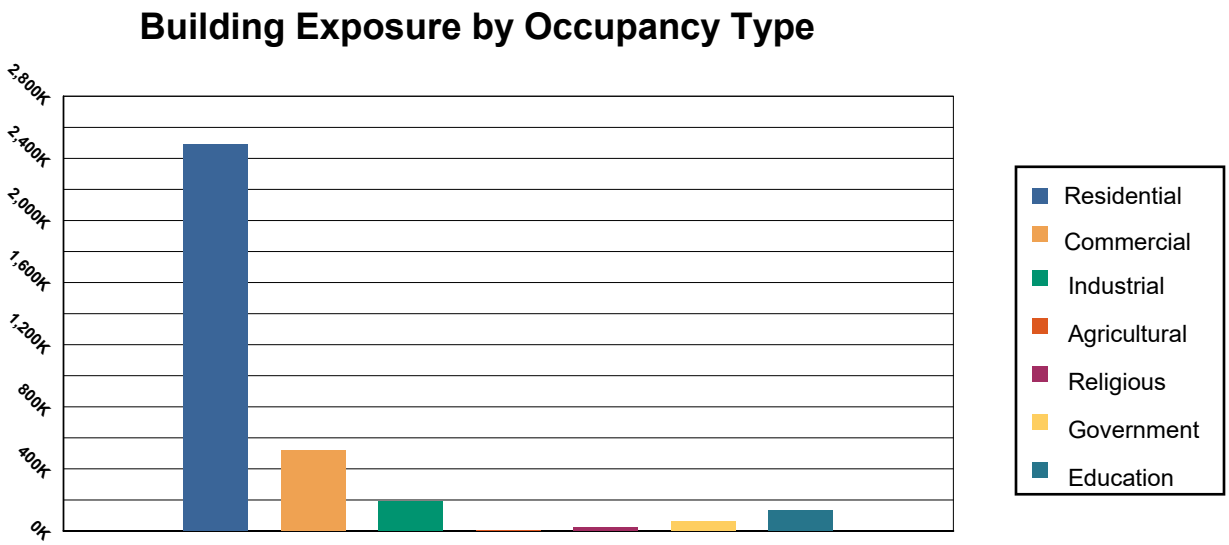
The geographical size of the region is 34.60 square miles and contains 3 census tracts. There are over 6 thousand households in the region and a total population of 16,426 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90% of the buildings (and 73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,578 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.



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Residential	2,487,008	72.69%
Commercial	518,285	15.15%
Industrial	192,490	5.63%
Agricultural	4,980	0.15%
Religious	20,773	0.61%
Government	63,577	1.86%
Education	134,206	3.92%
Total	**3,421,319**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 115 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

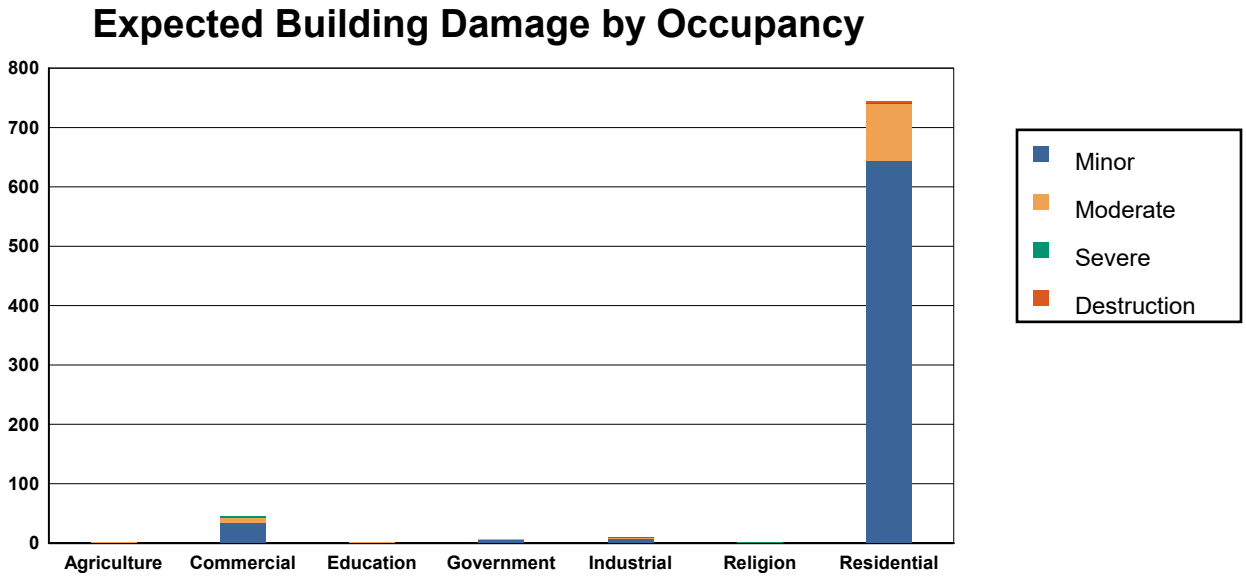


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11.11	85.44	1.40	10.79	0.33	2.53	0.15	1.14	0.01	0.10
Commercial	325.55	87.99	33.47	9.04	9.11	2.46	1.87	0.51	0.01	0.00
Education	9.72	88.36	1.08	9.84	0.19	1.74	0.01	0.07	0.00	0.00
Government	55.98	88.86	5.92	9.39	1.06	1.68	0.04	0.06	0.00	0.00
Industrial	72.91	87.84	7.99	9.62	1.77	2.14	0.31	0.37	0.02	0.02
Religion	14.35	89.66	1.47	9.16	0.18	1.13	0.01	0.05	0.00	0.00
Residential	4,278.07	85.19	644.17	12.83	94.85	1.89	3.18	0.06	1.73	0.03
Total	**4,767.68**		**695.50**		**107.49**		**5.56**		**1.78**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	63	88.32	7	9.66	1	1.96	0	0.06	0	0.00
Masonry	413	83.50	56	11.32	24	4.94	1	0.23	0	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	241	88.46	23	8.43	7	2.56	2	0.55	0	0.00
Wood	4,076	85.96	604	12.74	57	1.21	3	0.06	2	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

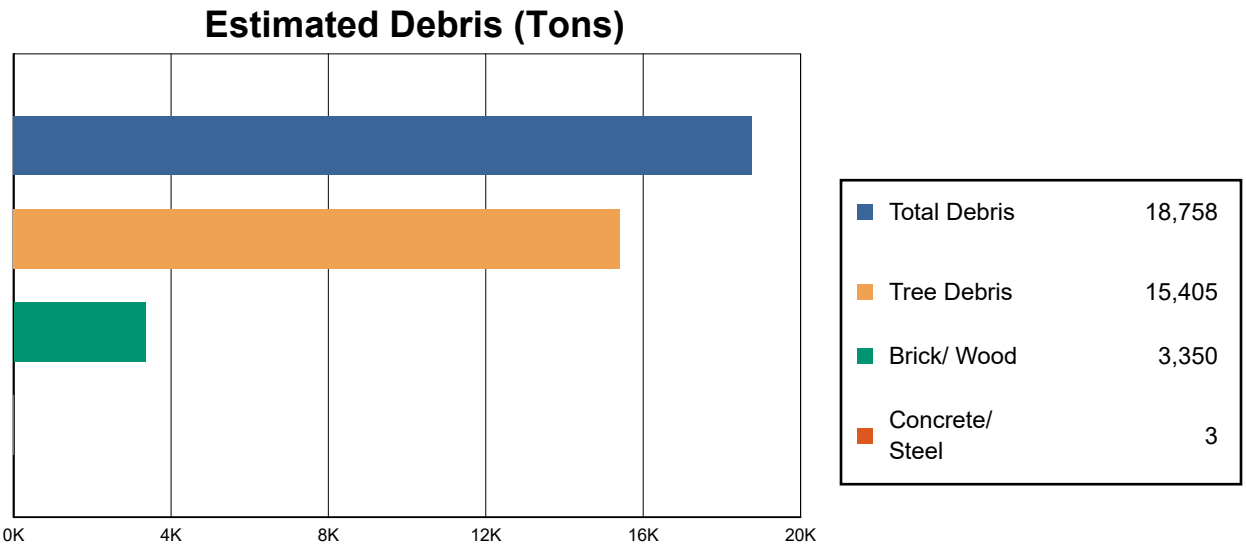
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

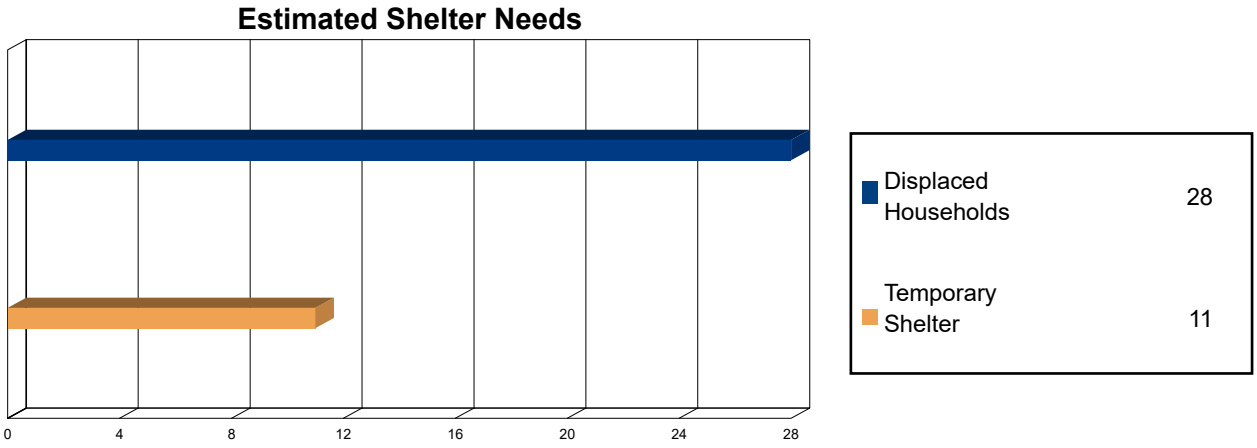


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 18,758 tons of debris will be generated. Of the total amount, 11,593 tons (62%) is Other Tree Debris. Of the remaining 7,165 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 134 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,812 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 28 households to be displaced due to the hurricane. Of these, 11 people (out of a total population of 16,426) will seek temporary shelter in public shelters.

Economic Loss

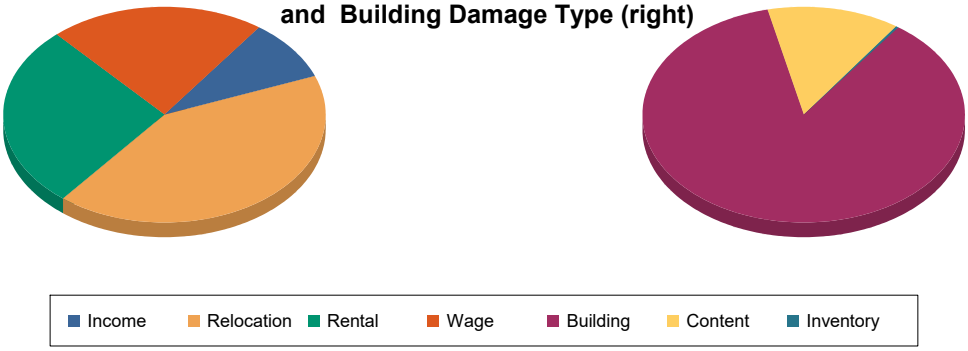
The total economic loss estimated for the hurricane is 41.9 million dollars, which represents 1.22 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 42 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 85% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

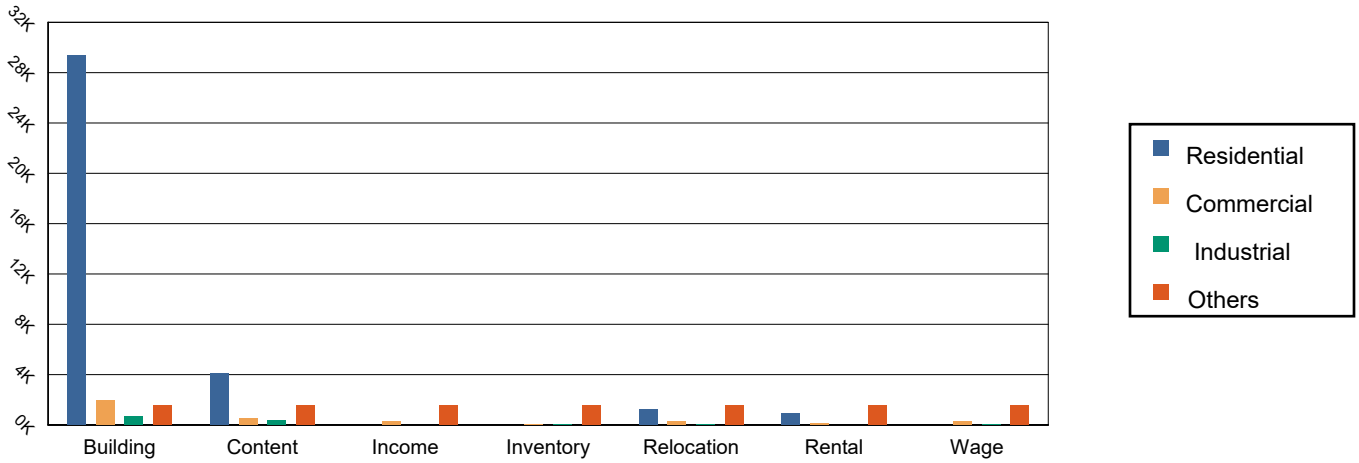


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	29,386.81	1,958.97	720.87	665.24	32,731.89
	Content	4,093.68	498.07	332.85	141.44	5,066.04
	Inventory	0.00	72.60	43.99	10.91	127.50
	Subtotal	**33,480.50**	**2,529.64**	**1,097.70**	**817.59**	**37,925.43**
Business Interruption Loss						
	Income	0.00	293.43	9.32	55.23	357.99
	Relocation	1,194.75	293.73	47.38	101.24	1,637.10
	Rental	915.10	151.53	5.97	11.27	1,083.87
	Wage	0.00	300.29	16.08	539.64	856.00
	Subtotal	**2,109.85**	**1,038.98**	**78.75**	**707.38**	**3,934.96**

Total

Total	**35,590.35**	**3,568.62**	**1,176.45**	**1,524.97**	**41,860.39**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,487,008	934,311	3,421,319
Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**
Study Region Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**

Hazus: Hurricane Global Risk Report

Region Name:	Ellington_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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Note:
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The geographical size of the region is 34.60 square miles and contains 3 census tracts. There are over 6 thousand households in the region and a total population of 16,426 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90% of the buildings (and 73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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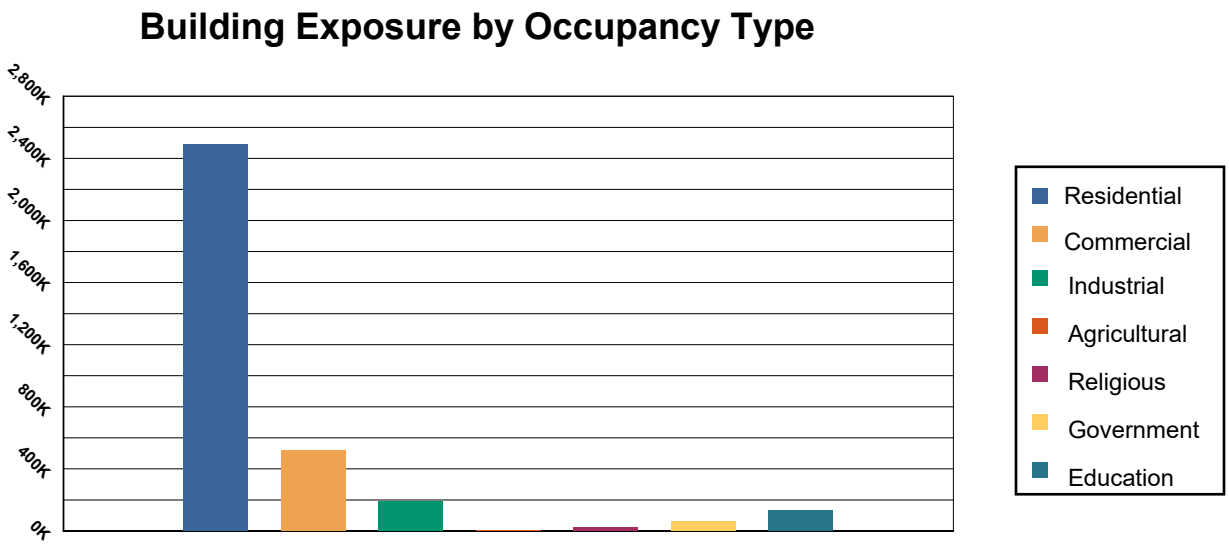

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Religious	20,773	0.61%
Government	63,577	1.86%
Education	134,206	3.92%
Total	**3,421,319**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 302 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 10 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

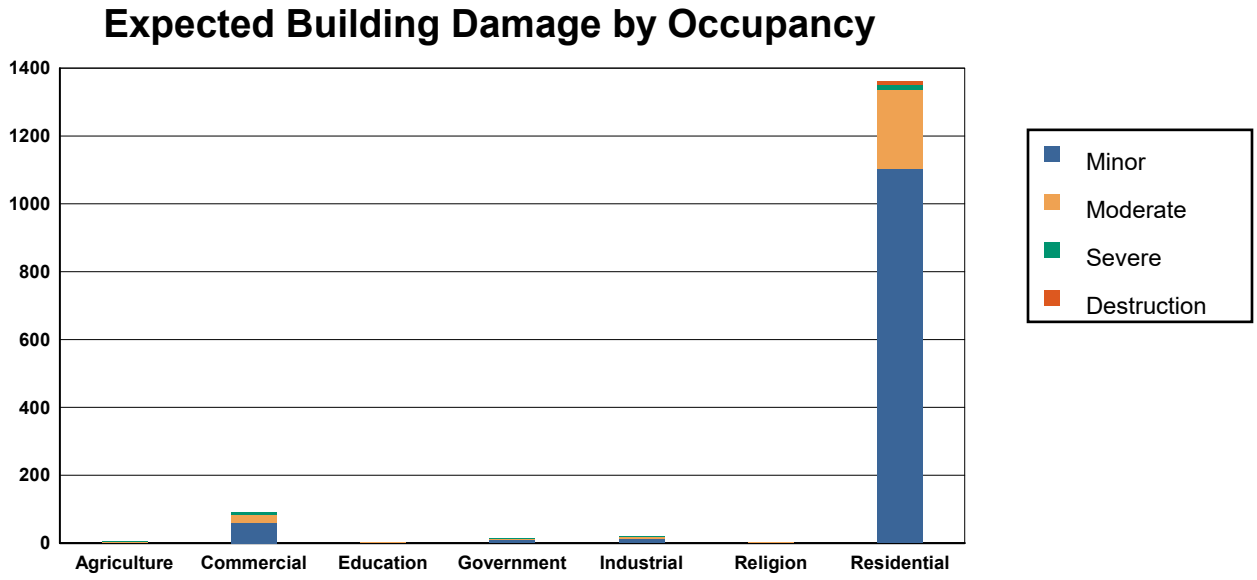


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.47	72.86	2.38	18.33	0.74	5.72	0.36	2.75	0.05	0.35
Commercial	280.60	75.84	59.37	16.05	24.02	6.49	5.97	1.61	0.05	0.01
Education	8.40	76.32	1.88	17.10	0.66	5.98	0.07	0.60	0.00	0.00
Government	48.47	76.94	10.38	16.48	3.77	5.99	0.38	0.60	0.00	0.00
Industrial	62.80	75.67	13.58	16.36	5.43	6.55	1.10	1.33	0.08	0.09
Religion	12.51	78.17	2.77	17.30	0.67	4.18	0.06	0.35	0.00	0.00
Residential	3,659.65	72.87	1,103.27	21.97	234.12	4.66	15.14	0.30	9.82	0.20
Total	**4,081.89**		**1,193.63**		**269.42**		**23.06**		**9.99**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	54	76.14	12	16.52	5	6.75	0	0.59	0	0.00
Masonry	351	71.01	88	17.80	51	10.35	4	0.76	0	0.08
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	209	76.49	40	14.62	19	7.03	5	1.84	0	0.02
Wood	3,496	73.73	1,057	22.28	167	3.52	13	0.27	10	0.20

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

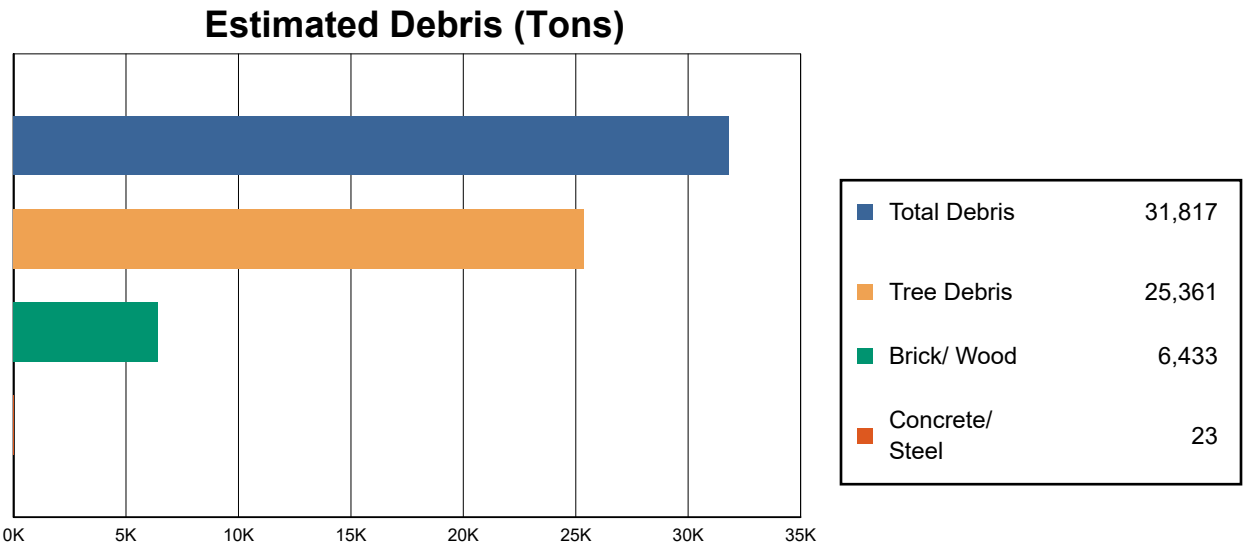
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	5	0	0	0

Induced Hurricane Damage

Debris Generation

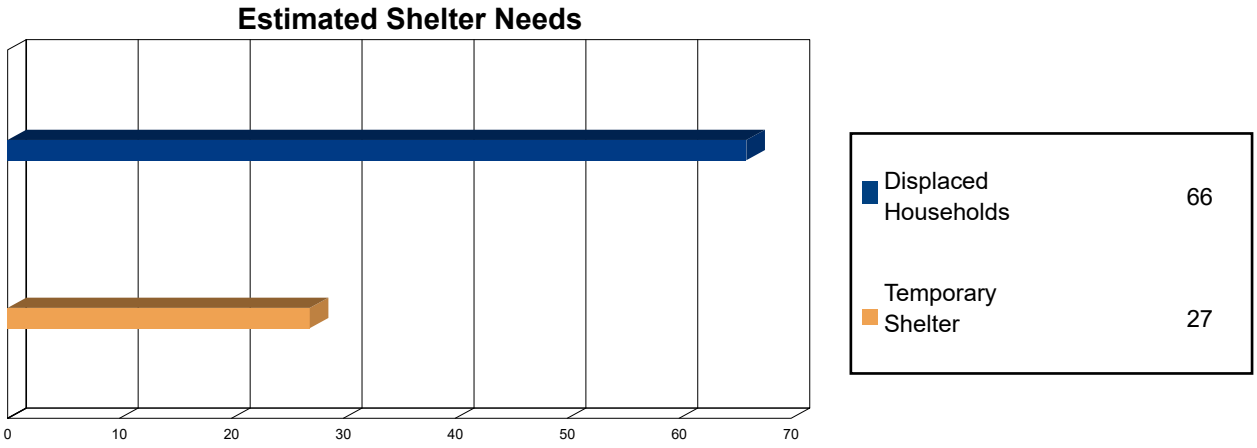


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 31,817 tons of debris will be generated. Of the total amount, 19,101 tons (60%) is Other Tree Debris. Of the remaining 12,716 tons, Brick/Wood comprises 51% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 258 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,260 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 66 households to be displaced due to the hurricane. Of these, 27 people (out of a total population of 16,426) will seek temporary shelter in public shelters.

Economic Loss

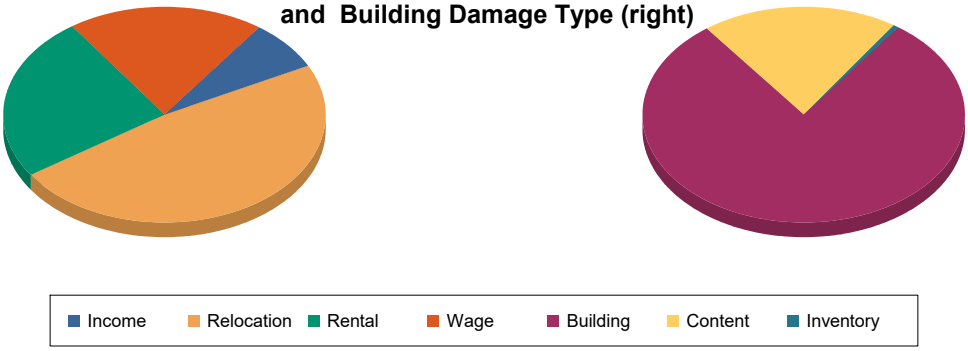
The total economic loss estimated for the hurricane is 92.8 million dollars, which represents 2.71 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 93 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 82% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

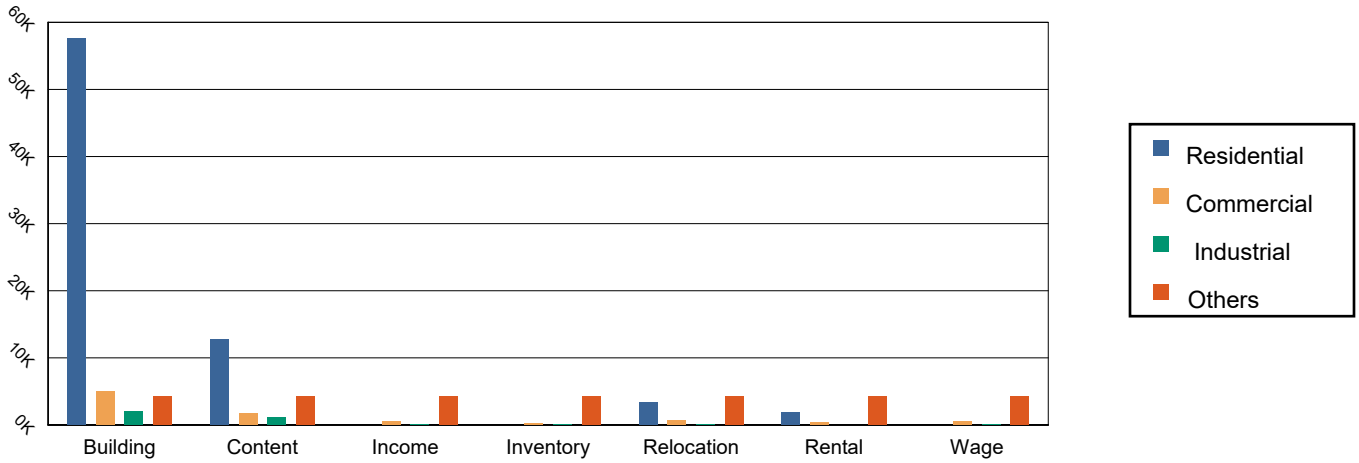


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	57,621.20	4,991.01	2,001.44	1,878.25	66,491.90
	Content	12,822.38	1,785.99	1,188.19	619.06	16,415.62
	Inventory	0.00	257.95	158.17	29.38	445.50
	Subtotal	**70,443.58**	**7,034.95**	**3,347.80**	**2,526.70**	**83,353.03**
Business Interruption Loss						
	Income	0.00	551.61	21.20	131.12	703.93
	Relocation	3,326.83	739.96	147.35	330.00	4,544.14
	Rental	1,902.54	369.19	16.31	33.28	2,321.33
	Wage	0.00	569.58	36.45	1,265.75	1,871.78
	Subtotal	**5,229.37**	**2,230.35**	**221.31**	**1,760.15**	**9,441.18**

Total

Total	**75,672.95**	**9,265.30**	**3,569.11**	**4,286.85**	**92,794.22**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,487,008	934,311	3,421,319
Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**
Study Region Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**

Hazus: Hurricane Global Risk Report

Region Name: Ellington_HU

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.60 square miles and contains 3 census tracts. There are over 6 thousand households in the region and a total population of 16,426 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,421 million dollars. Approximately 90% of the buildings (and 73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,578 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

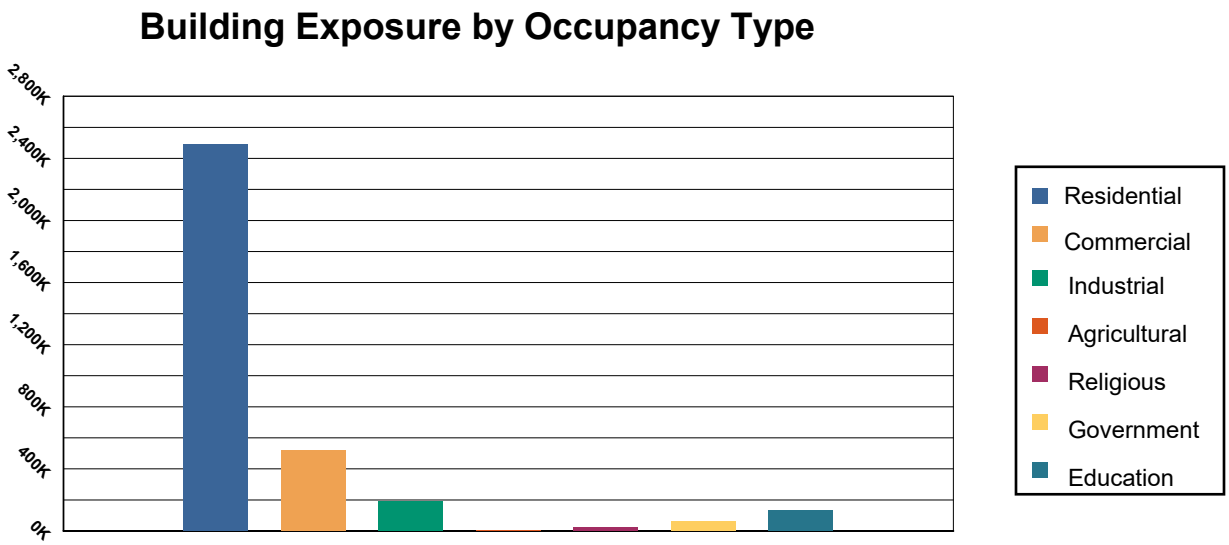


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,487,008	72.69%
Commercial	518,285	15.15%
Industrial	192,490	5.63%
Agricultural	4,980	0.15%
Religious	20,773	0.61%
Government	63,577	1.86%
Education	134,206	3.92%
Total	**3,421,319**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 5 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 515 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the region. There are an estimated 25 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

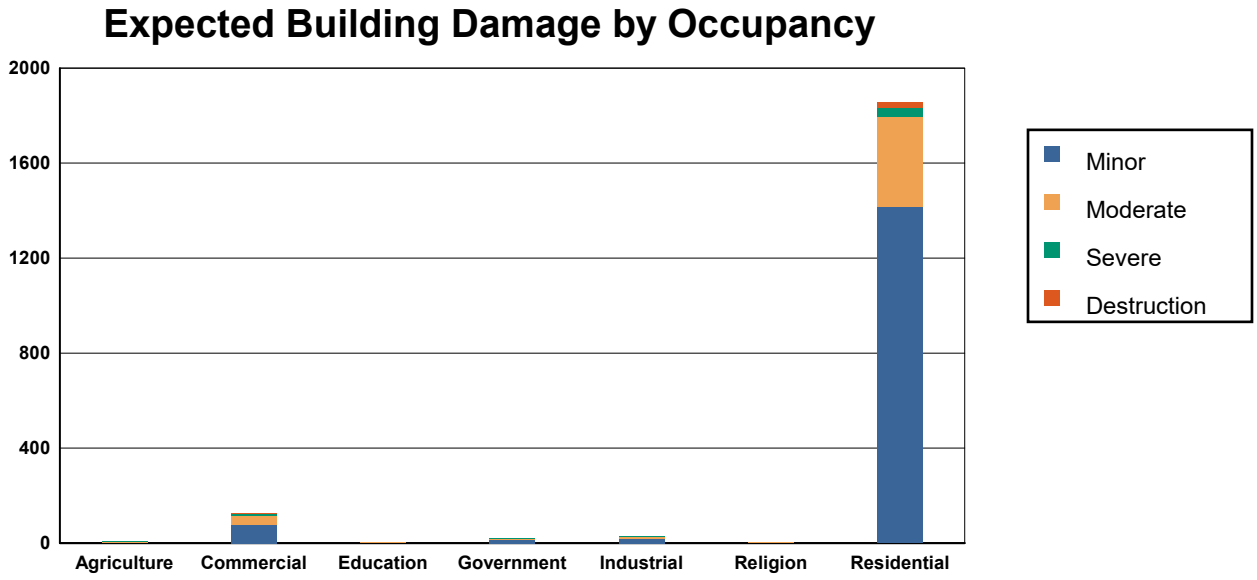


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8.07	62.08	3.08	23.71	1.18	9.05	0.58	4.46	0.09	0.70
Commercial	243.34	65.77	75.98	20.54	39.36	10.64	11.20	3.03	0.13	0.03
Education	7.28	66.16	2.37	21.59	1.16	10.57	0.19	1.69	0.00	0.00
Government	42.12	66.86	13.13	20.83	6.69	10.61	1.07	1.70	0.00	0.00
Industrial	54.30	65.42	17.00	20.48	9.26	11.15	2.30	2.77	0.15	0.18
Religion	10.91	68.19	3.67	22.93	1.26	7.87	0.16	1.01	0.00	0.00
Residential	3,165.69	63.04	1,416.08	28.20	379.31	7.55	36.46	0.73	24.47	0.49
Total	**3,531.71**		**1,531.30**		**438.21**		**51.95**		**24.83**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	47	65.90	15	20.52	8	11.86	1	1.72	0	0.00
Masonry	303	61.18	108	21.73	76	15.30	8	1.61	1	0.17
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	181	66.41	50	18.40	32	11.59	10	3.55	0	0.04
Wood	3,027	63.84	1,369	28.88	290	6.11	32	0.68	23	0.49

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

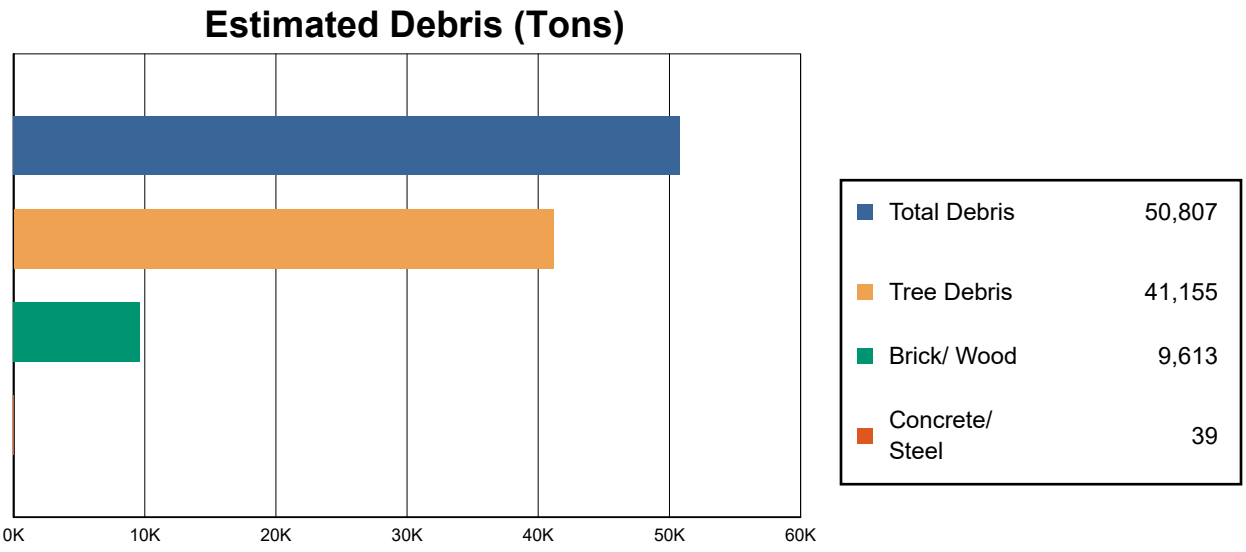
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	5	0	0	0

Induced Hurricane Damage

Debris Generation

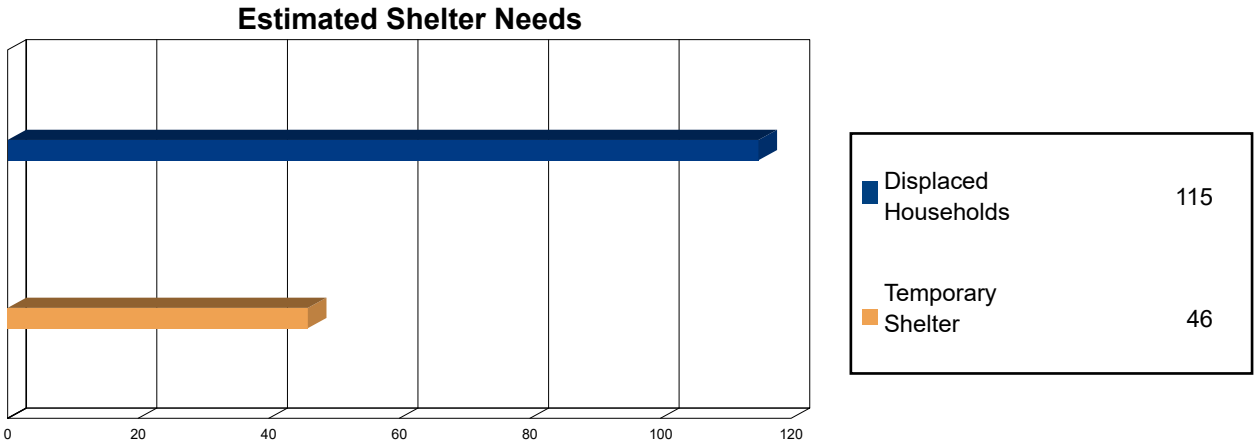


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 50,807 tons of debris will be generated. Of the total amount, 31,063 tons (61%) is Other Tree Debris. Of the remaining 19,744 tons, Brick/Wood comprises 49% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 386 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 10,092 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 115 households to be displaced due to the hurricane. Of these, 46 people (out of a total population of 16,426) will seek temporary shelter in public shelters.

Economic Loss

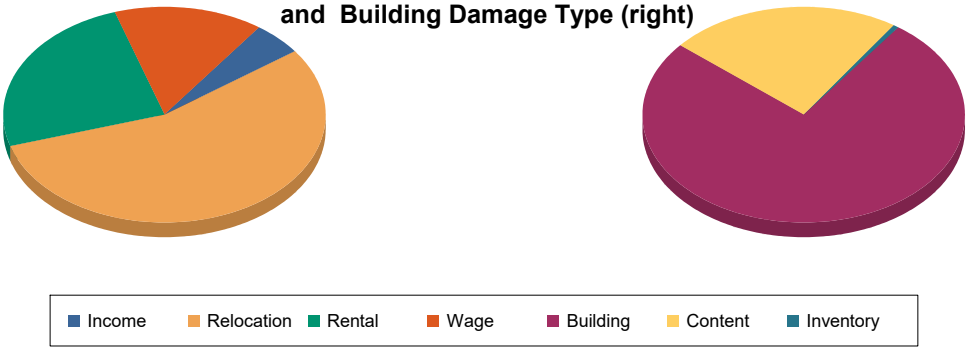
The total economic loss estimated for the hurricane is 155.0 million dollars, which represents 4.53 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 155 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 81% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

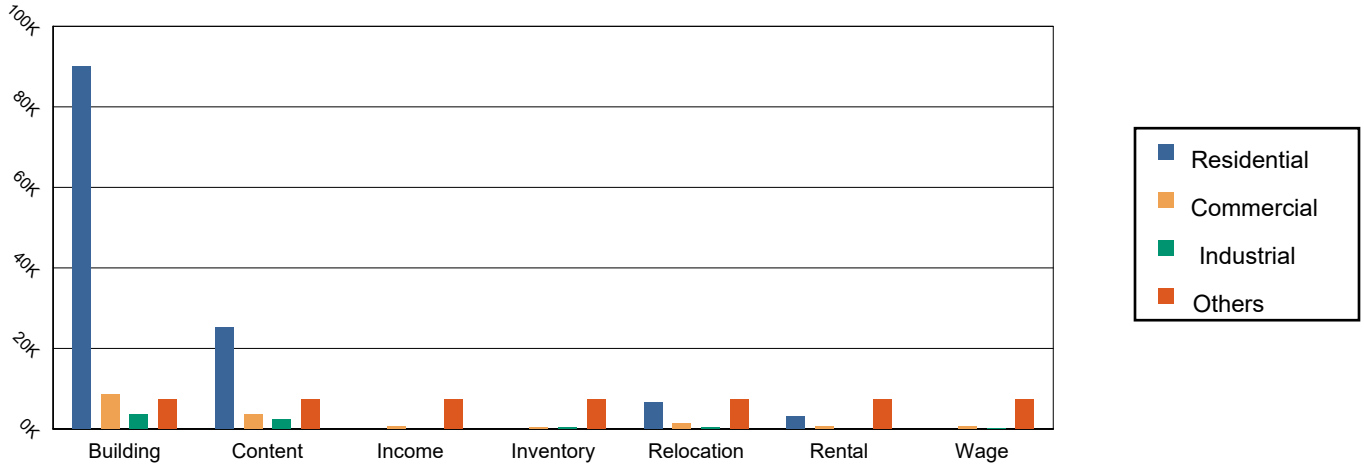


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	90,164.94	8,620.12	3,580.43	3,389.09	105,754.57
	Content	25,150.67	3,582.20	2,289.14	1,346.18	32,368.19
	Inventory	0.00	491.76	305.53	51.58	848.87
	Subtotal	**115,315.60**	**12,694.07**	**6,175.10**	**4,786.85**	**138,971.63**
Business Interruption Loss						
	Income	0.03	619.84	31.60	139.90	791.37
	Relocation	6,665.57	1,302.06	273.55	622.82	8,864.00
	Rental	3,219.51	666.69	30.39	65.33	3,981.91
	Wage	0.06	676.23	54.12	1,682.23	2,412.64
	Subtotal	**9,885.16**	**3,264.82**	**389.66**	**2,510.29**	**16,049.93**

Total

Total	**125,200.77**	**15,958.89**	**6,564.76**	**7,297.13**	**155,021.55**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	16,426	2,487,008	934,311	3,421,319
Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**
Study Region Total	**16,426**	**2,487,008**	**934,311**	**3,421,319**

Hazus: Hurricane Global Risk Report

Region Name:	Enfield_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.27 square miles and contains 12 census tracts. There are over 16 thousand households in the region and a total population of 42,141 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 14 thousand buildings in the region with a total building replacement value (excluding contents) of 7,873 million dollars. Approximately 90% of the buildings (and 56% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

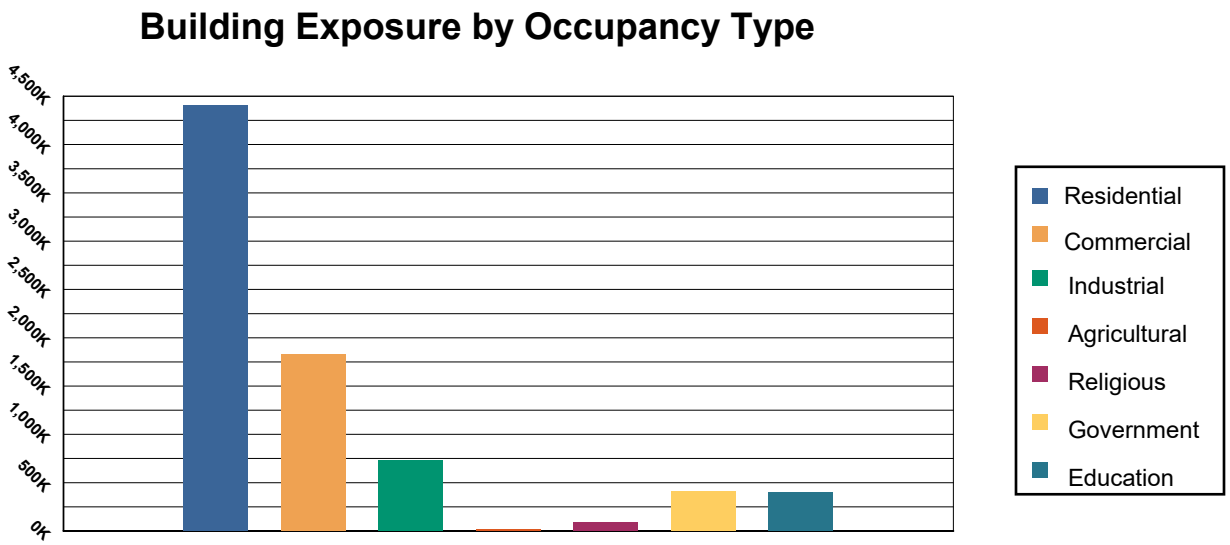


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,401,446	55.90%
Commercial	1,825,113	23.18%
Industrial	730,491	9.28%
Agricultural	11,907	0.15%
Religious	91,474	1.16%
Government	412,173	5.24%
Education	400,569	5.09%
Total	**7,873,173**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 14 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

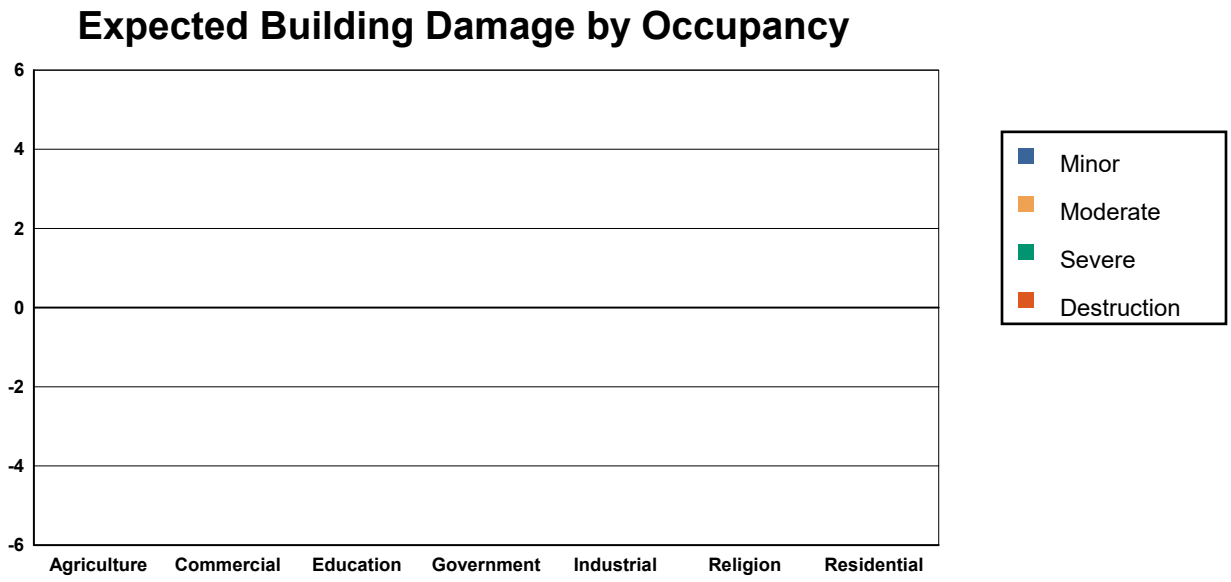


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	25.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	939.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	35.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	169.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	263.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	47.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	12,980.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**14,458.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	188	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	1,215	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	738	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	12,315	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

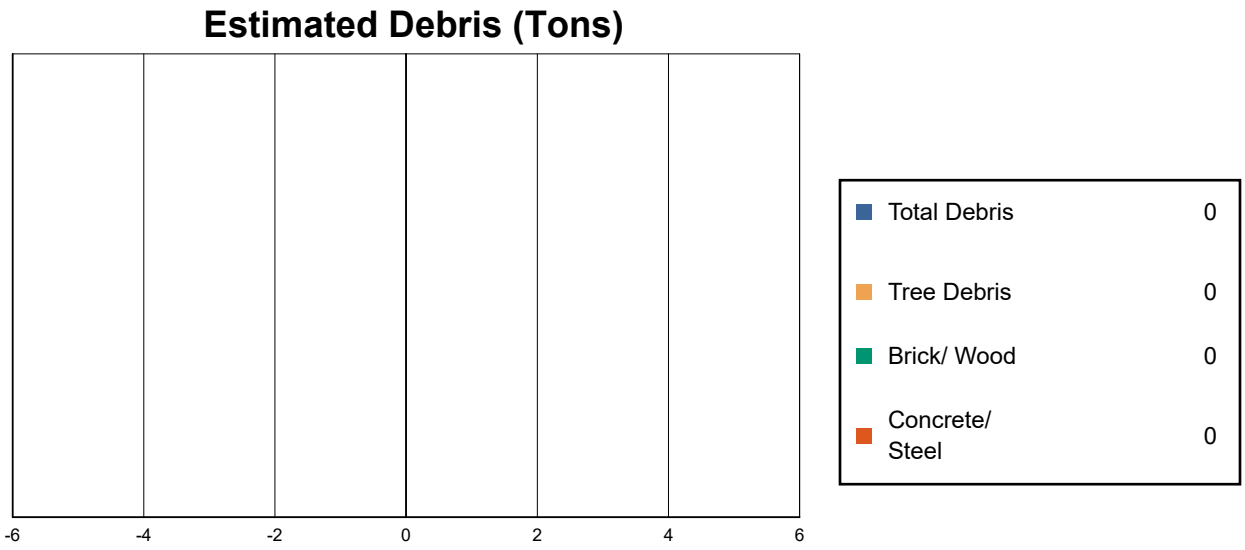
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	14	0	0	14

Induced Hurricane Damage

Debris Generation

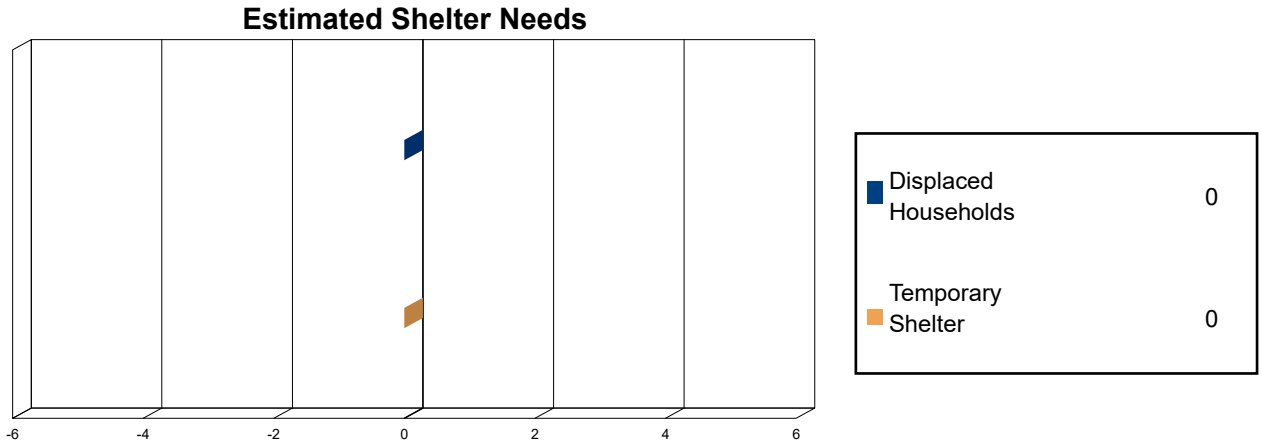


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 42,141) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

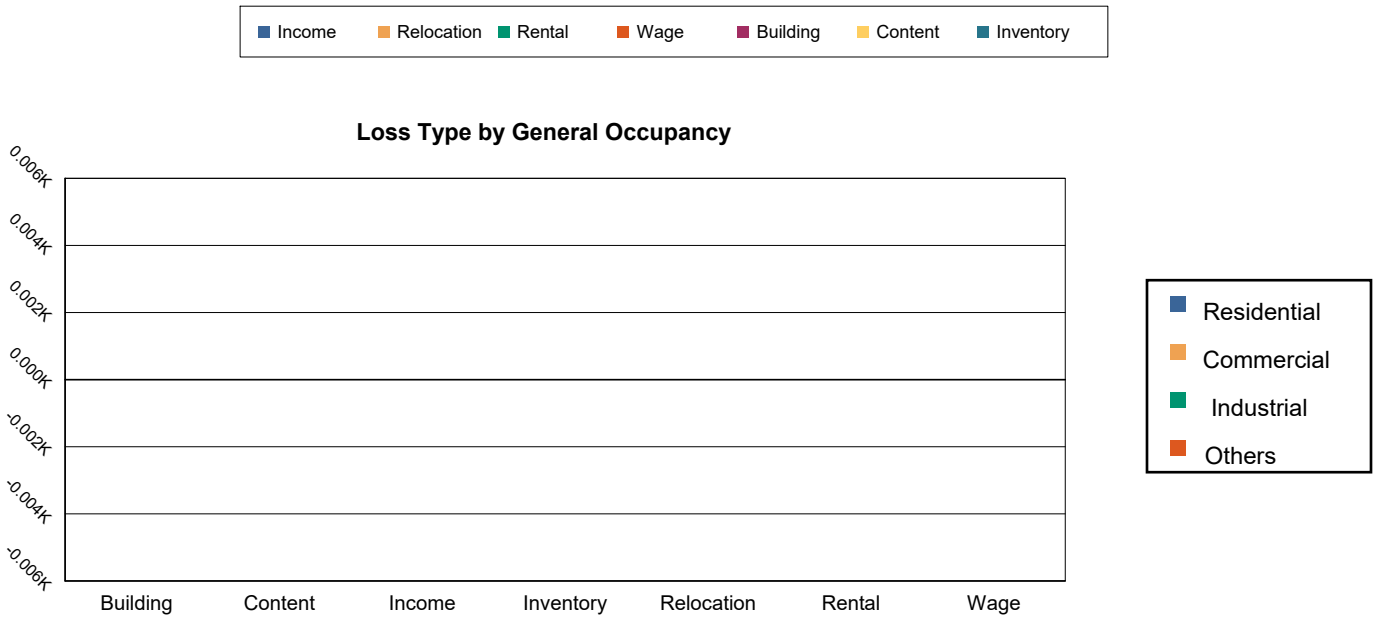


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	42,141	4,401,446	3,471,727	7,873,173
Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**
Study Region Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**

Hazus: Hurricane Global Risk Report

Region Name:	Enfield_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.27 square miles and contains 12 census tracts. There are over 16 thousand households in the region and a total population of 42,141 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 14 thousand buildings in the region with a total building replacement value (excluding contents) of 7,873 million dollars. Approximately 90% of the buildings (and 56% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

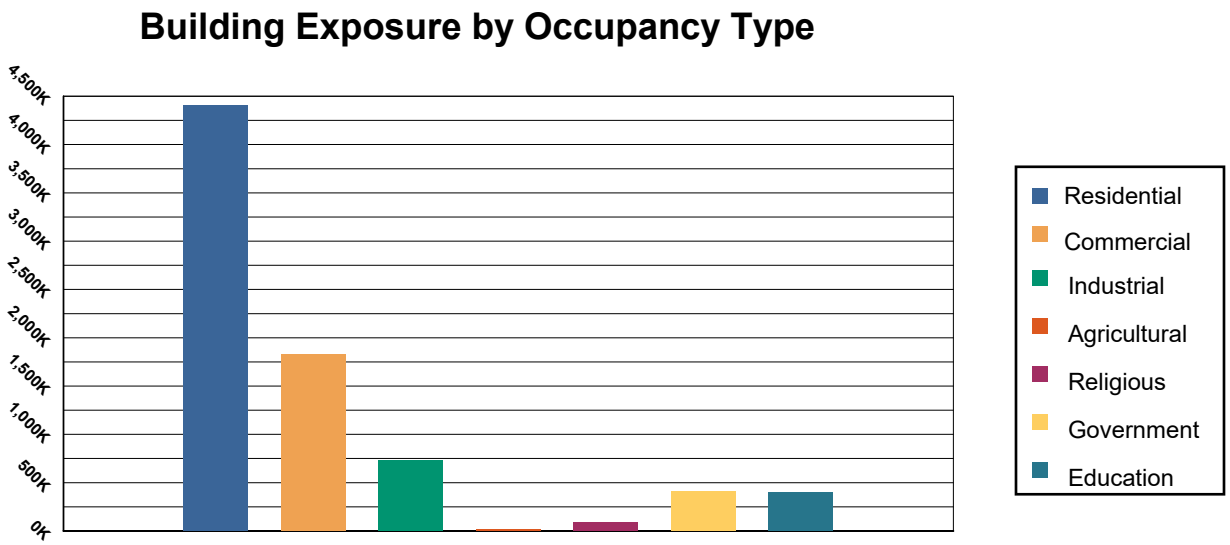


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,401,446	55.90%
Commercial	1,825,113	23.18%
Industrial	730,491	9.28%
Agricultural	11,907	0.15%
Religious	91,474	1.16%
Government	412,173	5.24%
Education	400,569	5.09%
Total	**7,873,173**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 14 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

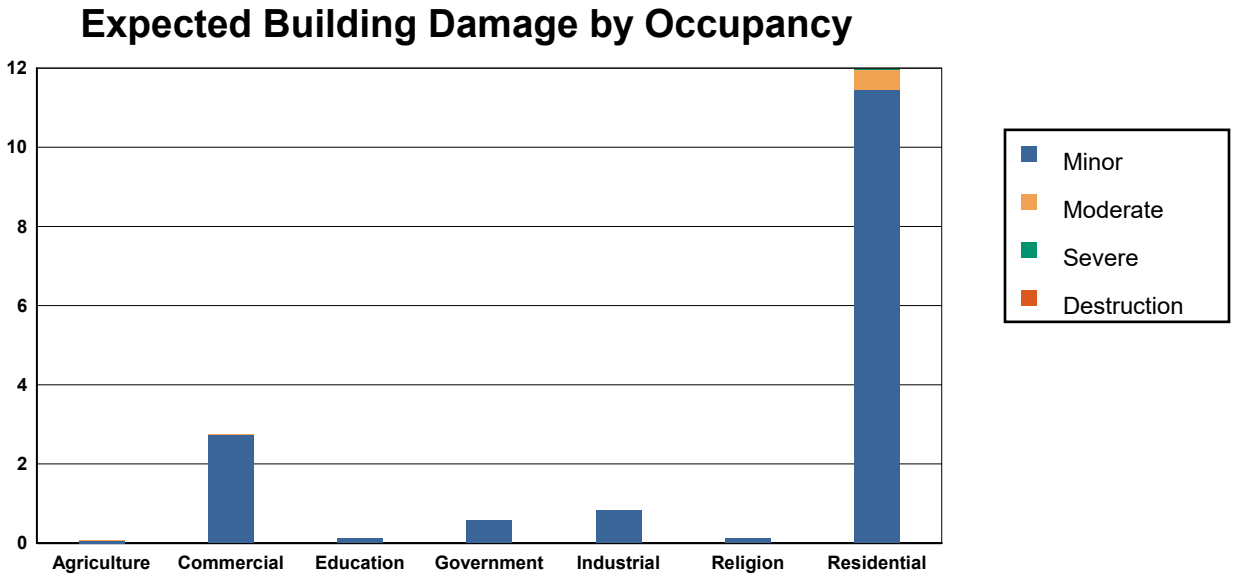


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	24.94	99.77	0.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	936.26	99.71	2.74	0.29	0.00	0.00	0.00	0.00	0.00	0.00
Education	34.89	99.69	0.11	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Government	168.43	99.66	0.57	0.34	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	262.17	99.69	0.83	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Religion	46.88	99.75	0.12	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Residential	12,968.05	99.91	11.46	0.09	0.48	0.00	0.00	0.00	0.00	0.00
Total	**14,441.63**		**15.88**		**0.49**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	187	99.61	1	0.39	0	0.00	0	0.00	0	0.00
Masonry	1,210	99.55	5	0.44	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	736	99.68	2	0.32	0	0.00	0	0.00	0	0.00
Wood	12,311	99.97	4	0.03	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

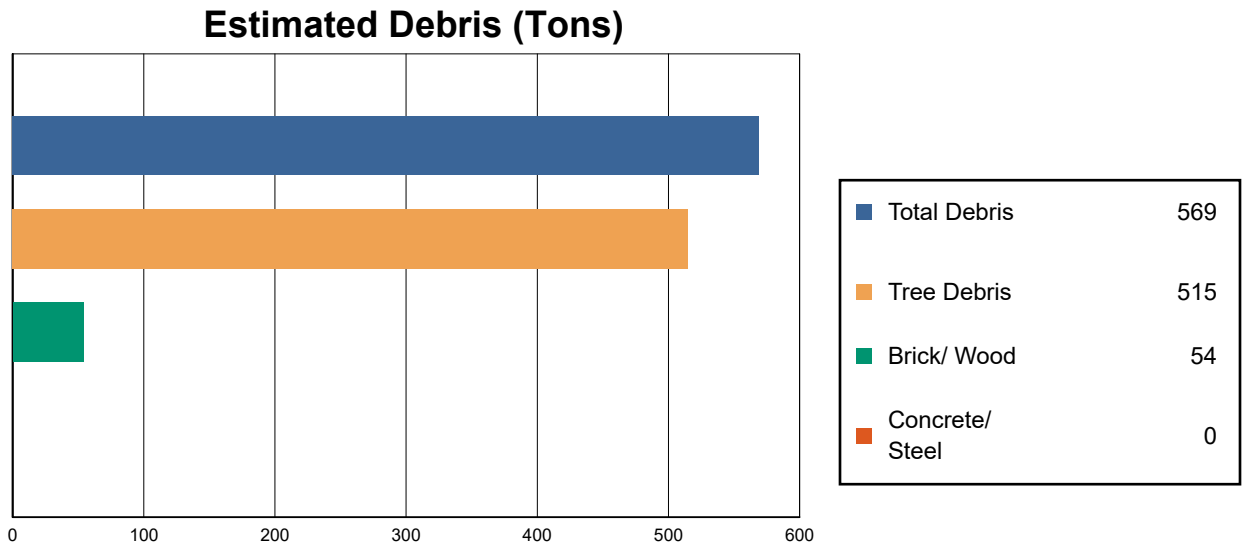
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	14	0	0	14

Induced Hurricane Damage

Debris Generation

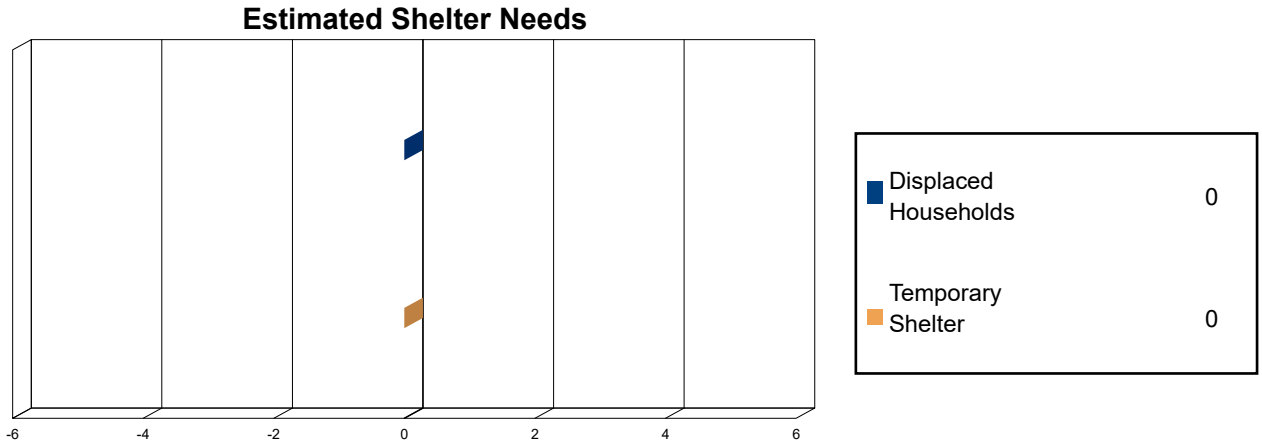


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 569 tons of debris will be generated. Of the total amount, 334 tons (59%) is Other Tree Debris. Of the remaining 235 tons, Brick/Wood comprises 23% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 181 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 42,141) will seek temporary shelter in public shelters.

Economic Loss

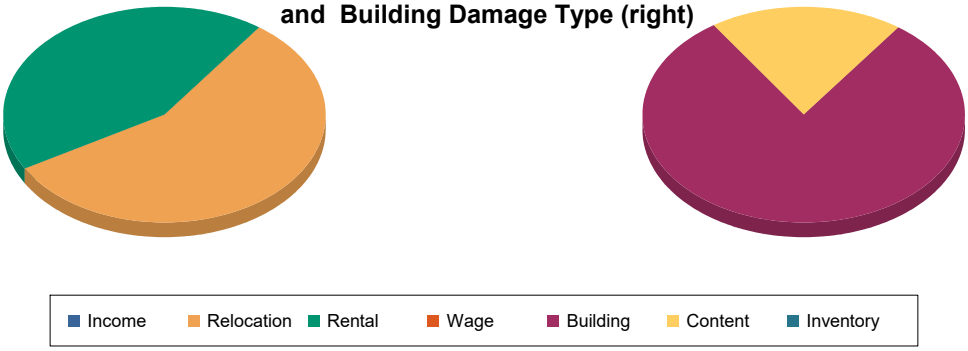
The total economic loss estimated for the hurricane is 1.9 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 86% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

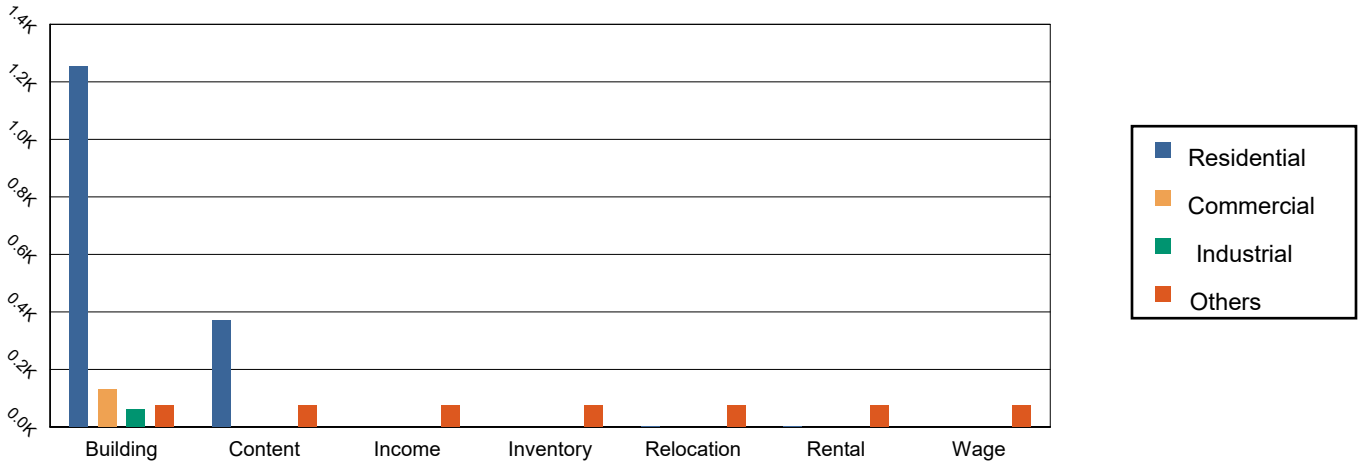


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,253.69	130.70	61.42	76.00	1,521.81
	Content	369.53	0.00	0.00	0.00	369.53
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,623.22**	**130.70**	**61.42**	**76.00**	**1,891.34**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	1.94	0.02	0.00	0.01	1.98
	Rental	1.51	0.00	0.00	0.00	1.51
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**3.46**	**0.02**	**0.00**	**0.01**	**3.49**

Total

Total	**1,626.67**	**130.72**	**61.42**	**76.01**	**1,894.83**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	42,141	4,401,446	3,471,727	7,873,173
Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**
Study Region Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**

Hazus: Hurricane Global Risk Report

Region Name:	Enfield_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
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Building Inventory

General Building Stock

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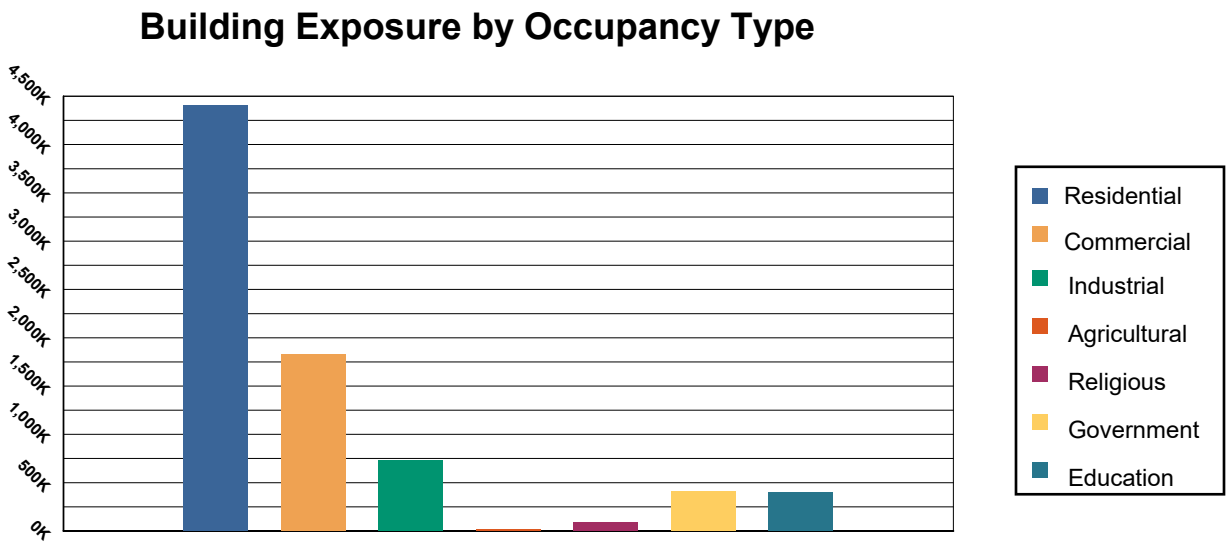

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Government	412,173	5.24%
Education	400,569	5.09%
Total	**7,873,173**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 14 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 12 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

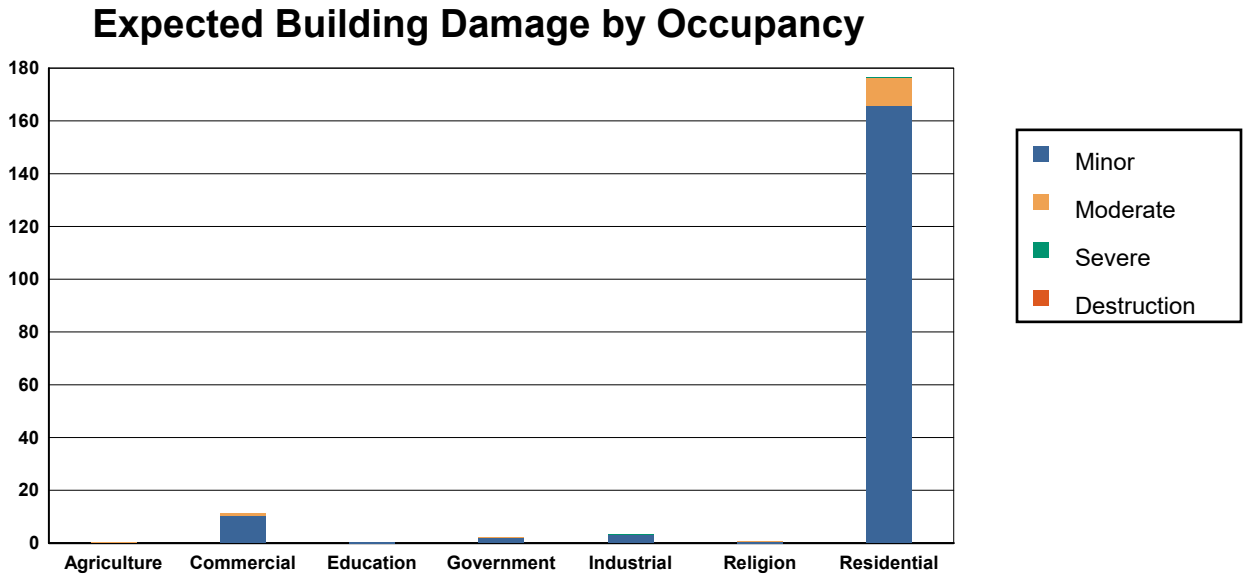


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	24.67	98.67	0.30	1.21	0.03	0.10	0.01	0.02	0.00	0.00
Commercial	927.57	98.78	10.40	1.11	1.01	0.11	0.02	0.00	0.00	0.00
Education	34.59	98.83	0.41	1.16	0.00	0.01	0.00	0.00	0.00	0.00
Government	166.93	98.78	2.05	1.21	0.02	0.01	0.00	0.00	0.00	0.00
Industrial	259.78	98.78	3.13	1.19	0.08	0.03	0.01	0.00	0.00	0.00
Religion	46.51	98.95	0.48	1.02	0.01	0.03	0.00	0.00	0.00	0.00
Residential	12,803.26	98.64	165.50	1.28	10.92	0.08	0.32	0.00	0.00	0.00
Total	**14,263.30**		**182.27**		**12.07**		**0.36**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	185	98.59	3	1.40	0	0.01	0	0.00	0	0.00
Masonry	1,188	97.81	23	1.91	3	0.27	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	729	98.79	8	1.12	1	0.10	0	0.00	0	0.00
Wood	12,183	98.93	128	1.04	4	0.03	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

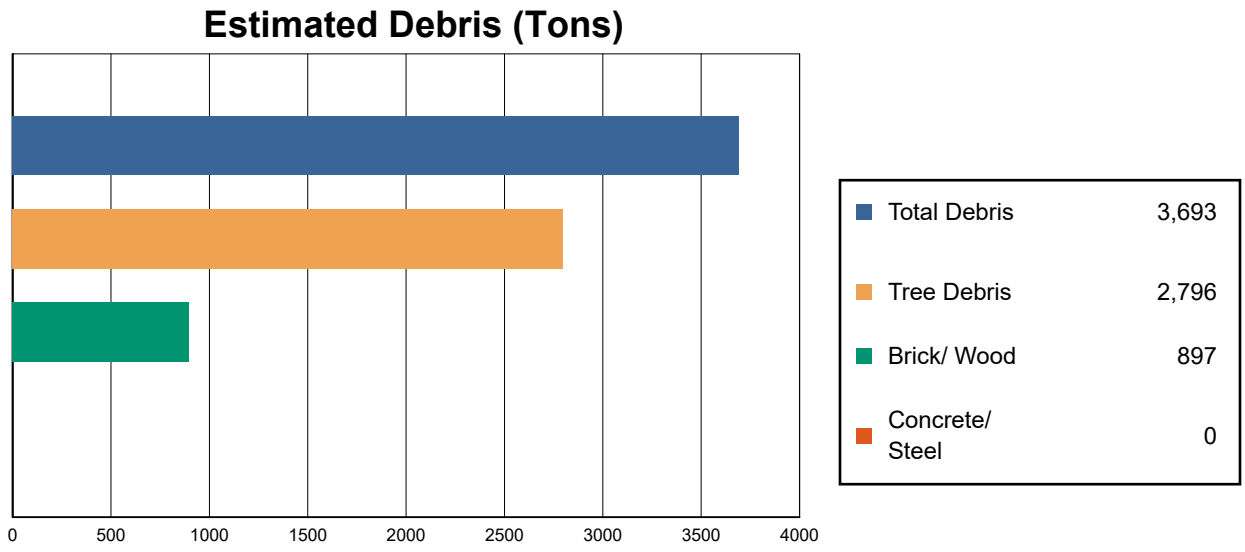
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	14	0	0	14

Induced Hurricane Damage

Debris Generation

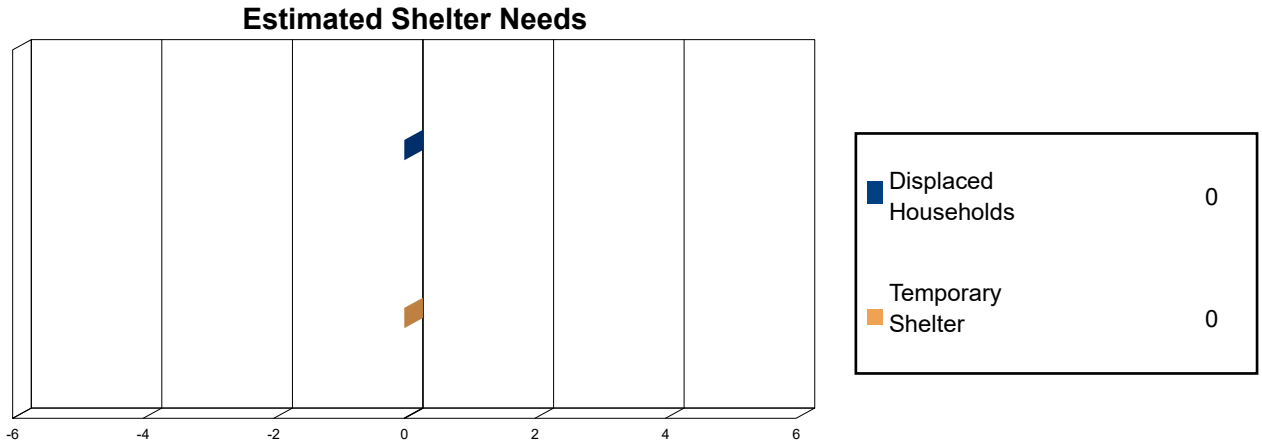


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,693 tons of debris will be generated. Of the total amount, 1,726 tons (47%) is Other Tree Debris. Of the remaining 1,967 tons, Brick/Wood comprises 46% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 36 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,070 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 42,141) will seek temporary shelter in public shelters.

Economic Loss

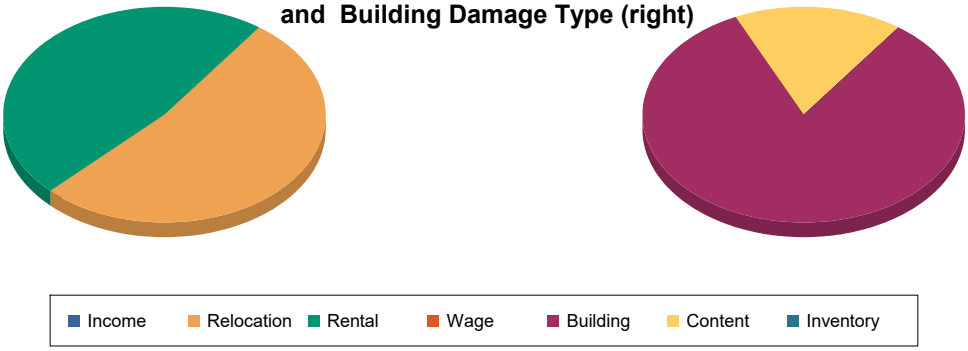
The total economic loss estimated for the hurricane is 14.9 million dollars, which represents 0.19 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 15 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 93% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

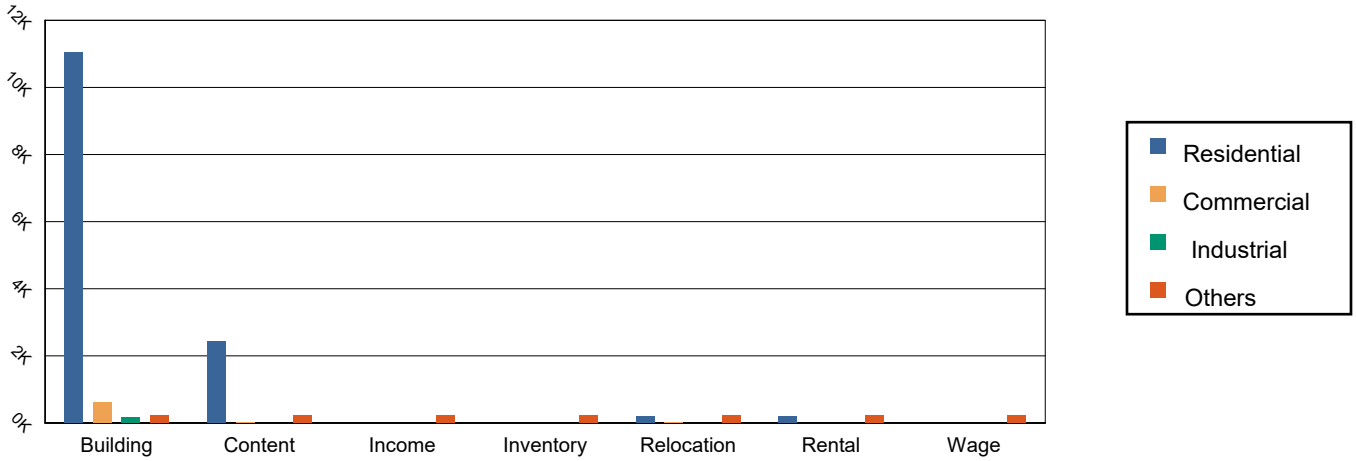


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	11,052.83	618.52	167.67	231.30	12,070.31
	Content	2,431.95	11.76	2.50	0.12	2,446.33
	Inventory	0.00	1.30	0.35	0.09	1.73
	Subtotal	**13,484.78**	**631.58**	**170.52**	**231.50**	**14,518.37**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	181.64	15.07	1.14	0.75	198.59
	Rental	180.36	0.00	0.00	0.00	180.36
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**361.99**	**15.07**	**1.14**	**0.75**	**378.95**

Total

Total	**13,846.77**	**646.64**	**171.66**	**232.25**	**14,897.32**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	42,141	4,401,446	3,471,727	7,873,173
Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**
Study Region Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**

Hazus: Hurricane Global Risk Report

Region Name:	Enfield_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.27 square miles and contains 12 census tracts. There are over 16 thousand households in the region and a total population of 42,141 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 14 thousand buildings in the region with a total building replacement value (excluding contents) of 7,873 million dollars. Approximately 90% of the buildings (and 56% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

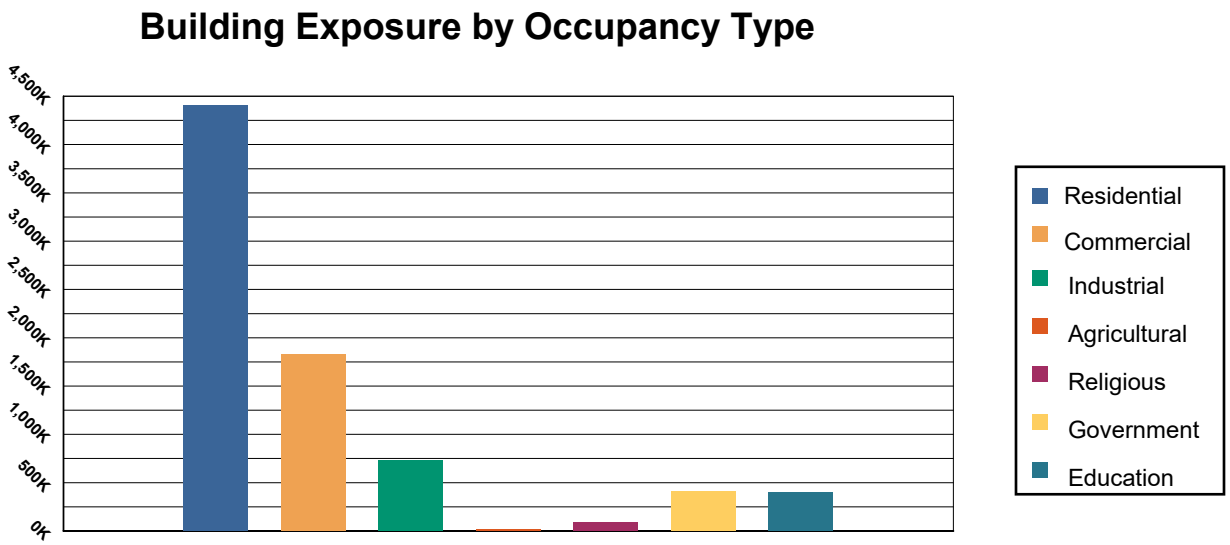


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,401,446	55.90%
Commercial	1,825,113	23.18%
Industrial	730,491	9.28%
Agricultural	11,907	0.15%
Religious	91,474	1.16%
Government	412,173	5.24%
Education	400,569	5.09%
Total	**7,873,173**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 14 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 70 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

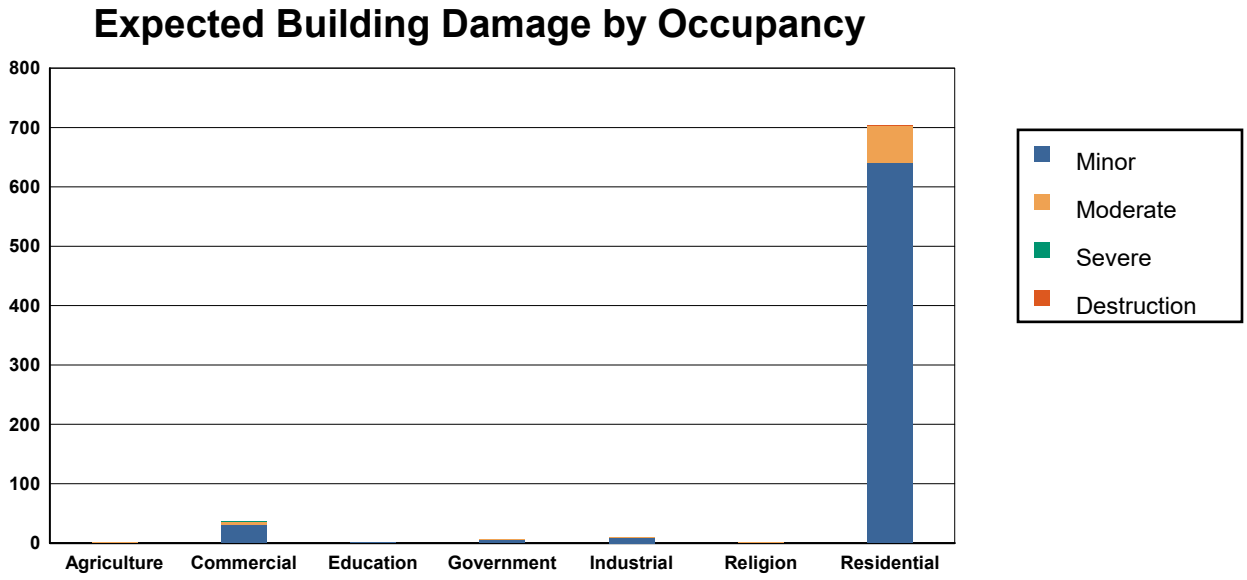


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	23.76	95.05	1.02	4.07	0.16	0.64	0.06	0.24	0.00	0.01
Commercial	901.89	96.05	31.22	3.33	5.29	0.56	0.60	0.06	0.00	0.00
Education	33.75	96.44	1.19	3.39	0.06	0.17	0.00	0.00	0.00	0.00
Government	162.54	96.18	6.14	3.63	0.32	0.19	0.00	0.00	0.00	0.00
Industrial	253.31	96.31	8.78	3.34	0.78	0.29	0.13	0.05	0.00	0.00
Religion	45.27	96.32	1.64	3.49	0.08	0.17	0.00	0.01	0.00	0.00
Residential	12,276.33	94.58	641.13	4.94	61.22	0.47	1.14	0.01	0.18	0.00
Total	**13,696.85**		**691.13**		**67.91**		**1.94**		**0.18**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	180	95.88	7	3.89	0	0.23	0	0.00	0	0.00
Masonry	1,139	93.77	60	4.91	16	1.28	0	0.04	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	710	96.27	23	3.10	4	0.55	1	0.07	0	0.00
Wood	11,725	95.21	562	4.56	27	0.22	1	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

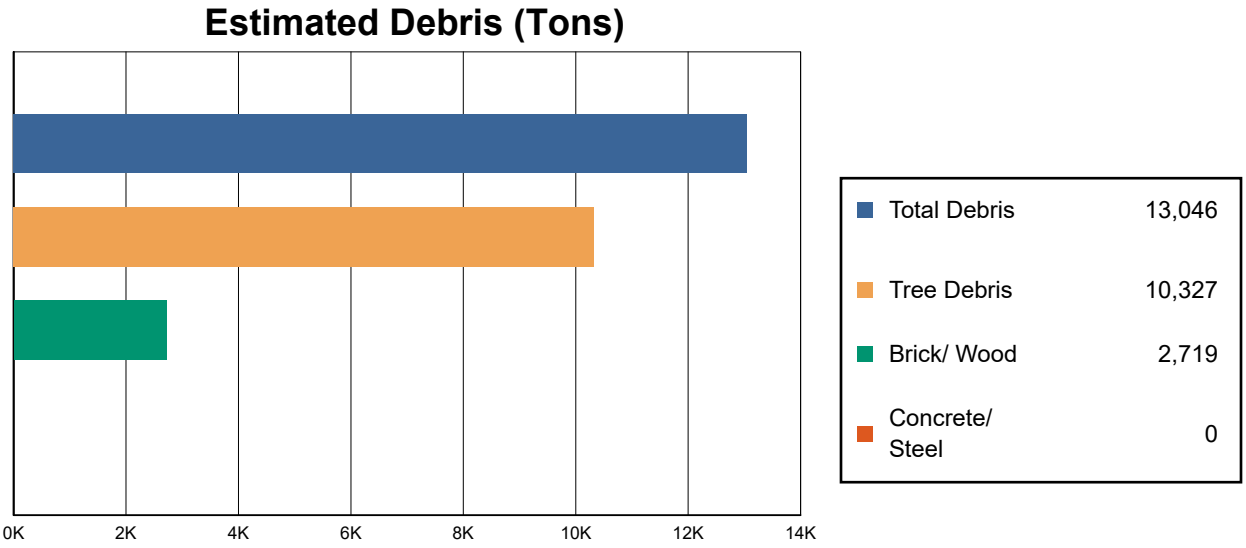
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	14	0	0	14

Induced Hurricane Damage

Debris Generation

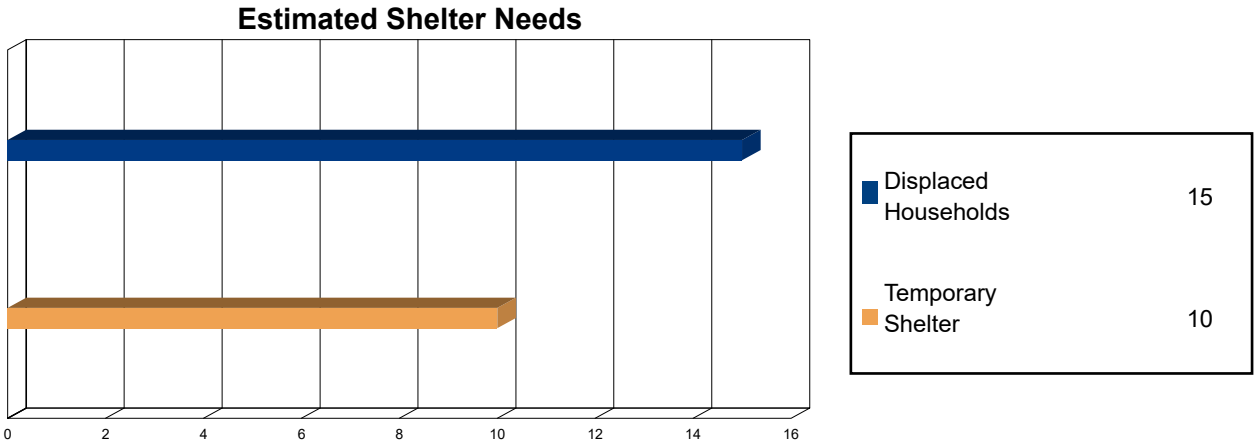


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 13,046 tons of debris will be generated. Of the total amount, 5,593 tons (43%) is Other Tree Debris. Of the remaining 7,453 tons, Brick/Wood comprises 36% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 109 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,734 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 15 households to be displaced due to the hurricane. Of these, 10 people (out of a total population of 42,141) will seek temporary shelter in public shelters.

Economic Loss

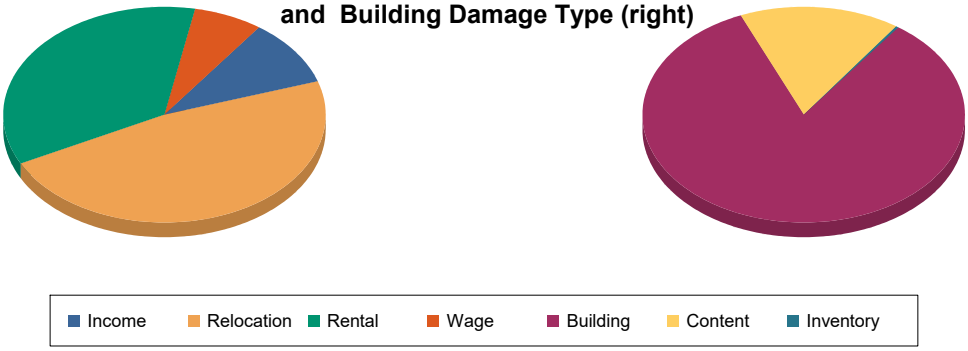
The total economic loss estimated for the hurricane is 38.1 million dollars, which represents 0.48 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 38 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

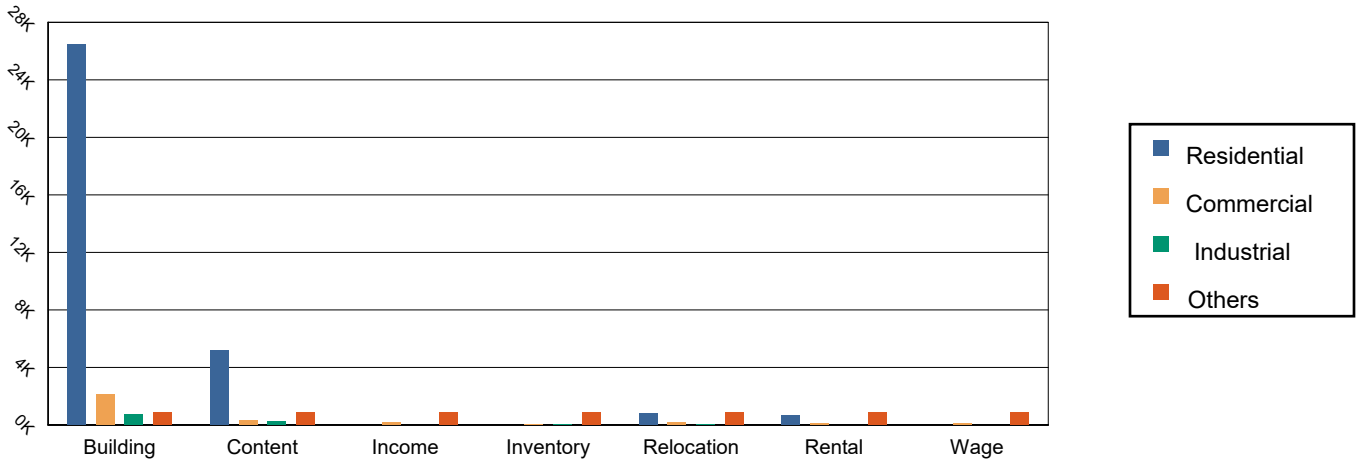


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	26,473.65	2,154.61	708.66	732.58	30,069.50
	Content	5,213.44	319.96	227.32	48.95	5,809.66
	Inventory	0.00	56.96	25.35	5.07	87.38
	Subtotal	**31,687.08**	**2,531.53**	**961.32**	**786.60**	**35,966.54**
Business Interruption Loss						
	Income	0.00	185.28	2.00	26.11	213.39
	Relocation	783.77	185.14	18.79	26.39	1,014.08
	Rental	667.16	83.56	1.35	1.81	753.87
	Wage	0.00	84.42	3.31	61.56	149.29
	Subtotal	**1,450.92**	**538.40**	**25.45**	**115.87**	**2,130.64**

Total

Total	**33,138.01**	**3,069.93**	**986.77**	**902.48**	**38,097.19**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	42,141	4,401,446	3,471,727	7,873,173
Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**
Study Region Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**

Hazus: Hurricane Global Risk Report

Region Name:	Enfield_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.27 square miles and contains 12 census tracts. There are over 16 thousand households in the region and a total population of 42,141 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 14 thousand buildings in the region with a total building replacement value (excluding contents) of 7,873 million dollars. Approximately 90% of the buildings (and 56% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

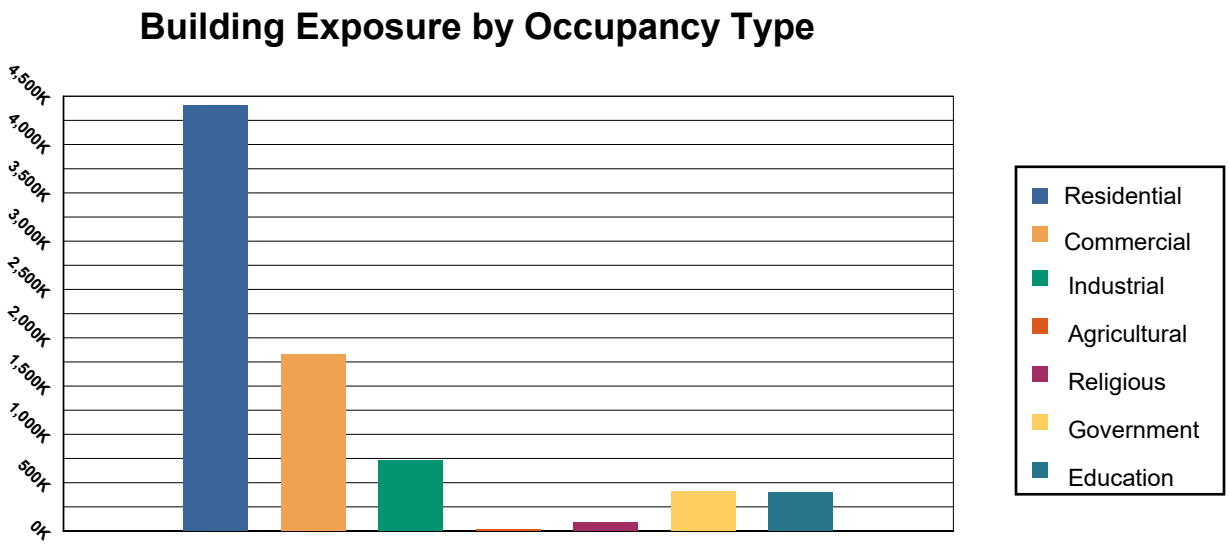


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,401,446	55.90%
Commercial	1,825,113	23.18%
Industrial	730,491	9.28%
Agricultural	11,907	0.15%
Religious	91,474	1.16%
Government	412,173	5.24%
Education	400,569	5.09%
Total	**7,873,173**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 14 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 226 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 3 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

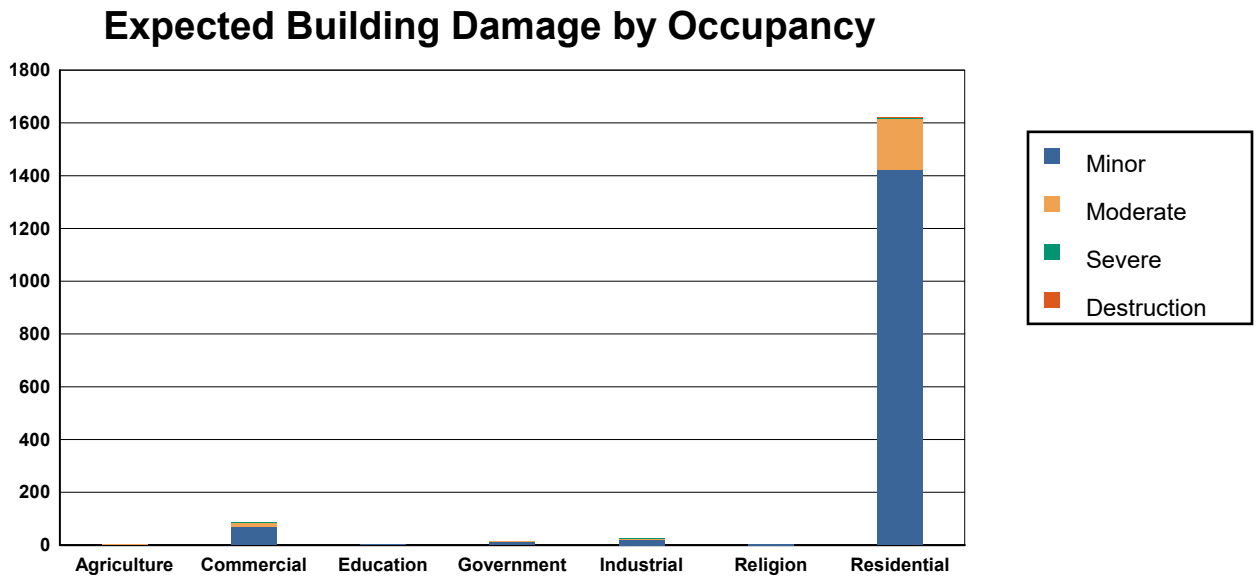


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.99	87.95	2.28	9.12	0.50	1.99	0.22	0.87	0.02	0.07
Commercial	850.02	90.52	69.37	7.39	16.68	1.78	2.93	0.31	0.00	0.00
Education	31.96	91.32	2.67	7.62	0.36	1.03	0.01	0.03	0.00	0.00
Government	153.38	90.76	13.54	8.01	2.02	1.20	0.06	0.04	0.00	0.00
Industrial	239.35	91.01	19.36	7.36	3.62	1.38	0.64	0.24	0.03	0.01
Religion	42.69	90.84	3.86	8.21	0.43	0.91	0.02	0.04	0.00	0.00
Residential	11,357.61	87.50	1,423.93	10.97	190.71	1.47	4.99	0.04	2.76	0.02
Total	**12,697.02**		**1,535.01**		**214.32**		**8.86**		**2.80**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	170	90.32	16	8.28	3	1.37	0	0.03	0	0.00
Masonry	1,058	87.10	114	9.40	41	3.35	2	0.14	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	672	91.04	50	6.72	14	1.86	3	0.37	0	0.00
Wood	10,888	88.42	1,312	10.65	108	0.87	5	0.04	3	0.02

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

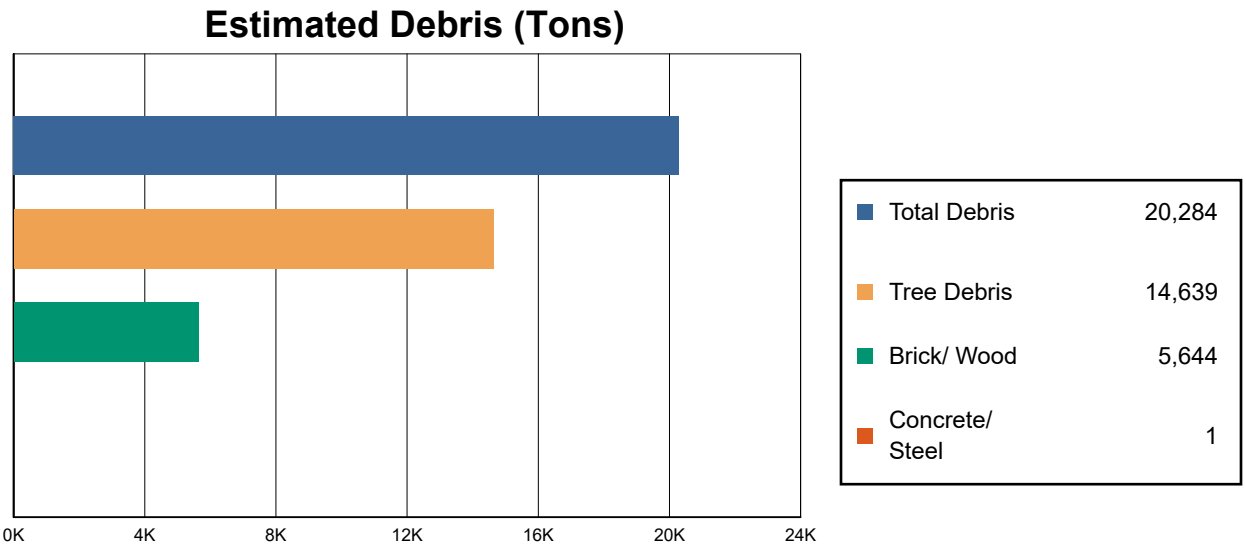
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	14	0	0	14

Induced Hurricane Damage

Debris Generation

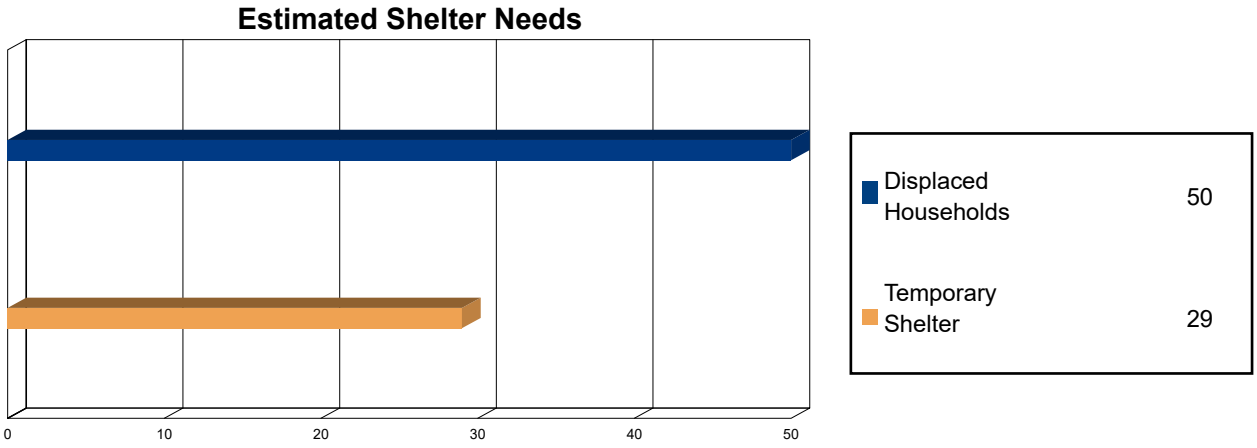


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 20,284 tons of debris will be generated. Of the total amount, 7,947 tons (39%) is Other Tree Debris. Of the remaining 12,337 tons, Brick/Wood comprises 46% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 226 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,692 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 50 households to be displaced due to the hurricane. Of these, 29 people (out of a total population of 42,141) will seek temporary shelter in public shelters.

Economic Loss

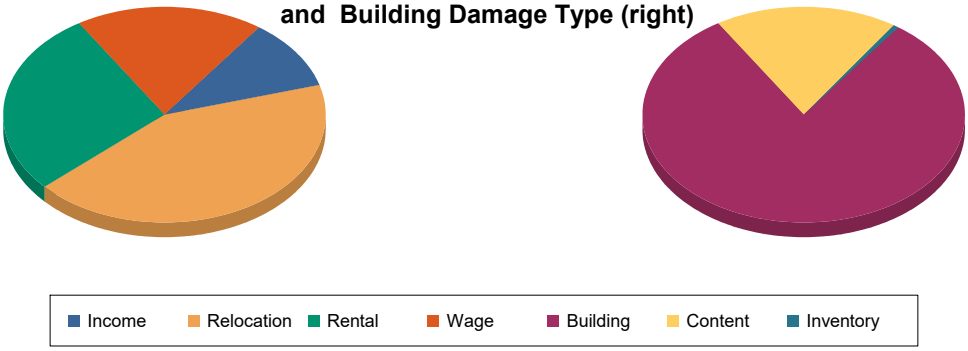
The total economic loss estimated for the hurricane is 77.1 million dollars, which represents 0.98 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 77 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 80% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

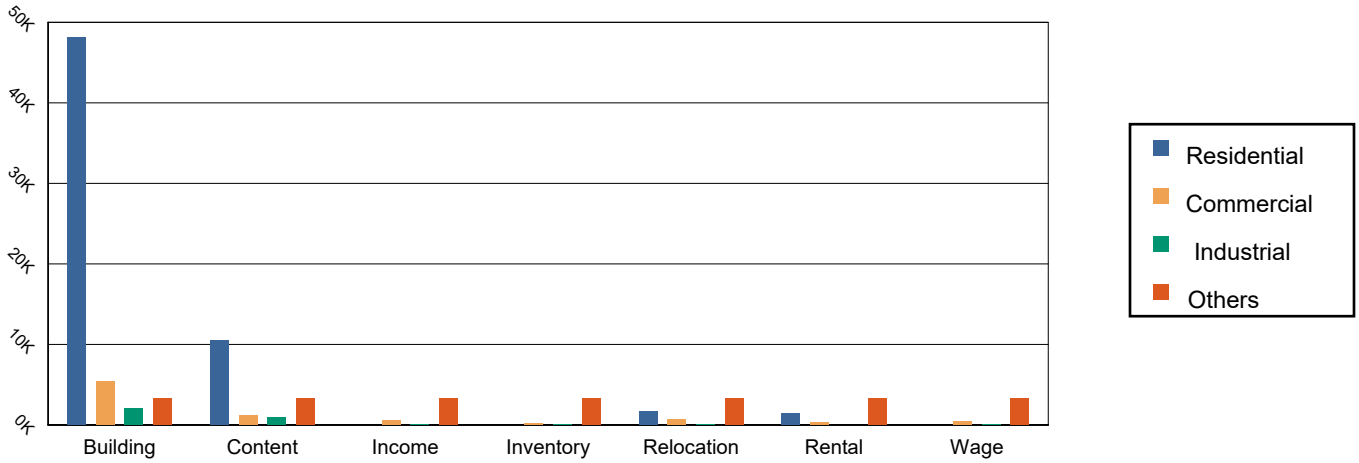


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	48,147.76	5,365.19	2,041.00	1,899.82	57,453.77
	Content	10,561.87	1,180.73	967.68	332.91	13,043.20
	Inventory	0.00	222.03	108.18	18.28	348.49
	Subtotal	**58,709.64**	**6,767.95**	**3,116.86**	**2,251.02**	**70,845.46**
Business Interruption Loss						
	Income	0.00	519.86	17.38	119.82	657.06
	Relocation	1,673.52	666.90	119.87	209.76	2,670.05
	Rental	1,387.47	316.44	14.77	27.58	1,746.26
	Wage	0.00	447.82	28.20	701.02	1,177.03
	Subtotal	**3,060.99**	**1,951.02**	**180.22**	**1,058.17**	**6,250.40**

Total

Total	**61,770.63**	**8,718.97**	**3,297.08**	**3,309.18**	**77,095.86**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	42,141	4,401,446	3,471,727	7,873,173
Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**
Study Region Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**

Hazus: Hurricane Global Risk Report

Region Name:	Enfield_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.27 square miles and contains 12 census tracts. There are over 16 thousand households in the region and a total population of 42,141 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 14 thousand buildings in the region with a total building replacement value (excluding contents) of 7,873 million dollars. Approximately 90% of the buildings (and 56% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

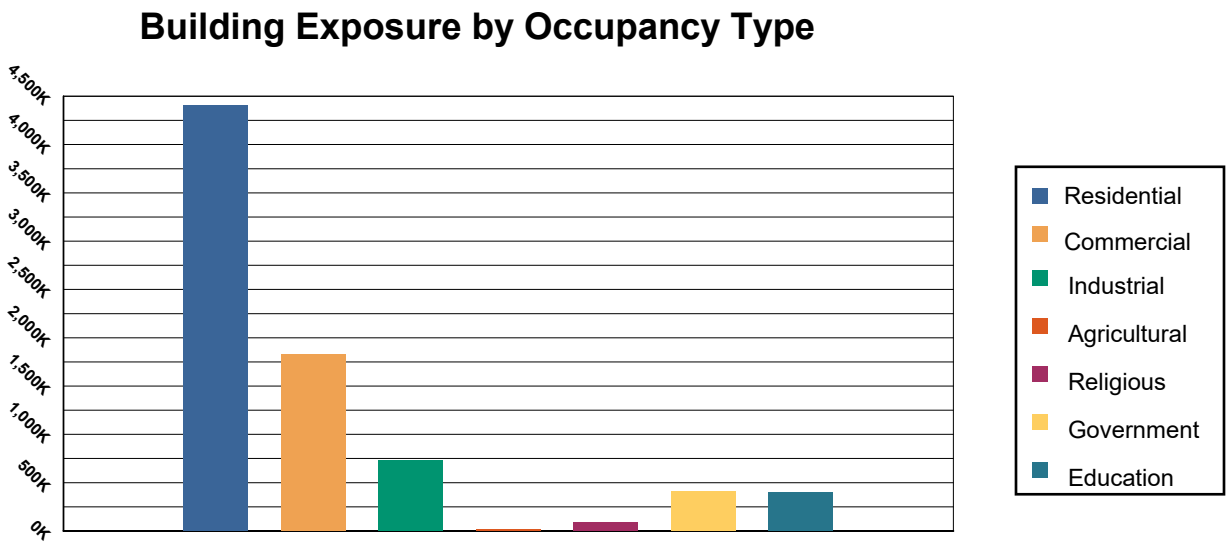


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,401,446	55.90%
Commercial	1,825,113	23.18%
Industrial	730,491	9.28%
Agricultural	11,907	0.15%
Religious	91,474	1.16%
Government	412,173	5.24%
Education	400,569	5.09%
Total	**7,873,173**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 14 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 615 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 19 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

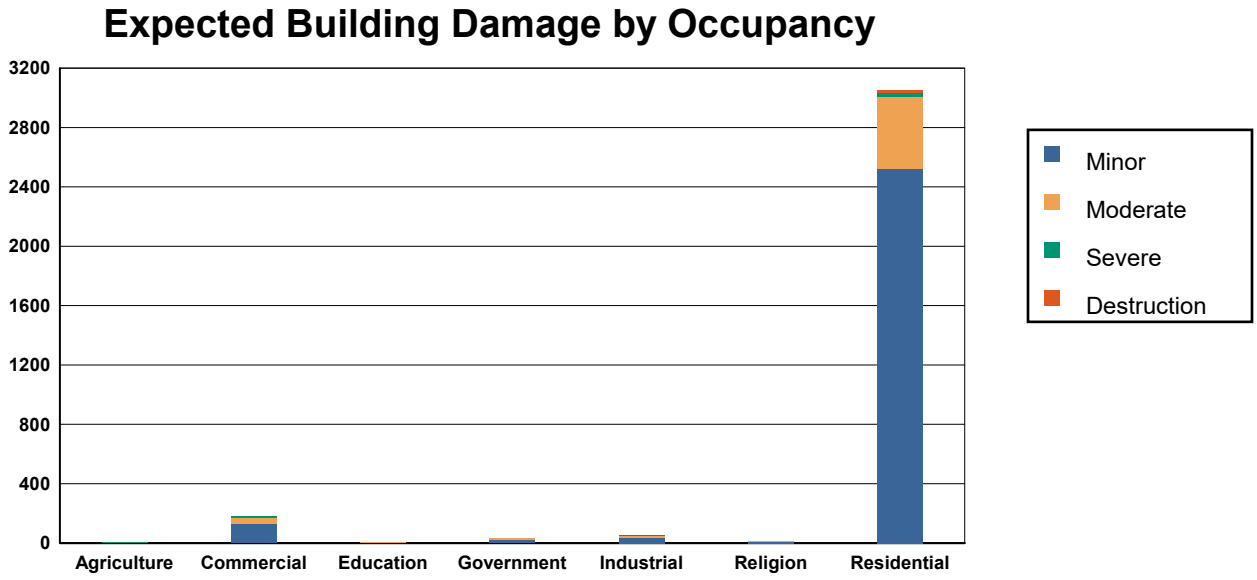


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.00	75.99	4.14	16.55	1.22	4.87	0.58	2.32	0.07	0.27
Commercial	757.71	80.69	126.82	13.51	44.93	4.79	9.49	1.01	0.06	0.01
Education	28.59	81.69	4.96	14.16	1.35	3.87	0.10	0.28	0.00	0.00
Government	135.65	80.27	25.00	14.79	7.78	4.60	0.58	0.34	0.00	0.00
Industrial	213.00	80.99	35.56	13.52	11.98	4.56	2.32	0.88	0.13	0.05
Religion	38.02	80.90	7.28	15.49	1.59	3.38	0.11	0.24	0.00	0.00
Residential	9,928.11	76.49	2,519.24	19.41	488.63	3.76	25.57	0.20	18.44	0.14
Total	**11,120.08**		**2,722.99**		**557.49**		**38.74**		**18.70**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	150	80.05	28	14.69	9	4.98	1	0.28	0	0.00
Masonry	929	76.45	188	15.48	92	7.53	6	0.49	1	0.05
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	600	81.25	90	12.26	38	5.20	9	1.27	0	0.01
Wood	9,557	77.60	2,389	19.40	330	2.68	23	0.19	17	0.13

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

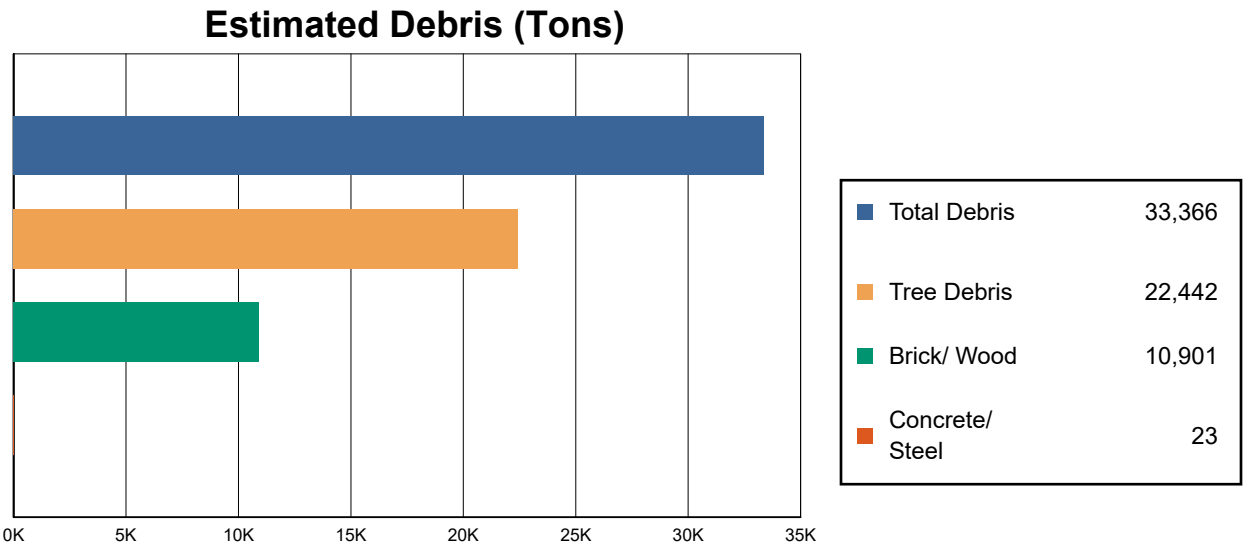
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	14	0	0	5

Induced Hurricane Damage

Debris Generation

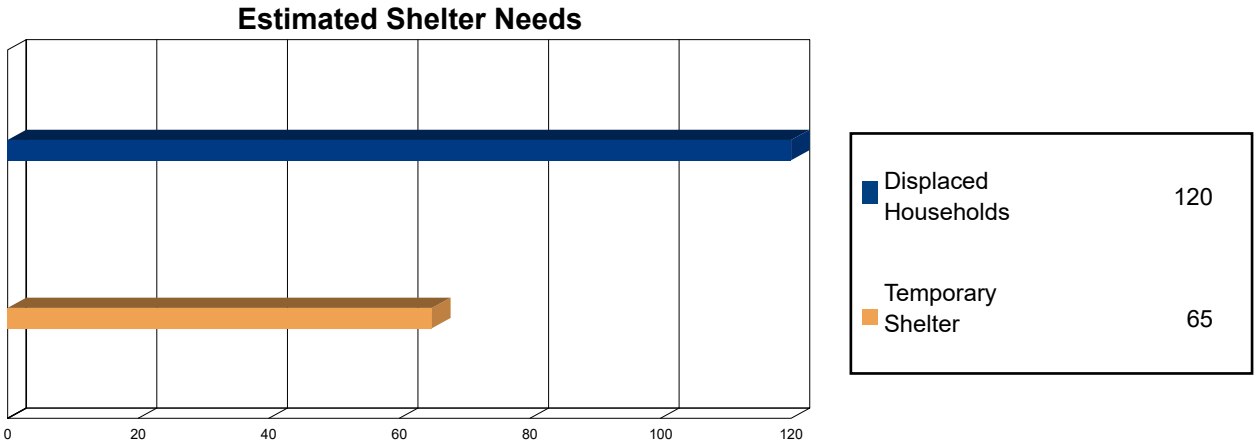


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 33,366 tons of debris will be generated. Of the total amount, 12,262 tons (37%) is Other Tree Debris. Of the remaining 21,104 tons, Brick/Wood comprises 52% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 437 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 10,180 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 120 households to be displaced due to the hurricane. Of these, 65 people (out of a total population of 42,141) will seek temporary shelter in public shelters.

Economic Loss

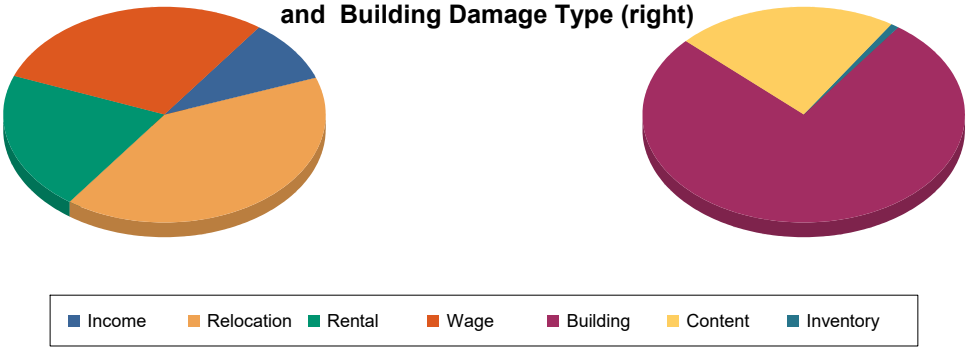
The total economic loss estimated for the hurricane is 165.4 million dollars, which represents 2.10 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 165 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 72% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

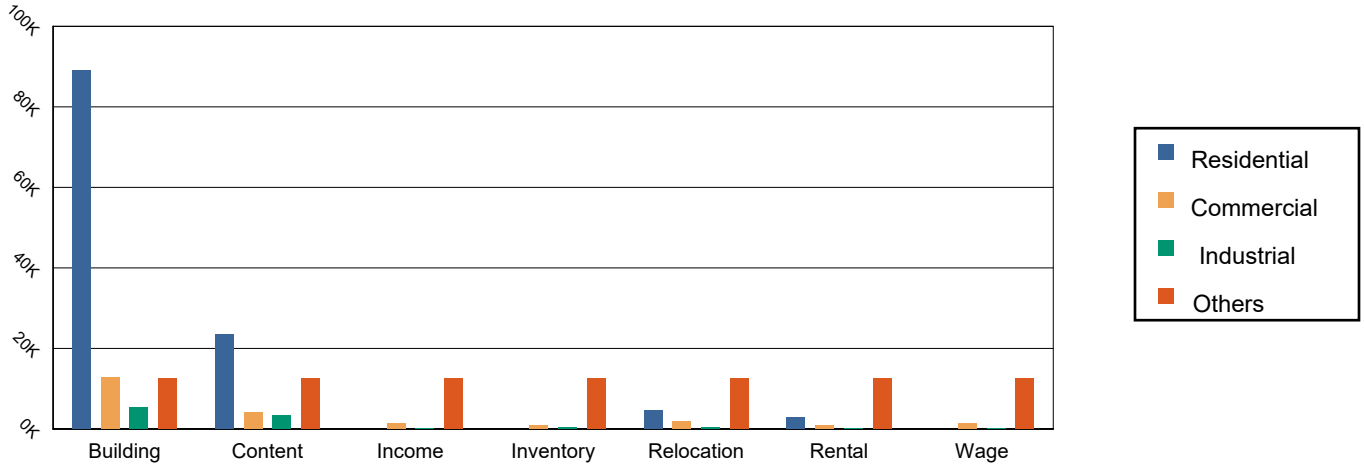


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	89,072.63	12,734.99	5,449.24	5,172.00	112,428.86
	Content	23,494.46	4,028.47	3,378.20	1,539.36	32,440.49
	Inventory	0.00	795.70	373.24	54.39	1,223.34
	Subtotal	**112,567.08**	**17,559.17**	**9,200.68**	**6,765.76**	**146,092.69**
Business Interruption Loss						
	Income	0.00	1,329.40	62.14	413.24	1,804.79
	Relocation	4,492.57	1,975.36	434.26	941.07	7,843.27
	Rental	2,797.00	983.25	60.68	153.84	3,994.76
	Wage	0.00	1,277.72	101.60	4,239.17	5,618.48
	Subtotal	**7,289.57**	**5,565.74**	**658.68**	**5,747.32**	**19,261.30**

Total

Total	**119,856.65**	**23,124.91**	**9,859.36**	**12,513.07**	**165,353.99**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	42,141	4,401,446	3,471,727	7,873,173
Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**
Study Region Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**

Hazus: Hurricane Global Risk Report

Region Name:	Enfield_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Monday, May 8, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.27 square miles and contains 12 census tracts. There are over 16 thousand households in the region and a total population of 42,141 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 14 thousand buildings in the region with a total building replacement value (excluding contents) of 7,873 million dollars. Approximately 90% of the buildings (and 56% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 14,458 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

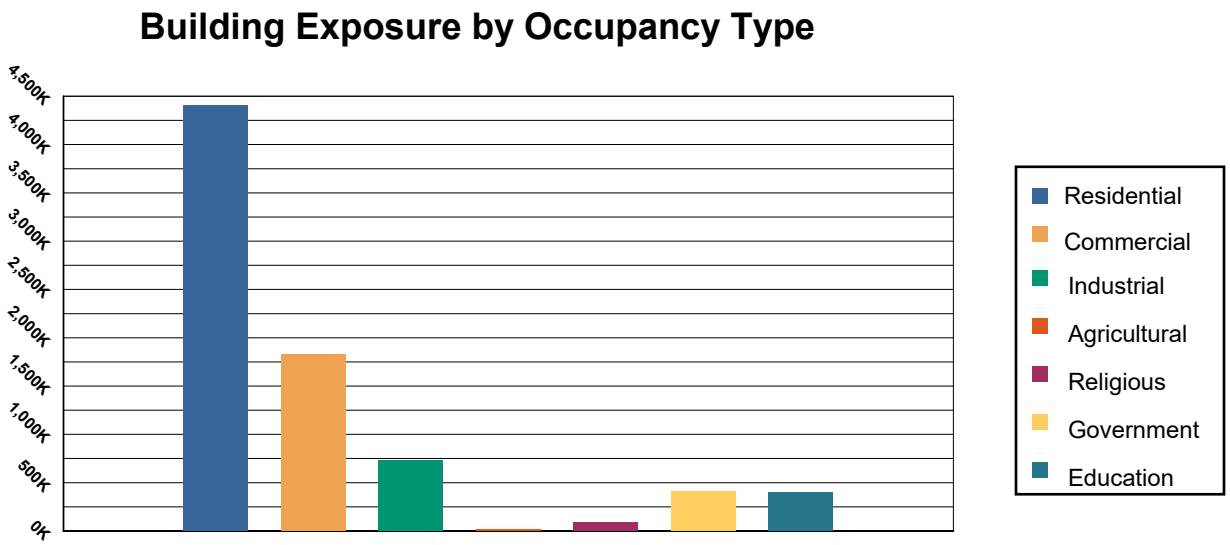


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,401,446	55.90%
Commercial	1,825,113	23.18%
Industrial	730,491	9.28%
Agricultural	11,907	0.15%
Religious	91,474	1.16%
Government	412,173	5.24%
Education	400,569	5.09%
Total	**7,873,173**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 14 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,068 buildings will be at least moderately damaged. This is over 7% of the total number of buildings in the region. There are an estimated 45 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

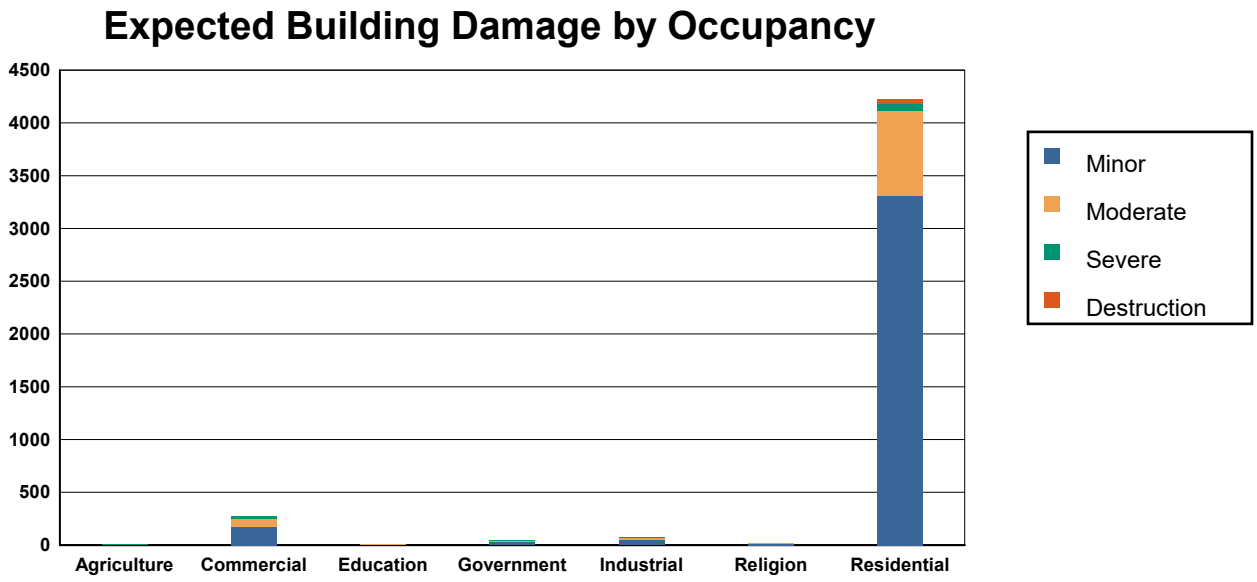


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16.59	66.35	5.42	21.69	1.92	7.68	0.93	3.74	0.14	0.54
Commercial	670.56	71.41	170.62	18.17	78.85	8.40	18.80	2.00	0.17	0.02
Education	25.39	72.54	6.65	19.00	2.66	7.59	0.30	0.86	0.00	0.00
Government	120.37	71.23	32.37	19.15	14.52	8.59	1.74	1.03	0.00	0.00
Industrial	188.98	71.85	46.96	17.86	21.88	8.32	4.90	1.86	0.29	0.11
Religion	33.68	71.66	9.89	21.05	3.10	6.59	0.33	0.70	0.00	0.00
Residential	8,754.57	67.45	3,308.09	25.49	810.52	6.24	62.78	0.48	44.04	0.34
Total	**9,810.13**		**3,580.02**		**933.44**		**89.79**		**44.63**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	132	70.46	36	19.12	18	9.53	2	0.89	0	0.00
Masonry	816	67.18	239	19.70	145	11.96	13	1.06	1	0.10
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	532	72.10	120	16.21	67	9.10	19	2.56	0	0.03
Wood	8,453	68.64	3,184	25.85	583	4.74	55	0.45	40	0.32

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

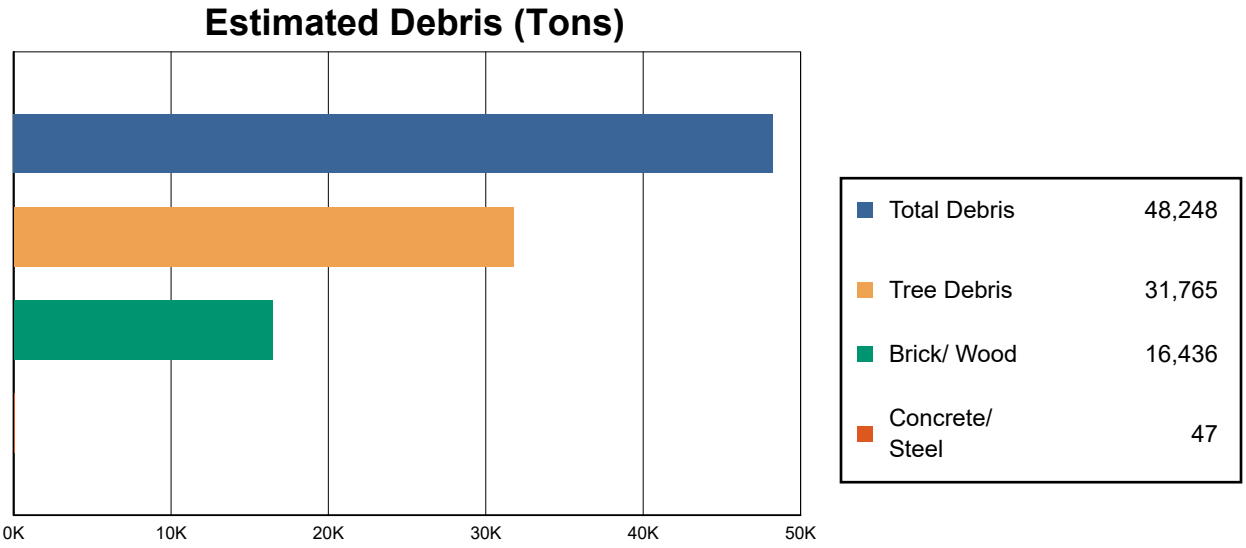
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	14	0	0	0

Induced Hurricane Damage

Debris Generation

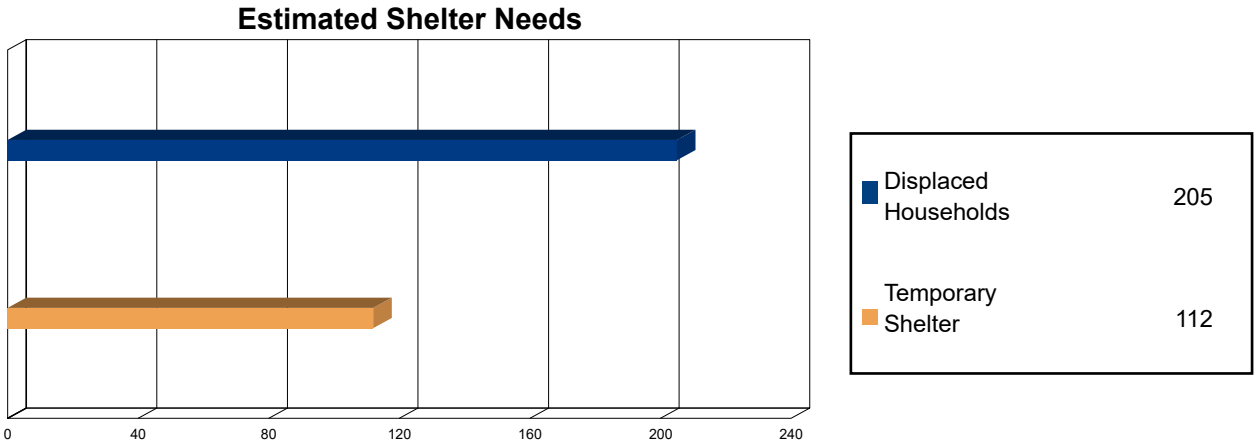


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 48,248 tons of debris will be generated. Of the total amount, 17,116 tons (35%) is Other Tree Debris. Of the remaining 31,132 tons, Brick/Wood comprises 53% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 659 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 14,649 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 205 households to be displaced due to the hurricane. Of these, 112 people (out of a total population of 42,141) will seek temporary shelter in public shelters.

Economic Loss

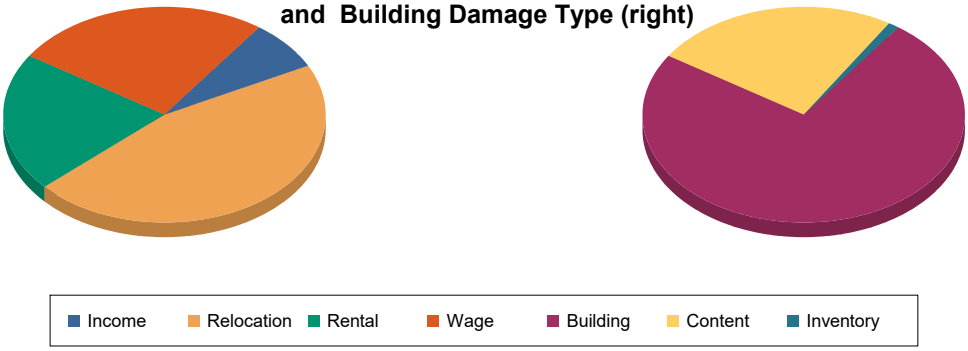
The total economic loss estimated for the hurricane is 269.4 million dollars, which represents 3.42 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 269 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 70% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

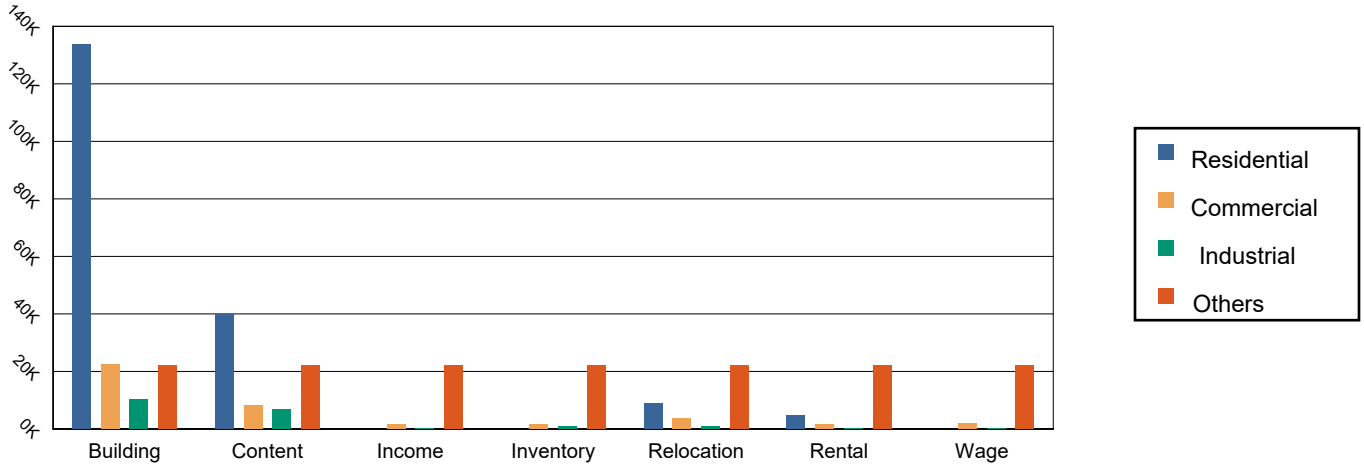


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	133,829.07	22,301.02	10,129.73	9,263.97	175,523.79
	Content	39,906.28	8,241.69	6,919.29	3,293.19	58,360.45
	Inventory	0.00	1,630.48	754.70	95.53	2,480.71
	Subtotal	**173,735.35**	**32,173.19**	**17,803.72**	**12,652.70**	**236,364.95**
Business Interruption Loss						
	Income	0.00	1,744.11	91.78	611.29	2,447.18
	Relocation	9,000.49	3,546.28	844.56	1,810.82	15,202.15
	Rental	4,714.76	1,755.74	115.04	290.19	6,875.73
	Wage	0.00	1,826.84	149.74	6,574.36	8,550.94
	Subtotal	**13,715.25**	**8,872.97**	**1,201.13**	**9,286.66**	**33,076.01**

Total

Total	**187,450.60**	**41,046.16**	**19,004.85**	**21,939.35**	**269,440.96**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	42,141	4,401,446	3,471,727	7,873,173
Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**
Study Region Total	**42,141**	**4,401,446**	**3,471,727**	**7,873,173**

Hazus: Hurricane Global Risk Report

Region Name:	Farmington_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.78 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 26,712 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87% of the buildings (and 60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,374 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

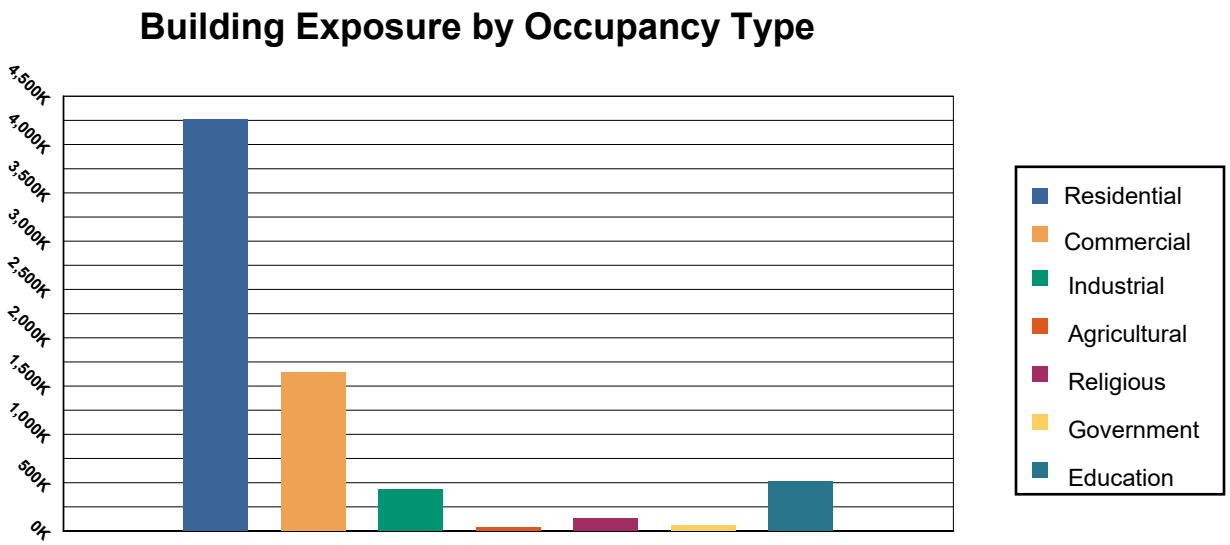


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,256,491	60.24%
Commercial	1,638,979	23.19%
Industrial	433,839	6.14%
Agricultural	30,970	0.44%
Religious	131,044	1.85%
Government	58,596	0.83%
Education	516,486	7.31%
Total	**7,066,405**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds. There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

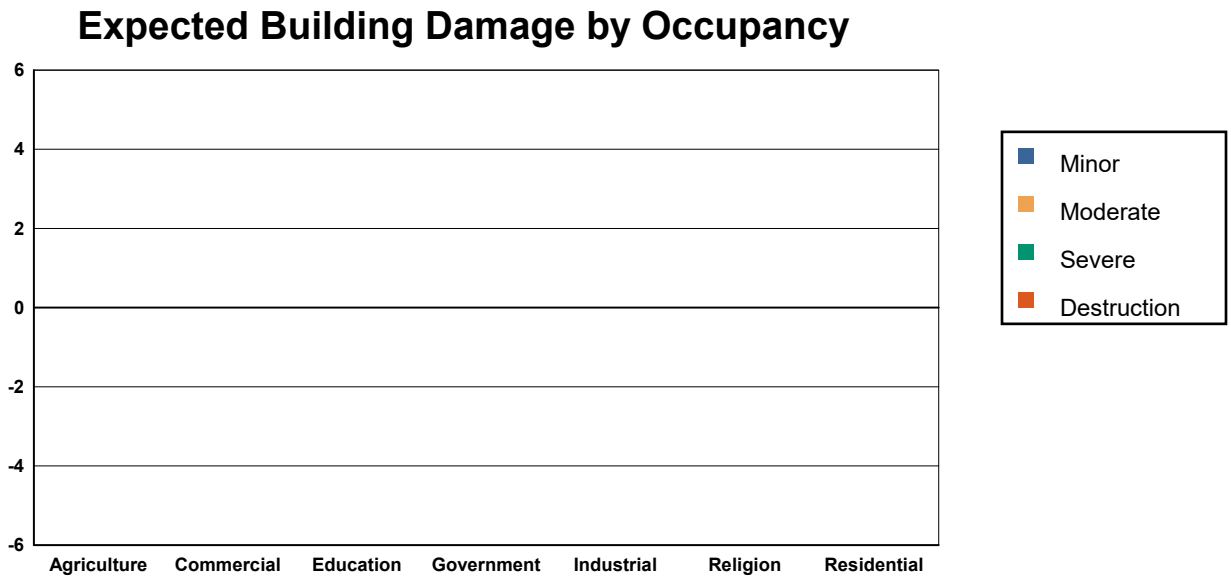


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	31.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	614.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	21.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	39.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	194.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	27.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	6,448.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**7,374.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	133	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	818	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	465	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	5,962	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 137 hospital beds available for use. On the day of the hurricane, the model estimates that 137 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

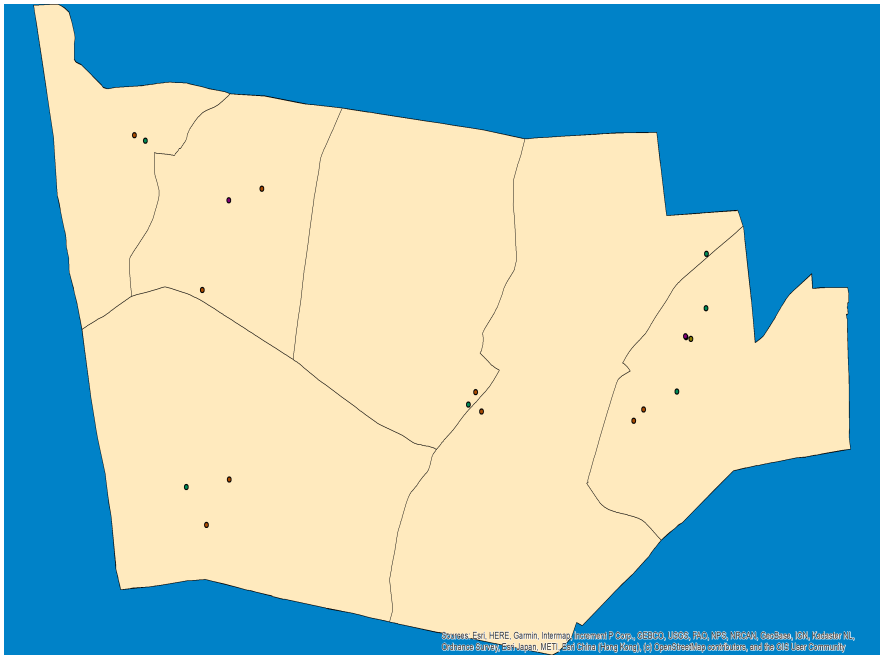
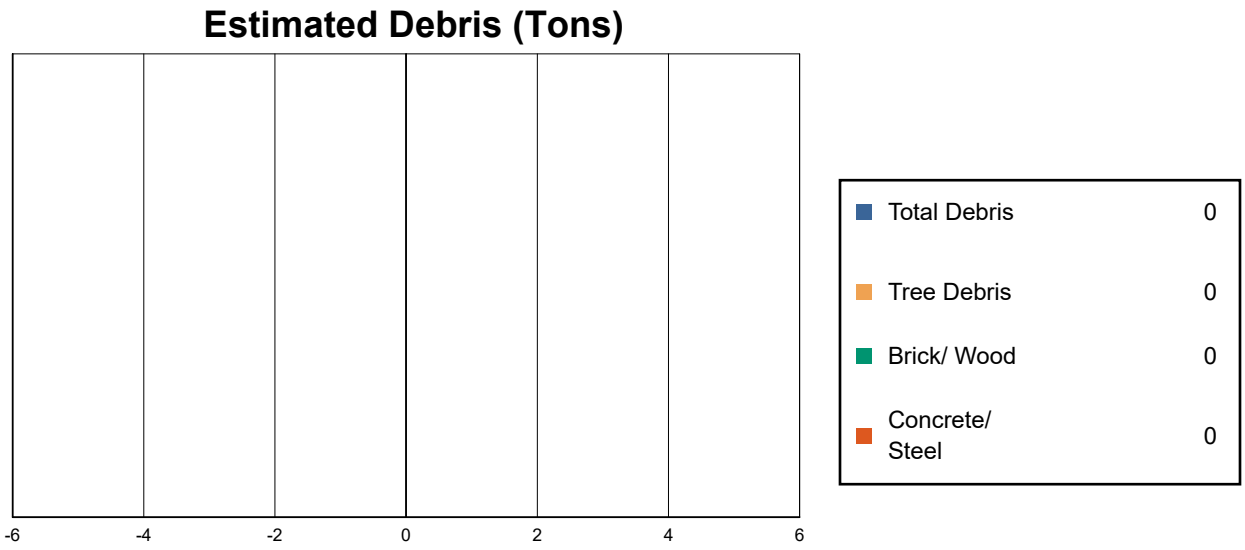


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

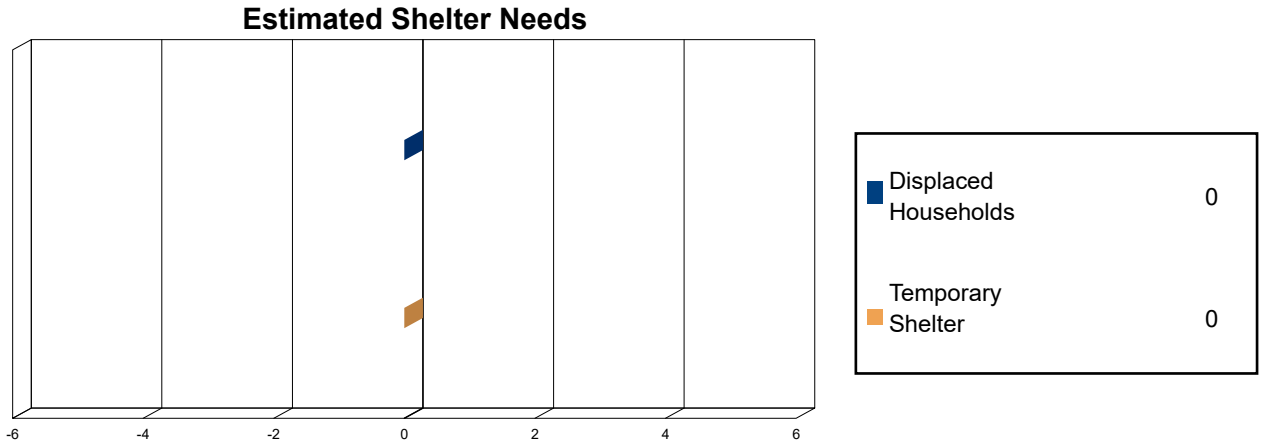


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,712) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

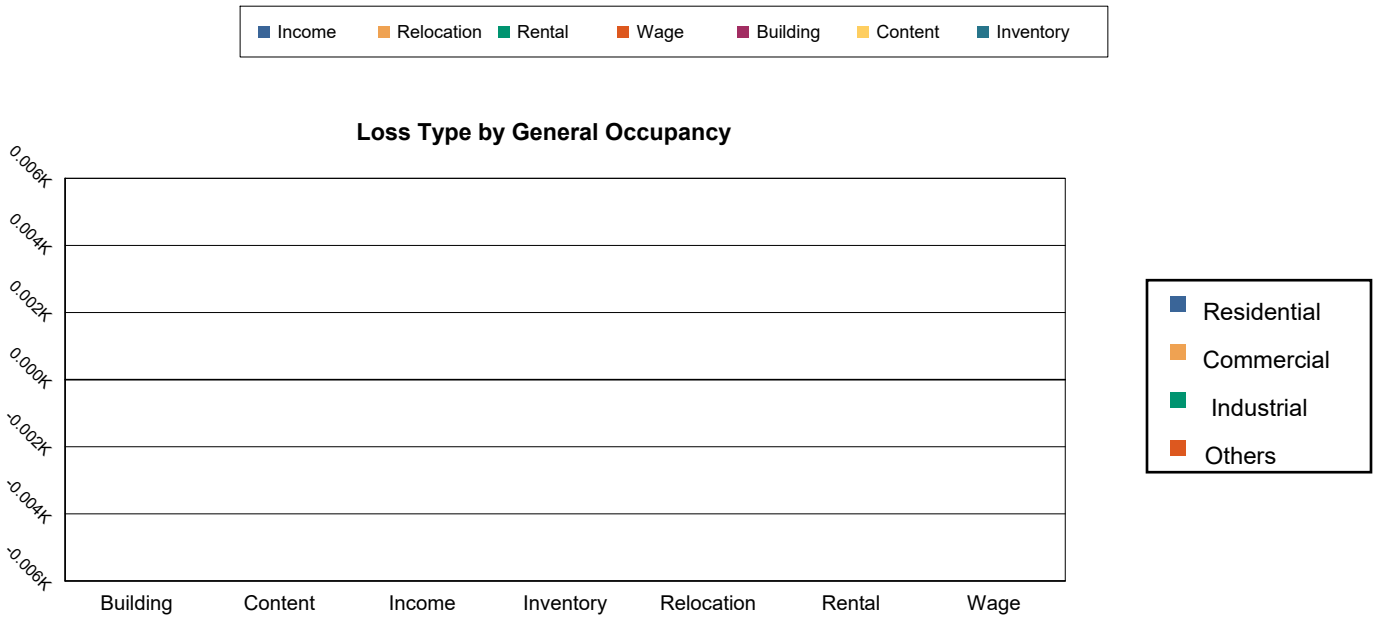


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,491	2,809,914	7,066,405
Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**
Study Region Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**

Hazus: Hurricane Global Risk Report

Region Name:	Farmington_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
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The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
Appendix A contains a complete listing of the counties contained in the region.

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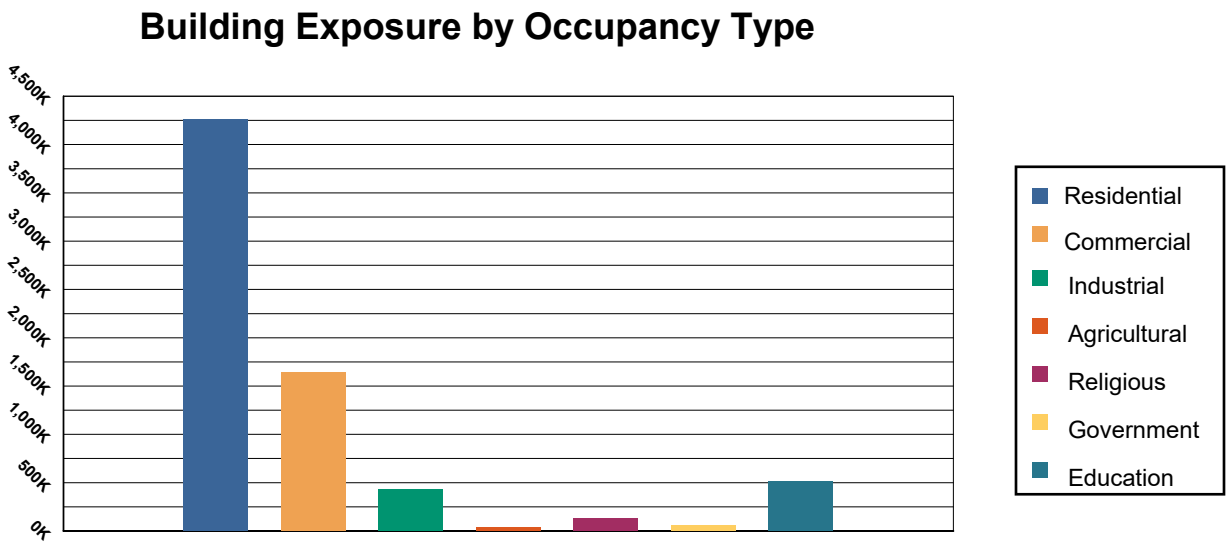

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Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,256,491	60.24%
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Industrial	433,839	6.14%
Agricultural	30,970	0.44%
Religious	131,044	1.85%
Government	58,596	0.83%
Education	516,486	7.31%
Total	**7,066,405**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds. There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

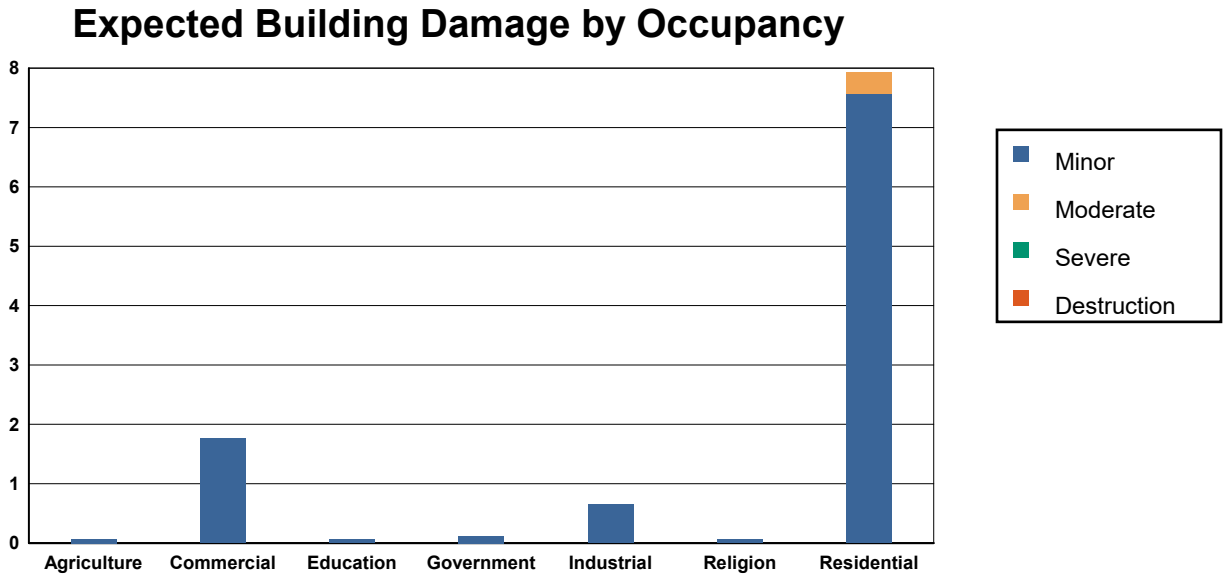


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	30.93	99.77	0.07	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	612.24	99.71	1.76	0.29	0.00	0.00	0.00	0.00	0.00	0.00
Education	20.93	99.69	0.07	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Government	38.88	99.70	0.12	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	193.35	99.66	0.65	0.34	0.00	0.00	0.00	0.00	0.00	0.00
Religion	26.93	99.76	0.07	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Residential	6,440.07	99.88	7.58	0.12	0.35	0.01	0.00	0.00	0.00	0.00
Total	**7,363.34**		**10.31**		**0.35**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	132	99.60	1	0.40	0	0.00	0	0.00	0	0.00
Masonry	814	99.49	4	0.50	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	463	99.67	2	0.33	0	0.00	0	0.00	0	0.00
Wood	5,960	99.96	2	0.04	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 137 hospital beds available for use. On the day of the hurricane, the model estimates that 137 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

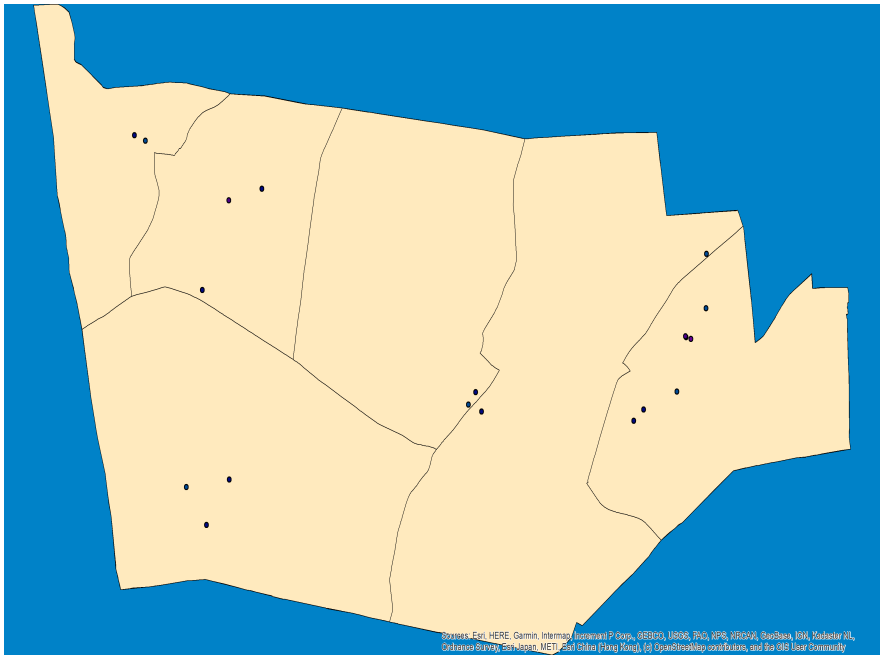
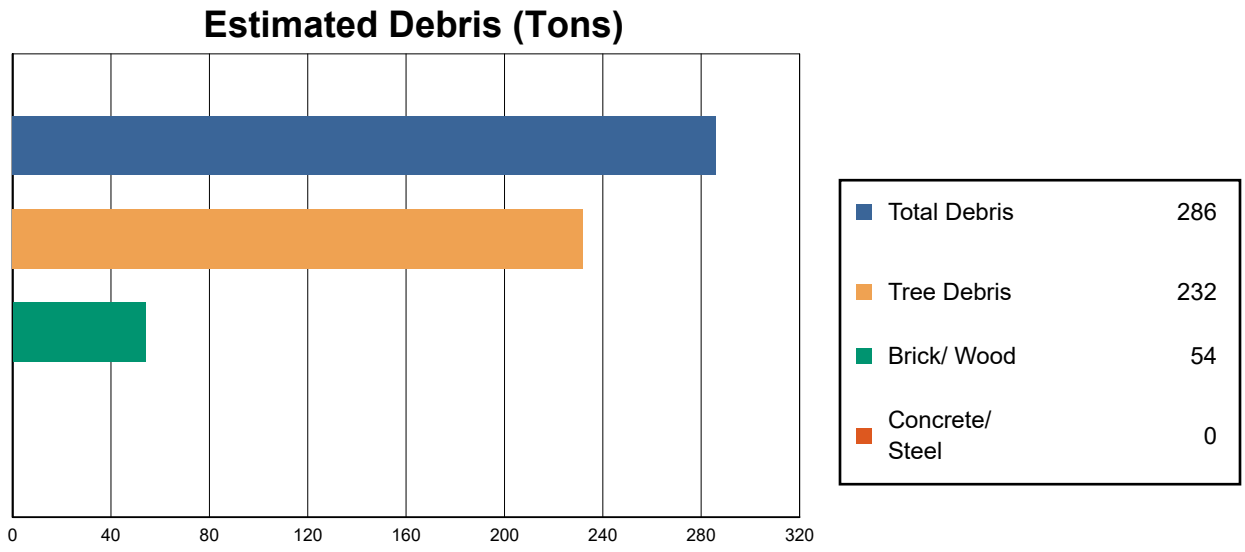


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

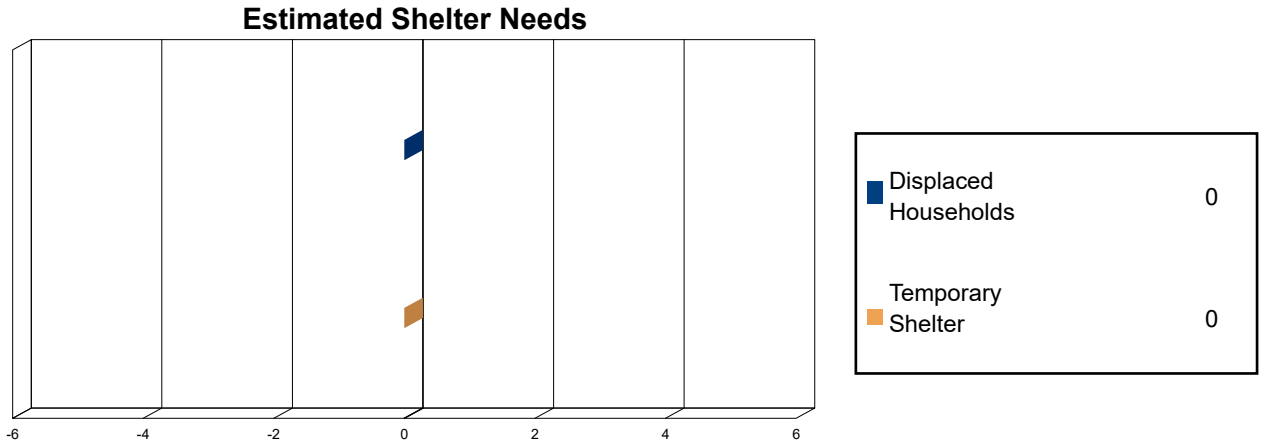


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 286 tons of debris will be generated. Of the total amount, 142 tons (50%) is Other Tree Debris. Of the remaining 144 tons, Brick/Wood comprises 37% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 90 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,712) will seek temporary shelter in public shelters.

Economic Loss

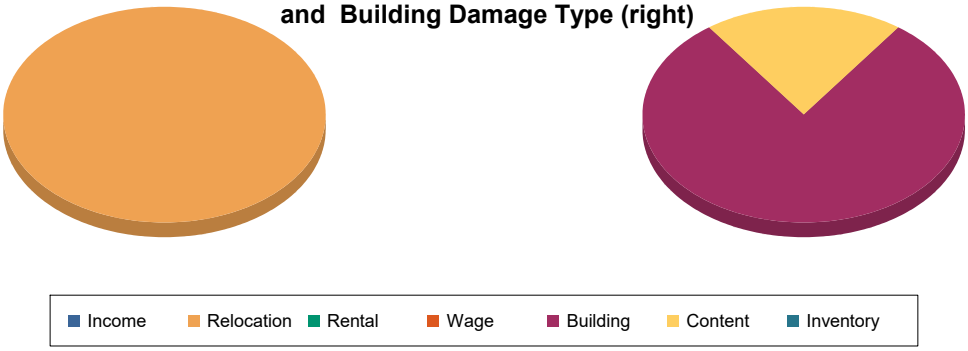
The total economic loss estimated for the hurricane is 1.7 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 89% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

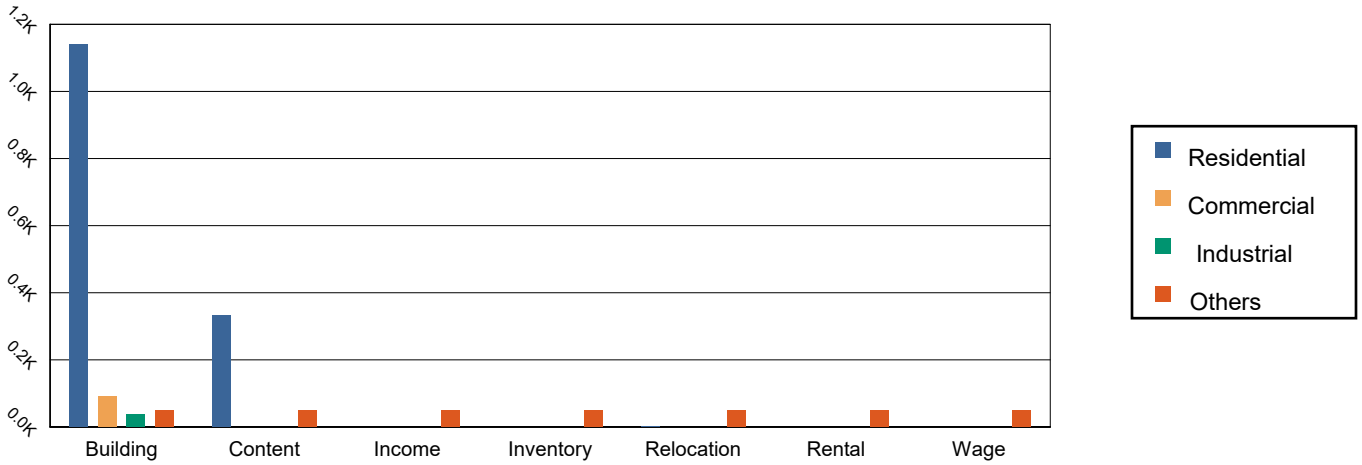


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,140.39	89.89	38.70	48.66	1,317.64
	Content	331.52	0.00	0.00	0.00	331.52
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,471.90**	**89.89**	**38.70**	**48.66**	**1,649.16**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	1.32	0.00	0.00	0.00	1.32
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1.32**	**0.00**	**0.00**	**0.00**	**1.32**

Total

Total	**1,473.22**	**89.89**	**38.70**	**48.66**	**1,650.48**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,491	2,809,914	7,066,405
Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**
Study Region Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**

Hazus: Hurricane Global Risk Report

Region Name: Farmington_HU

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.78 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 26,712 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87% of the buildings (and 60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,374 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

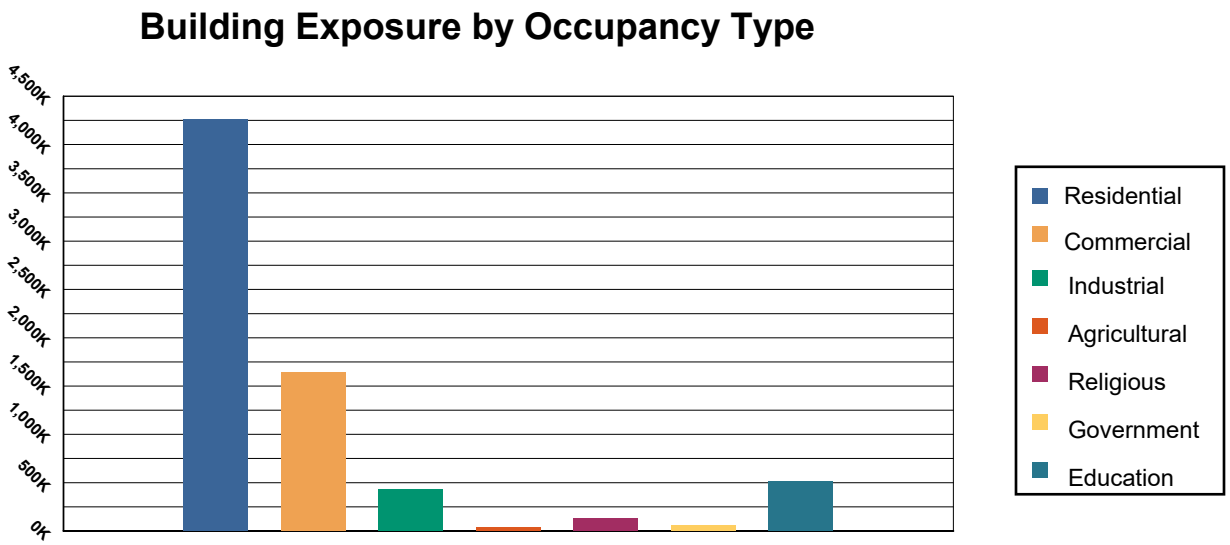


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,256,491	60.24%
Commercial	1,638,979	23.19%
Industrial	433,839	6.14%
Agricultural	30,970	0.44%
Religious	131,044	1.85%
Government	58,596	0.83%
Education	516,486	7.31%
Total	**7,066,405**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds. There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 10 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

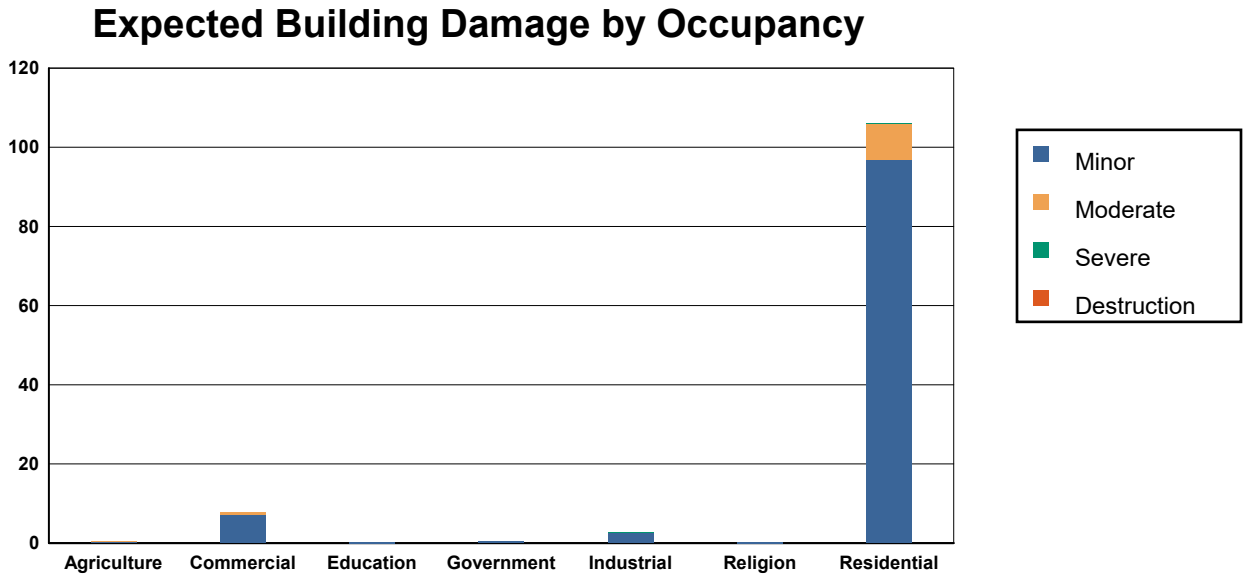


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	30.56	98.57	0.40	1.29	0.04	0.12	0.01	0.03	0.00	0.00
Commercial	606.30	98.75	7.05	1.15	0.64	0.10	0.01	0.00	0.00	0.00
Education	20.75	98.79	0.25	1.20	0.00	0.02	0.00	0.00	0.00	0.00
Government	38.57	98.91	0.42	1.08	0.00	0.01	0.00	0.00	0.00	0.00
Industrial	191.18	98.55	2.66	1.37	0.12	0.06	0.03	0.02	0.00	0.00
Religion	26.72	98.95	0.28	1.02	0.01	0.03	0.00	0.00	0.00	0.00
Residential	6,341.79	98.35	96.90	1.50	9.12	0.14	0.20	0.00	0.00	0.00
Total	**7,255.86**		**107.96**		**9.93**		**0.26**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	131	98.42	2	1.56	0	0.02	0	0.00	0	0.00
Masonry	794	97.10	20	2.39	4	0.49	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	459	98.69	6	1.22	0	0.09	0	0.00	0	0.00
Wood	5,889	98.78	71	1.18	2	0.04	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 137 hospital beds available for use. On the day of the hurricane, the model estimates that 137 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

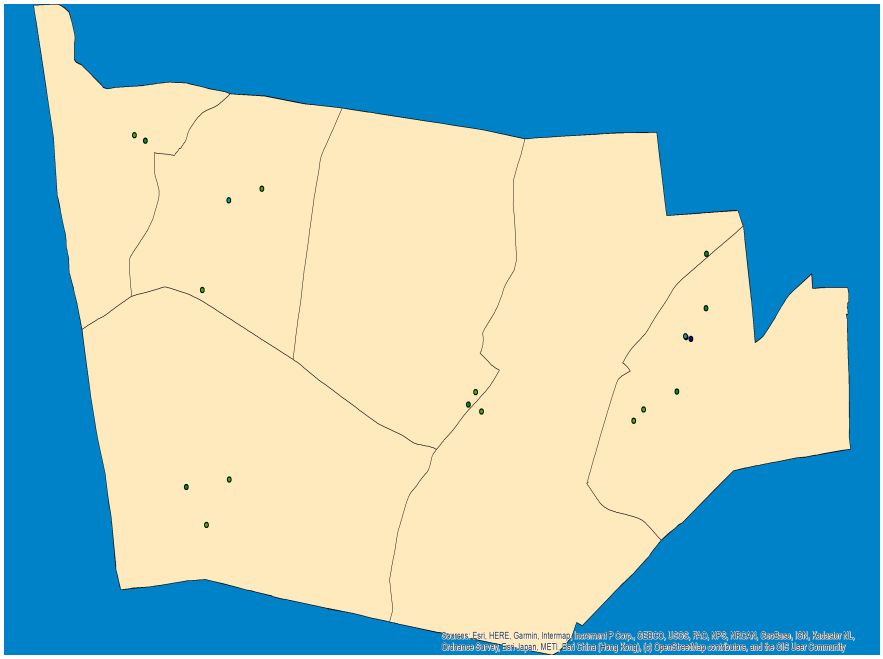
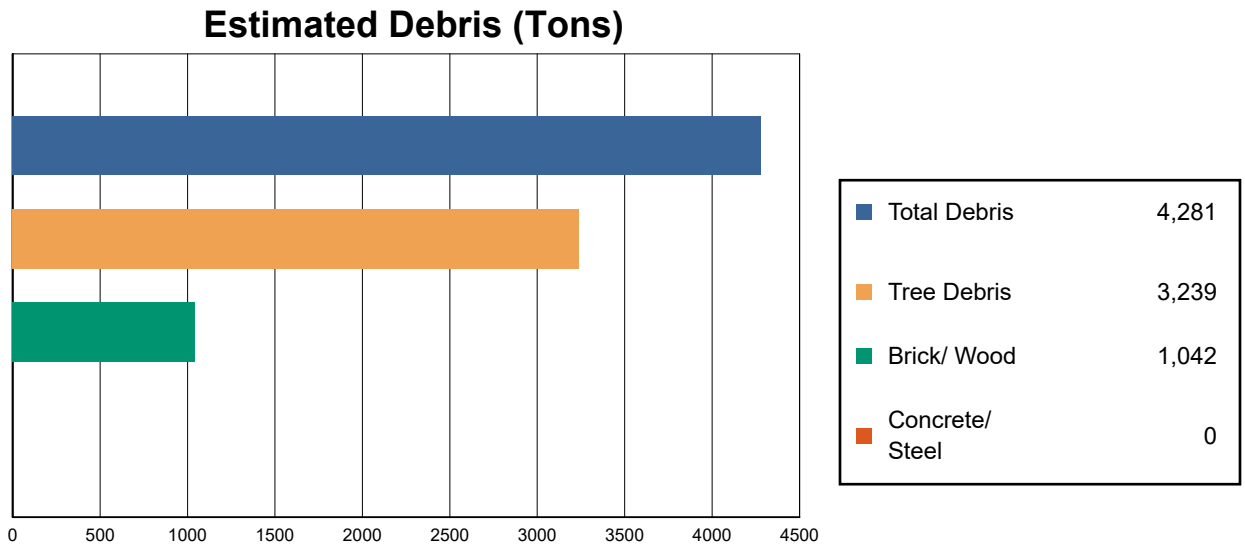


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

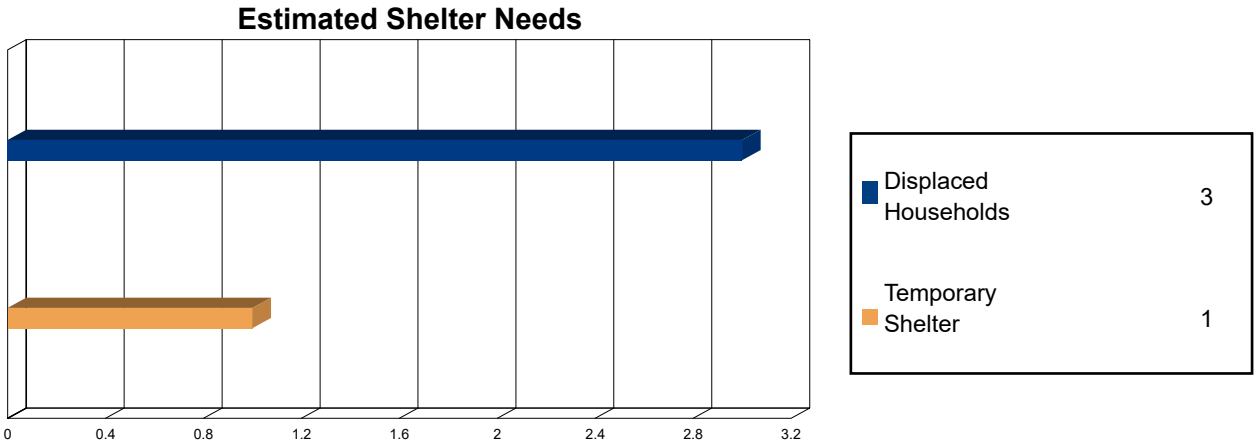


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 4,281 tons of debris will be generated. Of the total amount, 1,852 tons (43%) is Other Tree Debris. Of the remaining 2,429 tons, Brick/Wood comprises 43% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 42 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,387 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 3 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 26,712) will seek temporary shelter in public shelters.

Economic Loss

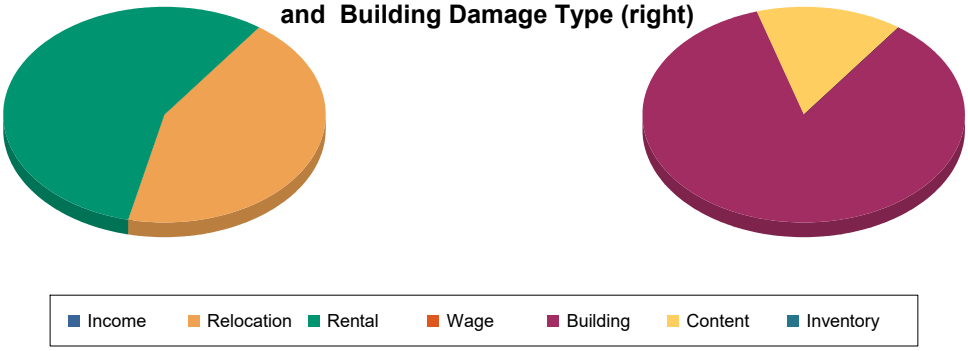
The total economic loss estimated for the hurricane is 15.0 million dollars, which represents 0.21 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 15 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

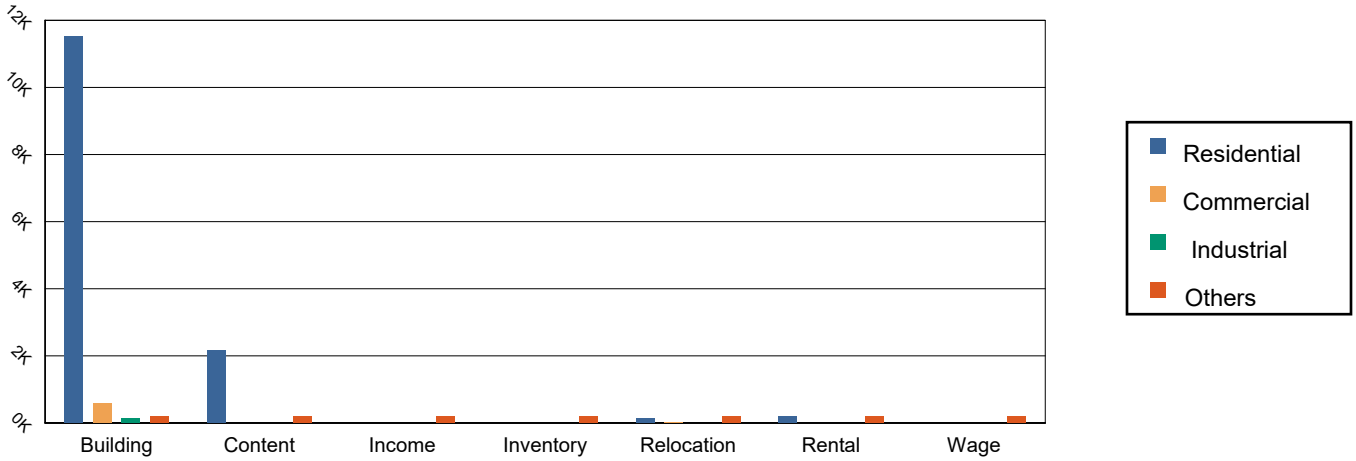


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	11,510.87	589.12	135.67	205.46	12,441.13
	Content	2,152.27	0.00	2.34	0.00	2,154.62
	Inventory	0.00	0.00	0.32	0.00	0.32
	Subtotal	**13,663.15**	**589.12**	**138.34**	**205.46**	**14,596.07**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	147.71	11.70	0.35	0.95	160.72
	Rental	207.06	0.00	0.00	0.00	207.06
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**354.76**	**11.70**	**0.35**	**0.95**	**367.77**

Total

Total	**14,017.91**	**600.82**	**138.70**	**206.41**	**14,963.85**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,491	2,809,914	7,066,405
Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**
Study Region Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**

Hazus: Hurricane Global Risk Report

Region Name:	Farmington_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.78 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 26,712 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87% of the buildings (and 60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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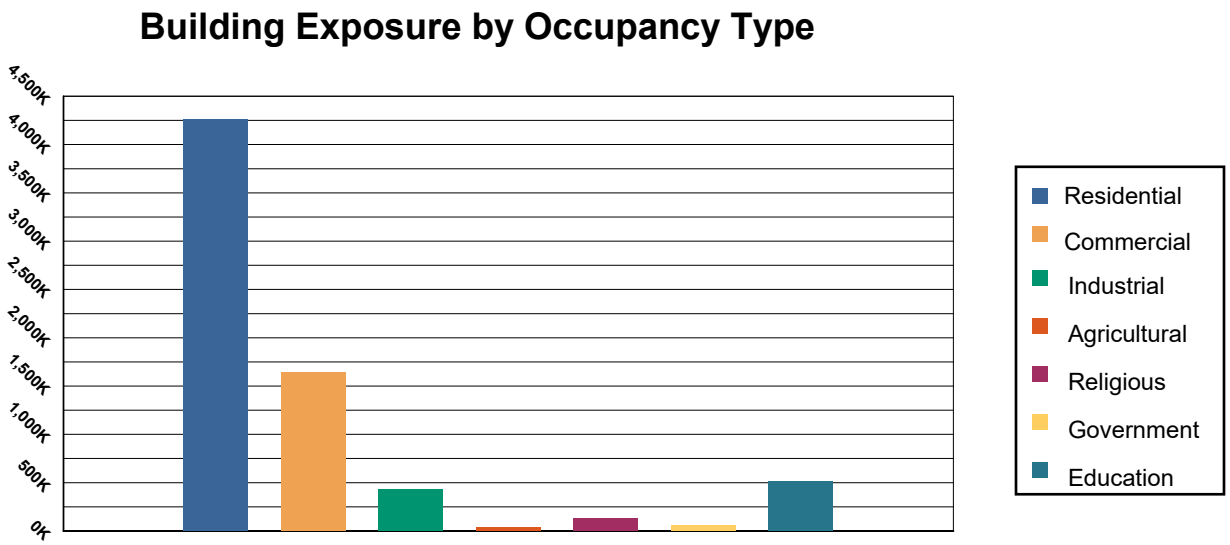


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,256,491	60.24%
Commercial	1,638,979	23.19%
Industrial	433,839	6.14%
Agricultural	30,970	0.44%
Religious	131,044	1.85%
Government	58,596	0.83%
Education	516,486	7.31%
Total	**7,066,405**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds. There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 51 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

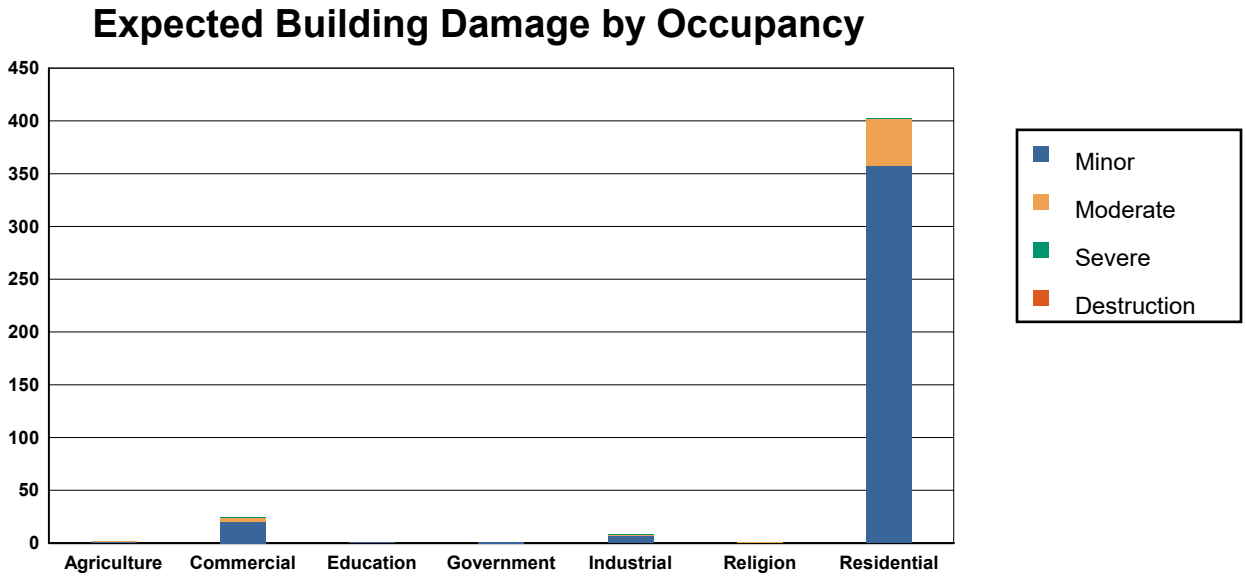


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	29.33	94.60	1.36	4.39	0.22	0.71	0.09	0.29	0.00	0.01
Commercial	589.69	96.04	20.79	3.39	3.14	0.51	0.38	0.06	0.00	0.00
Education	20.27	96.51	0.70	3.33	0.03	0.16	0.00	0.00	0.00	0.00
Government	37.84	97.03	1.12	2.87	0.04	0.10	0.00	0.00	0.00	0.00
Industrial	185.32	95.52	7.44	3.84	0.94	0.48	0.30	0.15	0.01	0.00
Religion	26.05	96.49	0.91	3.36	0.04	0.15	0.00	0.01	0.00	0.00
Residential	6,045.55	93.76	357.11	5.54	44.47	0.69	0.86	0.01	0.00	0.00
Total	**6,934.05**		**389.43**		**48.88**		**1.63**		**0.01**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	127	95.59	6	4.14	0	0.27	0	0.00	0	0.00
Masonry	754	92.15	46	5.67	17	2.07	1	0.10	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	447	96.19	15	3.25	2	0.49	0	0.06	0	0.00
Wood	5,639	94.58	306	5.13	16	0.28	1	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had 137 hospital beds available for use. On the day of the hurricane, the model estimates that 137 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

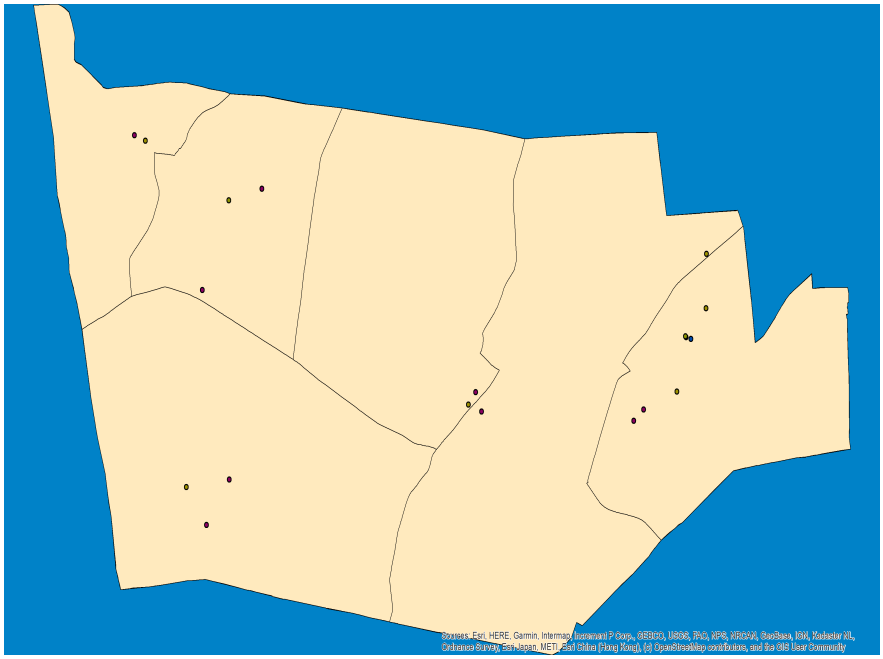
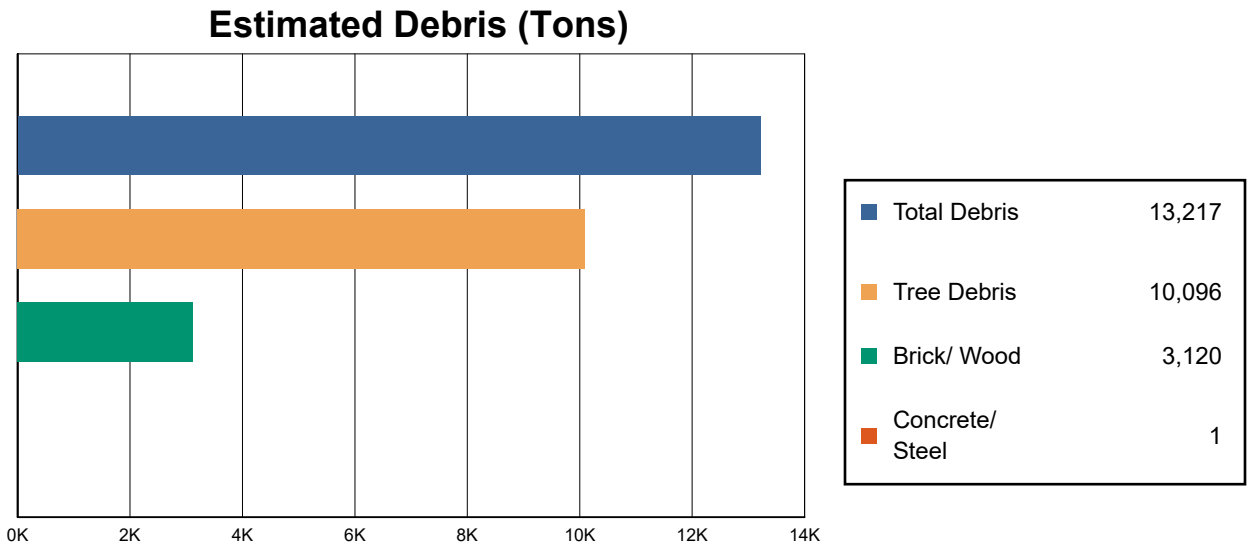


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

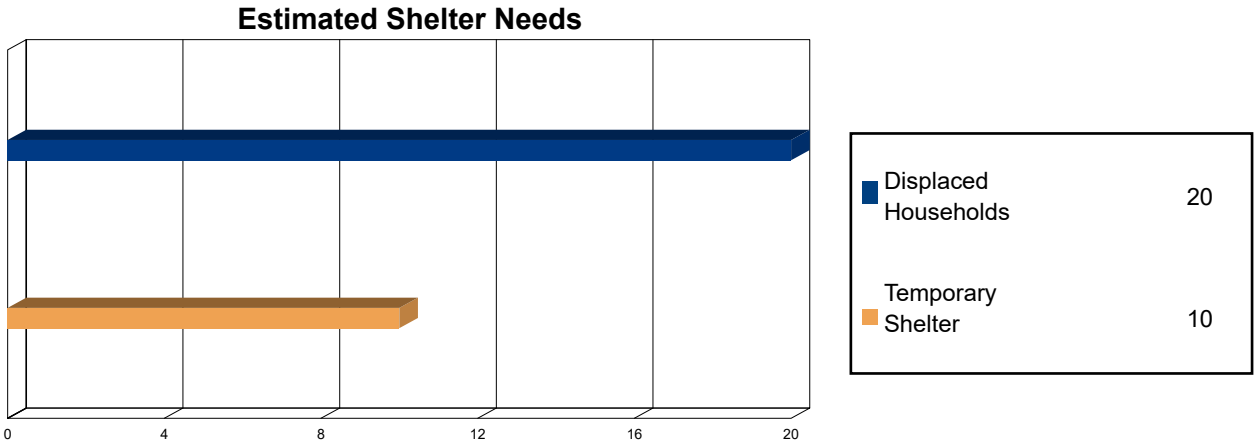


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 13,217 tons of debris will be generated. Of the total amount, 5,923 tons (45%) is Other Tree Debris. Of the remaining 7,294 tons, Brick/Wood comprises 43% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 125 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,173 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 20 households to be displaced due to the hurricane. Of these, 10 people (out of a total population of 26,712) will seek temporary shelter in public shelters.

Economic Loss

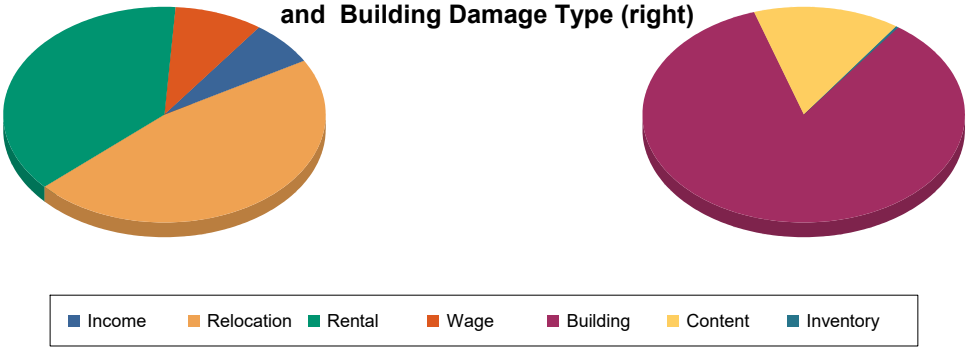
The total economic loss estimated for the hurricane is 39.3 million dollars, which represents 0.56 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 39 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

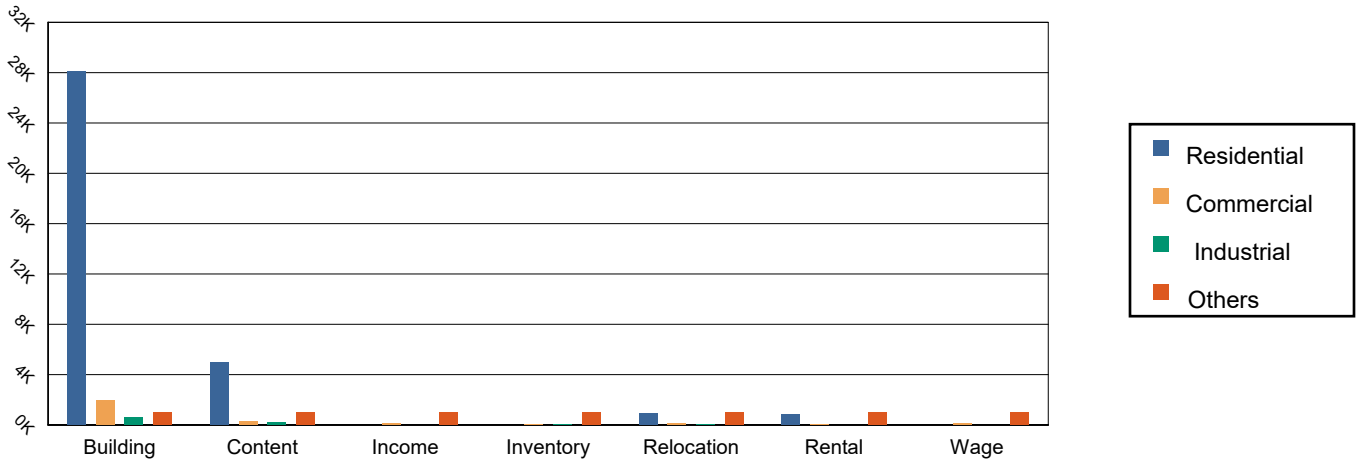


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	28,061.01	1,946.91	612.16	738.37	31,358.45
	Content	4,937.49	276.52	210.47	39.33	5,463.81
	Inventory	0.00	44.15	28.38	12.73	85.26
	Subtotal	**32,998.50**	**2,267.59**	**851.01**	**790.42**	**36,907.52**
Business Interruption Loss						
	Income	0.00	112.17	4.25	46.15	162.57
	Relocation	931.05	151.07	12.64	40.01	1,134.76
	Rental	851.79	67.16	2.85	3.35	925.15
	Wage	0.00	99.50	7.02	108.83	215.35
	Subtotal	**1,782.84**	**429.89**	**26.76**	**198.34**	**2,437.83**

Total

Total	**34,781.34**	**2,697.48**	**877.78**	**988.76**	**39,345.36**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,491	2,809,914	7,066,405
Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**
Study Region Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**

Hazus: Hurricane Global Risk Report

Region Name:	Farmington_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.78 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 26,712 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87% of the buildings (and 60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,374 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

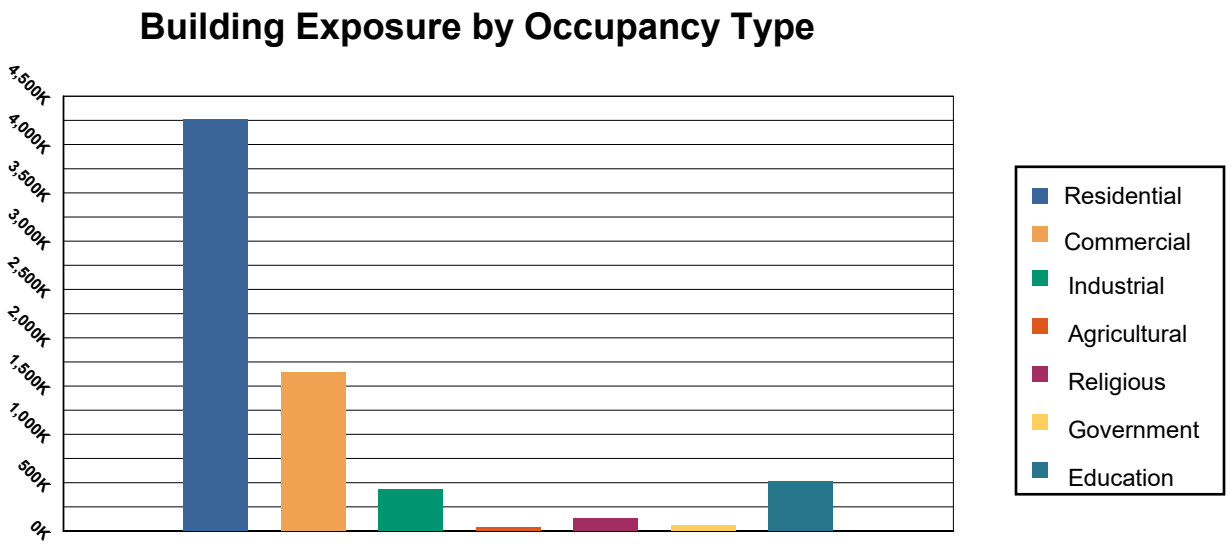


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,256,491	60.24%
Commercial	1,638,979	23.19%
Industrial	433,839	6.14%
Agricultural	30,970	0.44%
Religious	131,044	1.85%
Government	58,596	0.83%
Education	516,486	7.31%
Total	**7,066,405**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds. There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 135 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

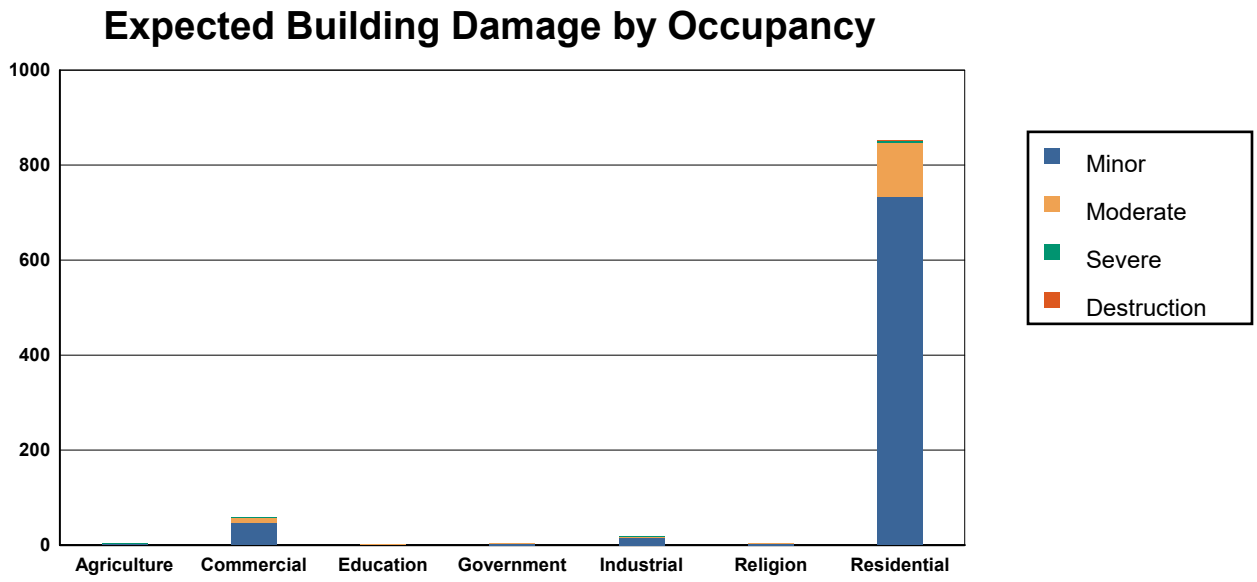


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	27.15	87.57	2.91	9.40	0.63	2.03	0.29	0.92	0.02	0.08
Commercial	556.03	90.56	46.86	7.63	9.52	1.55	1.59	0.26	0.00	0.00
Education	19.22	91.51	1.59	7.55	0.19	0.91	0.01	0.03	0.00	0.00
Government	36.06	92.46	2.69	6.89	0.25	0.63	0.01	0.01	0.00	0.00
Industrial	175.26	90.34	14.74	7.60	2.99	1.54	0.95	0.49	0.07	0.03
Religion	24.47	90.62	2.29	8.50	0.23	0.84	0.01	0.04	0.00	0.00
Residential	5,596.47	86.79	733.26	11.37	114.73	1.78	2.49	0.04	1.05	0.02
Total	**6,434.65**		**804.35**		**128.52**		**5.33**		**1.15**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	120	90.14	11	8.53	2	1.31	0	0.02	0	0.00
Masonry	696	85.14	82	9.99	37	4.56	2	0.30	0	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	424	91.23	32	6.96	7	1.53	1	0.28	0	0.00
Wood	5,240	87.89	662	11.10	57	0.95	3	0.04	1	0.01

Essential Facility Damage

Before the hurricane, the region had 137 hospital beds available for use. On the day of the hurricane, the model estimates that 137 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

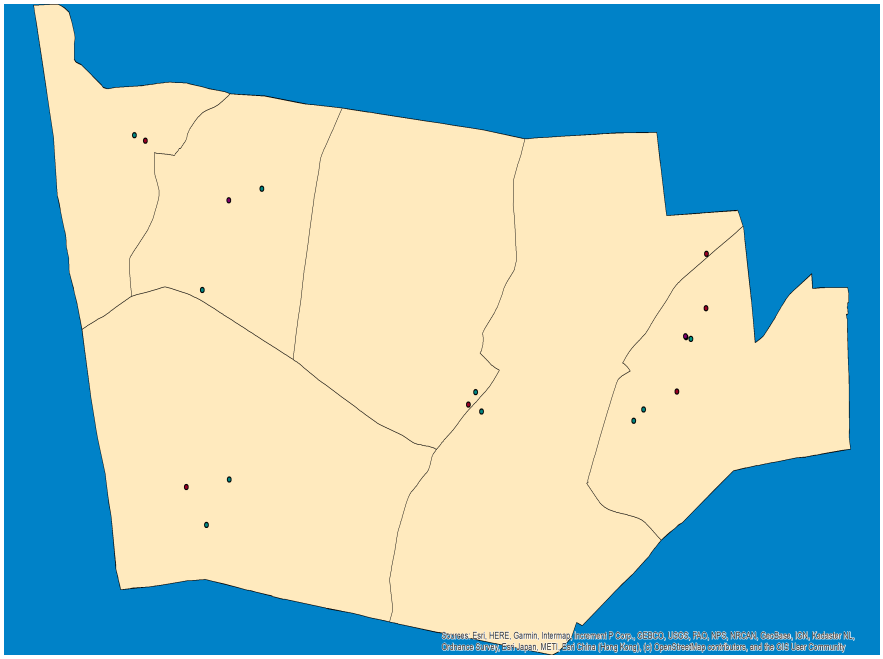
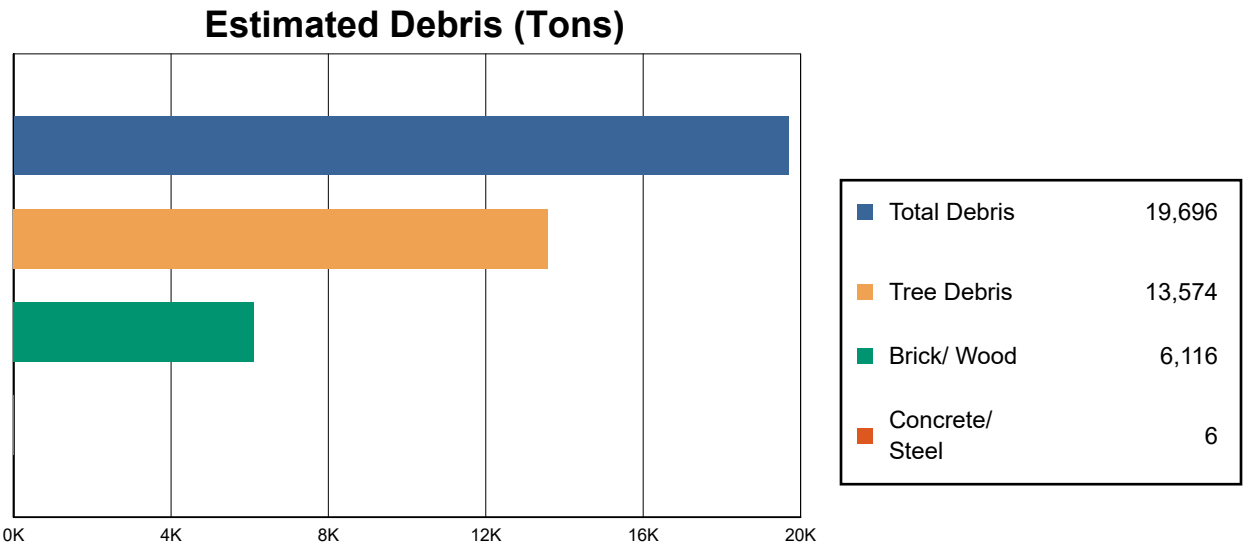


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

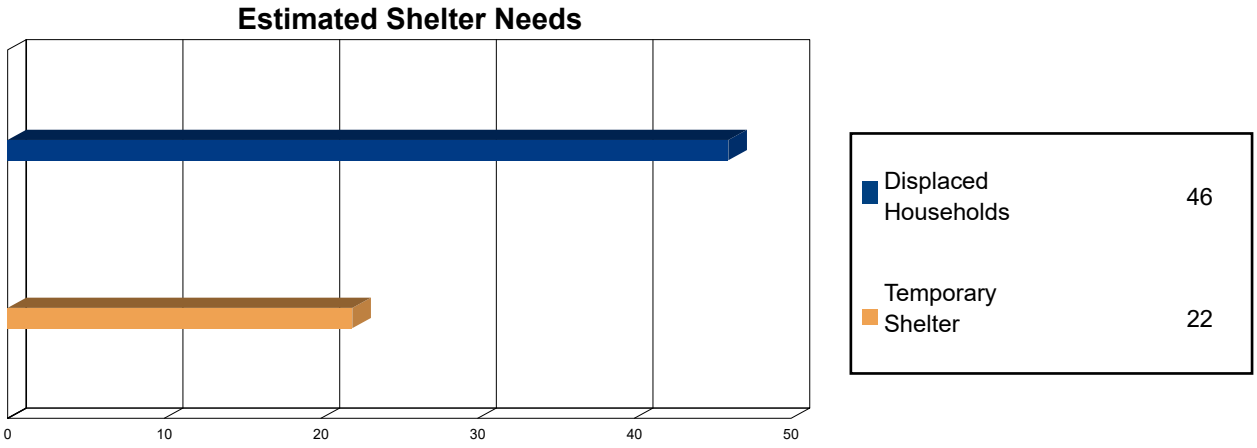


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 19,696 tons of debris will be generated. Of the total amount, 8,081 tons (41%) is Other Tree Debris. Of the remaining 11,615 tons, Brick/Wood comprises 53% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 245 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,493 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 46 households to be displaced due to the hurricane. Of these, 22 people (out of a total population of 26,712) will seek temporary shelter in public shelters.

Economic Loss

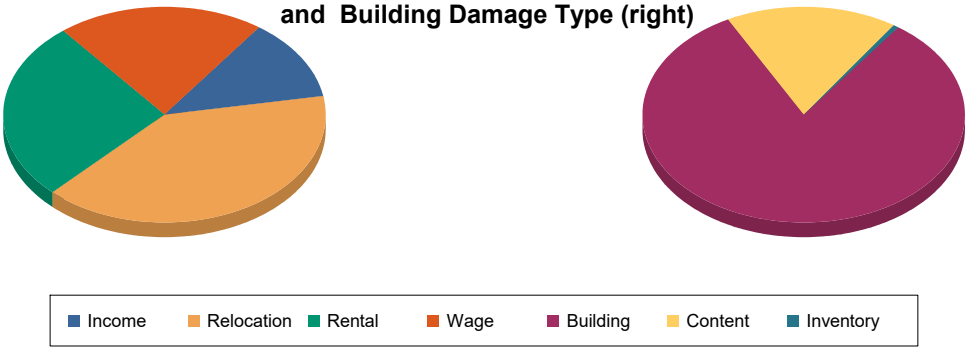
The total economic loss estimated for the hurricane is 78.0 million dollars, which represents 1.10 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 78 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 81% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

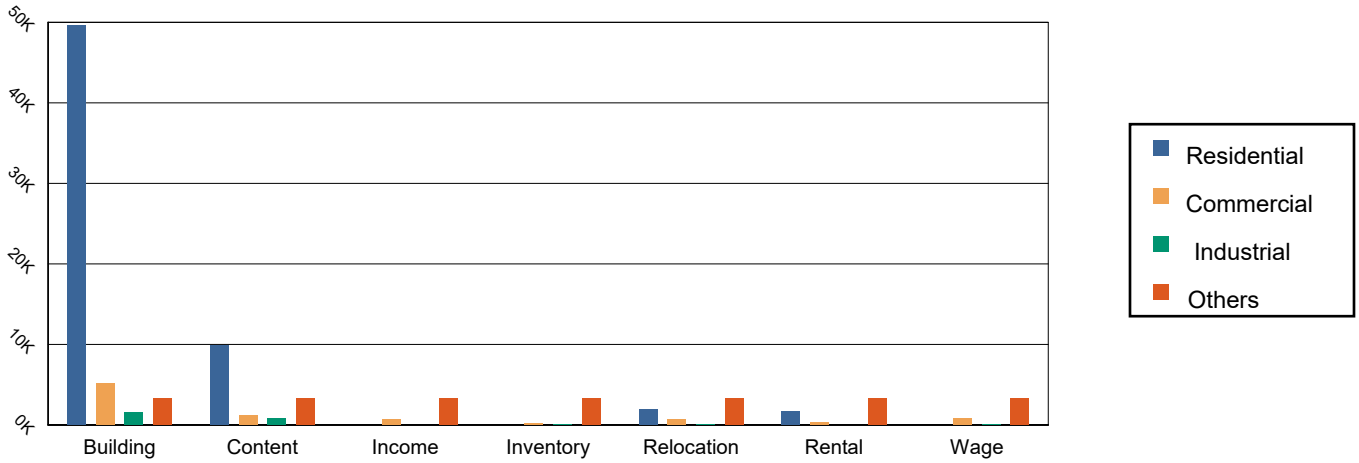


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	49,601.59	5,110.83	1,576.87	1,725.32	58,014.60
	Content	9,829.16	1,167.39	823.32	336.61	12,156.48
	Inventory	0.00	161.12	111.09	44.96	317.18
	Subtotal	**59,430.75**	**6,439.34**	**2,511.28**	**2,106.89**	**70,488.26**
Business Interruption Loss						
	Income	0.00	662.26	15.61	240.57	918.44
	Relocation	1,999.49	703.13	49.68	254.84	3,007.13
	Rental	1,657.96	335.19	9.85	23.18	2,026.18
	Wage	0.00	866.34	25.69	666.61	1,558.64
	Subtotal	**3,657.45**	**2,566.92**	**100.83**	**1,185.20**	**7,510.39**

Total

Total	**63,088.20**	**9,006.26**	**2,612.10**	**3,292.09**	**77,998.65**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,491	2,809,914	7,066,405
Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**
Study Region Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**

Hazus: Hurricane Global Risk Report

Region Name:	Farmington_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Wednesday, May 10, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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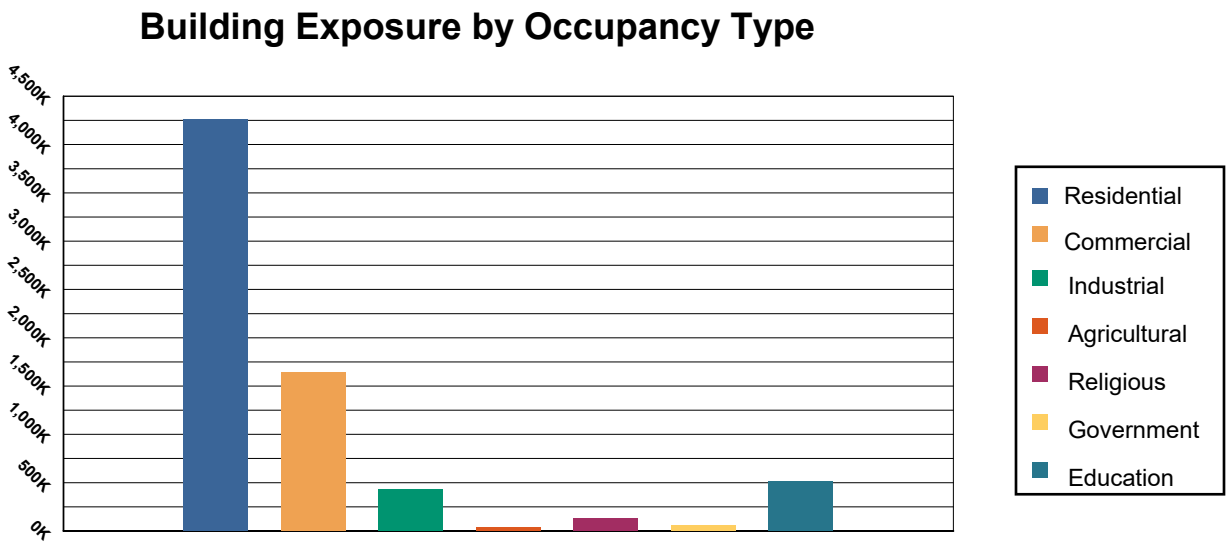

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Agricultural	30,970	0.44%
Religious	131,044	1.85%
Government	58,596	0.83%
Education	516,486	7.31%
Total	**7,066,405**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds. There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 361 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 8 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

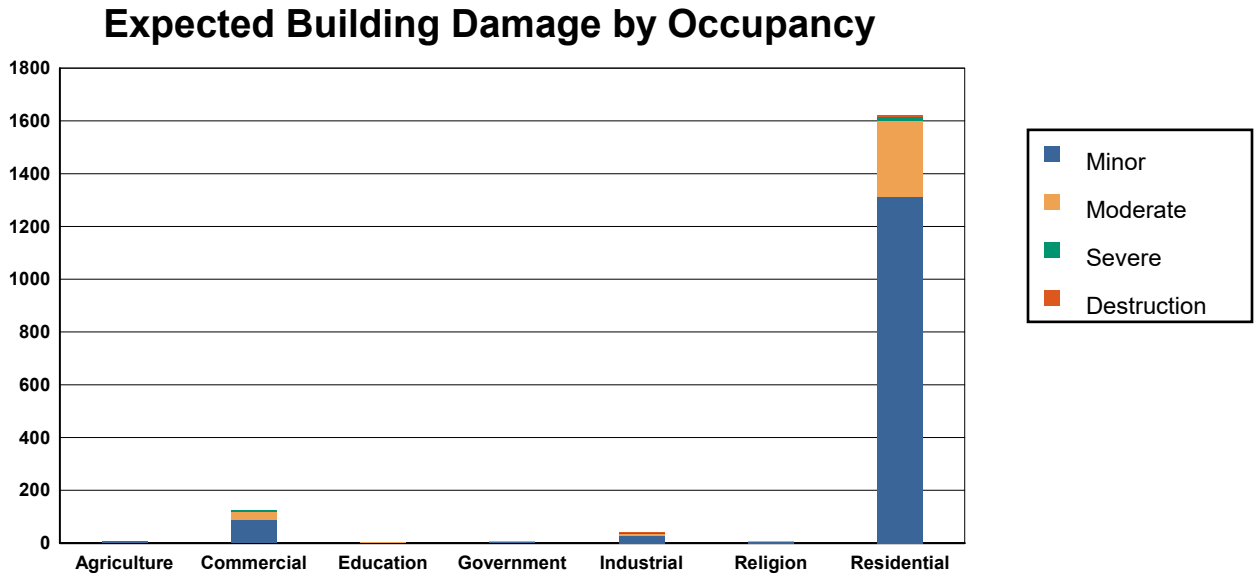


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	23.27	75.07	5.34	17.23	1.55	4.98	0.75	2.42	0.09	0.30
Commercial	490.05	79.81	89.81	14.63	28.49	4.64	5.61	0.91	0.03	0.01
Education	17.07	81.27	3.08	14.65	0.80	3.80	0.06	0.29	0.00	0.00
Government	32.30	82.81	5.42	13.91	1.22	3.12	0.06	0.16	0.00	0.00
Industrial	154.54	79.66	27.27	14.06	9.15	4.71	2.76	1.42	0.28	0.15
Religion	21.47	79.52	4.51	16.71	0.95	3.51	0.07	0.26	0.00	0.00
Residential	4,827.45	74.87	1,311.07	20.33	288.02	4.47	14.23	0.22	7.23	0.11
Total	**5,566.15**		**1,446.51**		**330.17**		**23.54**		**7.64**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	105	78.99	21	15.68	7	5.11	0	0.23	0	0.00
Masonry	598	73.15	133	16.29	78	9.59	7	0.88	1	0.10
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	376	80.89	62	13.29	22	4.81	5	1.01	0	0.01
Wood	4,543	76.20	1,223	20.51	176	2.96	13	0.21	7	0.11

Essential Facility Damage

Before the hurricane, the region had 137 hospital beds available for use. On the day of the hurricane, the model estimates that 137 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

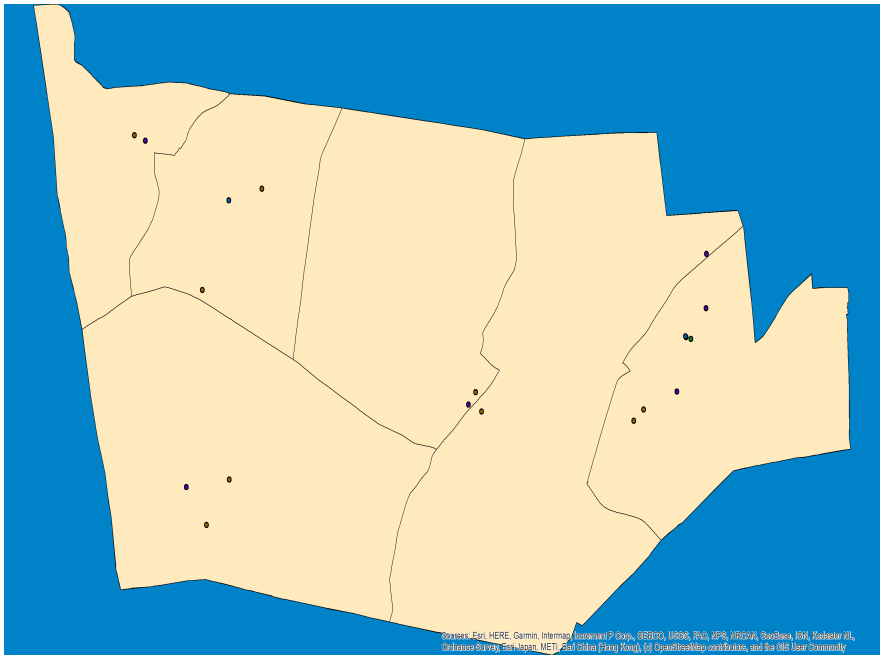
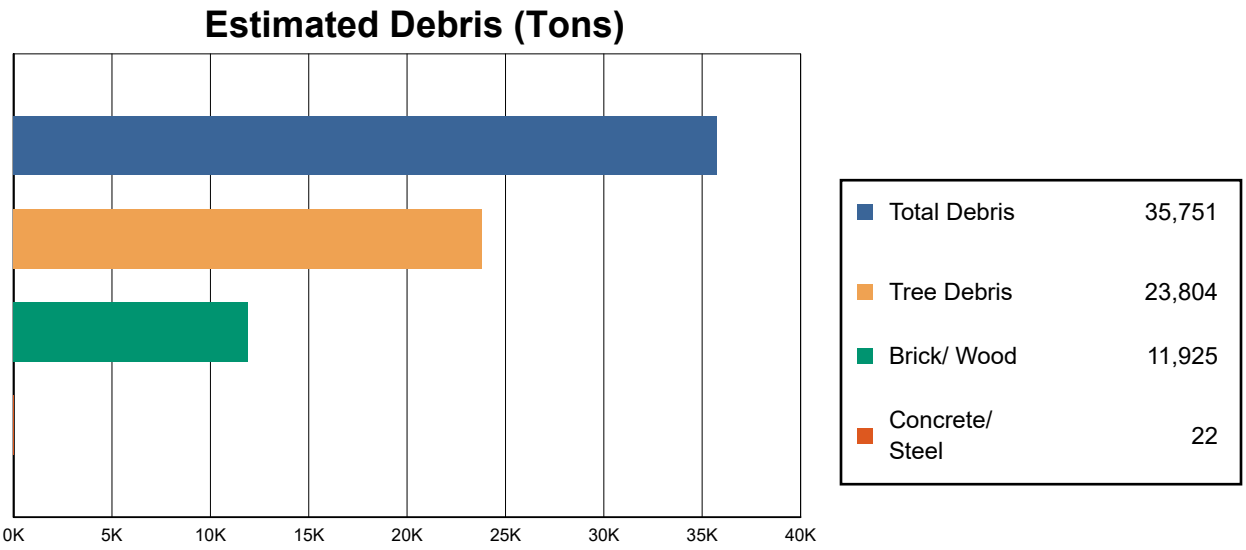


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	10	0	0	4

Induced Hurricane Damage

Debris Generation

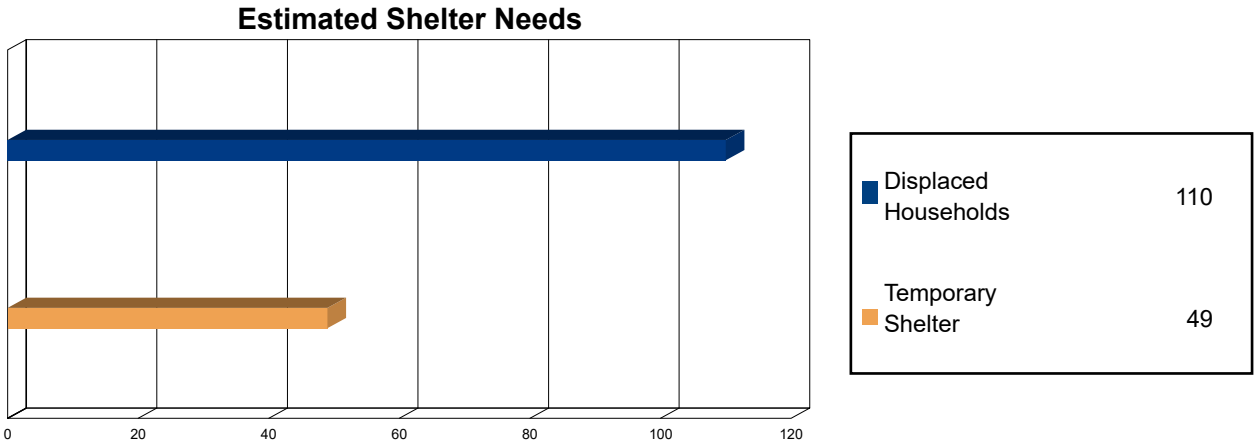


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 35,751 tons of debris will be generated. Of the total amount, 14,264 tons (40%) is Other Tree Debris. Of the remaining 21,487 tons, Brick/Wood comprises 55% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 478 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,540 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 110 households to be displaced due to the hurricane. Of these, 49 people (out of a total population of 26,712) will seek temporary shelter in public shelters.

Economic Loss

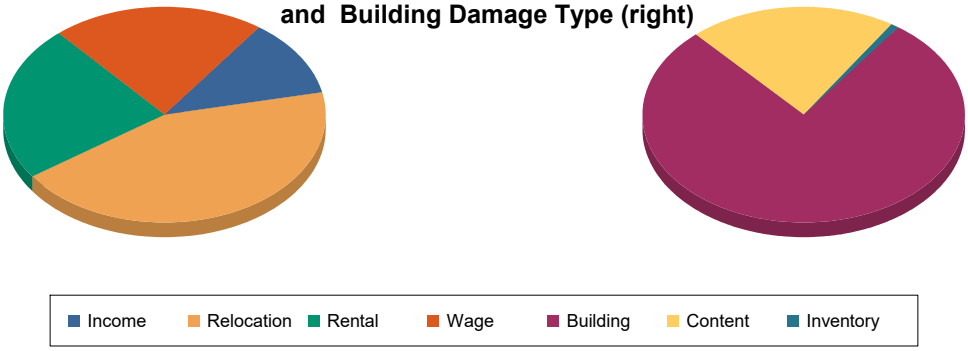
The total economic loss estimated for the hurricane is 166.1 million dollars, which represents 2.35 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 166 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 75% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

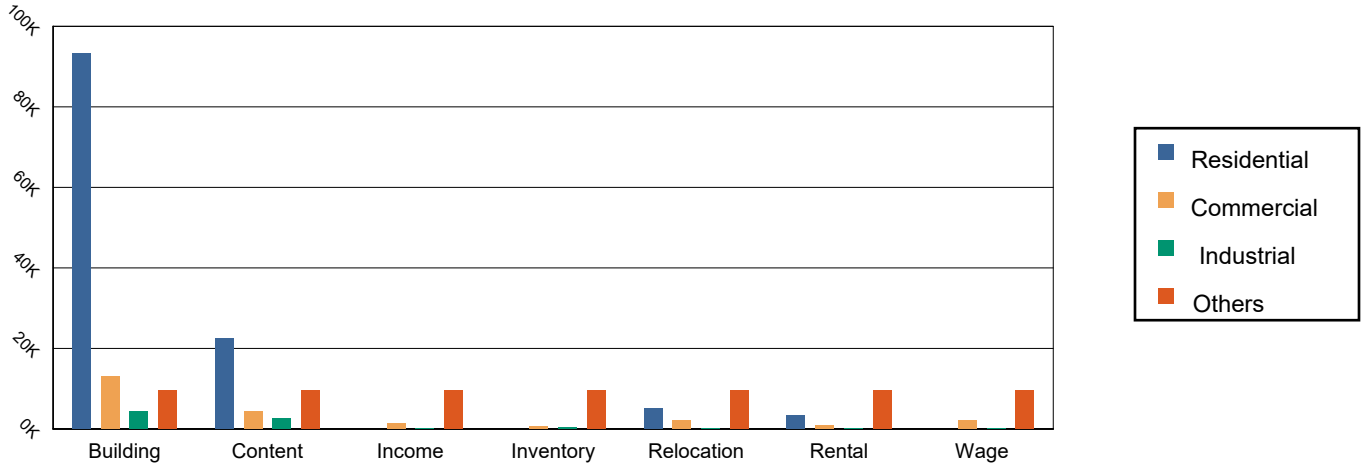


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	93,273.42	13,094.51	4,384.43	4,646.86	115,399.22
	Content	22,599.46	4,283.22	2,728.27	1,349.61	30,960.56
	Inventory	0.00	607.54	366.30	137.49	1,111.33
	Subtotal	**115,872.88**	**17,985.27**	**7,479.00**	**6,133.96**	**147,471.11**
Business Interruption Loss						
	Income	0.00	1,496.90	52.06	639.14	2,188.10
	Relocation	5,049.75	2,028.50	186.69	867.70	8,132.64
	Rental	3,296.99	925.26	34.38	77.04	4,333.68
	Wage	0.00	2,018.18	85.60	1,870.73	3,974.51
	Subtotal	**8,346.74**	**6,468.84**	**358.73**	**3,454.61**	**18,628.92**

Total

Total	124,219.62	24,454.11	7,837.73	9,588.57	166,100.04

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,491	2,809,914	7,066,405
Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**
Study Region Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**

Hazus: Hurricane Global Risk Report

Region Name:	Farmington_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Wednesday, May 10, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.78 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 26,712 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 7,066 million dollars. Approximately 87% of the buildings (and 60% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,374 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

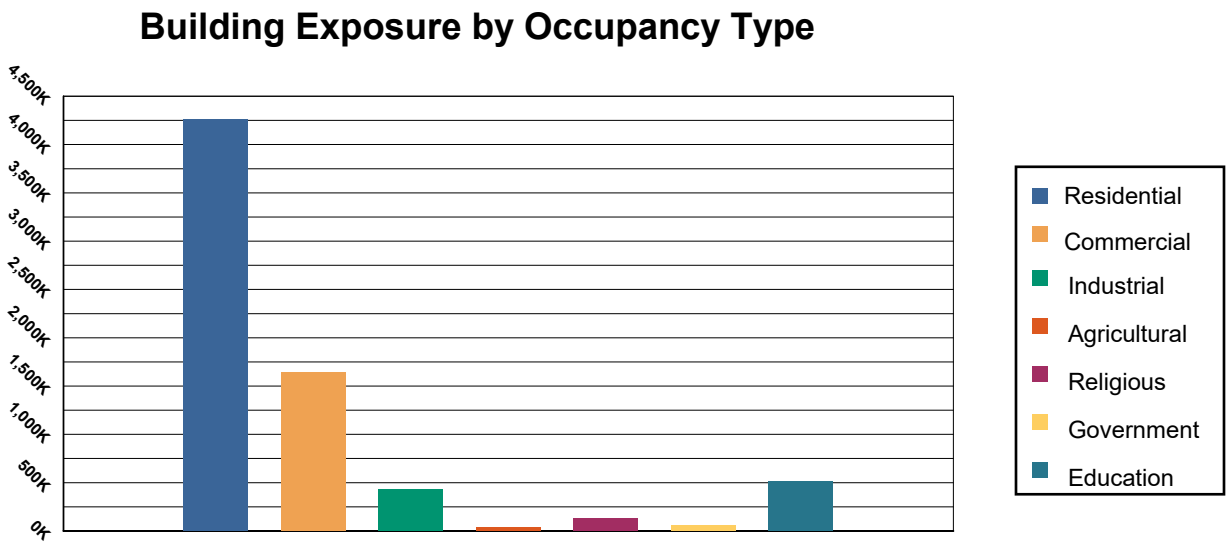


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,256,491	60.24%
Commercial	1,638,979	23.19%
Industrial	433,839	6.14%
Agricultural	30,970	0.44%
Religious	131,044	1.85%
Government	58,596	0.83%
Education	516,486	7.31%
Total	**7,066,405**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds. There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 631 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the region. There are an estimated 22 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

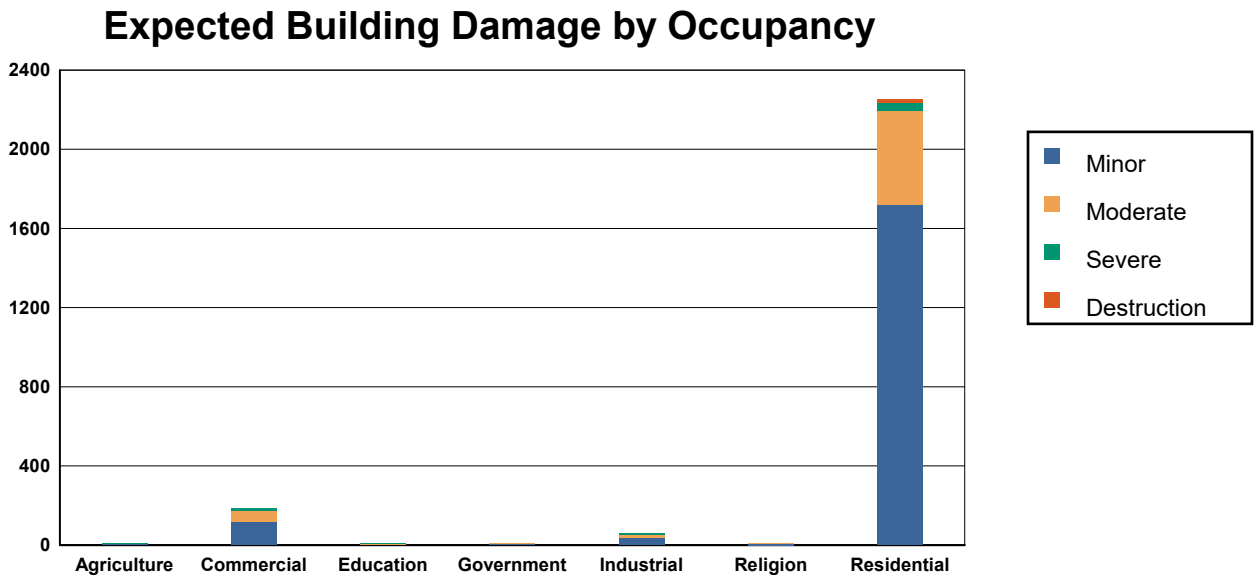


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	20.02	64.59	7.06	22.78	2.51	8.09	1.22	3.93	0.19	0.60
Commercial	430.90	70.18	120.41	19.61	51.19	8.34	11.41	1.86	0.10	0.02
Education	15.03	71.57	4.17	19.84	1.61	7.68	0.19	0.92	0.00	0.00
Government	28.83	73.93	7.38	18.92	2.57	6.58	0.23	0.58	0.00	0.00
Industrial	135.11	69.65	36.43	18.78	16.75	8.63	5.14	2.65	0.57	0.29
Religion	18.93	70.12	6.02	22.31	1.84	6.82	0.20	0.75	0.00	0.00
Residential	4,193.04	65.03	1,719.27	26.66	478.14	7.42	36.91	0.57	20.65	0.32
Total	**4,841.87**		**1,900.73**		**554.60**		**55.29**		**21.50**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	91	68.75	27	20.43	13	10.03	1	0.79	0	0.00
Masonry	517	63.21	167	20.40	119	14.51	14	1.67	2	0.21
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	331	71.19	83	17.82	41	8.88	10	2.09	0	0.02
Wood	3,961	66.43	1,630	27.33	320	5.37	32	0.54	19	0.32

Essential Facility Damage

Before the hurricane, the region had 137 hospital beds available for use. On the day of the hurricane, the model estimates that 137 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

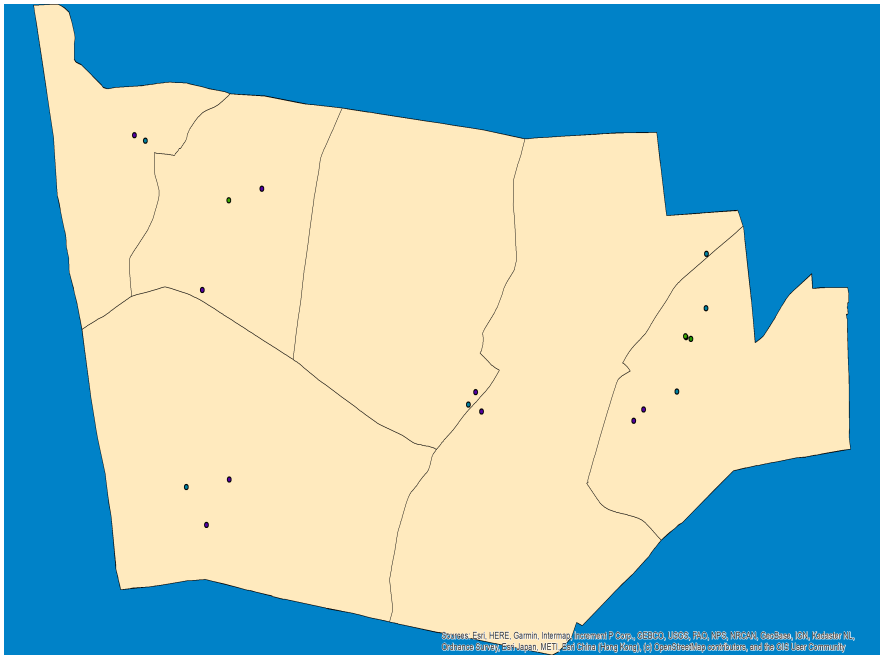
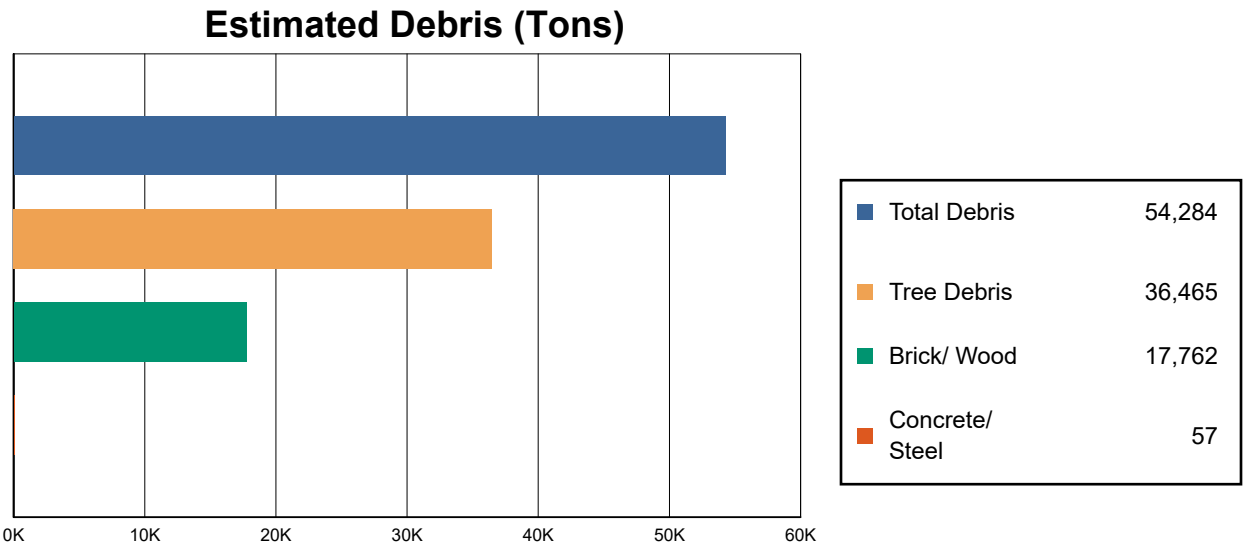


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	10	1	0	0

Induced Hurricane Damage

Debris Generation

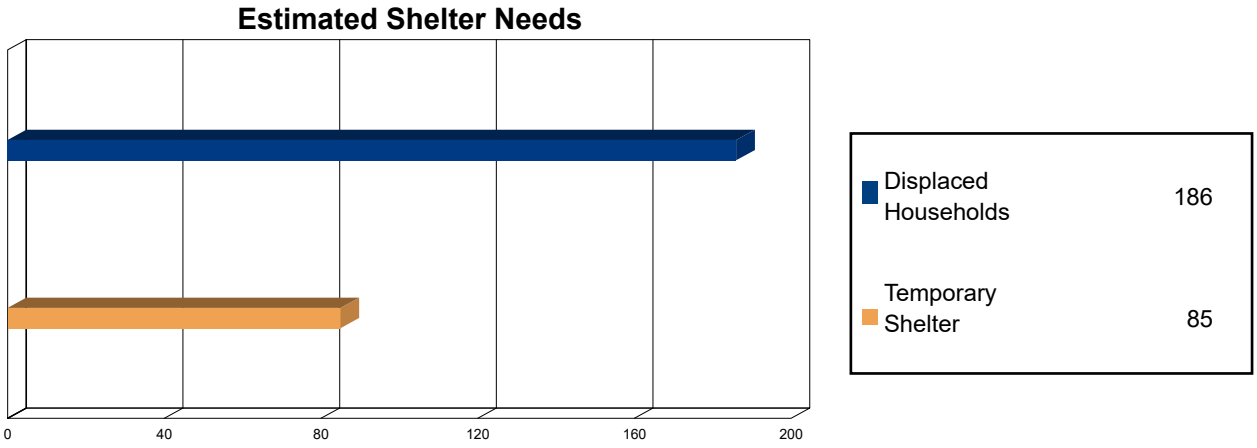


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 54,284 tons of debris will be generated. Of the total amount, 21,570 tons (40%) is Other Tree Debris. Of the remaining 32,714 tons, Brick/Wood comprises 54% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 713 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 14,895 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 186 households to be displaced due to the hurricane. Of these, 85 people (out of a total population of 26,712) will seek temporary shelter in public shelters.

Economic Loss

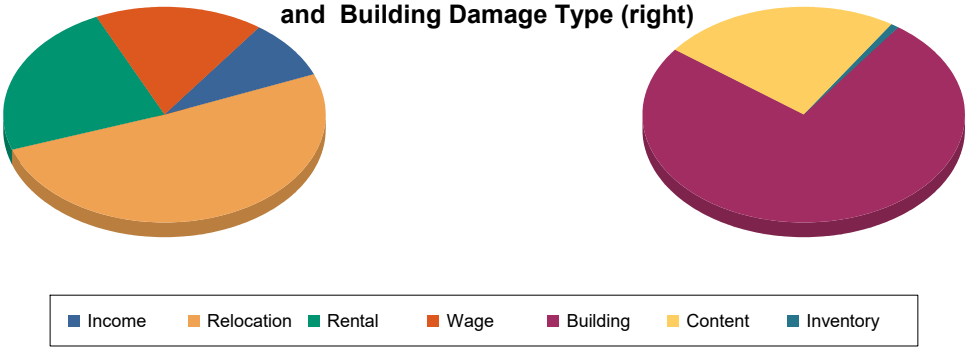
The total economic loss estimated for the hurricane is 269.6 million dollars, which represents 3.82 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 270 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 73% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

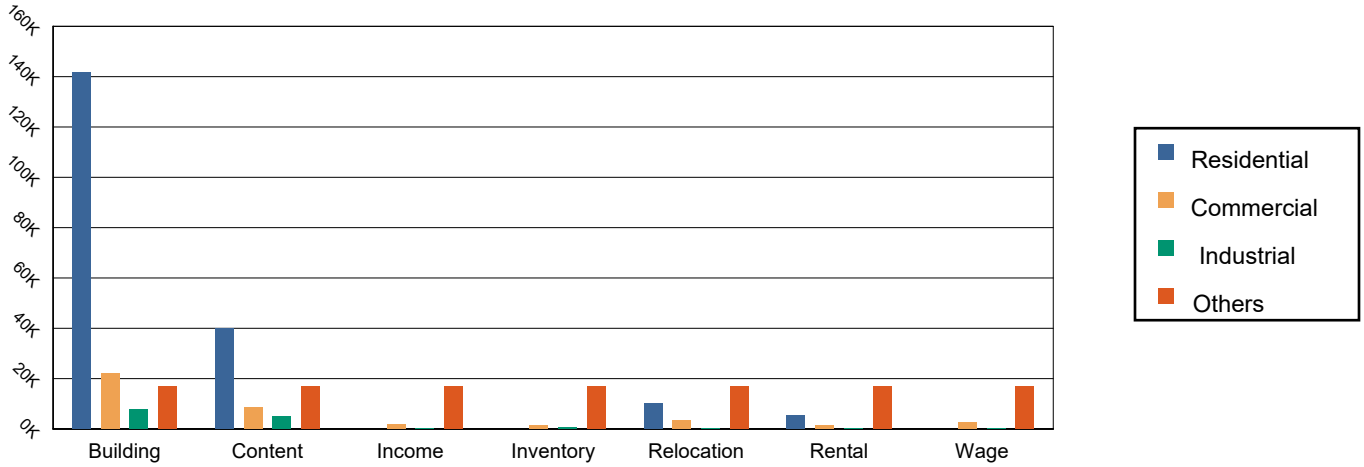


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	141,567.78	22,096.63	7,760.31	8,313.46	179,738.17
	Content	39,837.53	8,622.91	5,197.02	3,048.39	56,705.85
	Inventory	0.00	1,213.03	695.29	255.81	2,164.13
	Subtotal	**181,405.31**	**31,932.56**	**13,652.62**	**11,617.65**	**238,608.14**
Business Interruption Loss						
	Income	0.11	1,802.26	85.80	896.28	2,784.44
	Relocation	10,245.18	3,463.75	350.17	1,655.61	15,714.72
	Rental	5,476.99	1,581.50	58.65	144.71	7,261.85
	Wage	0.26	2,427.98	141.20	2,684.36	5,253.80
	Subtotal	**15,722.55**	**9,275.49**	**635.82**	**5,380.95**	**31,014.81**

Total

Total	197,127.86	41,208.05	14,288.44	16,998.60	269,622.95

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,712	4,256,491	2,809,914	7,066,405
Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**
Study Region Total	**26,712**	**4,256,491**	**2,809,914**	**7,066,405**

Hazus: Hurricane Global Risk Report

Region Name:	Glastonbury_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 52.19 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 35,159 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 12 thousand buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 86% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

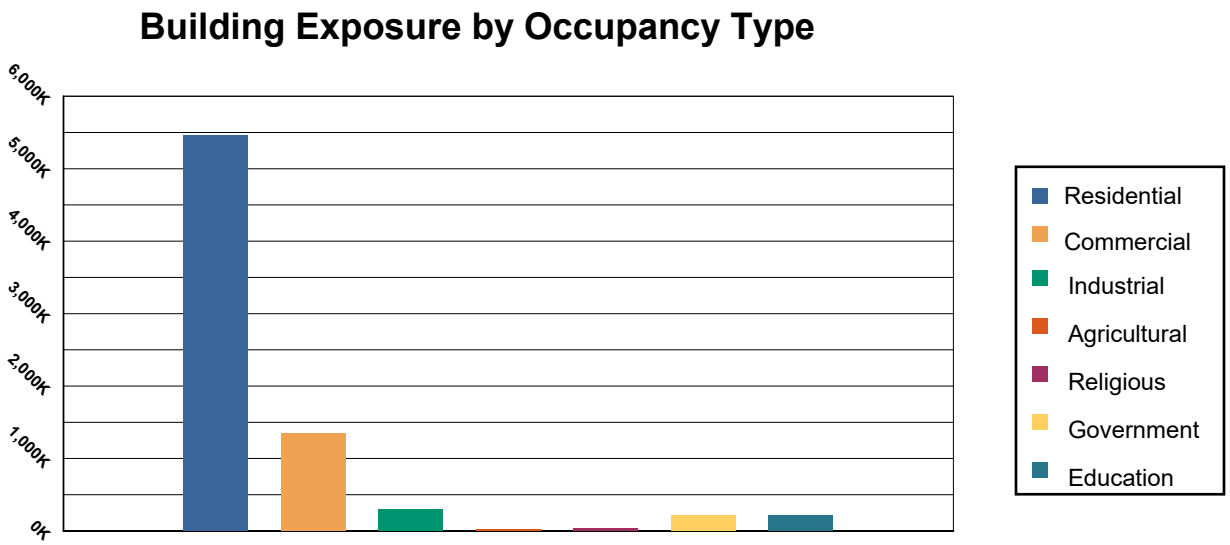


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,462,455	71.95%
Commercial	1,351,175	17.80%
Industrial	302,249	3.98%
Agricultural	15,685	0.21%
Religious	36,247	0.48%
Government	218,143	2.87%
Education	206,241	2.72%
Total	**7,592,195**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 9 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

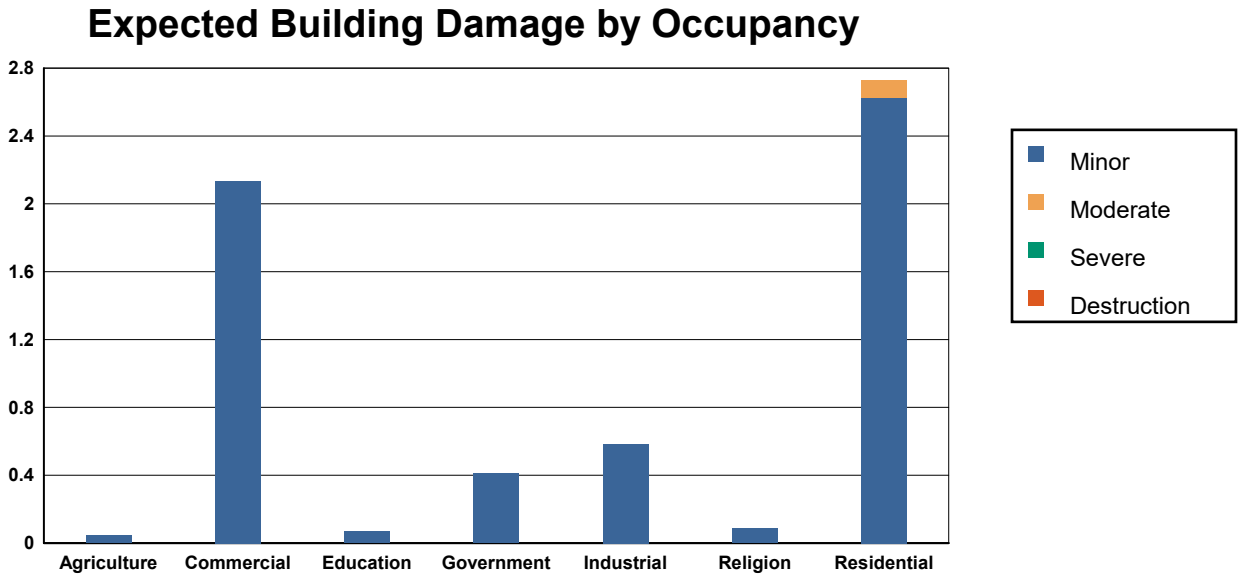


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	37.96	99.88	0.04	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1,074.87	99.80	2.13	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Education	30.93	99.78	0.07	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Government	245.59	99.83	0.41	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	290.42	99.80	0.58	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Religion	48.91	99.82	0.09	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Residential	10,620.27	99.97	2.62	0.02	0.10	0.00	0.00	0.00	0.00	0.00
Total	**12,348.94**		**5.95**		**0.10**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	187	99.76	0	0.24	0	0.00	0	0.00	0	0.00
Masonry	1,036	99.76	2	0.23	0	0.00	0	0.00	0	0.00
MH	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	817	99.79	2	0.21	0	0.00	0	0.00	0	0.00
Wood	10,300	99.99	1	0.01	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

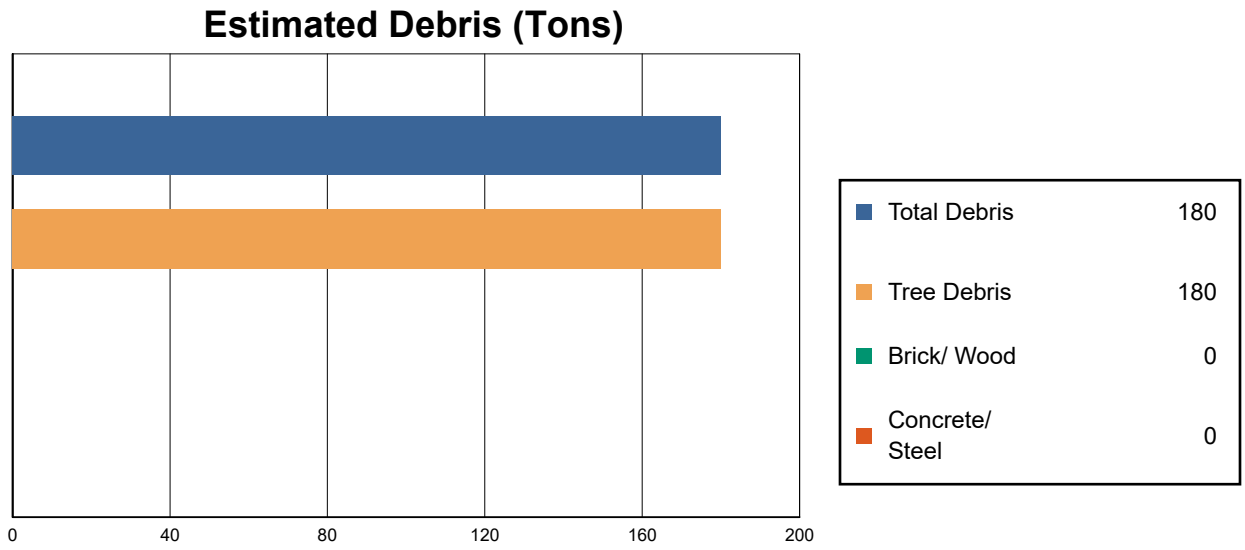
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	9	0	0	9

Induced Hurricane Damage

Debris Generation

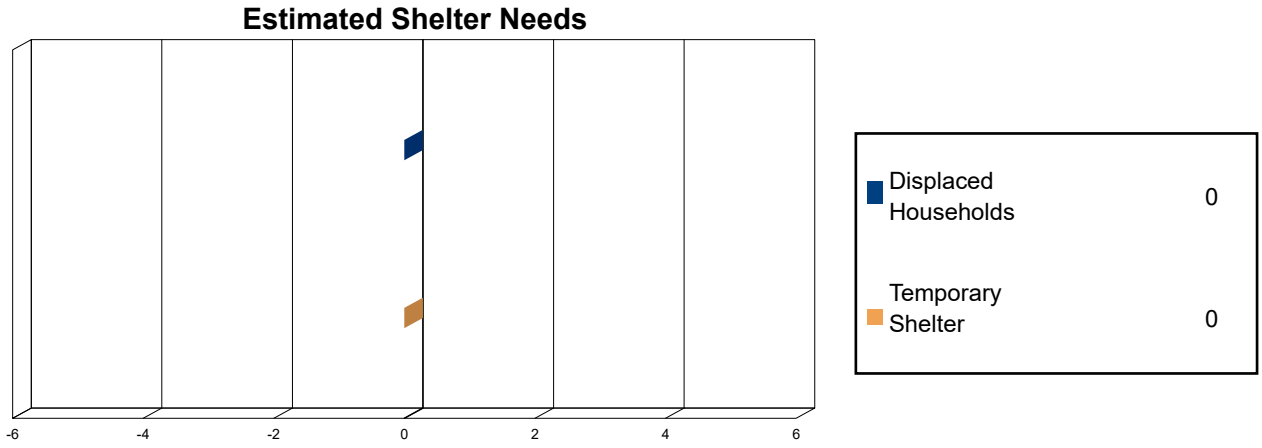


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 180 tons of debris will be generated. Of the total amount, 103 tons (57%) is Other Tree Debris. Of the remaining 77 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 77 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 35,159) will seek temporary shelter in public shelters.

Economic Loss

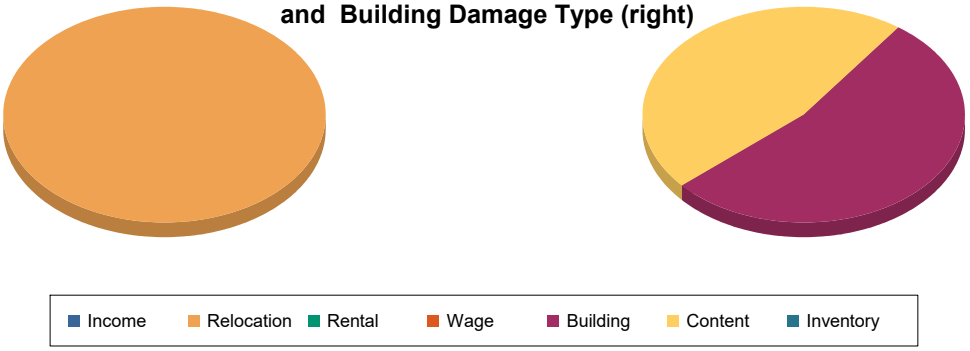
The total economic loss estimated for the hurricane is 0.4 million dollars, which represents 0.01 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	225.56	0.00	0.00	0.00	225.56
	Content	194.78	0.00	0.00	0.00	194.78
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**420.34**	**0.00**	**0.00**	**0.00**	**420.34**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.27	0.00	0.00	0.00	0.27
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.27**	**0.00**	**0.00**	**0.00**	**0.27**

Total

Total	**420.60**	**0.00**	**0.00**	**0.00**	**420.60**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	35,159	5,462,455	2,129,740	7,592,195
Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**
Study Region Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**

Hazus: Hurricane Global Risk Report

Region Name:	Glastonbury_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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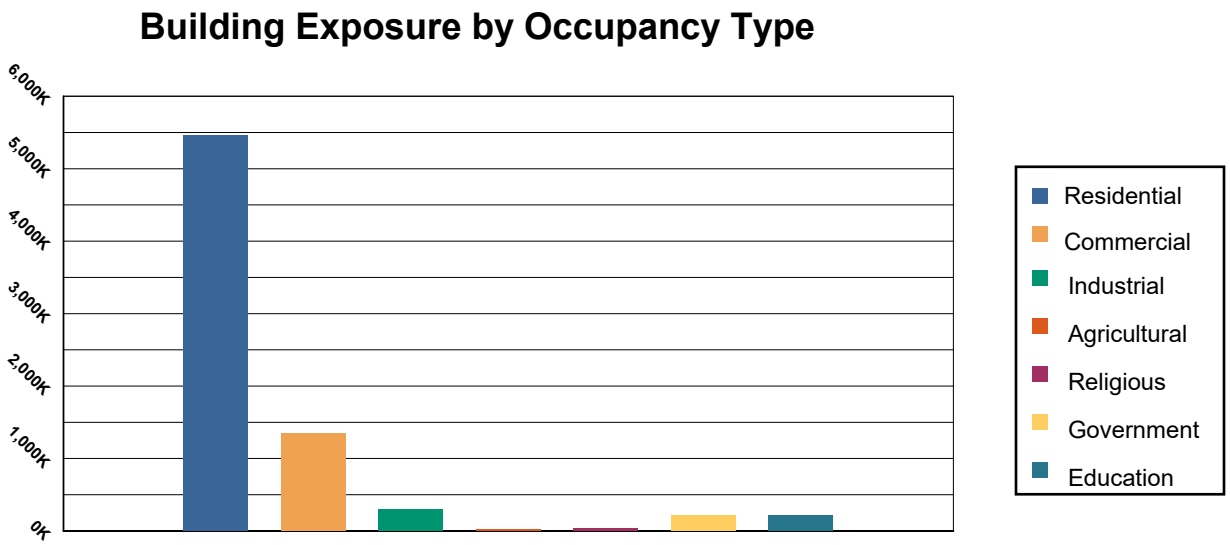


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,462,455	71.95%
Commercial	1,351,175	17.80%
Industrial	302,249	3.98%
Agricultural	15,685	0.21%
Religious	36,247	0.48%
Government	218,143	2.87%
Education	206,241	2.72%
Total	**7,592,195**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 9 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

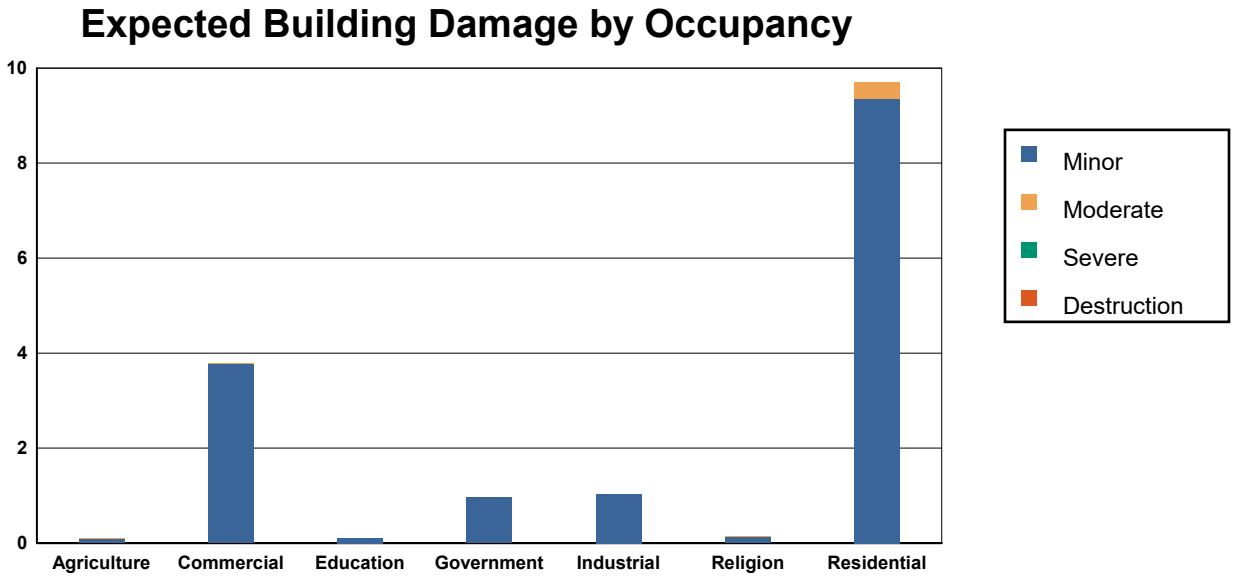


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	37.89	99.72	0.10	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1,073.21	99.65	3.78	0.35	0.01	0.00	0.00	0.00	0.00	0.00
Education	30.89	99.65	0.11	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Government	245.04	99.61	0.96	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	289.97	99.65	1.03	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Religion	48.86	99.72	0.14	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Residential	10,613.31	99.91	9.35	0.09	0.34	0.00	0.00	0.00	0.00	0.00
Total	**12,339.17**		**15.47**		**0.35**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	186	99.55	1	0.45	0	0.00	0	0.00	0	0.00
Masonry	1,033	99.52	5	0.47	0	0.01	0	0.00	0	0.00
MH	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	816	99.62	3	0.38	0	0.00	0	0.00	0	0.00
Wood	10,296	99.95	5	0.05	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

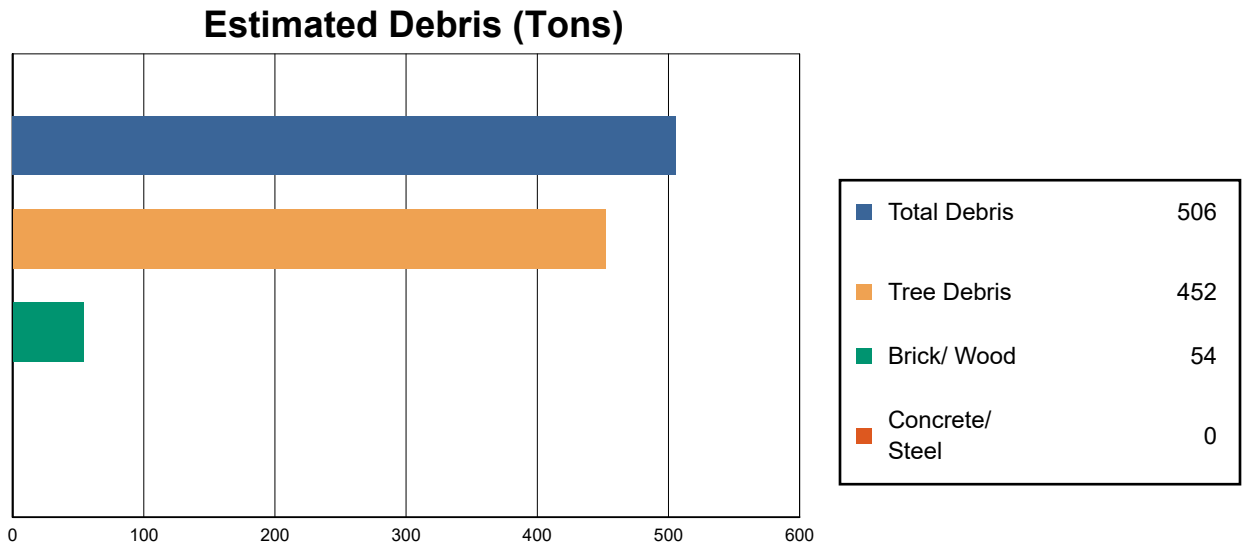
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	9	0	0	9

Induced Hurricane Damage

Debris Generation

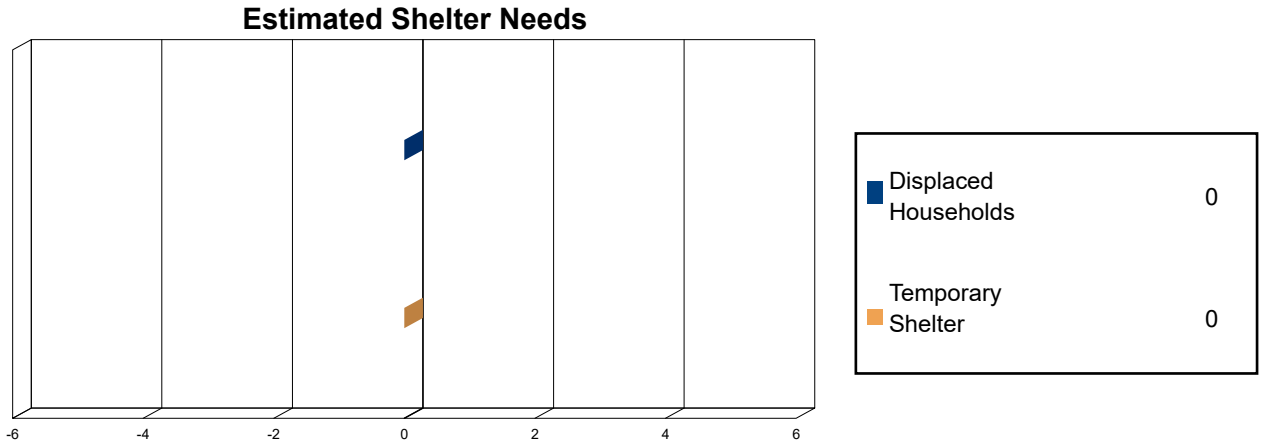


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 506 tons of debris will be generated. Of the total amount, 239 tons (47%) is Other Tree Debris. Of the remaining 267 tons, Brick/Wood comprises 20% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 213 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 35,159) will seek temporary shelter in public shelters.

Economic Loss

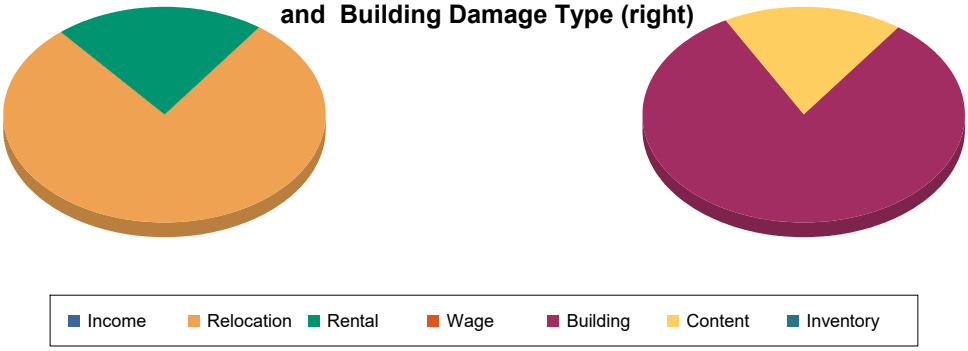
The total economic loss estimated for the hurricane is 3.2 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 3 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 93% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

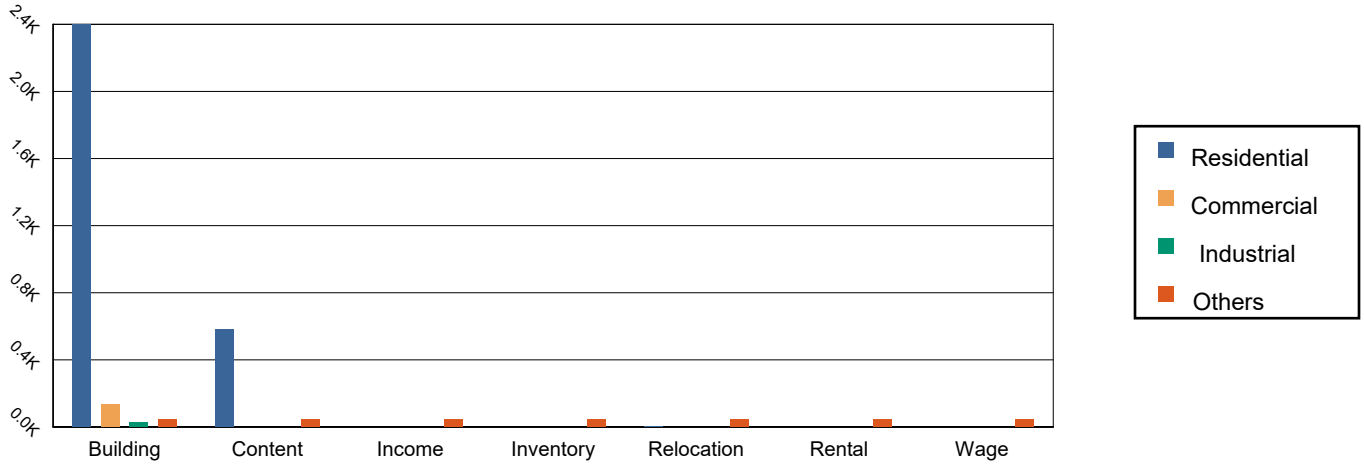


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,399.34	135.12	30.22	46.06	2,610.74
	Content	579.22	0.00	0.00	0.00	579.22
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2,978.56**	**135.12**	**30.22**	**46.06**	**3,189.97**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	1.05	0.04	0.00	0.00	1.10
	Rental	0.29	0.00	0.00	0.00	0.29
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1.34**	**0.04**	**0.00**	**0.00**	**1.39**

Total

Total	2,979.90	135.16	30.22	46.07	3,191.36

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	35,159	5,462,455	2,129,740	7,592,195
Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**
Study Region Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**

Hazus: Hurricane Global Risk Report

Region Name:	Glastonbury_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 52.19 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 35,159 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 12 thousand buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 86% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

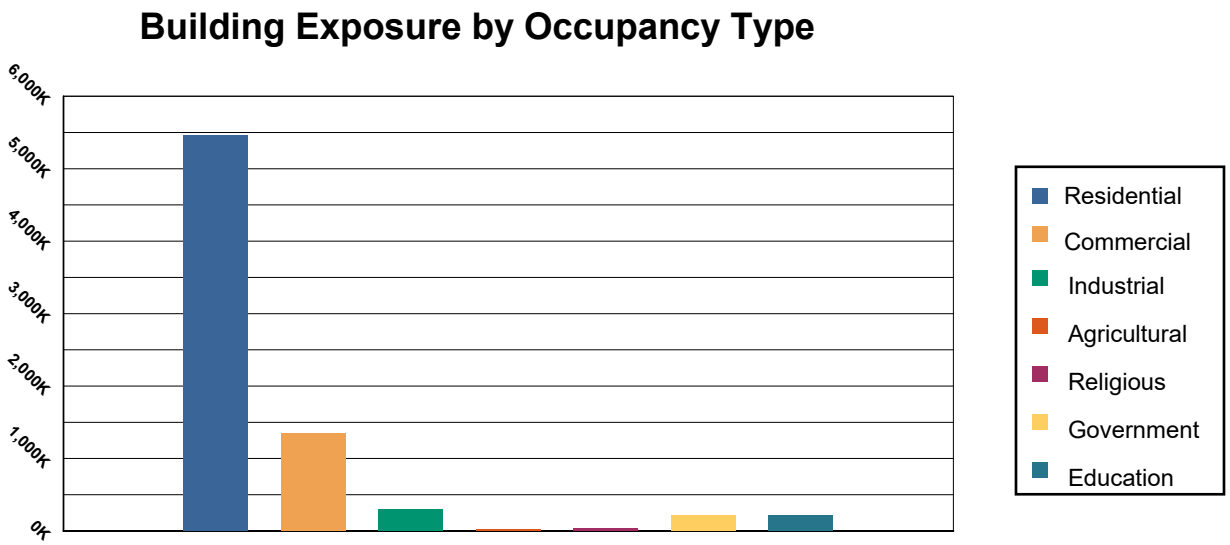


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,462,455	71.95%
Commercial	1,351,175	17.80%
Industrial	302,249	3.98%
Agricultural	15,685	0.21%
Religious	36,247	0.48%
Government	218,143	2.87%
Education	206,241	2.72%
Total	**7,592,195**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 9 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 19 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

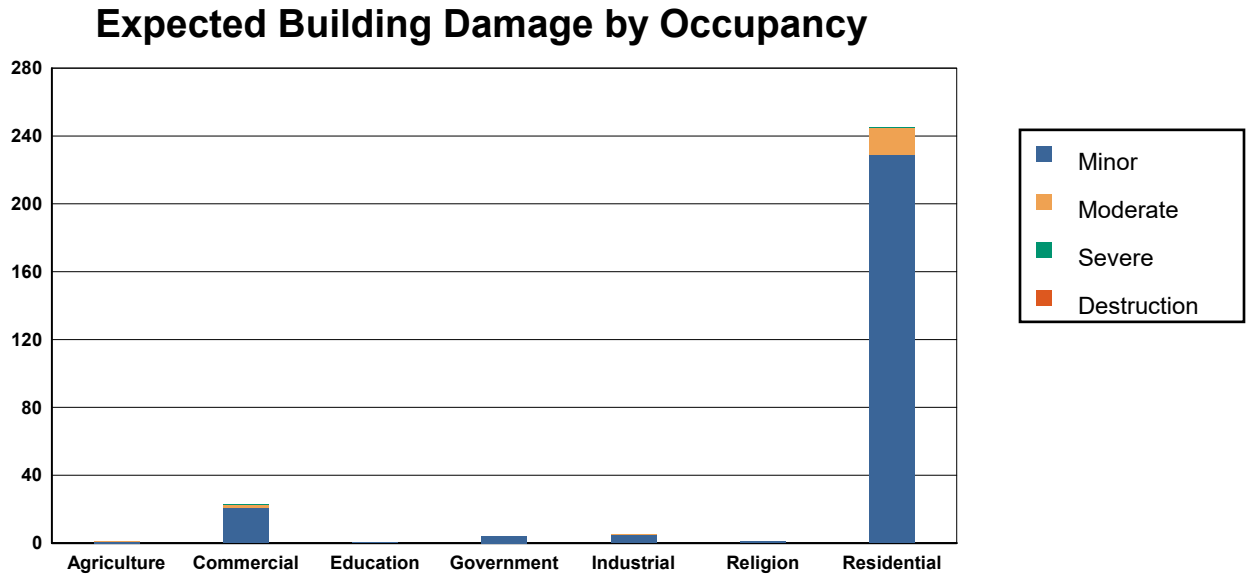


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	37.17	97.82	0.72	1.89	0.08	0.22	0.02	0.06	0.00	0.00
Commercial	1,054.04	97.87	20.93	1.94	1.96	0.18	0.07	0.01	0.00	0.00
Education	30.44	98.18	0.55	1.77	0.01	0.05	0.00	0.00	0.00	0.00
Government	241.87	98.32	4.07	1.65	0.07	0.03	0.00	0.00	0.00	0.00
Industrial	285.57	98.13	5.17	1.78	0.23	0.08	0.03	0.01	0.00	0.00
Religion	48.17	98.30	0.80	1.64	0.03	0.06	0.00	0.00	0.00	0.00
Residential	10,377.93	97.69	229.05	2.16	15.81	0.15	0.20	0.00	0.00	0.00
Total	**12,075.19**		**261.29**		**18.19**		**0.33**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	183	97.84	4	2.12	0	0.04	0	0.00	0	0.00
Masonry	1,003	96.62	29	2.81	6	0.56	0	0.01	0	0.00
MH	2	99.87	0	0.10	0	0.03	0	0.00	0	0.00
Steel	803	98.09	14	1.76	1	0.14	0	0.01	0	0.00
Wood	10,093	97.98	202	1.96	6	0.06	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

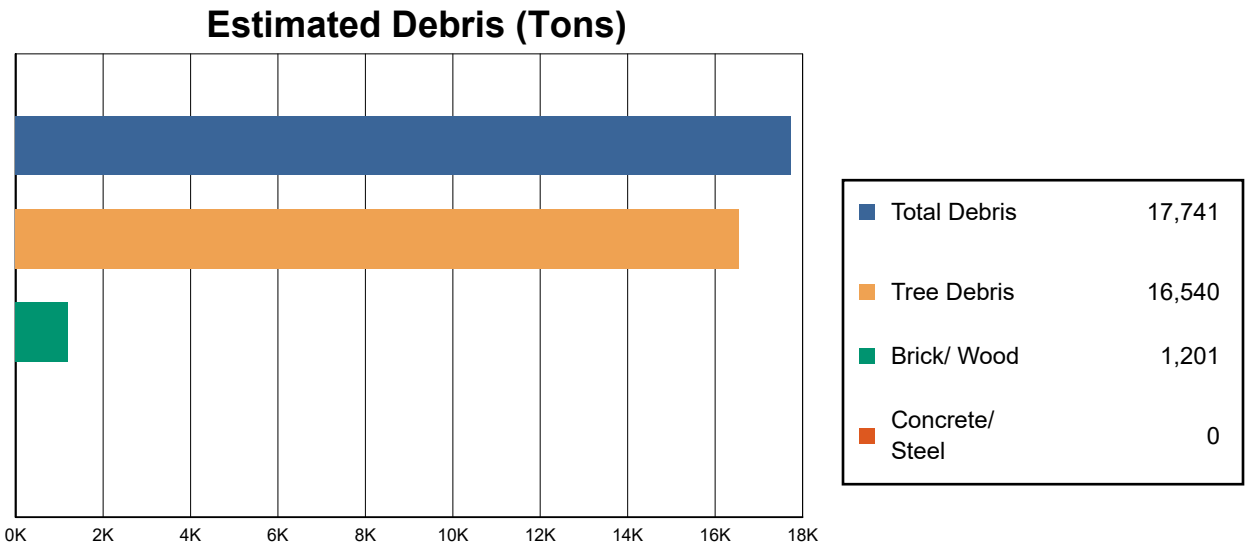
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	9	0	0	9

Induced Hurricane Damage

Debris Generation

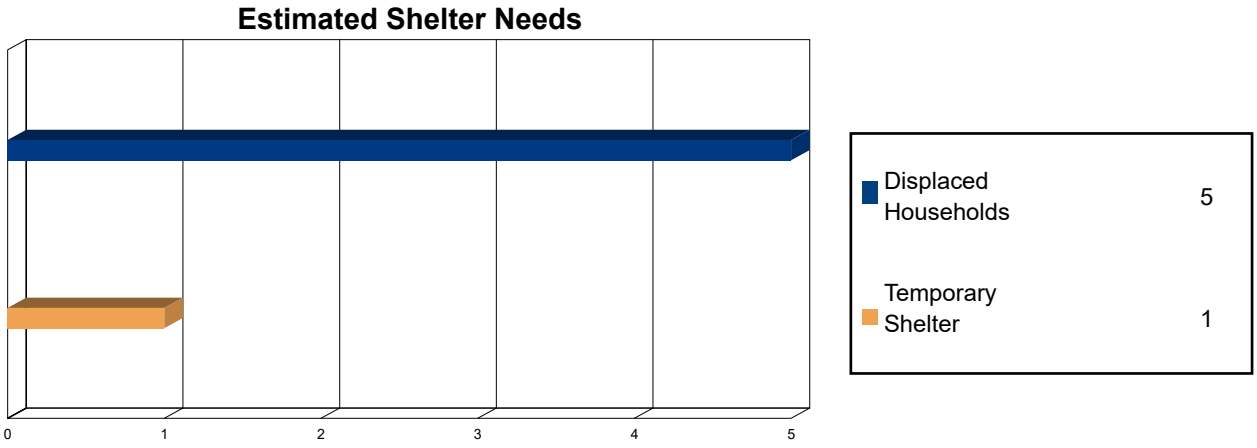


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 17,741 tons of debris will be generated. Of the total amount, 11,352 tons (64%) is Other Tree Debris. Of the remaining 6,389 tons, Brick/Wood comprises 19% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 48 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,188 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 35,159) will seek temporary shelter in public shelters.

Economic Loss

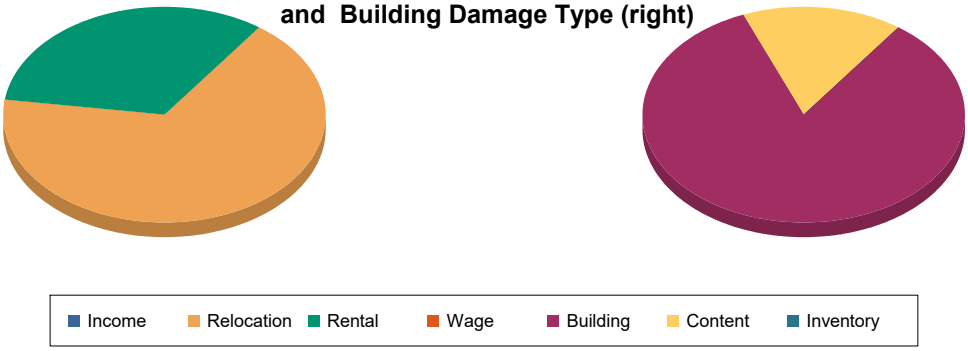
The total economic loss estimated for the hurricane is 25.3 million dollars, which represents 0.33 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 25 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

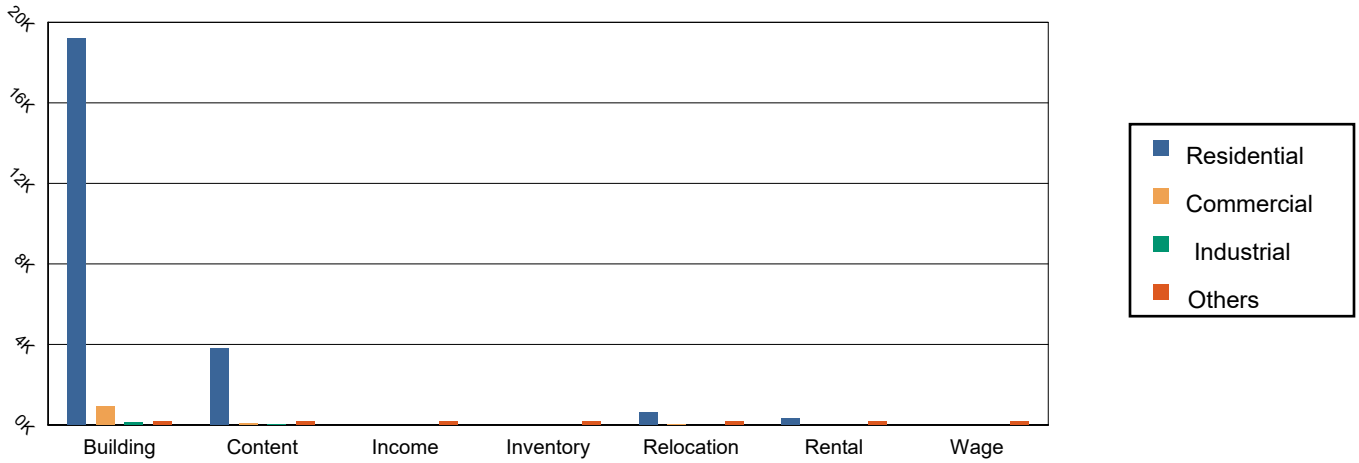


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	19,216.11	908.30	138.57	193.09	20,456.07
	Content	3,798.68	71.57	10.86	2.23	3,883.34
	Inventory	0.00	3.59	1.50	1.64	6.73
	Subtotal	**23,014.79**	**983.46**	**150.93**	**196.96**	**24,346.14**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	644.95	16.30	1.48	1.27	664.00
	Rental	324.41	0.00	0.00	0.00	324.41
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**969.36**	**16.30**	**1.48**	**1.27**	**988.41**

Total

Total	**23,984.15**	**999.77**	**152.41**	**198.23**	**25,334.55**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	35,159	5,462,455	2,129,740	7,592,195
Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**
Study Region Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**

Hazus: Hurricane Global Risk Report

Region Name:	Glastonbury_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
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The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 52.19 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 35,159 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 12 thousand buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 86% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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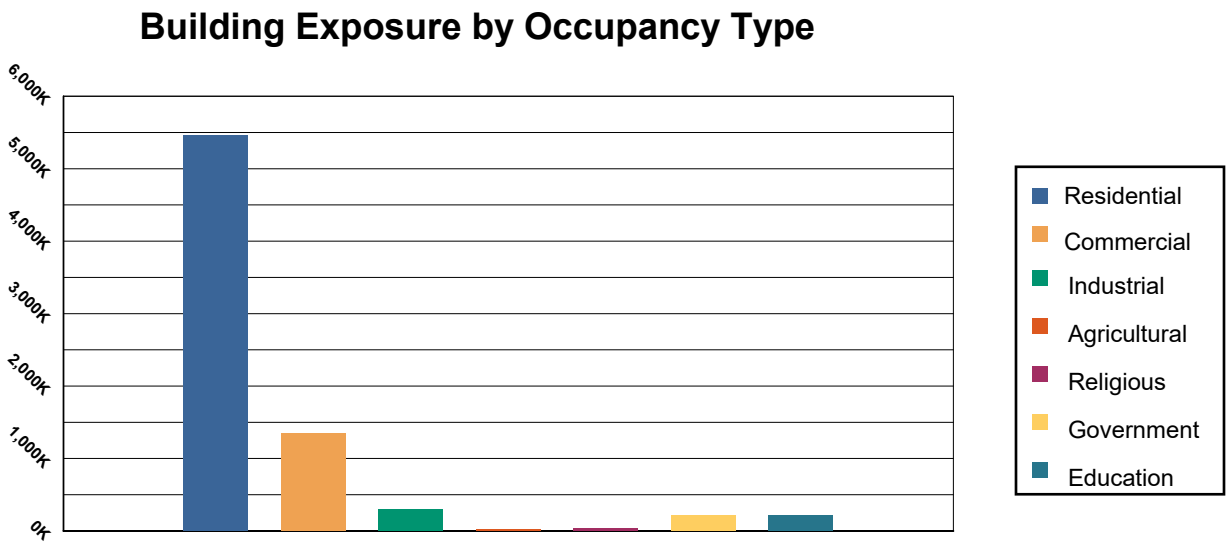

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Occupancy	Exposure ($1000)	Percent of Tot
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Religious	36,247	0.48%
Government	218,143	2.87%
Education	206,241	2.72%
Total	**7,592,195**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 9 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 93 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

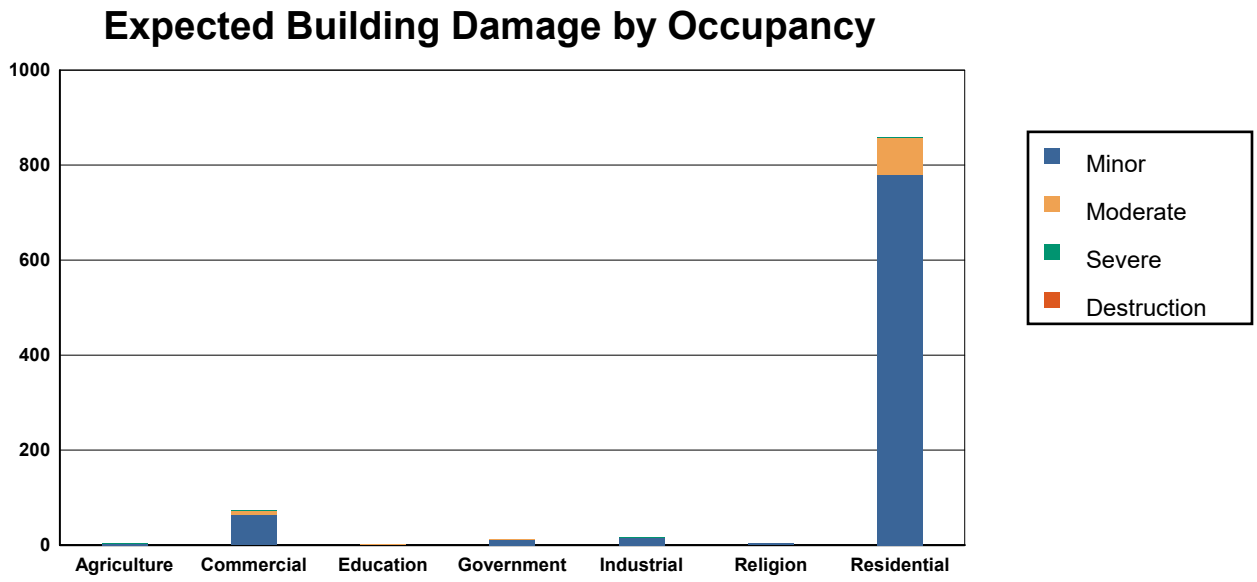


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	35.12	92.43	2.28	5.99	0.41	1.08	0.18	0.47	0.01	0.02
Commercial	1,003.11	93.14	62.96	5.85	9.95	0.92	0.99	0.09	0.00	0.00
Education	29.24	94.33	1.62	5.24	0.13	0.42	0.00	0.01	0.00	0.00
Government	234.29	95.24	10.99	4.47	0.71	0.29	0.01	0.00	0.00	0.00
Industrial	273.92	94.13	14.89	5.12	1.85	0.64	0.33	0.11	0.01	0.00
Religion	46.07	94.02	2.73	5.58	0.19	0.38	0.01	0.01	0.00	0.00
Residential	9,765.02	91.92	779.43	7.34	77.48	0.73	0.94	0.01	0.13	0.00
Total	**11,386.78**		**874.90**		**90.72**		**2.44**		**0.15**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	175	93.63	11	5.78	1	0.58	0	0.01	0	0.00
Masonry	943	90.80	73	7.00	22	2.15	1	0.05	0	0.00
MH	2	98.93	0	0.83	0	0.20	0	0.00	0	0.04
Steel	772	94.21	40	4.86	7	0.81	1	0.12	0	0.00
Wood	9,522	92.44	734	7.13	43	0.42	1	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

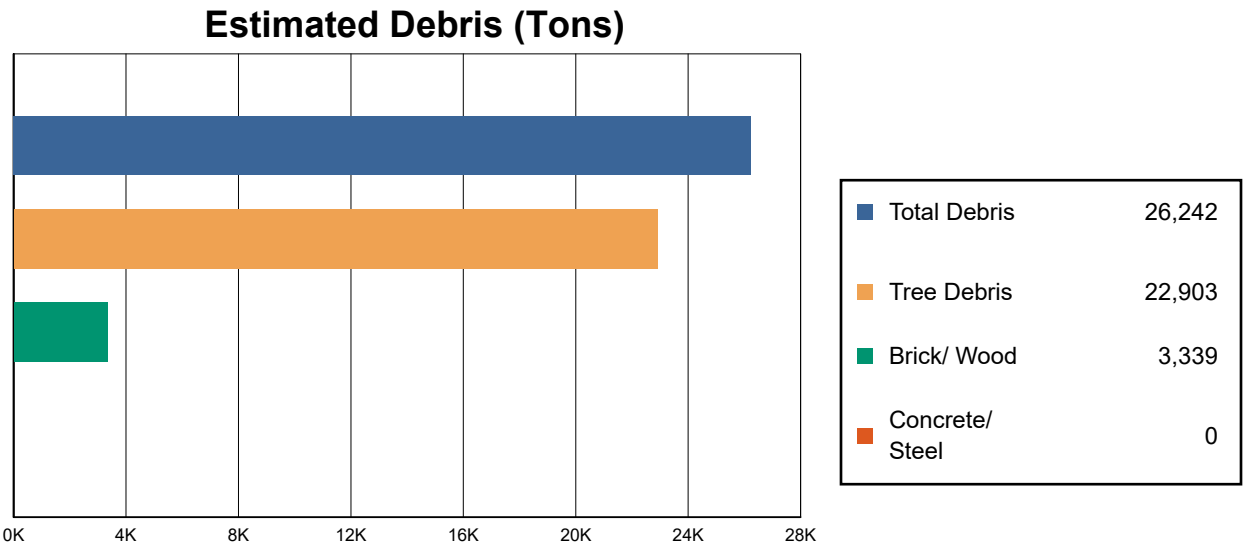
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	9	0	0	9

Induced Hurricane Damage

Debris Generation

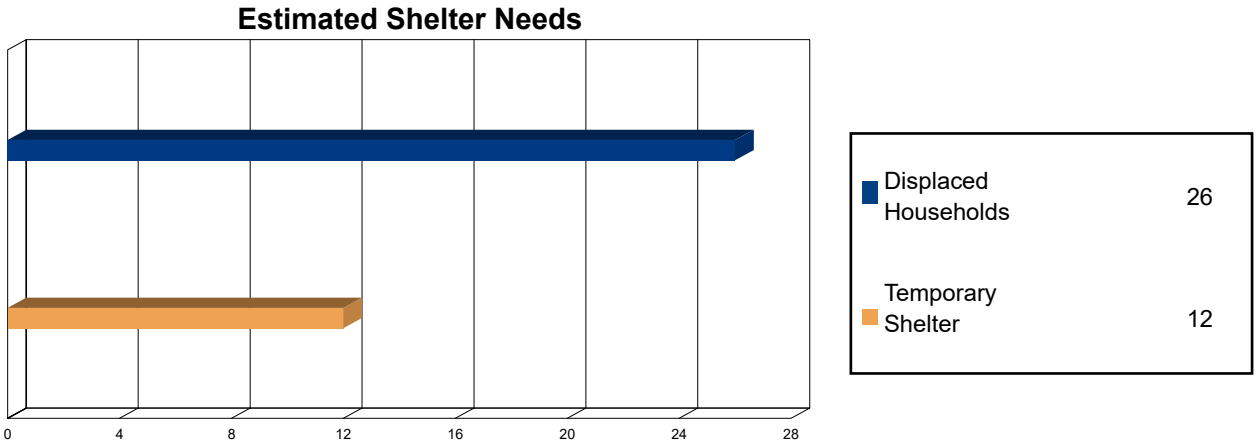


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 26,242 tons of debris will be generated. Of the total amount, 15,128 tons (58%) is Other Tree Debris. Of the remaining 11,114 tons, Brick/Wood comprises 30% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 134 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,775 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 26 households to be displaced due to the hurricane. Of these, 12 people (out of a total population of 35,159) will seek temporary shelter in public shelters.

Economic Loss

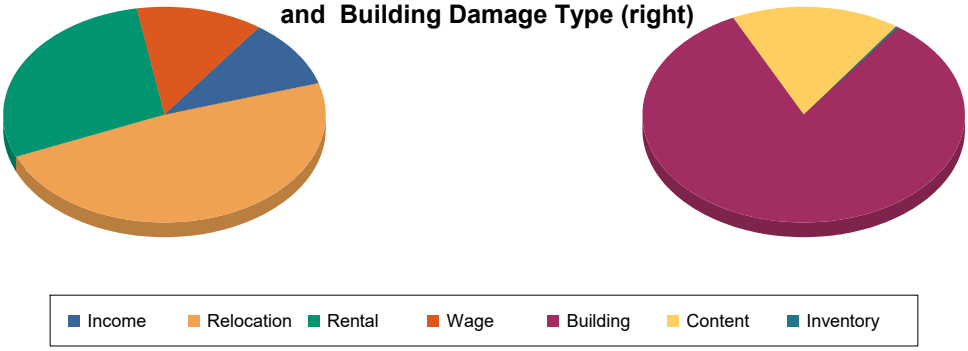
The total economic loss estimated for the hurricane is 55.7 million dollars, which represents 0.73 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 56 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 89% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

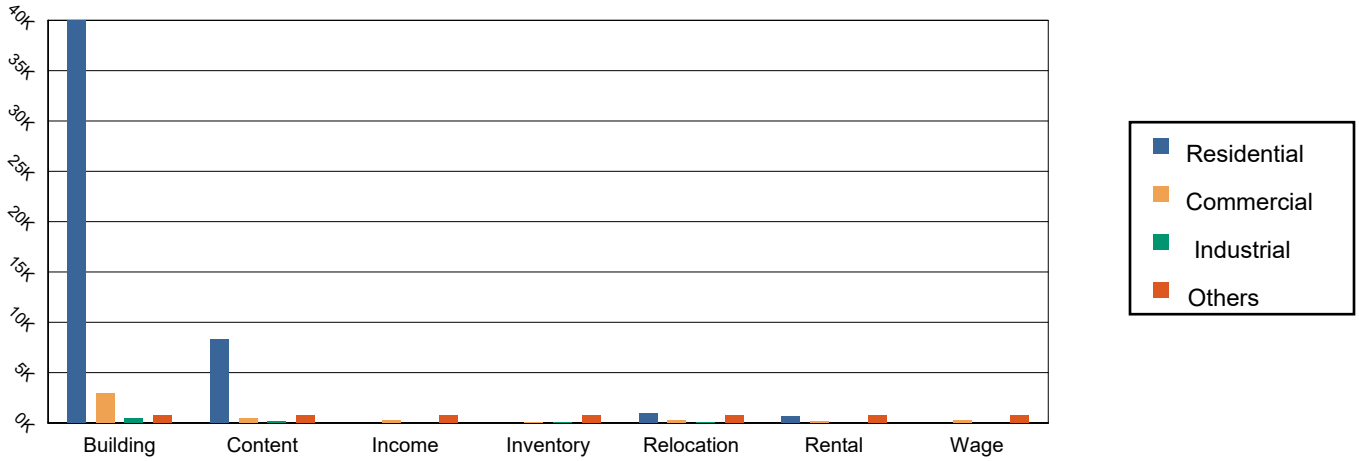


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	39,944.03	2,934.48	489.81	597.28	43,965.60
	Content	8,338.64	447.67	173.57	56.29	9,016.17
	Inventory	0.00	49.85	20.08	10.80	80.72
	Subtotal	**48,282.67**	**3,432.00**	**683.46**	**664.36**	**53,062.49**
Business Interruption Loss						
	Income	0.00	254.09	3.52	19.88	277.49
	Relocation	963.35	272.42	23.09	28.26	1,287.12
	Rental	624.56	137.53	2.98	1.66	766.73
	Wage	0.00	290.22	5.82	46.87	342.91
	Subtotal	**1,587.91**	**954.26**	**35.42**	**96.67**	**2,674.26**

Total

Total	**49,870.58**	**4,386.26**	**718.88**	**761.03**	**55,736.75**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	35,159	5,462,455	2,129,740	7,592,195
Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**
Study Region Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**

Hazus: Hurricane Global Risk Report

Region Name:	Glastonbury_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 52.19 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 35,159 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 12 thousand buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 86% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

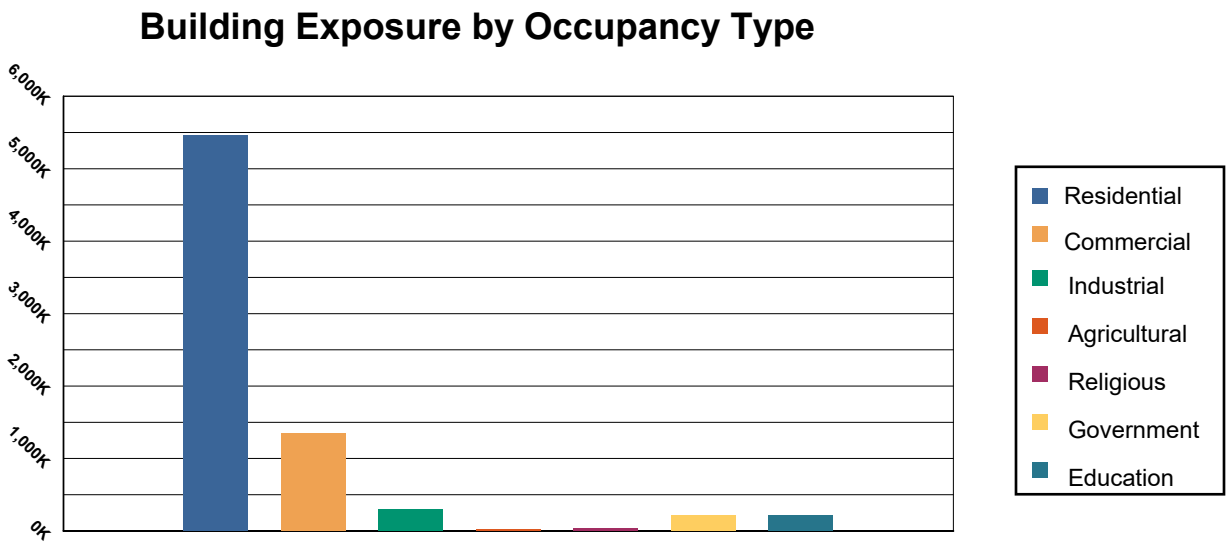


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,462,455	71.95%
Commercial	1,351,175	17.80%
Industrial	302,249	3.98%
Agricultural	15,685	0.21%
Religious	36,247	0.48%
Government	218,143	2.87%
Education	206,241	2.72%
Total	**7,592,195**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 9 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 274 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

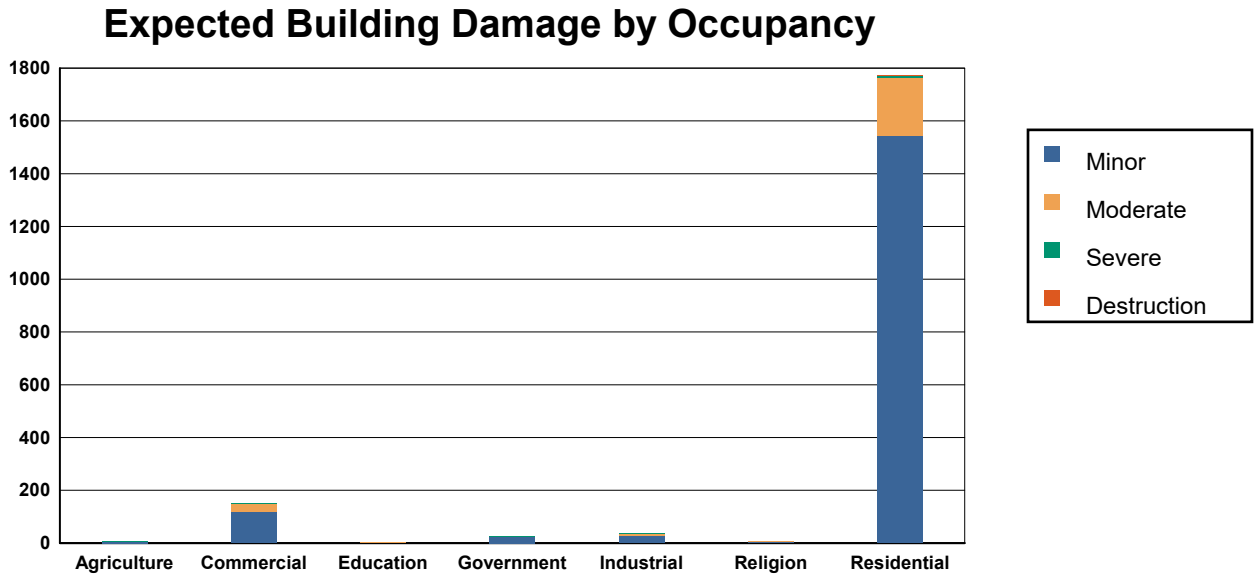


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	31.84	83.79	4.53	11.92	1.07	2.82	0.51	1.34	0.05	0.13
Commercial	924.92	85.88	119.54	11.10	28.97	2.69	3.57	0.33	0.01	0.00
Education	27.24	87.87	3.18	10.27	0.55	1.77	0.03	0.09	0.00	0.00
Government	219.16	89.09	23.16	9.41	3.53	1.44	0.15	0.06	0.00	0.00
Industrial	254.49	87.45	28.77	9.89	6.50	2.24	1.17	0.40	0.06	0.02
Religion	42.65	87.05	5.53	11.29	0.77	1.58	0.04	0.09	0.00	0.00
Residential	8,850.60	83.32	1,544.89	14.54	217.76	2.05	5.97	0.06	3.79	0.04
Total	**10,350.91**		**1,729.60**		**259.15**		**11.44**		**3.91**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	162	86.54	20	10.96	5	2.42	0	0.08	0	0.00
Masonry	859	82.74	128	12.34	49	4.72	2	0.18	0	0.02
MH	2	95.98	0	2.74	0	1.01	0	0.02	0	0.25
Steel	718	87.65	77	9.39	21	2.51	4	0.45	0	0.00
Wood	8,649	83.96	1,487	14.44	156	1.51	6	0.06	3	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

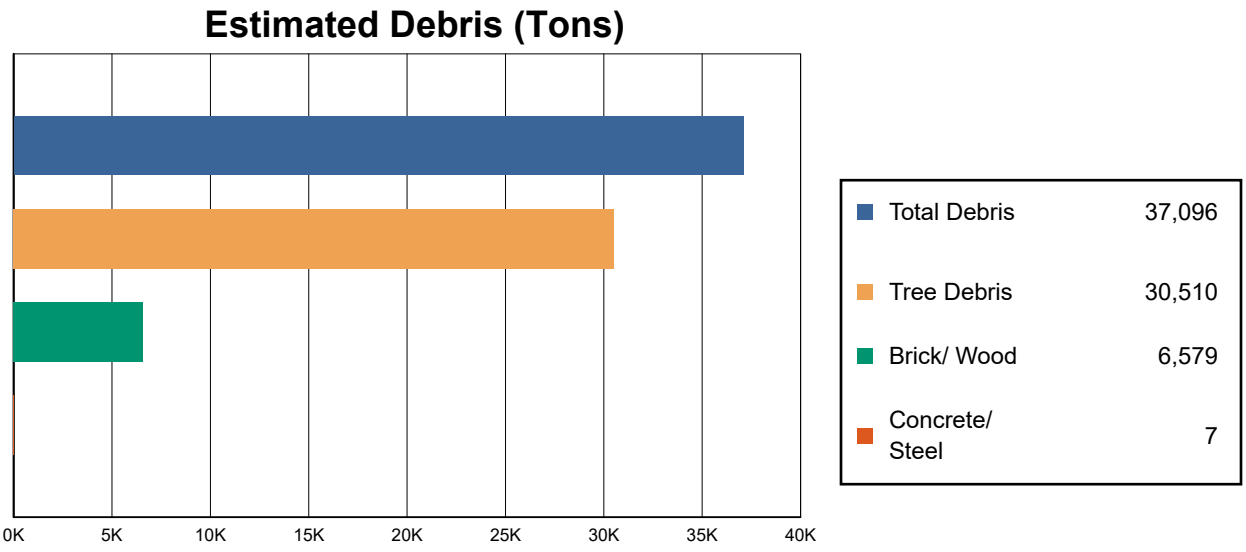
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	9	0	0	7

Induced Hurricane Damage

Debris Generation

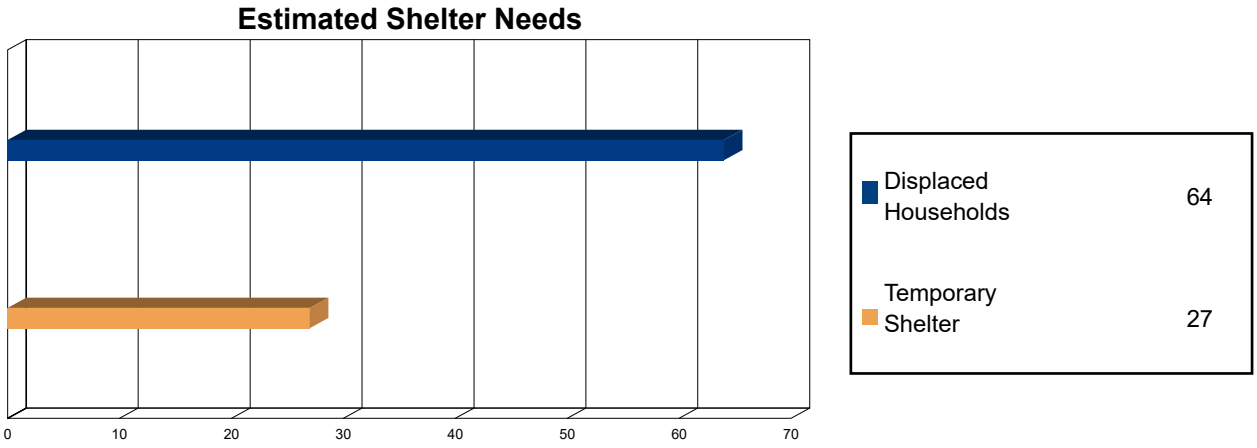


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 37,096 tons of debris will be generated. Of the total amount, 20,274 tons (55%) is Other Tree Debris. Of the remaining 16,822 tons, Brick/Wood comprises 39% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 263 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 10,236 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 64 households to be displaced due to the hurricane. Of these, 27 people (out of a total population of 35,159) will seek temporary shelter in public shelters.

Economic Loss

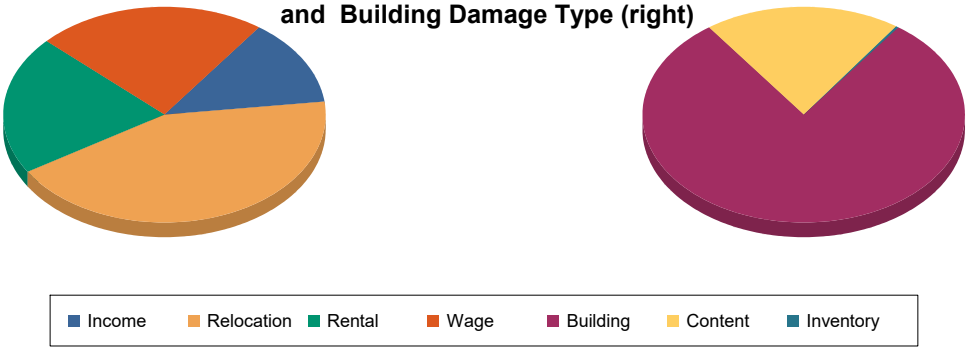
The total economic loss estimated for the hurricane is 107.3 million dollars, which represents 1.41 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 107 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 84% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

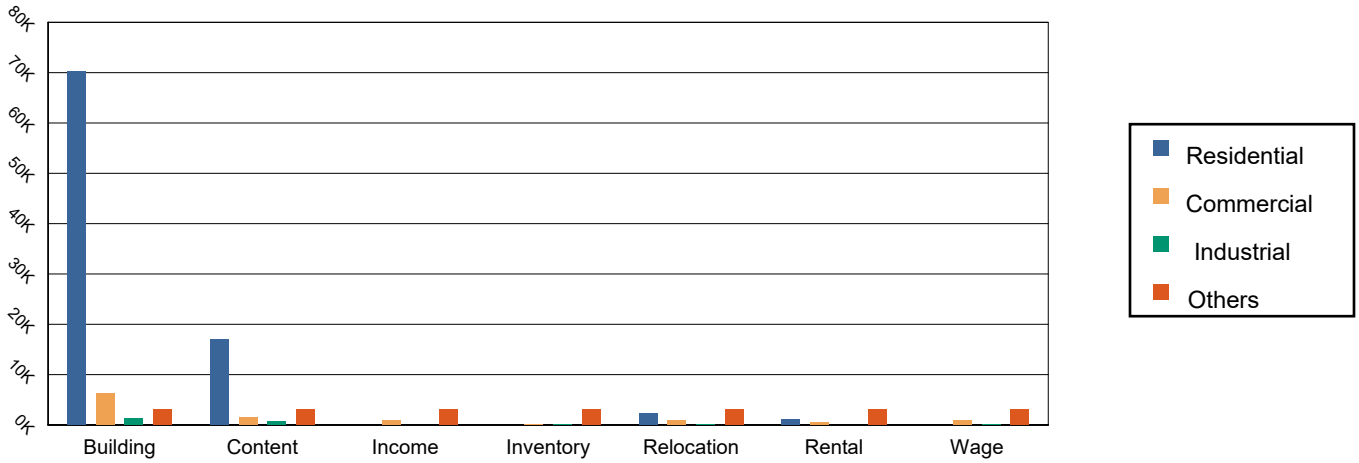


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	70,159.68	6,371.90	1,286.57	1,458.84	79,276.99
	Content	16,981.40	1,517.70	662.94	267.71	19,429.75
	Inventory	0.00	172.19	74.51	37.44	284.14
	Subtotal	**87,141.08**	**8,061.79**	**2,024.02**	**1,763.99**	**98,990.88**
Business Interruption Loss						
	Income	0.00	951.69	16.04	120.66	1,088.39
	Relocation	2,296.70	915.83	95.74	236.22	3,544.48
	Rental	1,182.74	502.62	13.58	38.16	1,737.10
	Wage	0.00	933.67	26.96	942.82	1,903.46
	Subtotal	**3,479.45**	**3,303.81**	**152.32**	**1,337.86**	**8,273.43**

Total

Total	**90,620.53**	**11,365.60**	**2,176.34**	**3,101.84**	**107,264.31**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	35,159	5,462,455	2,129,740	7,592,195
Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**
Study Region Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**

Hazus: Hurricane Global Risk Report

Region Name:	Glastonbury_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 52.19 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 35,159 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 12 thousand buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 86% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

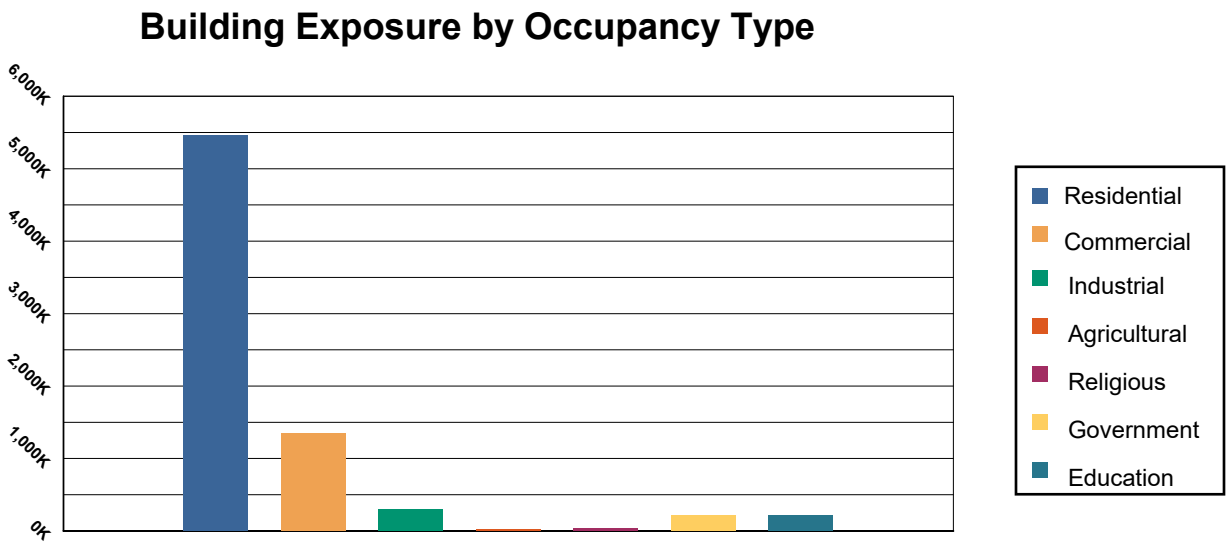


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,462,455	71.95%
Commercial	1,351,175	17.80%
Industrial	302,249	3.98%
Agricultural	15,685	0.21%
Religious	36,247	0.48%
Government	218,143	2.87%
Education	206,241	2.72%
Total	**7,592,195**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 9 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 675 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 20 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

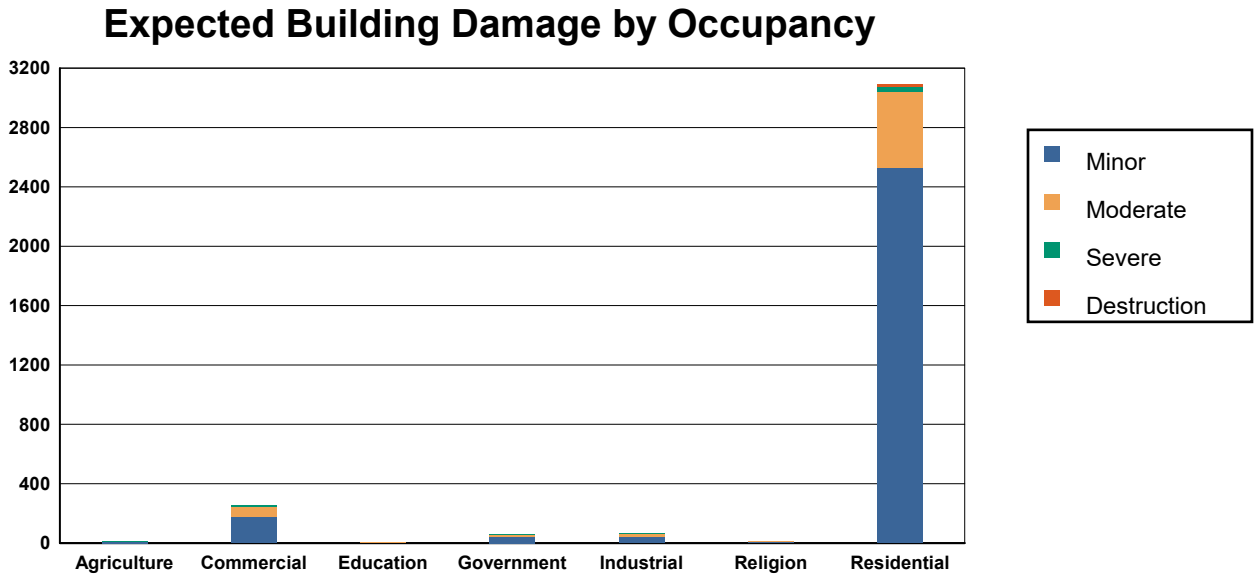


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	26.95	70.93	7.47	19.65	2.32	6.10	1.11	2.92	0.15	0.40
Commercial	825.60	76.66	180.98	16.80	61.81	5.74	8.56	0.79	0.05	0.00
Education	24.40	78.71	5.07	16.36	1.42	4.59	0.10	0.34	0.00	0.00
Government	190.62	77.49	41.72	16.96	12.75	5.18	0.92	0.37	0.00	0.00
Industrial	226.57	77.86	45.44	15.61	15.82	5.44	3.01	1.04	0.17	0.06
Religion	37.88	77.30	8.93	18.23	2.04	4.17	0.15	0.30	0.00	0.00
Residential	7,527.21	70.86	2,530.97	23.83	510.60	4.81	34.25	0.32	19.97	0.19
Total	**8,859.22**		**2,820.58**		**606.76**		**48.10**		**20.34**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	143	76.42	32	16.95	12	6.27	1	0.36	0	0.00
Masonry	746	71.83	194	18.73	92	8.84	5	0.53	1	0.08
MH	2	88.28	0	6.67	0	3.83	0	0.17	0	1.05
Steel	640	78.12	122	14.89	48	5.85	9	1.12	0	0.01
Wood	7,374	71.58	2,463	23.91	413	4.01	33	0.32	19	0.18

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

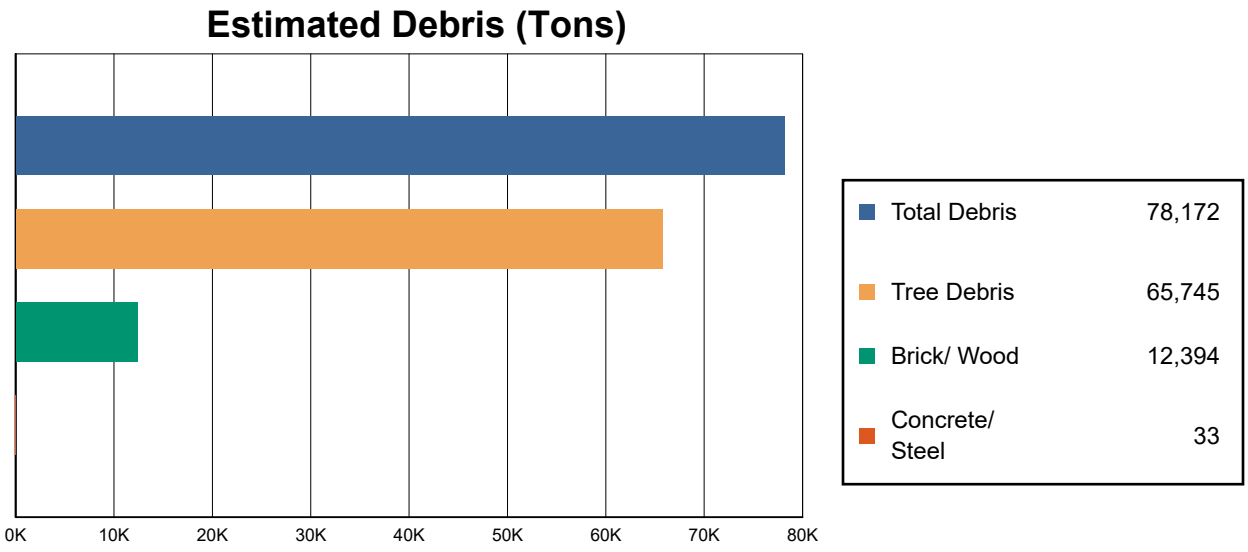
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	9	0	0	6

Induced Hurricane Damage

Debris Generation

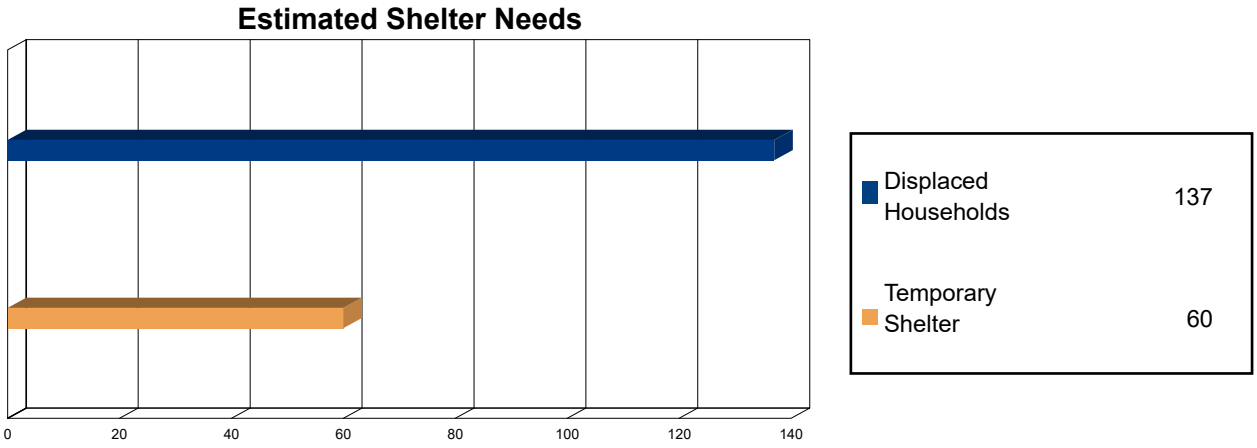


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 78,172 tons of debris will be generated. Of the total amount, 45,823 tons (59%) is Other Tree Debris. Of the remaining 32,349 tons, Brick/Wood comprises 38% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 497 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 19,922 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 137 households to be displaced due to the hurricane. Of these, 60 people (out of a total population of 35,159) will seek temporary shelter in public shelters.

Economic Loss

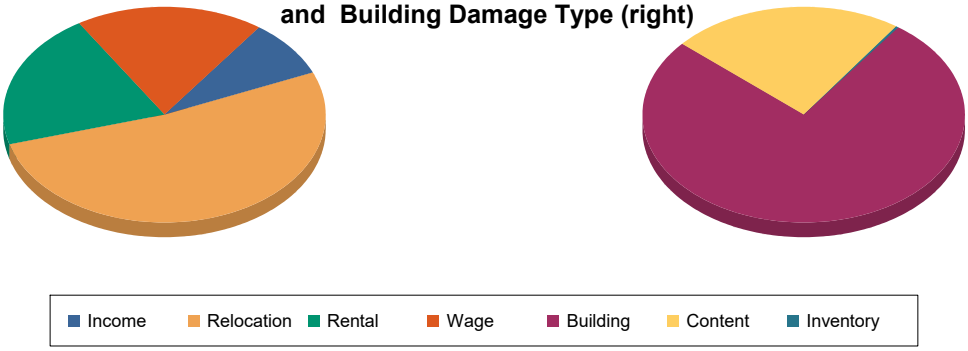
The total economic loss estimated for the hurricane is 216.7 million dollars, which represents 2.85 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 217 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 85% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

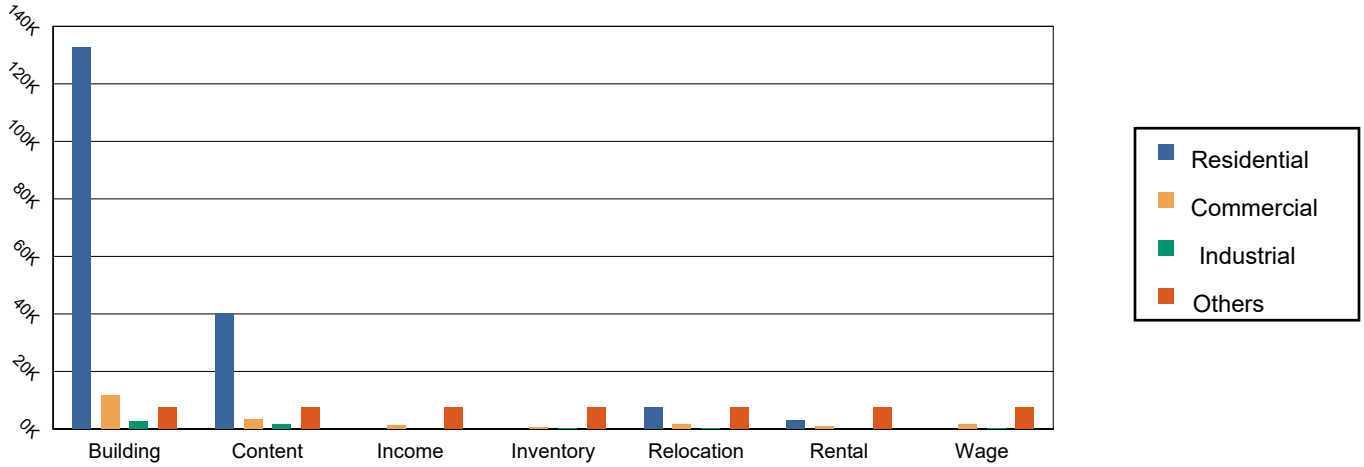


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	132,709.58	11,630.28	2,796.60	3,415.81	150,552.26
	Content	40,072.66	3,486.92	1,649.41	893.98	46,102.97
	Inventory	0.00	393.08	182.62	92.53	668.23
	Subtotal	**172,782.24**	**15,510.27**	**4,628.64**	**4,402.31**	**197,323.46**
Business Interruption Loss						
	Income	0.00	1,398.51	29.15	231.86	1,659.52
	Relocation	7,496.13	1,727.26	230.26	636.90	10,090.54
	Rental	2,915.44	911.33	30.04	112.16	3,968.97
	Wage	0.00	1,437.31	49.17	2,164.05	3,650.52
	Subtotal	**10,411.57**	**5,474.41**	**338.62**	**3,144.96**	**19,369.55**

Total

Total	**183,193.81**	**20,984.68**	**4,967.25**	**7,547.27**	**216,693.01**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	35,159	5,462,455	2,129,740	7,592,195
Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**
Study Region Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**

Hazus: Hurricane Global Risk Report

Region Name:	Glastonbury_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 52.19 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 35,159 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 12 thousand buildings in the region with a total building replacement value (excluding contents) of 7,592 million dollars. Approximately 86% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 12,355 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

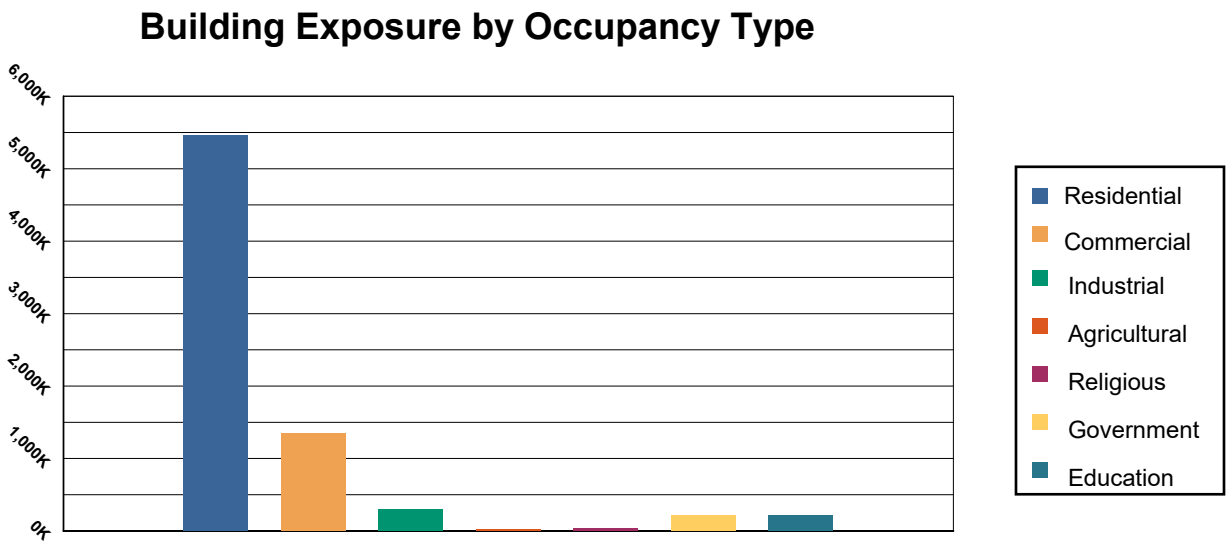


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,462,455	71.95%
Commercial	1,351,175	17.80%
Industrial	302,249	3.98%
Agricultural	15,685	0.21%
Religious	36,247	0.48%
Government	218,143	2.87%
Education	206,241	2.72%
Total	**7,592,195**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 9 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,176 buildings will be at least moderately damaged. This is over 10% of the total number of buildings in the region. There are an estimated 51 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

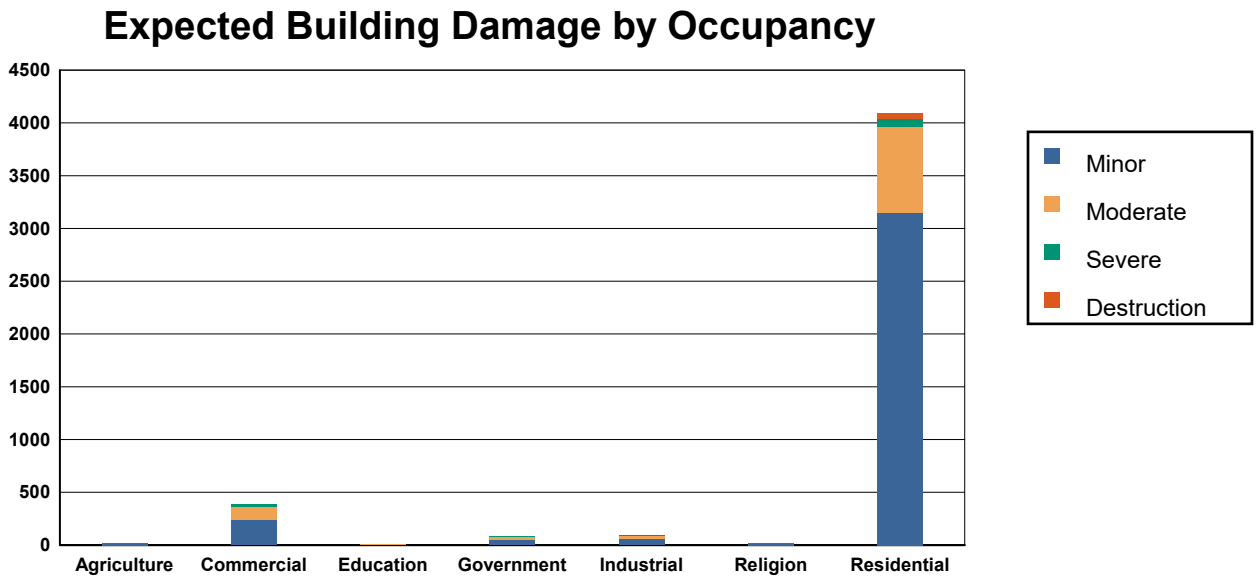


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.84	60.10	9.51	25.02	3.62	9.52	1.76	4.63	0.28	0.72
Commercial	684.98	63.60	243.85	22.64	123.88	11.50	24.09	2.24	0.19	0.02
Education	20.60	66.44	6.84	22.08	3.10	10.01	0.46	1.48	0.00	0.00
Government	165.80	67.40	53.18	21.62	23.98	9.75	3.04	1.24	0.00	0.00
Industrial	191.35	65.76	60.15	20.67	31.49	10.82	7.62	2.62	0.39	0.13
Religion	31.88	65.07	12.14	24.78	4.40	8.97	0.58	1.18	0.00	0.00
Residential	6,529.53	61.47	3,145.90	29.61	814.30	7.67	82.82	0.78	50.46	0.47
Total	**7,646.97**		**3,531.58**		**1,004.78**		**120.36**		**51.31**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	119	63.87	41	21.80	24	12.79	3	1.55	0	0.00
Masonry	629	60.61	241	23.19	151	14.54	15	1.47	2	0.18
MH	2	82.71	0	8.84	0	6.17	0	0.36	0	1.92
Steel	540	65.90	161	19.63	94	11.52	24	2.91	0	0.04
Wood	6,400	62.13	3,095	30.05	680	6.61	77	0.75	47	0.46

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

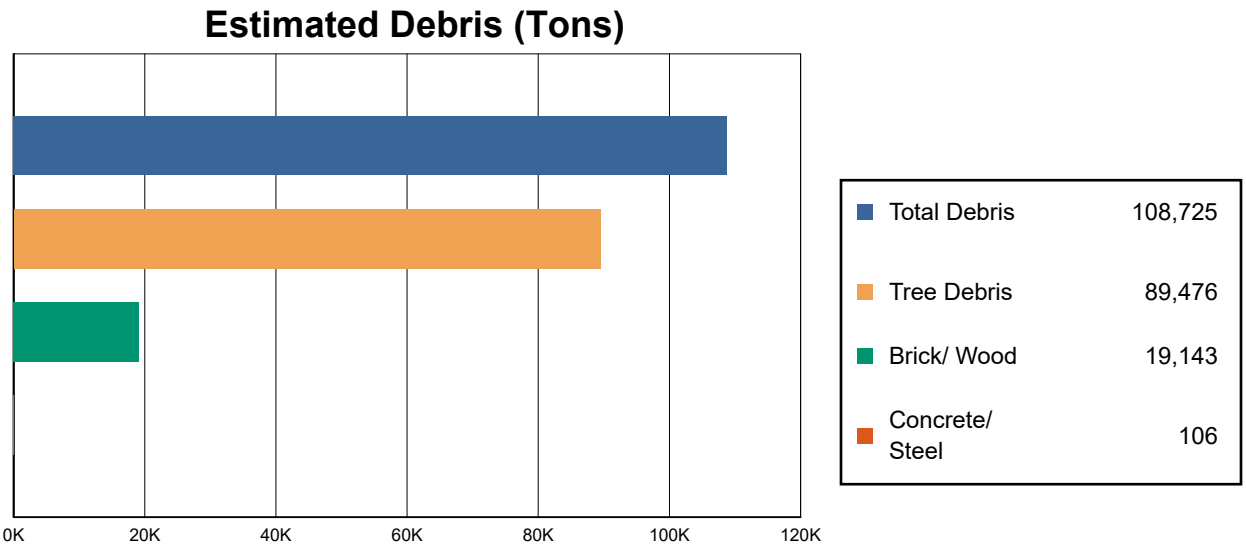
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	9	0	0	0

Induced Hurricane Damage

Debris Generation

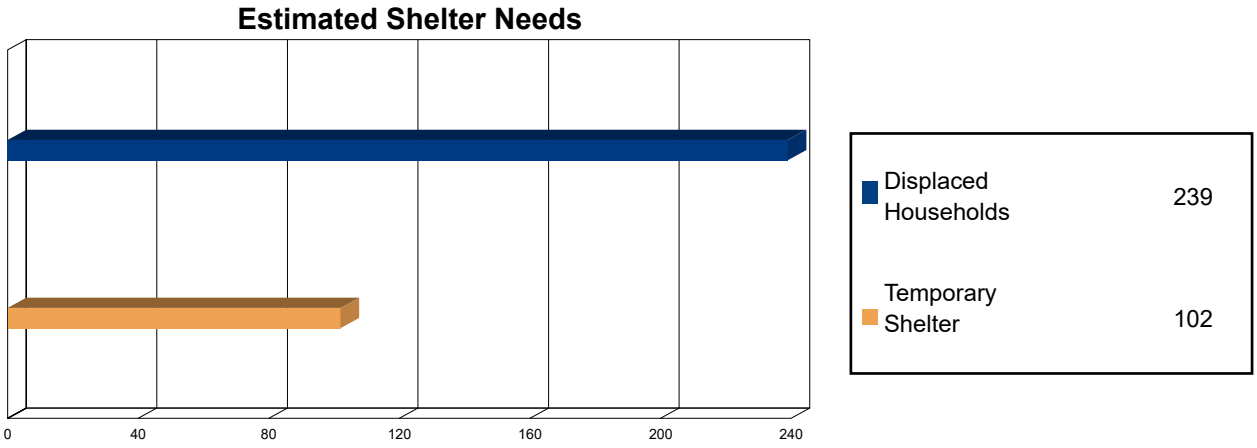


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 108,725 tons of debris will be generated. Of the total amount, 61,496 tons (57%) is Other Tree Debris. Of the remaining 47,229 tons, Brick/Wood comprises 41% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 770 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 27,980 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 239 households to be displaced due to the hurricane. Of these, 102 people (out of a total population of 35,159) will seek temporary shelter in public shelters.

Economic Loss

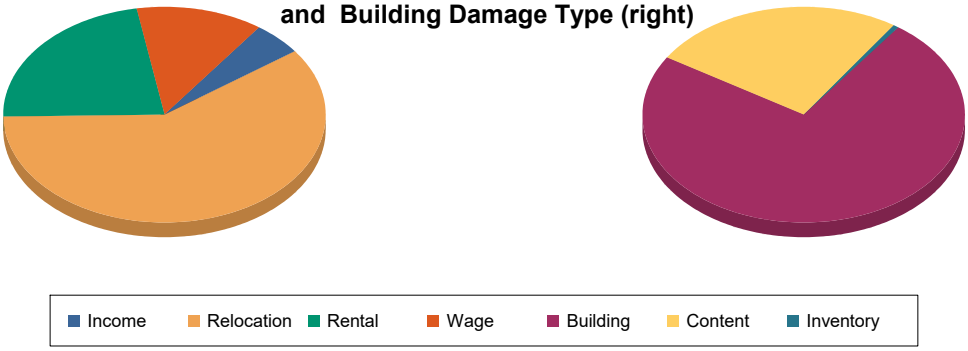
The total economic loss estimated for the hurricane is 352.7 million dollars, which represents 4.65 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 353 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 81% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

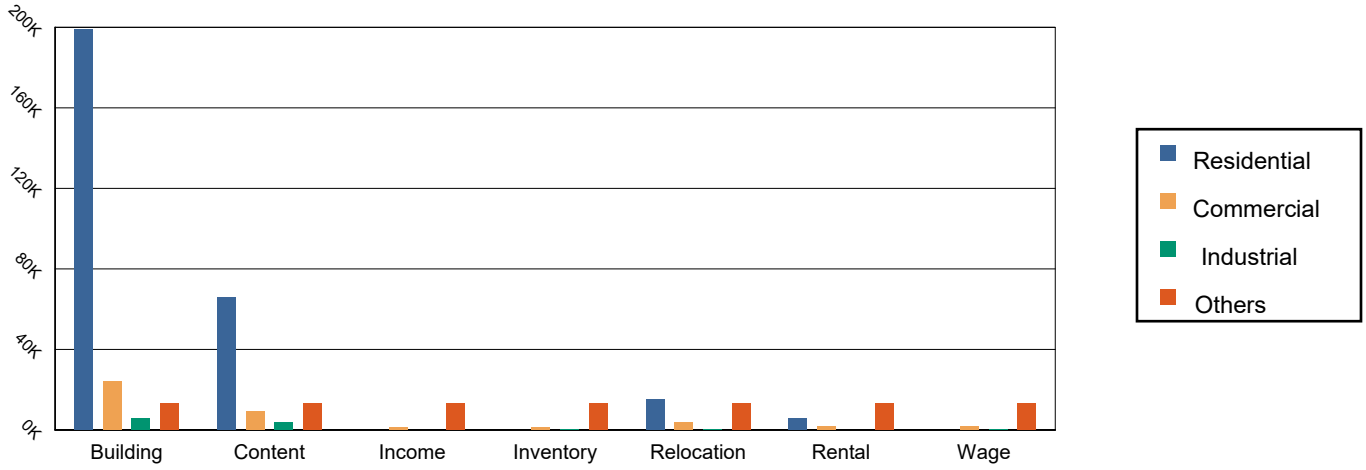


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	199,115.75	23,952.25	5,716.95	6,452.17	235,237.11
	Content	65,867.56	9,395.33	3,815.22	2,206.53	81,284.63
	Inventory	0.00	1,090.73	423.19	162.21	1,676.12
	Subtotal	**264,983.31**	**34,438.30**	**9,955.35**	**8,820.91**	**318,197.87**
Business Interruption Loss						
	Income	1.00	1,425.63	40.02	279.45	1,746.10
	Relocation	15,090.65	3,732.22	484.62	1,257.83	20,565.31
	Rental	5,530.19	1,954.88	61.61	232.96	7,779.64
	Wage	2.35	1,536.04	67.54	2,774.98	4,380.91
	Subtotal	**20,624.18**	**8,648.77**	**653.79**	**4,545.22**	**34,471.96**

Total

Total	**285,607.49**	**43,087.07**	**10,609.14**	**13,366.13**	**352,669.83**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	35,159	5,462,455	2,129,740	7,592,195
Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**
Study Region Total	**35,159**	**5,462,455**	**2,129,740**	**7,592,195**

Hazus: Hurricane Global Risk Report

Region Name:	Granby_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.85 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 10,903 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,351 million dollars. Approximately 90% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,329 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

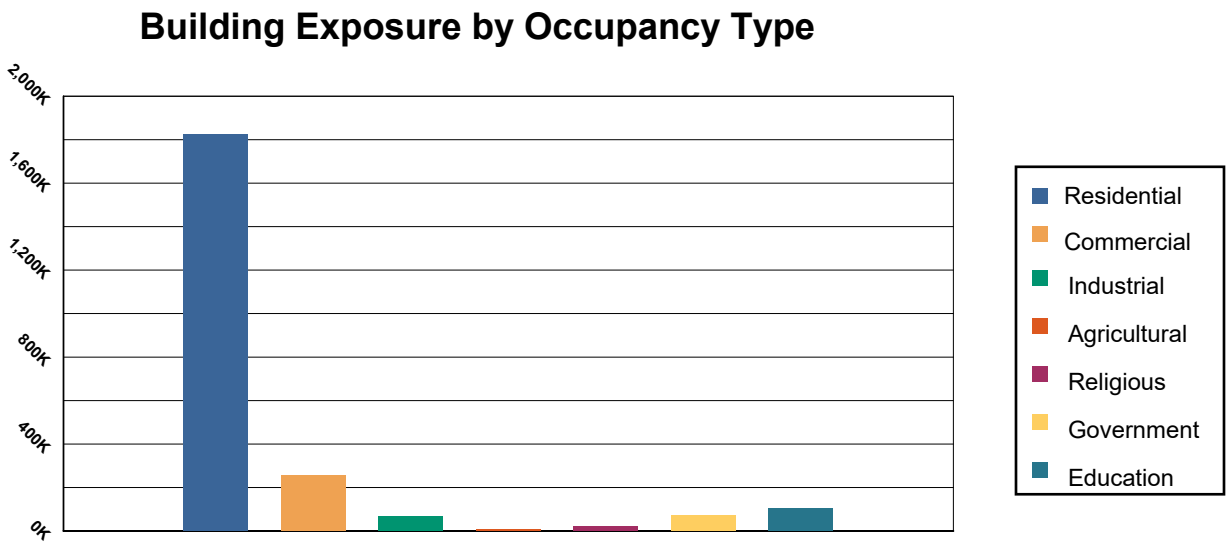


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,823,273	77.57%
Commercial	257,608	10.96%
Industrial	66,841	2.84%
Agricultural	6,798	0.29%
Religious	19,065	0.81%
Government	72,935	3.10%
Education	104,101	4.43%
Total	**2,350,621**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

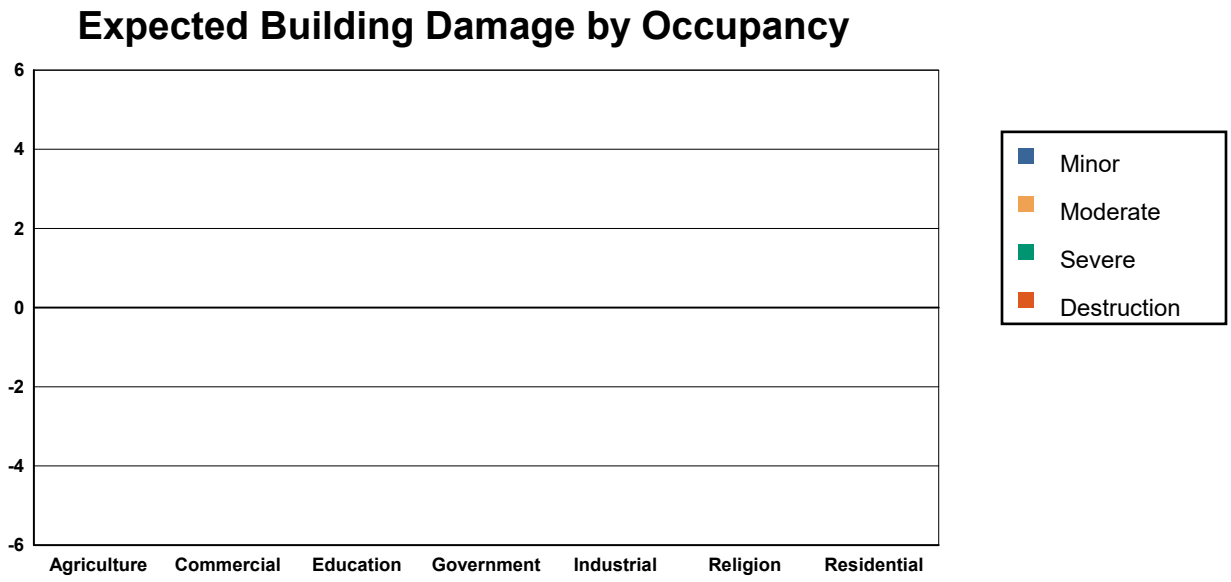


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	254.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	8.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	74.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	64.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	17.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	3,890.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**4,329.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	47	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	307	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	214	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	3,761	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

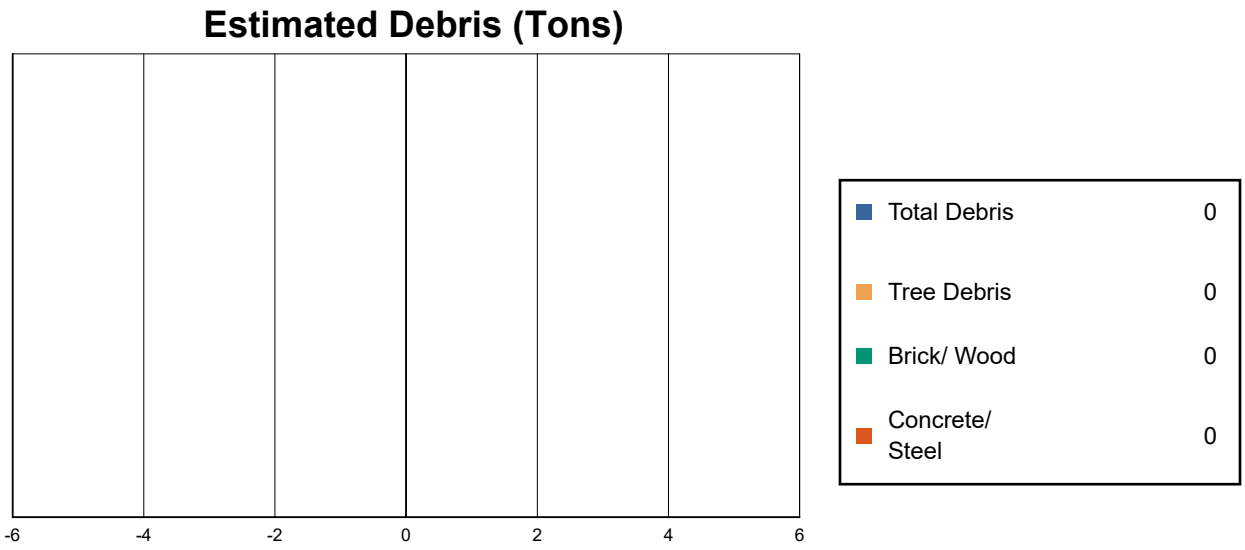
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

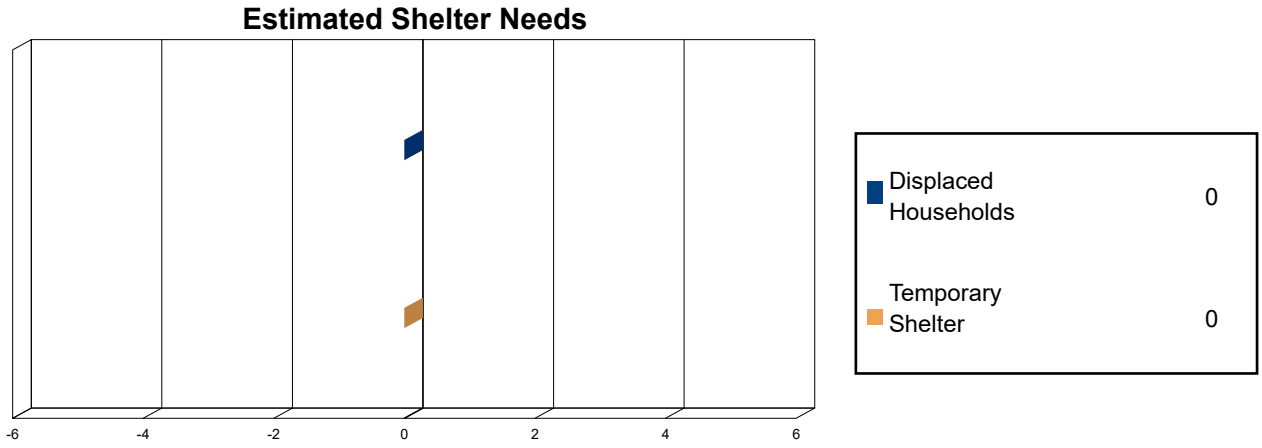


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,903) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

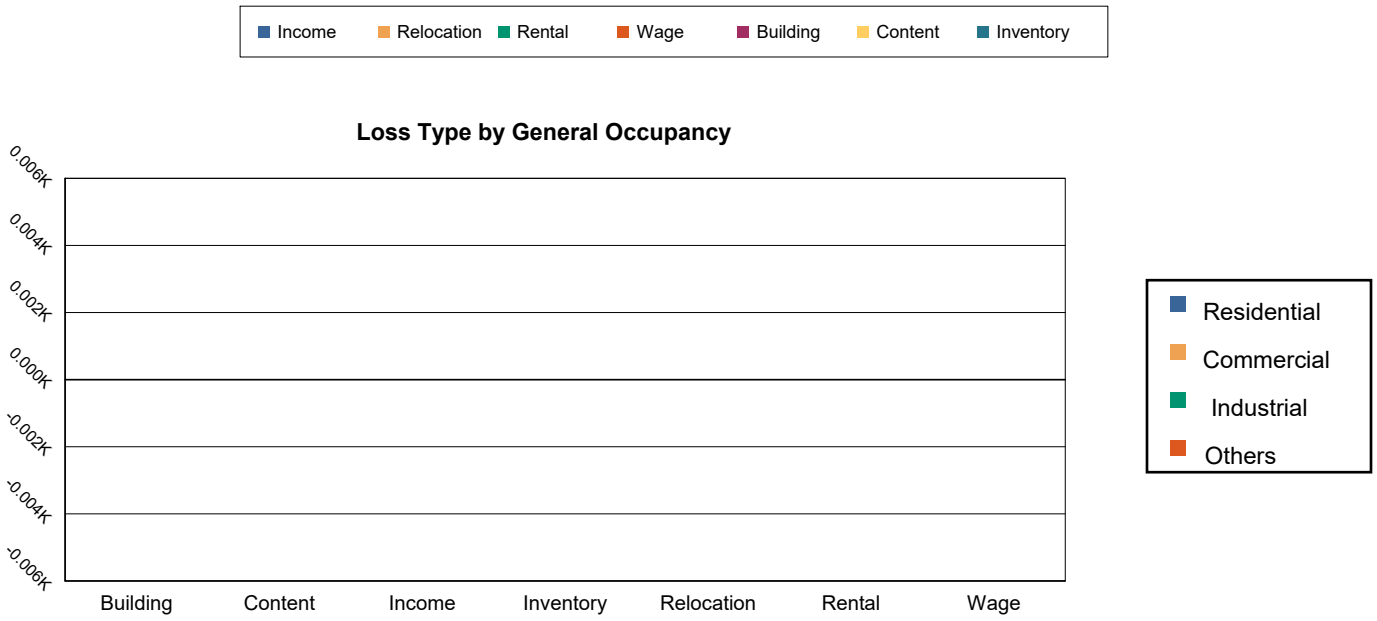


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,273	527,348	2,350,621
Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**
Study Region Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**

Hazus: Hurricane Global Risk Report

Region Name:	Granby_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.85 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 10,903 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,351 million dollars. Approximately 90% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,329 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

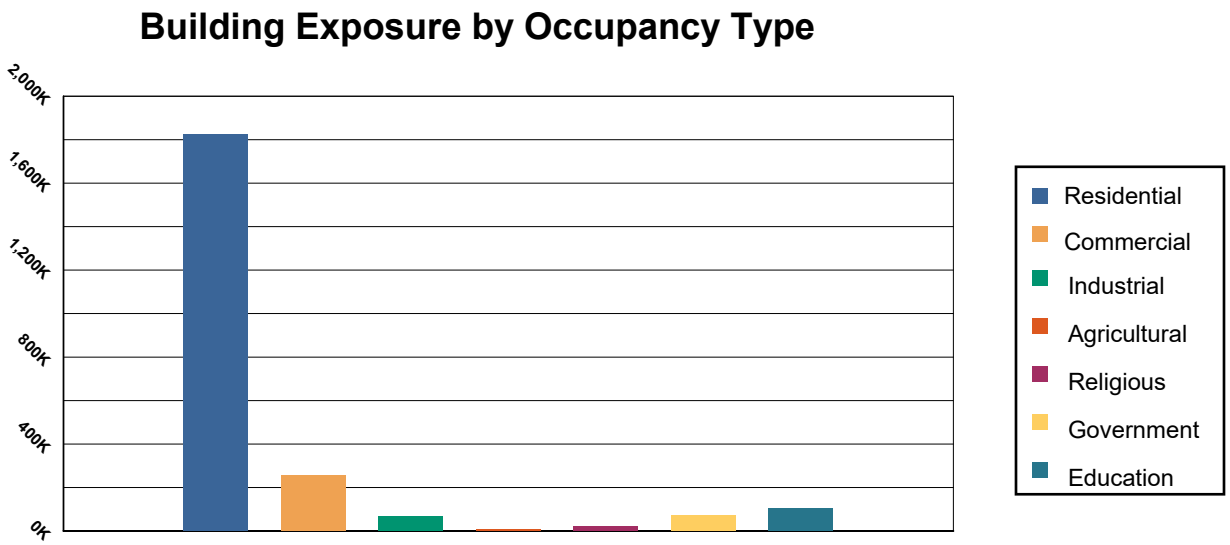


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,823,273	77.57%
Commercial	257,608	10.96%
Industrial	66,841	2.84%
Agricultural	6,798	0.29%
Religious	19,065	0.81%
Government	72,935	3.10%
Education	104,101	4.43%
Total	**2,350,621**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

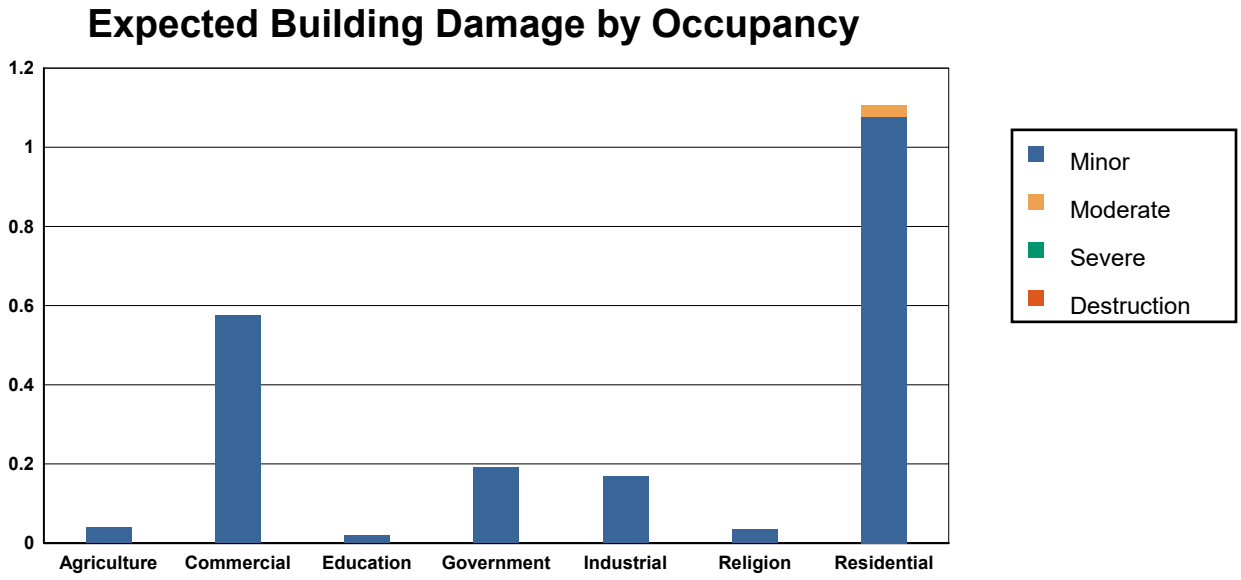


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.96	99.82	0.04	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	253.43	99.77	0.57	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Education	7.98	99.75	0.02	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Government	73.81	99.74	0.19	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	63.83	99.74	0.17	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Religion	16.97	99.80	0.03	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Residential	3,888.89	99.97	1.08	0.03	0.03	0.00	0.00	0.00	0.00	0.00
Total	**4,326.87**		**2.11**		**0.03**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	47	99.68	0	0.32	0	0.00	0	0.00	0	0.00
Masonry	306	99.73	1	0.27	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	213	99.74	1	0.26	0	0.00	0	0.00	0	0.00
Wood	3,761	99.99	0	0.01	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

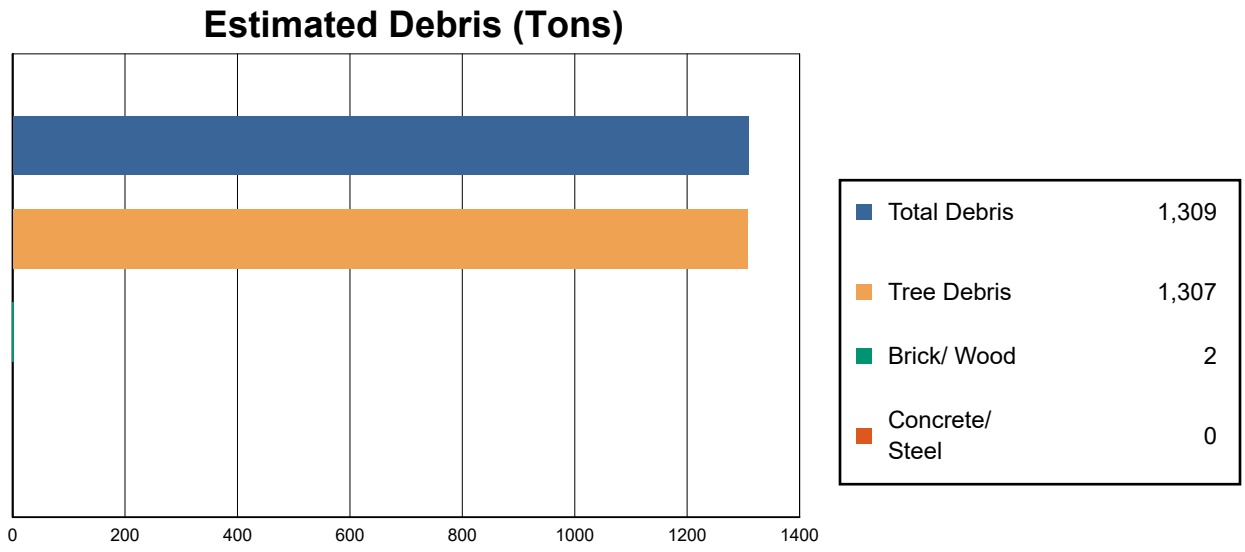
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

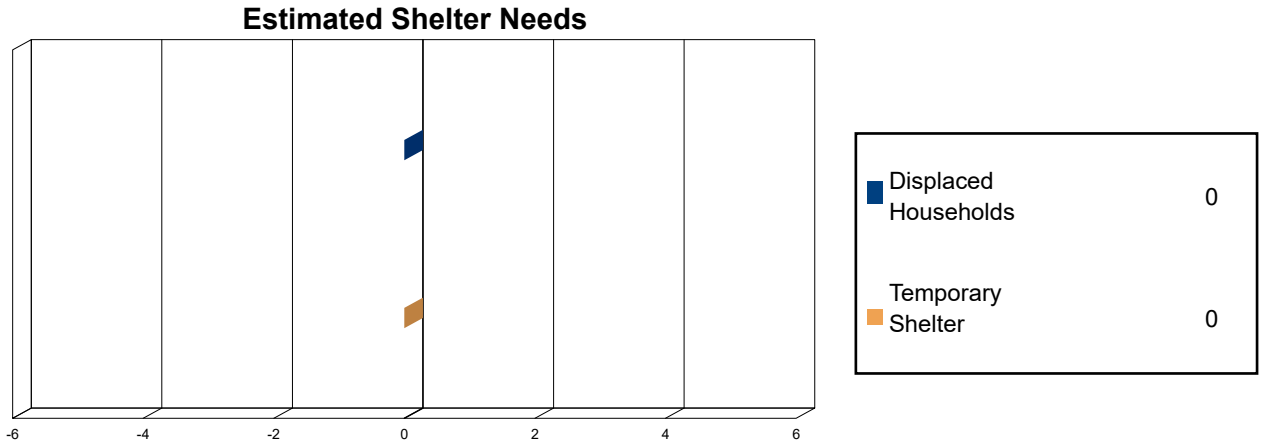


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,309 tons of debris will be generated. Of the total amount, 1,061 tons (81%) is Other Tree Debris. Of the remaining 248 tons, Brick/Wood comprises 1% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 246 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,903) will seek temporary shelter in public shelters.

Economic Loss

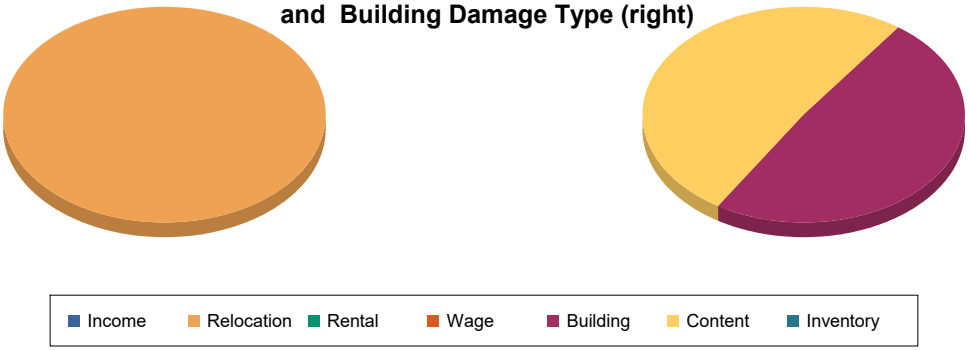
The total economic loss estimated for the hurricane is 1.1 million dollars, which represents 0.05 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	558.96	0.00	0.00	0.00	558.96
	Content	584.35	0.00	0.00	0.00	584.35
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,143.31**	**0.00**	**0.00**	**0.00**	**1,143.31**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.07	0.00	0.00	0.00	0.07
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.07**	**0.00**	**0.00**	**0.00**	**0.07**

Total

Total	**1,143.38**	**0.00**	**0.00**	**0.00**	**1,143.38**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,273	527,348	2,350,621
Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**
Study Region Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**

Hazus: Hurricane Global Risk Report

Region Name:	Granby_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Wednesday, May 10, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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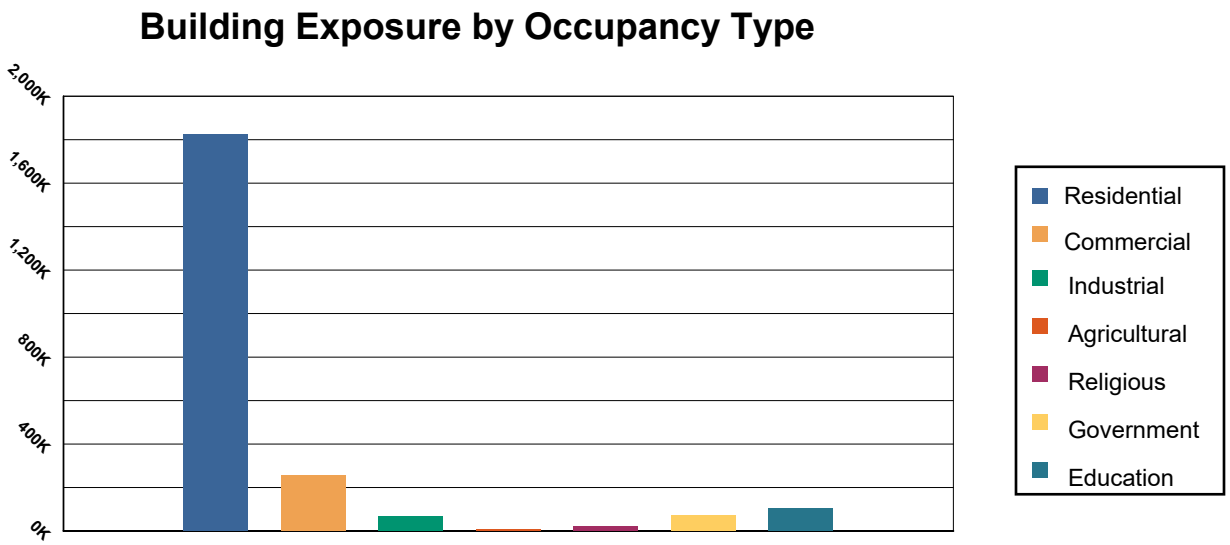

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For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

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Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

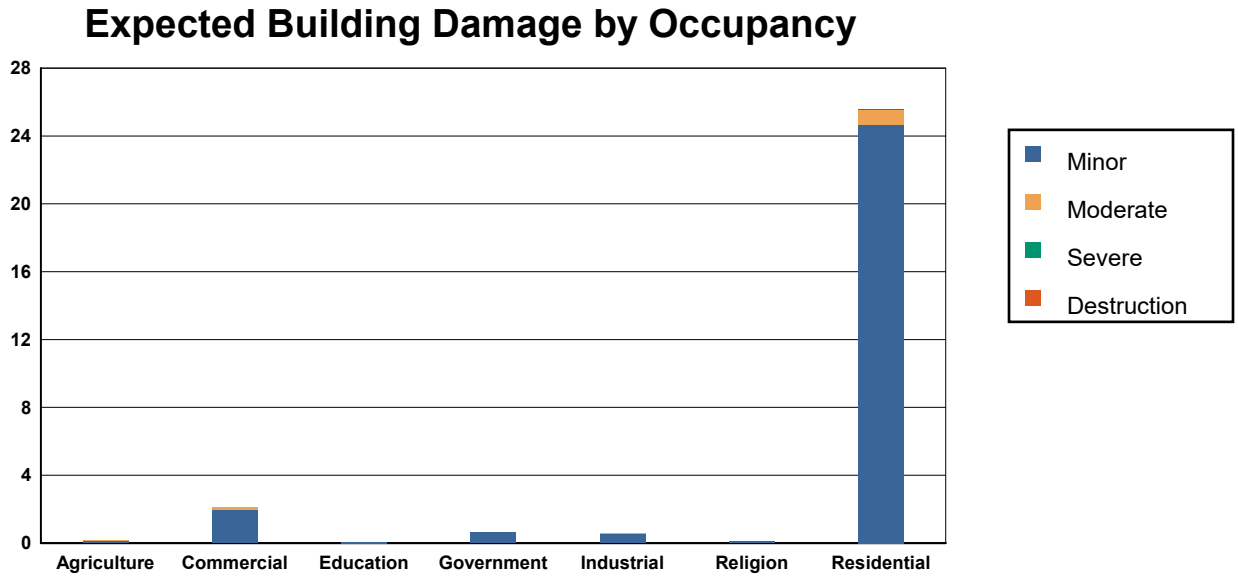


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.83	99.23	0.16	0.73	0.01	0.04	0.00	0.00	0.00	0.00
Commercial	251.86	99.16	1.97	0.78	0.17	0.07	0.00	0.00	0.00	0.00
Education	7.93	99.17	0.07	0.83	0.00	0.01	0.00	0.00	0.00	0.00
Government	73.37	99.15	0.62	0.84	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	63.44	99.12	0.55	0.86	0.01	0.02	0.00	0.00	0.00	0.00
Religion	16.89	99.33	0.11	0.65	0.00	0.01	0.00	0.00	0.00	0.00
Residential	3,864.44	99.34	24.64	0.63	0.89	0.02	0.02	0.00	0.00	0.00
Total	**4,299.76**		**28.13**		**1.09**		**0.02**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	46	98.90	1	1.10	0	0.00	0	0.00	0	0.00
Masonry	303	98.70	4	1.18	0	0.12	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	212	99.11	2	0.83	0	0.06	0	0.00	0	0.00
Wood	3,740	99.45	20	0.54	0	0.01	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

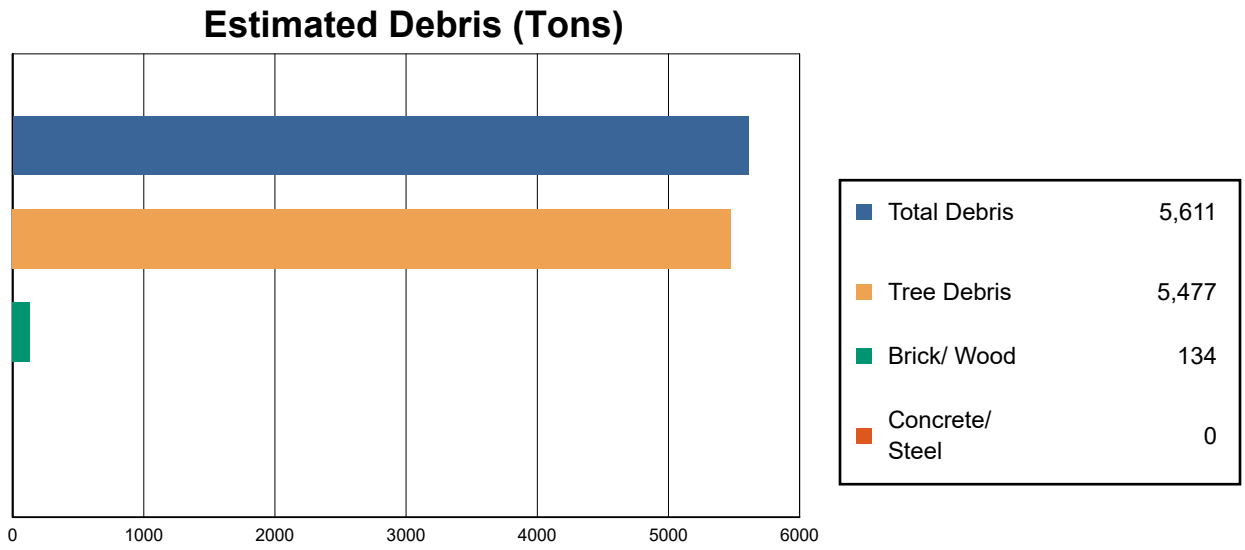
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation



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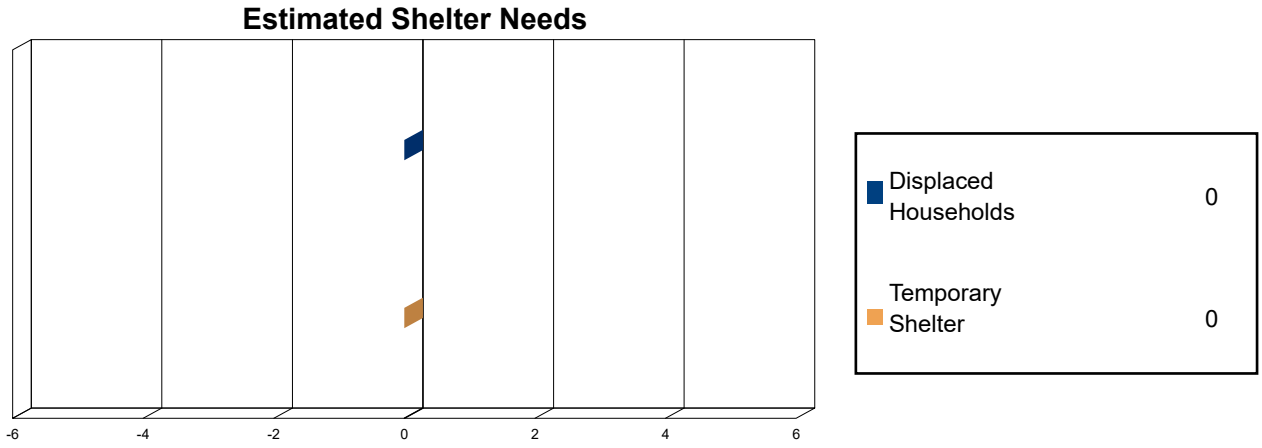
The model estimates that a total of 5,611 tons of debris will be generated. Of the total amount, 4,405 tons (79%) is Other Tree Debris. Of the remaining 1,206 tons, Brick/Wood comprises 11% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 5 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,072 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,903) will seek temporary shelter in public shelters.

Economic Loss

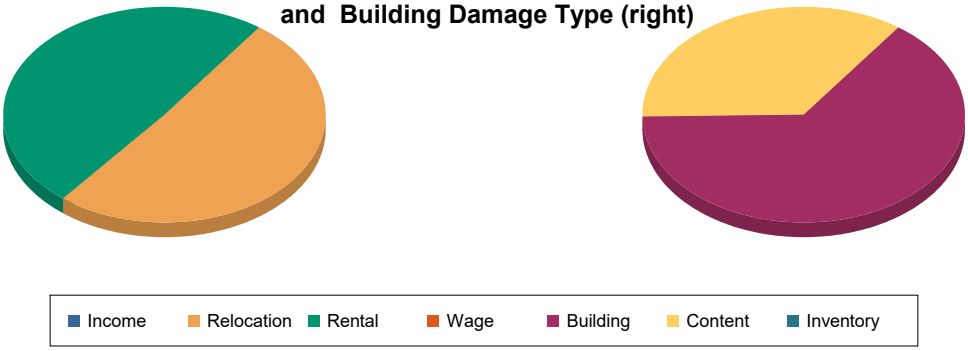
The total economic loss estimated for the hurricane is 8.1 million dollars, which represents 0.34 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 8 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 99% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

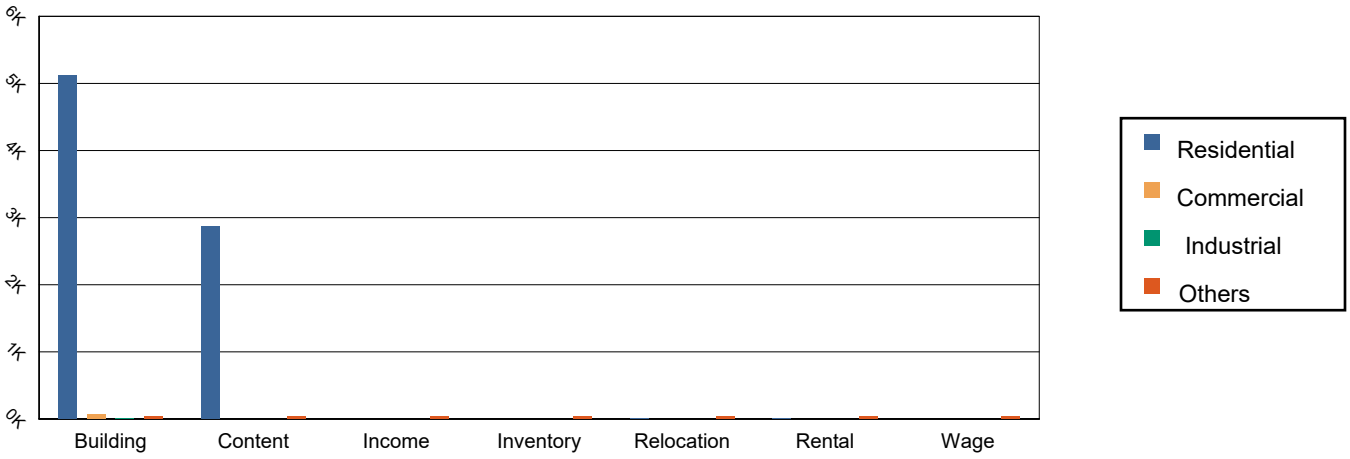


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,111.79	63.55	10.36	36.85	5,222.55
	Content	2,861.81	0.00	0.00	0.00	2,861.81
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**7,973.60**	**63.55**	**10.36**	**36.85**	**8,084.36**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	5.98	1.19	0.02	0.09	7.28
	Rental	7.05	0.00	0.00	0.00	7.05
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**13.03**	**1.19**	**0.02**	**0.09**	**14.33**

Total

Total	**7,986.63**	**64.74**	**10.38**	**36.95**	**8,098.70**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,273	527,348	2,350,621
Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**
Study Region Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**

Hazus: Hurricane Global Risk Report

Region Name:	Granby_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.85 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 10,903 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,351 million dollars. Approximately 90% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,329 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

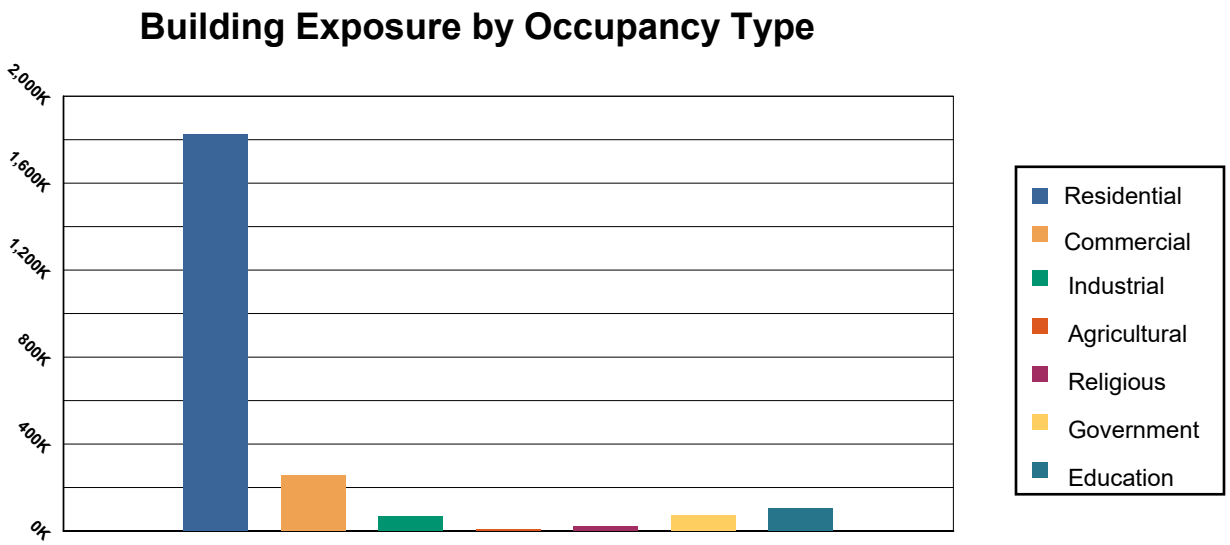


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,823,273	77.57%
Commercial	257,608	10.96%
Industrial	66,841	2.84%
Agricultural	6,798	0.29%
Religious	19,065	0.81%
Government	72,935	3.10%
Education	104,101	4.43%
Total	**2,350,621**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

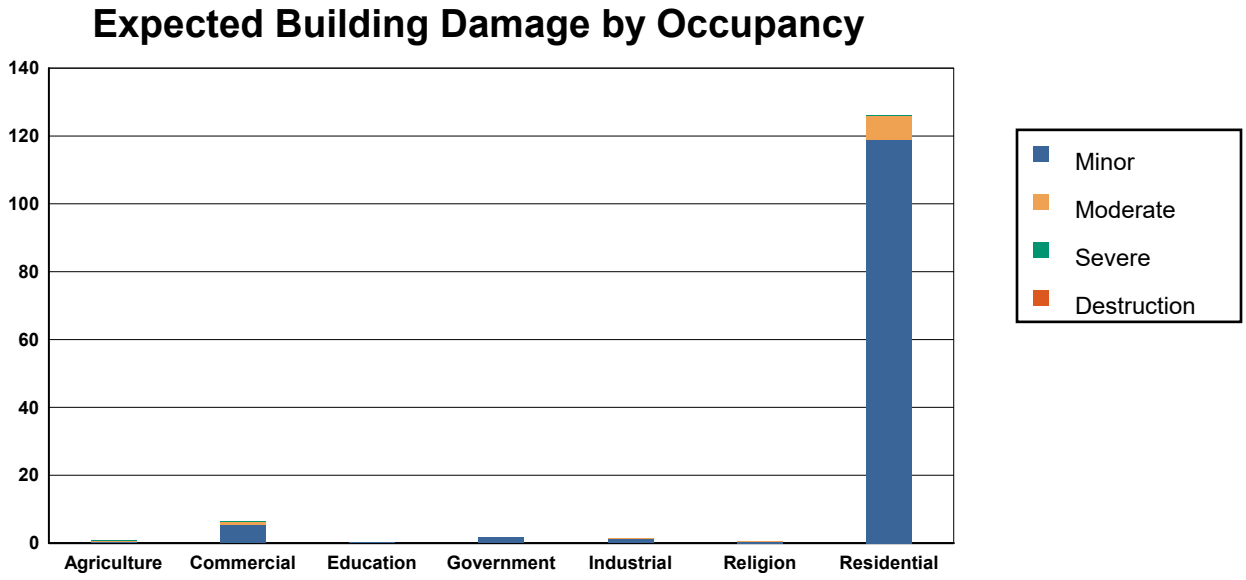


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.38	97.17	0.53	2.41	0.07	0.31	0.02	0.11	0.00	0.00
Commercial	247.51	97.44	5.43	2.14	0.98	0.38	0.08	0.03	0.00	0.00
Education	7.82	97.78	0.17	2.16	0.00	0.06	0.00	0.00	0.00	0.00
Government	72.40	97.83	1.57	2.12	0.03	0.05	0.00	0.00	0.00	0.00
Industrial	62.49	97.65	1.41	2.20	0.08	0.13	0.02	0.03	0.00	0.00
Religion	16.66	97.97	0.33	1.97	0.01	0.06	0.00	0.00	0.00	0.00
Residential	3,763.85	96.76	118.87	3.06	7.21	0.19	0.07	0.00	0.00	0.00
Total	**4,192.10**		**128.32**		**8.38**		**0.20**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	46	97.19	1	2.71	0	0.09	0	0.00	0	0.00
Masonry	295	96.20	10	3.17	2	0.61	0	0.02	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	209	97.59	4	2.05	1	0.33	0	0.03	0	0.00
Wood	3,648	96.99	109	2.91	4	0.10	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

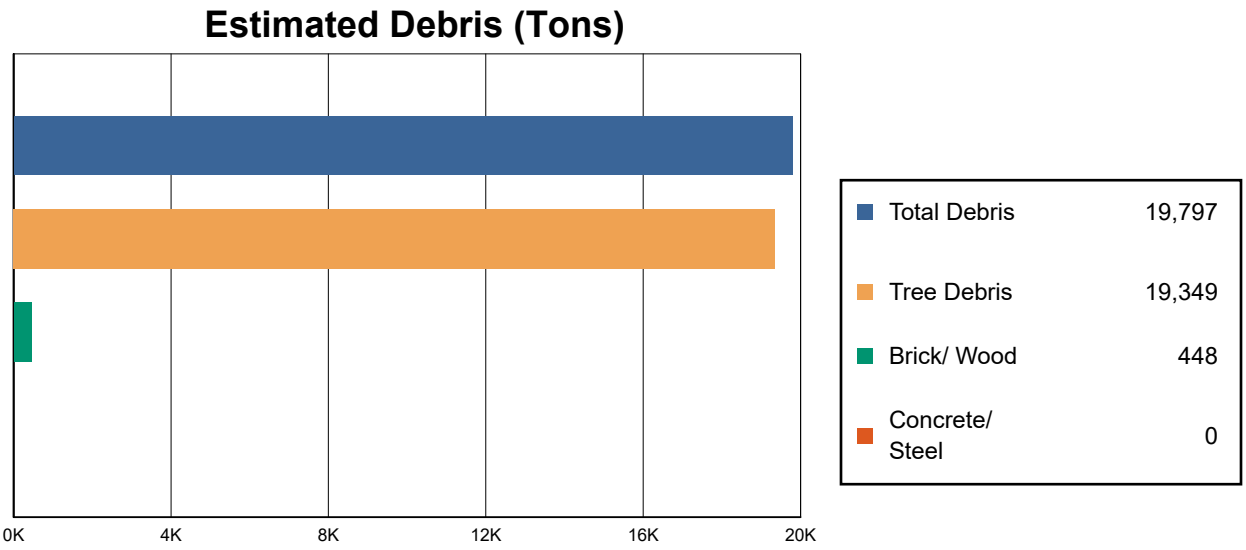
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

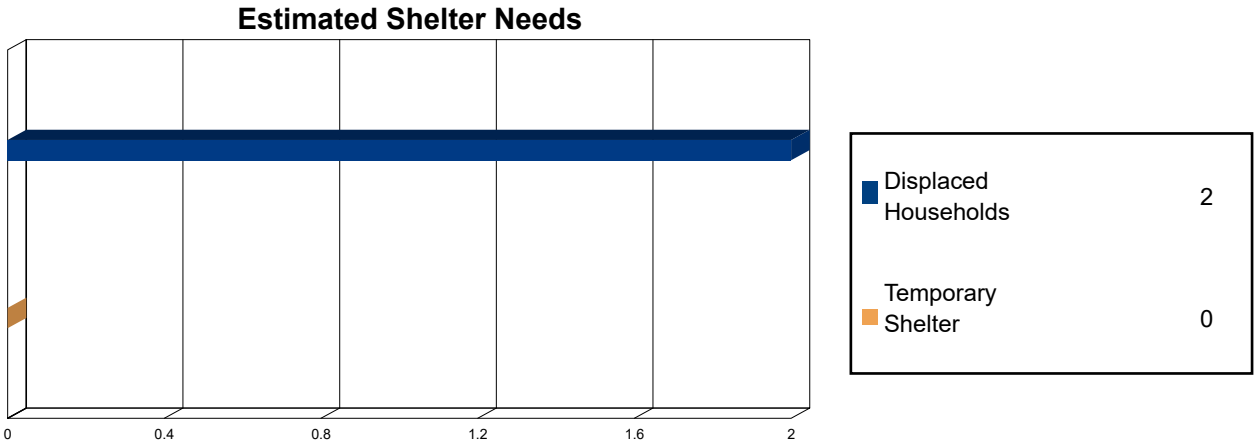


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 19,797 tons of debris will be generated. Of the total amount, 15,747 tons (80%) is Other Tree Debris. Of the remaining 4,050 tons, Brick/Wood comprises 11% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 18 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,602 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,903) will seek temporary shelter in public shelters.

Economic Loss

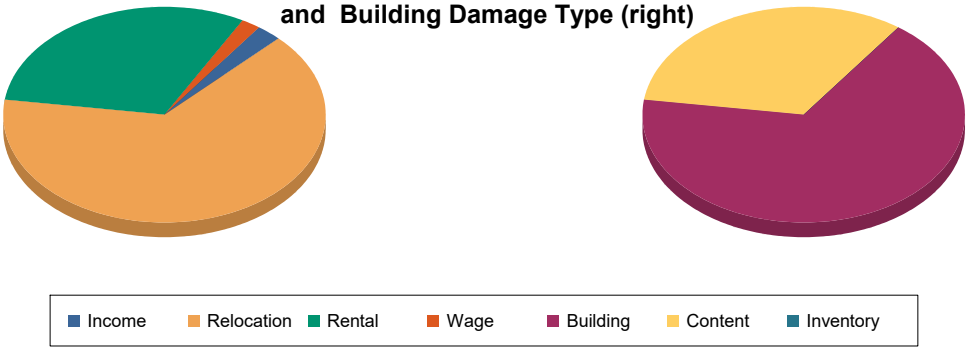
The total economic loss estimated for the hurricane is 18.1 million dollars, which represents 0.77 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 18 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

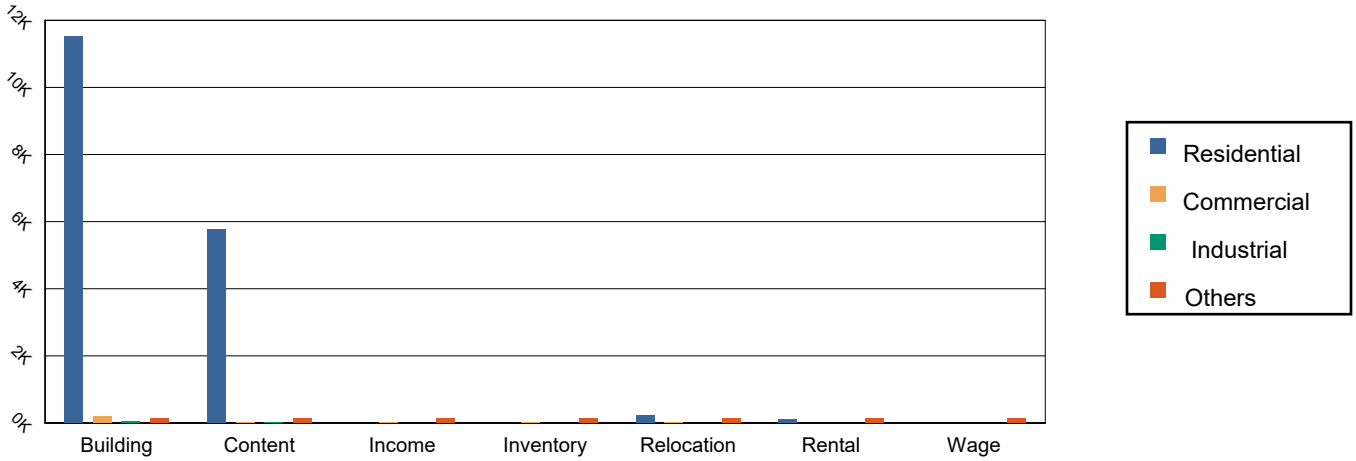


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	11,516.85	206.92	38.18	113.75	11,875.69
	Content	5,778.60	27.63	7.04	2.15	5,815.42
	Inventory	0.00	4.78	0.97	1.15	6.90
	Subtotal	**17,295.44**	**239.33**	**46.19**	**117.06**	**17,698.01**
Business Interruption Loss						
	Income	0.00	7.34	0.00	1.68	9.03
	Relocation	215.39	11.00	0.21	1.88	228.48
	Rental	105.38	3.06	0.00	0.12	108.56
	Wage	0.00	2.61	0.01	3.97	6.59
	Subtotal	**320.77**	**24.01**	**0.22**	**7.65**	**352.65**

Total

Total	**17,616.21**	**263.34**	**46.41**	**124.71**	**18,050.67**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,273	527,348	2,350,621
Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**
Study Region Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**

Hazus: Hurricane Global Risk Report

Region Name:	Granby_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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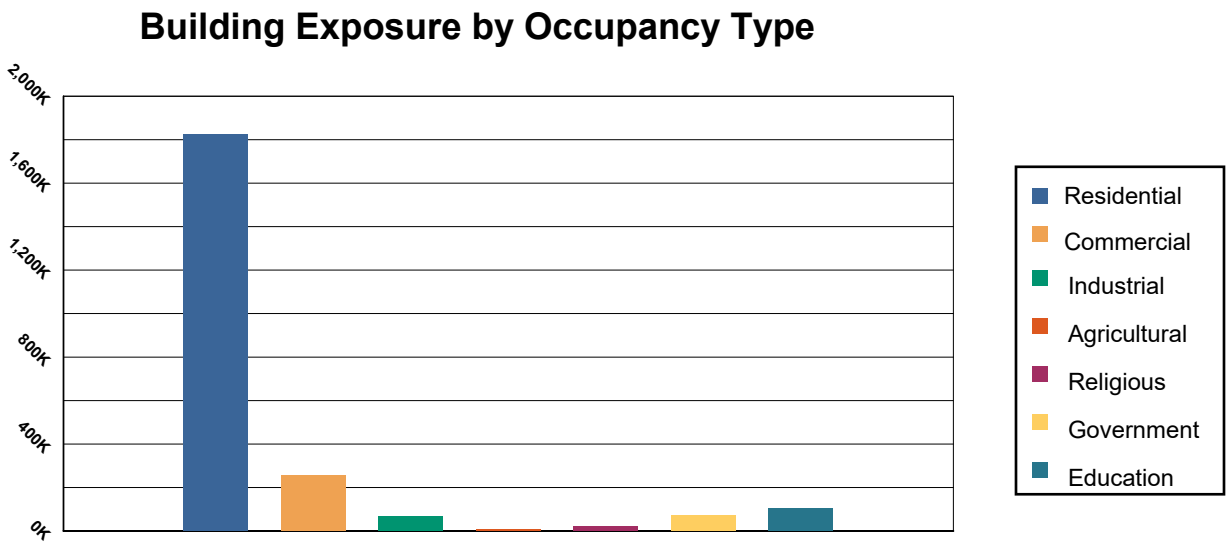

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Agricultural	6,798	0.29%
Religious	19,065	0.81%
Government	72,935	3.10%
Education	104,101	4.43%
Total	**2,350,621**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 27 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

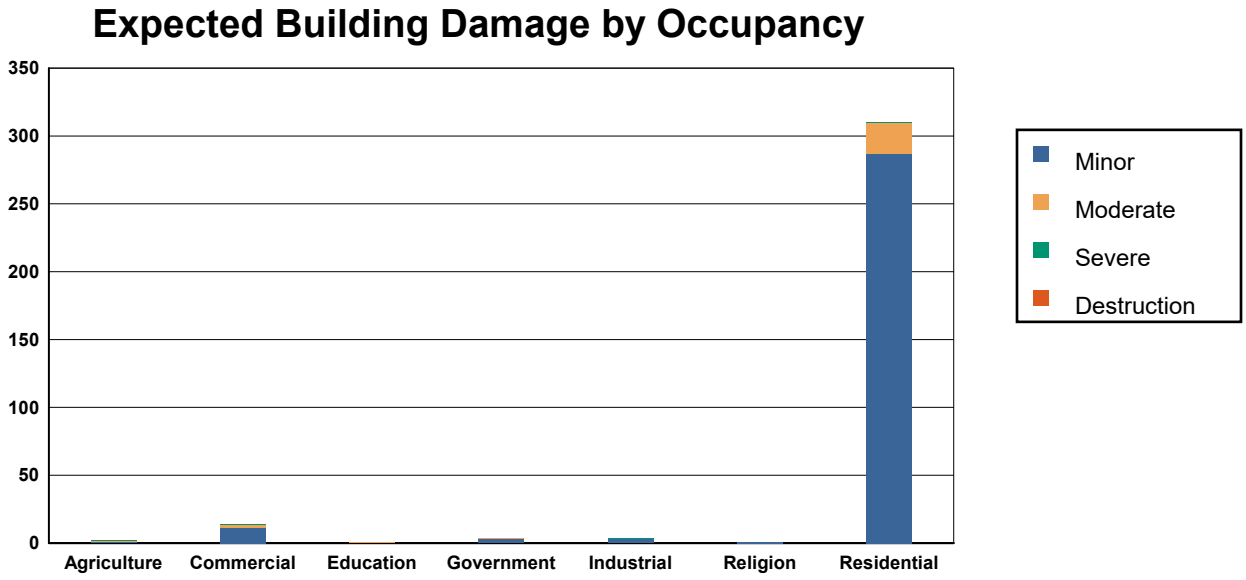


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	20.41	92.78	1.27	5.76	0.22	1.01	0.09	0.43	0.00	0.02
Commercial	240.07	94.51	11.03	4.34	2.48	0.98	0.42	0.17	0.00	0.00
Education	7.63	95.32	0.36	4.45	0.02	0.23	0.00	0.00	0.00	0.00
Government	70.64	95.46	3.20	4.32	0.16	0.22	0.00	0.00	0.00	0.00
Industrial	60.67	94.79	2.93	4.57	0.32	0.50	0.09	0.14	0.00	0.01
Religion	16.16	95.06	0.80	4.72	0.04	0.21	0.00	0.01	0.00	0.00
Residential	3,579.93	92.03	286.72	7.37	23.17	0.60	0.18	0.00	0.00	0.00
Total	**3,995.50**		**306.30**		**26.41**		**0.79**		**0.01**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	44	94.33	2	5.26	0	0.41	0	0.00	0	0.00
Masonry	283	92.23	19	6.23	4	1.45	0	0.09	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	203	94.93	9	4.02	2	0.89	0	0.16	0	0.00
Wood	3,473	92.35	272	7.22	16	0.42	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

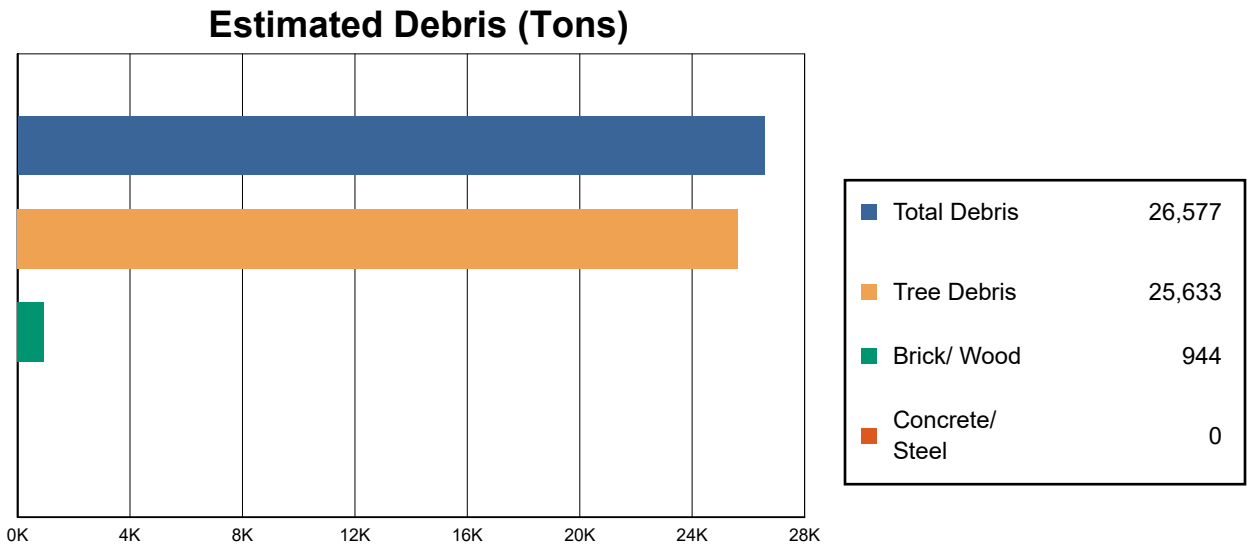
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

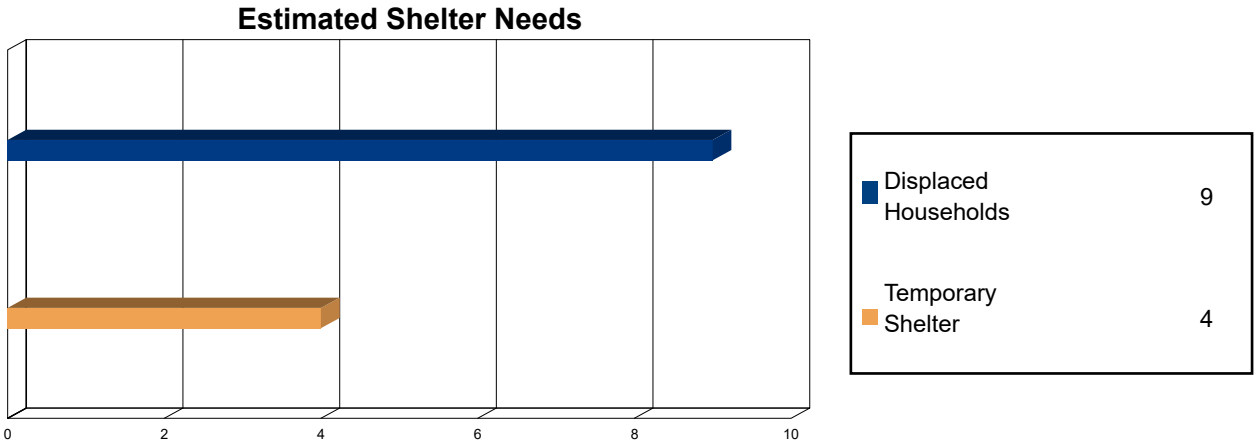


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 26,577 tons of debris will be generated. Of the total amount, 20,888 tons (79%) is Other Tree Debris. Of the remaining 5,689 tons, Brick/Wood comprises 17% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 38 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,745 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 9 households to be displaced due to the hurricane. Of these, 4 people (out of a total population of 10,903) will seek temporary shelter in public shelters.

Economic Loss

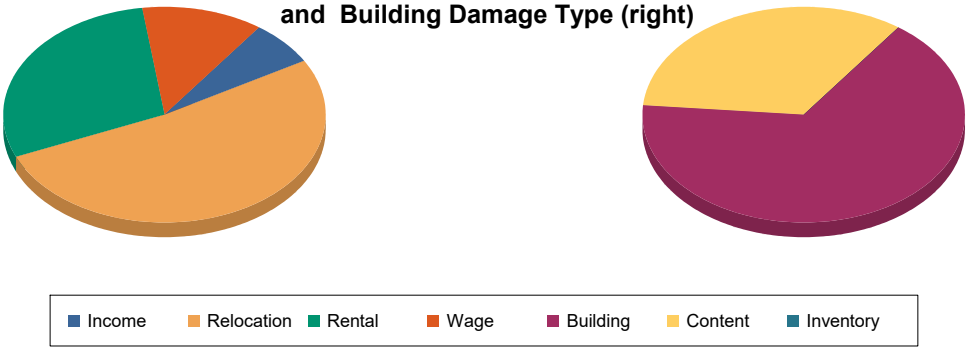
The total economic loss estimated for the hurricane is 31.4 million dollars, which represents 1.33 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 31 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

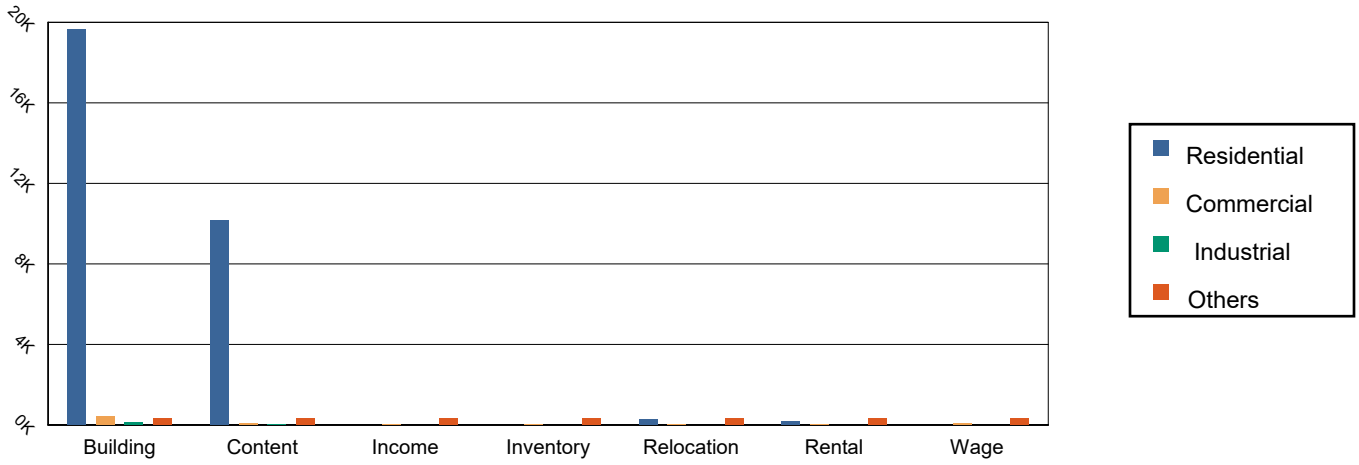


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	19,631.93	437.77	102.92	254.35	20,426.97
	Content	10,158.17	58.58	34.09	19.19	10,270.03
	Inventory	0.00	11.18	4.63	3.65	19.47
	Subtotal	**29,790.10**	**507.53**	**141.64**	**277.19**	**30,716.46**
Business Interruption Loss						
	Income	0.00	33.93	0.45	10.58	44.96
	Relocation	277.97	51.49	1.85	11.37	342.68
	Rental	168.77	23.33	0.30	0.82	193.23
	Wage	0.00	54.92	0.75	24.94	80.61
	Subtotal	**446.74**	**163.67**	**3.35**	**47.71**	**661.47**

Total

Total	**30,236.84**	**671.20**	**144.99**	**324.90**	**31,377.93**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,273	527,348	2,350,621
Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**
Study Region Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**

Hazus: Hurricane Global Risk Report

Region Name:	Granby_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.85 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 10,903 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,351 million dollars. Approximately 90% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,329 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

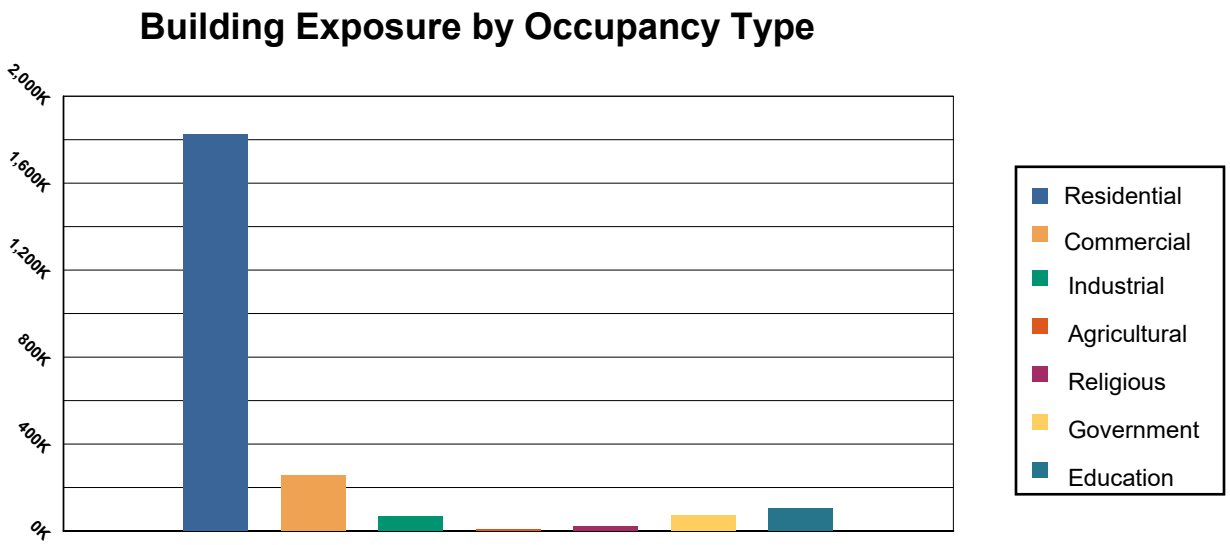


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,823,273	77.57%
Commercial	257,608	10.96%
Industrial	66,841	2.84%
Agricultural	6,798	0.29%
Religious	19,065	0.81%
Government	72,935	3.10%
Education	104,101	4.43%
Total	**2,350,621**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 97 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

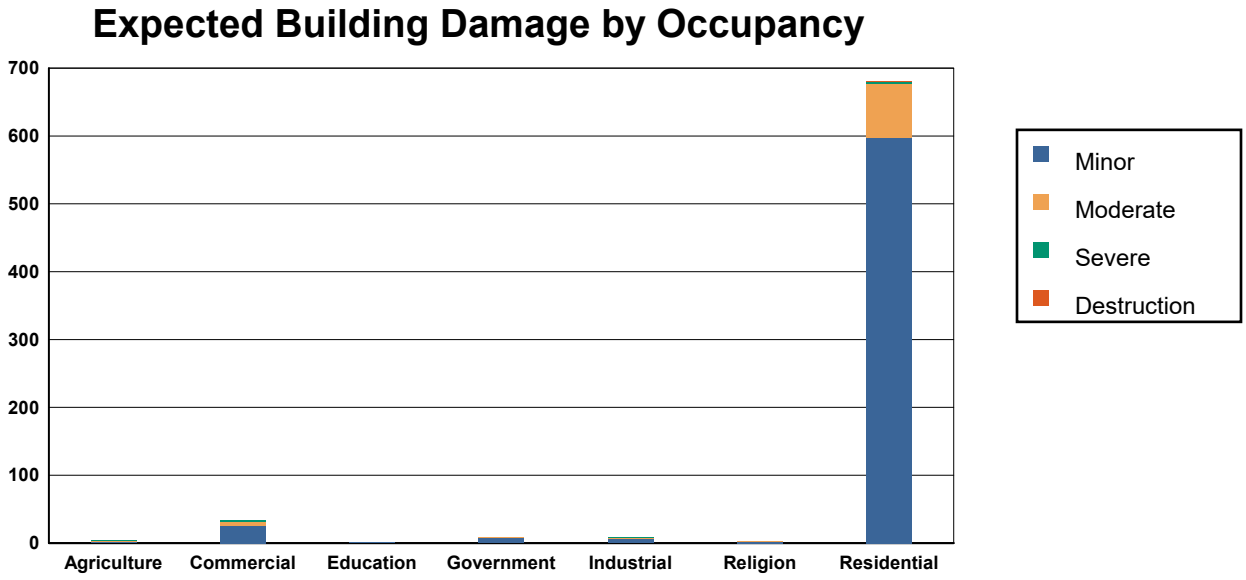


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	18.37	83.50	2.68	12.18	0.62	2.82	0.30	1.37	0.03	0.13
Commercial	219.82	86.54	25.16	9.91	7.15	2.81	1.85	0.73	0.01	0.00
Education	7.06	88.23	0.82	10.24	0.12	1.47	0.01	0.08	0.00	0.00
Government	65.60	88.65	7.29	9.85	1.07	1.44	0.05	0.06	0.00	0.00
Industrial	56.04	87.57	6.35	9.92	1.27	1.98	0.32	0.50	0.02	0.04
Religion	14.91	87.72	1.87	10.98	0.21	1.24	0.01	0.06	0.00	0.00
Residential	3,209.19	82.50	597.08	15.35	79.76	2.05	2.59	0.07	1.38	0.04
Total	**3,591.00**		**641.24**		**90.20**		**5.13**		**1.44**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	41	86.39	5	11.26	1	2.30	0	0.05	0	0.00
Masonry	256	83.50	38	12.29	12	3.85	1	0.32	0	0.03
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	187	87.61	19	8.98	6	2.71	2	0.71	0	0.00
Wood	3,119	82.93	575	15.30	63	1.68	2	0.06	1	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

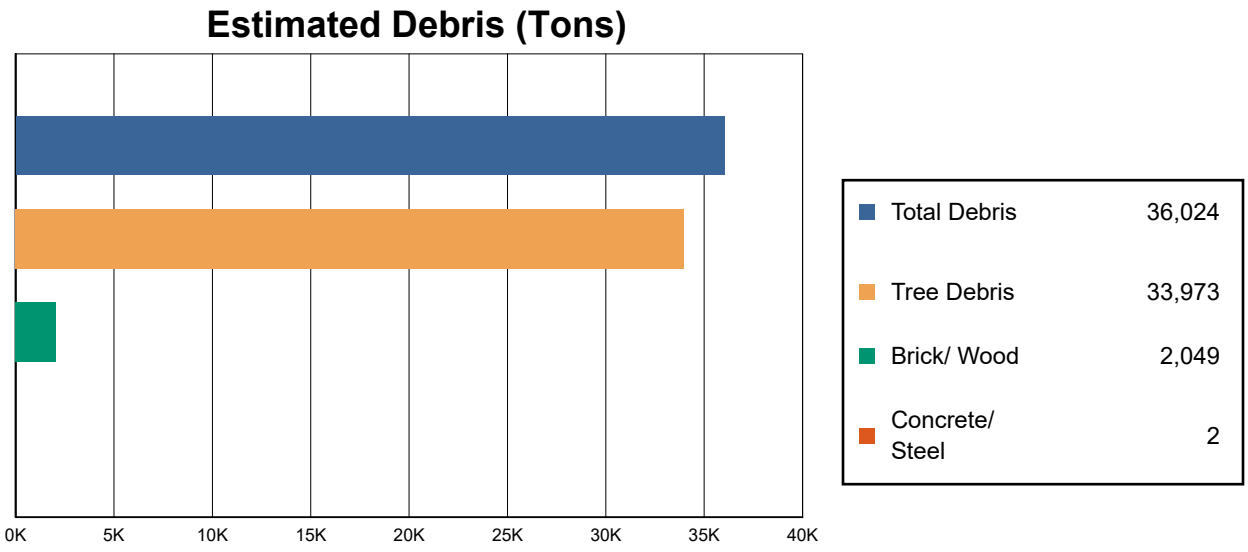
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

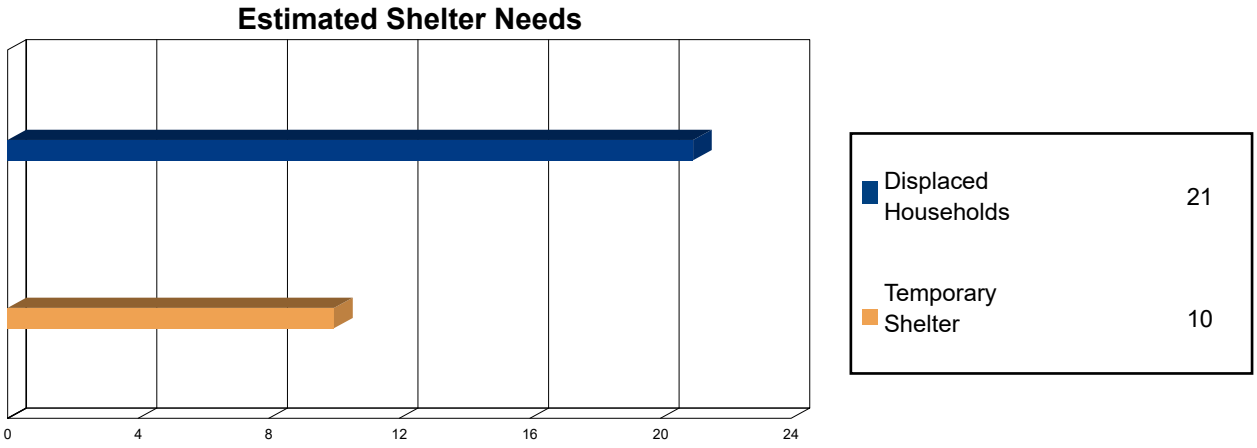


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 36,024 tons of debris will be generated. Of the total amount, 27,577 tons (77%) is Other Tree Debris. Of the remaining 8,447 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 82 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,396 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 21 households to be displaced due to the hurricane. Of these, 10 people (out of a total population of 10,903) will seek temporary shelter in public shelters.

Economic Loss

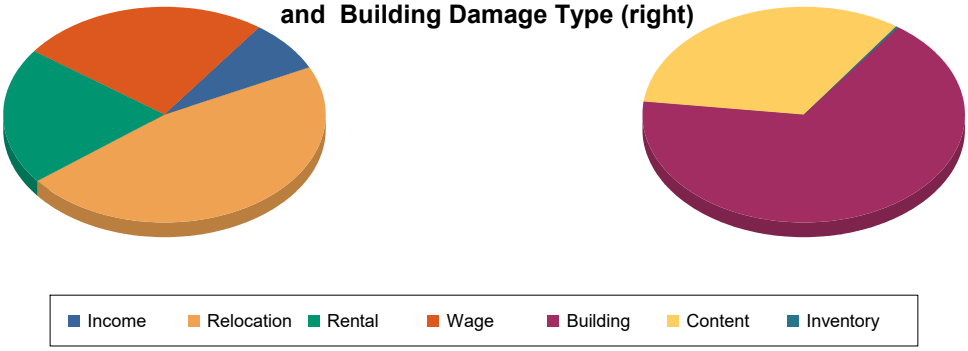
The total economic loss estimated for the hurricane is 55.4 million dollars, which represents 2.36 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 55 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 93% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

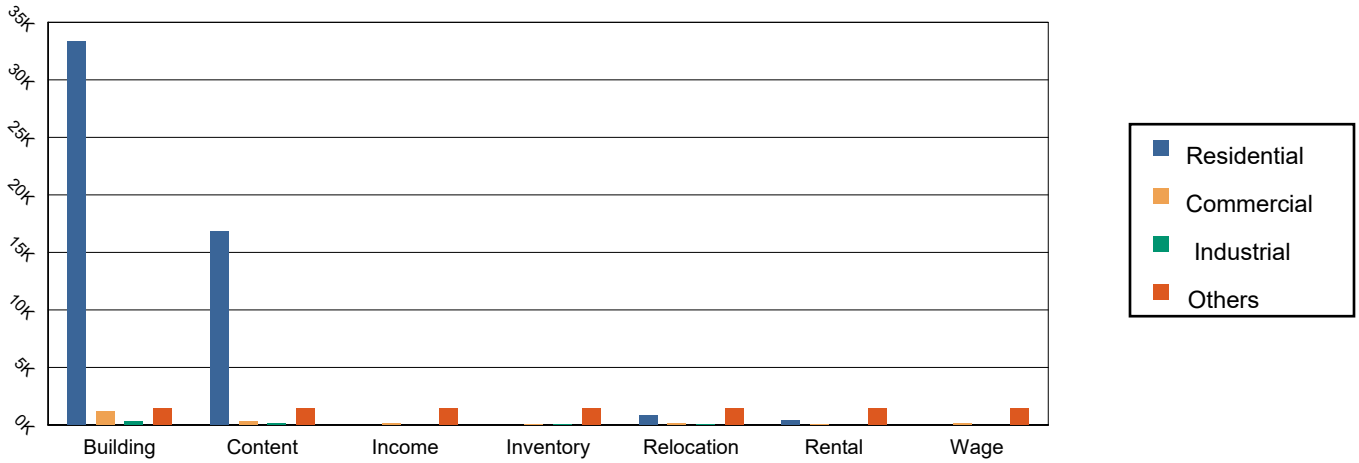


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	33,354.24	1,162.88	305.02	683.56	35,505.70
	Content	16,771.80	306.47	150.56	118.85	17,347.68
	Inventory	0.00	58.48	20.24	15.87	94.60
	Subtotal	**50,126.04**	**1,527.83**	**475.83**	**818.28**	**52,947.98**
Business Interruption Loss						
	Income	0.00	132.23	4.24	55.67	192.14
	Relocation	869.92	172.71	14.14	106.57	1,163.34
	Rental	406.90	82.98	2.78	17.32	509.98
	Wage	0.00	176.18	7.22	439.09	622.49
	Subtotal	**1,276.82**	**564.10**	**28.38**	**618.65**	**2,487.95**

Total

Total	**51,402.86**	**2,091.93**	**504.21**	**1,436.92**	**55,435.93**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,273	527,348	2,350,621
Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**
Study Region Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**

Hazus: Hurricane Global Risk Report

Region Name:	Granby_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.85 square miles and contains 2 census tracts. There are over 4 thousand households in the region and a total population of 10,903 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,351 million dollars. Approximately 90% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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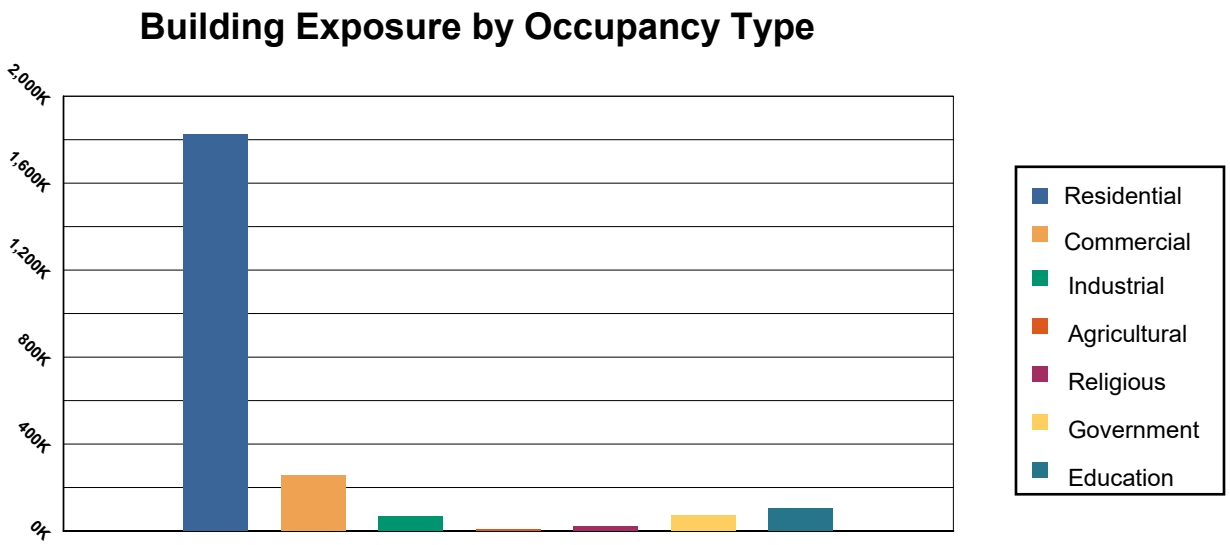

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
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Commercial	257,608	10.96%
Industrial	66,841	2.84%
Agricultural	6,798	0.29%
Religious	19,065	0.81%
Government	72,935	3.10%
Education	104,101	4.43%
Total	**2,350,621**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 182 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

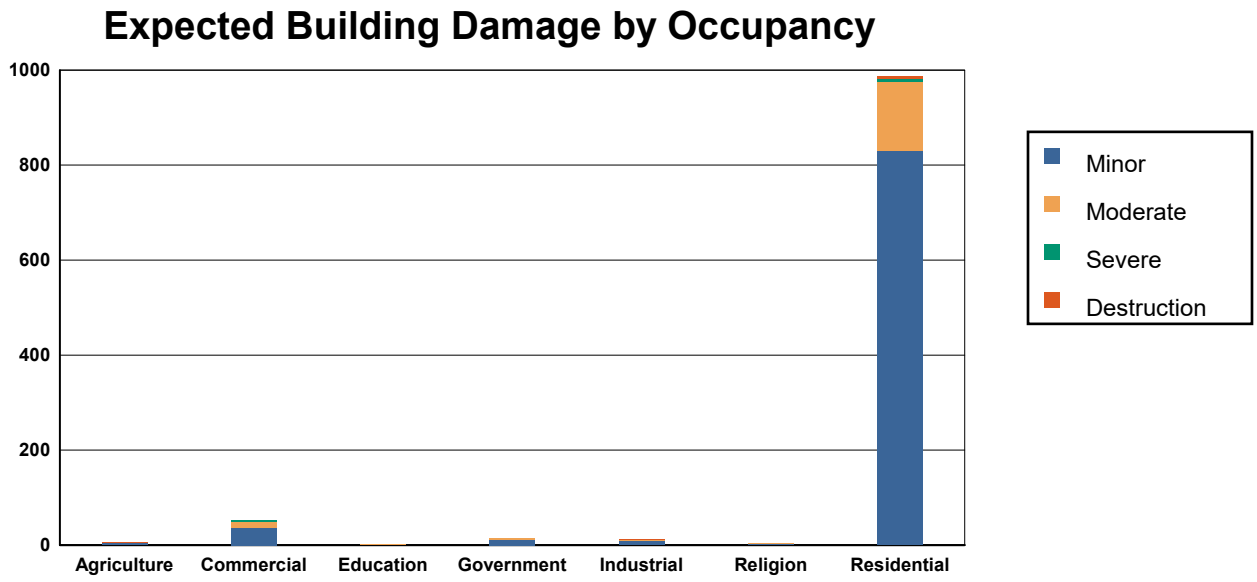


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16.57	75.33	3.80	17.26	1.06	4.80	0.51	2.31	0.06	0.29
Commercial	201.42	79.30	36.39	14.33	12.67	4.99	3.50	1.38	0.02	0.01
Education	6.50	81.31	1.20	15.05	0.28	3.45	0.02	0.20	0.00	0.00
Government	60.54	81.82	10.77	14.55	2.55	3.45	0.14	0.18	0.00	0.00
Industrial	51.49	80.45	9.24	14.43	2.63	4.11	0.59	0.92	0.06	0.09
Religion	13.70	80.57	2.78	16.33	0.50	2.94	0.03	0.16	0.00	0.00
Residential	2,902.37	74.61	830.30	21.34	144.73	3.72	8.06	0.21	4.53	0.12
Total	**3,252.59**		**894.47**		**164.41**		**12.84**		**4.68**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	37	78.91	7	15.94	2	4.98	0	0.17	0	0.00
Masonry	233	75.93	52	16.95	20	6.42	2	0.61	0	0.08
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	172	80.56	28	13.09	11	4.99	3	1.35	0	0.01
Wood	2,824	75.08	805	21.41	120	3.18	8	0.20	4	0.11

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

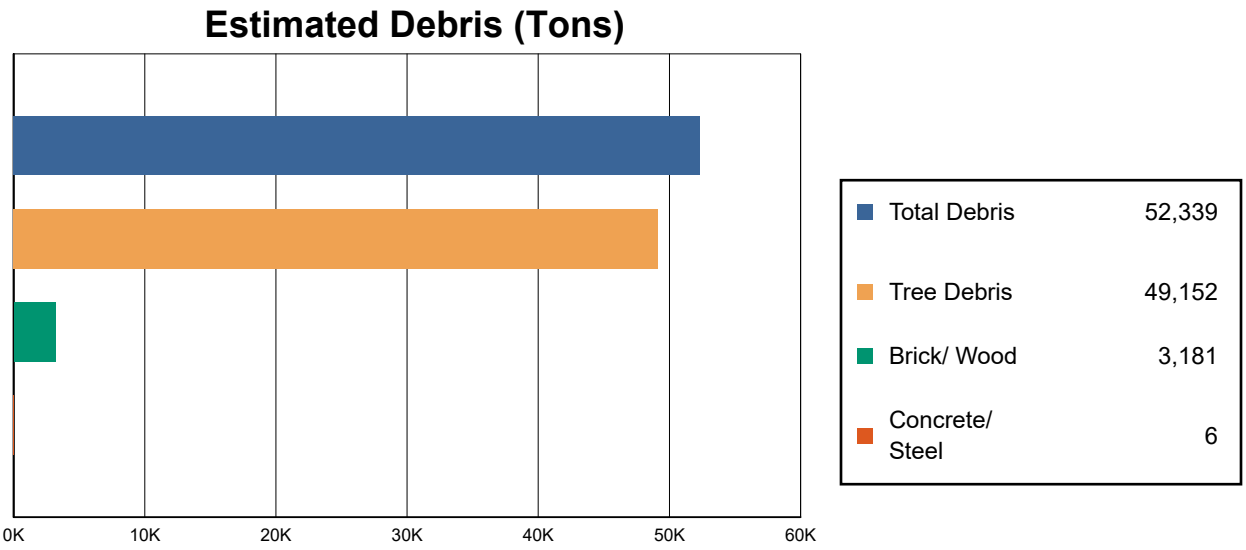
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	4	0	0	2

Induced Hurricane Damage

Debris Generation

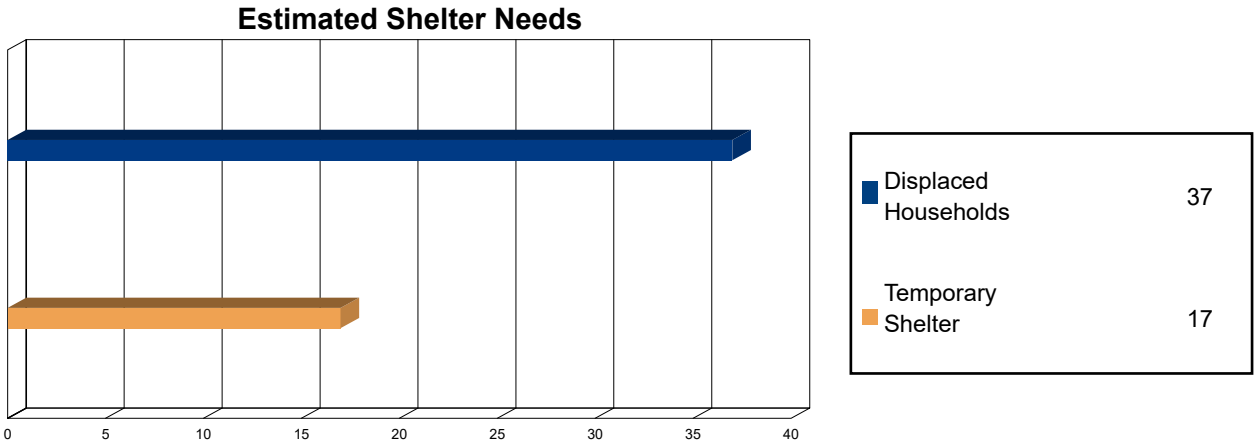


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 52,339 tons of debris will be generated. Of the total amount, 39,980 tons (76%) is Other Tree Debris. Of the remaining 12,359 tons, Brick/Wood comprises 26% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 127 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,172 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 37 households to be displaced due to the hurricane. Of these, 17 people (out of a total population of 10,903) will seek temporary shelter in public shelters.

Economic Loss

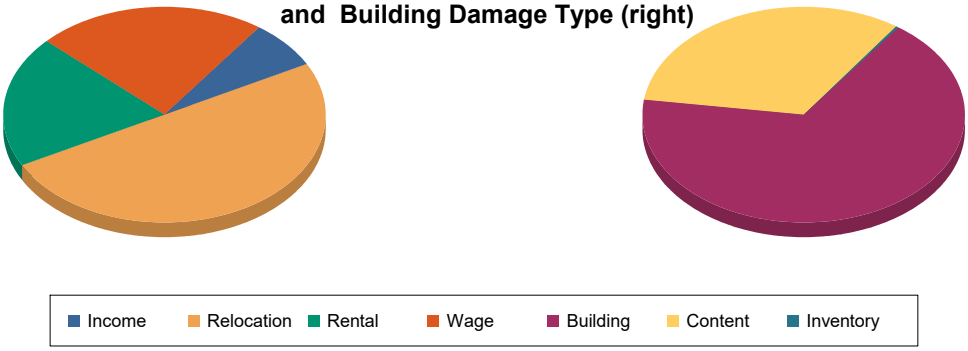
The total economic loss estimated for the hurricane is 80.8 million dollars, which represents 3.44 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 81 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

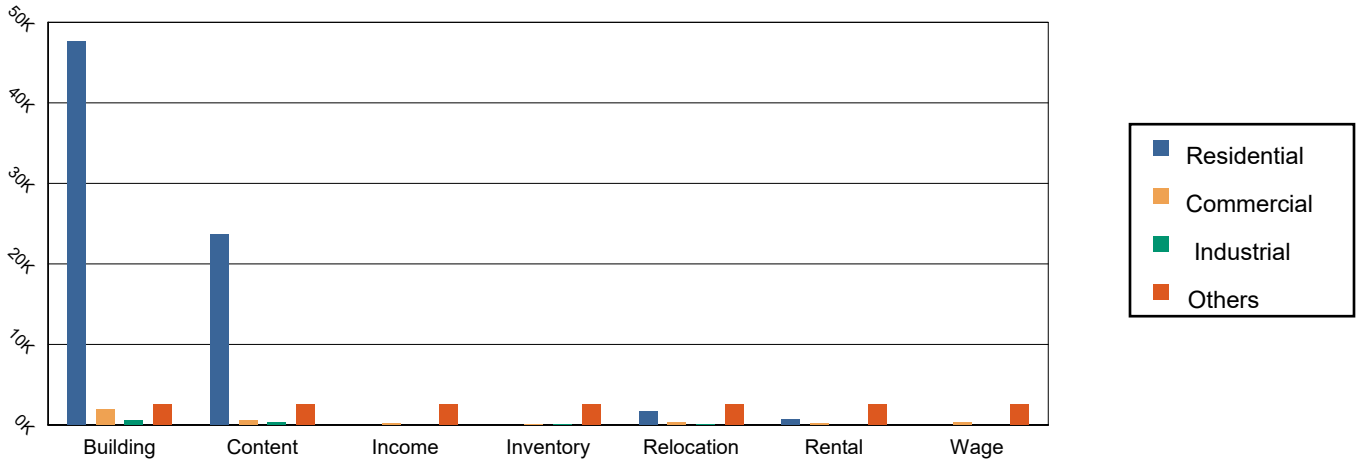


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	47,582.32	1,965.50	551.42	1,196.23	51,295.47
	Content	23,653.98	605.02	299.52	267.56	24,826.07
	Inventory	0.00	119.13	40.20	30.17	189.51
	Subtotal	**71,236.30**	**2,689.65**	**891.14**	**1,493.96**	**76,311.04**
Business Interruption Loss						
	Income	0.00	208.03	6.65	104.47	319.14
	Relocation	1,664.11	311.61	27.32	219.89	2,222.93
	Rental	689.17	148.93	4.59	31.33	874.03
	Wage	0.00	281.20	11.30	737.97	1,030.46
	Subtotal	**2,353.28**	**949.78**	**49.86**	**1,093.65**	**4,446.56**

Total

Total	**73,589.58**	**3,639.42**	**940.99**	**2,587.61**	**80,757.61**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	10,903	1,823,273	527,348	2,350,621
Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**
Study Region Total	**10,903**	**1,823,273**	**527,348**	**2,350,621**

Hazus: Hurricane Global Risk Report

Region Name:	Hartford_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.06 square miles and contains 41 census tracts. There are over 47 thousand households in the region and a total population of 121,054 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 20 thousand buildings in the region with a total building replacement value (excluding contents) of 18,506 million dollars. Approximately 77% of the buildings (and 47% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 20,715 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

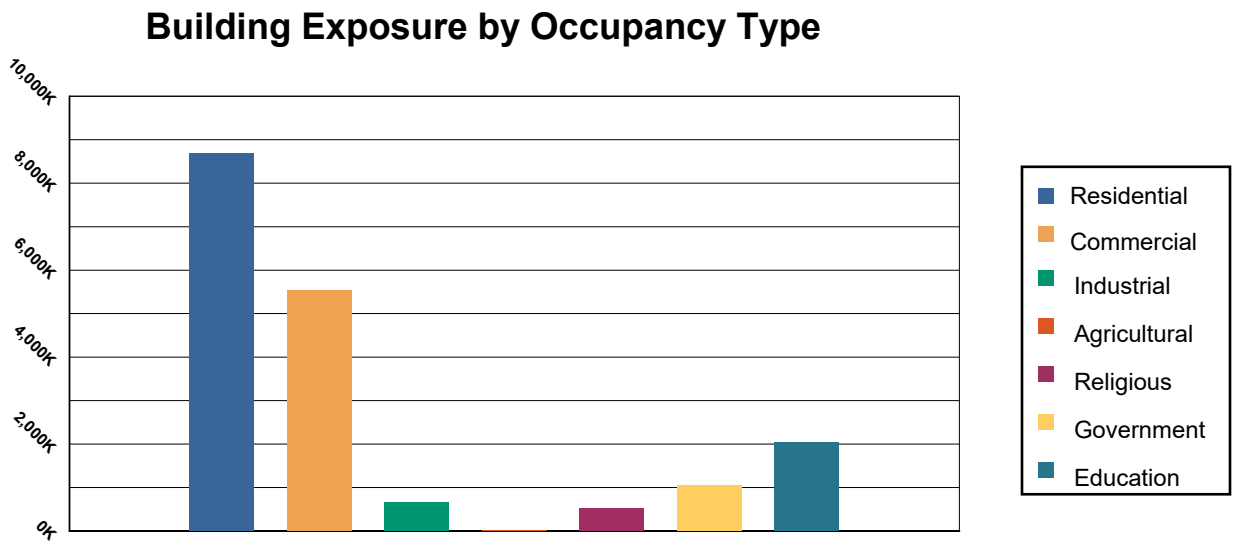


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	8,688,123	46.95%
Commercial	5,529,462	29.88%
Industrial	655,146	3.54%
Agricultural	13,597	0.07%
Religious	527,256	2.85%
Government	1,049,844	5.67%
Education	2,042,617	11.04%
Total	**18,506,045**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds. There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

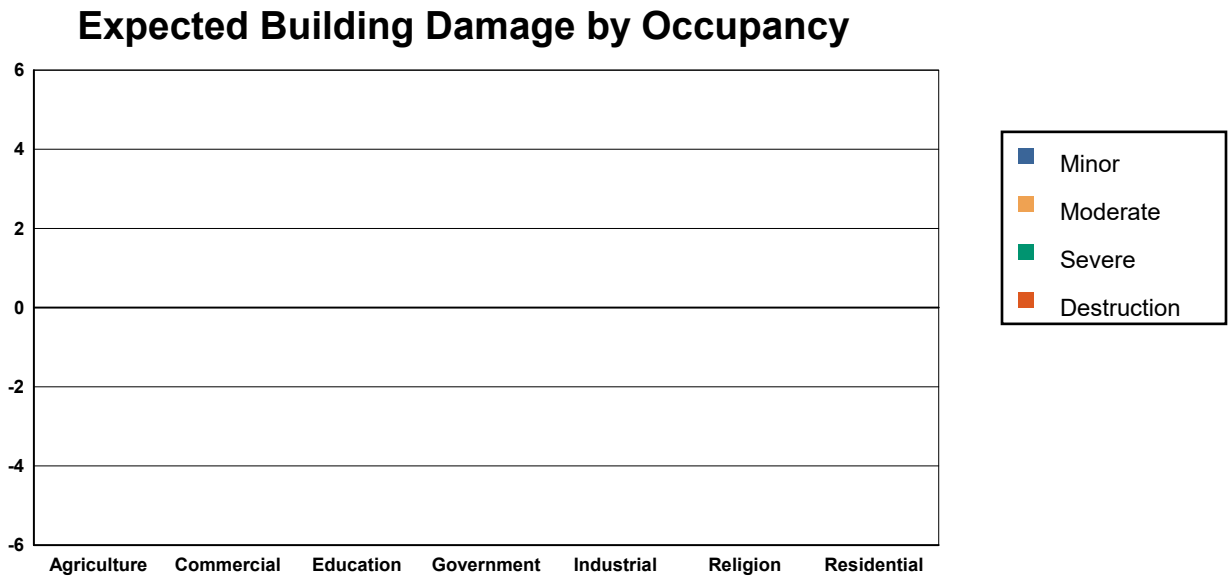


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	32.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	3,332.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	110.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	504.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	439.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	369.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	15,929.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**20,715.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	807	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	4,377	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	2,334	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	13,176	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 1,731 hospital beds available for use. On the day of the hurricane, the model estimates that 1,731 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

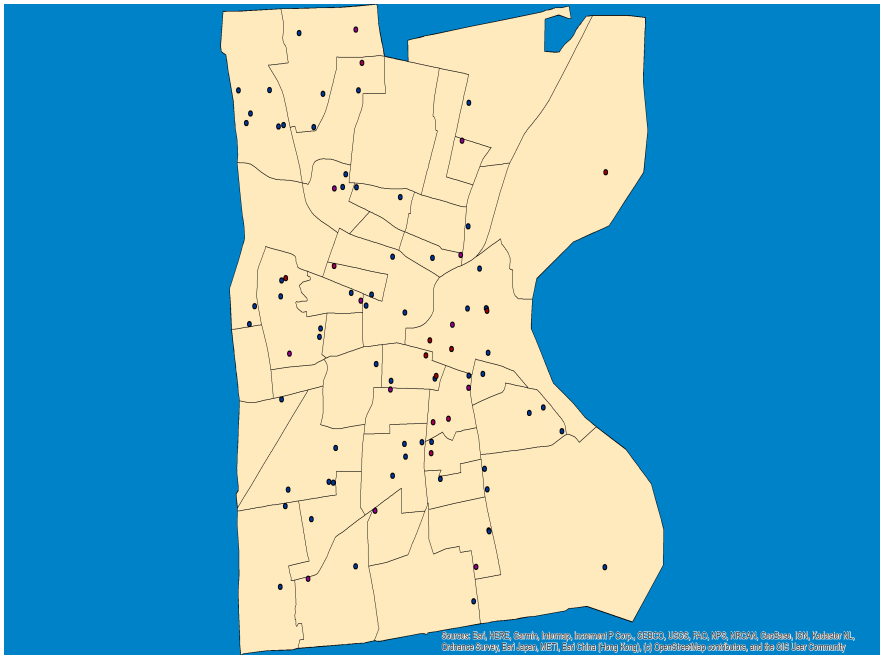
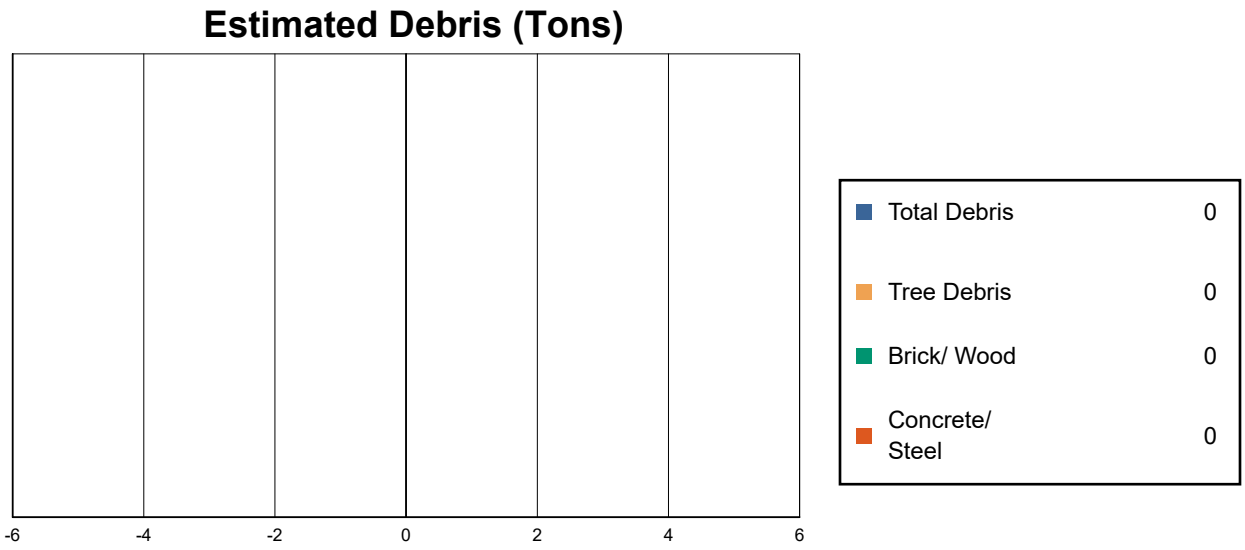


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	2	0	0	2
Fire Stations	12	0	0	12
Hospitals	5	0	0	5
Police Stations	7	0	0	7
Schools	62	0	0	62

Induced Hurricane Damage

Debris Generation

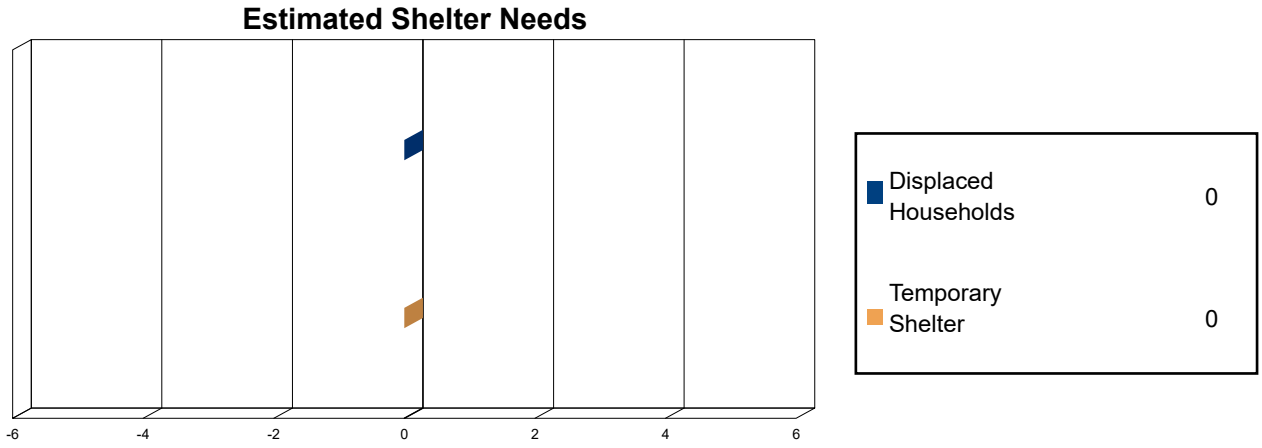


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 121,054) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

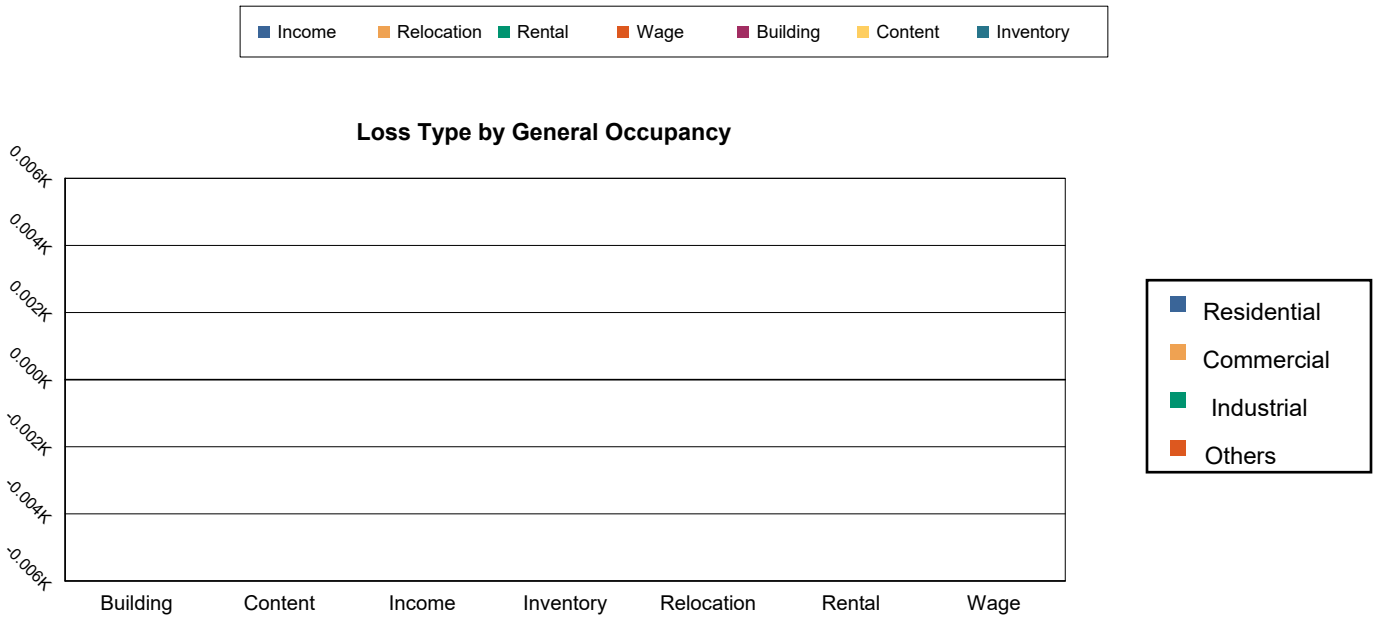


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
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Hartford	121,054	8,688,123	9,817,922	18,506,045
Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**
Study Region Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**

Hazus: Hurricane Global Risk Report

Region Name:	Hartford_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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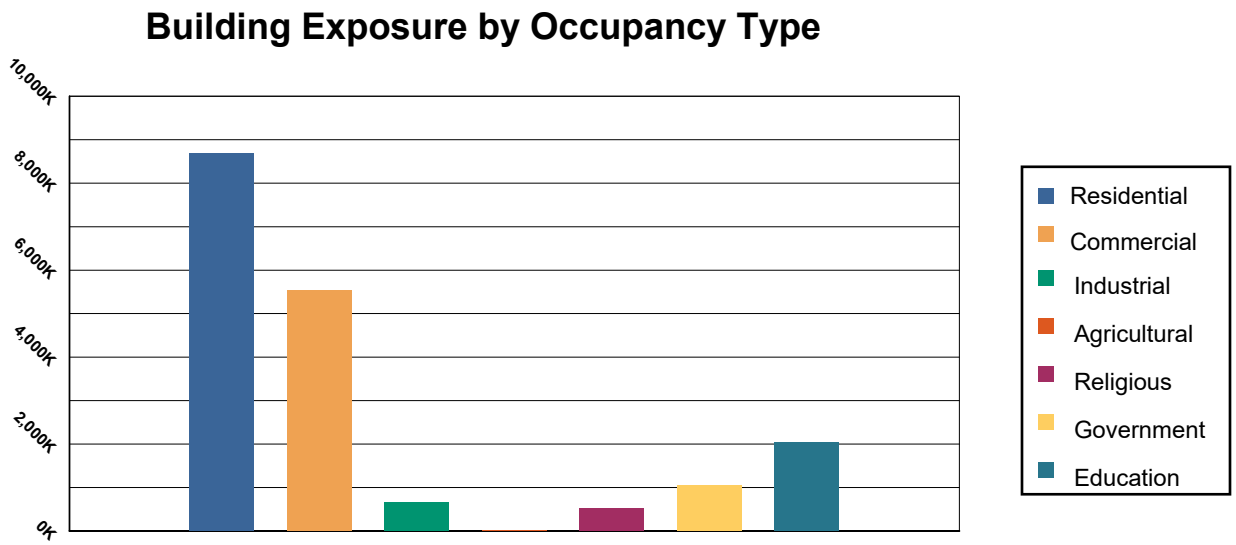

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Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

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Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

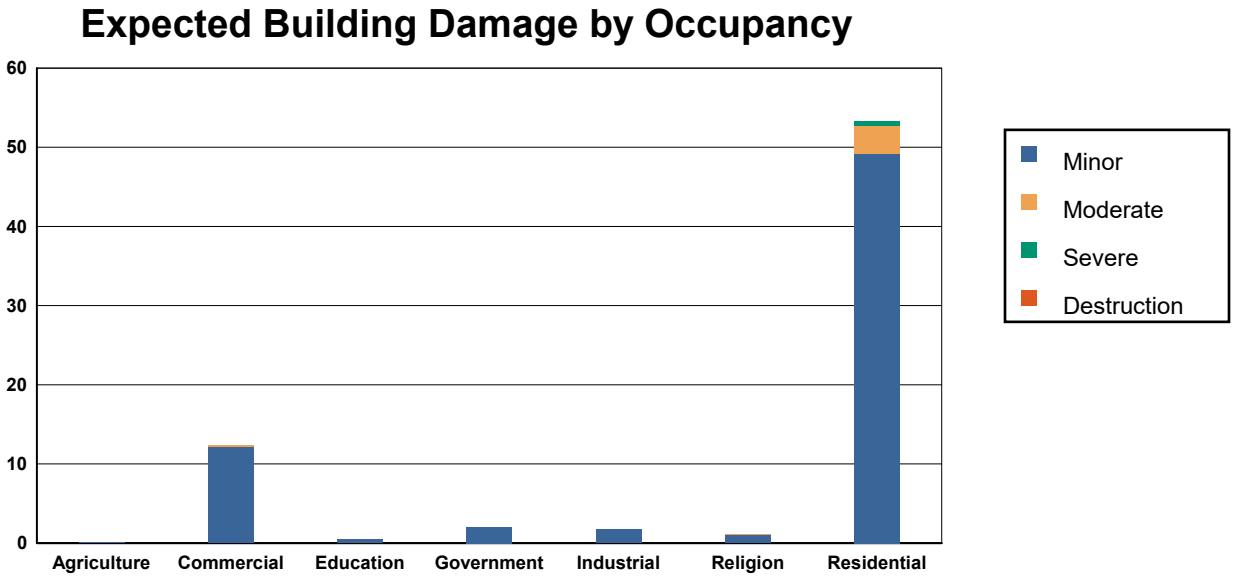


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	31.91	99.72	0.09	0.27	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	3,319.61	99.63	12.23	0.37	0.16	0.00	0.00	0.00	0.00	0.00
Education	109.57	99.61	0.43	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Government	501.96	99.60	2.04	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	437.25	99.60	1.75	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Religion	367.90	99.70	1.07	0.29	0.04	0.01	0.00	0.00	0.00	0.00
Residential	15,875.73	99.67	49.13	0.31	3.60	0.02	0.53	0.00	0.00	0.00
Total	**20,643.93**		**66.73**		**3.80**		**0.53**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	803	99.52	4	0.48	0	0.00	0	0.00	0	0.00
Masonry	4,343	99.23	32	0.73	2	0.04	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	2,324	99.58	10	0.42	0	0.00	0	0.00	0	0.00
Wood	13,160	99.88	14	0.10	2	0.01	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 1,731 hospital beds available for use. On the day of the hurricane, the model estimates that 1,731 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

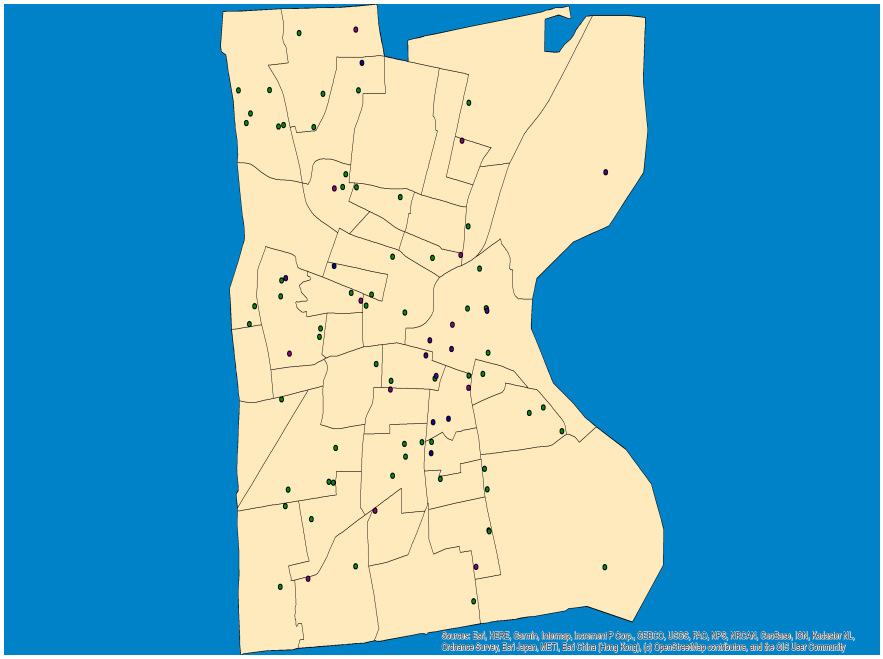
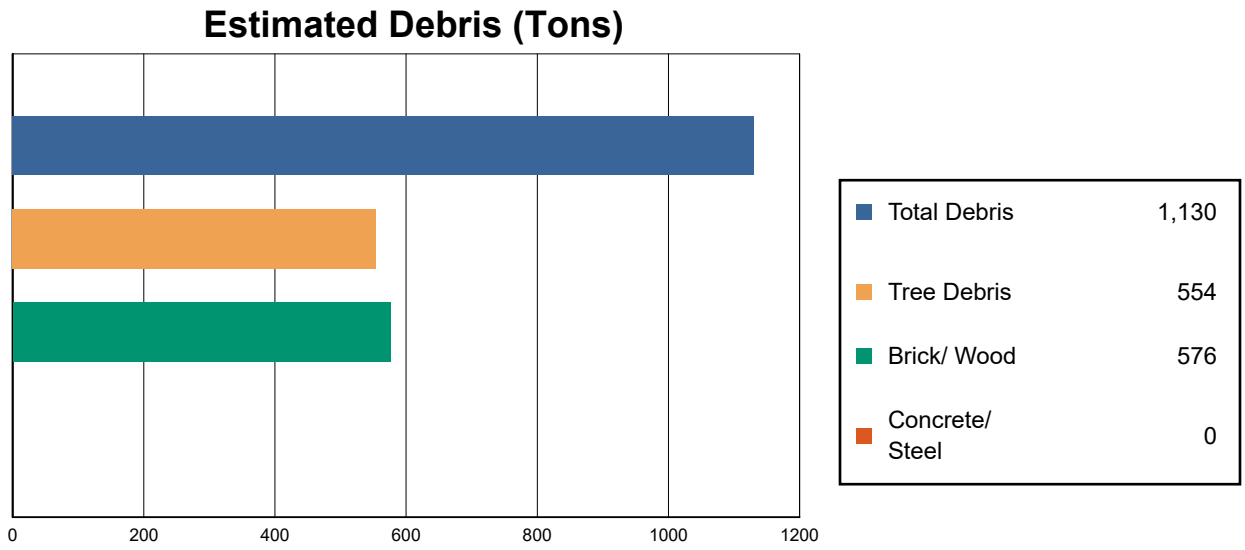


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	2	0	0	2
Fire Stations	12	0	0	12
Hospitals	5	0	0	5
Police Stations	7	0	0	7
Schools	62	0	0	62

Induced Hurricane Damage

Debris Generation

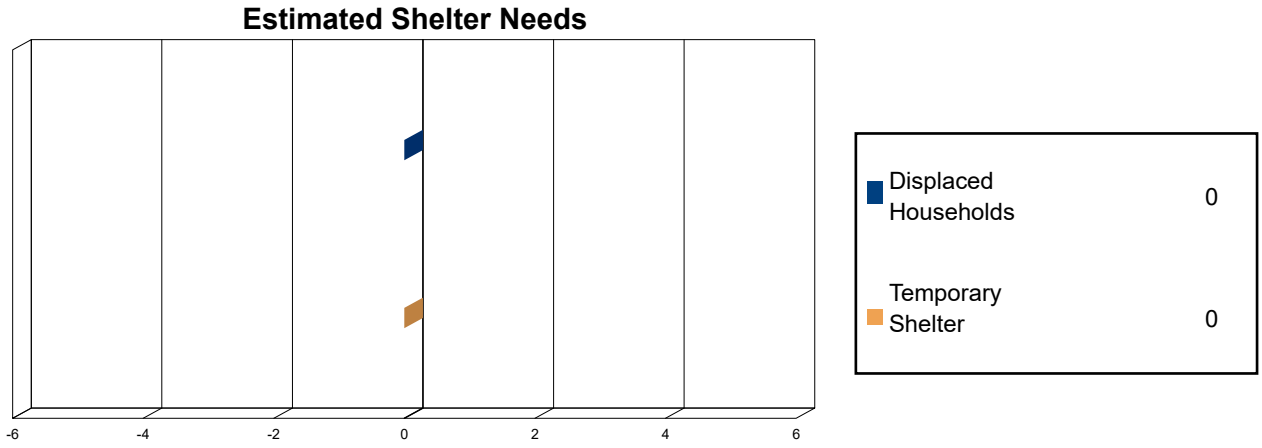


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,130 tons of debris will be generated. Of the total amount, 141 tons (12%) is Other Tree Debris. Of the remaining 989 tons, Brick/Wood comprises 58% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 23 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 413 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 121,054) will seek temporary shelter in public shelters.

Economic Loss

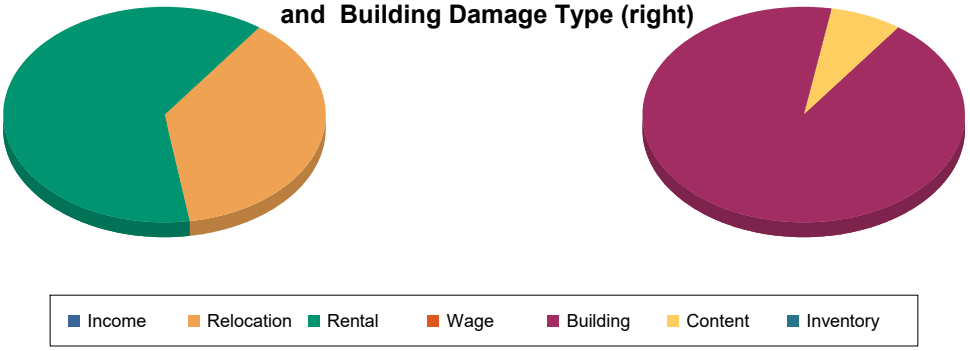
The total economic loss estimated for the hurricane is 5.7 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 6 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

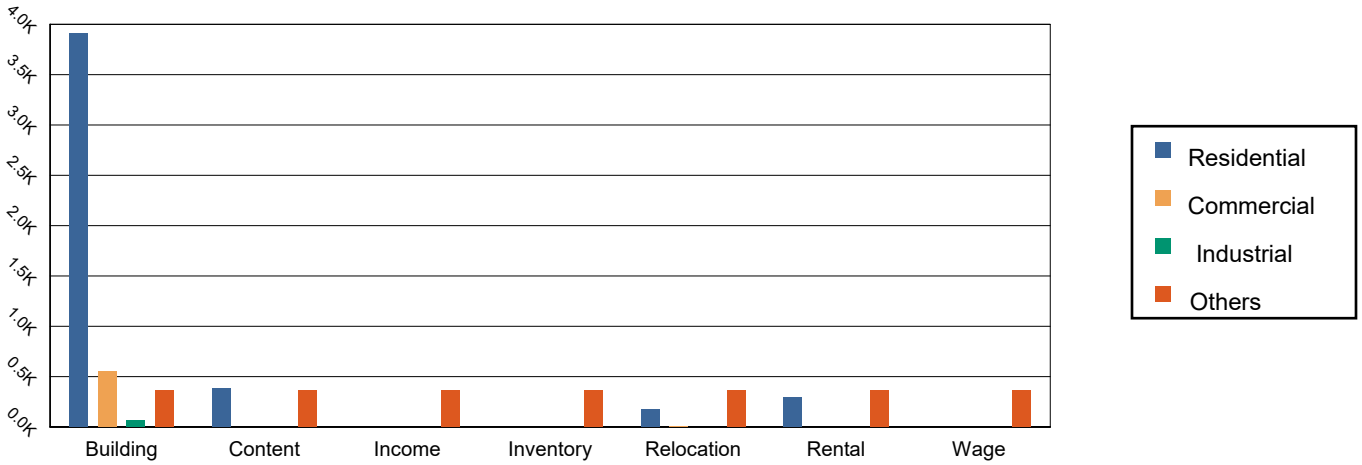


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,905.30	552.95	65.51	361.97	4,885.73
	Content	381.27	0.00	0.00	0.00	381.27
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**4,286.57**	**552.95**	**65.51**	**361.97**	**5,267.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	171.73	1.96	0.00	0.29	173.98
	Rental	290.64	0.00	0.00	0.00	290.64
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**462.37**	**1.96**	**0.00**	**0.29**	**464.62**

Total

Total	**4,748.95**	**554.91**	**65.51**	**362.26**	**5,731.63**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	121,054	8,688,123	9,817,922	18,506,045
Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**
Study Region Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**

Hazus: Hurricane Global Risk Report

Region Name: Hartford_HU

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, May 10, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
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Essential Facility Inventory	
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General Building Stock	
Essential Facilities Damage	
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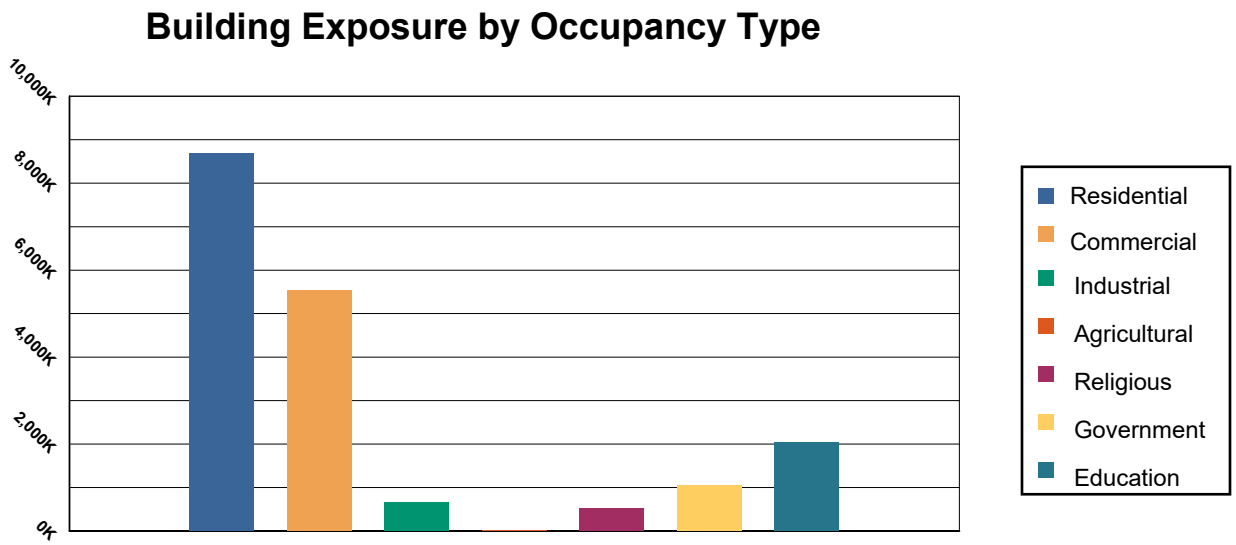

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Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds. There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 86 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

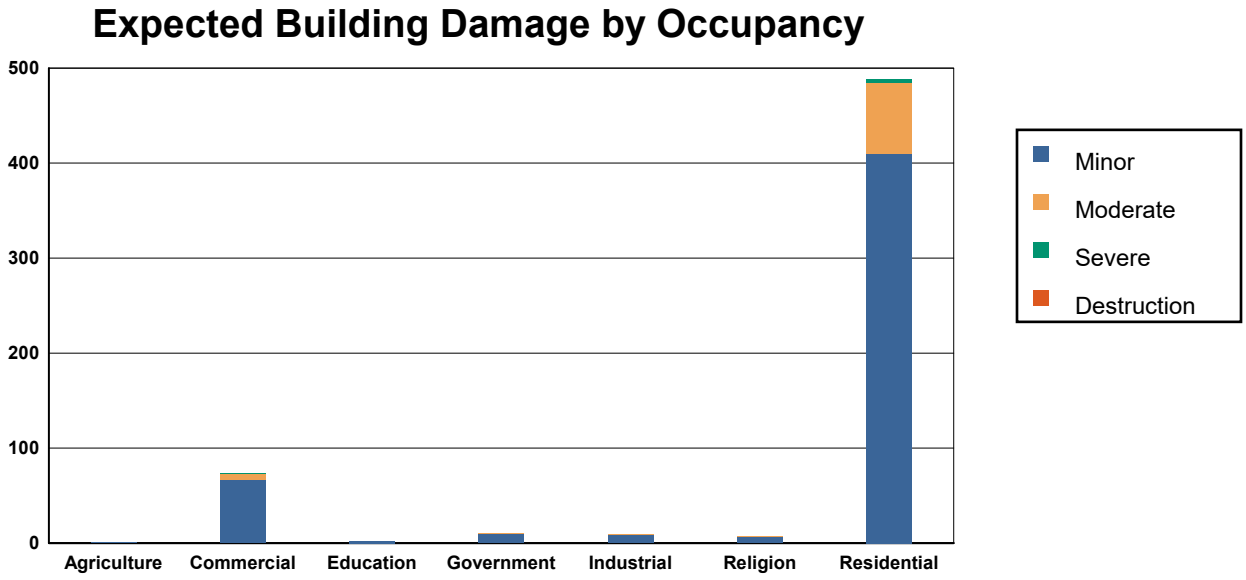


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	31.18	97.45	0.71	2.21	0.08	0.25	0.02	0.07	0.00	0.01
Commercial	3,258.81	97.80	66.83	2.01	5.97	0.18	0.39	0.01	0.00	0.00
Education	107.82	98.02	2.13	1.93	0.05	0.05	0.00	0.00	0.00	0.00
Government	493.66	97.95	10.12	2.01	0.22	0.04	0.00	0.00	0.00	0.00
Industrial	429.60	97.86	8.92	2.03	0.40	0.09	0.07	0.01	0.00	0.00
Religion	362.05	98.12	6.73	1.82	0.20	0.05	0.02	0.01	0.00	0.00
Residential	15,440.69	96.93	409.71	2.57	75.54	0.47	3.05	0.02	0.00	0.00
Total	**20,123.83**		**505.14**		**82.46**		**3.56**		**0.01**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	788	97.62	19	2.32	1	0.06	0	0.00	0	0.00
Masonry	4,164	95.14	164	3.75	48	1.09	1	0.02	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	2,284	97.85	46	1.98	4	0.16	0	0.01	0	0.00
Wood	12,915	98.02	243	1.85	15	0.12	2	0.02	0	0.00

Essential Facility Damage

Before the hurricane, the region had 1,731 hospital beds available for use. On the day of the hurricane, the model estimates that 1,731 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

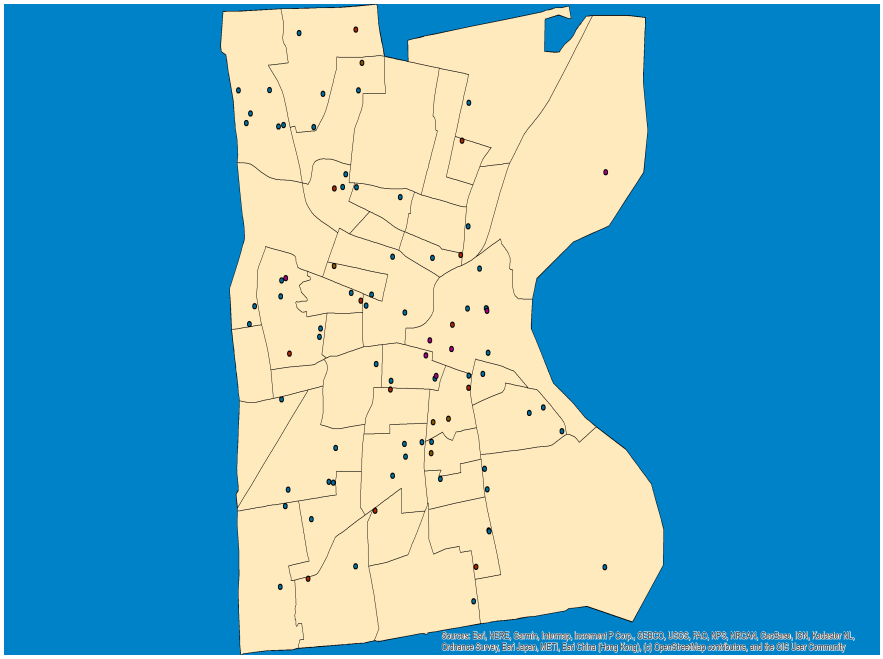
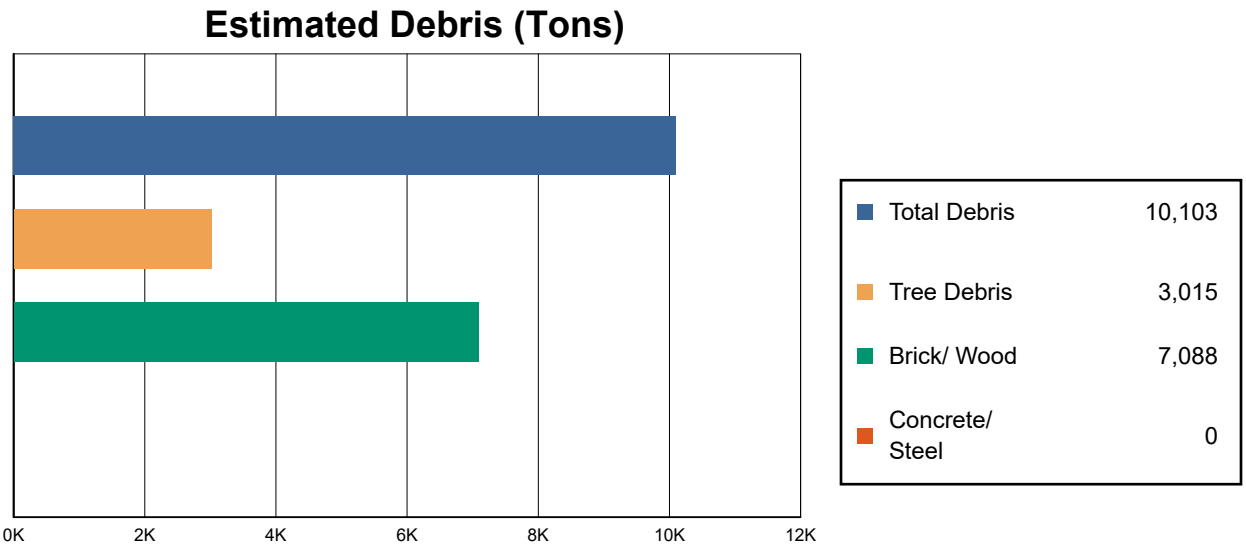


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	2	0	0	2
Fire Stations	12	0	0	12
Hospitals	5	0	0	5
Police Stations	7	0	0	7
Schools	62	0	0	62

Induced Hurricane Damage

Debris Generation

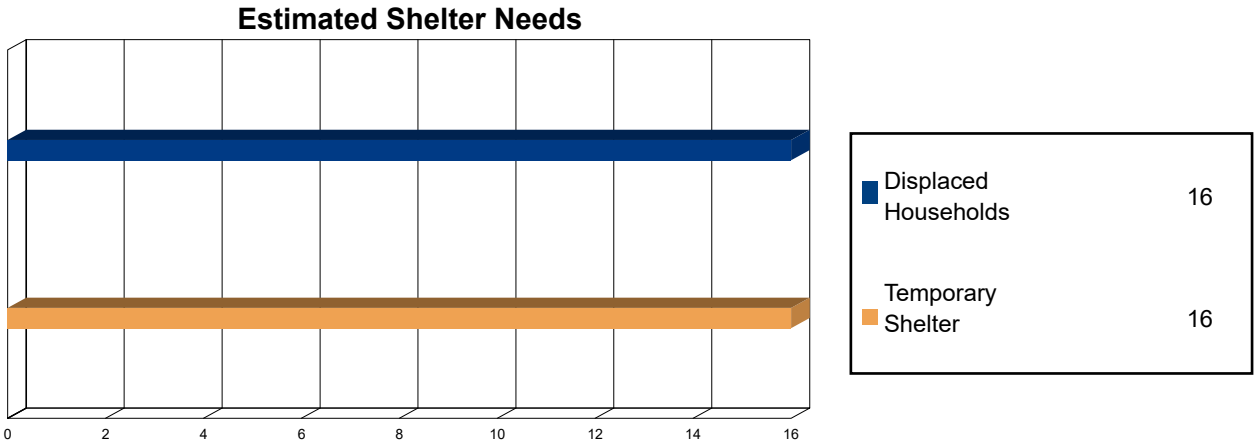


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 10,103 tons of debris will be generated. Of the total amount, 829 tons (8%) is Other Tree Debris. Of the remaining 9,274 tons, Brick/Wood comprises 76% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 284 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,186 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 16 households to be displaced due to the hurricane. Of these, 16 people (out of a total population of 121,054) will seek temporary shelter in public shelters.

Economic Loss

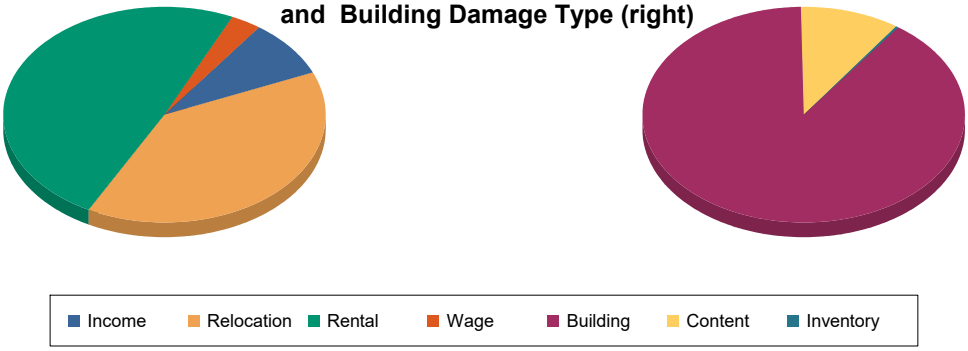
The total economic loss estimated for the hurricane is 57.0 million dollars, which represents 0.31 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 57 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

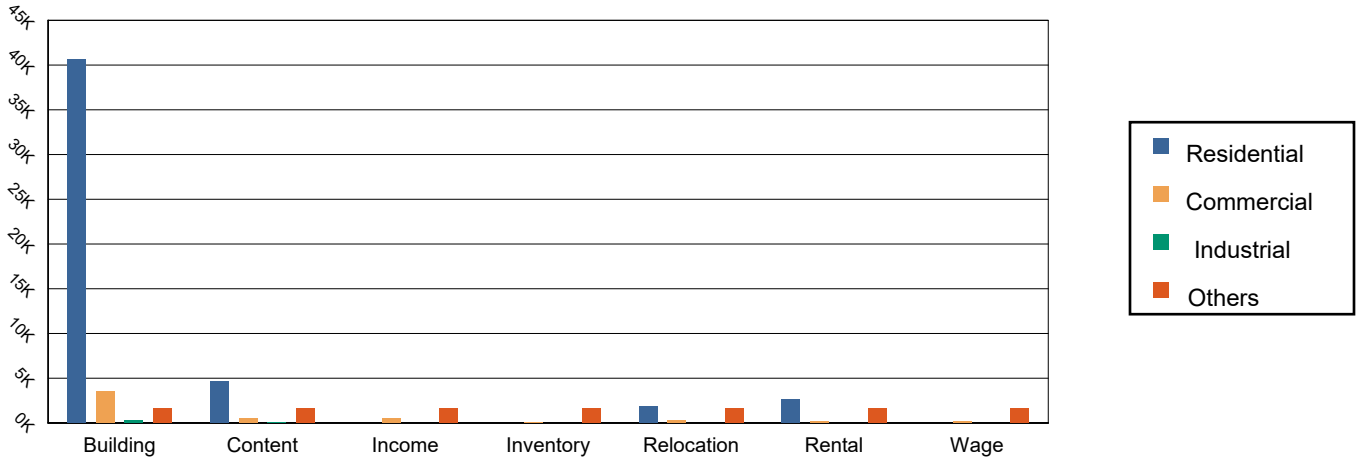


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	40,648.09	3,513.63	308.25	1,560.98	46,030.95
	Content	4,626.98	480.90	69.28	34.78	5,211.95
	Inventory	0.00	62.21	8.23	1.83	72.27
	Subtotal	**45,275.07**	**4,056.74**	**385.76**	**1,597.60**	**51,315.17**
Business Interruption Loss						
	Income	0.00	494.71	0.00	0.00	494.71
	Relocation	1,899.25	324.52	3.29	10.03	2,237.09
	Rental	2,617.94	202.31	0.00	0.00	2,820.25
	Wage	0.00	175.82	0.00	0.00	175.82
	Subtotal	**4,517.19**	**1,197.36**	**3.29**	**10.03**	**5,727.87**

Total

Total	**49,792.25**	**5,254.10**	**389.05**	**1,607.63**	**57,043.04**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	121,054	8,688,123	9,817,922	18,506,045
Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**
Study Region Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**

Hazus: Hurricane Global Risk Report

Region Name:	Hartford_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.06 square miles and contains 41 census tracts. There are over 47 thousand households in the region and a total population of 121,054 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 20 thousand buildings in the region with a total building replacement value (excluding contents) of 18,506 million dollars. Approximately 77% of the buildings (and 47% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 20,715 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

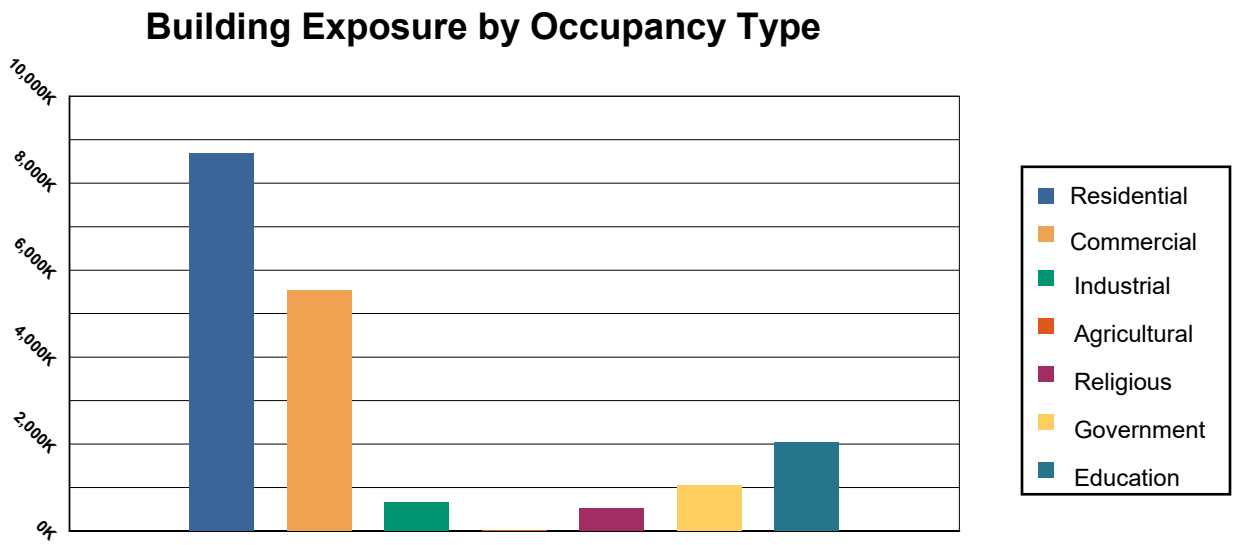


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	8,688,123	46.95%
Commercial	5,529,462	29.88%
Industrial	655,146	3.54%
Agricultural	13,597	0.07%
Religious	527,256	2.85%
Government	1,049,844	5.67%
Education	2,042,617	11.04%
Total	**18,506,045**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds. There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 342 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

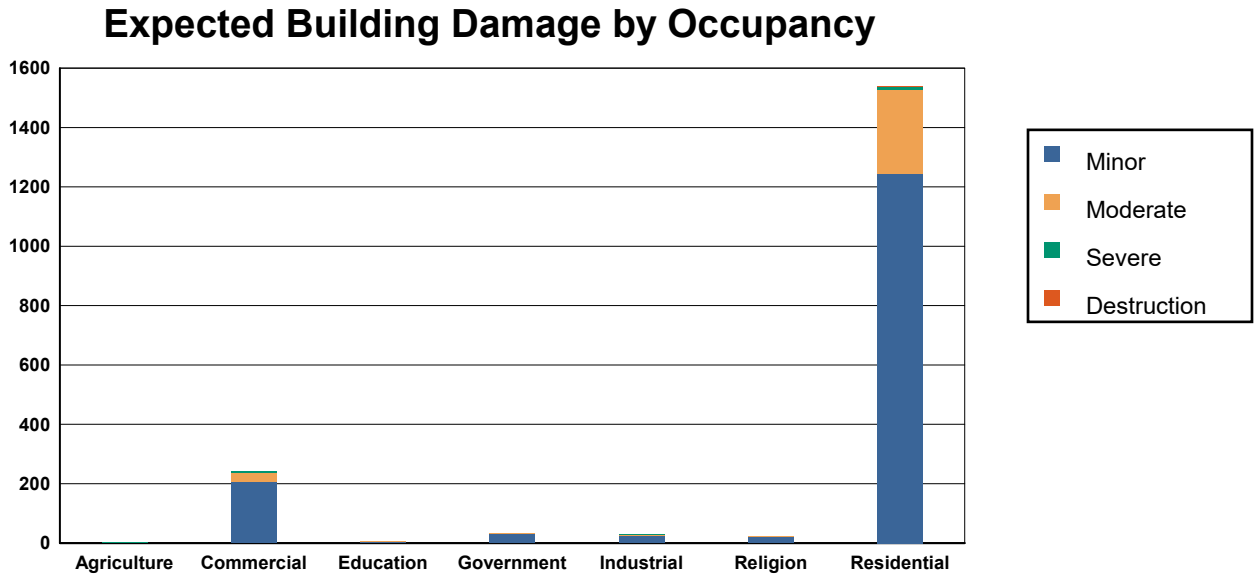


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	29.11	90.97	2.26	7.06	0.44	1.36	0.18	0.56	0.01	0.04
Commercial	3,090.17	92.74	204.94	6.15	33.39	1.00	3.49	0.10	0.00	0.00
Education	102.90	93.54	6.45	5.86	0.64	0.58	0.01	0.01	0.00	0.00
Government	470.87	93.43	29.97	5.95	3.10	0.62	0.06	0.01	0.00	0.00
Industrial	408.40	93.03	26.35	6.00	3.66	0.83	0.57	0.13	0.02	0.01
Religion	344.38	93.33	22.63	6.13	1.91	0.52	0.08	0.02	0.00	0.00
Residential	14,391.17	90.35	1,243.52	7.81	282.95	1.78	10.83	0.07	0.53	0.00
Total	**18,837.00**		**1,536.13**		**326.09**		**15.22**		**0.56**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	747	92.57	53	6.62	6	0.80	0	0.01	0	0.00
Masonry	3,833	87.57	367	8.39	173	3.95	4	0.09	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	2,174	93.15	133	5.71	24	1.01	3	0.13	0	0.00
Wood	12,156	92.26	942	7.15	70	0.53	7	0.06	1	0.00

Essential Facility Damage

Before the hurricane, the region had 1,731 hospital beds available for use. On the day of the hurricane, the model estimates that 1,731 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

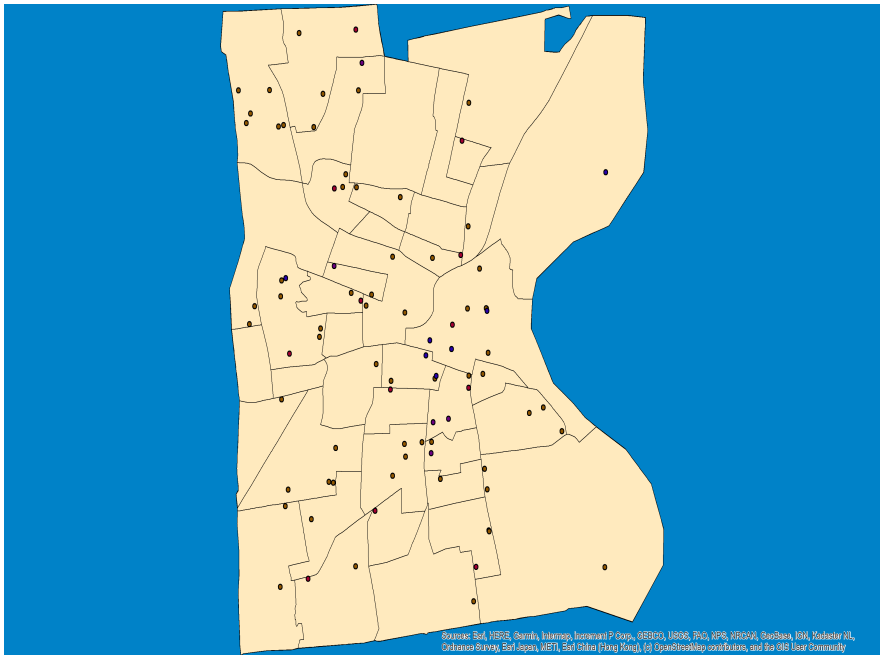
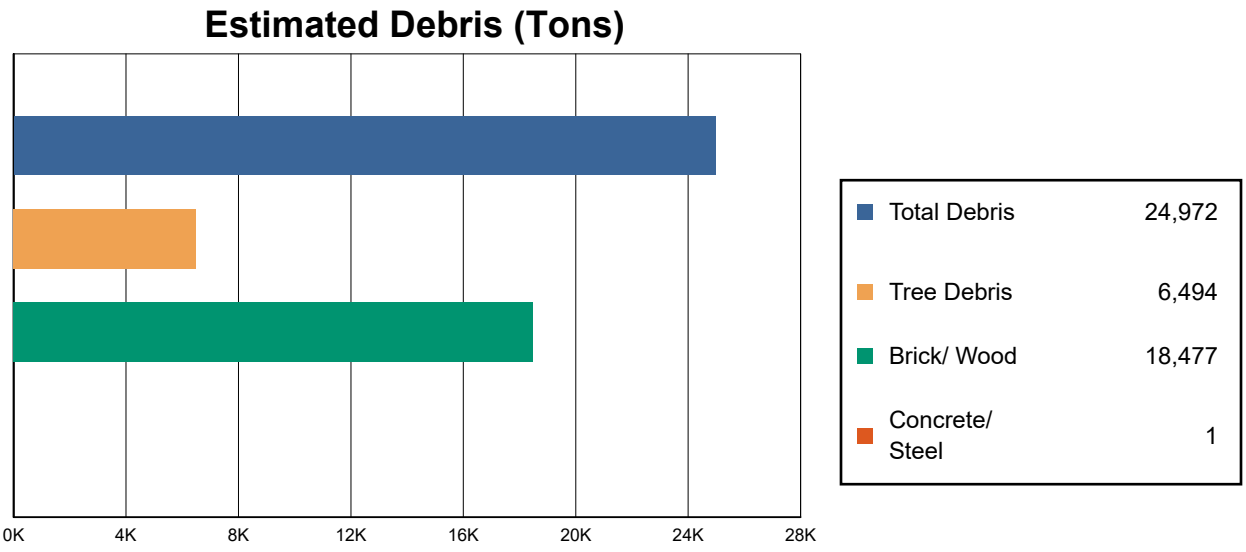


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	2	0	0	2
Fire Stations	12	0	0	12
Hospitals	5	0	0	5
Police Stations	7	0	0	7
Schools	62	0	0	62

Induced Hurricane Damage

Debris Generation

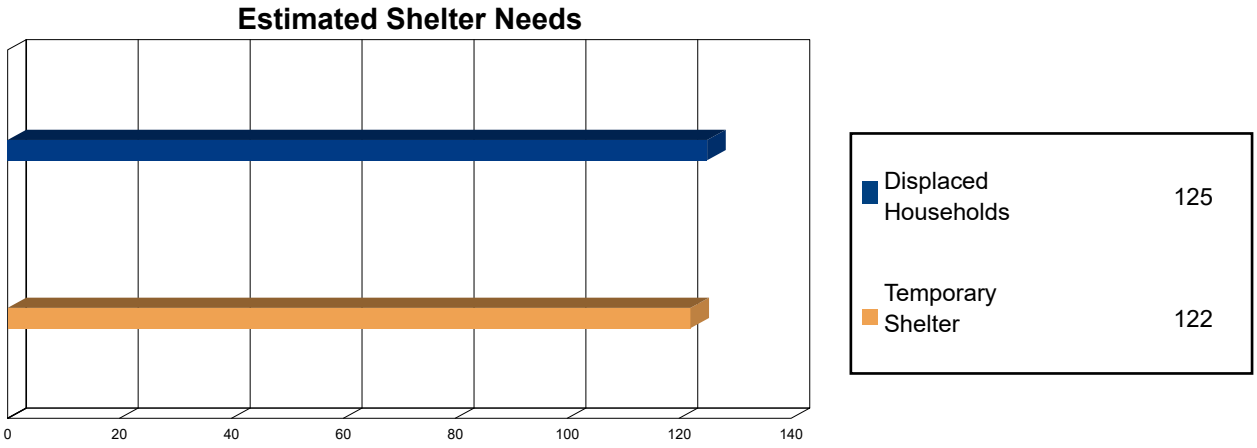


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 24,972 tons of debris will be generated. Of the total amount, 1,922 tons (8%) is Other Tree Debris. Of the remaining 23,050 tons, Brick/Wood comprises 80% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 739 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,572 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 125 households to be displaced due to the hurricane. Of these, 122 people (out of a total population of 121,054) will seek temporary shelter in public shelters.

Economic Loss

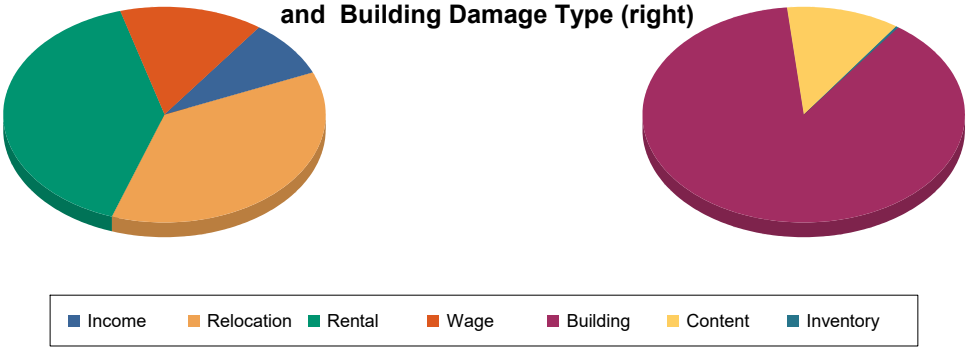
The total economic loss estimated for the hurricane is 160.5 million dollars, which represents 0.87 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 160 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 82% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

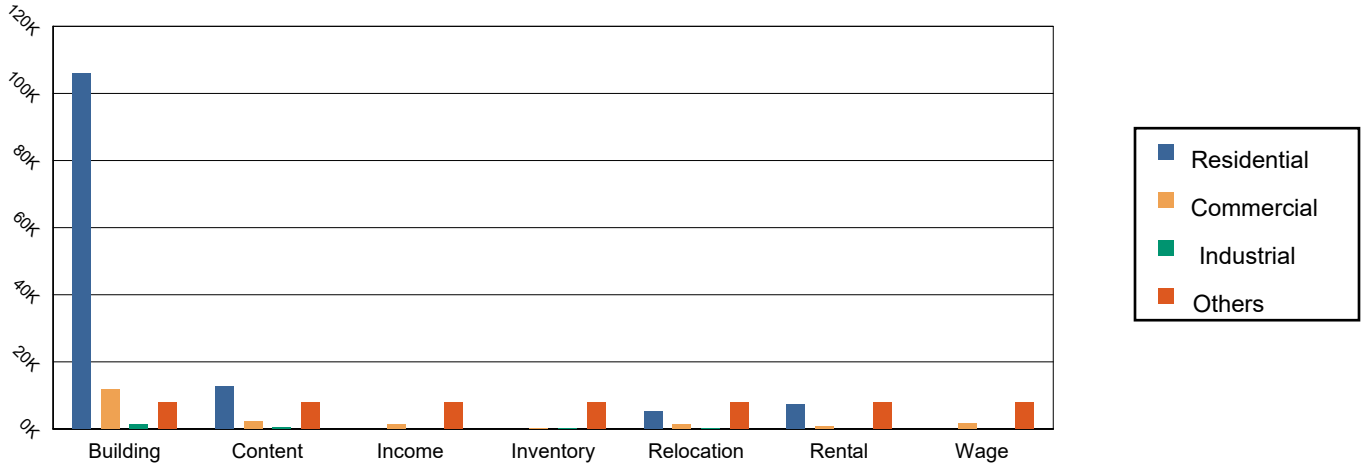


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	106,034.43	11,750.09	1,238.69	5,126.74	124,149.96
	Content	12,712.57	2,229.58	506.34	777.53	16,226.03
	Inventory	0.00	250.22	61.83	14.18	326.24
	Subtotal	**118,747.00**	**14,229.89**	**1,806.87**	**5,918.45**	**140,702.22**
Business Interruption Loss						
	Income	0.00	1,363.79	12.50	341.62	1,717.90
	Relocation	5,284.03	1,438.37	63.63	422.34	7,208.37
	Rental	7,208.26	744.66	9.10	44.08	8,006.09
	Wage	0.00	1,575.60	20.42	1,237.15	2,833.17
	Subtotal	**12,492.29**	**5,122.41**	**105.64**	**2,045.18**	**19,765.54**

Total

Total	**131,239.30**	**19,352.31**	**1,912.51**	**7,963.64**	**160,467.75**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	121,054	8,688,123	9,817,922	18,506,045
Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**
Study Region Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**

Hazus: Hurricane Global Risk Report

Region Name:	Hartford_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.06 square miles and contains 41 census tracts. There are over 47 thousand households in the region and a total population of 121,054 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 20 thousand buildings in the region with a total building replacement value (excluding contents) of 18,506 million dollars. Approximately 77% of the buildings (and 47% of the building value) are associated with residential housing.

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General Building Stock

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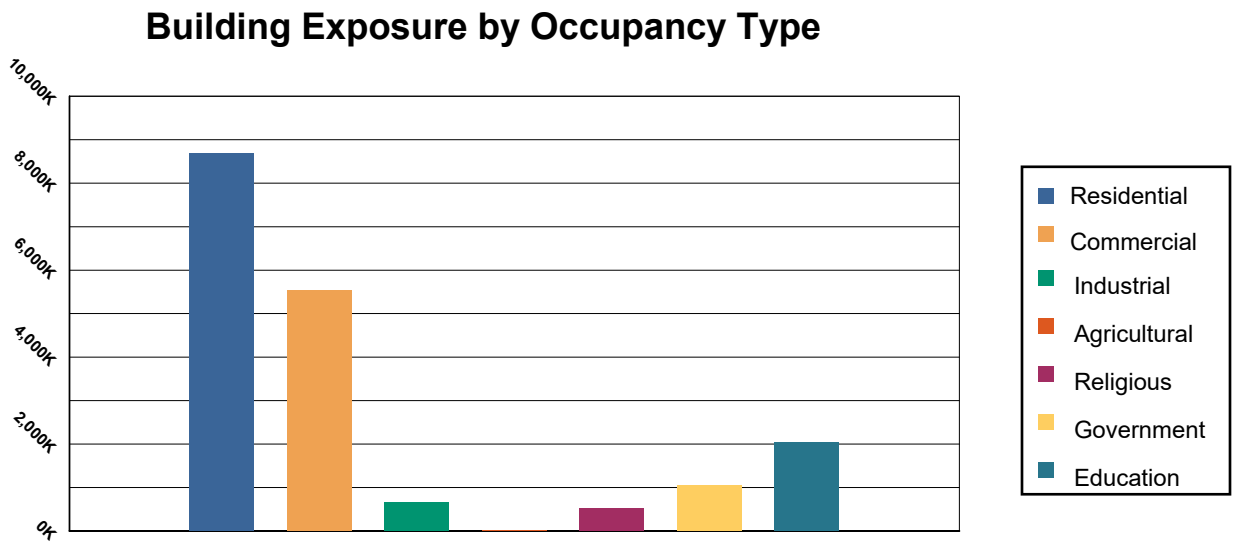

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Occupancy	Exposure ($1000)	Percent of Tot
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Religious	527,256	2.85%
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Education	2,042,617	11.04%
Total	**18,506,045**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds. There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 848 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

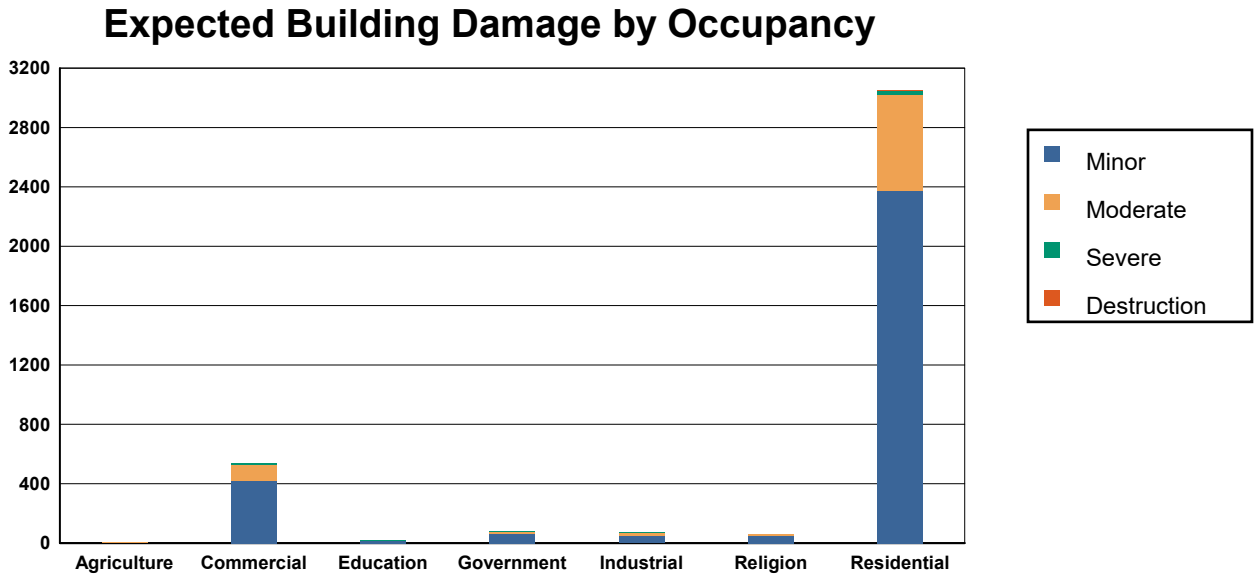


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	25.76	80.50	4.48	13.99	1.18	3.68	0.53	1.66	0.05	0.17
Commercial	2,790.09	83.74	417.85	12.54	110.90	3.33	13.11	0.39	0.04	0.00
Education	93.61	85.10	13.33	12.12	2.93	2.67	0.12	0.11	0.00	0.00
Government	427.28	84.78	61.87	12.28	14.24	2.83	0.61	0.12	0.00	0.00
Industrial	369.14	84.09	53.31	12.14	14.27	3.25	2.15	0.49	0.13	0.03
Religion	312.97	84.82	47.49	12.87	8.17	2.21	0.37	0.10	0.00	0.00
Residential	12,877.25	80.84	2,372.45	14.89	647.46	4.06	27.66	0.17	4.18	0.03
Total	**16,896.11**		**2,970.77**		**799.16**		**44.55**		**4.41**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	673	83.40	105	13.03	28	3.47	1	0.10	0	0.00
Masonry	3,380	77.23	611	13.97	374	8.55	11	0.25	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,970	84.39	270	11.55	83	3.56	12	0.50	0	0.00
Wood	10,981	83.34	1,962	14.89	211	1.60	19	0.14	4	0.03

Essential Facility Damage

Before the hurricane, the region had 1,731 hospital beds available for use. On the day of the hurricane, the model estimates that 1,731 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

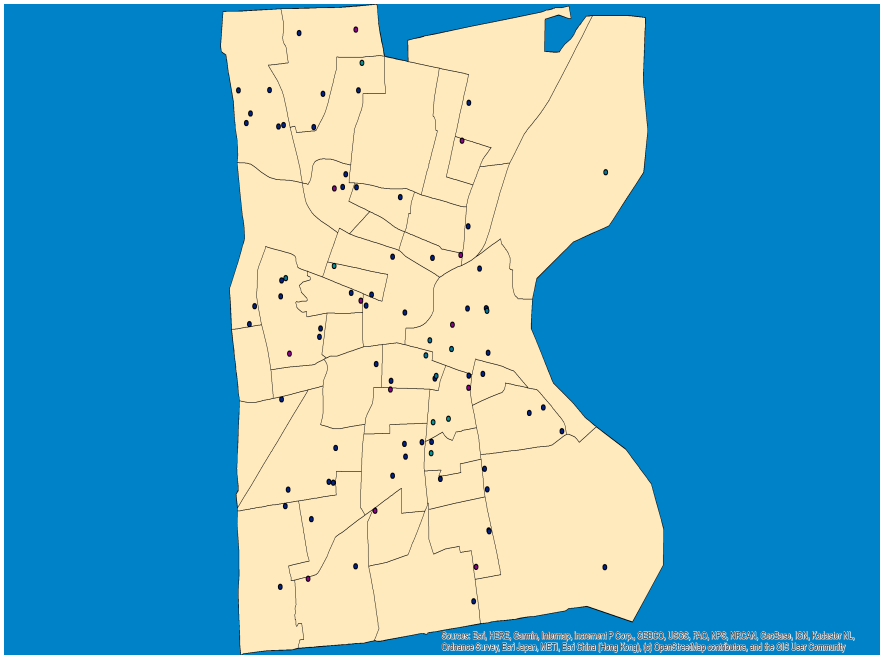
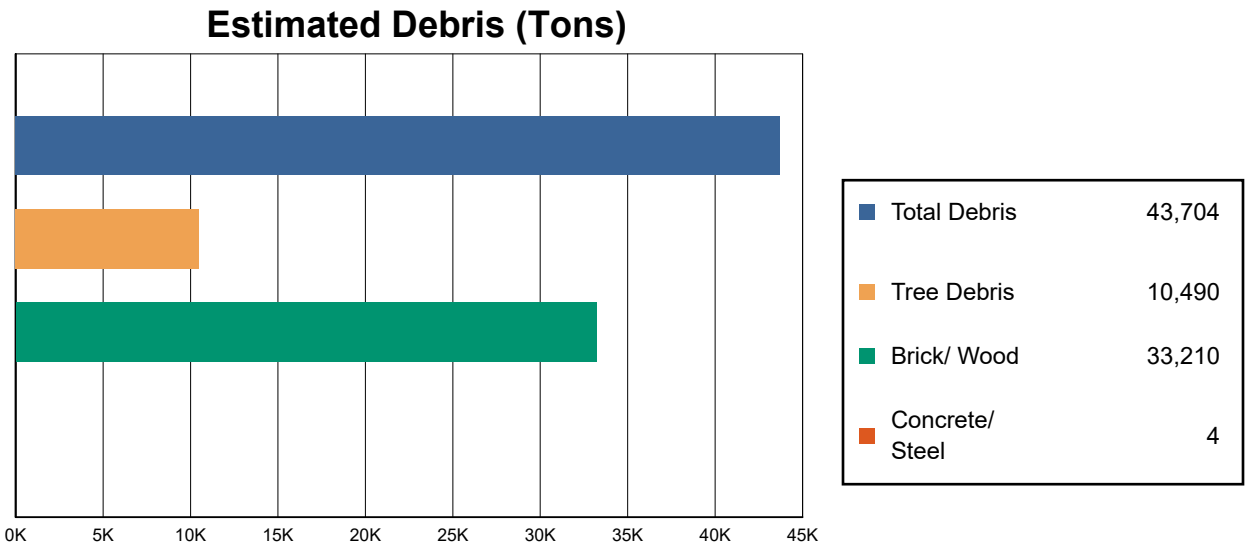


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	2	0	0	2
Fire Stations	12	0	0	12
Hospitals	5	0	0	5
Police Stations	7	0	0	7
Schools	62	0	0	59

Induced Hurricane Damage

Debris Generation

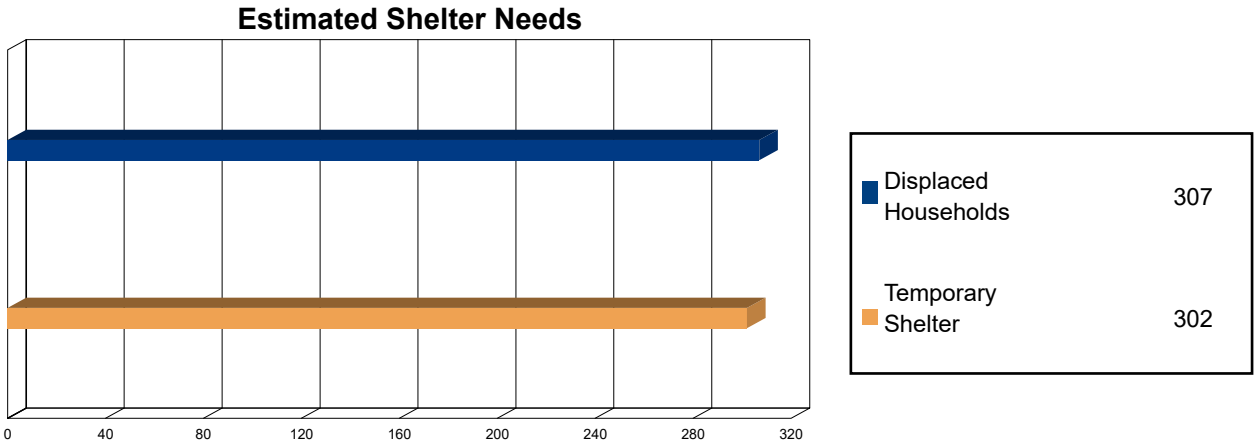


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 43,704 tons of debris will be generated. Of the total amount, 3,166 tons (7%) is Other Tree Debris. Of the remaining 40,538 tons, Brick/Wood comprises 82% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1329 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,324 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 307 households to be displaced due to the hurricane. Of these, 302 people (out of a total population of 121,054) will seek temporary shelter in public shelters.

Economic Loss

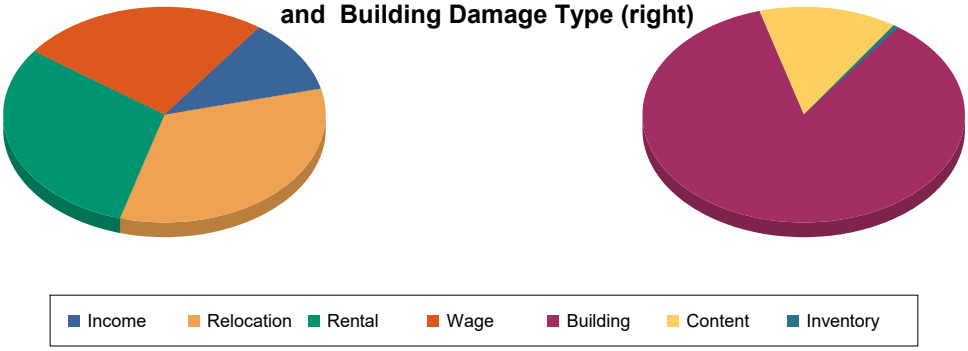
The total economic loss estimated for the hurricane is 326.2 million dollars, which represents 1.76 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 326 million dollars. 16% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 73% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

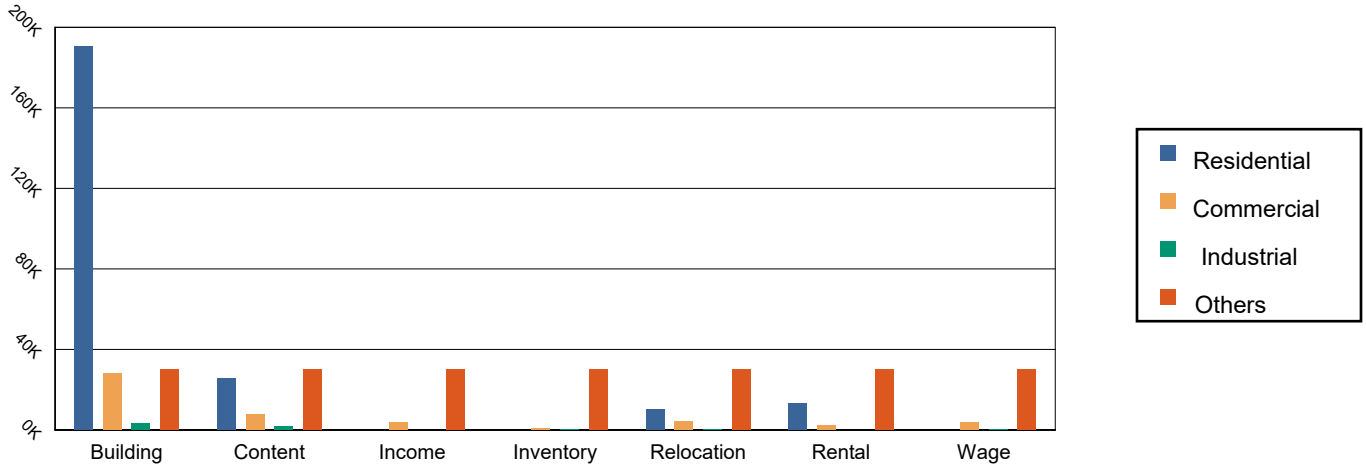


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	190,677.54	28,193.92	3,470.24	13,224.11	235,565.80
	Content	25,542.79	7,676.27	1,940.07	3,460.45	38,619.58
	Inventory	0.00	916.15	231.72	44.73	1,192.60
	Subtotal	**216,220.32**	**36,786.34**	**5,642.03**	**16,729.29**	**275,377.97**
Business Interruption Loss						
	Income	0.00	3,813.16	39.39	1,772.38	5,624.93
	Relocation	10,151.83	4,130.66	245.30	2,412.23	16,940.02
	Rental	13,018.91	2,120.16	30.64	320.28	15,490.00
	Wage	0.00	3,782.98	64.42	8,881.71	12,729.11
	Subtotal	**23,170.74**	**13,846.96**	**379.76**	**13,386.60**	**50,784.05**

Total

Total	**239,391.07**	**50,633.29**	**6,021.78**	**30,115.89**	**326,162.03**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	121,054	8,688,123	9,817,922	18,506,045
Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**
Study Region Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**

Hazus: Hurricane Global Risk Report

Region Name:	Hartford_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.06 square miles and contains 41 census tracts. There are over 47 thousand households in the region and a total population of 121,054 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 20 thousand buildings in the region with a total building replacement value (excluding contents) of 18,506 million dollars. Approximately 77% of the buildings (and 47% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 20,715 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

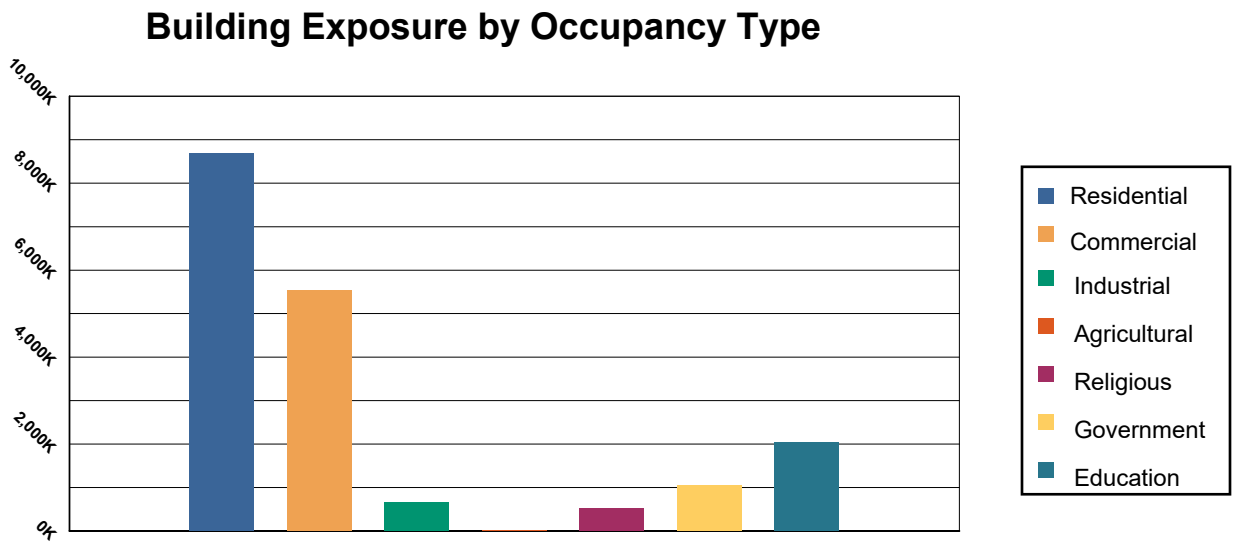


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	8,688,123	46.95%
Commercial	5,529,462	29.88%
Industrial	655,146	3.54%
Agricultural	13,597	0.07%
Religious	527,256	2.85%
Government	1,049,844	5.67%
Education	2,042,617	11.04%
Total	**18,506,045**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds. There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2,013 buildings will be at least moderately damaged. This is over 10% of the total number of buildings in the region. There are an estimated 24 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

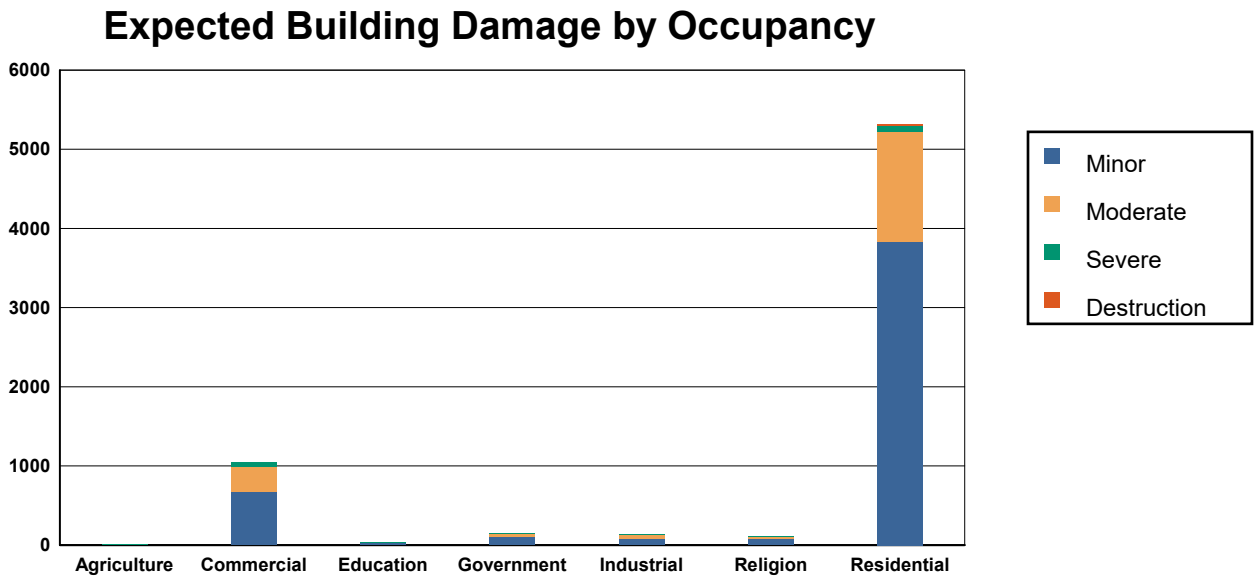


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	20.67	64.60	7.18	22.45	2.67	8.33	1.29	4.04	0.19	0.58
Commercial	2,283.30	68.53	675.77	20.28	318.22	9.55	54.33	1.63	0.38	0.01
Education	77.40	70.36	21.73	19.75	9.71	8.82	1.17	1.06	0.00	0.00
Government	351.99	69.84	99.30	19.70	46.98	9.32	5.73	1.14	0.00	0.00
Industrial	301.99	68.79	84.71	19.30	43.01	9.80	8.80	2.00	0.48	0.11
Religion	258.83	70.14	80.17	21.73	27.05	7.33	2.95	0.80	0.00	0.00
Residential	10,607.70	66.59	3,830.89	24.05	1,383.60	8.69	84.19	0.53	22.62	0.14
Total	**13,901.89**		**4,799.76**		**1,831.23**		**158.46**		**23.67**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	547	67.74	163	20.15	90	11.09	8	1.02	0	0.00
Masonry	2,736	62.50	869	19.86	731	16.71	40	0.91	1	0.03
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,616	69.22	427	18.28	243	10.40	49	2.09	0	0.02
Wood	9,126	69.26	3,371	25.58	599	4.55	57	0.43	22	0.17

Essential Facility Damage

Before the hurricane, the region had 1,731 hospital beds available for use. On the day of the hurricane, the model estimates that 1,731 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

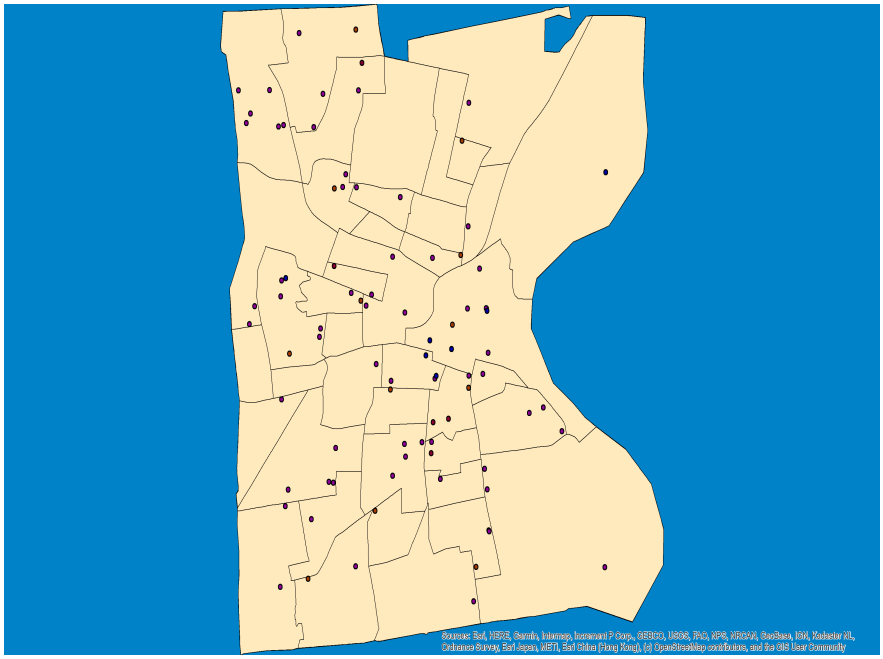
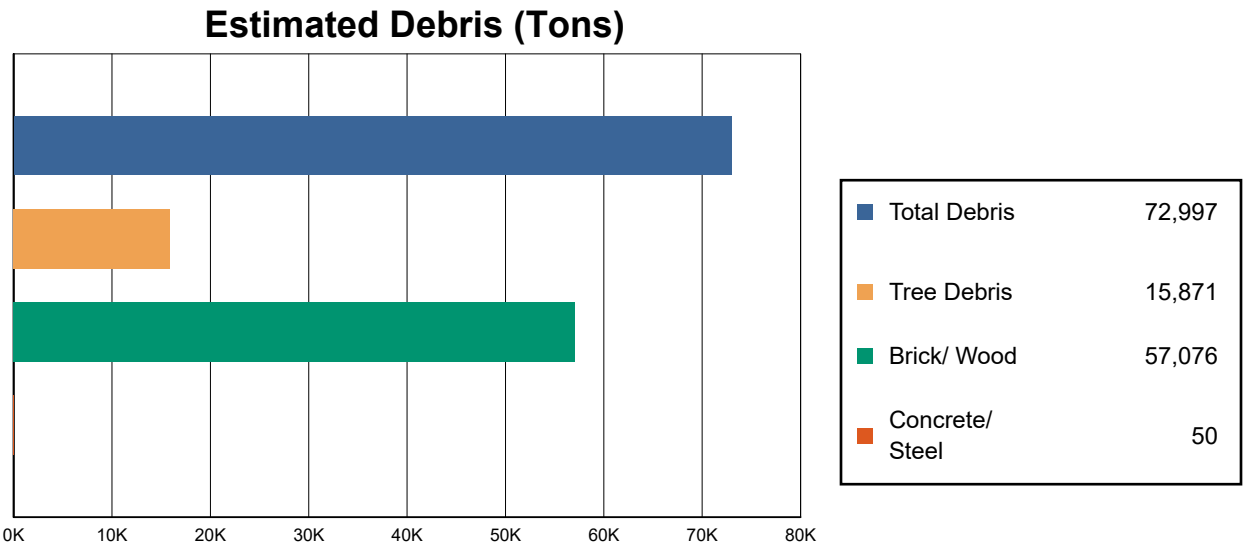


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	2	0	0	2
Fire Stations	12	0	0	12
Hospitals	5	0	0	5
Police Stations	7	0	0	7
Schools	62	3	0	0

Induced Hurricane Damage

Debris Generation

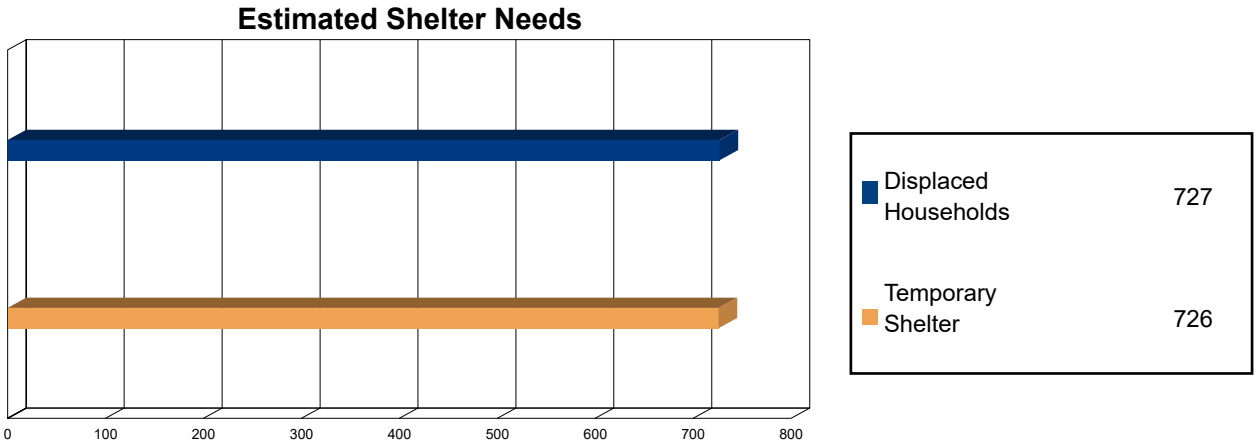


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 72,997 tons of debris will be generated. Of the total amount, 4,845 tons (7%) is Other Tree Debris. Of the remaining 68,152 tons, Brick/Wood comprises 84% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 2285 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 11,026 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 727 households to be displaced due to the hurricane. Of these, 726 people (out of a total population of 121,054) will seek temporary shelter in public shelters.

Economic Loss

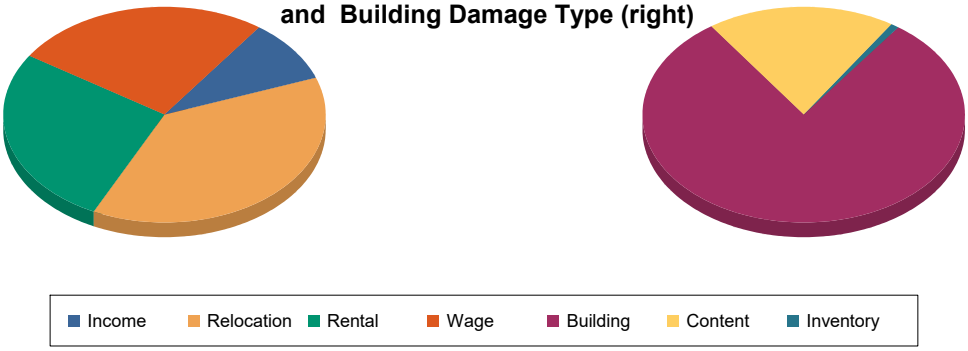
The total economic loss estimated for the hurricane is 676.5 million dollars, which represents 3.66 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 676 million dollars. 16% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 63% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

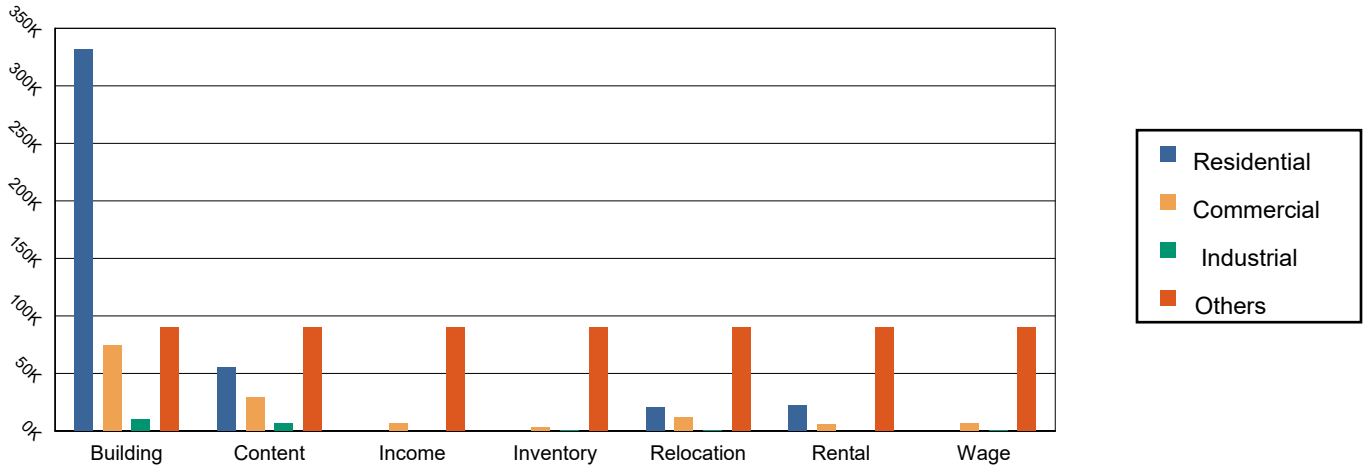


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	331,157.50	74,701.45	10,037.99	38,689.26	454,586.20
	Content	55,381.43	29,080.04	6,763.33	16,250.71	107,475.51
	Inventory	0.00	3,363.74	802.65	122.60	4,288.99
	Subtotal	**386,538.93**	**107,145.23**	**17,603.97**	**55,062.57**	**566,350.70**
Business Interruption Loss						
	Income	0.00	6,453.38	93.88	3,944.91	10,492.17
	Relocation	20,506.61	11,819.65	809.02	8,346.63	41,481.91
	Rental	22,489.16	5,983.58	100.76	1,189.24	29,762.74
	Wage	0.00	6,829.21	153.99	21,395.35	28,378.55
	Subtotal	**42,995.77**	**31,085.82**	**1,157.65**	**34,876.13**	**110,115.38**

Total

Total	**429,534.70**	**138,231.06**	**18,761.63**	**89,938.70**	**676,466.08**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	121,054	8,688,123	9,817,922	18,506,045
Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**
Study Region Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**

Hazus: Hurricane Global Risk Report

Region Name:	Hartford_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.06 square miles and contains 41 census tracts. There are over 47 thousand households in the region and a total population of 121,054 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 20 thousand buildings in the region with a total building replacement value (excluding contents) of 18,506 million dollars. Approximately 77% of the buildings (and 47% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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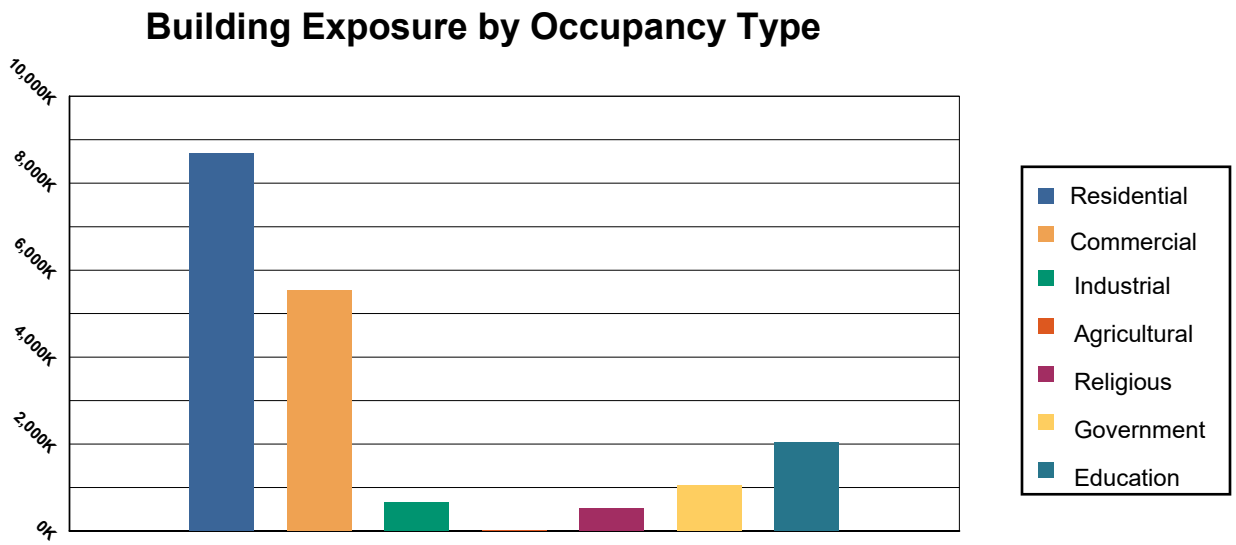


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	8,688,123	46.95%
Commercial	5,529,462	29.88%
Industrial	655,146	3.54%
Agricultural	13,597	0.07%
Religious	527,256	2.85%
Government	1,049,844	5.67%
Education	2,042,617	11.04%
Total	**18,506,045**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds. There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 3,087 buildings will be at least moderately damaged. This is over 15% of the total number of buildings in the region. There are an estimated 52 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

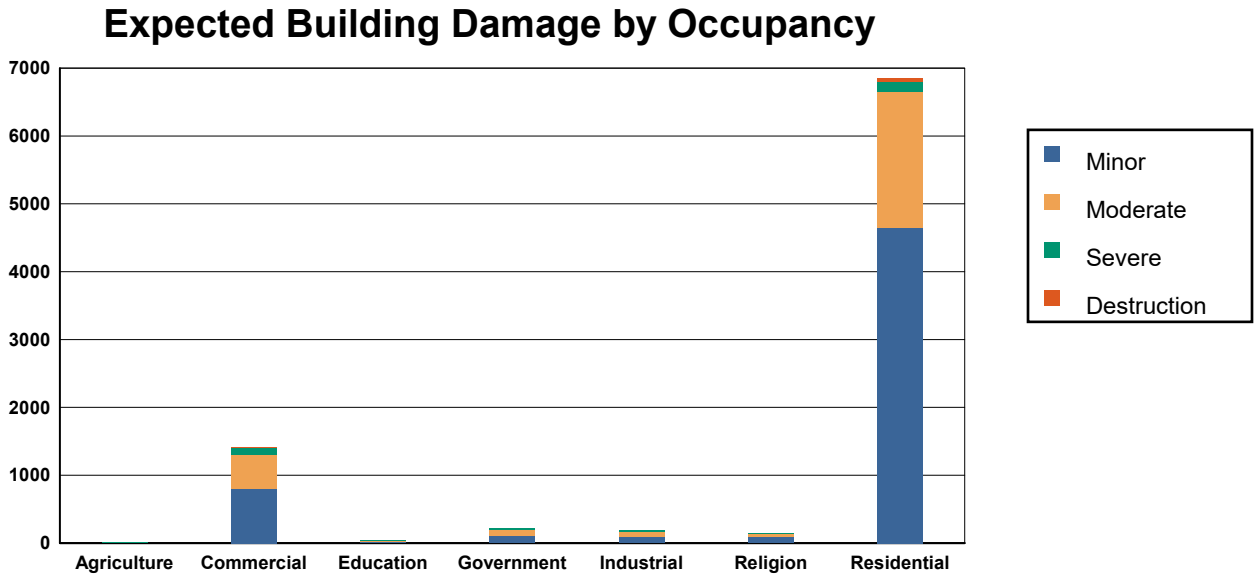


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.16	53.63	8.64	26.99	3.88	12.11	1.99	6.21	0.34	1.06
Commercial	1,918.55	57.58	796.54	23.91	497.48	14.93	118.51	3.56	0.91	0.03
Education	65.58	59.62	25.58	23.25	15.67	14.24	3.17	2.88	0.00	0.00
Government	295.99	58.73	116.03	23.02	76.08	15.10	15.90	3.16	0.00	0.00
Industrial	253.13	57.66	98.27	22.38	67.64	15.41	19.05	4.34	0.91	0.21
Religion	219.32	59.44	97.29	26.37	44.51	12.06	7.88	2.14	0.00	0.00
Residential	9,074.67	56.97	4,641.71	29.14	2,002.39	12.57	160.88	1.01	49.35	0.31
Total	**11,844.41**		**5,784.05**		**2,707.65**		**327.39**		**51.51**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	458	56.70	184	22.80	143	17.66	23	2.83	0	0.00
Masonry	2,310	52.78	979	22.36	998	22.81	88	2.00	2	0.05
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,360	58.25	490	21.01	378	16.19	105	4.51	1	0.04
Wood	7,833	59.45	4,205	31.91	982	7.46	108	0.82	48	0.37

Essential Facility Damage

Before the hurricane, the region had 1,731 hospital beds available for use. On the day of the hurricane, the model estimates that 1,731 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

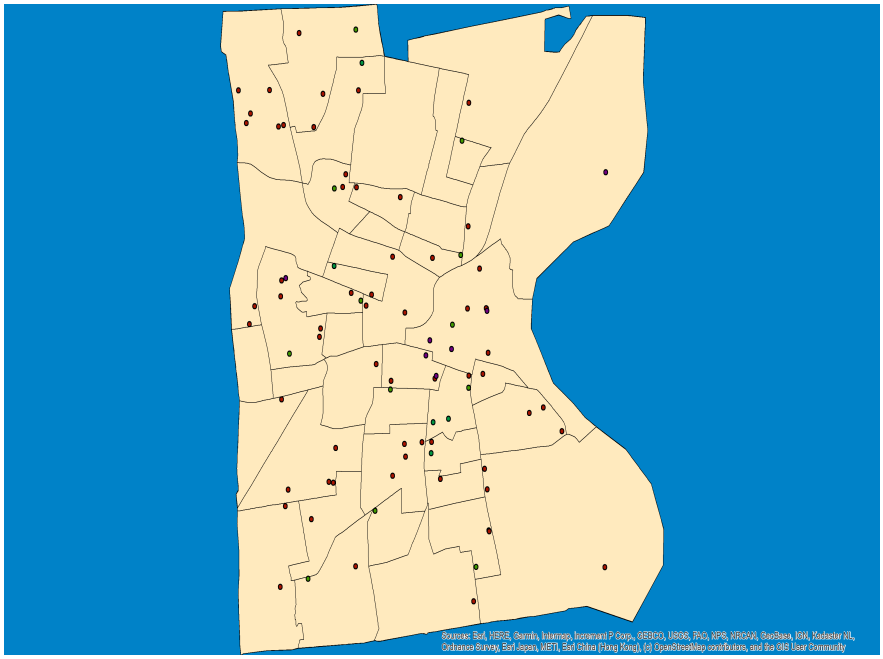
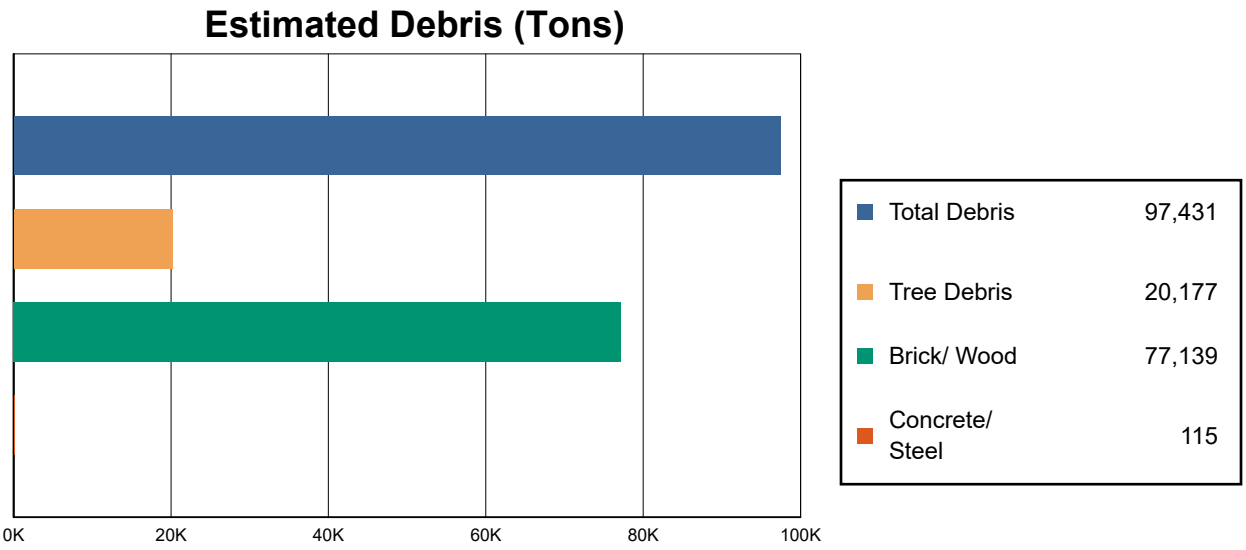


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	2	0	0	2
Fire Stations	12	0	0	12
Hospitals	5	0	0	4
Police Stations	7	0	0	7
Schools	62	5	0	0

Induced Hurricane Damage

Debris Generation

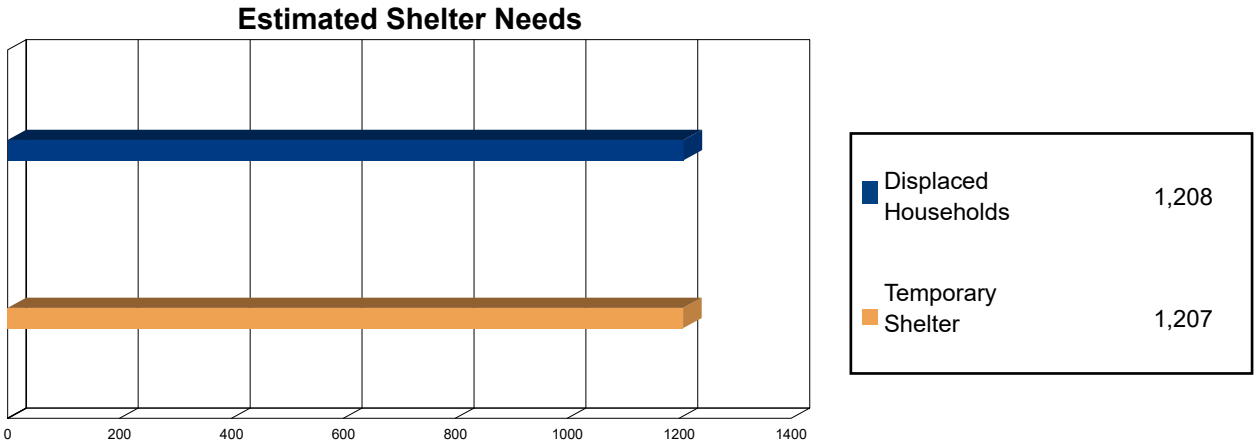


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 97,431 tons of debris will be generated. Of the total amount, 6,230 tons (6%) is Other Tree Debris. Of the remaining 91,201 tons, Brick/Wood comprises 85% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 3090 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 13,947 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1,208 households to be displaced due to the hurricane. Of these, 1,207 people (out of a total population of 121,054) will seek temporary shelter in public shelters.

Economic Loss

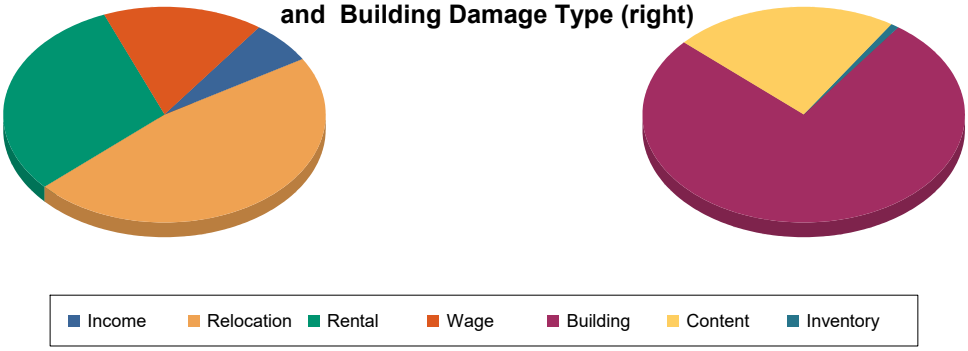
The total economic loss estimated for the hurricane is 1021.5 million dollars, which represents 5.52 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1,022 million dollars. 14% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 59% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

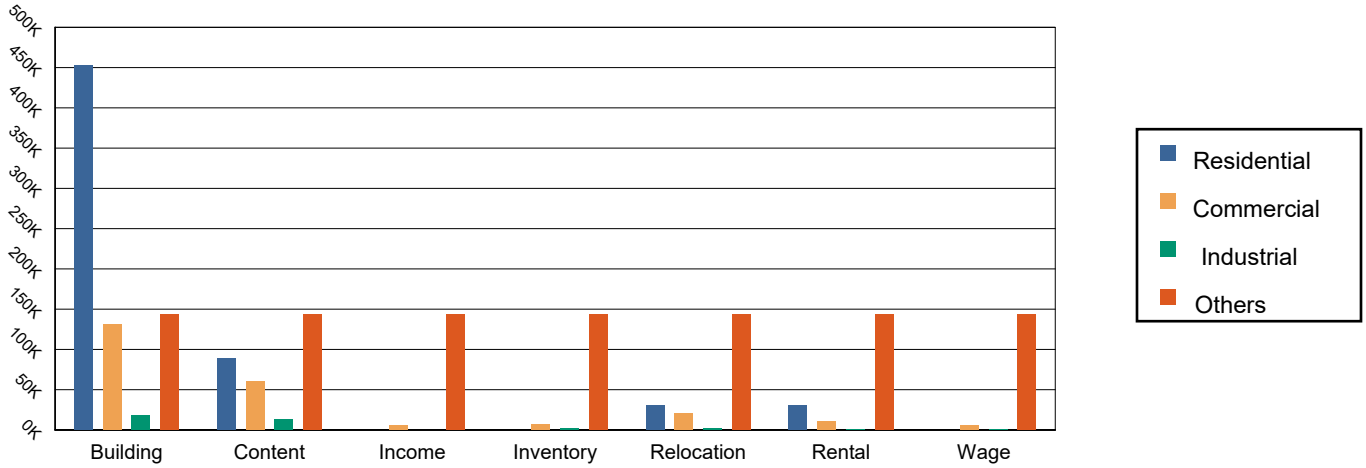


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	452,429.54	131,311.43	17,849.22	71,235.19	672,825.39
	Content	88,478.65	60,260.68	13,028.09	35,606.17	197,373.60
	Inventory	0.00	6,627.89	1,543.59	200.86	8,372.33
	Subtotal	**540,908.19**	**198,200.00**	**32,420.90**	**107,042.22**	**878,571.32**
Business Interruption Loss						
	Income	27.90	5,645.24	132.98	3,218.17	9,024.29
	Relocation	30,698.12	20,264.89	1,391.52	14,780.17	67,134.70
	Rental	30,834.04	10,394.64	178.91	2,172.82	43,580.41
	Wage	65.74	6,160.99	216.63	16,764.51	23,207.88
	Subtotal	**61,625.81**	**42,465.77**	**1,920.04**	**36,935.67**	**142,947.29**

Total

Total	**602,534.01**	**240,665.77**	**34,340.94**	**143,977.89**	**1,021,518.61**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	121,054	8,688,123	9,817,922	18,506,045
Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**
Study Region Total	**121,054**	**8,688,123**	**9,817,922**	**18,506,045**

Hazus: Hurricane Global Risk Report

Region Name:	Hebron_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 37.26 square miles and contains 2 census tracts. There are over 3 thousand households in the region and a total population of 9,098 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 91% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,618 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

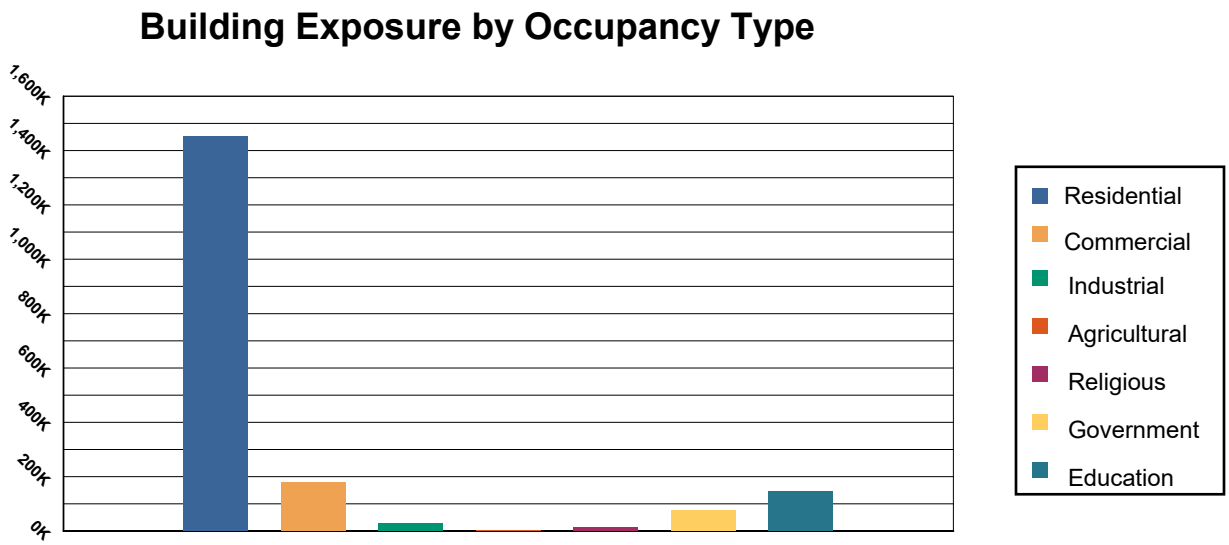


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,453,601	76.66%
Commercial	177,400	9.36%
Industrial	28,629	1.51%
Agricultural	3,417	0.18%
Religious	13,776	0.73%
Government	74,899	3.95%
Education	144,413	7.62%
Total	**1,896,135**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

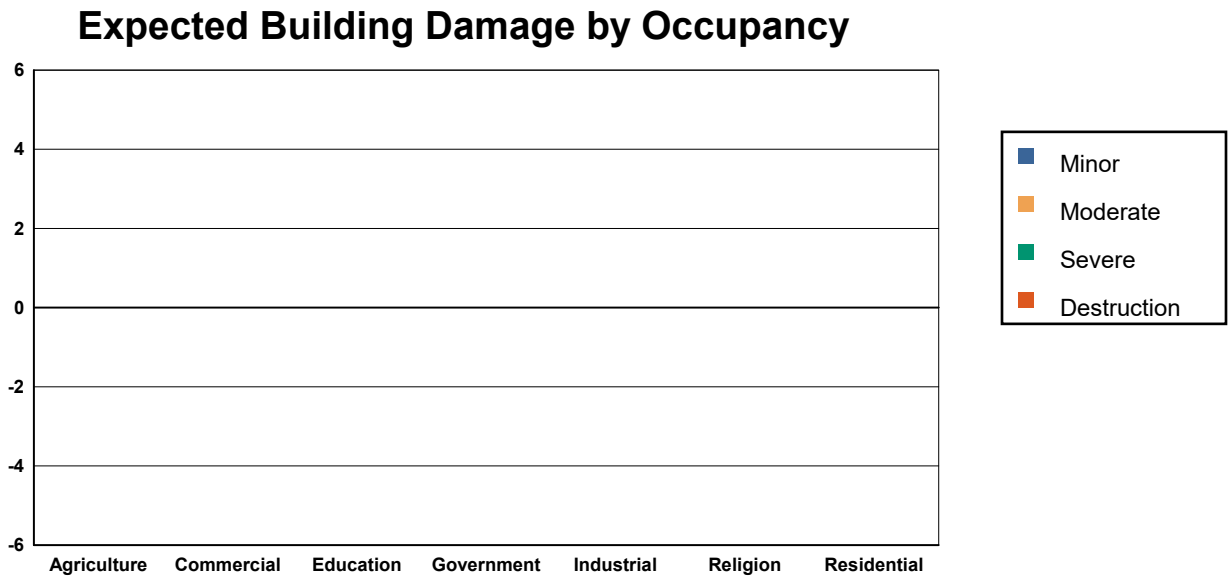


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	196.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	6.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	74.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	42.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	16.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	3,277.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**3,618.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	37	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	258	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	162	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	3,160	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

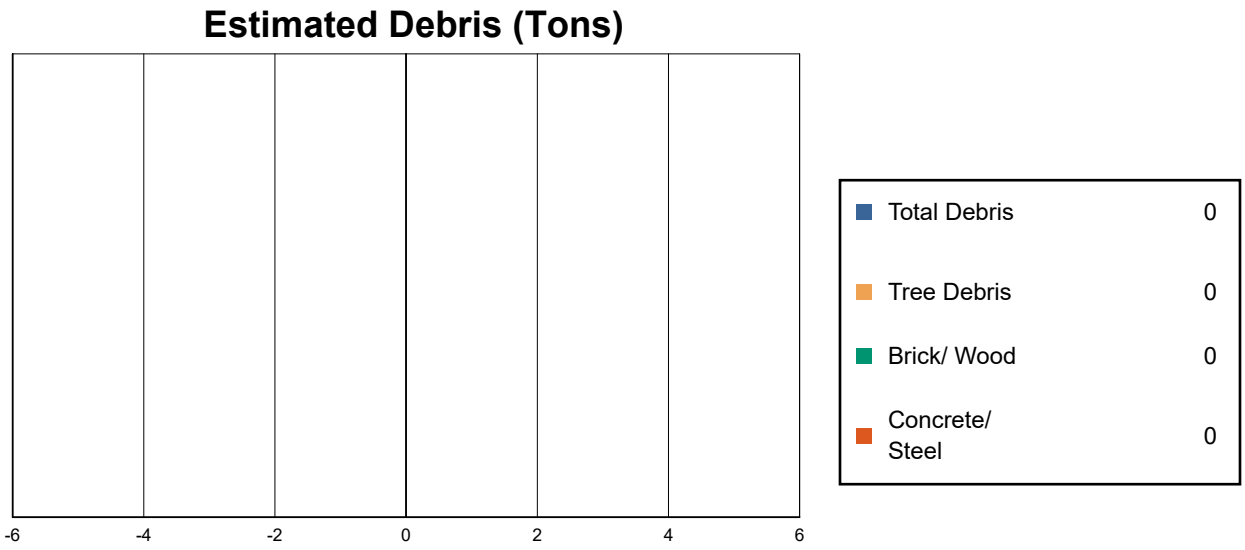
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

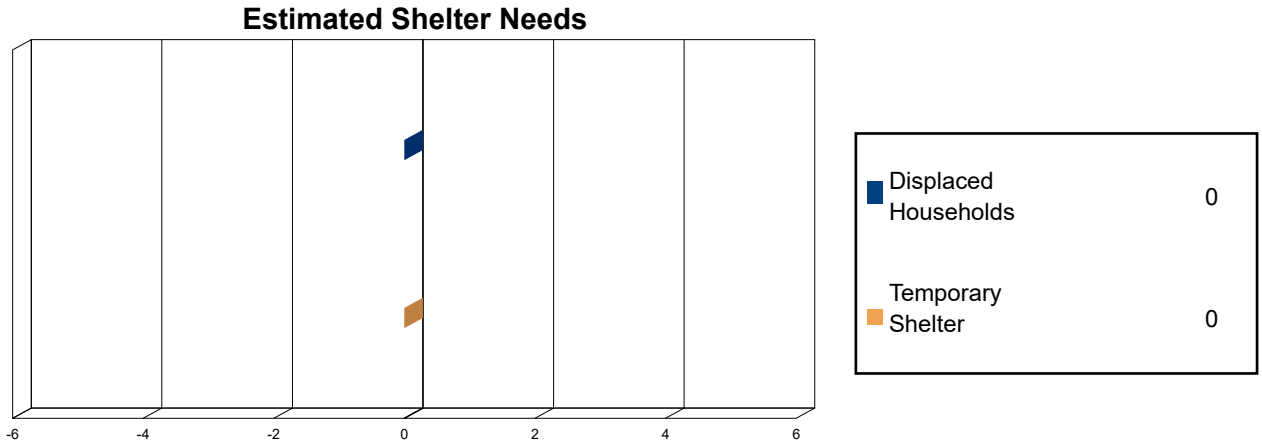


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,098) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

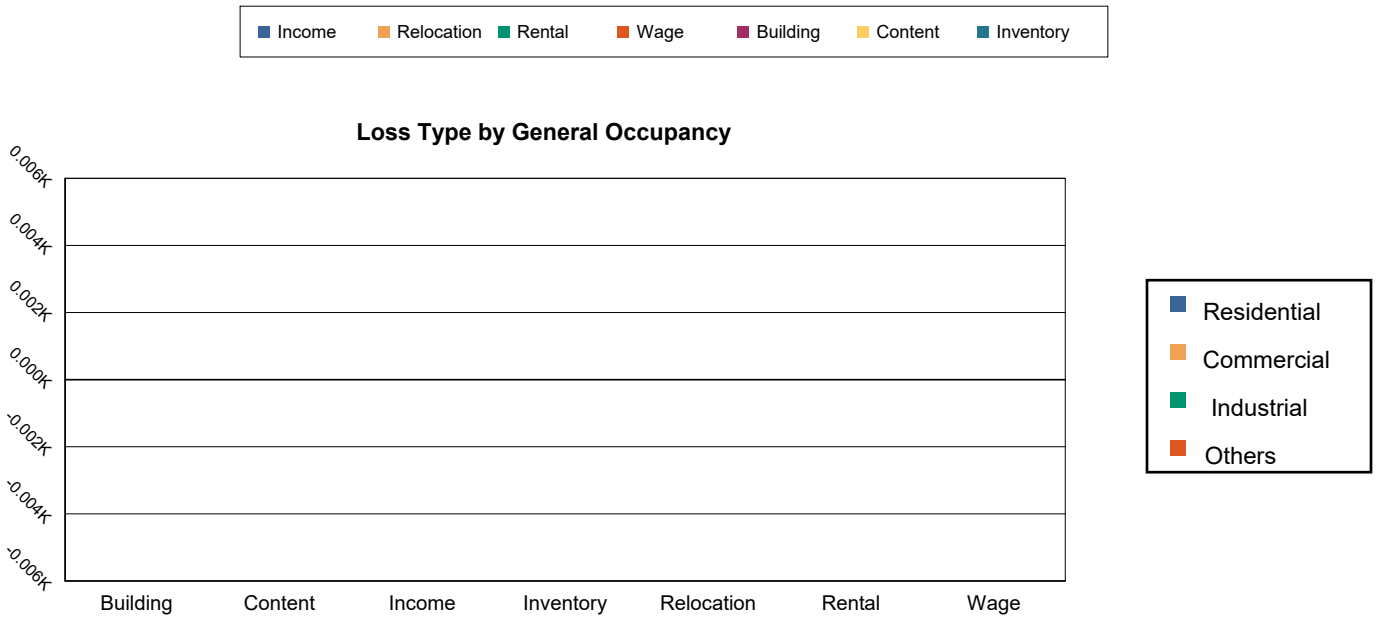


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,601	442,534	1,896,135
Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**
Study Region Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**

Hazus: Hurricane Global Risk Report

Region Name:	Hebron_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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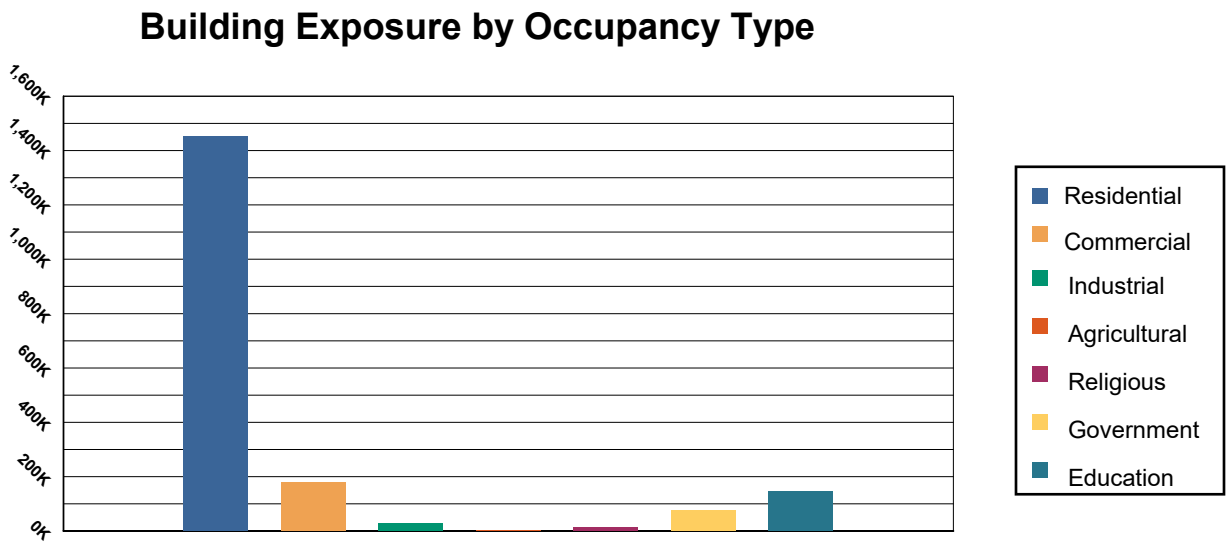

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Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,453,601	76.66%
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Agricultural	3,417	0.18%
Religious	13,776	0.73%
Government	74,899	3.95%
Education	144,413	7.62%
Total	**1,896,135**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

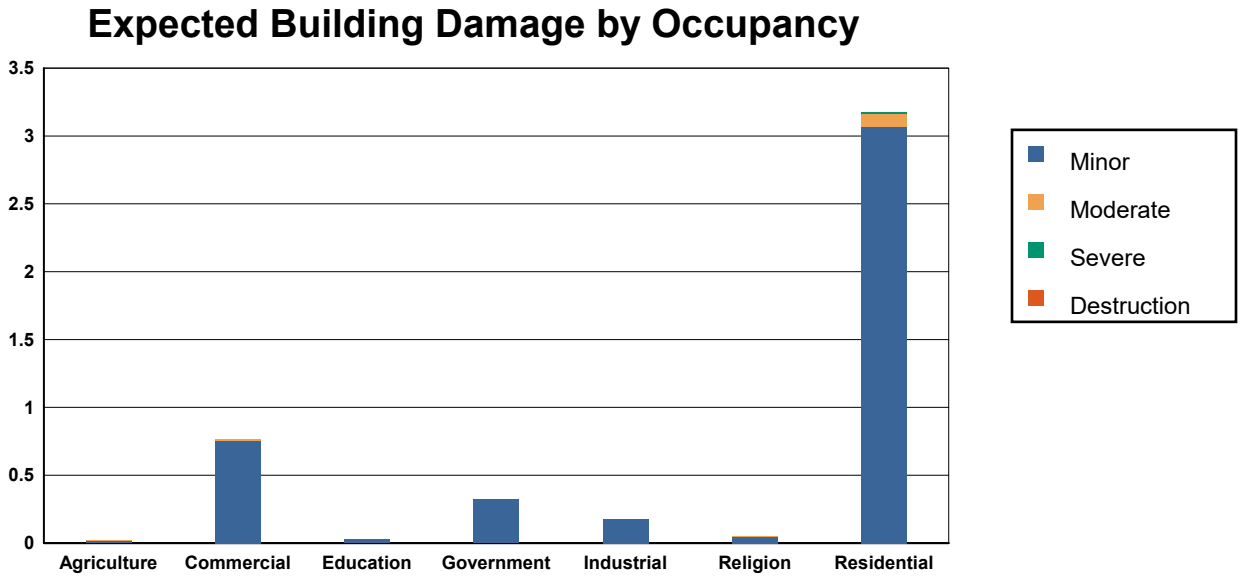


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.98	99.69	0.02	0.30	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	195.24	99.61	0.75	0.38	0.01	0.00	0.00	0.00	0.00	0.00
Education	5.98	99.60	0.02	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Government	73.68	99.56	0.32	0.44	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	41.82	99.58	0.18	0.42	0.00	0.00	0.00	0.00	0.00	0.00
Religion	15.95	99.67	0.05	0.32	0.00	0.01	0.00	0.00	0.00	0.00
Residential	3,273.83	99.90	3.06	0.09	0.10	0.00	0.01	0.00	0.00	0.00
Total	**3,613.47**		**4.41**		**0.11**		**0.01**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	37	99.53	0	0.47	0	0.00	0	0.00	0	0.00
Masonry	257	99.54	1	0.44	0	0.02	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	161	99.55	1	0.45	0	0.00	0	0.00	0	0.00
Wood	3,158	99.93	2	0.07	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

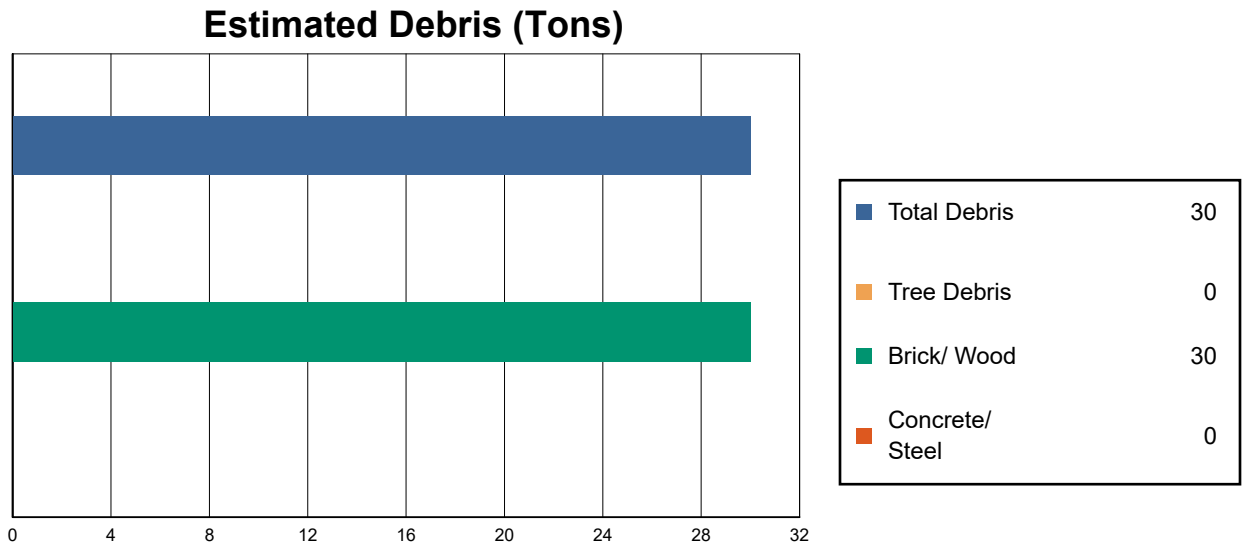
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

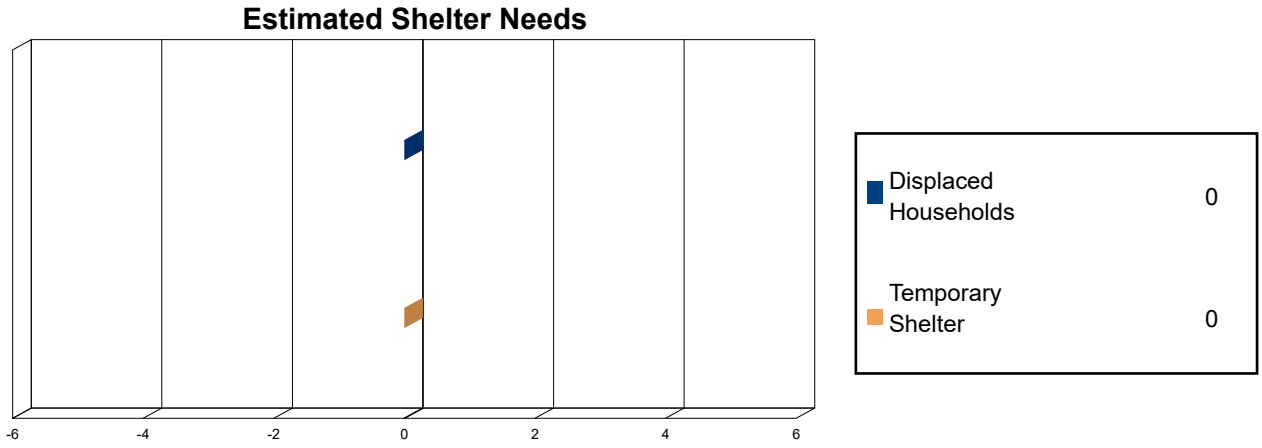


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 30 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 30 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,098) will seek temporary shelter in public shelters.

Economic Loss

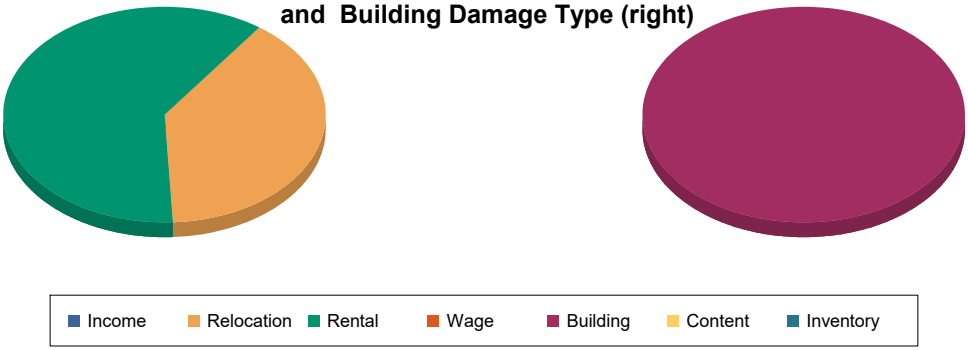
The total economic loss estimated for the hurricane is 0.8 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

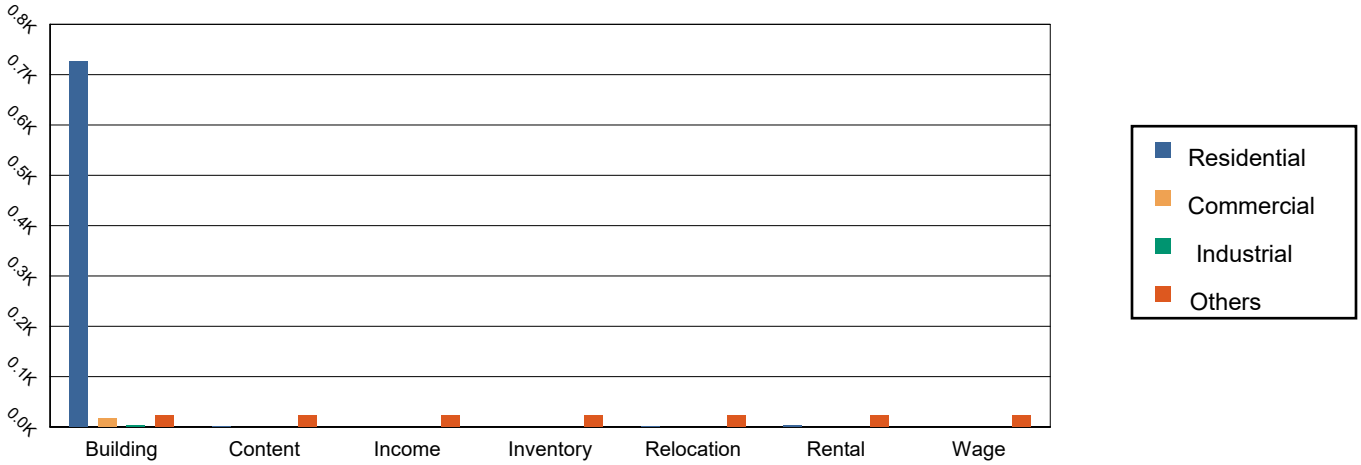


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	726.27	17.74	2.86	23.31	770.19
	Content	1.03	0.00	0.00	0.00	1.03
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**727.30**	**17.74**	**2.86**	**23.31**	**771.22**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	1.77	0.05	0.00	0.01	1.83
	Rental	2.86	0.00	0.00	0.00	2.86
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**4.63**	**0.05**	**0.00**	**0.01**	**4.69**

Total

Total	**731.93**	**17.79**	**2.86**	**23.32**	**775.90**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,601	442,534	1,896,135
Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**
Study Region Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**

Hazus: Hurricane Global Risk Report

Region Name:	Hebron_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 37.26 square miles and contains 2 census tracts. There are over 3 thousand households in the region and a total population of 9,098 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 91% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,618 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

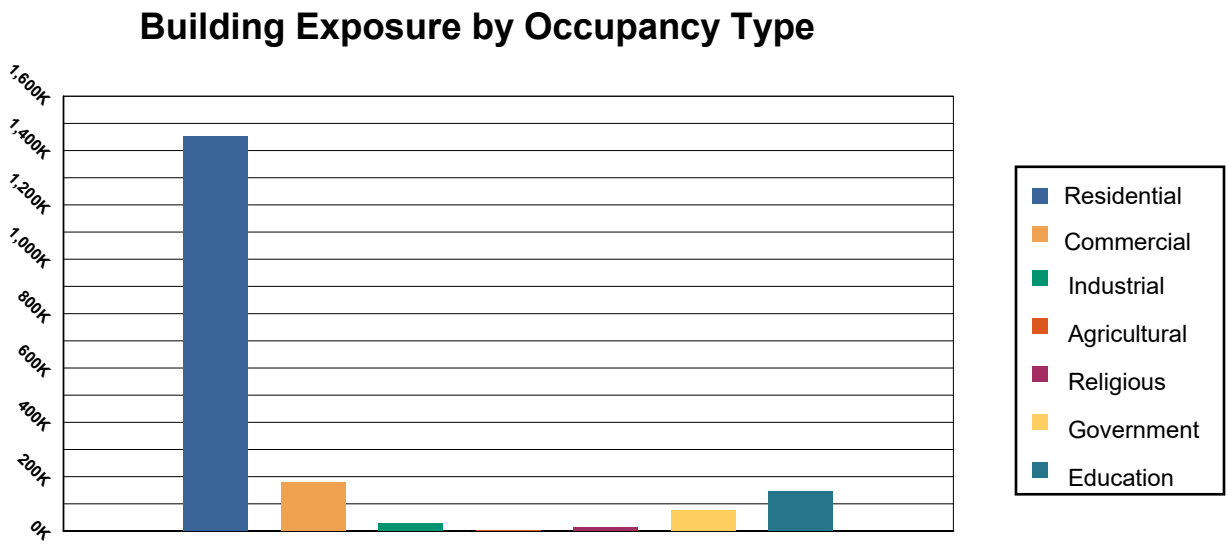


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,453,601	76.66%
Commercial	177,400	9.36%
Industrial	28,629	1.51%
Agricultural	3,417	0.18%
Religious	13,776	0.73%
Government	74,899	3.95%
Education	144,413	7.62%
Total	**1,896,135**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 5 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

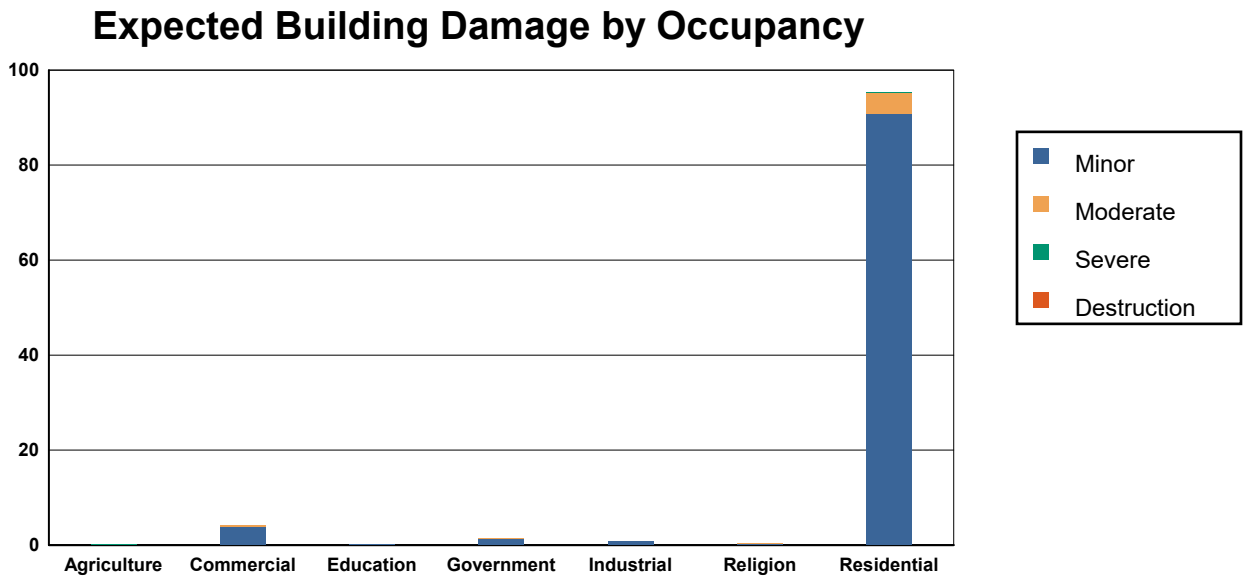


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.82	97.47	0.15	2.17	0.02	0.27	0.01	0.09	0.00	0.00
Commercial	191.90	97.91	3.75	1.91	0.34	0.17	0.02	0.01	0.00	0.00
Education	5.89	98.14	0.11	1.82	0.00	0.04	0.00	0.00	0.00	0.00
Government	72.54	98.02	1.44	1.94	0.03	0.04	0.00	0.00	0.00	0.00
Industrial	41.16	98.01	0.81	1.93	0.02	0.06	0.00	0.00	0.00	0.00
Religion	15.69	98.06	0.30	1.88	0.01	0.05	0.00	0.01	0.00	0.00
Residential	3,181.70	97.09	90.90	2.77	4.33	0.13	0.07	0.00	0.00	0.00
Total	**3,515.70**		**97.46**		**4.74**		**0.10**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	36	97.95	1	2.01	0	0.04	0	0.00	0	0.00
Masonry	250	97.06	7	2.58	1	0.35	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	159	98.01	3	1.89	0	0.10	0	0.01	0	0.00
Wood	3,072	97.21	85	2.70	3	0.09	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

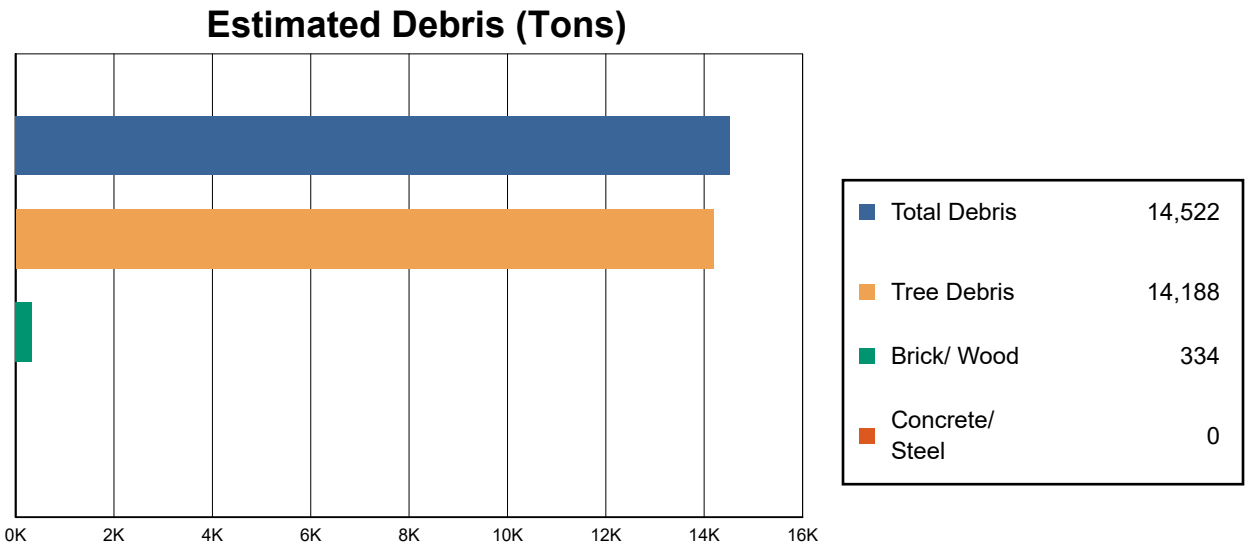
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

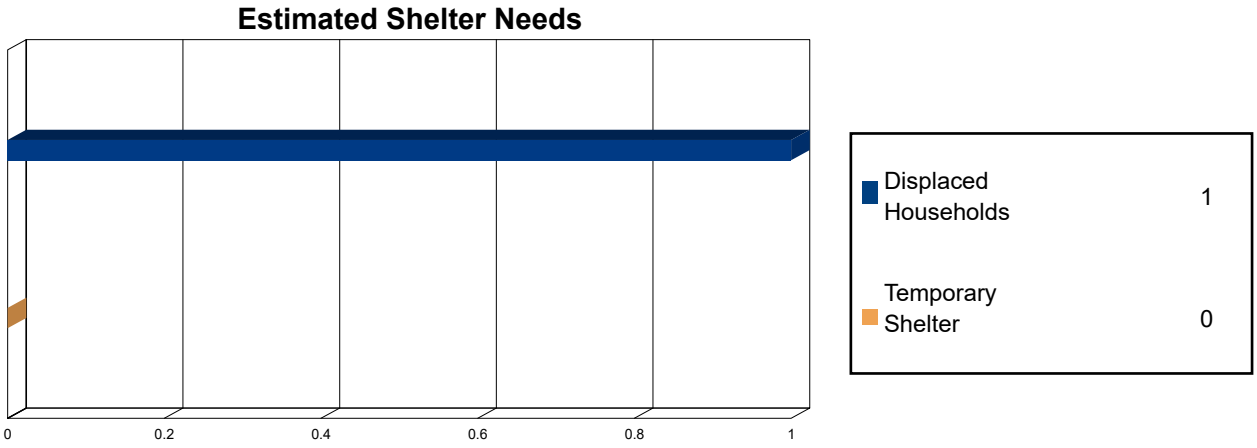


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 14,522 tons of debris will be generated. Of the total amount, 12,063 tons (83%) is Other Tree Debris. Of the remaining 2,459 tons, Brick/Wood comprises 14% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 13 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,125 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,098) will seek temporary shelter in public shelters.

Economic Loss

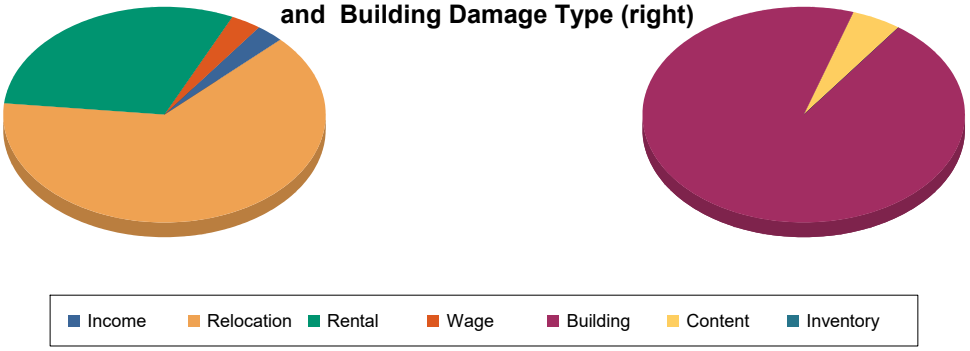
The total economic loss estimated for the hurricane is 6.0 million dollars, which represents 0.32 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 6 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

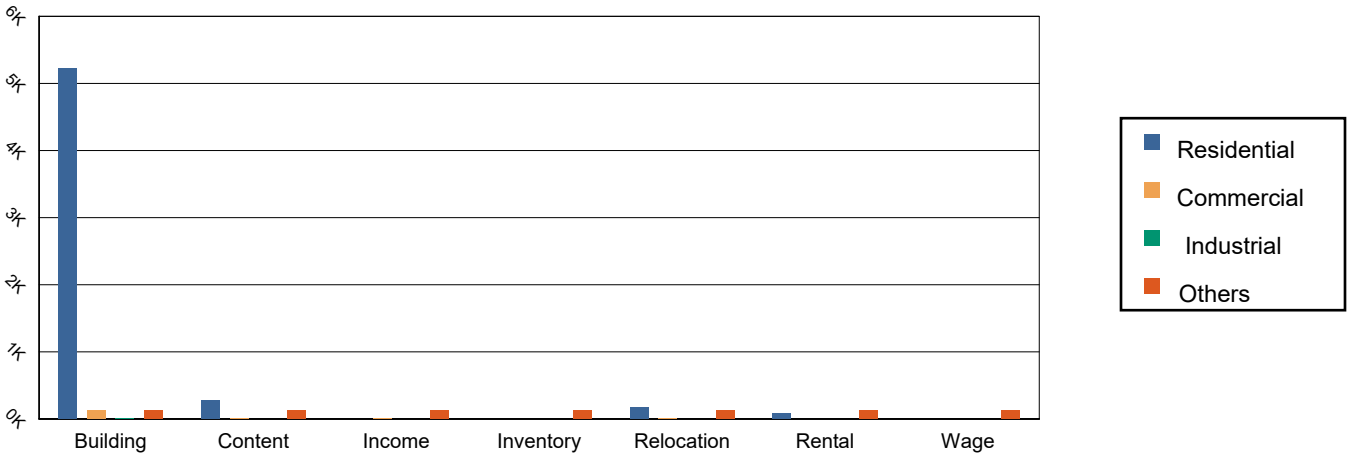


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,218.76	126.26	12.64	112.18	5,469.84
	Content	277.83	11.54	0.97	1.34	291.68
	Inventory	0.00	0.78	0.09	0.32	1.19
	Subtotal	**5,496.59**	**138.58**	**13.69**	**113.85**	**5,762.71**
Business Interruption Loss						
	Income	0.00	4.60	0.00	2.64	7.23
	Relocation	164.04	4.15	0.13	2.24	170.56
	Rental	79.37	1.91	0.00	0.18	81.46
	Wage	0.00	1.63	0.00	6.22	7.85
	Subtotal	**243.41**	**12.28**	**0.13**	**11.28**	**267.10**

Total

Total	**5,739.99**	**150.87**	**13.82**	**125.13**	**6,029.81**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,601	442,534	1,896,135
Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**
Study Region Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**

Hazus: Hurricane Global Risk Report

Region Name:	Hebron_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 37.26 square miles and contains 2 census tracts. There are over 3 thousand households in the region and a total population of 9,098 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 91% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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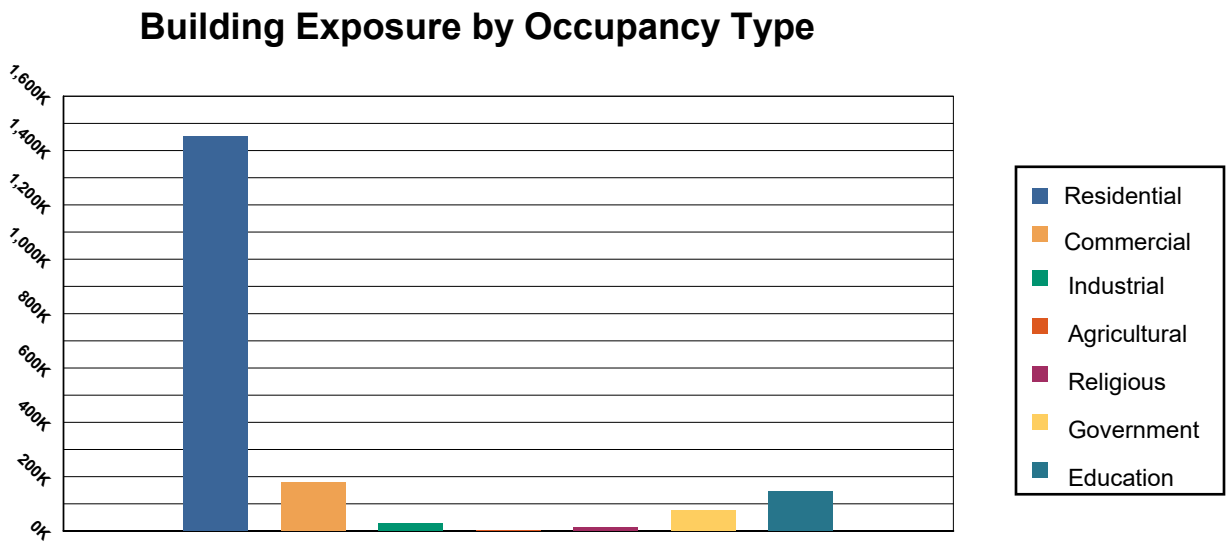


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,453,601	76.66%
Commercial	177,400	9.36%
Industrial	28,629	1.51%
Agricultural	3,417	0.18%
Religious	13,776	0.73%
Government	74,899	3.95%
Education	144,413	7.62%
Total	**1,896,135**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 23 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

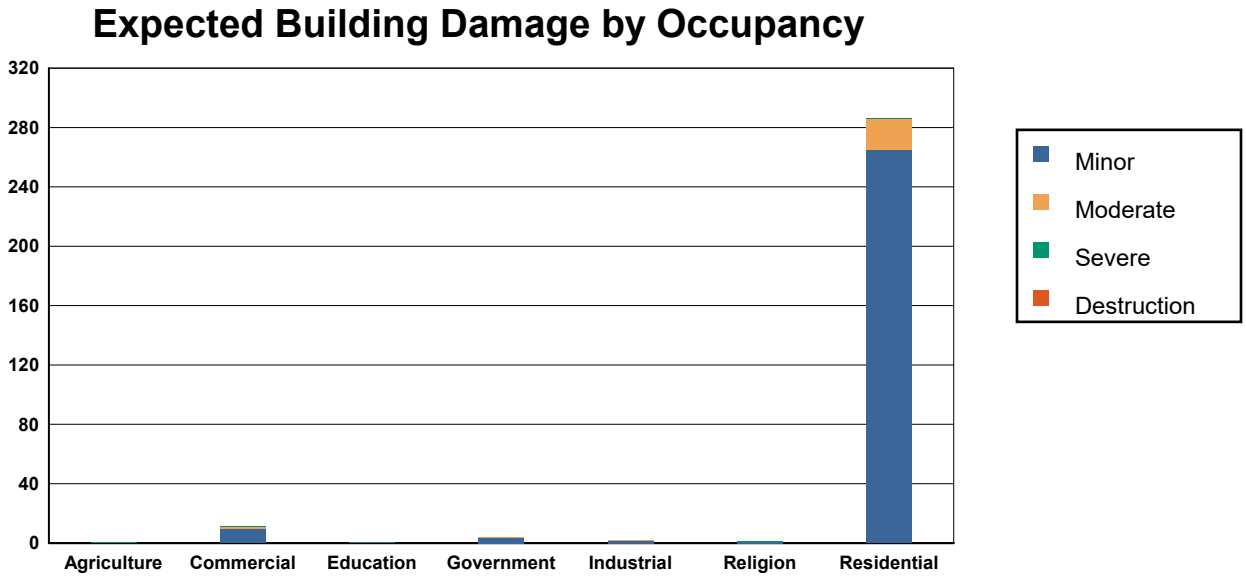


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.42	91.77	0.45	6.48	0.08	1.19	0.04	0.53	0.00	0.03
Commercial	184.81	94.29	9.90	5.05	1.17	0.60	0.13	0.06	0.00	0.00
Education	5.69	94.85	0.29	4.87	0.02	0.28	0.00	0.01	0.00	0.00
Government	70.35	95.07	3.45	4.66	0.19	0.26	0.00	0.00	0.00	0.00
Industrial	39.90	95.01	1.95	4.65	0.14	0.33	0.01	0.02	0.00	0.00
Religion	15.12	94.53	0.83	5.20	0.04	0.26	0.00	0.01	0.00	0.00
Residential	2,991.03	91.27	265.13	8.09	20.46	0.62	0.39	0.01	0.00	0.00
Total	**3,313.34**		**282.00**		**22.10**		**0.56**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	35	94.99	2	4.72	0	0.29	0	0.00	0	0.00
Masonry	239	92.71	16	6.17	3	1.08	0	0.04	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	154	95.05	7	4.48	1	0.43	0	0.05	0	0.00
Wood	2,889	91.44	254	8.03	17	0.52	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

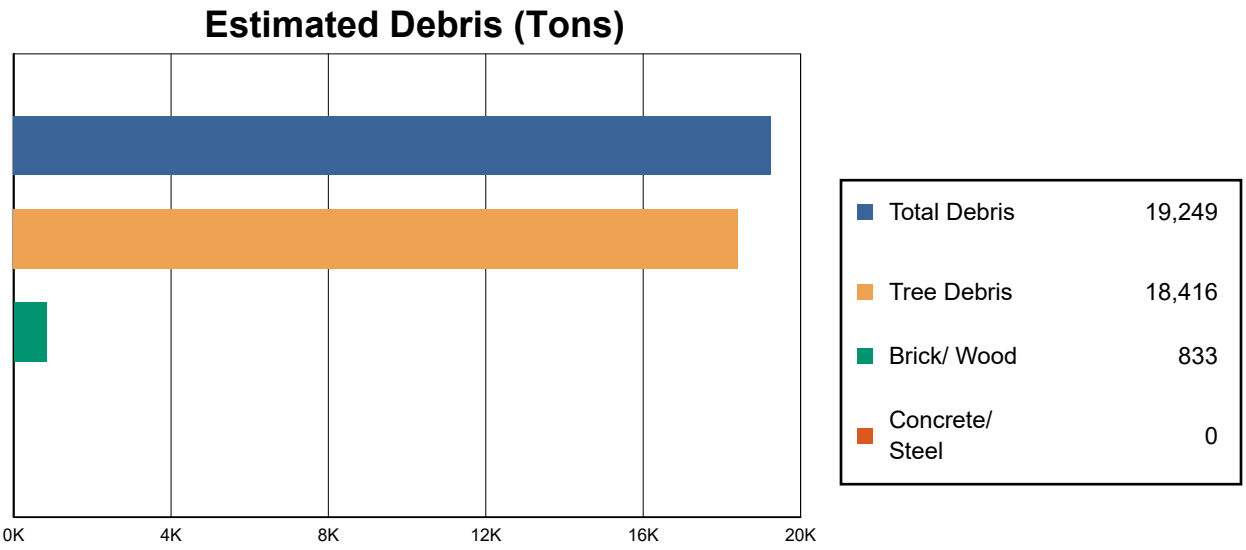
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

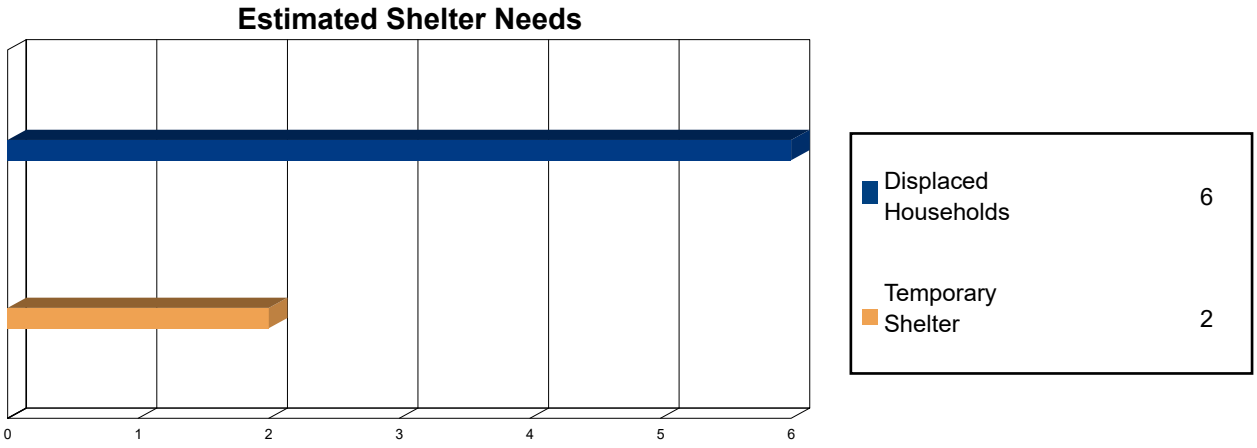


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 19,249 tons of debris will be generated. Of the total amount, 15,677 tons (81%) is Other Tree Debris. Of the remaining 3,572 tons, Brick/Wood comprises 23% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 33 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,739 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 6 households to be displaced due to the hurricane. Of these, 2 people (out of a total population of 9,098) will seek temporary shelter in public shelters.

Economic Loss

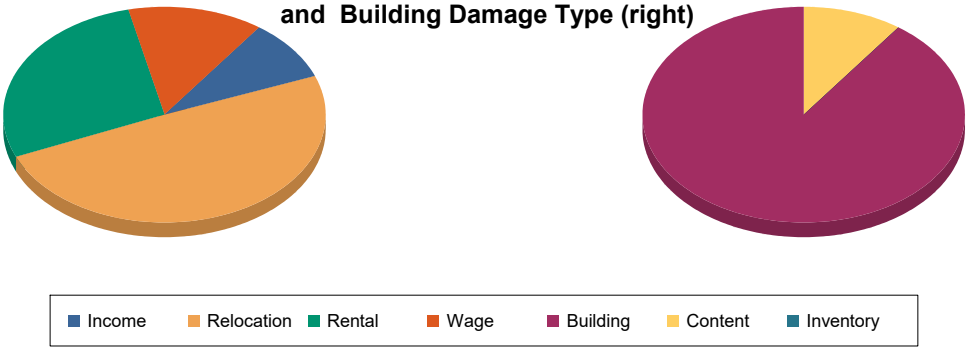
The total economic loss estimated for the hurricane is 12.3 million dollars, which represents 0.65 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 12 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 92% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

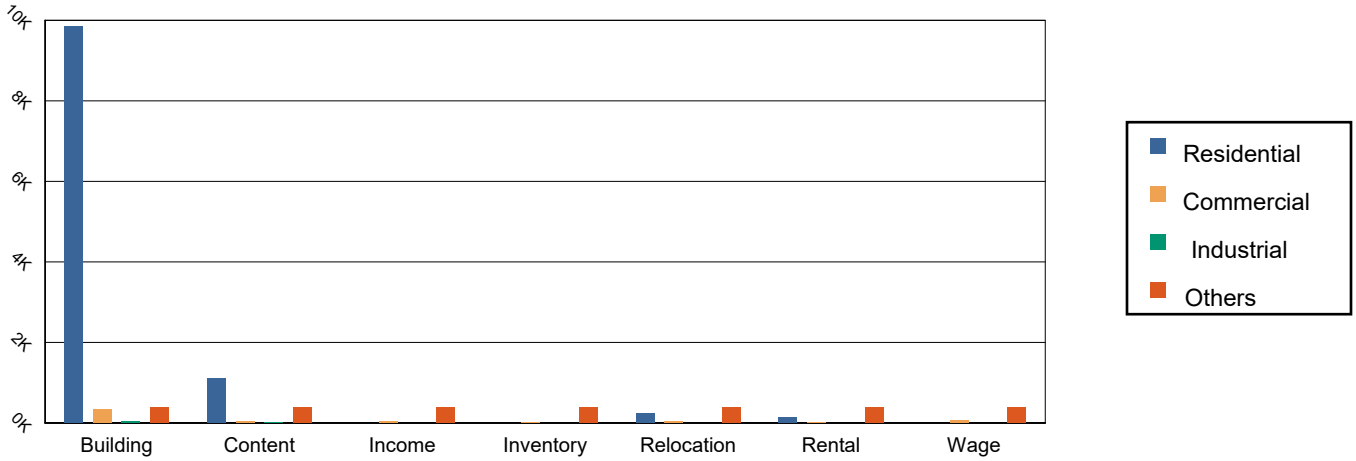


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	9,855.75	339.09	32.29	313.02	10,540.15
	Content	1,094.42	46.61	3.74	20.90	1,165.67
	Inventory	0.00	4.00	0.37	2.38	6.76
	Subtotal	**10,950.17**	**389.71**	**36.40**	**336.30**	**11,712.58**
Business Interruption Loss						
	Income	0.00	43.23	0.00	7.60	50.83
	Relocation	227.69	36.63	0.76	10.10	275.18
	Rental	131.72	21.91	0.00	0.61	154.23
	Wage	0.00	58.25	0.00	17.91	76.16
	Subtotal	**359.41**	**160.02**	**0.76**	**36.21**	**556.40**

Total

Total	**11,309.58**	**549.73**	**37.16**	**372.51**	**12,268.99**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,601	442,534	1,896,135
Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**
Study Region Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**

Hazus: Hurricane Global Risk Report

Region Name:	Hebron_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 37.26 square miles and contains 2 census tracts. There are over 3 thousand households in the region and a total population of 9,098 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 91% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,618 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

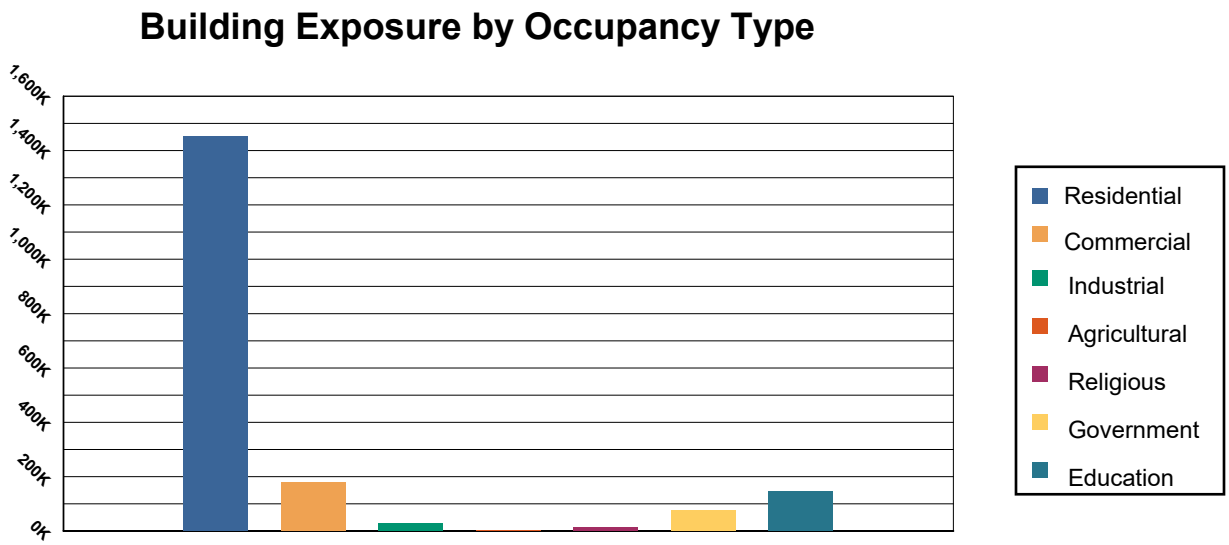


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,453,601	76.66%
Commercial	177,400	9.36%
Industrial	28,629	1.51%
Agricultural	3,417	0.18%
Religious	13,776	0.73%
Government	74,899	3.95%
Education	144,413	7.62%
Total	**1,896,135**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 72 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

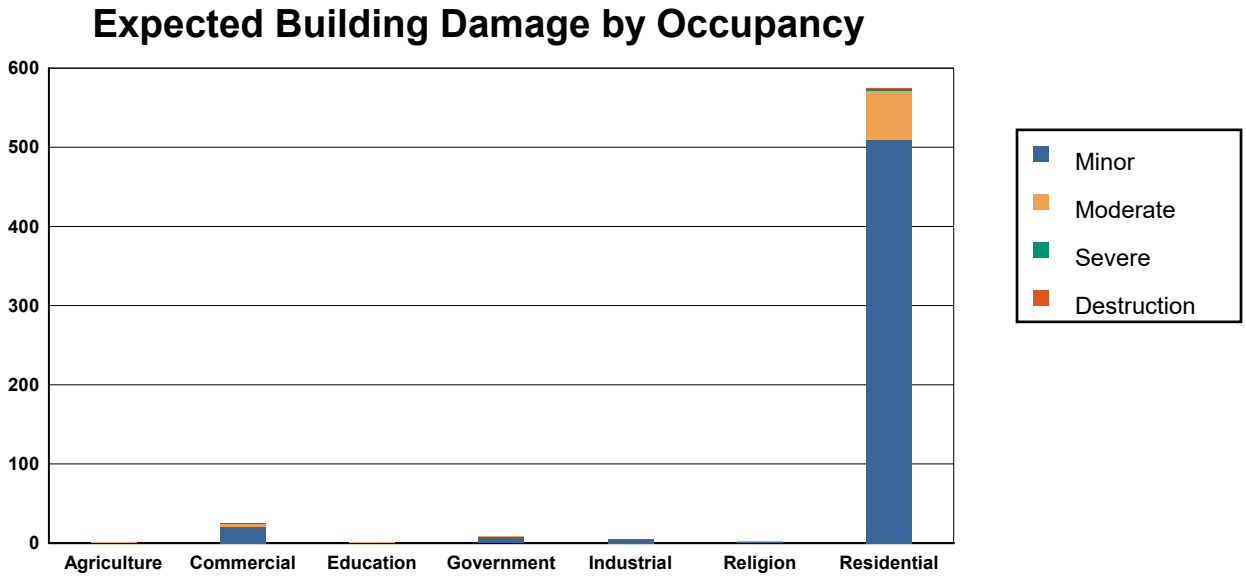


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	5.81	82.95	0.88	12.56	0.21	2.93	0.10	1.43	0.01	0.14
Commercial	171.63	87.57	20.31	10.36	3.59	1.83	0.47	0.24	0.00	0.00
Education	5.32	88.60	0.60	10.05	0.08	1.30	0.00	0.06	0.00	0.00
Government	65.87	89.01	7.15	9.66	0.95	1.28	0.03	0.04	0.00	0.00
Industrial	37.30	88.82	4.04	9.62	0.60	1.43	0.05	0.13	0.00	0.00
Religion	14.03	87.69	1.77	11.06	0.19	1.20	0.01	0.05	0.00	0.00
Residential	2,702.31	82.46	509.31	15.54	61.96	1.89	2.34	0.07	1.07	0.03
Total	**3,002.27**		**544.06**		**67.58**		**3.01**		**1.09**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	33	88.93	4	9.60	1	1.43	0	0.04	0	0.00
Masonry	220	85.42	30	11.70	7	2.74	0	0.13	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	144	89.04	15	9.14	3	1.61	0	0.21	0	0.00
Wood	2,611	82.63	491	15.55	54	1.72	2	0.06	1	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

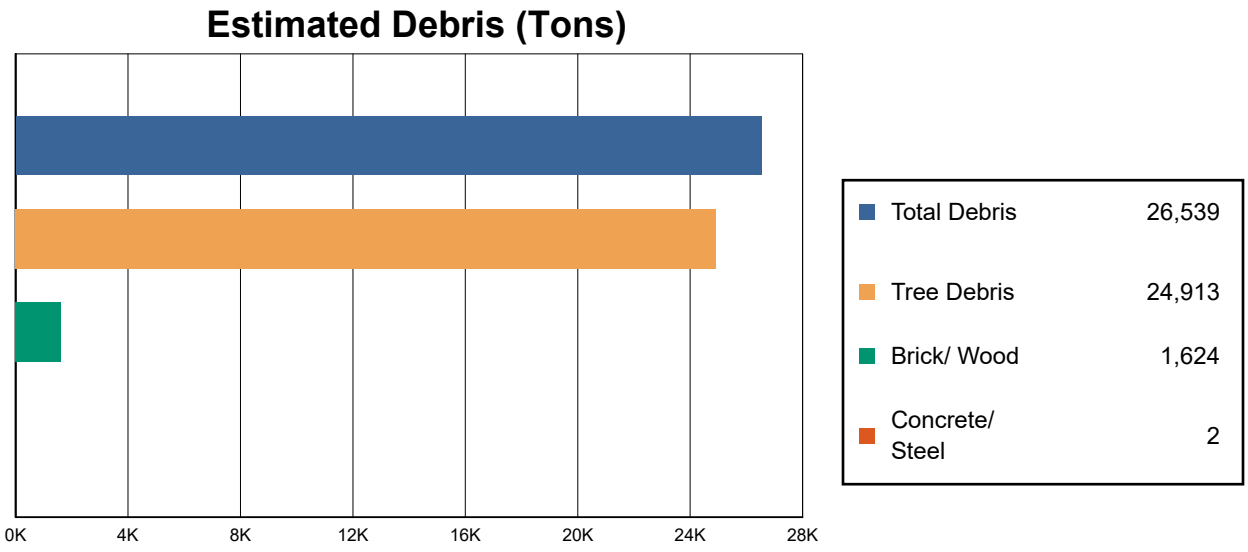
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

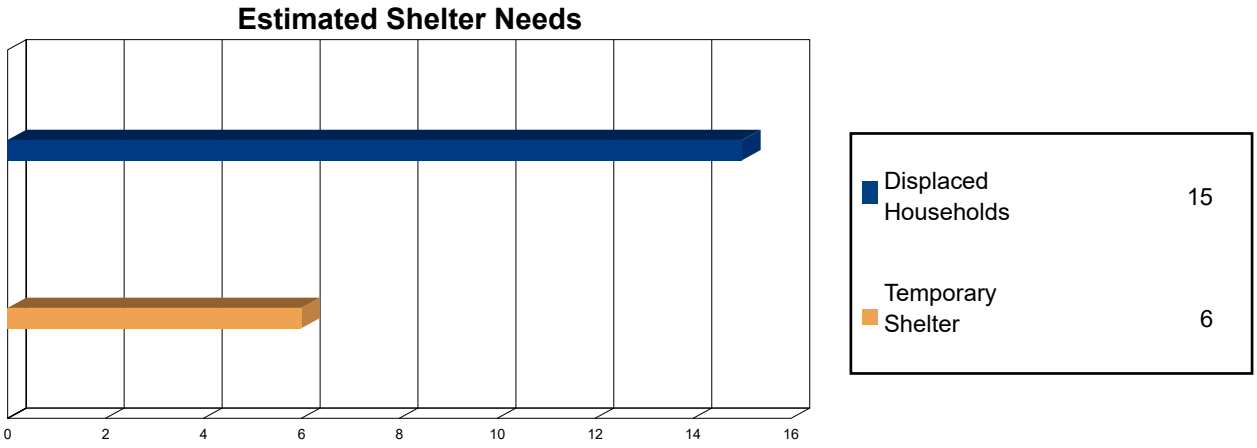


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 26,539 tons of debris will be generated. Of the total amount, 21,200 tons (80%) is Other Tree Debris. Of the remaining 5,339 tons, Brick/Wood comprises 30% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 65 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,713 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 15 households to be displaced due to the hurricane. Of these, 6 people (out of a total population of 9,098) will seek temporary shelter in public shelters.

Economic Loss

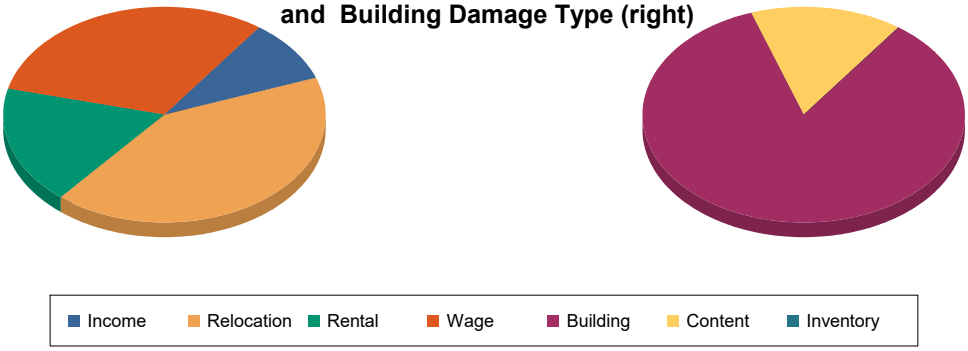
The total economic loss estimated for the hurricane is 24.9 million dollars, which represents 1.31 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 25 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

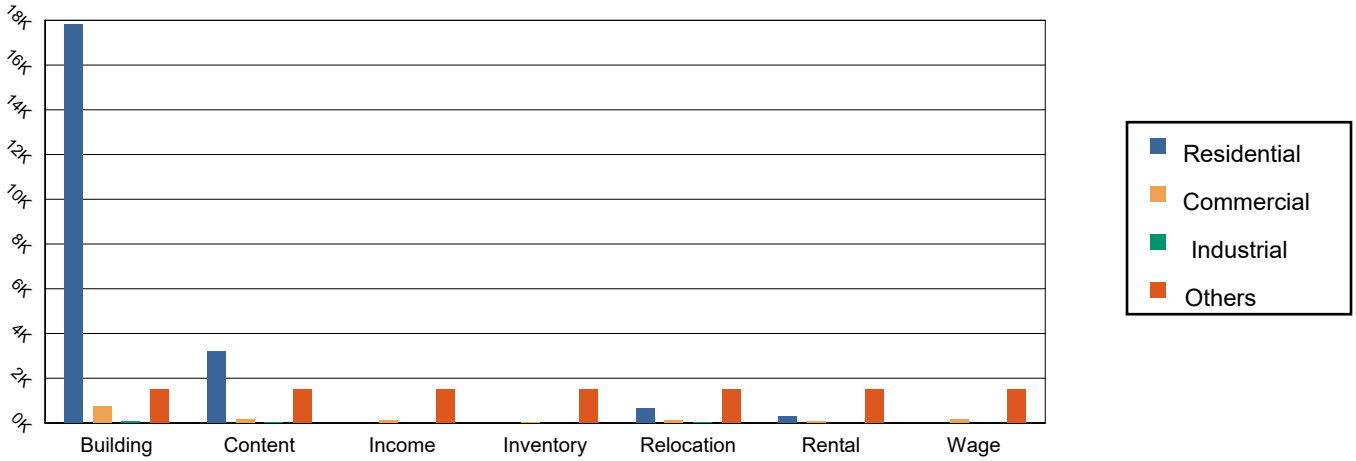


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	17,823.49	739.93	81.17	719.17	19,363.76
	Content	3,214.47	140.51	22.63	100.29	3,477.90
	Inventory	0.00	13.57	2.44	7.99	24.00
	Subtotal	**21,037.96**	**894.01**	**106.24**	**827.45**	**22,865.66**
Business Interruption Loss						
	Income	0.00	126.51	1.40	65.21	193.13
	Relocation	630.29	110.79	6.22	114.76	862.06
	Rental	284.25	65.44	1.15	18.05	368.89
	Wage	0.00	171.31	2.41	470.13	643.85
	Subtotal	**914.54**	**474.06**	**11.18**	**668.14**	**2,067.92**

Total

Total	**21,952.49**	**1,368.07**	**117.42**	**1,495.60**	**24,933.58**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,601	442,534	1,896,135
Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**
Study Region Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**

Hazus: Hurricane Global Risk Report

Region Name:	Hebron_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
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Building Inventory

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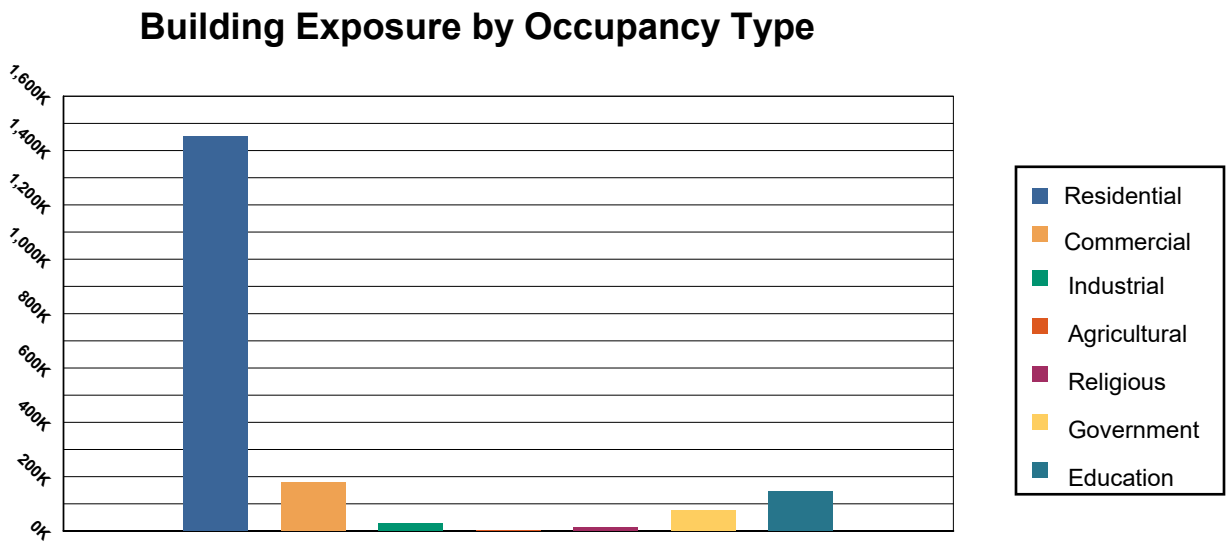


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,453,601	76.66%
Commercial	177,400	9.36%
Industrial	28,629	1.51%
Agricultural	3,417	0.18%
Religious	13,776	0.73%
Government	74,899	3.95%
Education	144,413	7.62%
Total	**1,896,135**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 183 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 6 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

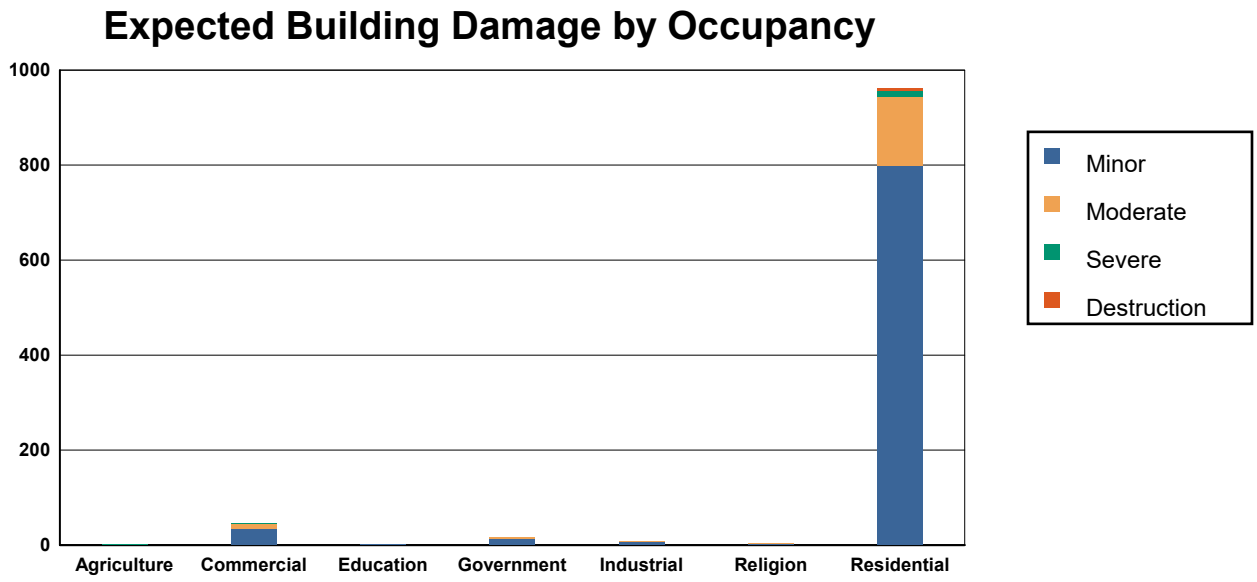


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4.87	69.62	1.43	20.48	0.45	6.40	0.21	3.06	0.03	0.43
Commercial	149.60	76.32	34.80	17.75	10.31	5.26	1.29	0.66	0.01	0.00
Education	4.63	77.17	1.06	17.66	0.29	4.86	0.02	0.31	0.00	0.00
Government	58.19	78.64	12.26	16.57	3.35	4.53	0.20	0.27	0.00	0.00
Industrial	32.98	78.52	6.87	16.37	1.95	4.65	0.19	0.45	0.00	0.01
Religion	12.32	76.99	3.00	18.78	0.64	3.99	0.04	0.24	0.00	0.00
Residential	2,314.88	70.64	797.92	24.35	146.79	4.48	11.38	0.35	6.03	0.18
Total	**2,577.47**		**857.35**		**163.78**		**13.34**		**6.08**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	29	78.25	6	16.46	2	5.00	0	0.29	0	0.00
Masonry	192	74.25	49	18.85	17	6.41	1	0.43	0	0.06
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	127	78.41	26	15.82	8	5.12	1	0.64	0	0.00
Wood	2,237	70.79	774	24.50	133	4.21	10	0.33	6	0.18

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

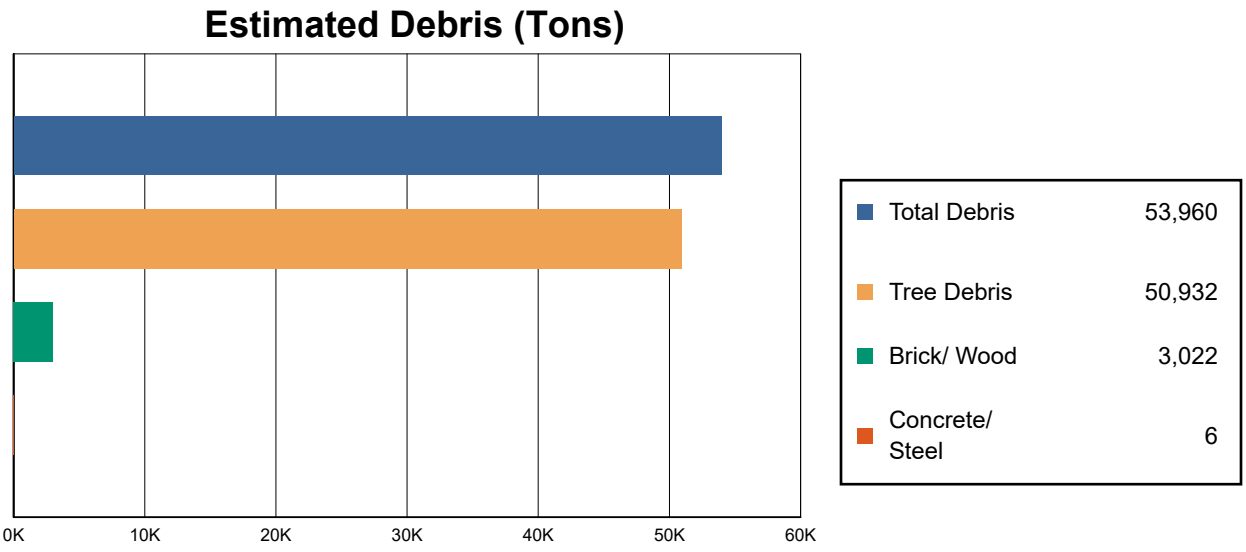
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	4	0	0	1

Induced Hurricane Damage

Debris Generation

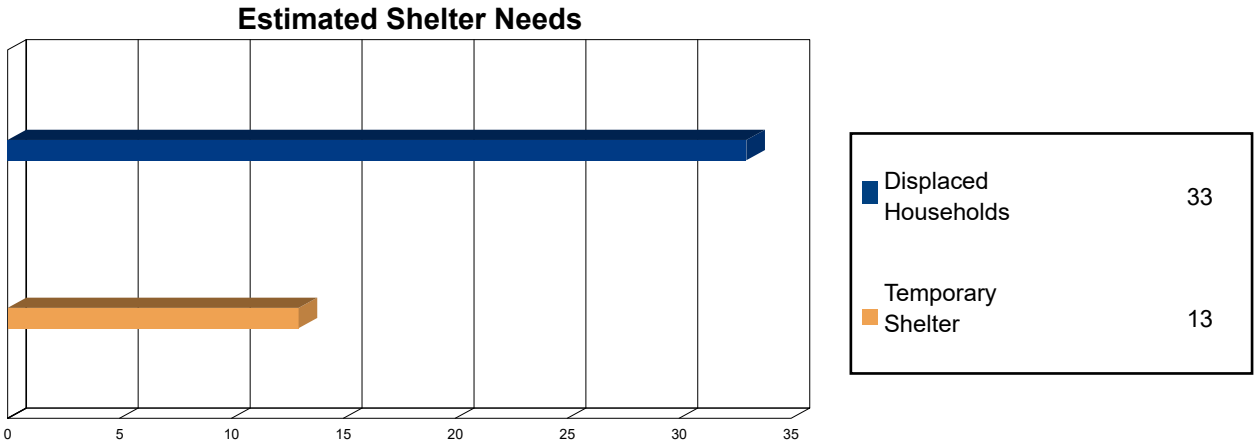


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 53,960 tons of debris will be generated. Of the total amount, 43,448 tons (81%) is Other Tree Debris. Of the remaining 10,512 tons, Brick/Wood comprises 29% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 121 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,484 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 33 households to be displaced due to the hurricane. Of these, 13 people (out of a total population of 9,098) will seek temporary shelter in public shelters.

Economic Loss

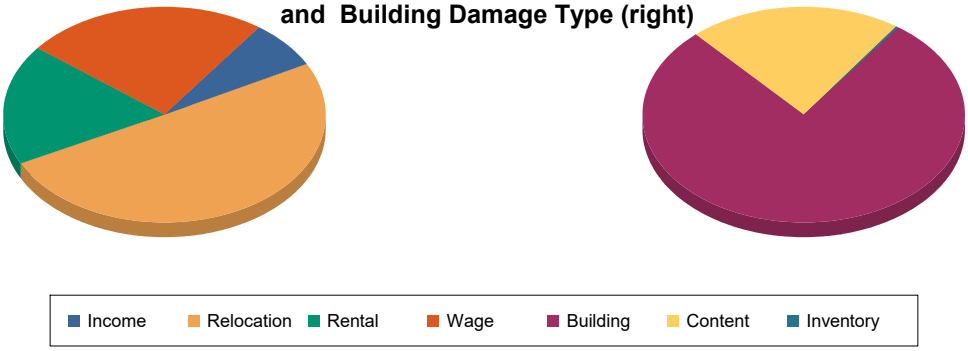
The total economic loss estimated for the hurricane is 52.0 million dollars, which represents 2.74 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 52 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

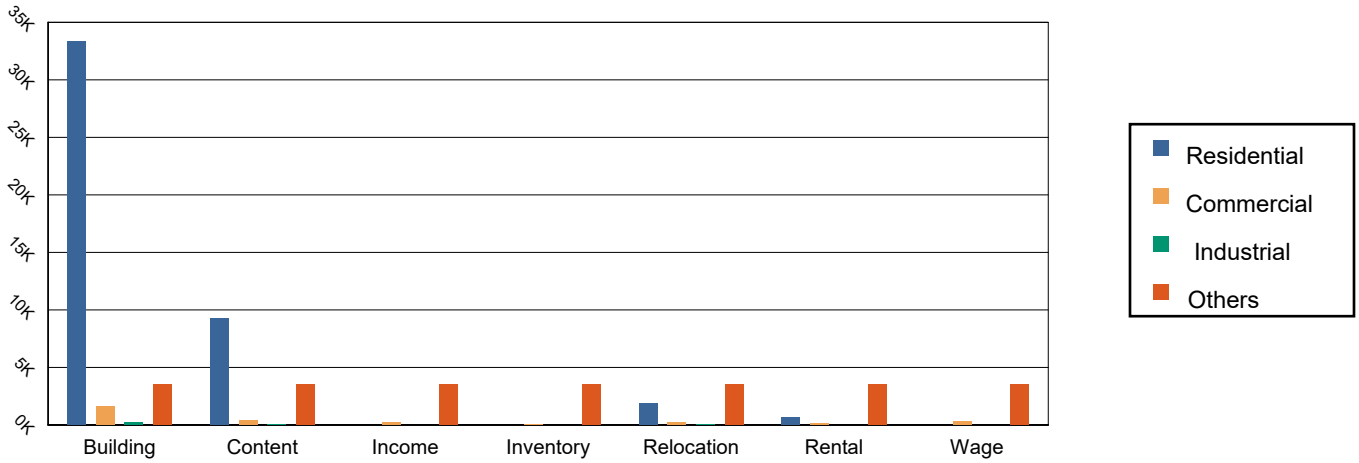


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	33,367.04	1,620.06	187.66	1,712.13	36,886.89
	Content	9,272.13	417.31	66.77	386.43	10,142.65
	Inventory	0.00	41.62	7.62	21.03	70.26
	Subtotal	**42,639.16**	**2,078.99**	**262.05**	**2,119.59**	**47,099.80**
Business Interruption Loss						
	Income	0.00	212.83	2.60	138.21	353.64
	Relocation	1,870.58	258.32	16.96	311.46	2,457.32
	Rental	694.51	140.78	2.49	40.10	877.88
	Wage	0.00	286.61	4.47	909.17	1,200.26
	Subtotal	**2,565.09**	**898.55**	**26.52**	**1,398.94**	**4,889.10**

Total

Total	**45,204.26**	**2,977.54**	**288.57**	**3,518.53**	**51,988.90**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,601	442,534	1,896,135
Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**
Study Region Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**

Hazus: Hurricane Global Risk Report

Region Name:	Hebron_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 37.26 square miles and contains 2 census tracts. There are over 3 thousand households in the region and a total population of 9,098 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 1,896 million dollars. Approximately 91% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,618 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

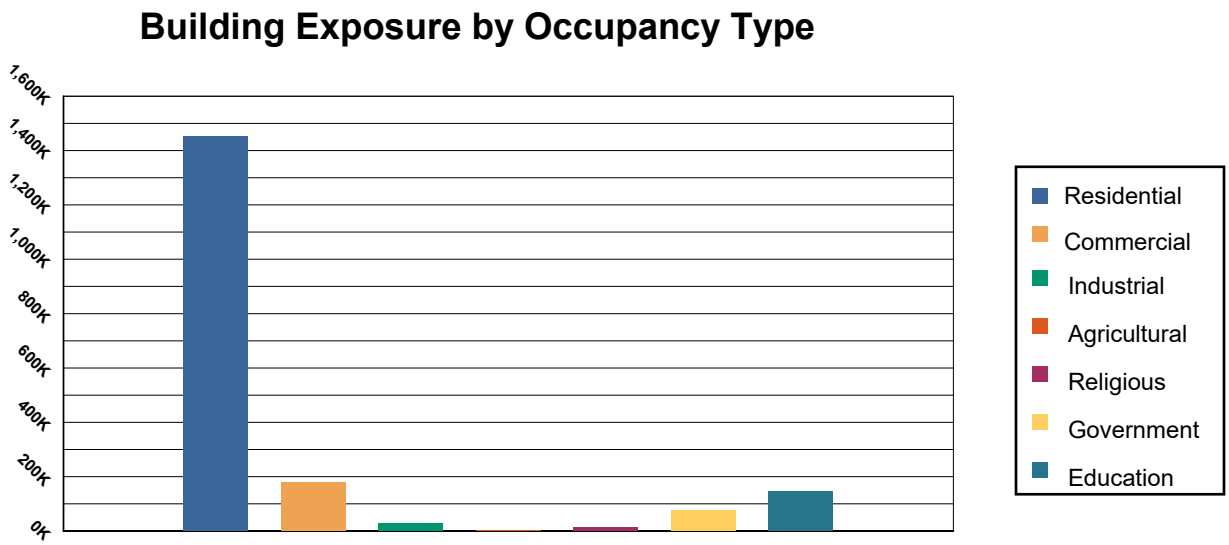


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,453,601	76.66%
Commercial	177,400	9.36%
Industrial	28,629	1.51%
Agricultural	3,417	0.18%
Religious	13,776	0.73%
Government	74,899	3.95%
Education	144,413	7.62%
Total	**1,896,135**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 313 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the region. There are an estimated 15 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

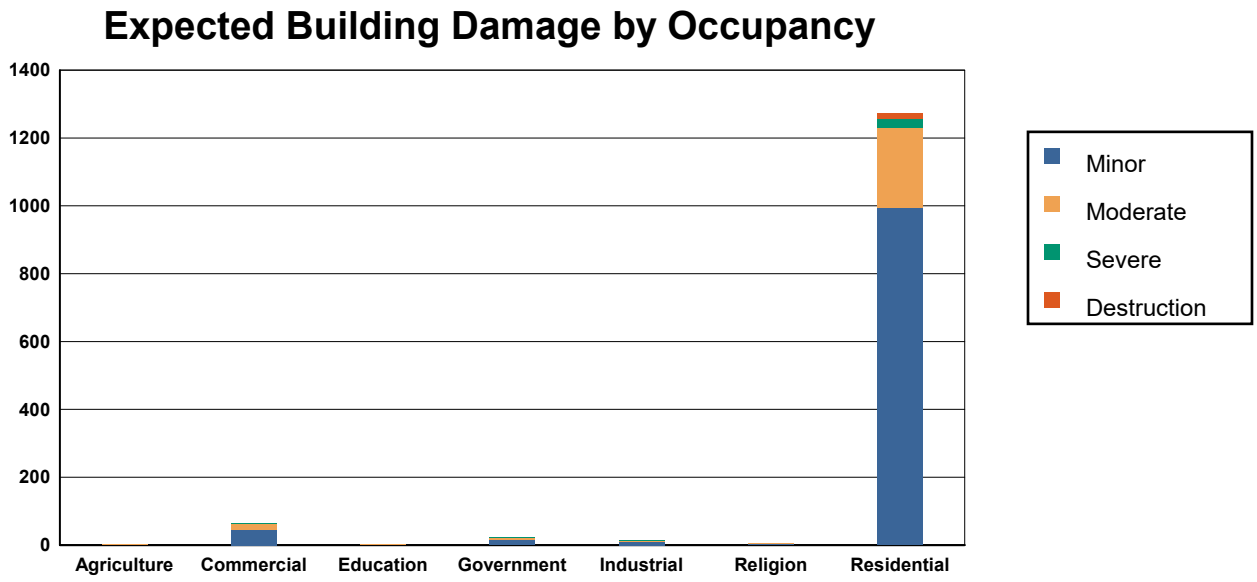


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4.21	60.08	1.78	25.37	0.66	9.39	0.31	4.48	0.05	0.68
Commercial	130.13	66.39	44.77	22.84	18.34	9.36	2.75	1.40	0.02	0.01
Education	4.06	67.61	1.35	22.54	0.54	8.97	0.05	0.88	0.00	0.00
Government	50.45	68.17	16.14	21.81	6.75	9.12	0.66	0.89	0.00	0.00
Industrial	28.55	67.97	9.04	21.52	3.89	9.26	0.51	1.22	0.01	0.02
Religion	10.64	66.49	3.98	24.87	1.27	7.92	0.11	0.71	0.00	0.00
Residential	2,005.89	61.21	994.37	30.34	235.04	7.17	26.46	0.81	15.24	0.47
Total	**2,233.91**		**1,071.42**		**266.48**		**30.86**		**15.32**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	25	67.94	8	21.31	4	9.82	0	0.93	0	0.00
Masonry	167	64.54	61	23.69	27	10.62	3	1.01	0	0.14
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	111	68.22	33	20.54	16	9.73	2	1.50	0	0.01
Wood	1,938	61.32	968	30.64	215	6.81	25	0.78	14	0.45

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

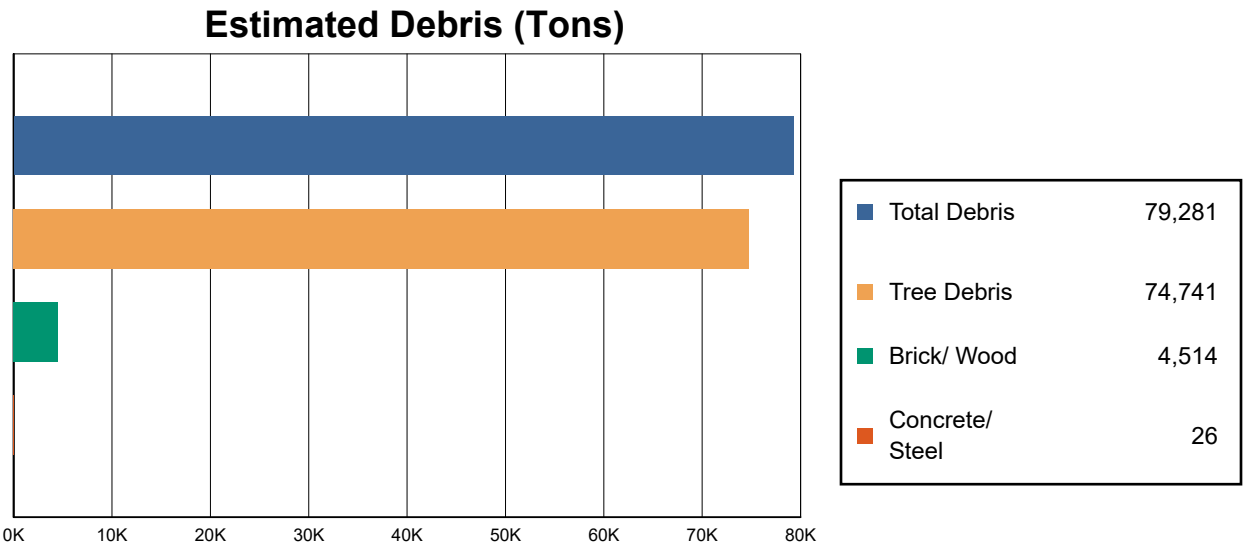
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

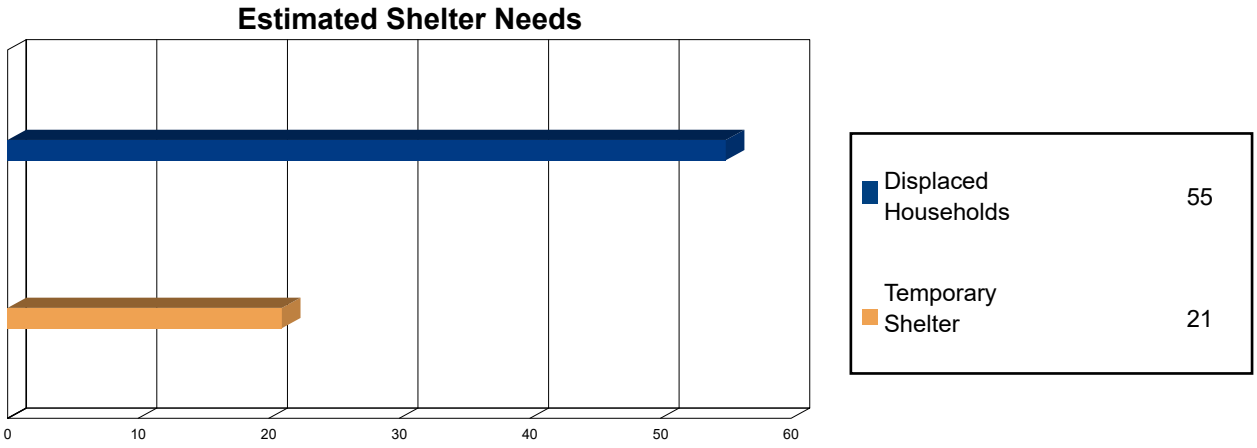


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 79,281 tons of debris will be generated. Of the total amount, 63,601 tons (80%) is Other Tree Debris. Of the remaining 15,680 tons, Brick/Wood comprises 29% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 182 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 11,140 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 55 households to be displaced due to the hurricane. Of these, 21 people (out of a total population of 9,098) will seek temporary shelter in public shelters.

Economic Loss

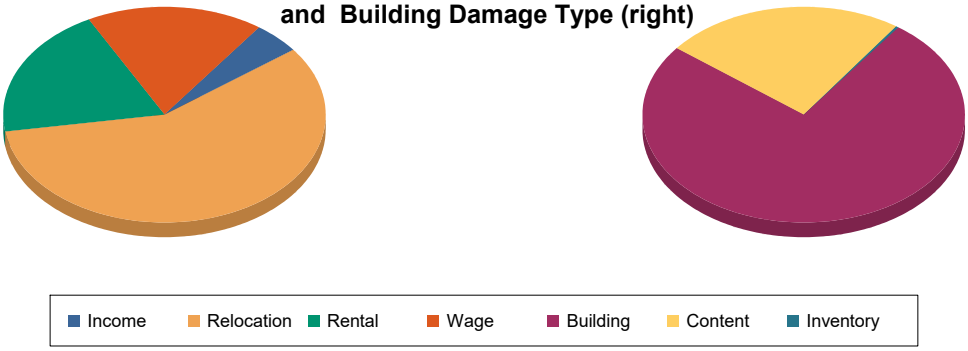
The total economic loss estimated for the hurricane is 83.9 million dollars, which represents 4.42 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 84 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

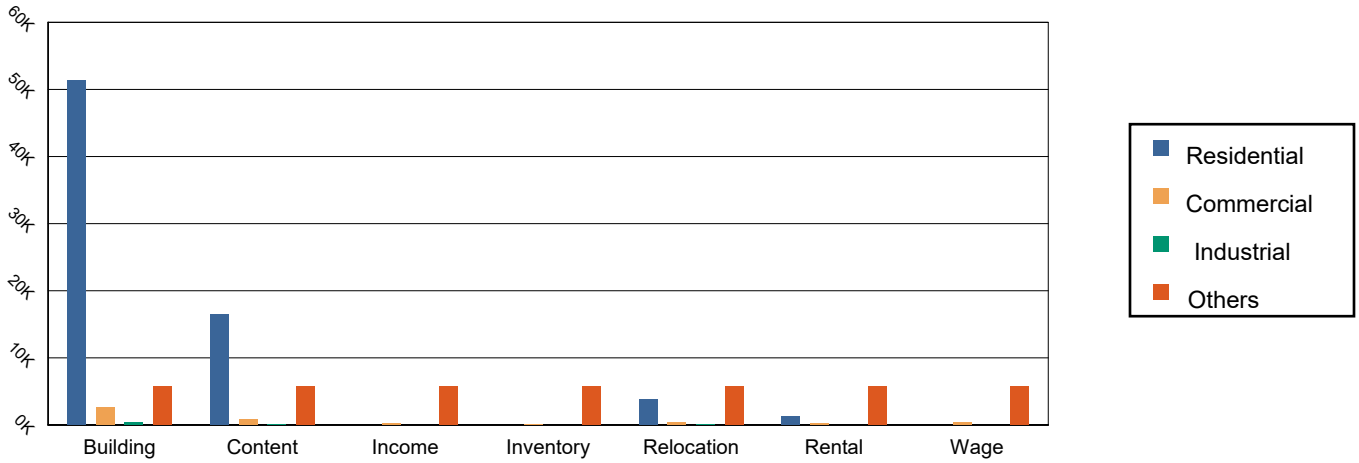


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	51,297.91	2,572.99	351.77	2,905.31	57,127.99
	Content	16,489.38	829.79	161.59	826.31	18,307.05
	Inventory	0.00	79.87	18.40	32.58	130.85
	Subtotal	**67,787.29**	**3,482.65**	**531.76**	**3,764.19**	**75,565.89**
Business Interruption Loss						
	Income	0.03	226.34	3.32	160.36	390.05
	Relocation	3,839.58	415.57	33.66	538.65	4,827.47
	Rental	1,332.29	219.06	4.46	73.14	1,628.95
	Wage	0.07	314.47	5.72	1,167.88	1,488.14
	Subtotal	**5,171.97**	**1,175.44**	**47.16**	**1,940.04**	**8,334.61**

Total

Total	**72,959.27**	**4,658.09**	**578.91**	**5,704.23**	**83,900.50**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	9,098	1,453,601	442,534	1,896,135
Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**
Study Region Total	**9,098**	**1,453,601**	**442,534**	**1,896,135**

Hazus: Hurricane Global Risk Report

Region Name:	Manchester_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 27.69 square miles and contains 15 census tracts. There are over 25 thousand households in the region and a total population of 59,713 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 17 thousand buildings in the region with a total building replacement value (excluding contents) of 11,096 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

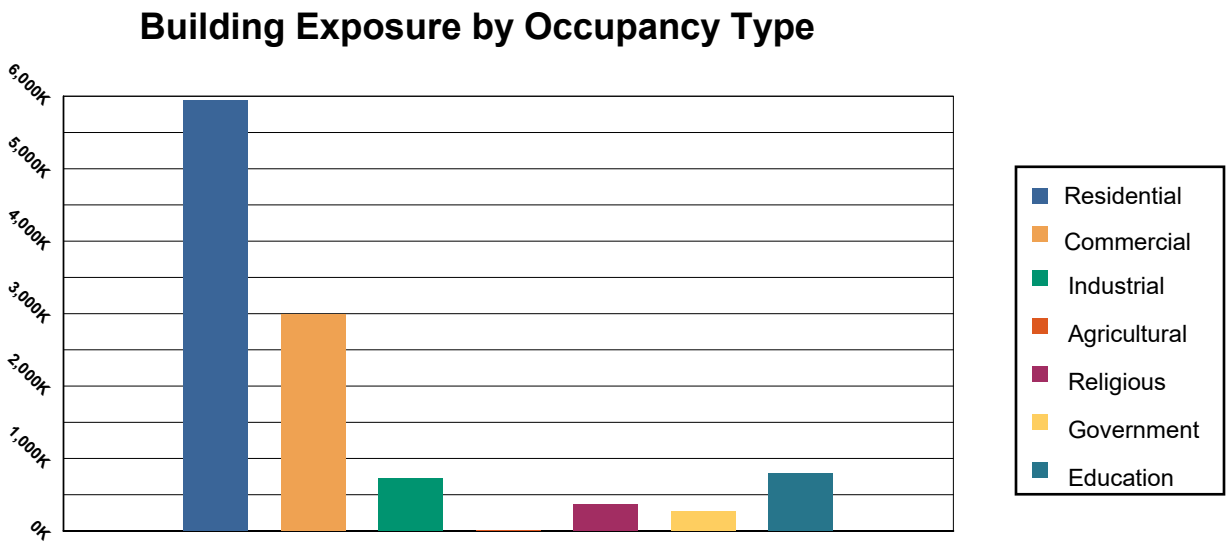


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,947,093	53.60%
Commercial	2,982,903	26.88%
Industrial	726,009	6.54%
Agricultural	8,765	0.08%
Religious	369,889	3.33%
Government	273,715	2.47%
Education	787,456	7.10%
Total	**11,095,830**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds. There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

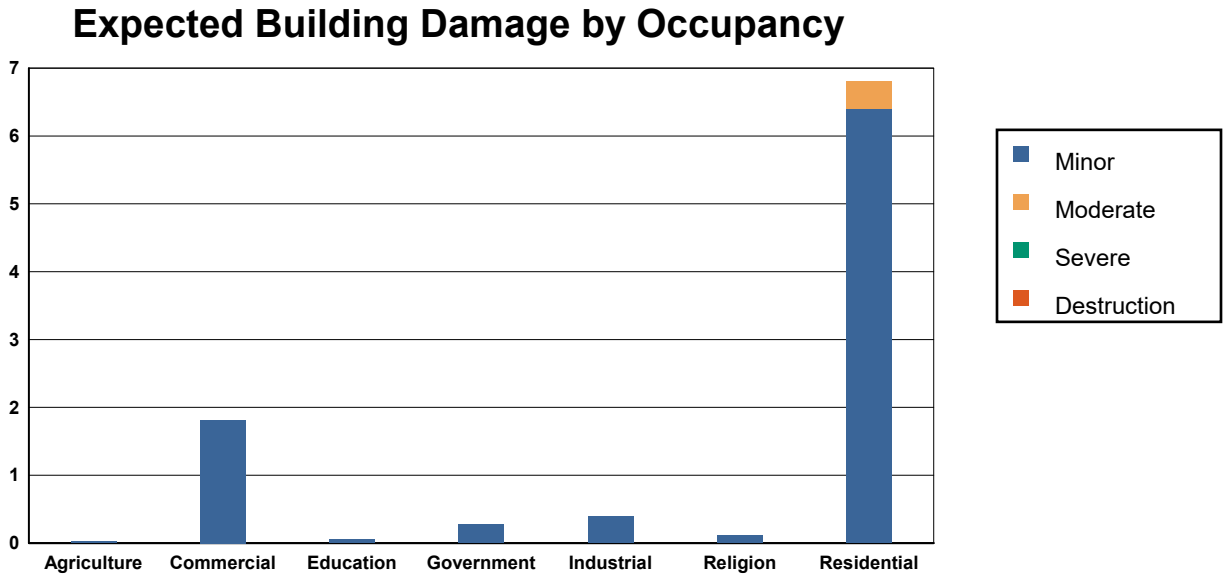


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	30.97	99.91	0.03	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1,501.19	99.88	1.81	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Education	43.94	99.87	0.06	0.13	0.00	0.00	0.00	0.00	0.00	0.00
Government	236.73	99.89	0.27	0.11	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	324.61	99.88	0.39	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Religion	93.88	99.88	0.12	0.13	0.00	0.00	0.00	0.00	0.00	0.00
Residential	15,085.19	99.95	6.40	0.04	0.41	0.00	0.00	0.00	0.00	0.00
Total	**17,316.51**		**9.08**		**0.41**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	320	99.84	1	0.16	0	0.00	0	0.00	0	0.00
Masonry	1,964	99.81	4	0.18	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,134	99.87	1	0.13	0	0.00	0	0.00	0	0.00
Wood	13,891	99.98	2	0.01	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 249 hospital beds available for use. On the day of the hurricane, the model estimates that 249 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

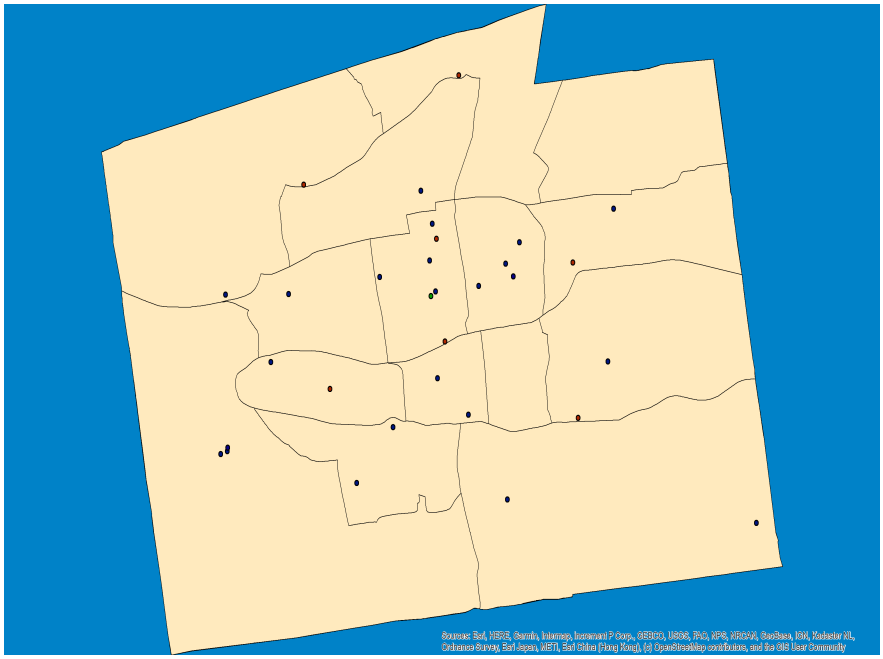
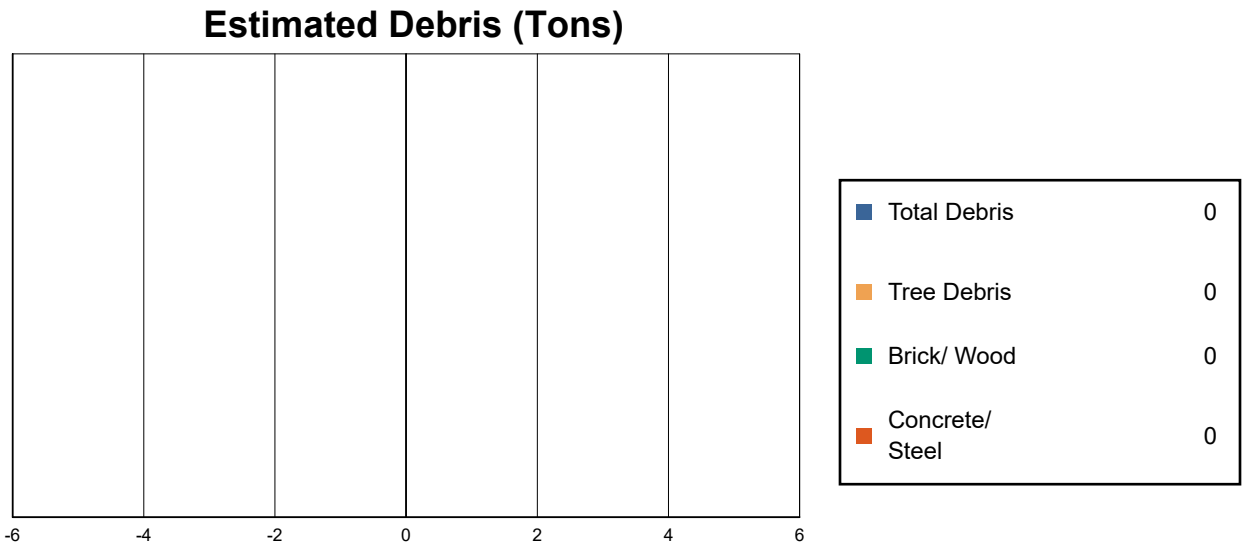


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	7	0	0	7
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	21	0	0	21

Induced Hurricane Damage

Debris Generation

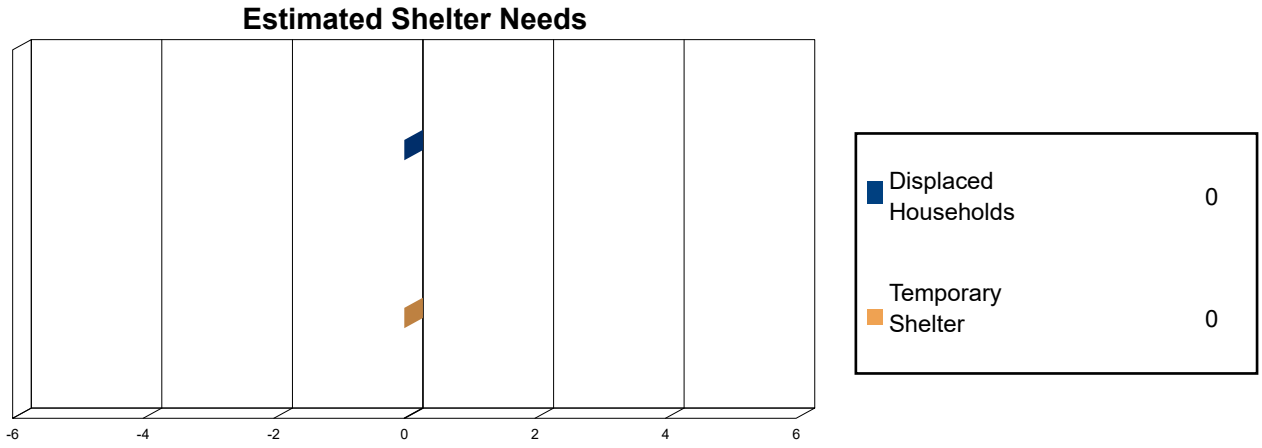


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 59,713) will seek temporary shelter in public shelters.

Economic Loss

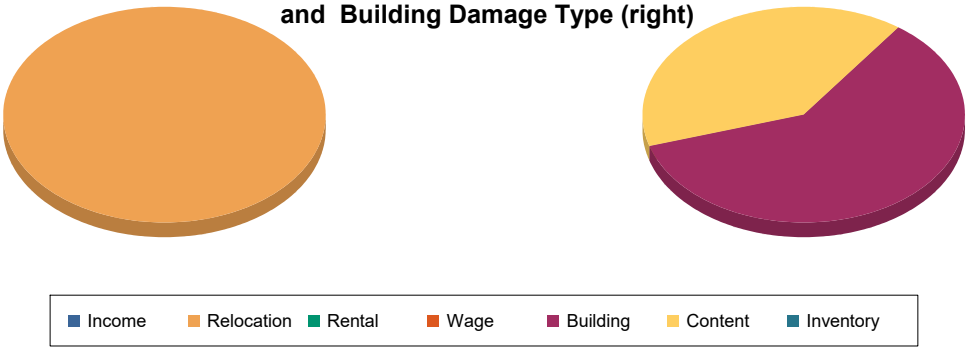
The total economic loss estimated for the hurricane is 0.2 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	121.72	0.00	0.00	0.00	121.72
	Content	80.23	0.00	0.00	0.00	80.23
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**201.94**	**0.00**	**0.00**	**0.00**	**201.94**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	1.06	0.00	0.00	0.00	1.06
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1.06**	**0.00**	**0.00**	**0.00**	**1.06**

Total

Total	**203.01**	**0.00**	**0.00**	**0.00**	**203.01**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,947,093	5,148,737	11,095,830
Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**
Study Region Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**

Hazus: Hurricane Global Risk Report

Region Name:	Manchester_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 27.69 square miles and contains 15 census tracts. There are over 25 thousand households in the region and a total population of 59,713 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 17 thousand buildings in the region with a total building replacement value (excluding contents) of 11,096 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

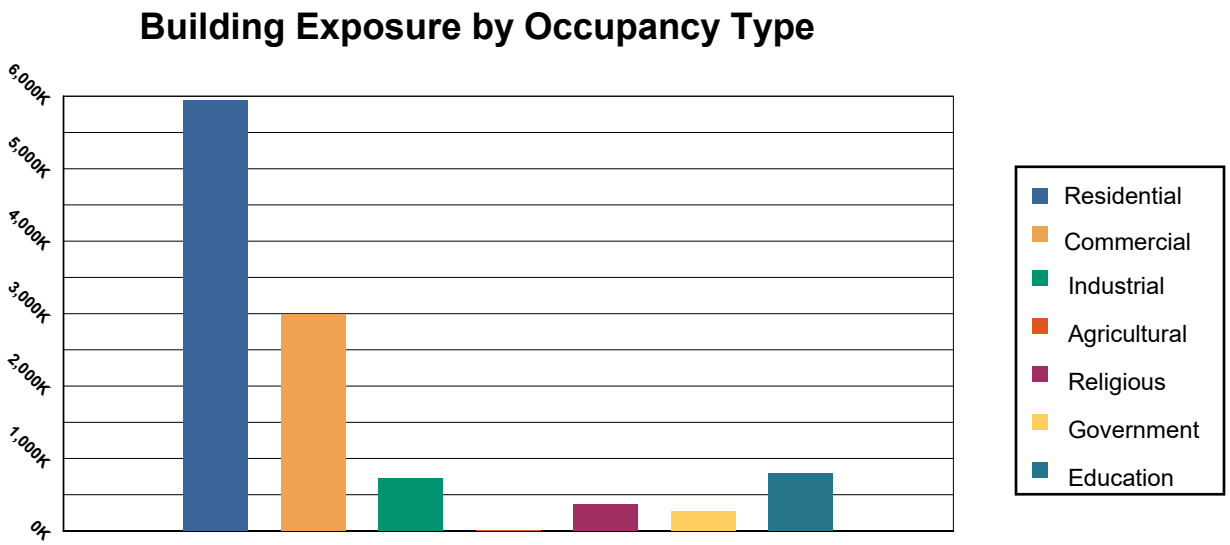


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,947,093	53.60%
Commercial	2,982,903	26.88%
Industrial	726,009	6.54%
Agricultural	8,765	0.08%
Religious	369,889	3.33%
Government	273,715	2.47%
Education	787,456	7.10%
Total	**11,095,830**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds. There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

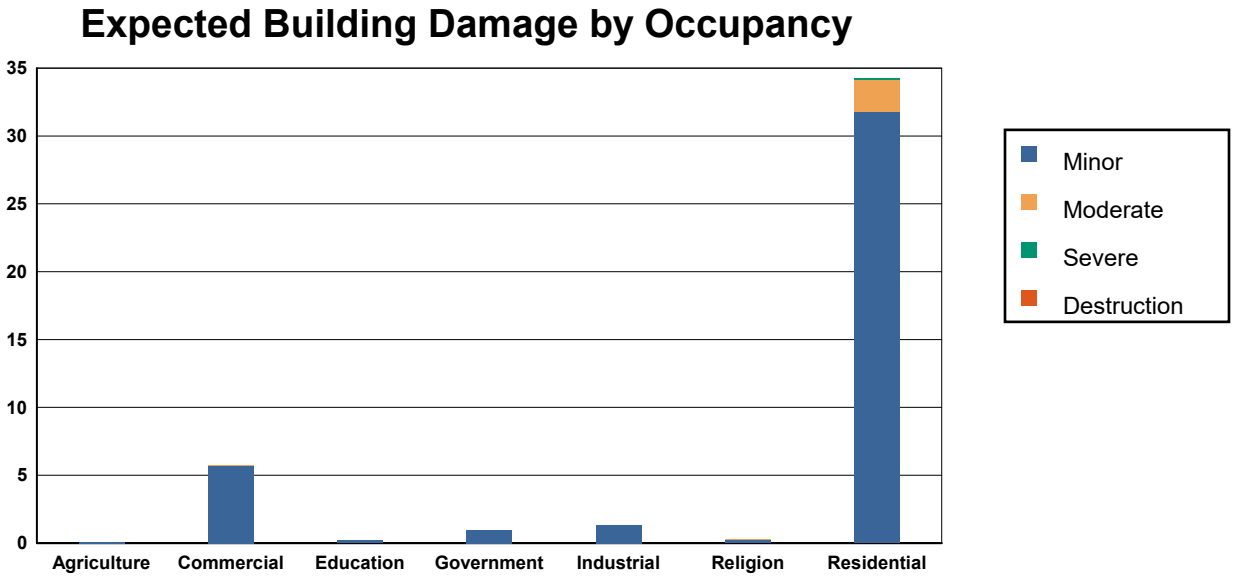


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	30.91	99.69	0.09	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1,497.26	99.62	5.67	0.38	0.07	0.00	0.00	0.00	0.00	0.00
Education	43.82	99.60	0.18	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Government	236.02	99.59	0.98	0.41	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	323.66	99.59	1.34	0.41	0.00	0.00	0.00	0.00	0.00	0.00
Religion	93.70	99.68	0.29	0.31	0.01	0.01	0.00	0.00	0.00	0.00
Residential	15,057.74	99.77	31.82	0.21	2.32	0.02	0.12	0.00	0.00	0.00
Total	**17,283.11**		**40.37**		**2.40**		**0.12**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	319	99.50	2	0.50	0	0.00	0	0.00	0	0.00
Masonry	1,954	99.27	14	0.69	1	0.03	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,130	99.59	5	0.41	0	0.00	0	0.00	0	0.00
Wood	13,881	99.92	11	0.08	1	0.01	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 249 hospital beds available for use. On the day of the hurricane, the model estimates that 249 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

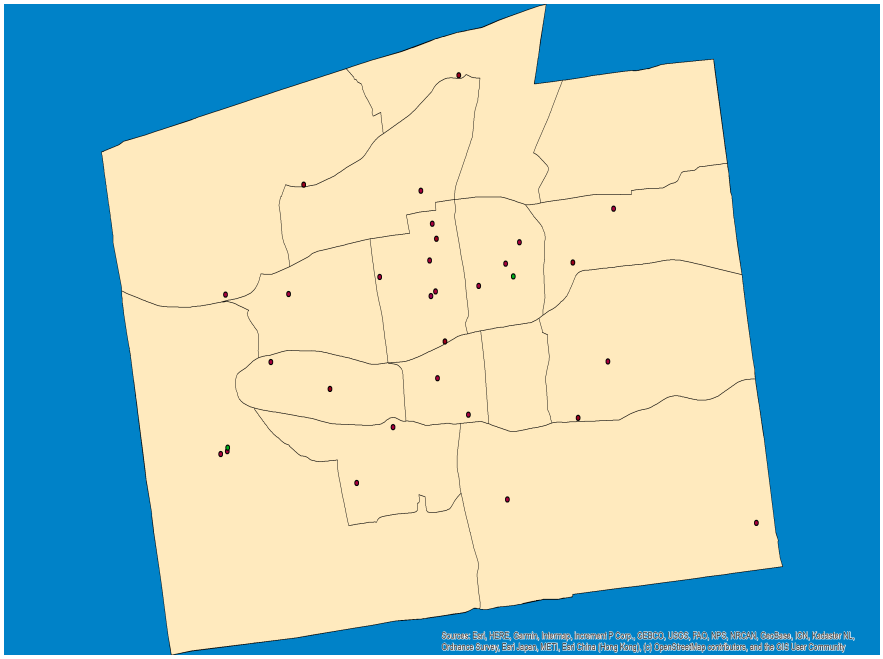
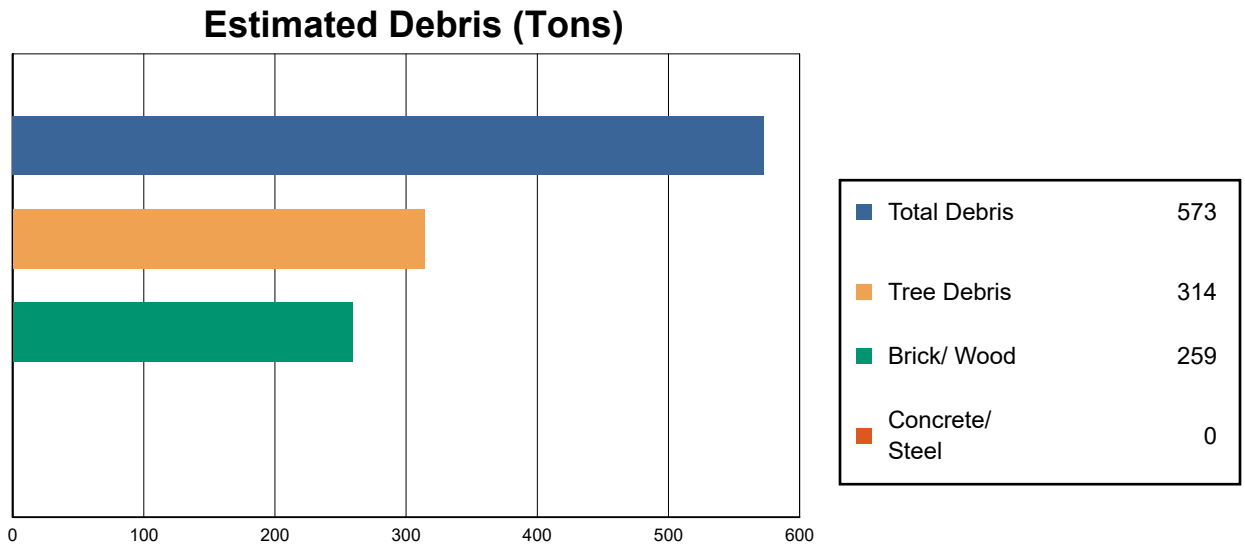


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	7	0	0	7
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	21	0	0	21

Induced Hurricane Damage

Debris Generation

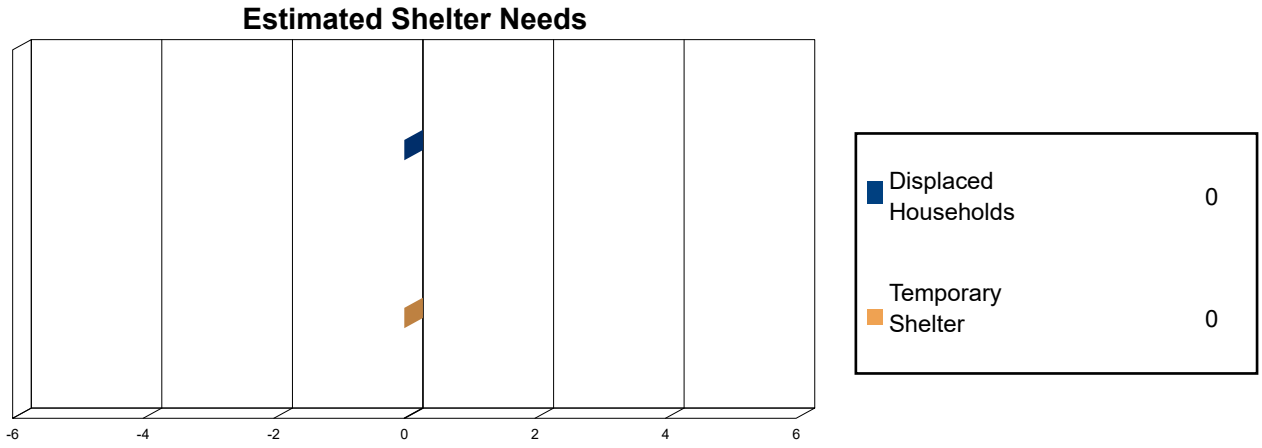


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 573 tons of debris will be generated. Of the total amount, 132 tons (23%) is Other Tree Debris. Of the remaining 441 tons, Brick/Wood comprises 59% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 10 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 182 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 59,713) will seek temporary shelter in public shelters.

Economic Loss

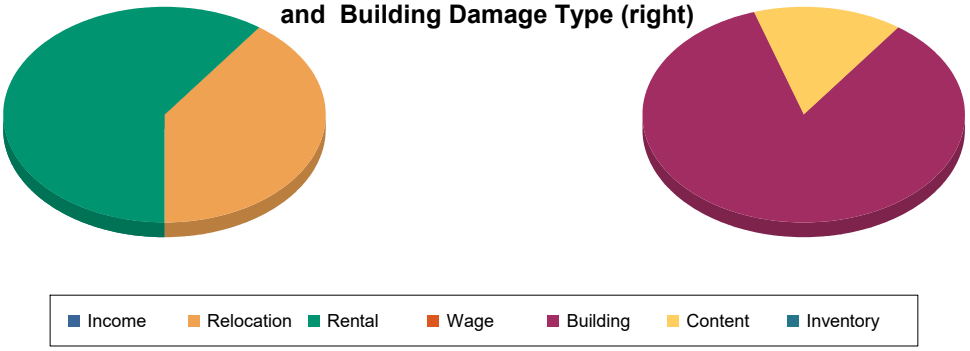
The total economic loss estimated for the hurricane is 4.4 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 4 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

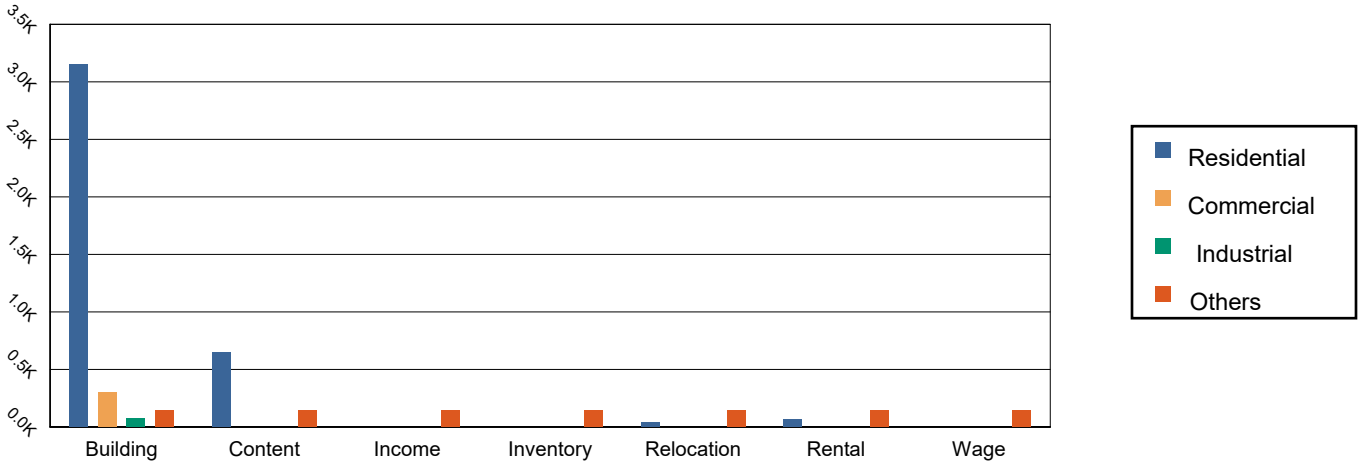


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,154.30	304.19	72.60	143.12	3,674.21
	Content	648.25	0.00	0.00	0.00	648.25
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**3,802.55**	**304.19**	**72.60**	**143.12**	**4,322.46**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	40.01	0.94	0.00	0.17	41.12
	Rental	61.76	0.00	0.00	0.00	61.76
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**101.77**	**0.94**	**0.00**	**0.17**	**102.88**

Total

Total	**3,904.32**	**305.13**	**72.60**	**143.29**	**4,425.35**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,947,093	5,148,737	11,095,830
Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**
Study Region Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**

Hazus: Hurricane Global Risk Report

Region Name: Manchester_HU

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, May 10, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
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Building Inventory

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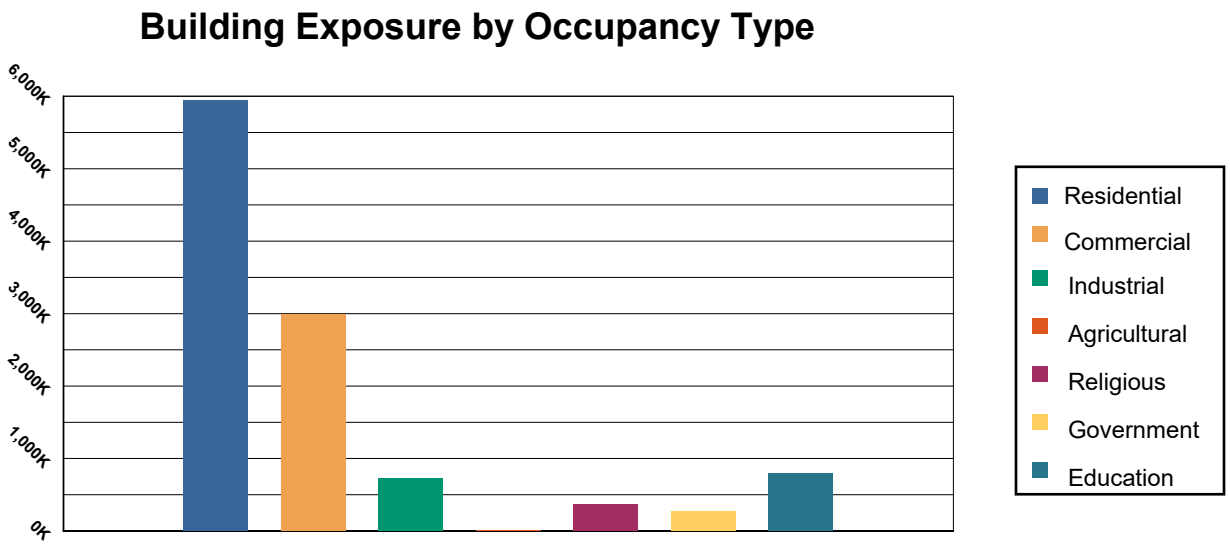

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Religious	369,889	3.33%
Government	273,715	2.47%
Education	787,456	7.10%
Total	**11,095,830**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds. There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 54 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

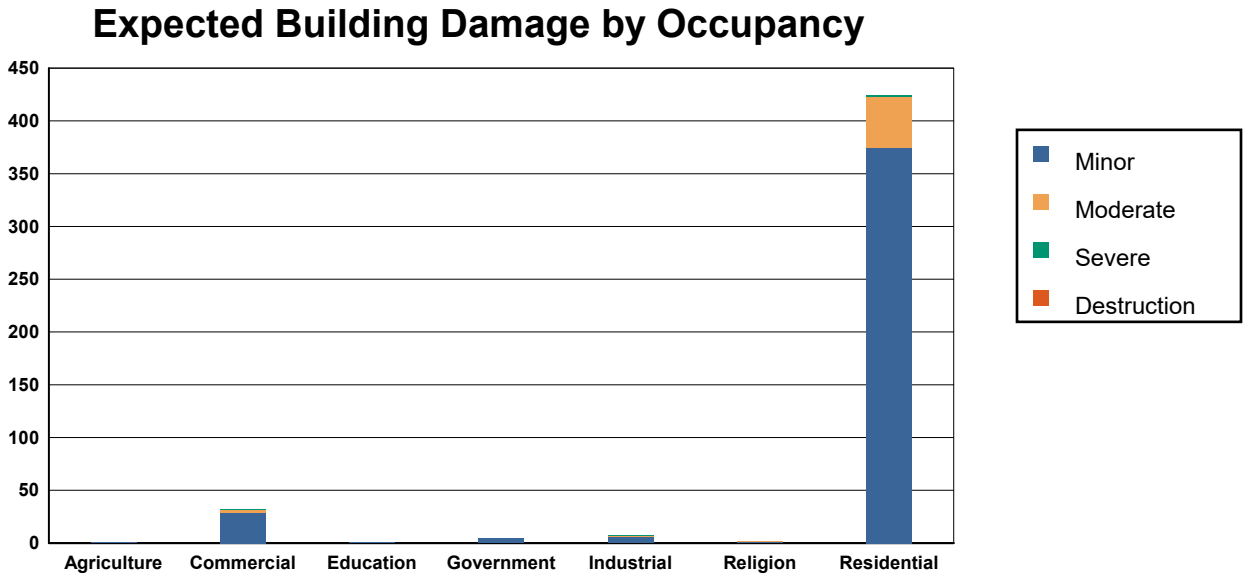


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	30.24	97.54	0.66	2.13	0.08	0.25	0.02	0.07	0.00	0.00
Commercial	1,470.76	97.85	28.60	1.90	3.40	0.23	0.24	0.02	0.00	0.00
Education	43.14	98.05	0.84	1.91	0.02	0.05	0.00	0.00	0.00	0.00
Government	232.50	98.10	4.41	1.86	0.09	0.04	0.00	0.00	0.00	0.00
Industrial	318.12	97.88	6.43	1.98	0.37	0.11	0.08	0.02	0.00	0.00
Religion	92.28	98.17	1.67	1.77	0.05	0.05	0.01	0.01	0.00	0.00
Residential	14,667.84	97.19	374.50	2.48	48.29	0.32	1.37	0.01	0.00	0.00
Total	**16,854.87**		**417.11**		**52.30**		**1.71**		**0.01**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	313	97.65	7	2.29	0	0.06	0	0.00	0	0.00
Masonry	1,883	95.69	67	3.40	18	0.90	0	0.02	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,111	97.92	21	1.84	3	0.22	0	0.02	0	0.00
Wood	13,599	97.89	281	2.02	12	0.08	1	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had 249 hospital beds available for use. On the day of the hurricane, the model estimates that 249 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

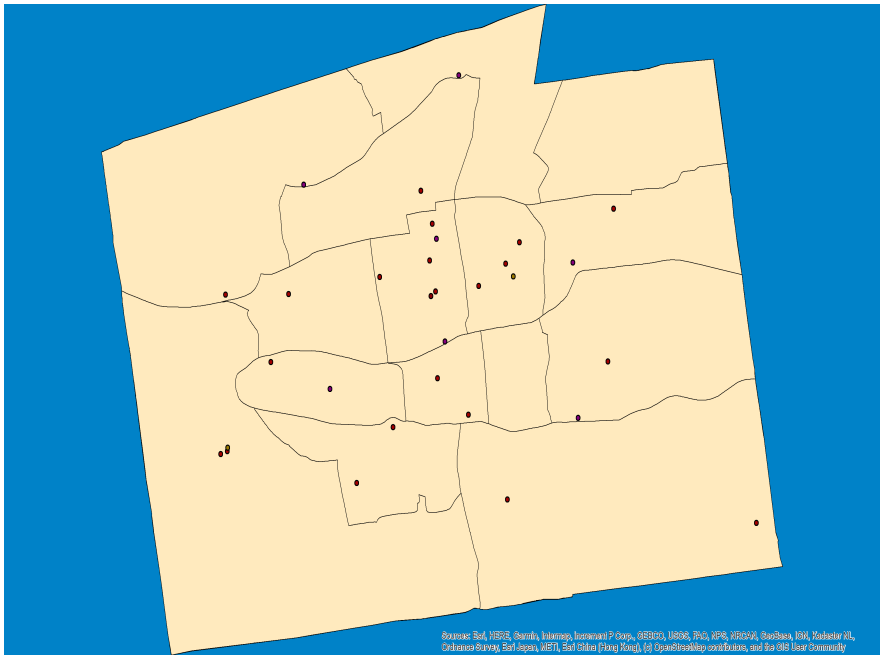
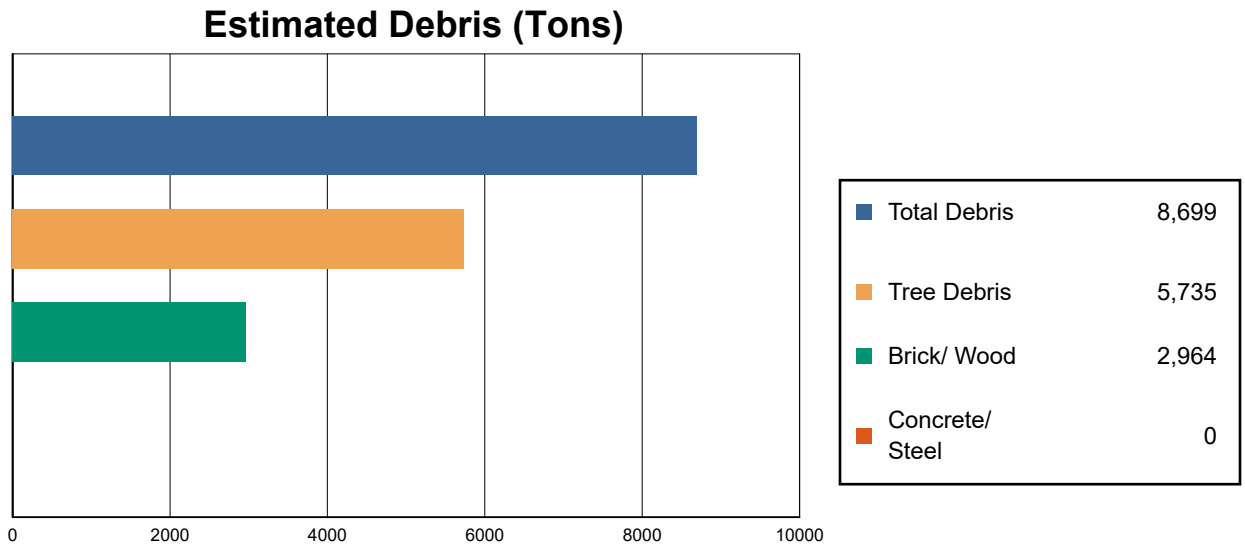


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	7	0	0	7
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	21	0	0	21

Induced Hurricane Damage

Debris Generation

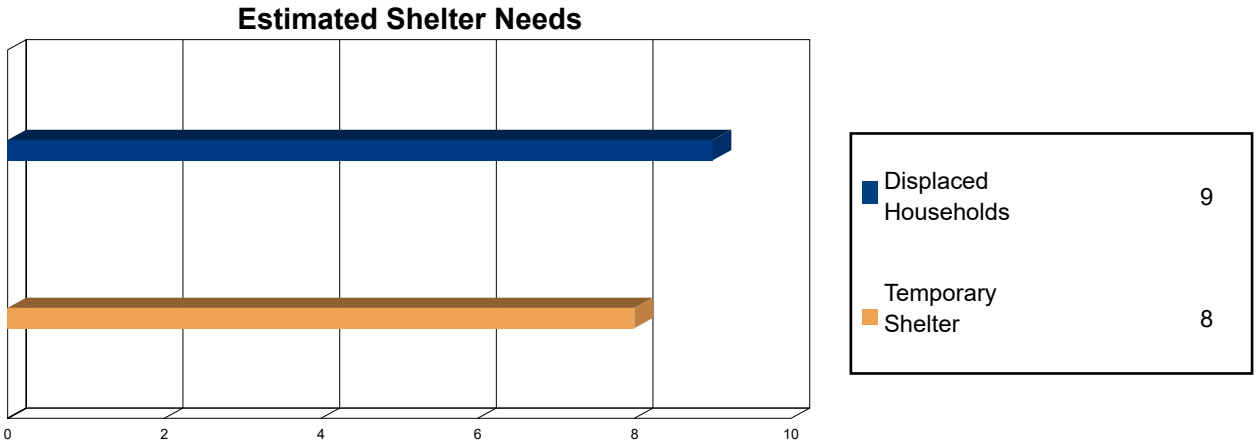


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 8,699 tons of debris will be generated. Of the total amount, 2,355 tons (27%) is Other Tree Debris. Of the remaining 6,344 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 119 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,380 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 9 households to be displaced due to the hurricane. Of these, 8 people (out of a total population of 59,713) will seek temporary shelter in public shelters.

Economic Loss

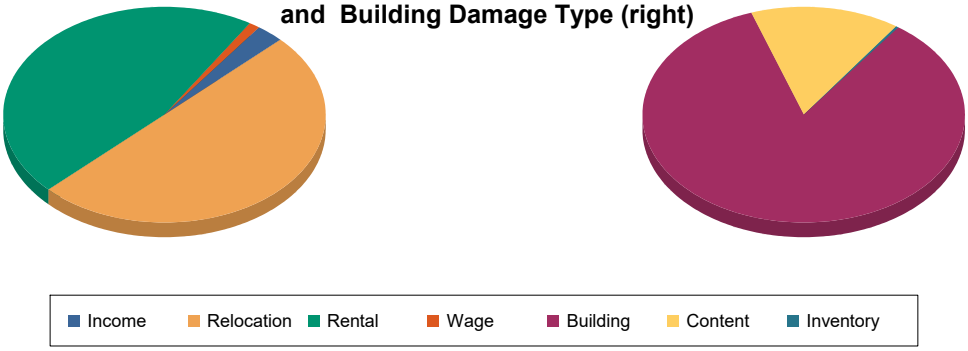
The total economic loss estimated for the hurricane is 35.1 million dollars, which represents 0.32 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 35 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

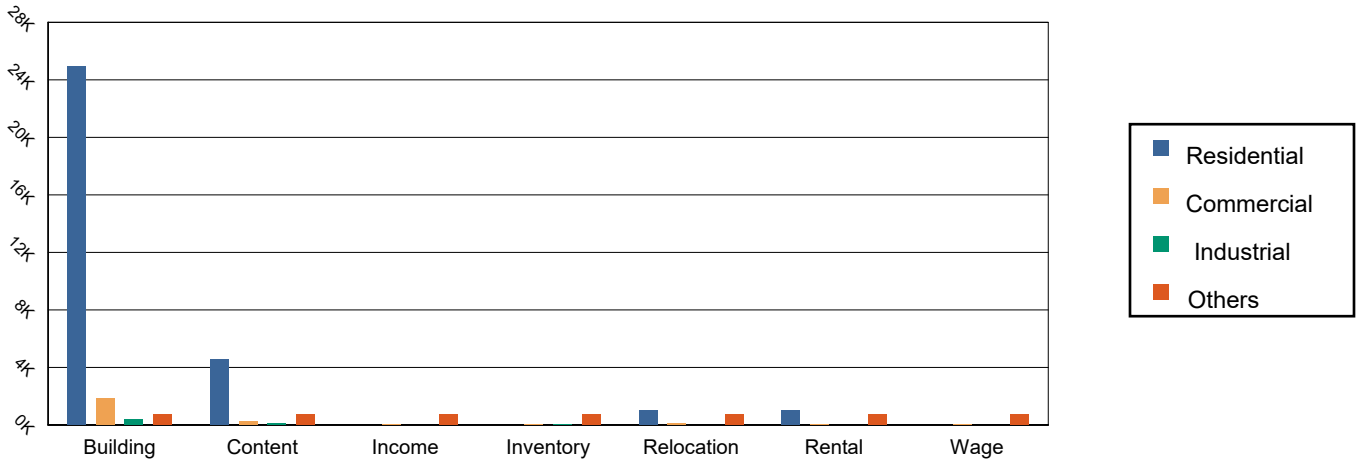


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	24,914.32	1,856.99	387.48	702.51	27,861.29
	Content	4,541.23	276.15	95.94	31.62	4,944.94
	Inventory	0.00	54.84	12.27	1.14	68.25
	Subtotal	**29,455.54**	**2,187.98**	**495.68**	**735.27**	**32,874.47**
Business Interruption Loss						
	Income	0.00	63.28	0.00	0.00	63.28
	Relocation	1,021.32	77.88	3.08	3.99	1,106.27
	Rental	995.51	25.96	0.00	0.00	1,021.46
	Wage	0.00	22.49	0.00	0.00	22.49
	Subtotal	**2,016.83**	**189.61**	**3.08**	**3.99**	**2,213.51**

Total

Total	**31,472.37**	**2,377.59**	**498.76**	**739.26**	**35,087.98**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,947,093	5,148,737	11,095,830
Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**
Study Region Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**

Hazus: Hurricane Global Risk Report

Region Name:	Manchester_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 27.69 square miles and contains 15 census tracts. There are over 25 thousand households in the region and a total population of 59,713 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 17 thousand buildings in the region with a total building replacement value (excluding contents) of 11,096 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

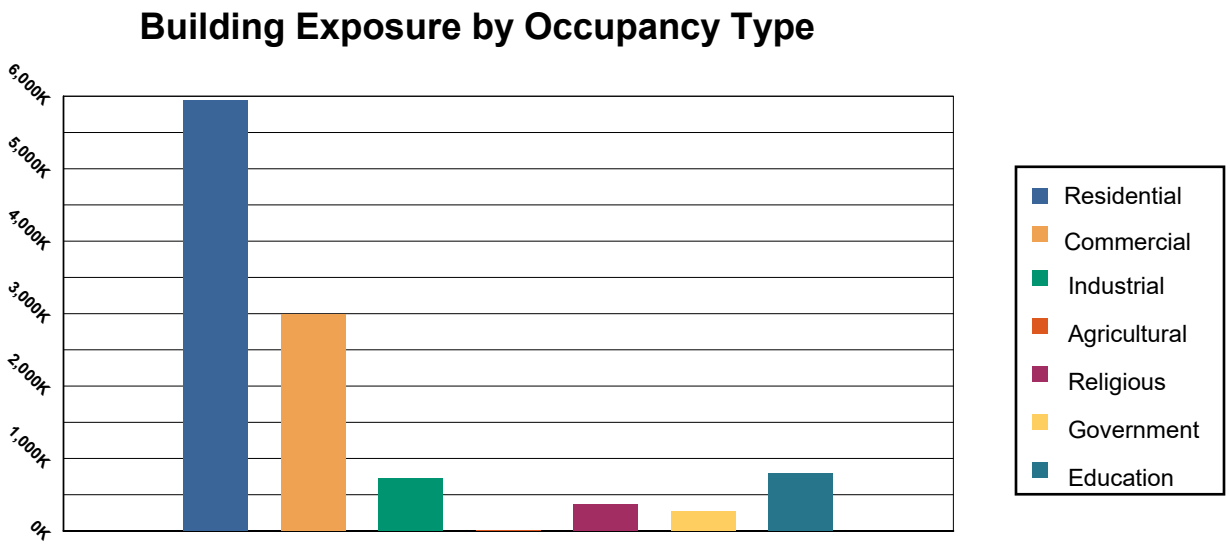


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,947,093	53.60%
Commercial	2,982,903	26.88%
Industrial	726,009	6.54%
Agricultural	8,765	0.08%
Religious	369,889	3.33%
Government	273,715	2.47%
Education	787,456	7.10%
Total	**11,095,830**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds. There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 220 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

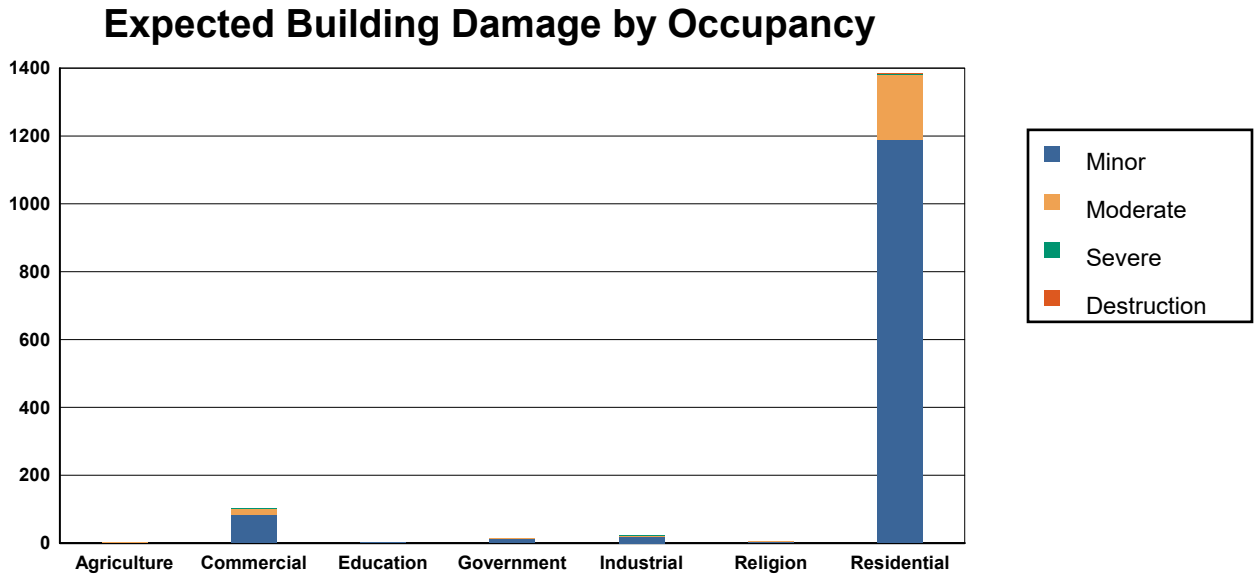


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	28.35	91.45	2.08	6.70	0.40	1.28	0.17	0.54	0.01	0.03
Commercial	1,400.11	93.15	83.93	5.58	16.46	1.09	2.51	0.17	0.00	0.00
Education	41.35	93.98	2.42	5.50	0.22	0.51	0.00	0.01	0.00	0.00
Government	223.48	94.29	12.39	5.23	1.12	0.47	0.02	0.01	0.00	0.00
Industrial	303.11	93.26	18.35	5.65	2.87	0.88	0.64	0.20	0.03	0.01
Religion	88.08	93.70	5.48	5.82	0.43	0.46	0.02	0.02	0.00	0.00
Residential	13,707.51	90.83	1,189.60	7.88	189.10	1.25	5.08	0.03	0.71	0.00
Total	**15,791.98**		**1,314.24**		**210.59**		**8.44**		**0.75**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	299	93.06	20	6.22	2	0.71	0	0.01	0	0.00
Masonry	1,752	89.03	152	7.72	62	3.14	2	0.11	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,062	93.59	58	5.08	13	1.14	2	0.19	0	0.00
Wood	12,785	92.02	1,035	7.45	68	0.49	4	0.03	1	0.01

Essential Facility Damage

Before the hurricane, the region had 249 hospital beds available for use. On the day of the hurricane, the model estimates that 249 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

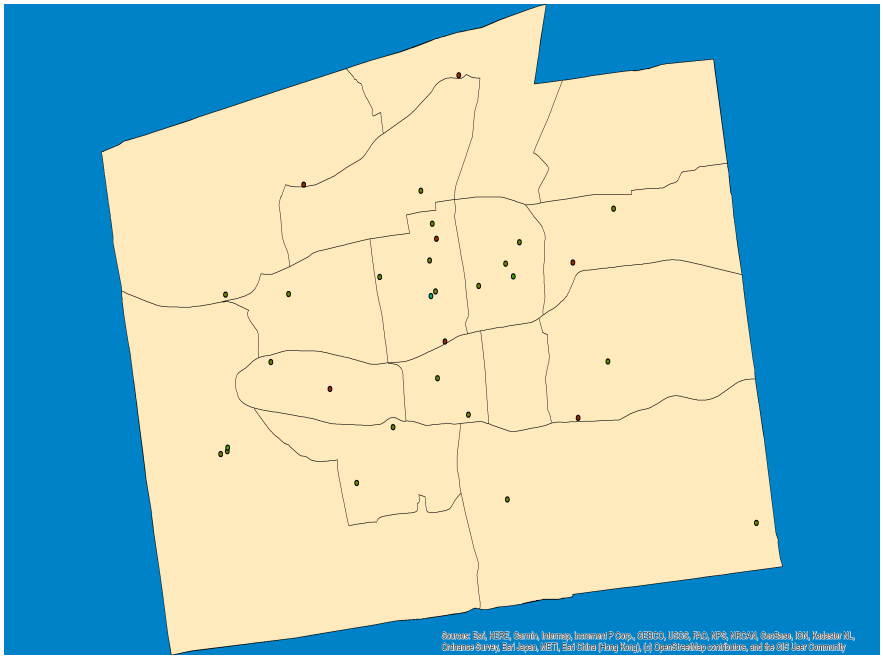
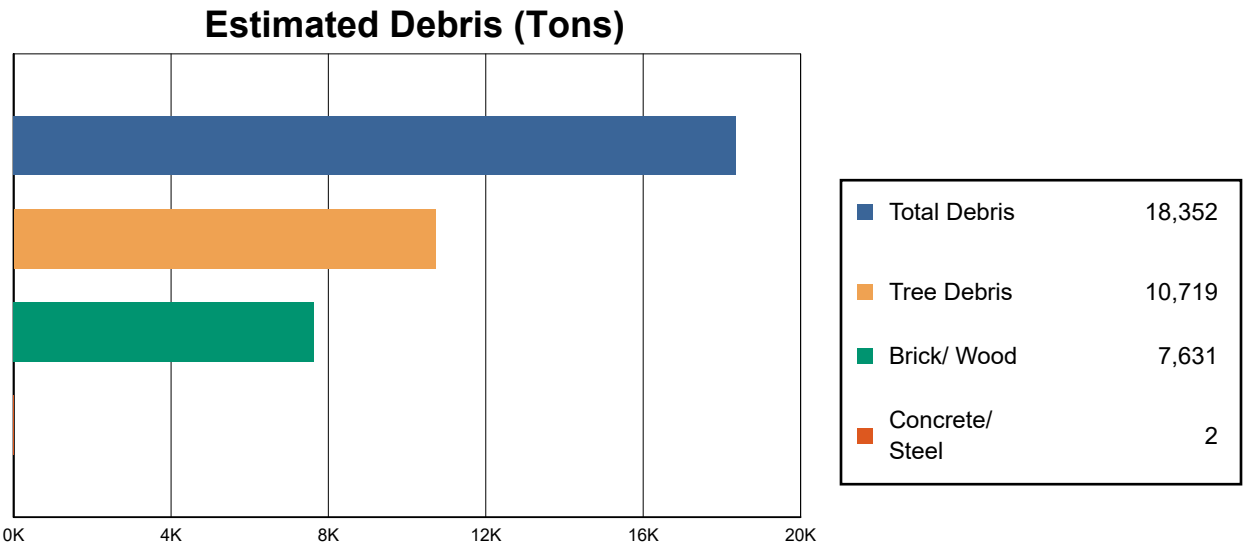


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	7	0	0	7
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	21	0	0	21

Induced Hurricane Damage

Debris Generation

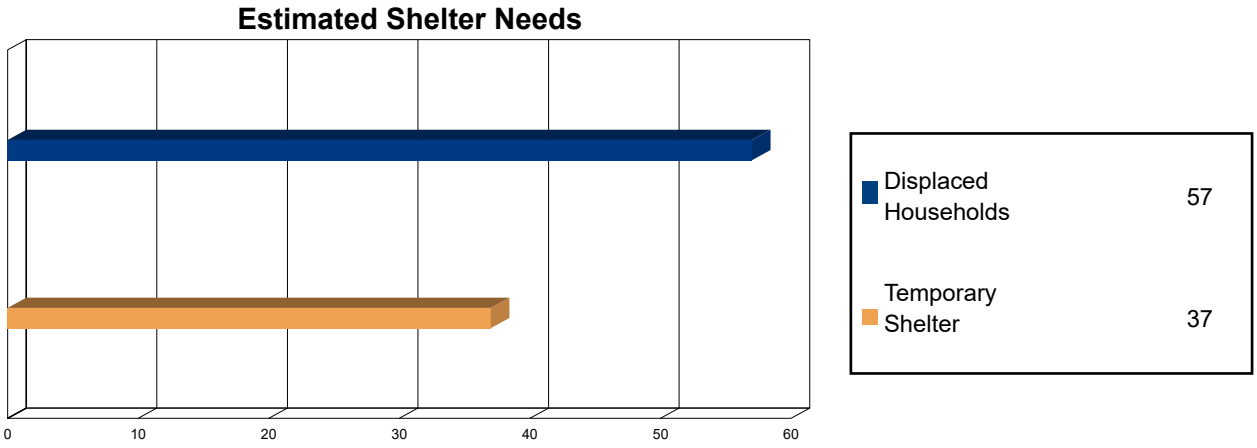


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 18,352 tons of debris will be generated. Of the total amount, 4,251 tons (23%) is Other Tree Debris. Of the remaining 14,101 tons, Brick/Wood comprises 54% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 305 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,468 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 57 households to be displaced due to the hurricane. Of these, 37 people (out of a total population of 59,713) will seek temporary shelter in public shelters.

Economic Loss

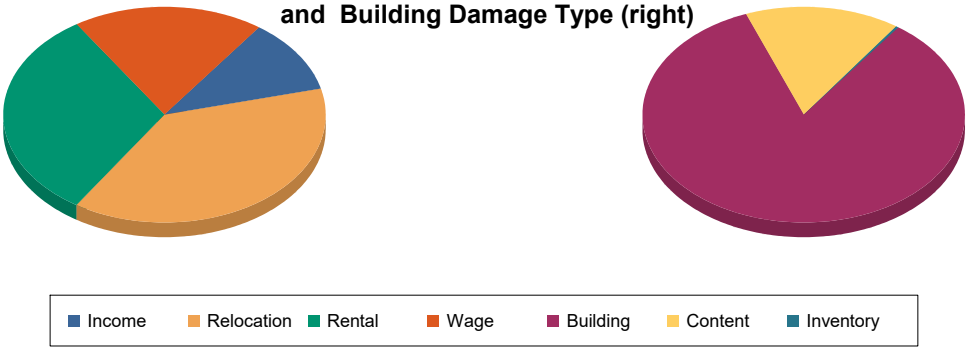
The total economic loss estimated for the hurricane is 88.8 million dollars, which represents 0.80 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 89 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 81% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

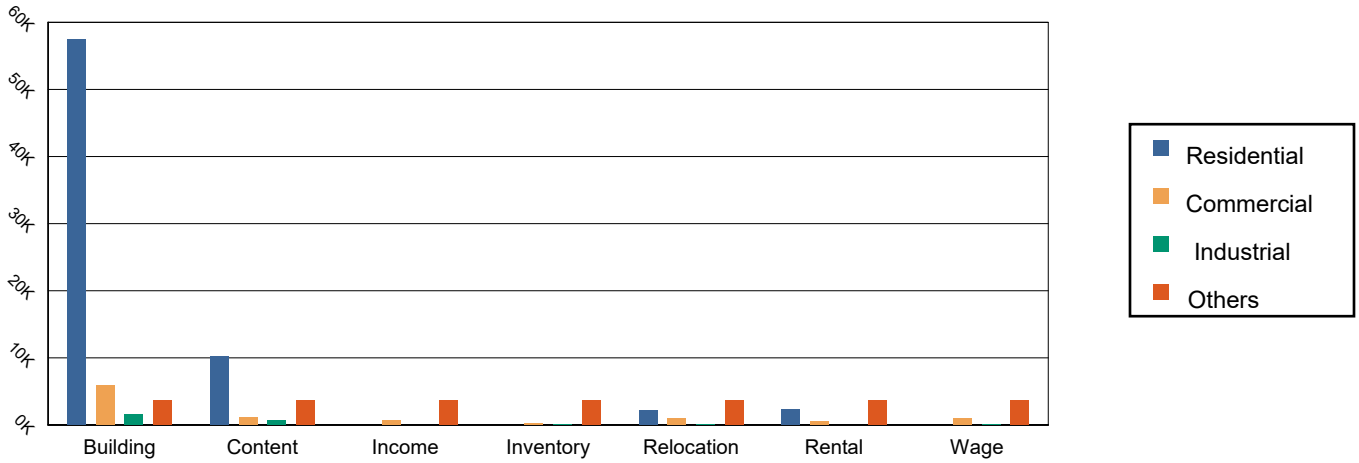


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	57,384.68	5,838.09	1,609.29	2,212.27	67,044.33
	Content	10,228.79	1,072.00	727.99	244.93	12,273.71
	Inventory	0.00	215.72	92.37	8.17	316.26
	Subtotal	**67,613.47**	**7,125.81**	**2,429.65**	**2,465.37**	**79,634.30**
Business Interruption Loss						
	Income	0.00	754.83	16.94	248.73	1,020.50
	Relocation	2,195.39	970.11	68.60	233.81	3,467.92
	Rental	2,392.92	467.48	12.59	23.85	2,896.84
	Wage	0.00	982.87	27.74	747.36	1,757.97
	Subtotal	**4,588.32**	**3,175.30**	**125.87**	**1,253.75**	**9,143.23**

Total

Total	**72,201.79**	**10,301.11**	**2,555.52**	**3,719.12**	**88,777.54**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,947,093	5,148,737	11,095,830
Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**
Study Region Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**

Hazus: Hurricane Global Risk Report

Region Name:	Manchester_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Wednesday, May 10, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

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There are an estimated 17 thousand buildings in the region with a total building replacement value (excluding contents) of 11,096 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

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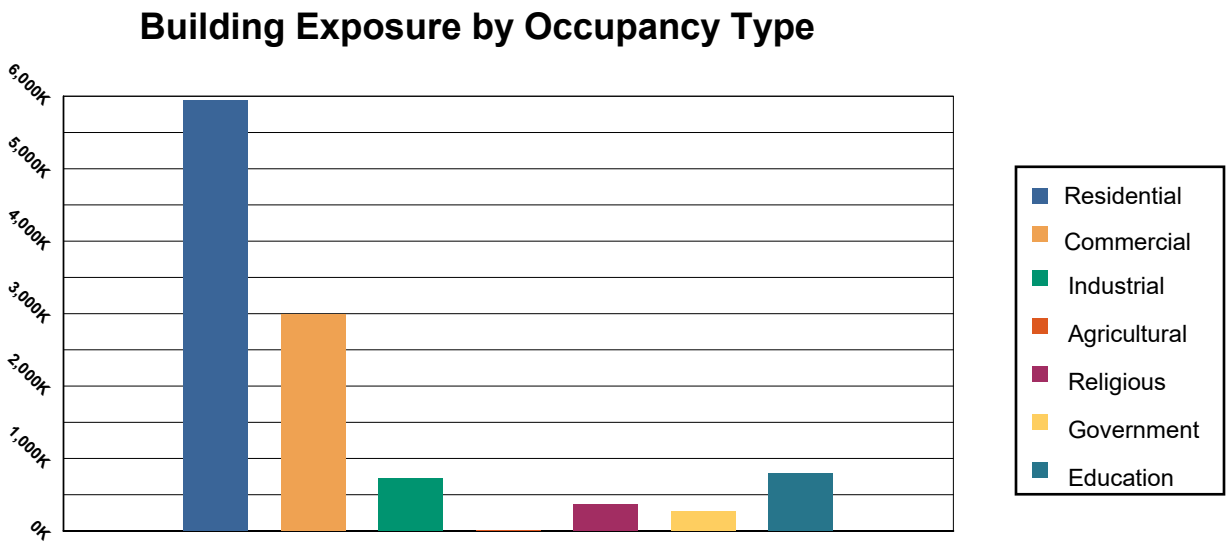

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Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,947,093	53.60%
Commercial	2,982,903	26.88%
Industrial	726,009	6.54%
Agricultural	8,765	0.08%
Religious	369,889	3.33%
Government	273,715	2.47%
Education	787,456	7.10%
Total	**11,095,830**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds. There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 561 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 7 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

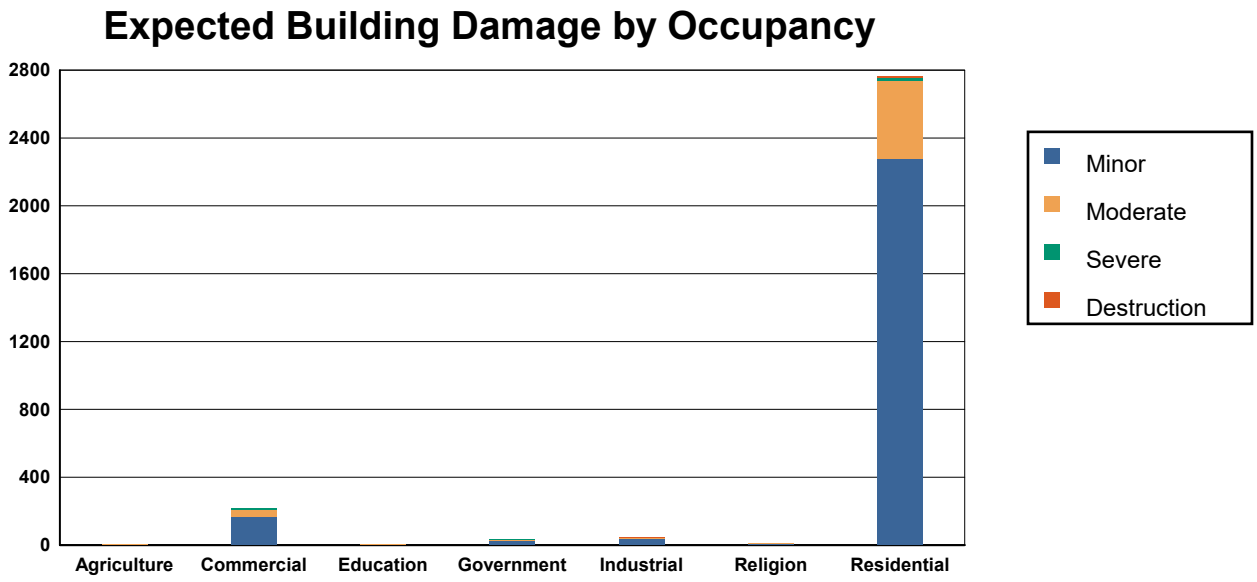


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	25.49	82.24	3.98	12.85	1.01	3.26	0.47	1.50	0.05	0.15
Commercial	1,283.31	85.38	164.19	10.92	46.88	3.12	8.59	0.57	0.03	0.00
Education	38.08	86.55	4.89	11.11	0.98	2.23	0.05	0.11	0.00	0.00
Government	206.55	87.15	25.14	10.61	5.07	2.14	0.24	0.10	0.00	0.00
Industrial	278.64	85.74	34.78	10.70	9.37	2.88	2.07	0.64	0.14	0.04
Religion	80.76	85.92	11.31	12.03	1.83	1.95	0.10	0.11	0.00	0.00
Residential	12,330.31	81.70	2,277.40	15.09	460.40	3.05	16.78	0.11	7.11	0.05
Total	**14,243.15**		**2,521.68**		**525.54**		**28.30**		**7.33**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	273	84.99	38	11.91	10	3.00	0	0.10	0	0.00
Masonry	1,571	79.85	256	13.03	134	6.79	6	0.32	0	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	978	86.13	112	9.89	37	3.28	8	0.68	0	0.00
Wood	11,564	83.24	2,082	14.99	226	1.63	14	0.10	7	0.05

Essential Facility Damage

Before the hurricane, the region had 249 hospital beds available for use. On the day of the hurricane, the model estimates that 249 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

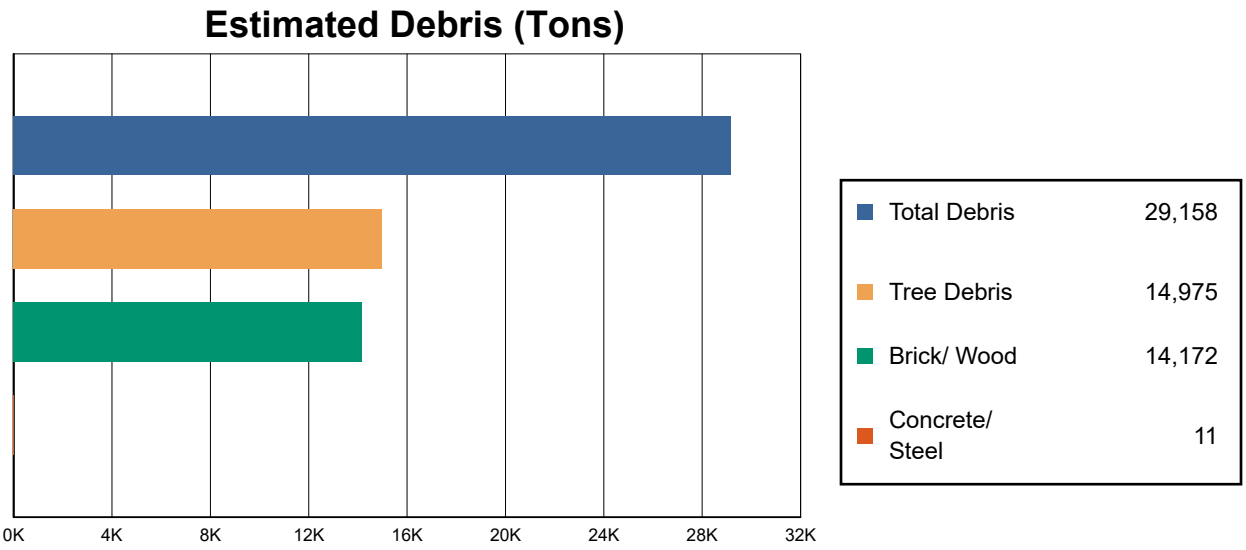
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	7	0	0	7
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	21	0	0	20

Induced Hurricane Damage

Debris Generation

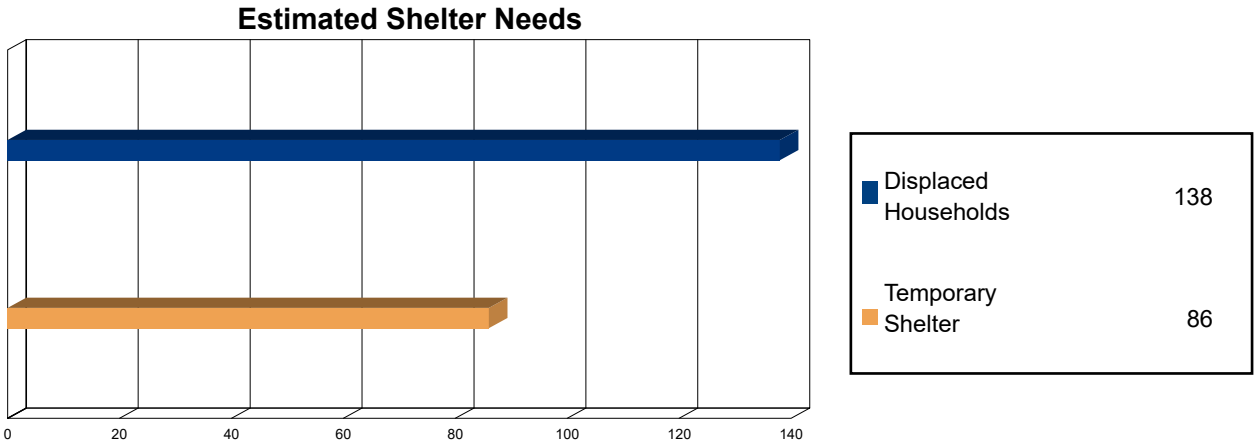


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 29,158 tons of debris will be generated. Of the total amount, 5,847 tons (20%) is Other Tree Debris. Of the remaining 23,311 tons, Brick/Wood comprises 61% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 567 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,128 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 138 households to be displaced due to the hurricane. Of these, 86 people (out of a total population of 59,713) will seek temporary shelter in public shelters.

Economic Loss

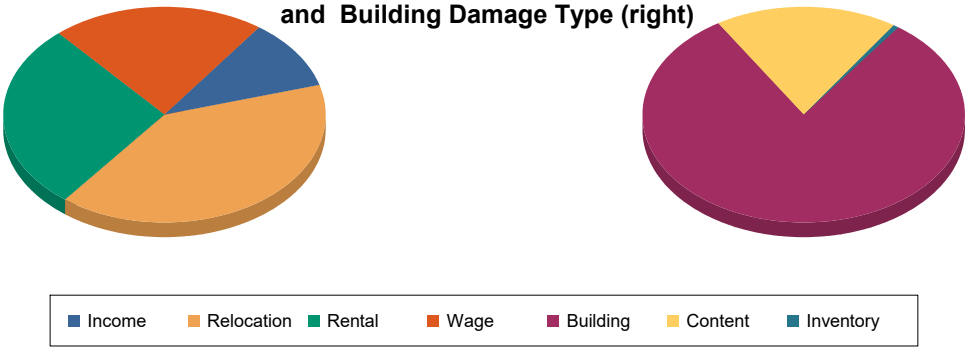
The total economic loss estimated for the hurricane is 172.7 million dollars, which represents 1.56 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 173 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 76% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

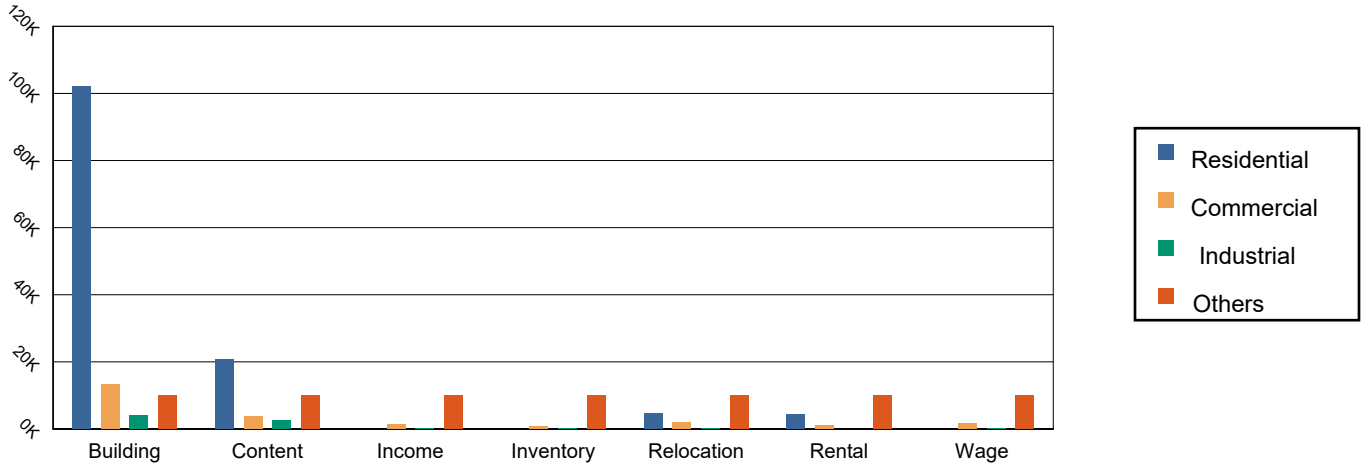


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	101,943.73	13,167.67	4,078.39	5,218.69	124,408.48
	Content	20,702.54	3,707.74	2,424.22	1,119.75	27,954.26
	Inventory	0.00	691.14	301.41	25.12	1,017.67
	Subtotal	**122,646.27**	**17,566.55**	**6,804.03**	**6,363.56**	**153,380.40**
Business Interruption Loss						
	Income	0.00	1,430.87	46.73	576.24	2,053.84
	Relocation	4,684.82	2,021.31	226.93	752.32	7,685.38
	Rental	4,433.00	901.60	37.20	76.44	5,448.24
	Wage	0.00	1,705.48	76.75	2,328.43	4,110.65
	Subtotal	**9,117.83**	**6,059.25**	**387.61**	**3,733.43**	**19,298.12**

Total

Total	**131,764.09**	**23,625.80**	**7,191.64**	**10,096.99**	**172,678.52**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,947,093	5,148,737	11,095,830
Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**
Study Region Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**

Hazus: Hurricane Global Risk Report

Region Name: Manchester_HU

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 27.69 square miles and contains 15 census tracts. There are over 25 thousand households in the region and a total population of 59,713 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 17 thousand buildings in the region with a total building replacement value (excluding contents) of 11,096 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

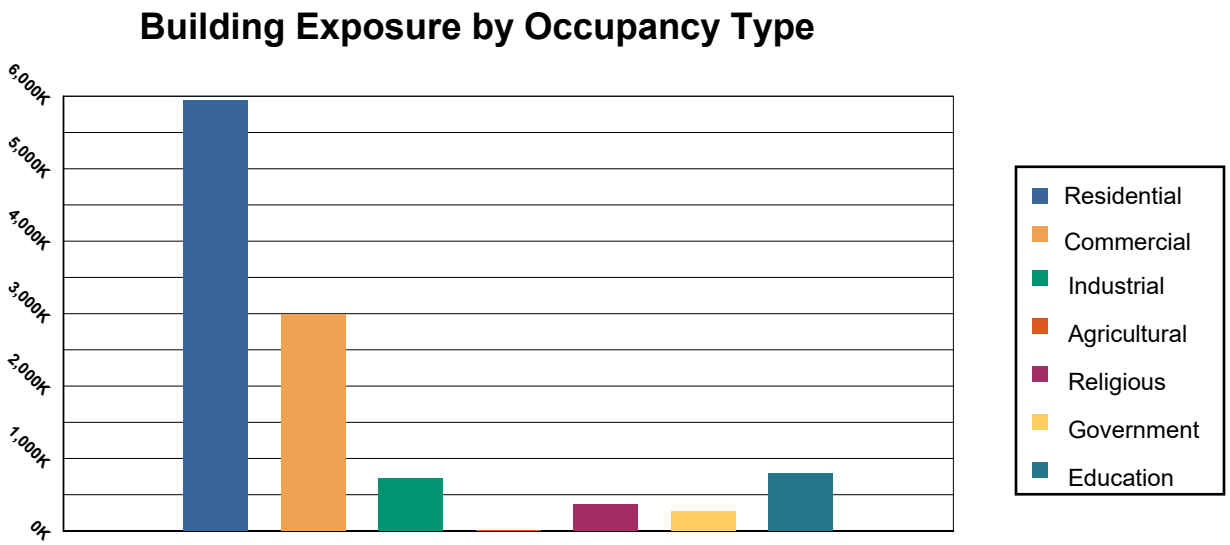


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,947,093	53.60%
Commercial	2,982,903	26.88%
Industrial	726,009	6.54%
Agricultural	8,765	0.08%
Religious	369,889	3.33%
Government	273,715	2.47%
Education	787,456	7.10%
Total	**11,095,830**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds. There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,328 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. There are an estimated 35 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

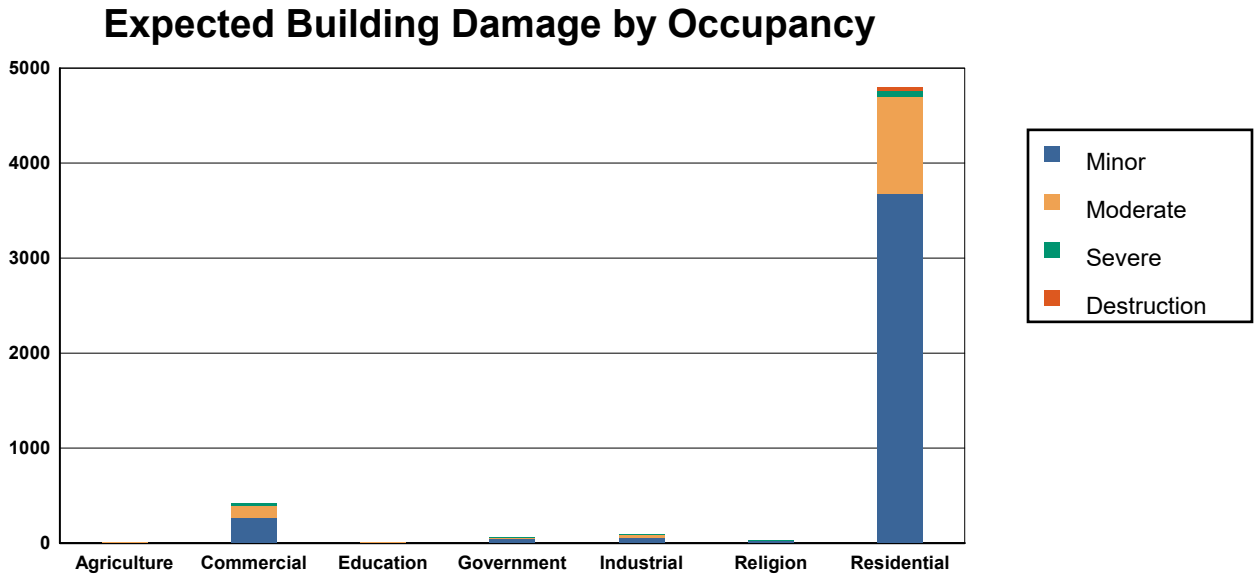


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.10	68.06	6.46	20.84	2.22	7.15	1.07	3.47	0.15	0.49
Commercial	1,083.06	72.06	270.49	18.00	121.94	8.11	27.29	1.82	0.23	0.02
Education	32.28	73.36	8.20	18.65	3.17	7.19	0.35	0.79	0.00	0.00
Government	176.74	74.57	42.20	17.81	16.32	6.88	1.75	0.74	0.00	0.00
Industrial	236.57	72.79	56.00	17.23	25.57	7.87	6.37	1.96	0.48	0.15
Religion	68.07	72.41	19.45	20.69	5.88	6.26	0.60	0.64	0.00	0.00
Residential	10,294.71	68.21	3,682.97	24.40	1,014.18	6.72	65.84	0.44	34.30	0.23
Total	**11,912.52**		**4,085.77**		**1,189.27**		**103.27**		**35.16**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	228	71.11	61	18.92	29	9.19	3	0.78	0	0.00
Masonry	1,303	66.20	380	19.31	264	13.42	20	1.00	2	0.08
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	829	73.06	183	16.15	97	8.57	25	2.20	0	0.02
Wood	9,712	69.91	3,482	25.06	611	4.40	55	0.39	33	0.24

Essential Facility Damage

Before the hurricane, the region had 249 hospital beds available for use. On the day of the hurricane, the model estimates that 249 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

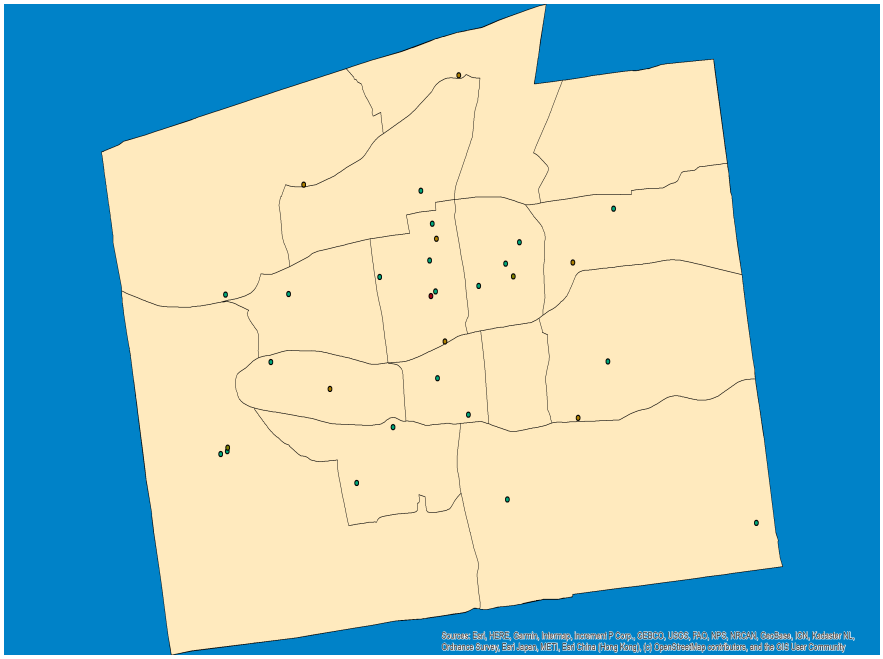
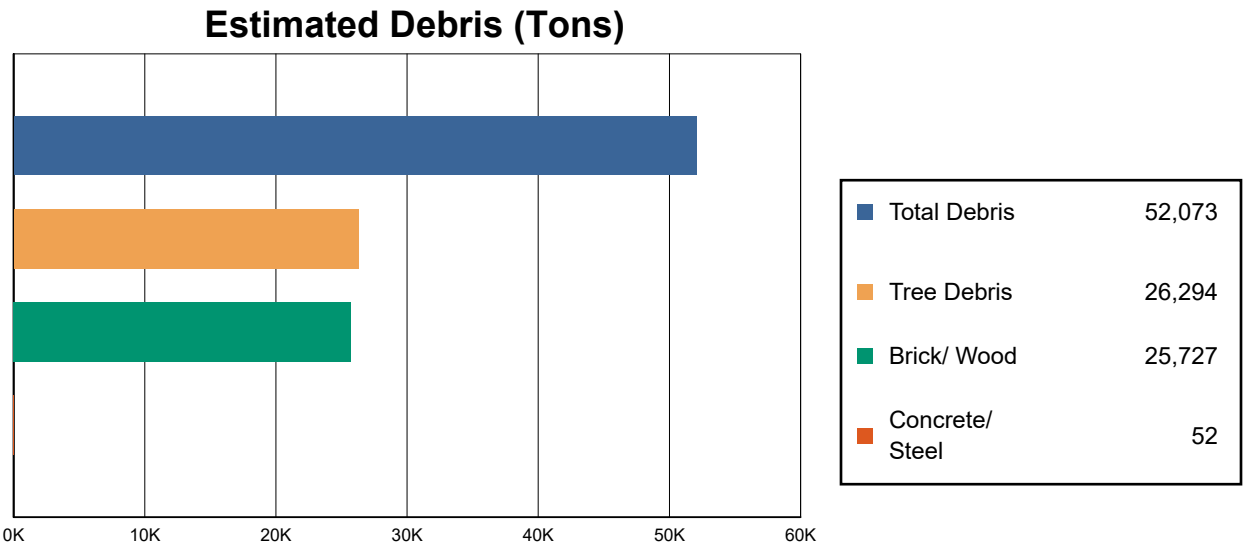


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	7	0	0	7
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	21	1	0	0

Induced Hurricane Damage

Debris Generation

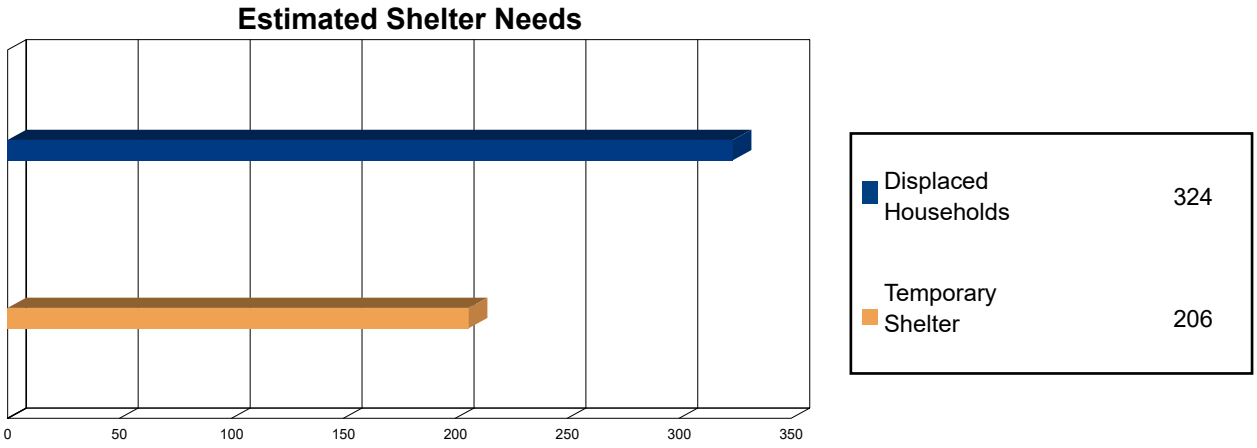


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 52,073 tons of debris will be generated. Of the total amount, 10,479 tons (20%) is Other Tree Debris. Of the remaining 41,594 tons, Brick/Wood comprises 62% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1031 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 15,815 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 324 households to be displaced due to the hurricane. Of these, 206 people (out of a total population of 59,713) will seek temporary shelter in public shelters.

Economic Loss

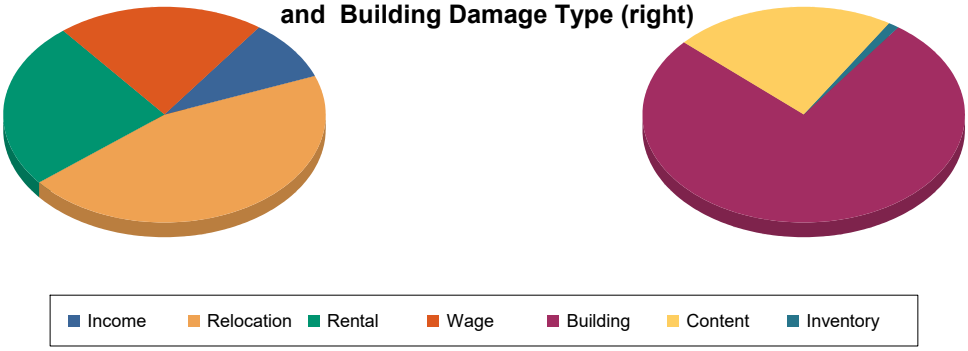
The total economic loss estimated for the hurricane is 359.0 million dollars, which represents 3.24 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 359 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 70% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

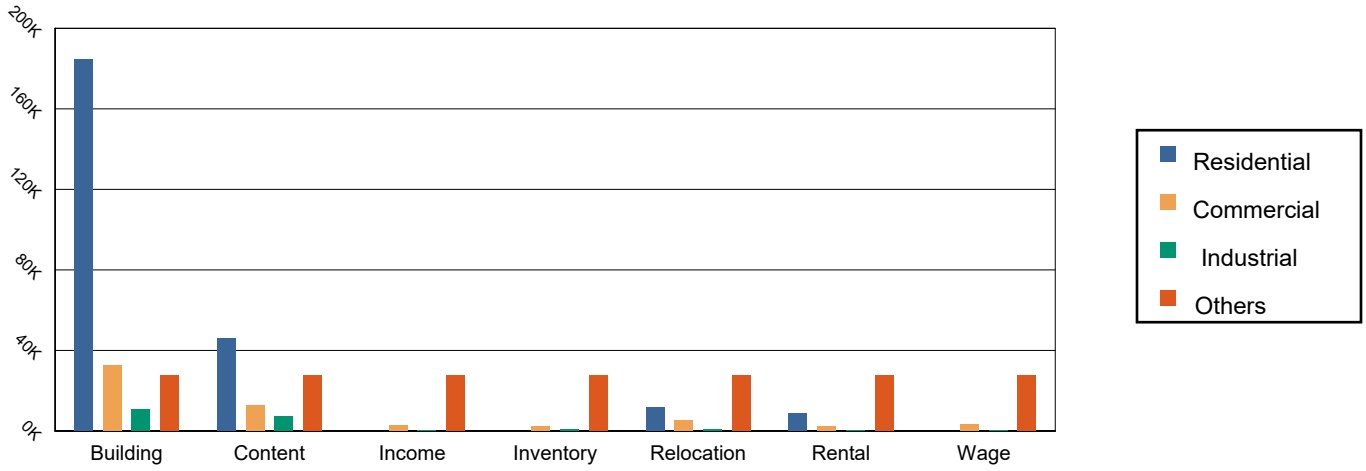


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	184,694.03	32,778.37	10,462.90	13,304.04	241,239.34
	Content	45,774.66	12,497.67	7,272.73	4,208.86	69,753.92
	Inventory	0.00	2,296.29	892.91	65.62	3,254.82
	Subtotal	**230,468.68**	**47,572.34**	**18,628.54**	**17,578.53**	**314,248.09**
Business Interruption Loss						
	Income	0.00	2,683.97	106.24	1,281.10	4,071.31
	Relocation	11,871.66	5,239.16	655.10	2,405.61	20,171.53
	Rental	8,520.61	2,304.34	99.92	266.49	11,191.35
	Wage	0.00	3,263.16	174.15	5,839.84	9,277.15
	Subtotal	**20,392.26**	**13,490.63**	**1,035.41**	**9,793.04**	**44,711.34**

Total

Total	250,860.94	61,062.97	19,663.96	27,371.56	358,959.43

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,947,093	5,148,737	11,095,830
Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**
Study Region Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**

Hazus: Hurricane Global Risk Report

Region Name:	Manchester_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Wednesday, May 10, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

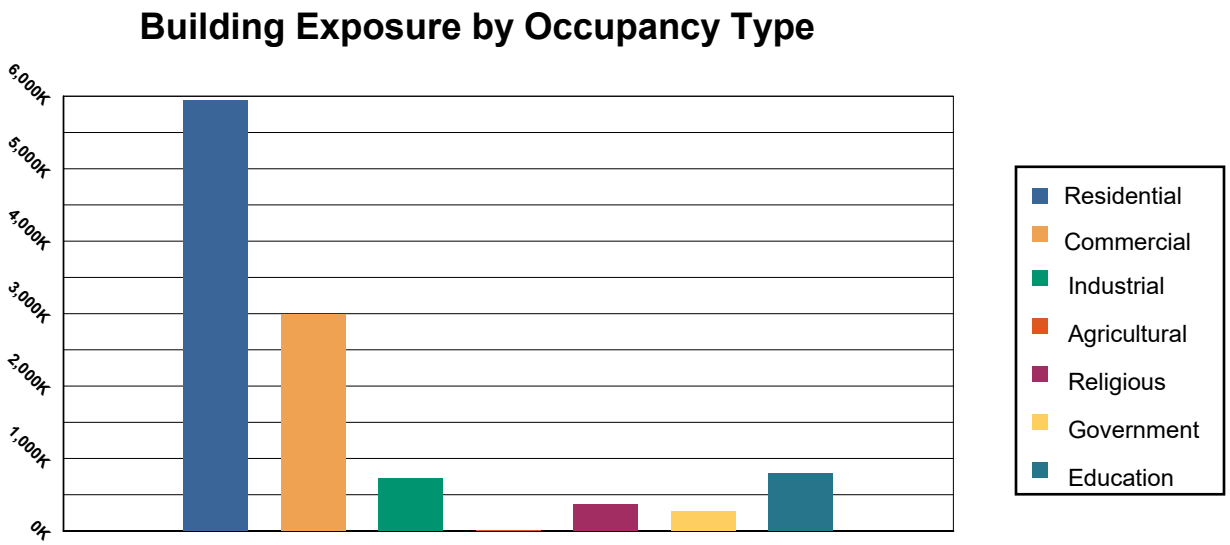
The geographical size of the region is 27.69 square miles and contains 15 census tracts. There are over 25 thousand households in the region and a total population of 59,713 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 17 thousand buildings in the region with a total building replacement value (excluding contents) of 11,096 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 17,326 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.



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Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,947,093	53.60%
Commercial	2,982,903	26.88%
Industrial	726,009	6.54%
Agricultural	8,765	0.08%
Religious	369,889	3.33%
Government	273,715	2.47%
Education	787,456	7.10%
Total	**11,095,830**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds. There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2,071 buildings will be at least moderately damaged. This is over 12% of the total number of buildings in the region. There are an estimated 76 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

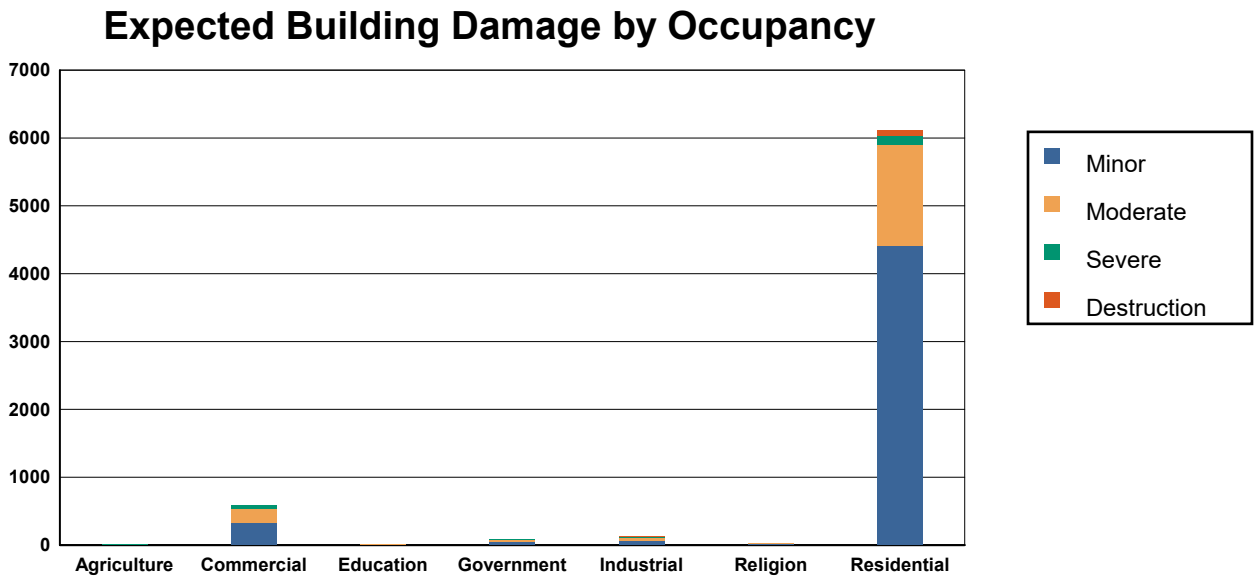


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.71	57.12	7.99	25.79	3.34	10.76	1.68	5.43	0.28	0.90
Commercial	915.70	60.92	331.31	22.04	198.81	13.23	56.58	3.76	0.60	0.04
Education	27.63	62.79	9.99	22.71	5.37	12.20	1.01	2.29	0.00	0.00
Government	152.04	64.15	51.66	21.80	28.13	11.87	5.17	2.18	0.00	0.00
Industrial	199.70	61.45	68.23	20.99	42.77	13.16	13.35	4.11	0.95	0.29
Religion	58.88	62.64	23.77	25.29	9.75	10.37	1.59	1.70	0.00	0.00
Residential	8,974.97	59.47	4,415.16	29.25	1,491.35	9.88	136.01	0.90	74.51	0.49
Total	**10,346.62**		**4,908.11**		**1,779.53**		**215.40**		**76.34**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	193	60.13	71	22.21	49	15.30	8	2.35	0	0.00
Masonry	1,112	56.52	437	22.22	374	18.98	42	2.12	3	0.16
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	704	62.03	221	19.50	158	13.88	51	4.54	1	0.06
Wood	8,490	61.11	4,252	30.61	966	6.95	113	0.81	72	0.51

Essential Facility Damage

Before the hurricane, the region had 249 hospital beds available for use. On the day of the hurricane, the model estimates that 249 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

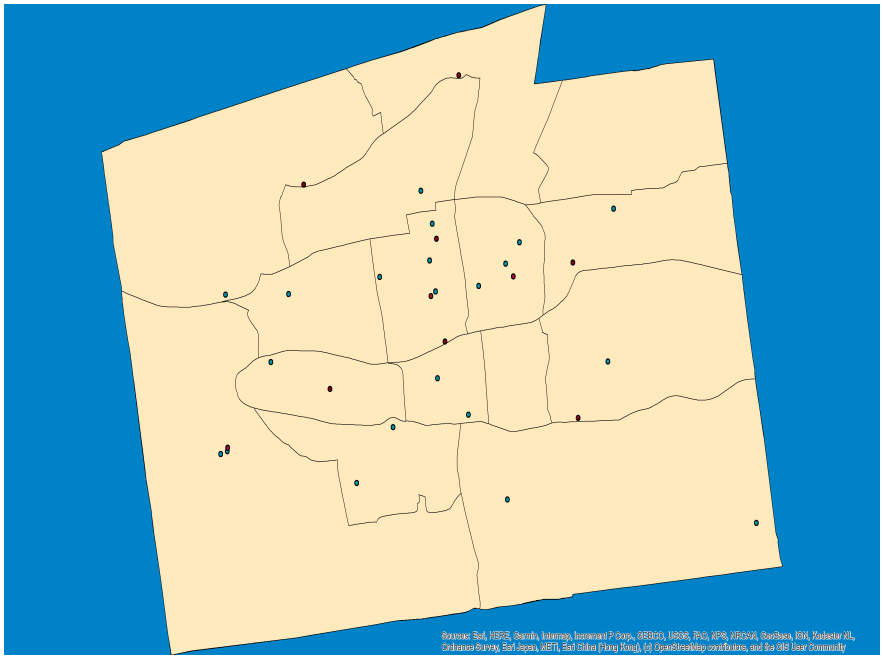
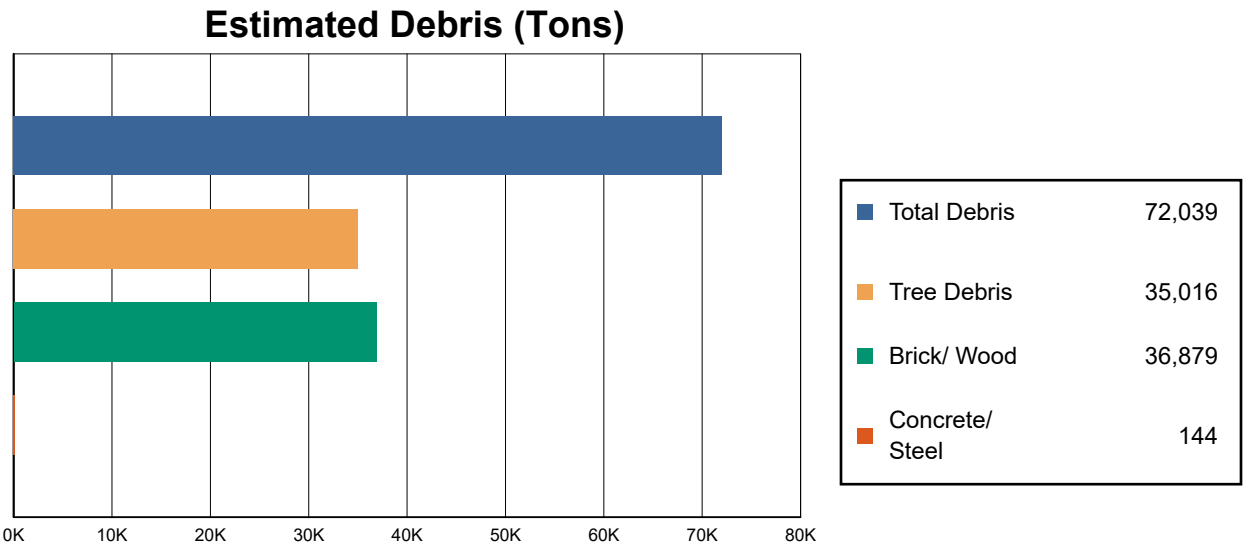


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	7	0	0	7
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	21	2	0	0

Induced Hurricane Damage

Debris Generation

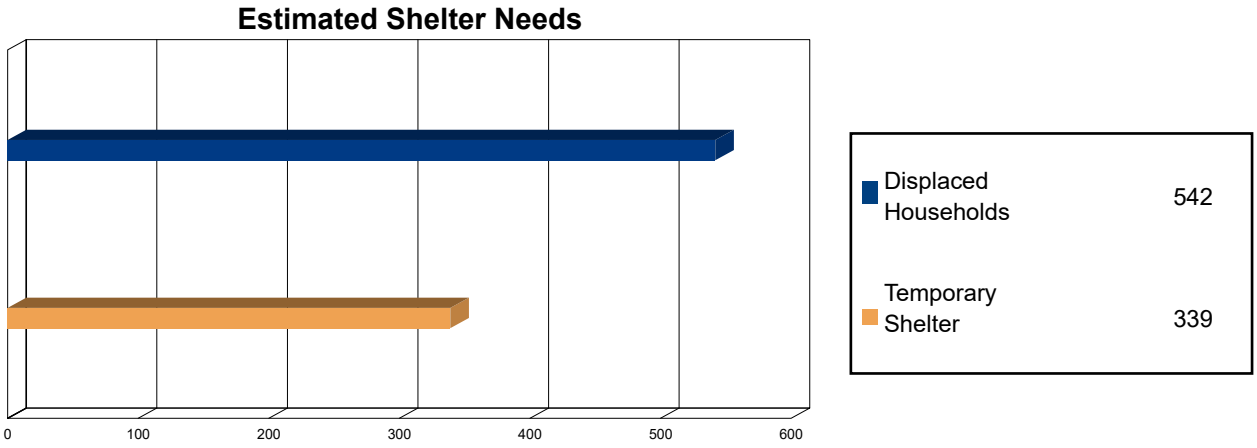


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 72,039 tons of debris will be generated. Of the total amount, 13,782 tons (19%) is Other Tree Debris. Of the remaining 58,257 tons, Brick/Wood comprises 63% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1481 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 21,234 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 542 households to be displaced due to the hurricane. Of these, 339 people (out of a total population of 59,713) will seek temporary shelter in public shelters.

Economic Loss

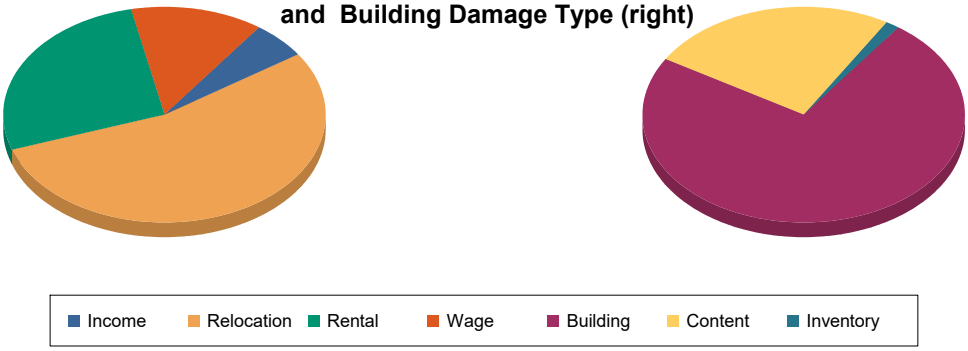
The total economic loss estimated for the hurricane is 572.3 million dollars, which represents 5.16 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 572 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 64% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

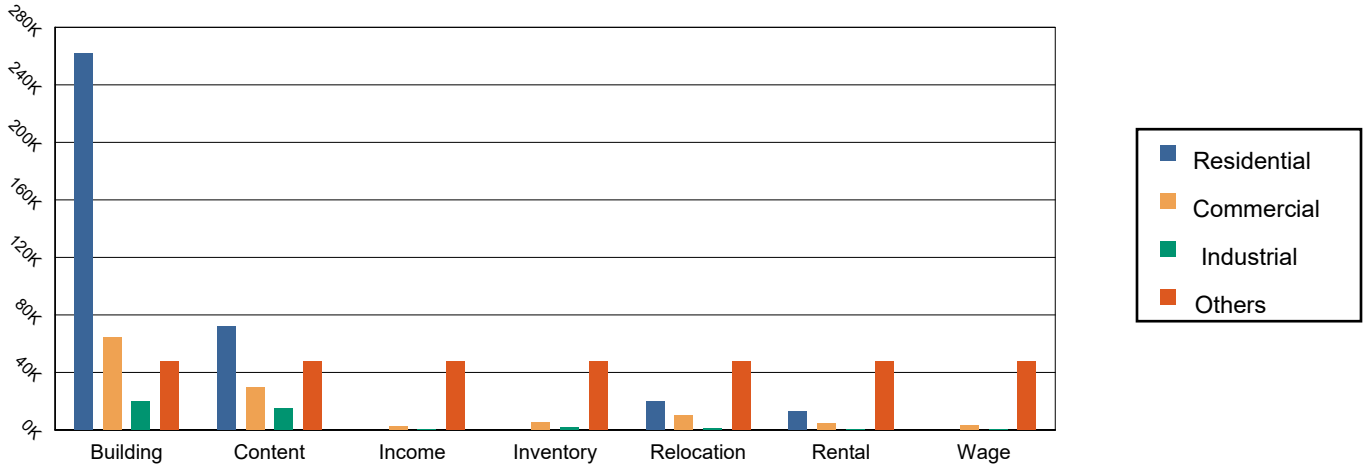


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	261,624.66	64,345.91	19,673.44	25,365.15	371,009.16
	Content	71,651.23	29,643.80	14,889.68	10,206.35	126,391.06
	Inventory	0.00	5,551.31	1,811.86	115.90	7,479.08
	Subtotal	**333,275.88**	**99,541.03**	**36,374.98**	**35,687.40**	**504,879.30**
Business Interruption Loss						
	Income	9.30	2,338.39	175.61	1,221.03	3,744.34
	Relocation	20,184.98	10,290.31	1,257.04	4,698.03	36,430.37
	Rental	12,775.02	4,652.04	196.71	520.46	18,144.23
	Wage	21.91	2,923.48	288.02	5,824.15	9,057.55
	Subtotal	**32,991.22**	**20,204.22**	**1,917.39**	**12,263.67**	**67,376.49**

Total

Total	**366,267.10**	**119,745.25**	**38,292.37**	**47,951.07**	**572,255.79**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	59,713	5,947,093	5,148,737	11,095,830
Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**
Study Region Total	**59,713**	**5,947,093**	**5,148,737**	**11,095,830**

Hazus: Hurricane Global Risk Report

Region Name:	Mansfield_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 45.68 square miles and contains 4 census tracts. There are over 6 thousand households in the region and a total population of 25,892 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 5,758 million dollars. Approximately 86% of the buildings (and 41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,908 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

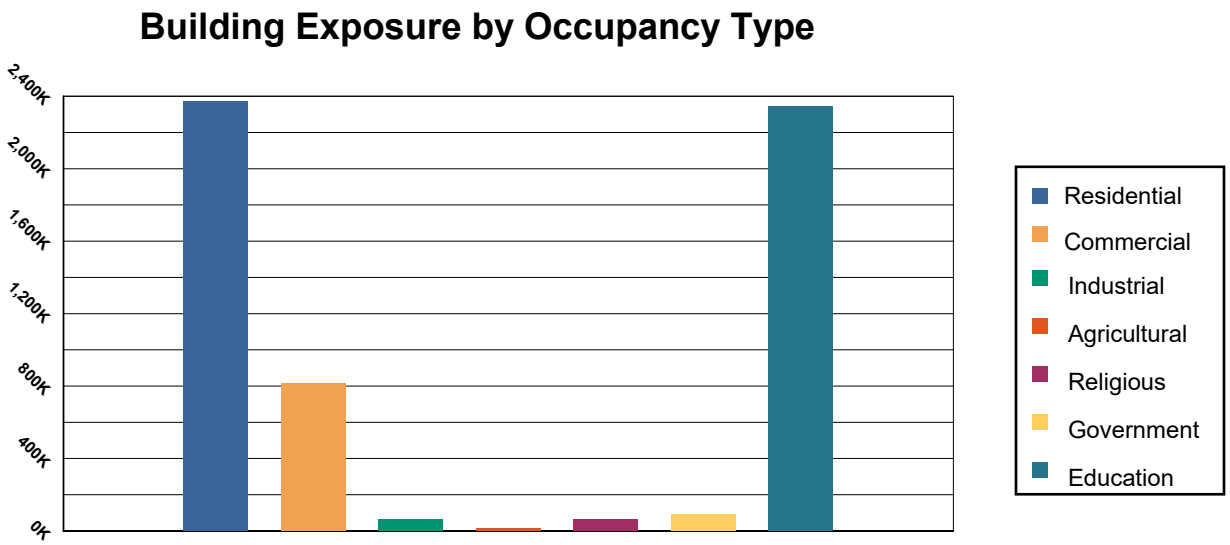


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,371,427	41.19%
Commercial	812,934	14.12%
Industrial	63,826	1.11%
Agricultural	13,703	0.24%
Religious	62,641	1.09%
Government	89,863	1.56%
Education	2,343,266	40.70%
Total	**5,757,660**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds. There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

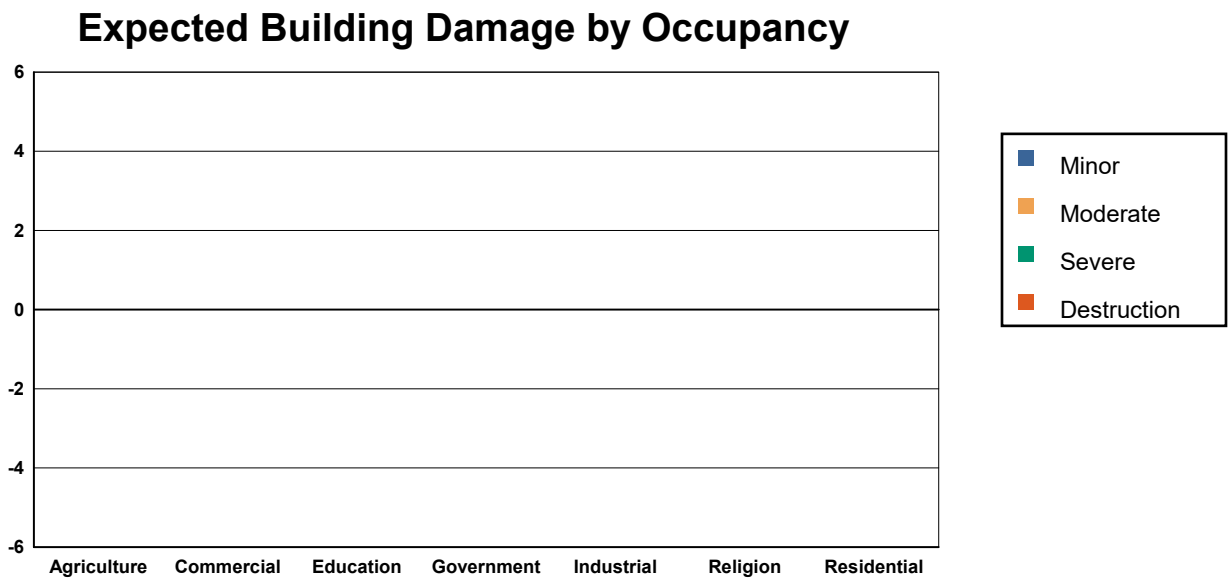


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	449.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	18.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	112.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	57.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	30.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	4,225.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**4,908.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	122	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	563	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	139	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	358	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	3,727	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 57 hospital beds available for use. On the day of the hurricane, the model estimates that 57 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

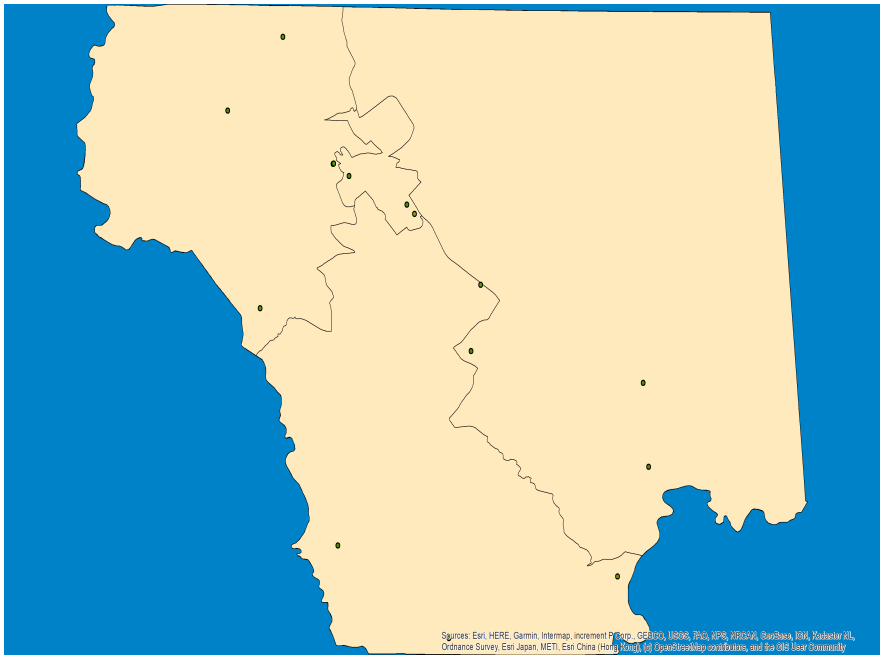
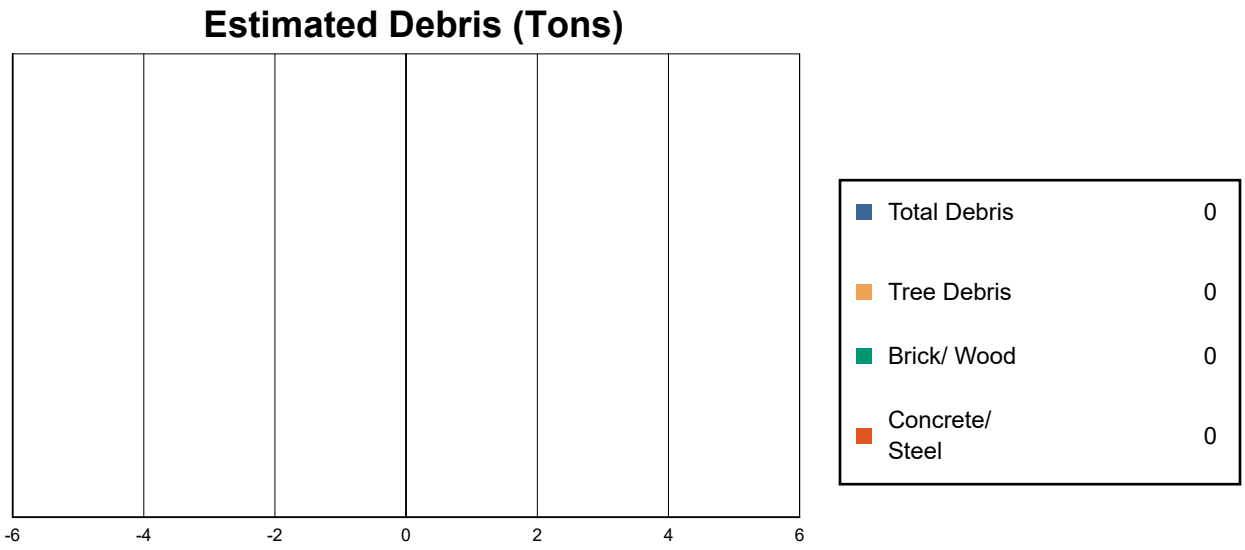


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

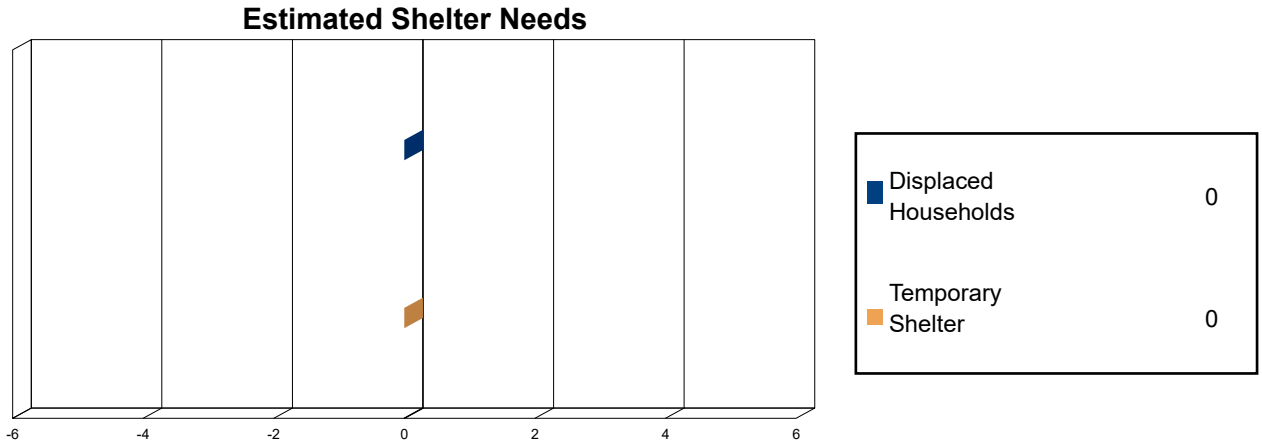


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 25,892) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

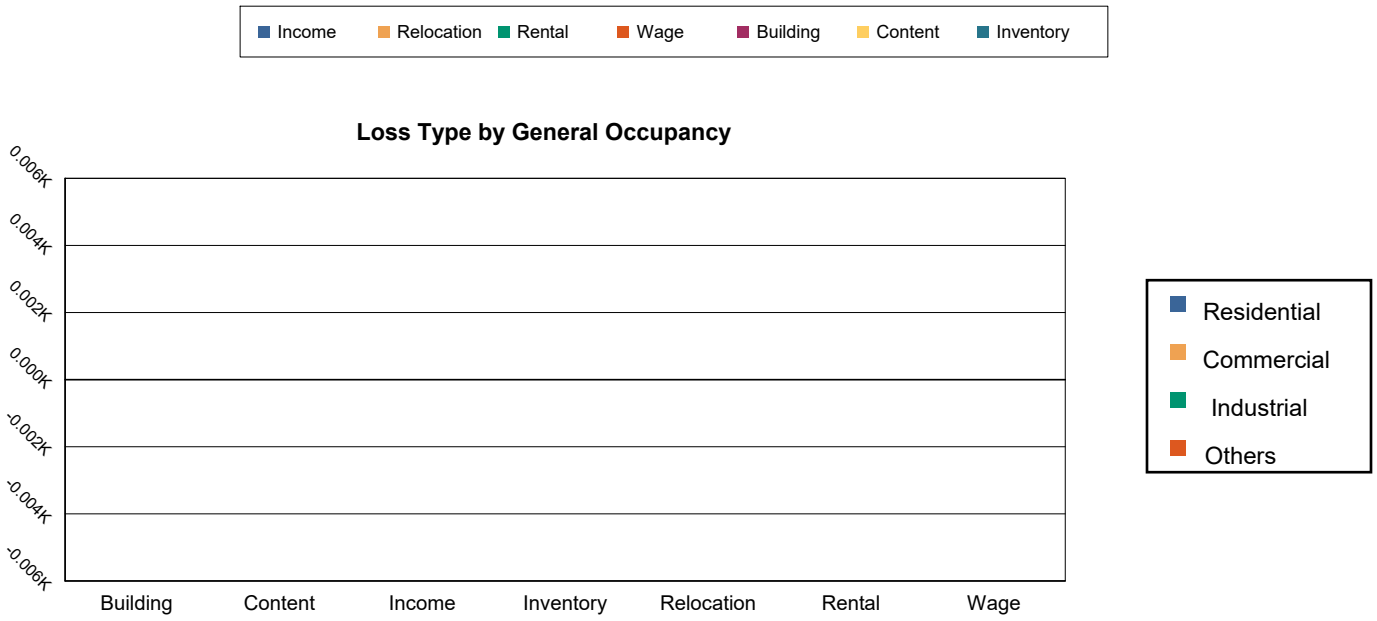


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,427	3,386,233	5,757,660
Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**
Study Region Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**

Hazus: Hurricane Global Risk Report

Region Name:	Mansfield_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
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The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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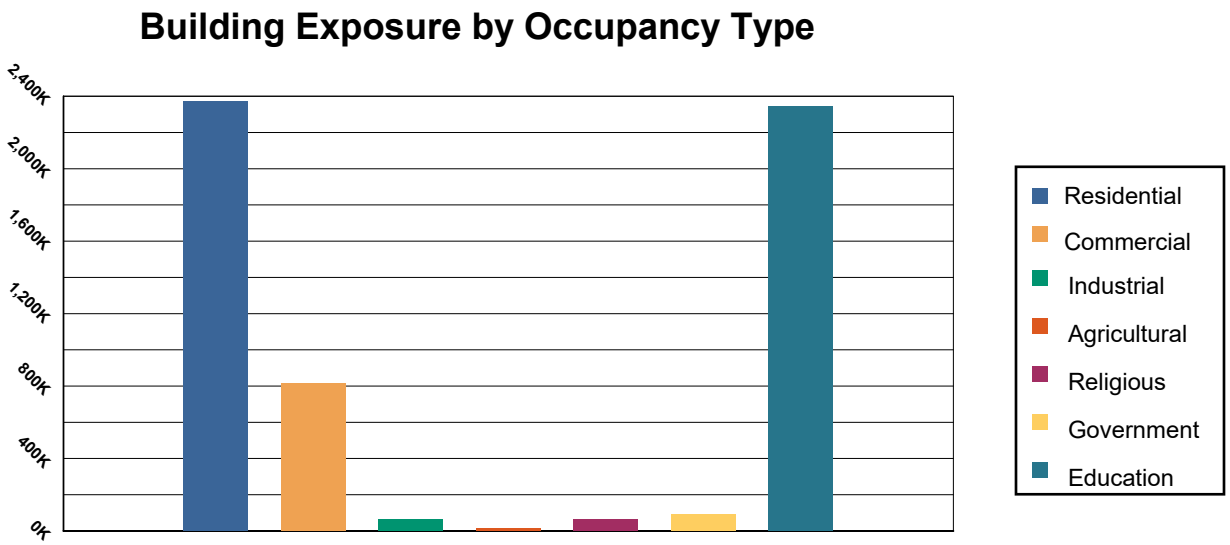

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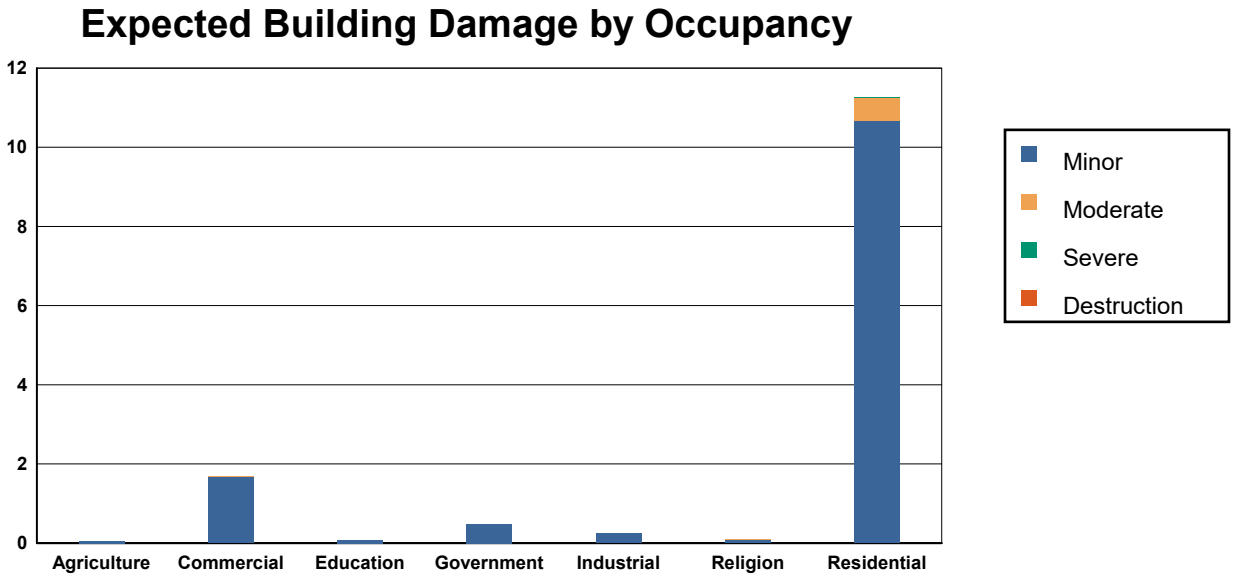


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16.94	99.67	0.05	0.32	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	447.32	99.62	1.66	0.37	0.02	0.00	0.00	0.00	0.00	0.00
Education	17.92	99.58	0.08	0.42	0.00	0.00	0.00	0.00	0.00	0.00
Government	111.52	99.57	0.48	0.43	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	56.76	99.58	0.24	0.42	0.00	0.00	0.00	0.00	0.00	0.00
Religion	29.91	99.68	0.09	0.31	0.00	0.01	0.00	0.00	0.00	0.00
Residential	4,213.72	99.73	10.66	0.25	0.59	0.01	0.02	0.00	0.00	0.00
Total	**4,894.09**		**13.27**		**0.62**		**0.02**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	121	99.40	1	0.60	0	0.00	0	0.00	0	0.00
Masonry	559	99.26	4	0.71	0	0.03	0	0.00	0	0.00
MH	139	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	356	99.57	2	0.43	0	0.00	0	0.00	0	0.00
Wood	3,724	99.91	3	0.09	0	0.01	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 57 hospital beds available for use. On the day of the hurricane, the model estimates that 57 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

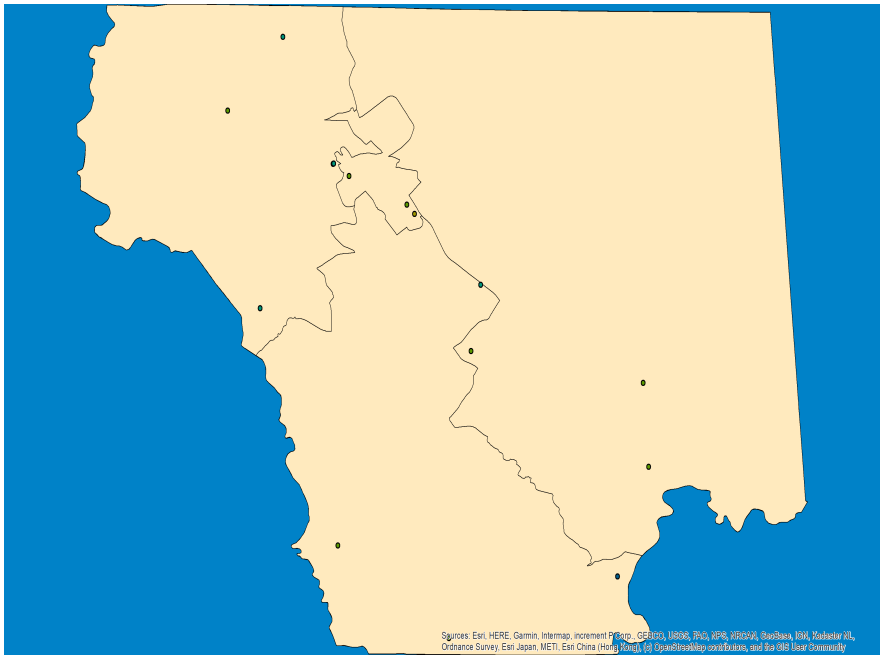
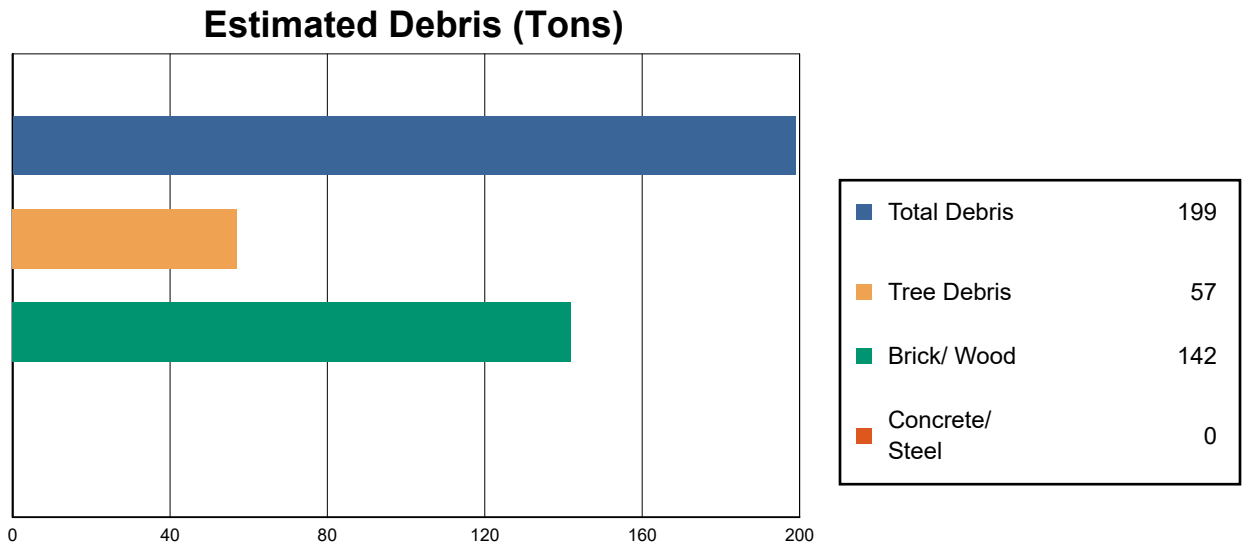


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

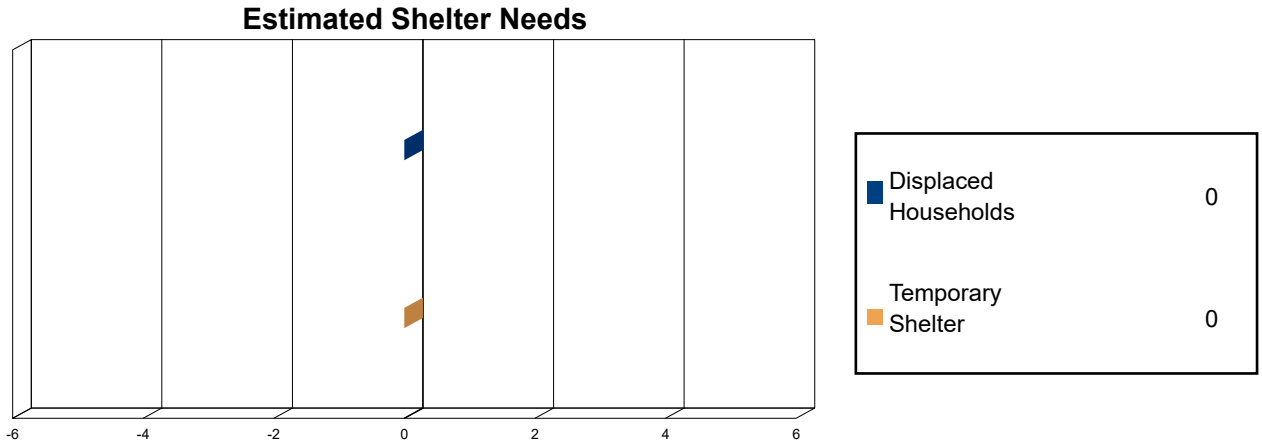


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 199 tons of debris will be generated. Of the total amount, 32 tons (16%) is Other Tree Debris. Of the remaining 167 tons, Brick/Wood comprises 85% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 6 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 25 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 25,892) will seek temporary shelter in public shelters.

Economic Loss

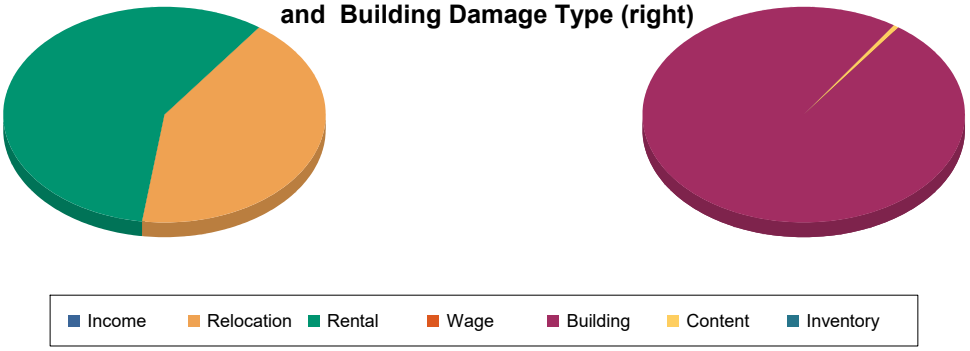
The total economic loss estimated for the hurricane is 1.4 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 75% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

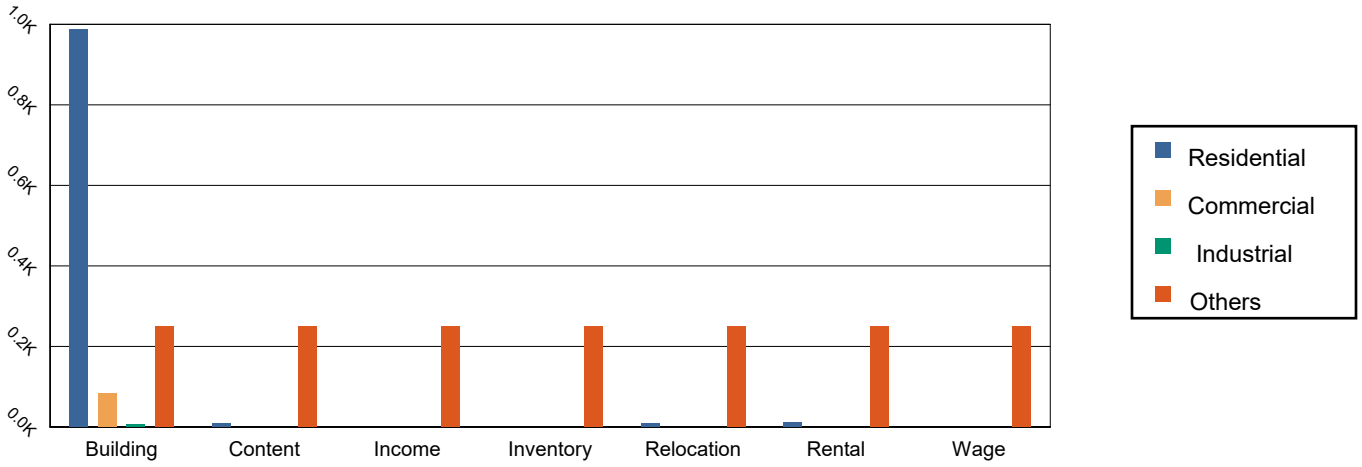


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	986.47	84.24	6.38	250.07	1,327.15
	Content	8.16	0.00	0.00	0.00	8.16
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**994.62**	**84.24**	**6.38**	**250.07**	**1,335.31**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	8.35	0.27	0.00	0.04	8.65
	Rental	11.80	0.00	0.00	0.00	11.80
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**20.15**	**0.27**	**0.00**	**0.04**	**20.45**

Total

Total	**1,014.77**	**84.50**	**6.38**	**250.10**	**1,355.76**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,427	3,386,233	5,757,660
Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**
Study Region Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**

Hazus: Hurricane Global Risk Report

Region Name:	Mansfield_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Thursday, May 11, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
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Debris Generation	
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Shelter Requirements	
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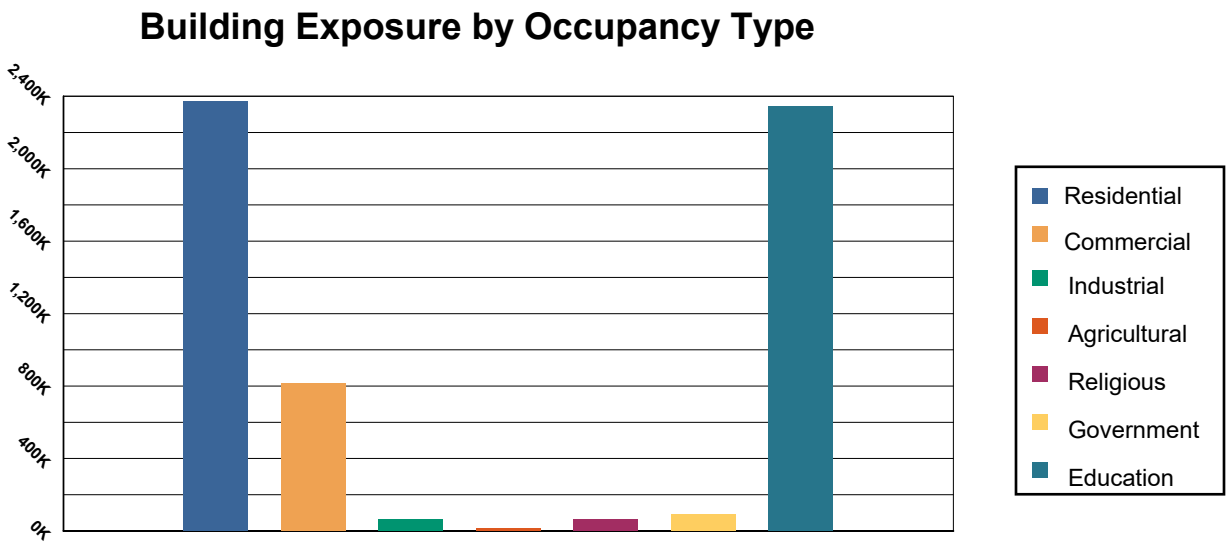

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Religious	62,641	1.09%
Government	89,863	1.56%
Education	2,343,266	40.70%
Total	**5,757,660**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds. There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 16 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

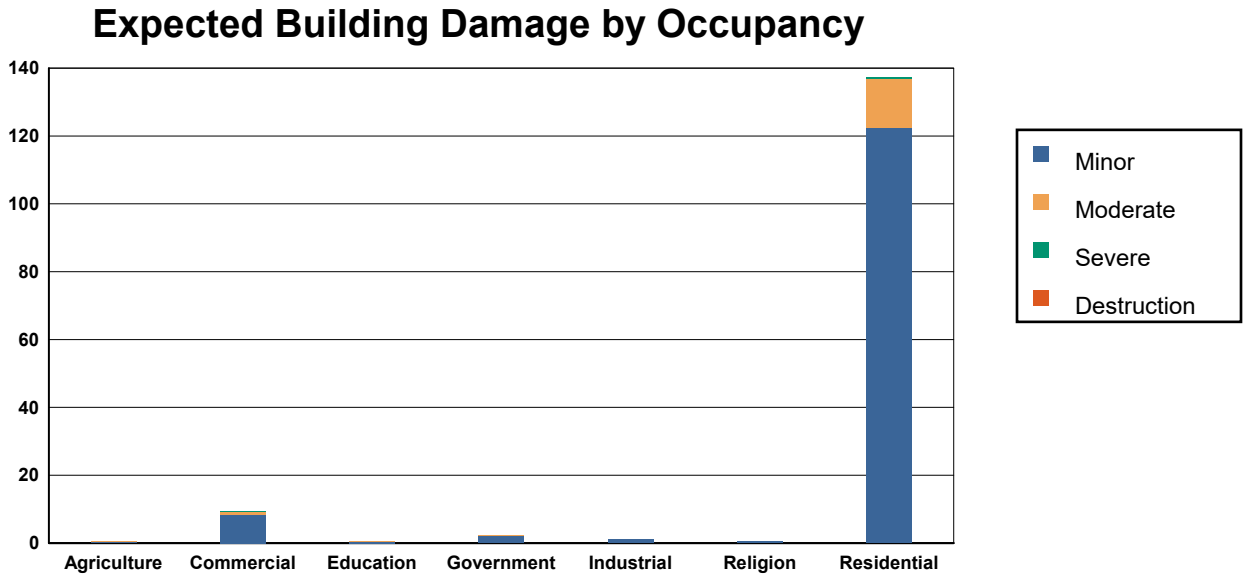


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16.49	97.00	0.43	2.55	0.06	0.34	0.02	0.11	0.00	0.00
Commercial	439.53	97.89	8.28	1.84	1.14	0.25	0.06	0.01	0.00	0.00
Education	17.61	97.85	0.38	2.09	0.01	0.06	0.00	0.00	0.00	0.00
Government	109.67	97.92	2.28	2.04	0.05	0.04	0.00	0.00	0.00	0.00
Industrial	55.83	97.95	1.14	2.00	0.03	0.05	0.00	0.00	0.00	0.00
Religion	29.44	98.13	0.54	1.81	0.02	0.06	0.00	0.00	0.00	0.00
Residential	4,087.90	96.75	122.50	2.90	14.29	0.34	0.31	0.01	0.00	0.00
Total	**4,756.47**		**135.55**		**15.59**		**0.39**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	118	96.96	4	2.93	0	0.11	0	0.00	0	0.00
Masonry	538	95.59	20	3.48	5	0.91	0	0.02	0	0.00
MH	139	99.84	0	0.13	0	0.03	0	0.00	0	0.00
Steel	350	97.77	7	1.94	1	0.27	0	0.02	0	0.00
Wood	3,633	97.48	90	2.41	4	0.10	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had 57 hospital beds available for use. On the day of the hurricane, the model estimates that 57 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

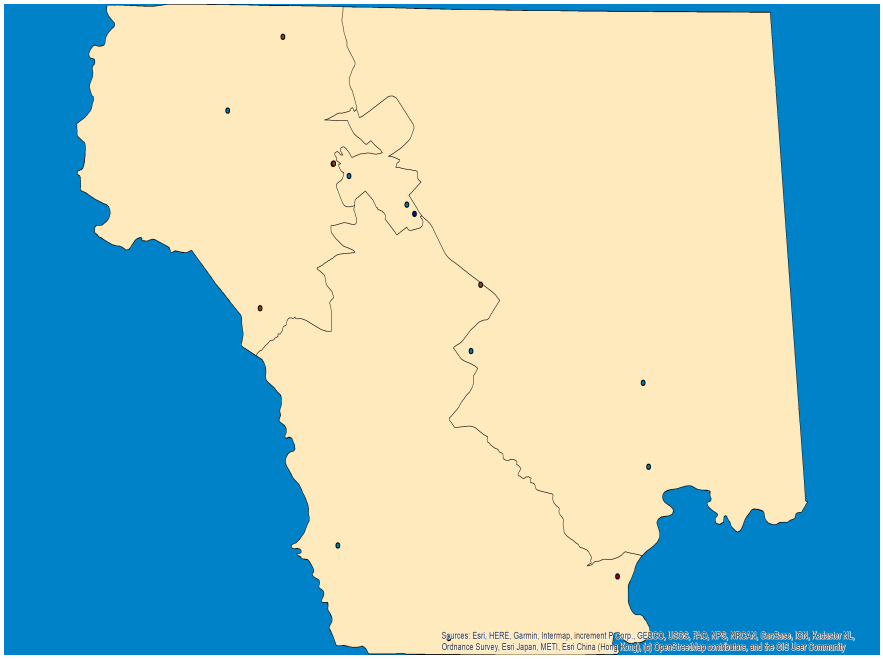
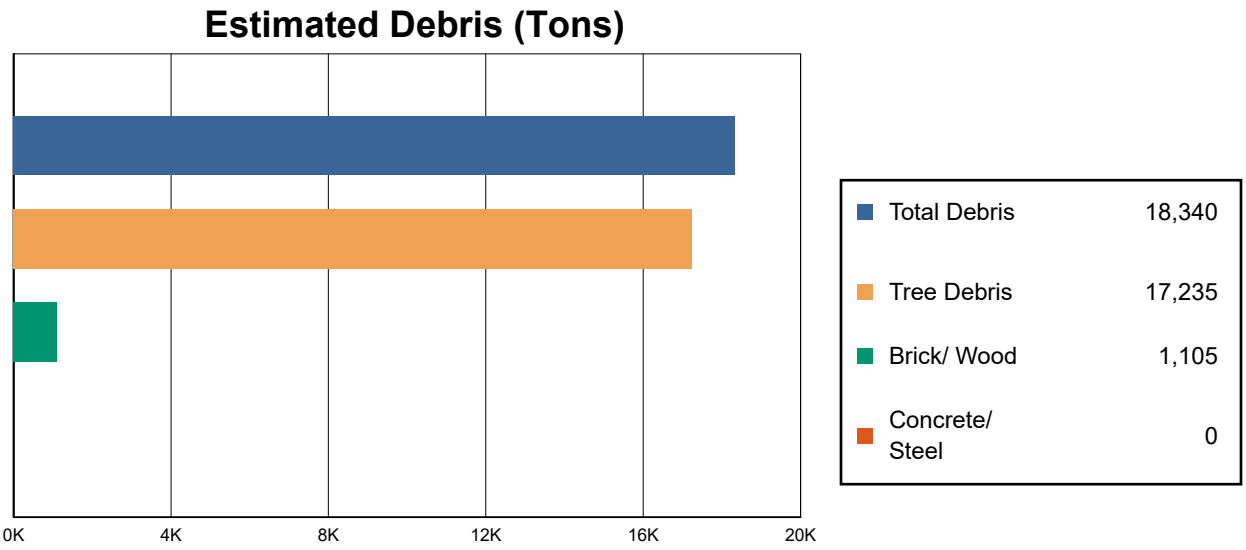


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

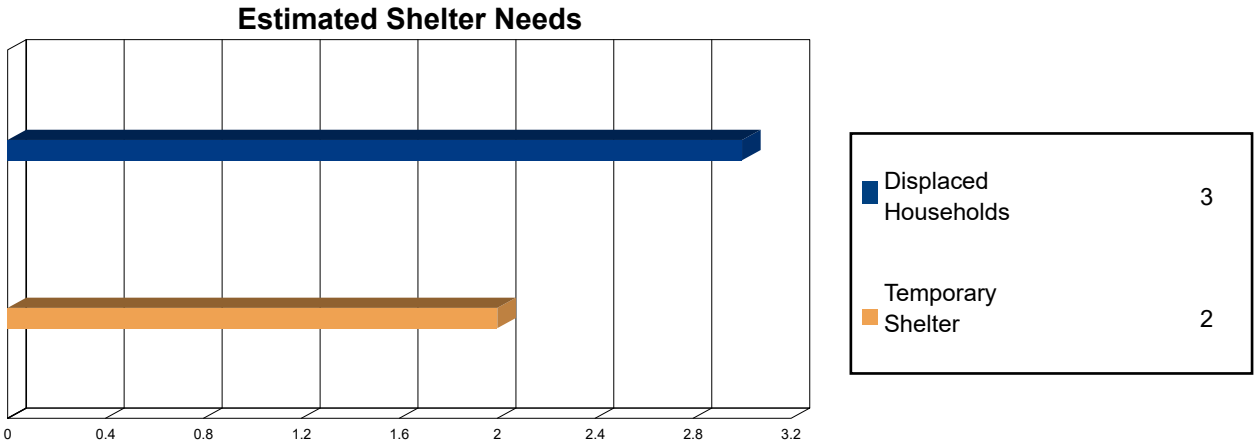


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 18,340 tons of debris will be generated. Of the total amount, 13,712 tons (75%) is Other Tree Debris. Of the remaining 4,628 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 44 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,523 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 3 households to be displaced due to the hurricane. Of these, 2 people (out of a total population of 25,892) will seek temporary shelter in public shelters.

Economic Loss

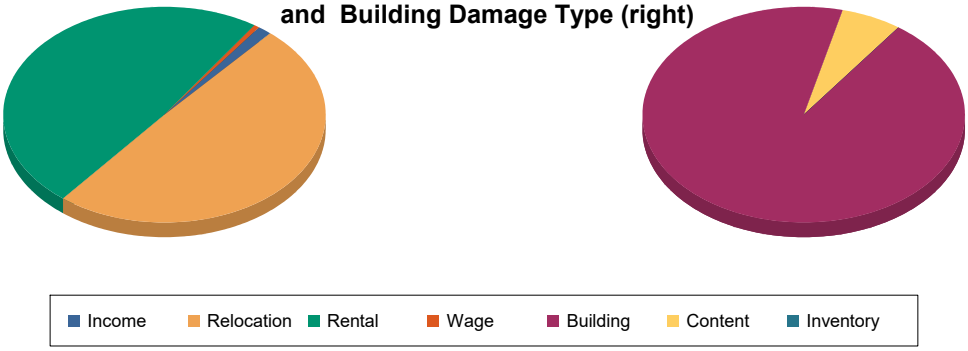
The total economic loss estimated for the hurricane is 11.3 million dollars, which represents 0.20 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 11 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 82% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

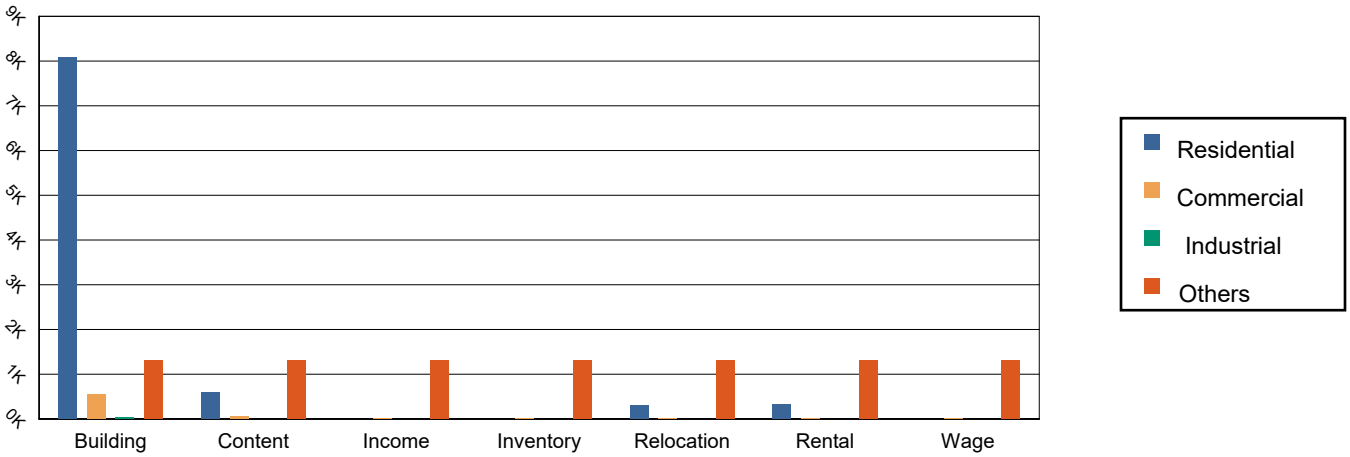


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	8,080.15	543.13	30.25	1,277.78	9,931.31
	Content	582.65	56.26	2.23	7.16	648.31
	Inventory	0.00	8.09	0.21	2.38	10.68
	Subtotal	**8,662.80**	**607.48**	**32.70**	**1,287.32**	**10,590.31**
Business Interruption Loss						
	Income	0.00	9.07	0.00	0.00	9.07
	Relocation	306.04	19.02	0.42	14.98	340.46
	Rental	330.89	3.76	0.00	0.00	334.65
	Wage	0.00	3.22	0.00	0.00	3.22
	Subtotal	**636.93**	**35.08**	**0.42**	**14.98**	**687.41**

Total

Total	**9,299.74**	**642.56**	**33.12**	**1,302.30**	**11,277.72**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,427	3,386,233	5,757,660
Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**
Study Region Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**

Hazus: Hurricane Global Risk Report

Region Name:	Mansfield_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 45.68 square miles and contains 4 census tracts. There are over 6 thousand households in the region and a total population of 25,892 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 5,758 million dollars. Approximately 86% of the buildings (and 41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,908 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

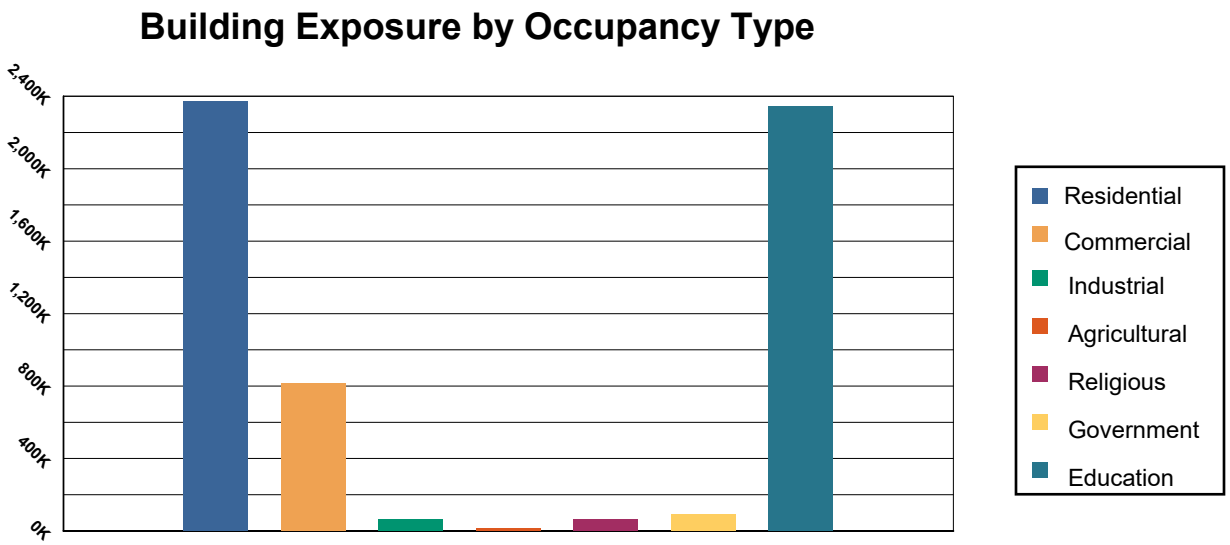


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,371,427	41.19%
Commercial	812,934	14.12%
Industrial	63,826	1.11%
Agricultural	13,703	0.24%
Religious	62,641	1.09%
Government	89,863	1.56%
Education	2,343,266	40.70%
Total	**5,757,660**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds. There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 56 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

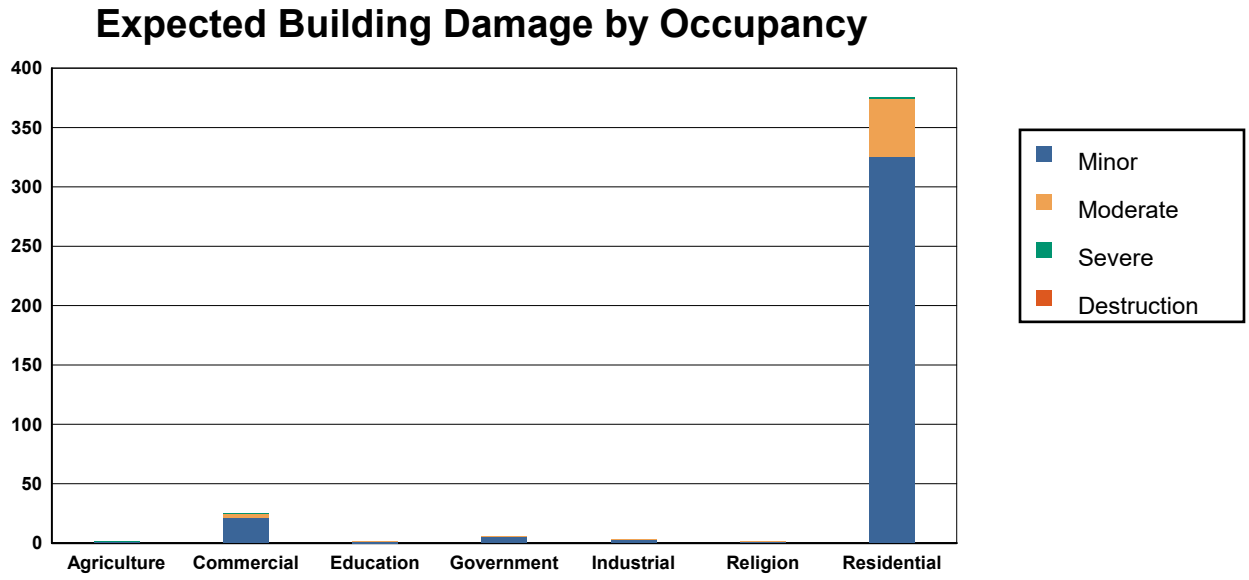


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15.54	91.44	1.14	6.72	0.21	1.26	0.09	0.55	0.01	0.04
Commercial	423.36	94.29	20.87	4.65	4.15	0.92	0.62	0.14	0.00	0.00
Education	16.97	94.26	0.95	5.30	0.08	0.43	0.00	0.01	0.00	0.00
Government	105.96	94.61	5.62	5.02	0.42	0.37	0.00	0.00	0.00	0.00
Industrial	54.02	94.77	2.75	4.83	0.21	0.37	0.01	0.03	0.00	0.00
Religion	28.35	94.50	1.56	5.19	0.09	0.30	0.00	0.01	0.00	0.00
Residential	3,849.89	91.12	325.49	7.70	48.61	1.15	0.98	0.02	0.03	0.00
Total	**4,494.09**		**358.39**		**53.77**		**1.71**		**0.04**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	112	92.19	9	6.99	1	0.82	0	0.00	0	0.00
Masonry	508	90.16	40	7.16	15	2.63	0	0.05	0	0.00
MH	137	98.82	1	0.90	0	0.22	0	0.00	0	0.05
Steel	337	94.16	17	4.62	4	1.07	1	0.16	0	0.00
Wood	3,439	92.26	270	7.25	17	0.46	1	0.02	0	0.00

Essential Facility Damage

Before the hurricane, the region had 57 hospital beds available for use. On the day of the hurricane, the model estimates that 57 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

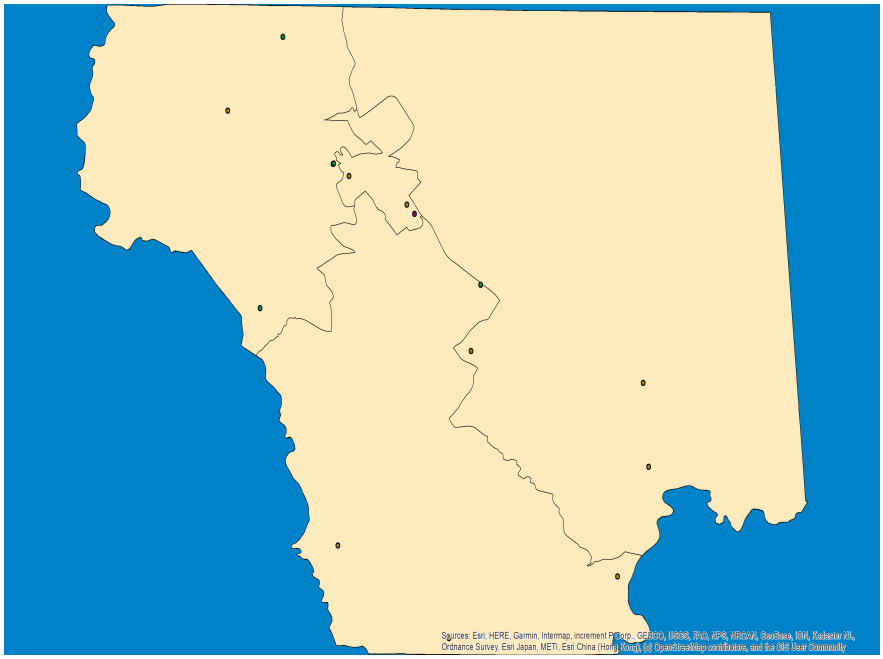
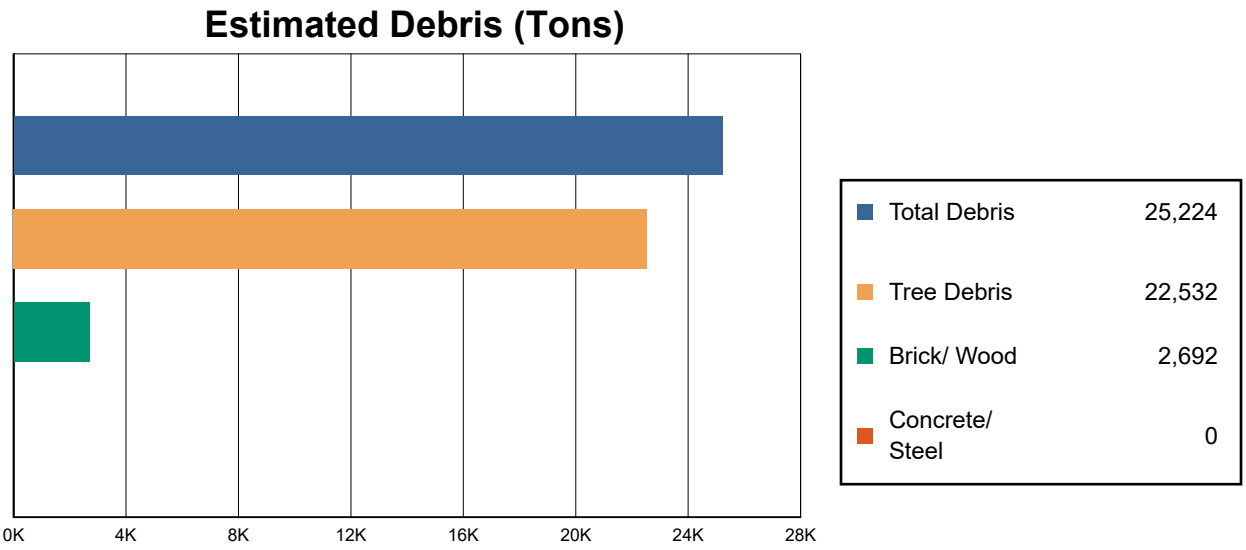


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

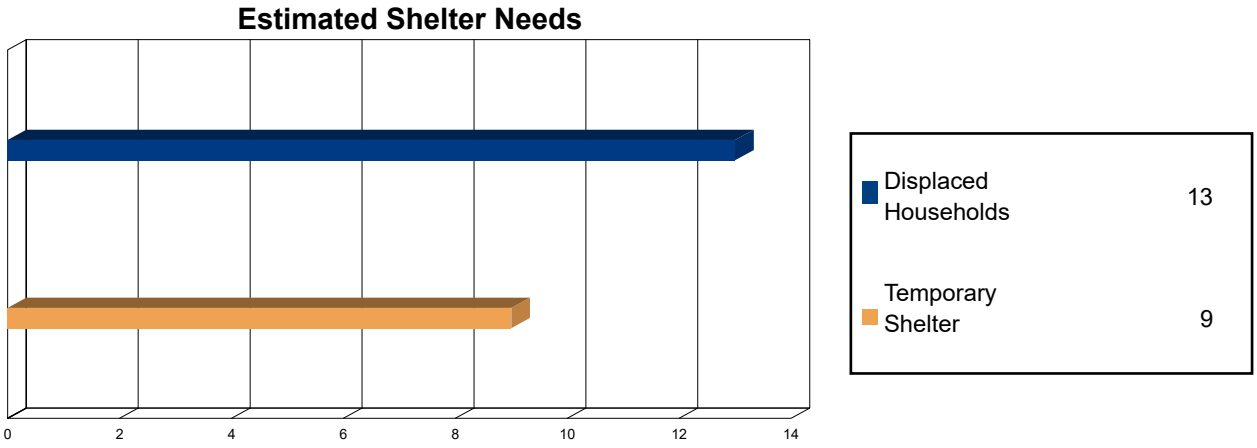


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 25,224 tons of debris will be generated. Of the total amount, 17,895 tons (71%) is Other Tree Debris. Of the remaining 7,329 tons, Brick/Wood comprises 37% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 108 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,637 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 13 households to be displaced due to the hurricane. Of these, 9 people (out of a total population of 25,892) will seek temporary shelter in public shelters.

Economic Loss

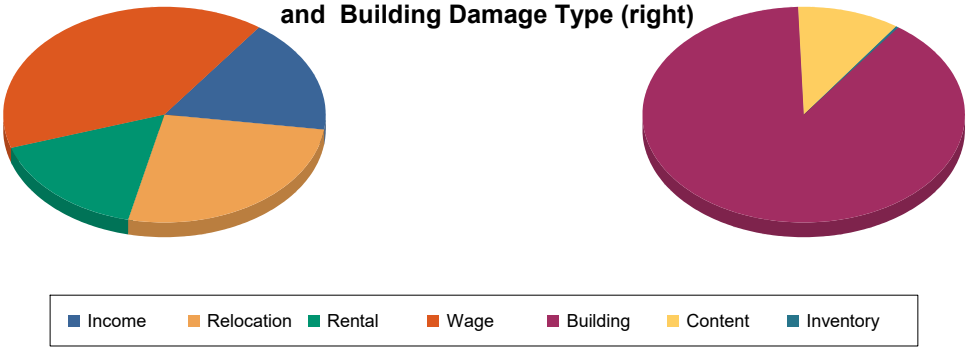
The total economic loss estimated for the hurricane is 31.7 million dollars, which represents 0.55 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 32 million dollars. 19% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 65% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

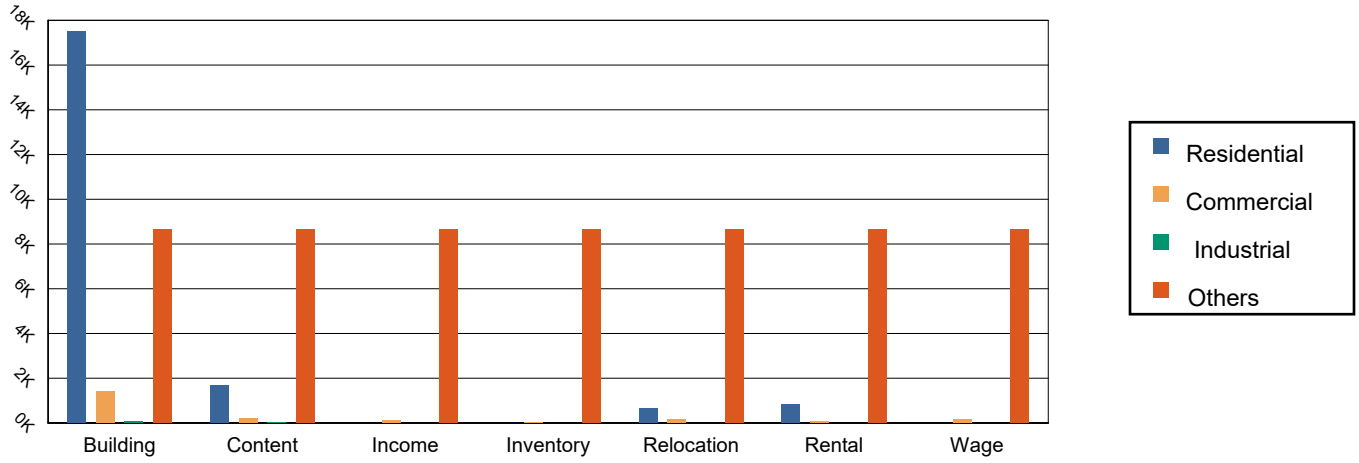


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	17,491.90	1,431.38	86.62	4,025.06	23,034.95
	Content	1,690.12	216.63	16.63	718.39	2,641.78
	Inventory	0.00	39.25	1.70	12.69	53.63
	Subtotal	**19,182.02**	**1,687.26**	**104.94**	**4,756.14**	**25,730.36**
Business Interruption Loss						
	Income	0.00	118.54	0.42	905.43	1,024.39
	Relocation	627.95	178.95	4.11	752.02	1,563.03
	Rental	824.05	79.80	0.34	69.35	973.54
	Wage	0.00	179.76	0.71	2,191.25	2,371.71
	Subtotal	**1,452.00**	**557.05**	**5.57**	**3,918.05**	**5,932.67**

Total

Total	20,634.02	2,244.31	110.52	8,674.19	31,663.03

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,427	3,386,233	5,757,660
Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**
Study Region Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**

Hazus: Hurricane Global Risk Report

Region Name:	Mansfield_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 45.68 square miles and contains 4 census tracts. There are over 6 thousand households in the region and a total population of 25,892 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 5,758 million dollars. Approximately 86% of the buildings (and 41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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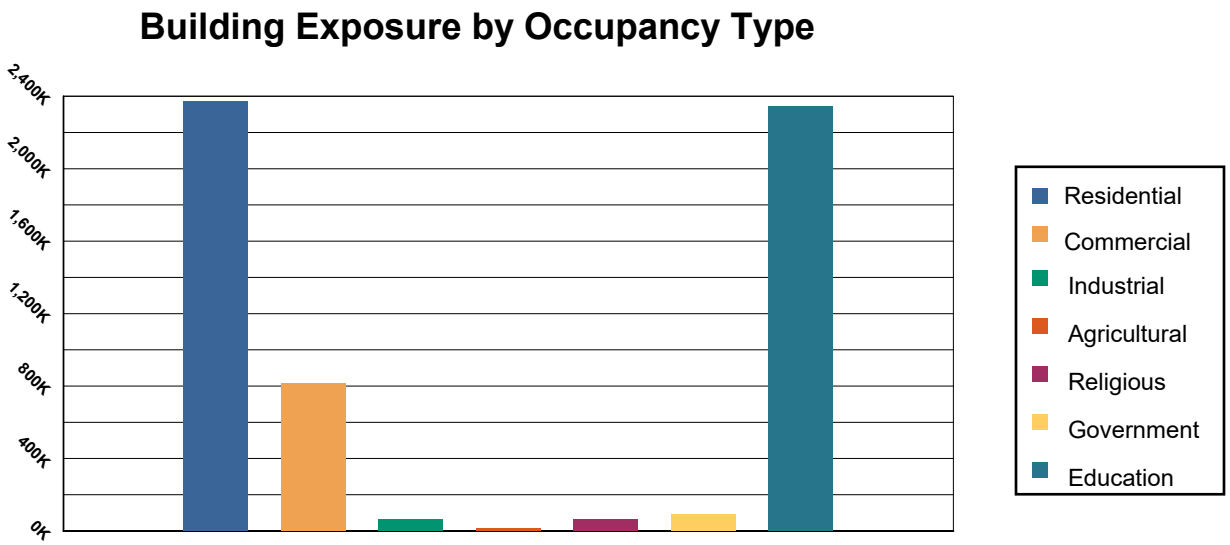

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Religious	62,641	1.09%
Government	89,863	1.56%
Education	2,343,266	40.70%
Total	**5,757,660**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds. There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 143 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

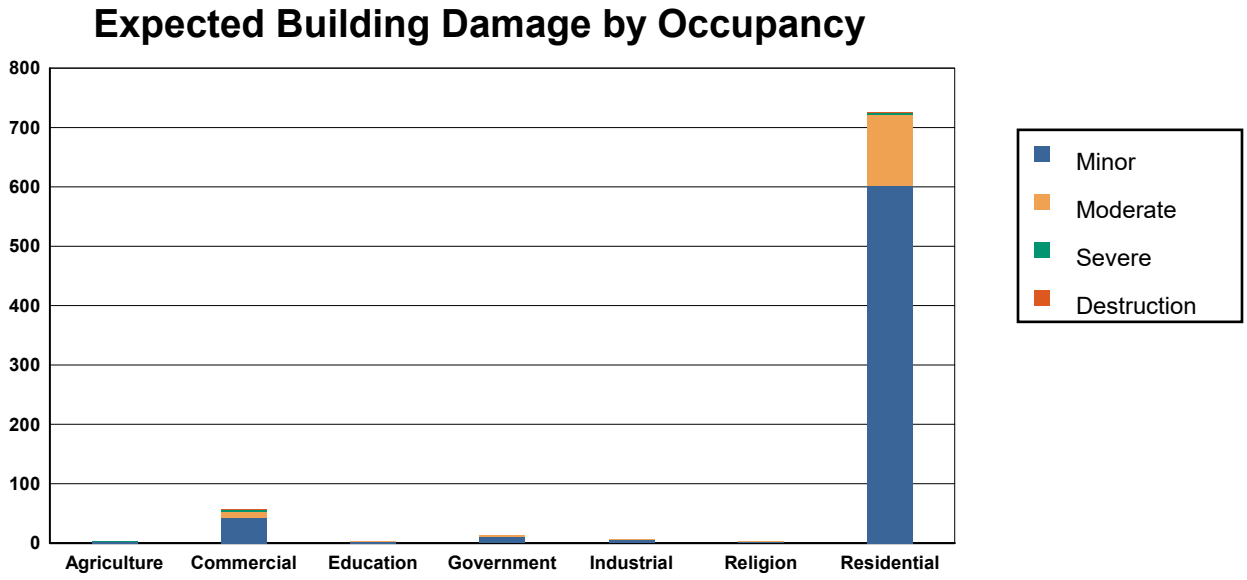


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	14.10	82.92	2.12	12.47	0.51	3.03	0.25	1.45	0.02	0.14
Commercial	392.98	87.52	42.34	9.43	11.18	2.49	2.49	0.56	0.00	0.00
Education	15.73	87.38	1.90	10.54	0.35	1.96	0.02	0.11	0.00	0.00
Government	98.88	88.28	11.13	9.94	1.90	1.70	0.09	0.08	0.00	0.00
Industrial	50.56	88.69	5.47	9.59	0.89	1.57	0.08	0.14	0.00	0.00
Religion	26.37	87.89	3.22	10.73	0.39	1.31	0.02	0.07	0.00	0.00
Residential	3,499.34	82.82	601.28	14.23	119.99	2.84	3.45	0.08	0.93	0.02
Total	**4,097.95**		**667.47**		**135.22**		**6.40**		**0.96**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	102	83.70	16	12.92	4	3.31	0	0.07	0	0.00
Masonry	462	82.05	69	12.17	32	5.62	1	0.15	0	0.01
MH	133	95.83	4	2.82	1	1.07	0	0.02	0	0.26
Steel	313	87.36	32	9.03	10	2.93	2	0.68	0	0.00
Wood	3,145	84.39	525	14.09	53	1.43	3	0.08	1	0.02

Essential Facility Damage

Before the hurricane, the region had 57 hospital beds available for use. On the day of the hurricane, the model estimates that 57 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

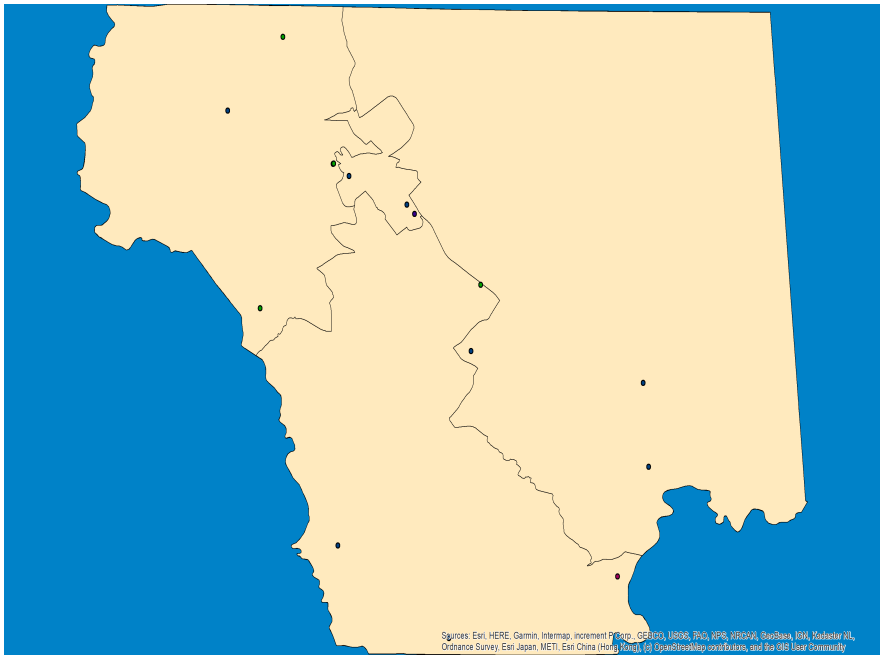
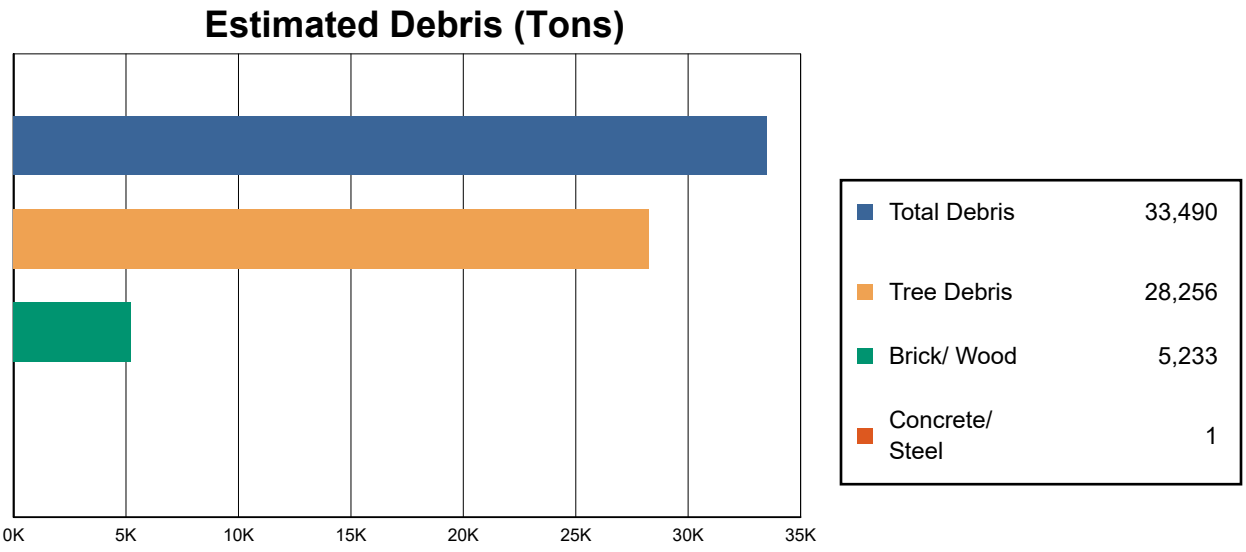


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	8	0	0	7

Induced Hurricane Damage

Debris Generation

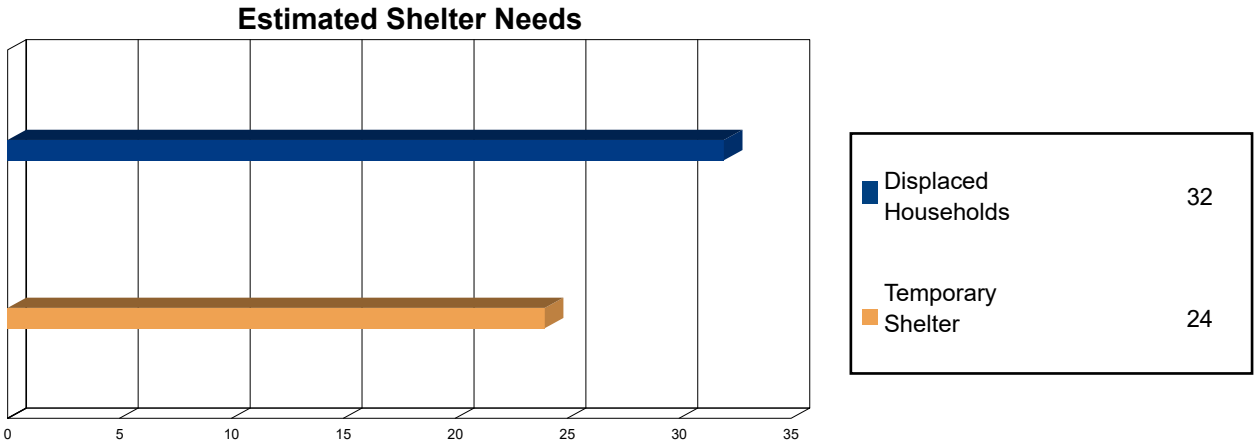


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 33,490 tons of debris will be generated. Of the total amount, 22,312 tons (67%) is Other Tree Debris. Of the remaining 11,178 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 209 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,944 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 32 households to be displaced due to the hurricane. Of these, 24 people (out of a total population of 25,892) will seek temporary shelter in public shelters.

Economic Loss

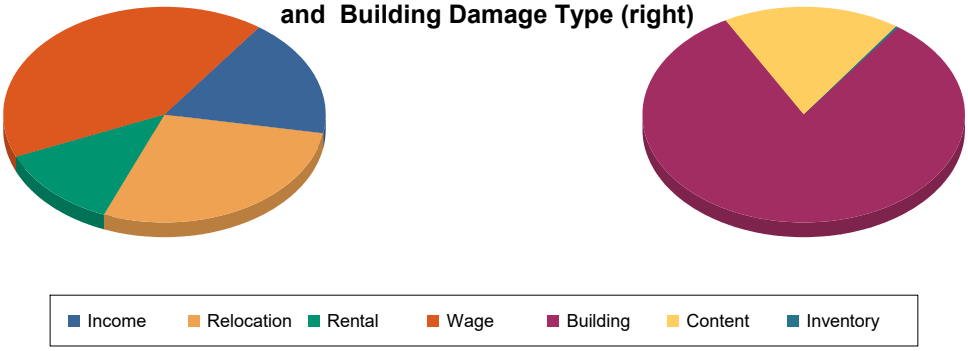
The total economic loss estimated for the hurricane is 72.5 million dollars, which represents 1.26 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 72 million dollars. 21% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 54% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

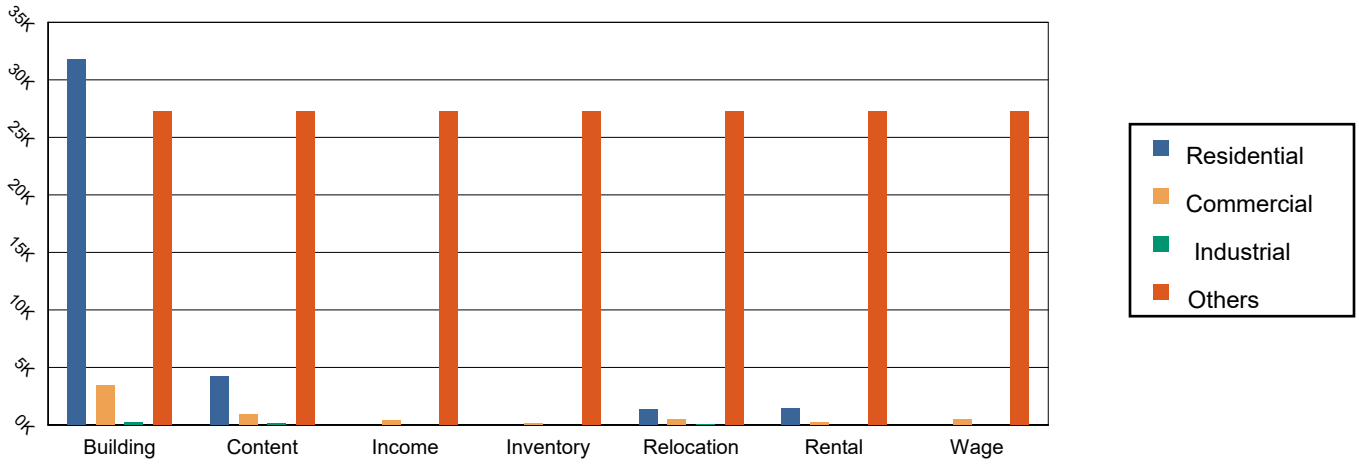


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	31,734.39	3,410.30	234.51	11,307.93	46,687.13
	Content	4,209.22	892.60	98.06	4,837.50	10,037.38
	Inventory	0.00	164.87	10.42	40.56	215.86
	Subtotal	**35,943.62**	**4,467.77**	**342.99**	**16,186.00**	**56,940.37**
Business Interruption Loss						
	Income	0.00	361.09	3.01	2,380.63	2,744.74
	Relocation	1,390.81	512.48	19.83	2,512.78	4,435.89
	Rental	1,467.29	229.78	2.49	216.06	1,915.62
	Wage	0.00	472.16	5.03	5,962.43	6,439.62
	Subtotal	**2,858.10**	**1,575.49**	**30.36**	**11,071.91**	**15,535.86**

Total

Total	**38,801.71**	**6,043.26**	**373.35**	**27,257.91**	**72,476.23**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,427	3,386,233	5,757,660
Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**
Study Region Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**

Hazus: Hurricane Global Risk Report

Region Name:	Mansfield_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 45.68 square miles and contains 4 census tracts. There are over 6 thousand households in the region and a total population of 25,892 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 5,758 million dollars. Approximately 86% of the buildings (and 41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,908 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

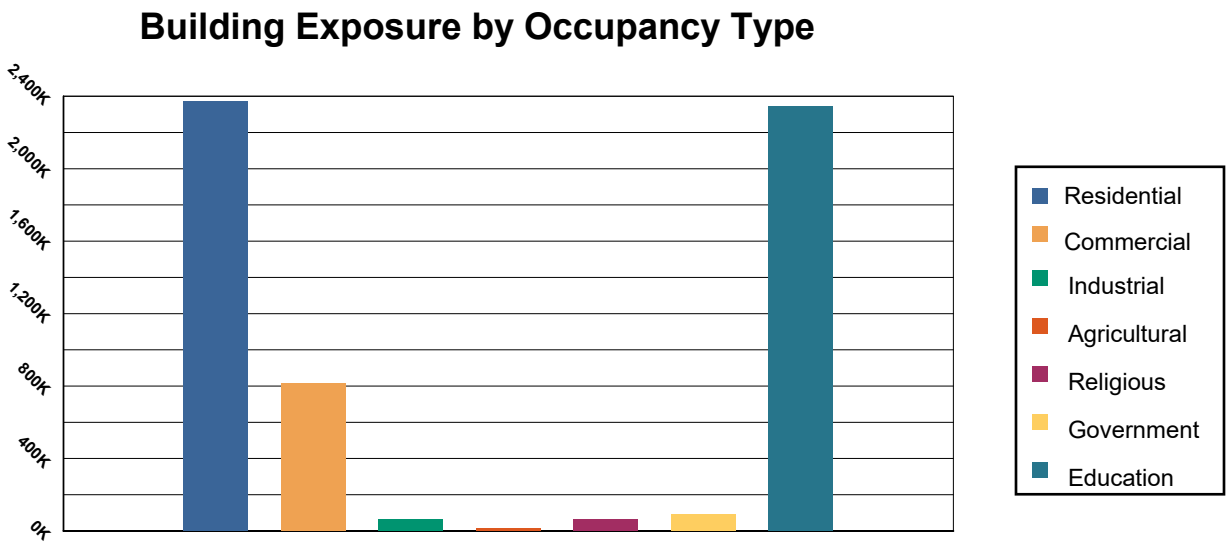


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,371,427	41.19%
Commercial	812,934	14.12%
Industrial	63,826	1.11%
Agricultural	13,703	0.24%
Religious	62,641	1.09%
Government	89,863	1.56%
Education	2,343,266	40.70%
Total	**5,757,660**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds. There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 322 buildings will be at least moderately damaged. This is over 7% of the total number of buildings in the region. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

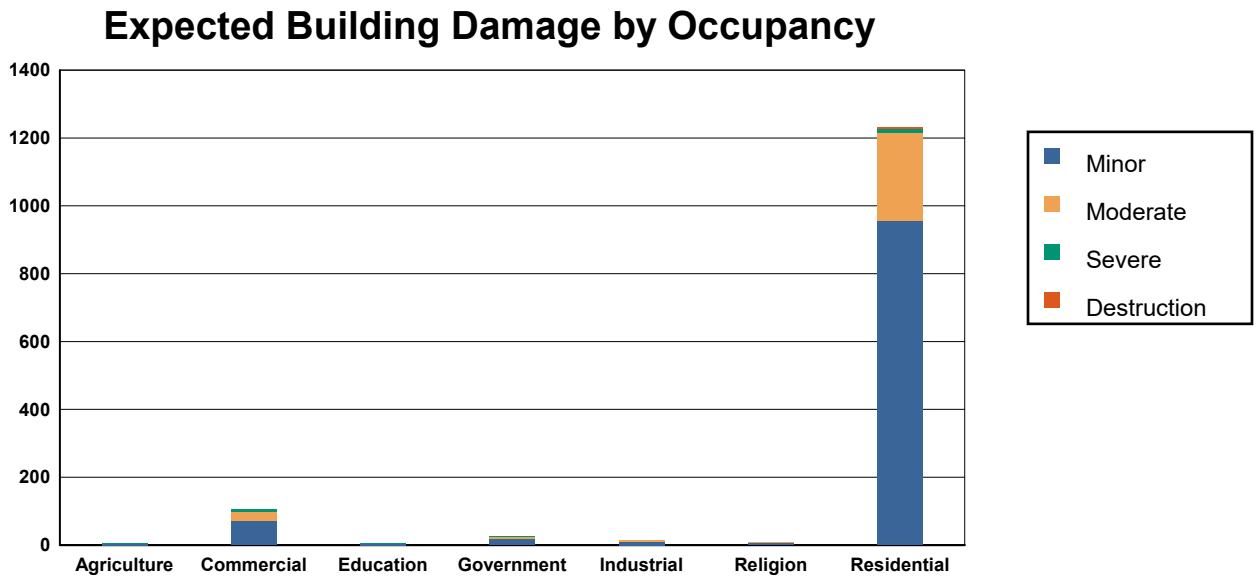


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11.87	69.82	3.44	20.23	1.09	6.41	0.53	3.10	0.07	0.43
Commercial	343.50	76.50	72.41	16.13	26.66	5.94	6.38	1.42	0.05	0.01
Education	13.61	75.63	3.19	17.73	1.09	6.06	0.11	0.59	0.00	0.00
Government	86.35	77.10	19.05	17.01	6.08	5.43	0.52	0.46	0.00	0.00
Industrial	44.36	77.82	9.48	16.63	2.84	4.98	0.31	0.55	0.01	0.02
Religion	23.04	76.78	5.61	18.69	1.27	4.23	0.09	0.31	0.00	0.00
Residential	2,993.55	70.85	956.33	22.63	258.66	6.12	11.80	0.28	4.67	0.11
Total	**3,516.28**		**1,069.49**		**297.69**		**19.74**		**4.80**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	86	70.30	24	20.01	11	9.27	1	0.43	0	0.00
Masonry	395	70.17	104	18.50	61	10.84	3	0.46	0	0.02
MH	125	89.75	8	5.99	5	3.26	0	0.13	1	0.86
Steel	272	76.05	54	15.17	25	6.98	6	1.78	0	0.01
Wood	2,712	72.76	866	23.25	135	3.62	10	0.27	4	0.11

Essential Facility Damage

Before the hurricane, the region had 57 hospital beds available for use. On the day of the hurricane, the model estimates that 57 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

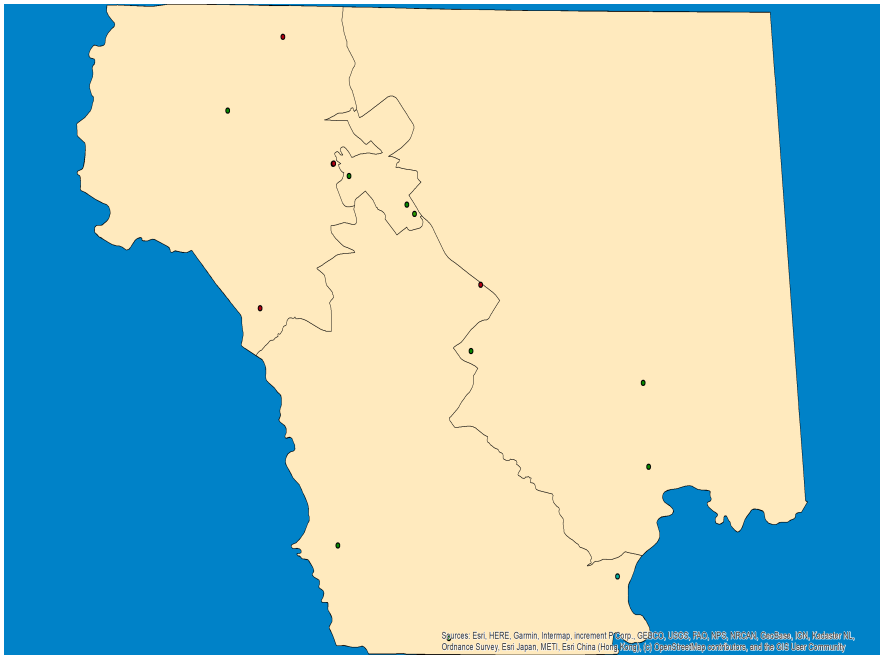
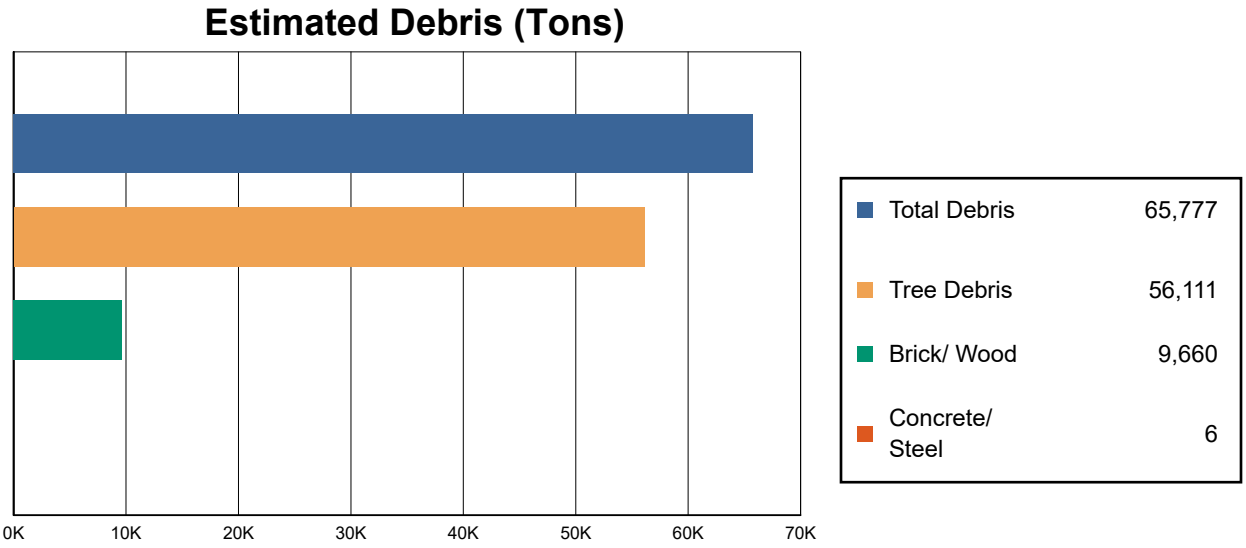


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	8	1	0	6

Induced Hurricane Damage

Debris Generation

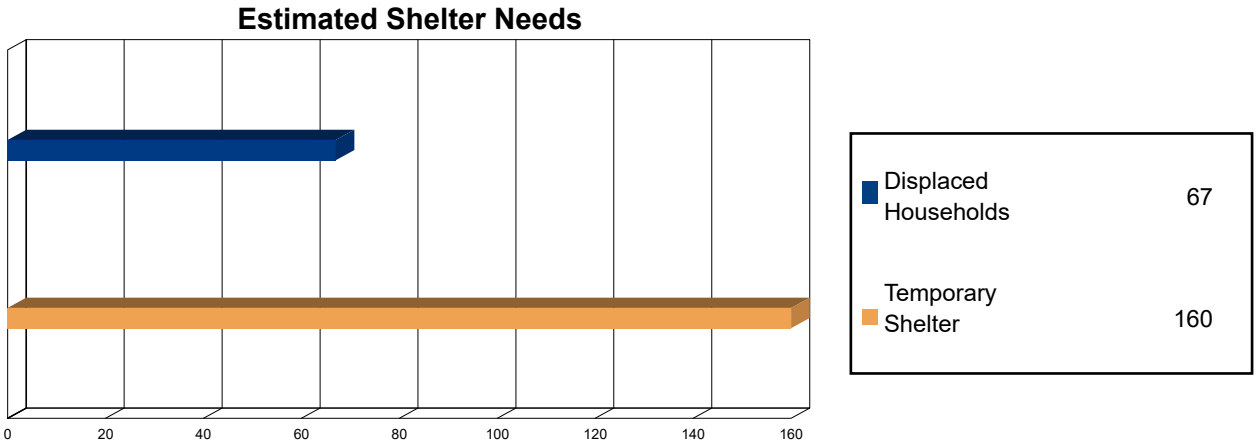


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 65,777 tons of debris will be generated. Of the total amount, 44,480 tons (68%) is Other Tree Debris. Of the remaining 21,297 tons, Brick/Wood comprises 45% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 387 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 11,631 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 67 households to be displaced due to the hurricane. Of these, 160 people (out of a total population of 25,892) will seek temporary shelter in public shelters.

Economic Loss

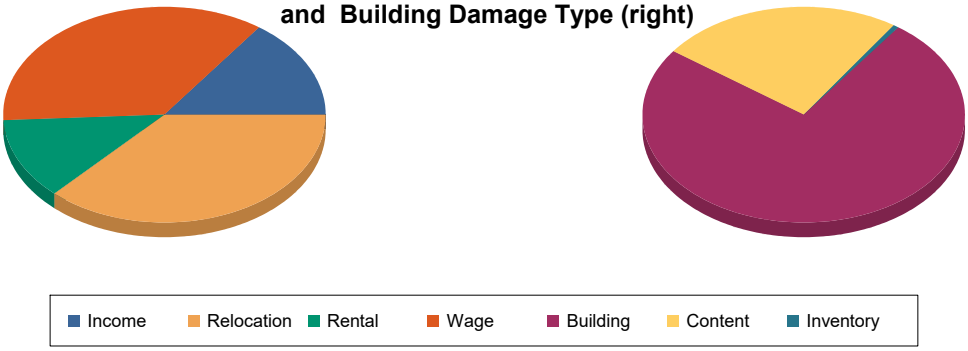
The total economic loss estimated for the hurricane is 159.9 million dollars, which represents 2.78 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 160 million dollars. 21% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 46% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

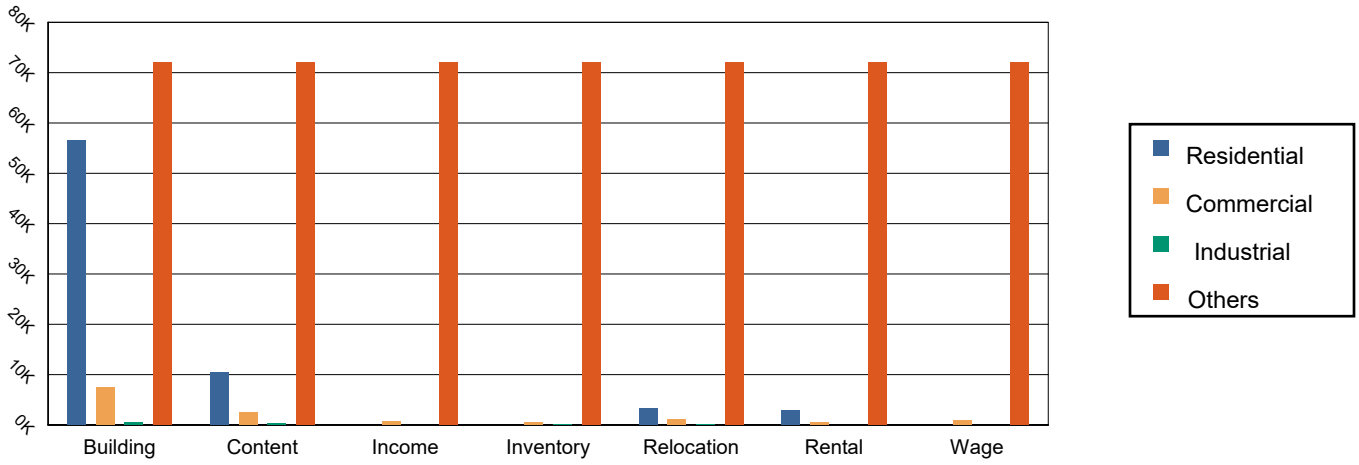


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	56,608.61	7,538.18	596.51	30,693.19	95,436.49
	Content	10,393.11	2,502.12	309.92	17,812.72	31,017.87
	Inventory	0.00	479.74	33.49	101.60	614.83
	Subtotal	**67,001.71**	**10,520.04**	**939.92**	**48,607.51**	**127,069.18**
Business Interruption Loss						
	Income	0.06	625.15	5.36	4,311.28	4,941.85
	Relocation	3,362.37	1,179.53	58.08	7,481.32	12,081.30
	Rental	2,849.65	516.72	6.67	644.01	4,017.05
	Wage	0.15	835.09	8.97	10,921.94	11,766.14
	Subtotal	**6,212.24**	**3,156.49**	**79.08**	**23,358.54**	**32,806.34**

Total

Total	**73,213.95**	**13,676.53**	**1,019.00**	**71,966.05**	**159,875.53**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,427	3,386,233	5,757,660
Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**
Study Region Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**

Hazus: Hurricane Global Risk Report

Region Name:	Mansfield_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 45.68 square miles and contains 4 census tracts. There are over 6 thousand households in the region and a total population of 25,892 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 5,758 million dollars. Approximately 86% of the buildings (and 41% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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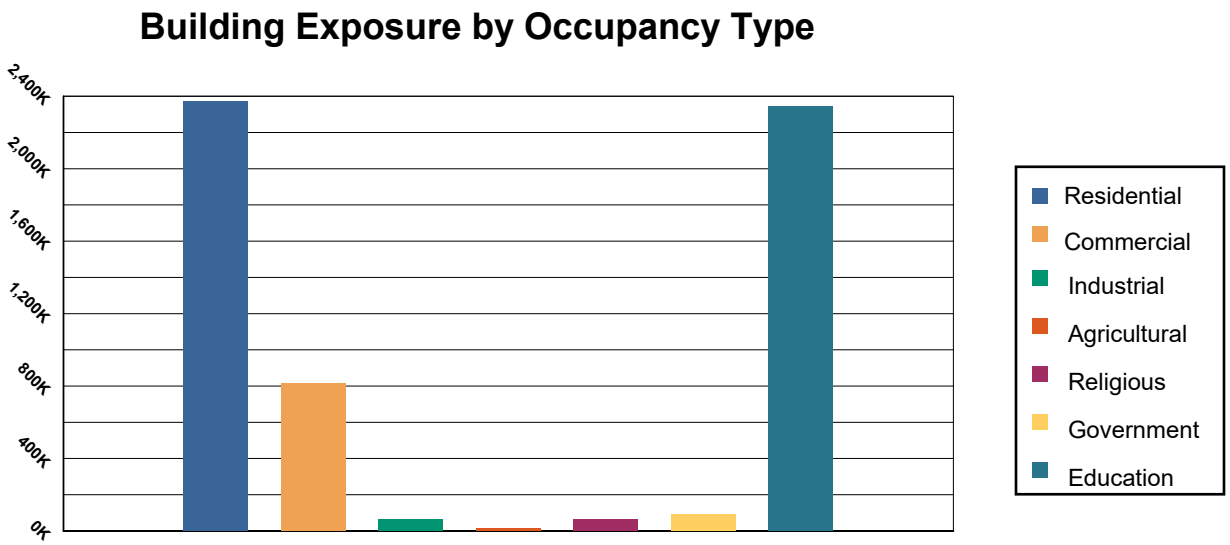


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,371,427	41.19%
Commercial	812,934	14.12%
Industrial	63,826	1.11%
Agricultural	13,703	0.24%
Religious	62,641	1.09%
Government	89,863	1.56%
Education	2,343,266	40.70%
Total	**5,757,660**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds. There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 542 buildings will be at least moderately damaged. This is over 11% of the total number of buildings in the region. There are an estimated 14 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

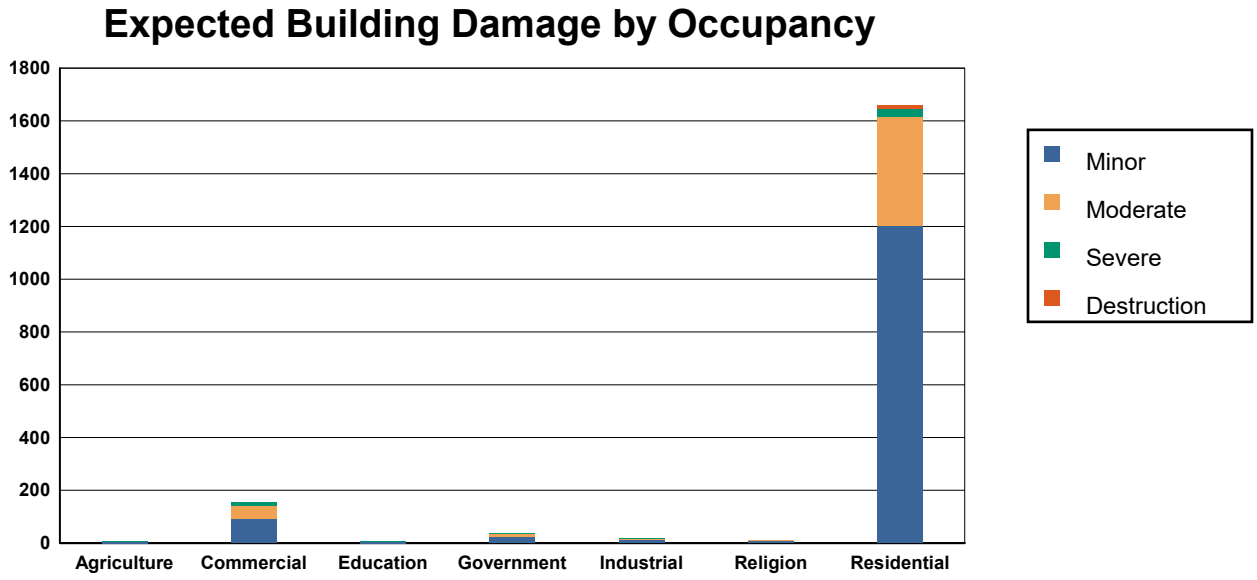


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.99	58.79	4.36	25.63	1.69	9.95	0.83	4.86	0.13	0.77
Commercial	295.94	65.91	94.09	20.96	46.62	10.38	12.21	2.72	0.14	0.03
Education	11.67	64.85	4.04	22.43	1.97	10.96	0.32	1.76	0.00	0.00
Government	74.33	66.36	24.49	21.87	11.54	10.30	1.65	1.47	0.00	0.00
Industrial	38.21	67.04	12.37	21.69	5.56	9.76	0.84	1.47	0.02	0.03
Religion	19.87	66.24	7.37	24.58	2.48	8.25	0.28	0.93	0.00	0.00
Residential	2,565.55	60.72	1,203.76	28.49	413.59	9.79	28.58	0.68	13.52	0.32
Total	**3,015.57**		**1,350.48**		**483.46**		**44.70**		**13.80**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	72	58.75	29	23.72	20	16.19	2	1.35	0	0.00
Masonry	337	59.77	127	22.50	93	16.55	6	1.12	0	0.06
MH	115	82.51	12	8.93	9	6.27	1	0.37	3	1.92
Steel	234	65.27	69	19.29	43	11.96	12	3.44	0	0.03
Wood	2,338	62.74	1,119	30.01	234	6.27	24	0.66	12	0.32

Essential Facility Damage

Before the hurricane, the region had 57 hospital beds available for use. On the day of the hurricane, the model estimates that 57 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

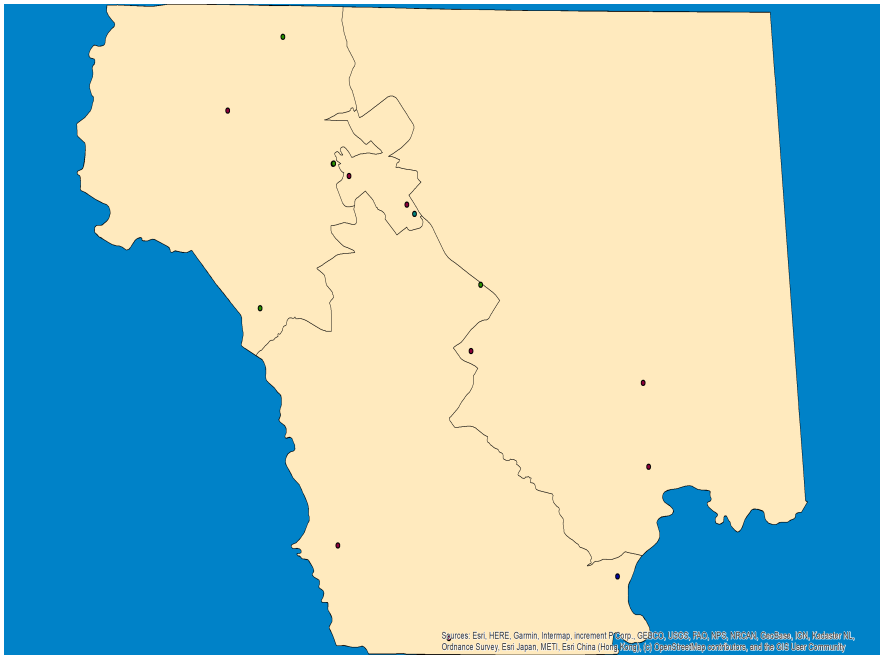
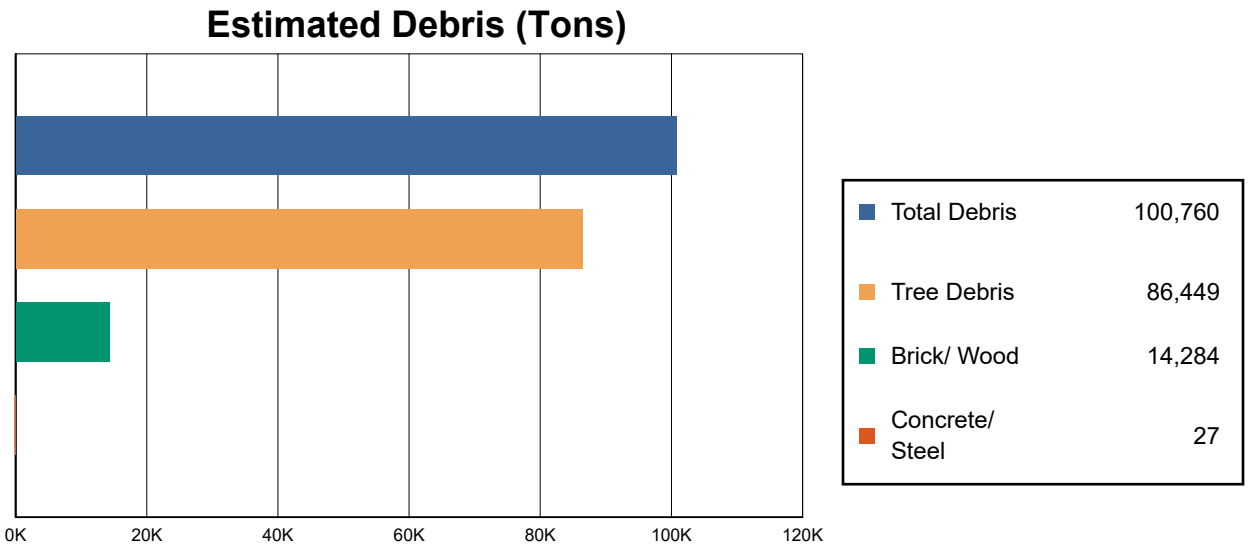


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	8	2	0	0

Induced Hurricane Damage

Debris Generation

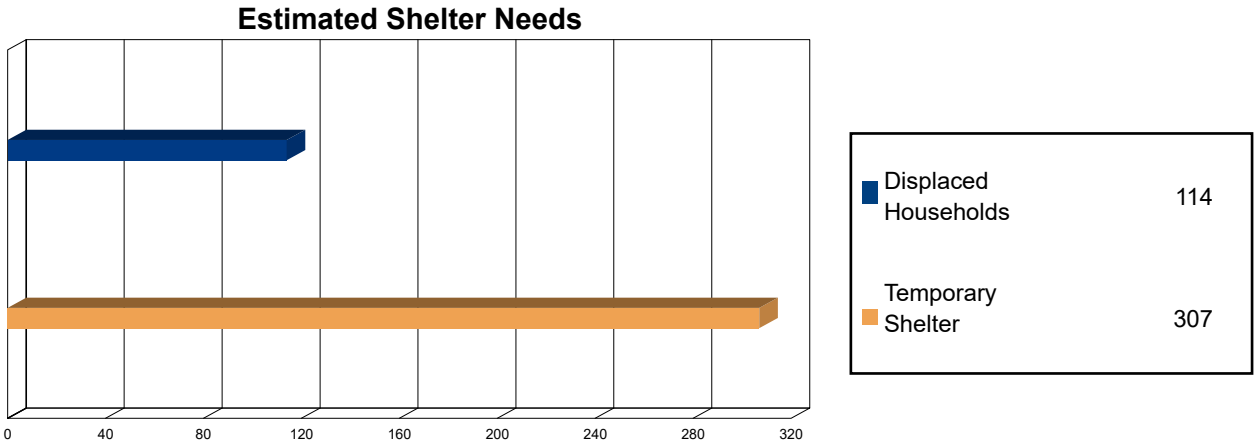


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 100,760 tons of debris will be generated. Of the total amount, 68,657 tons (68%) is Other Tree Debris. Of the remaining 32,103 tons, Brick/Wood comprises 44% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 572 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 17,792 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 114 households to be displaced due to the hurricane. Of these, 307 people (out of a total population of 25,892) will seek temporary shelter in public shelters.

Economic Loss

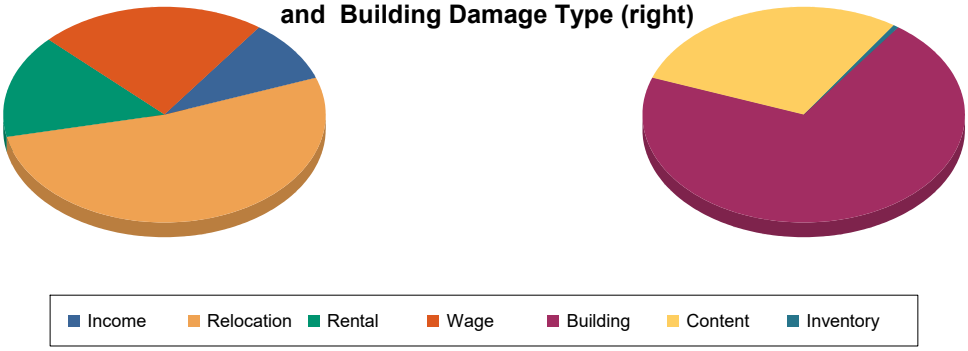
The total economic loss estimated for the hurricane is 262.8 million dollars, which represents 4.57 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 263 million dollars. 16% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 43% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

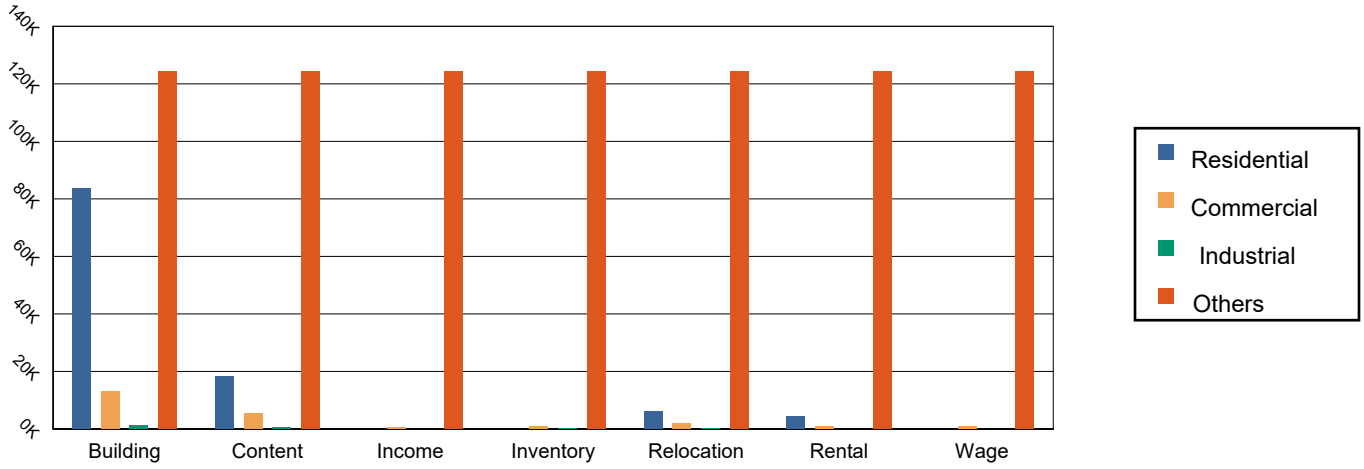


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	83,629.65	13,209.89	1,104.33	58,097.19	156,041.05
	Content	18,400.43	5,332.10	657.02	39,394.88	63,784.43
	Inventory	0.00	998.05	72.31	169.74	1,240.10
	Subtotal	**102,030.09**	**19,540.04**	**1,833.66**	**97,661.80**	**221,065.58**
Business Interruption Loss						
	Income	6.04	709.43	7.50	3,239.72	3,962.69
	Relocation	6,017.62	2,065.98	106.60	13,654.82	21,845.01
	Rental	4,359.23	903.97	12.26	1,209.40	6,484.86
	Wage	14.22	959.88	12.51	8,502.42	9,489.03
	Subtotal	**10,397.11**	**4,639.25**	**138.87**	**26,606.36**	**41,781.59**

Total

Total	**112,427.20**	**24,179.29**	**1,972.52**	**124,268.16**	**262,847.17**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	25,892	2,371,427	3,386,233	5,757,660
Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**
Study Region Total	**25,892**	**2,371,427**	**3,386,233**	**5,757,660**

Hazus: Hurricane Global Risk Report

Region Name:	Marlborough_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 6,133 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 90% of the buildings (and 80% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

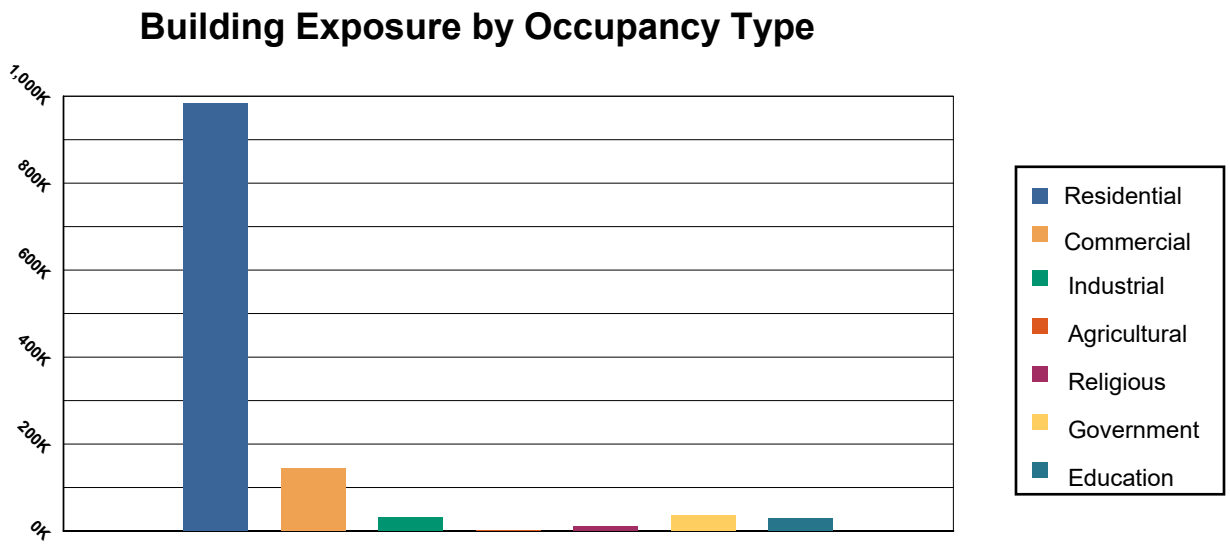


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	984,414	79.71%
Commercial	144,504	11.70%
Industrial	30,369	2.46%
Agricultural	1,006	0.08%
Religious	11,386	0.92%
Government	34,948	2.83%
Education	28,326	2.29%
Total	**1,234,953**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

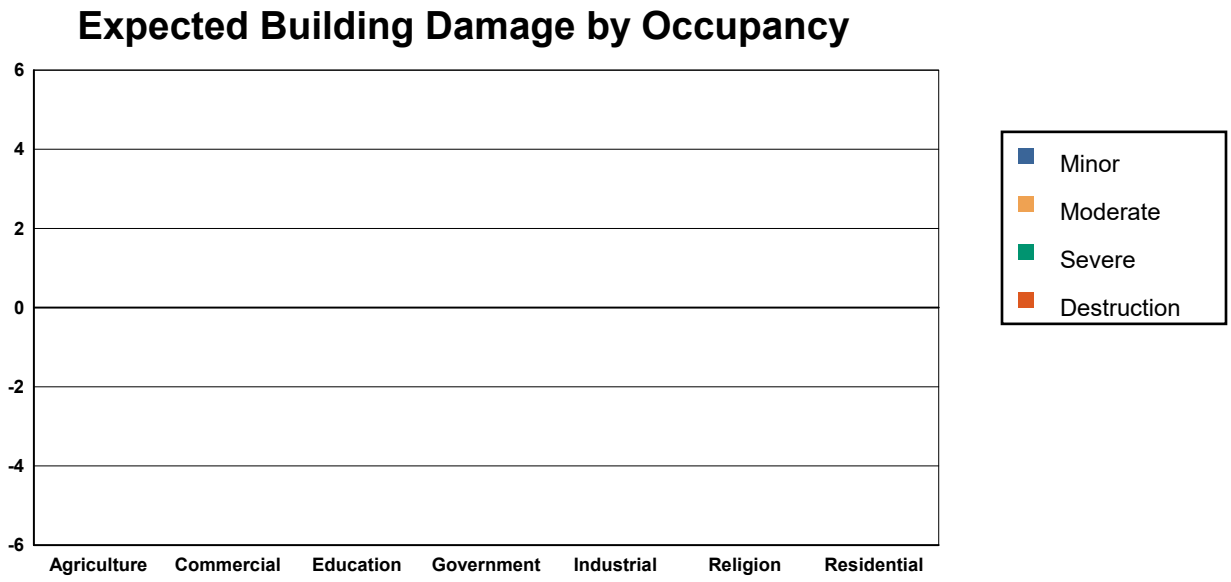


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	154.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	6.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	46.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	38.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	8.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	2,293.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**2,549.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	25	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	175	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	9	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	120	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	2,219	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

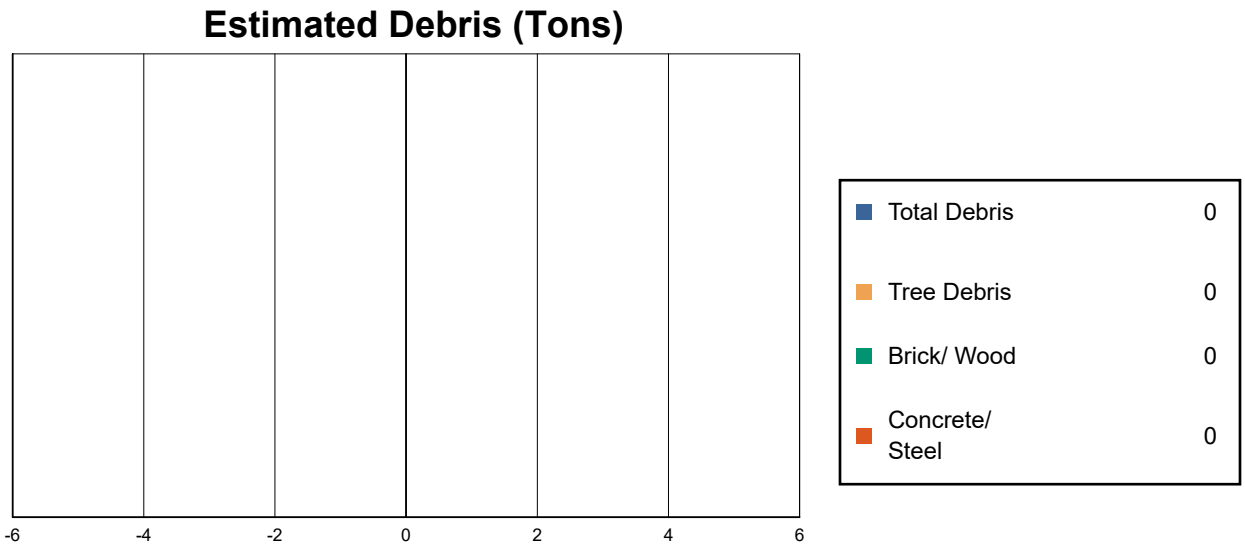
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

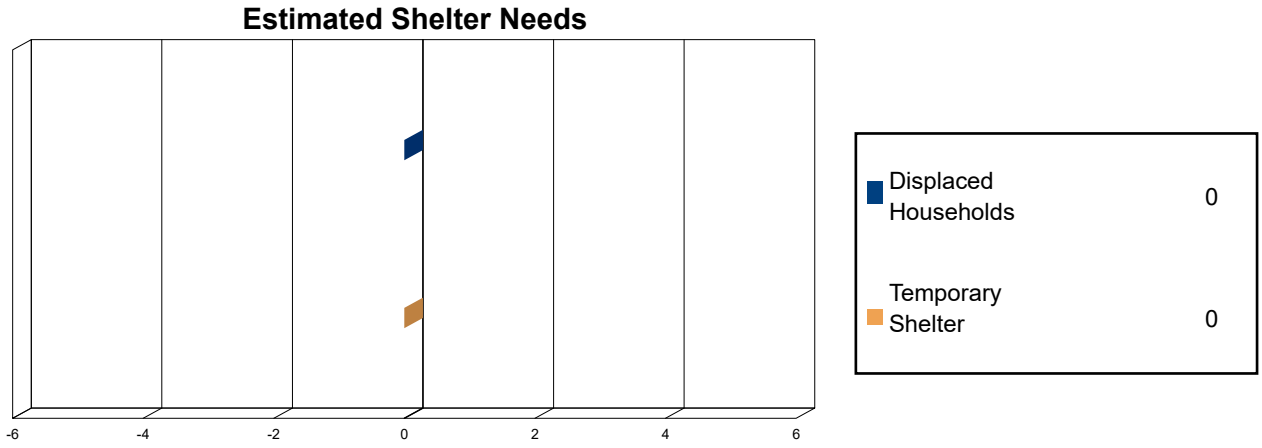


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 6,133) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

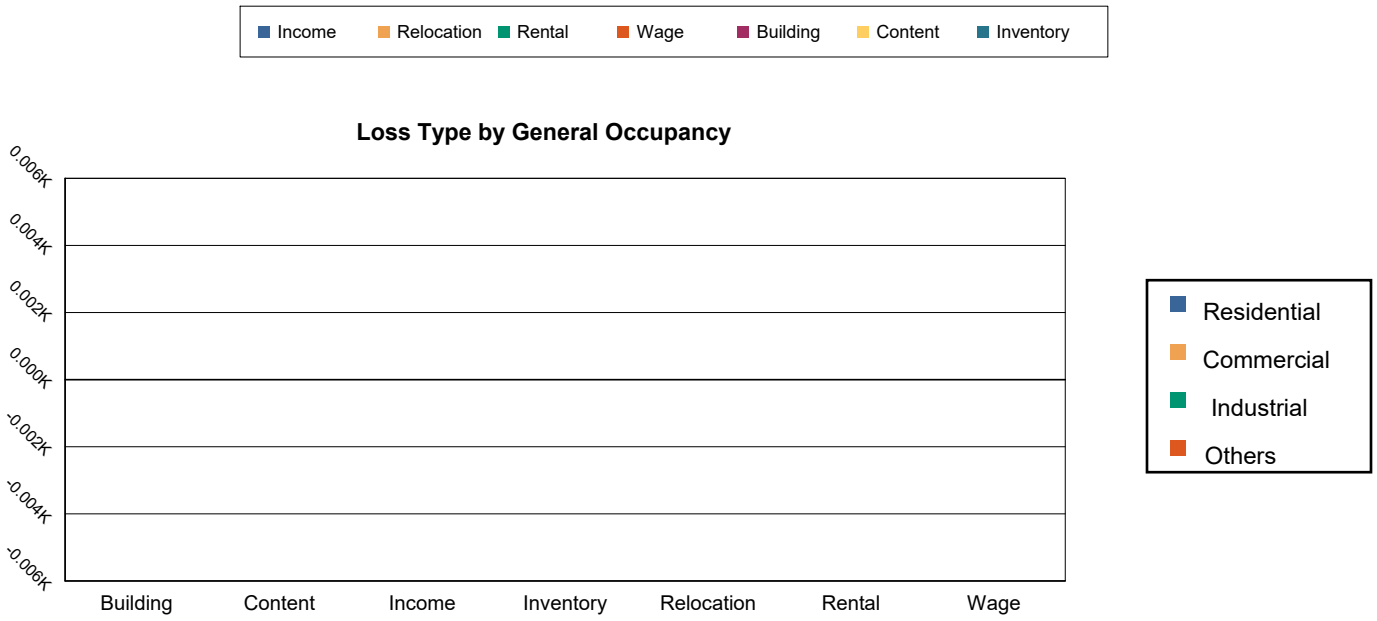


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,414	250,539	1,234,953
Total	**6,133**	**984,414**	**250,539**	**1,234,953**
Study Region Total	**6,133**	**984,414**	**250,539**	**1,234,953**

Hazus: Hurricane Global Risk Report

Region Name:	Marlborough_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 90% of the buildings (and 80% of the building value) are associated with residential housing.

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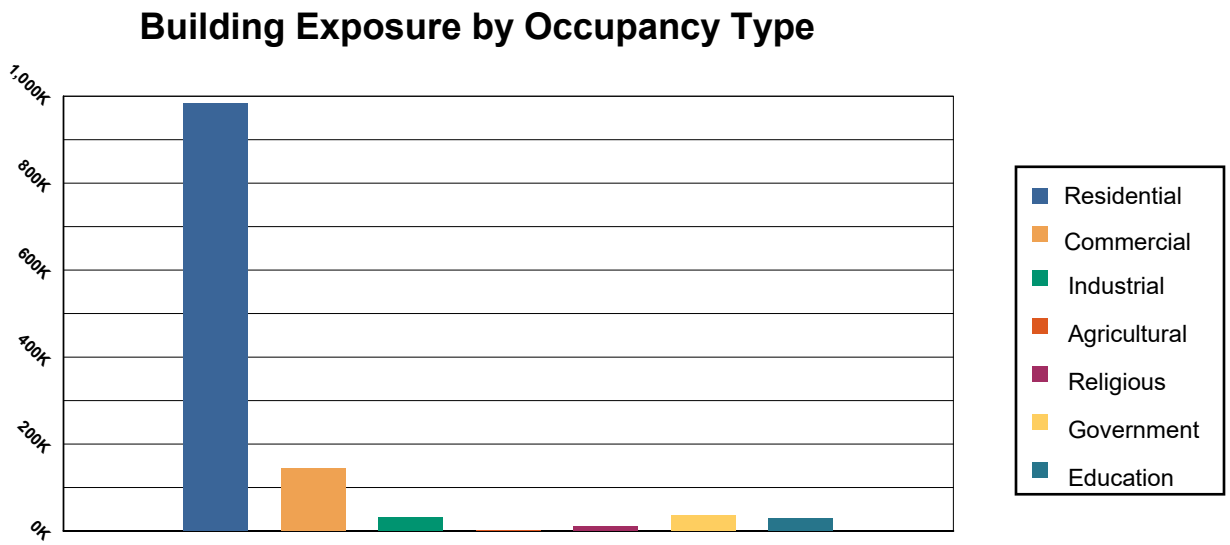


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	984,414	79.71%
Commercial	144,504	11.70%
Industrial	30,369	2.46%
Agricultural	1,006	0.08%
Religious	11,386	0.92%
Government	34,948	2.83%
Education	28,326	2.29%
Total	**1,234,953**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

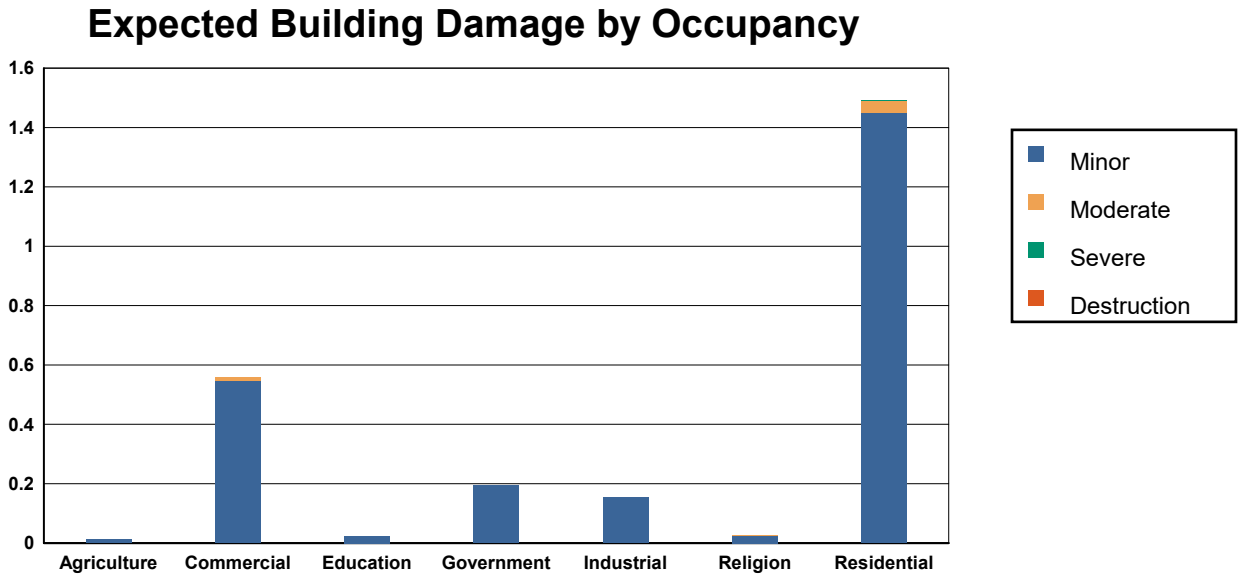


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	3.99	99.69	0.01	0.30	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	153.44	99.64	0.55	0.36	0.01	0.01	0.00	0.00	0.00	0.00
Education	5.98	99.60	0.02	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Government	45.81	99.58	0.19	0.42	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	37.85	99.59	0.15	0.41	0.00	0.00	0.00	0.00	0.00	0.00
Religion	7.98	99.69	0.02	0.30	0.00	0.01	0.00	0.00	0.00	0.00
Residential	2,291.51	99.93	1.45	0.06	0.04	0.00	0.00	0.00	0.00	0.00
Total	**2,546.54**		**2.41**		**0.05**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	25	99.55	0	0.45	0	0.00	0	0.00	0	0.00
Masonry	174	99.62	1	0.38	0	0.01	0	0.00	0	0.00
MH	9	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	120	99.59	0	0.41	0	0.00	0	0.00	0	0.00
Wood	2,218	99.94	1	0.06	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

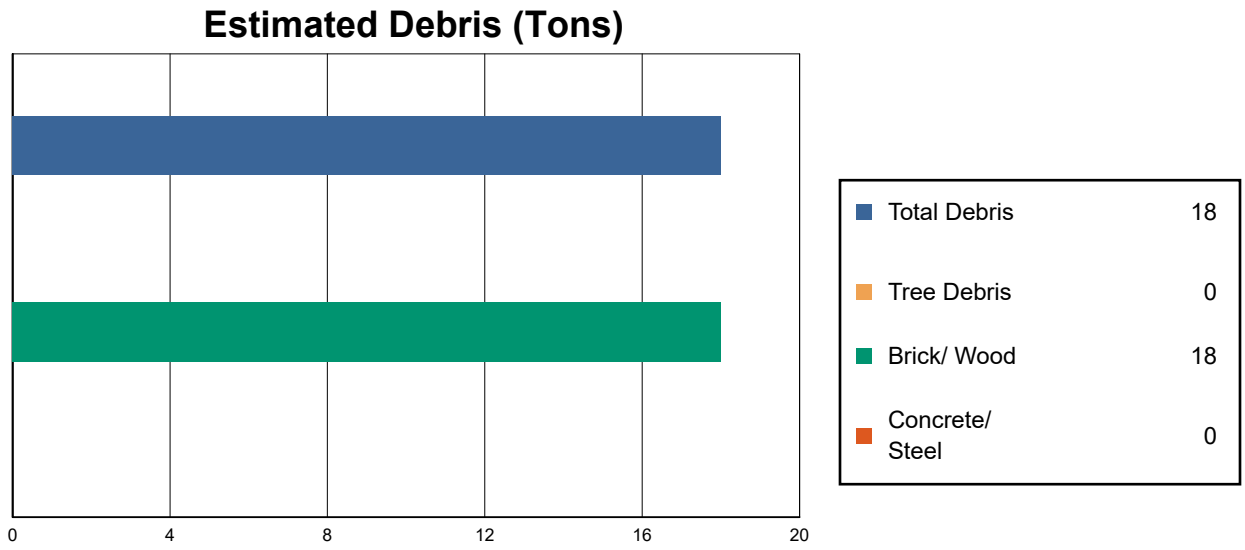
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

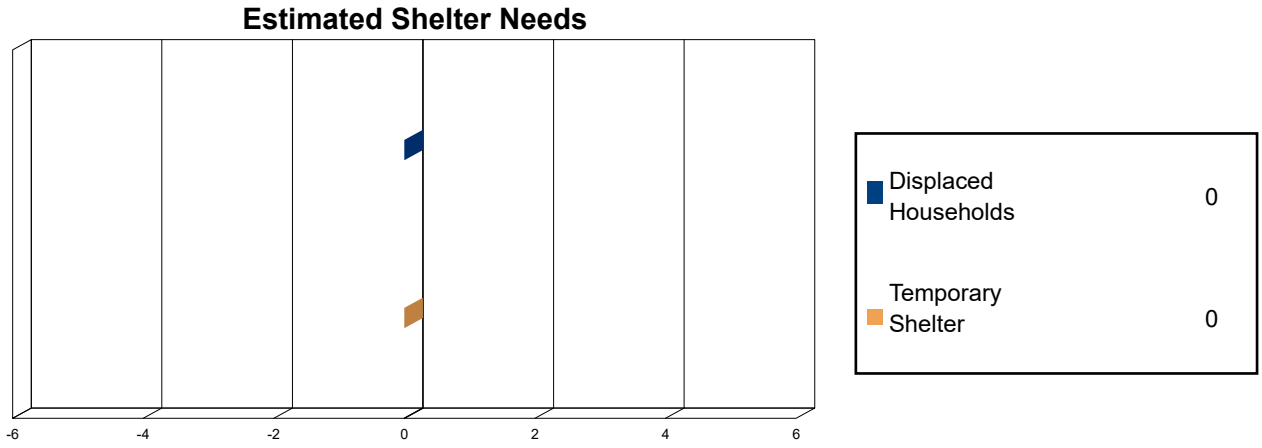


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 18 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 18 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 6,133) will seek temporary shelter in public shelters.

Economic Loss

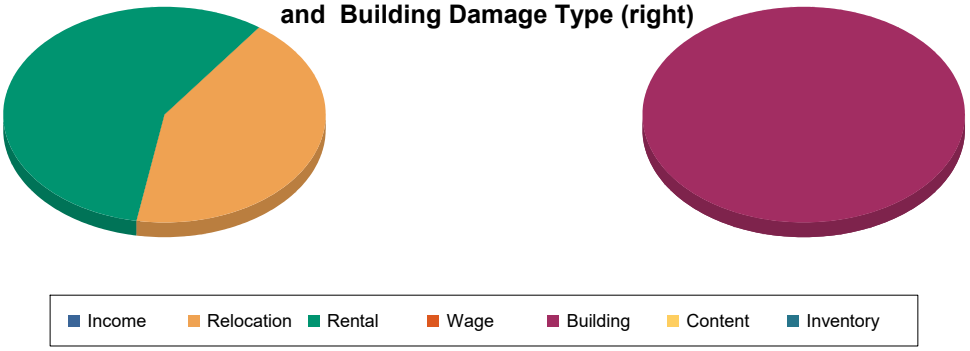
The total economic loss estimated for the hurricane is 0.4 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

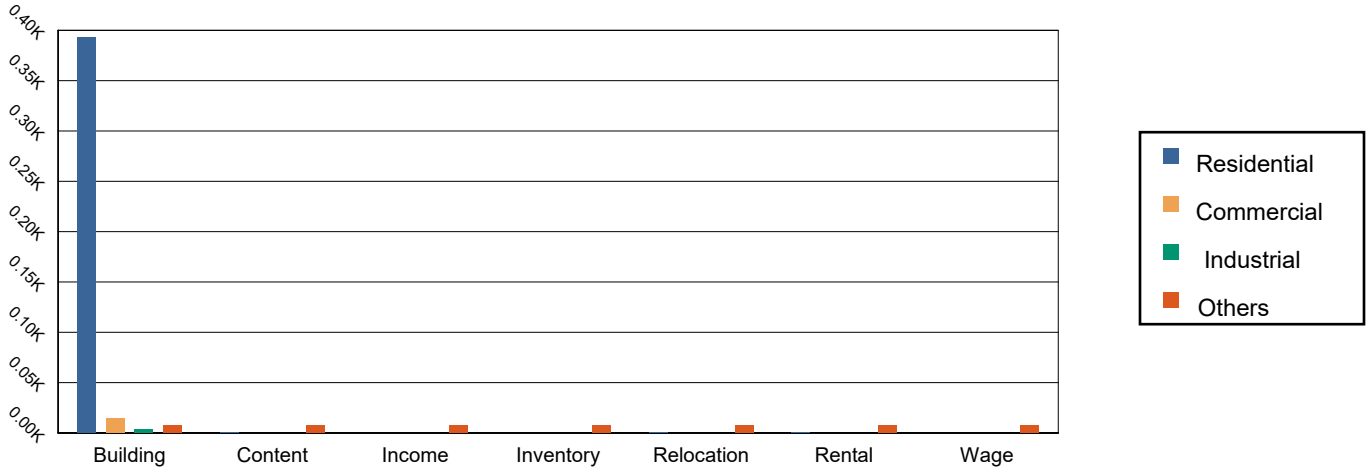


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	393.29	14.45	3.04	7.47	418.24
	Content	0.29	0.00	0.00	0.00	0.29
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**393.57**	**14.45**	**3.04**	**7.47**	**418.53**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.52	0.07	0.00	0.01	0.60
	Rental	0.80	0.00	0.00	0.00	0.80
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1.32**	**0.07**	**0.00**	**0.01**	**1.40**

Total

Total	**394.90**	**14.52**	**3.04**	**7.47**	**419.92**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,414	250,539	1,234,953
Total	**6,133**	**984,414**	**250,539**	**1,234,953**
Study Region Total	**6,133**	**984,414**	**250,539**	**1,234,953**

Hazus: Hurricane Global Risk Report

Region Name:	Marlborough_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 6,133 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 90% of the buildings (and 80% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

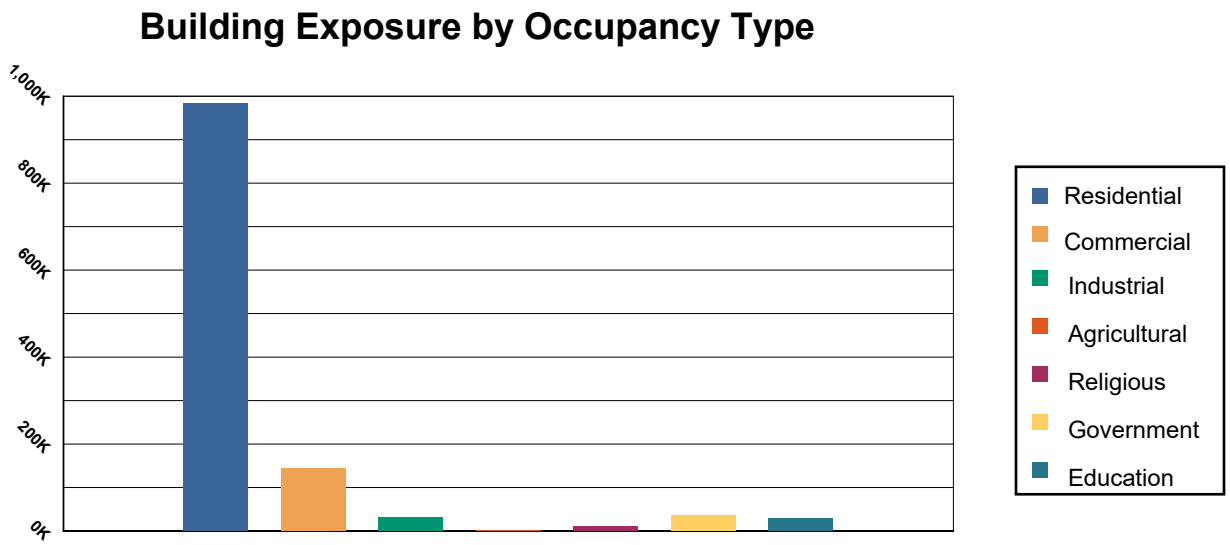


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	984,414	79.71%
Commercial	144,504	11.70%
Industrial	30,369	2.46%
Agricultural	1,006	0.08%
Religious	11,386	0.92%
Government	34,948	2.83%
Education	28,326	2.29%
Total	**1,234,953**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

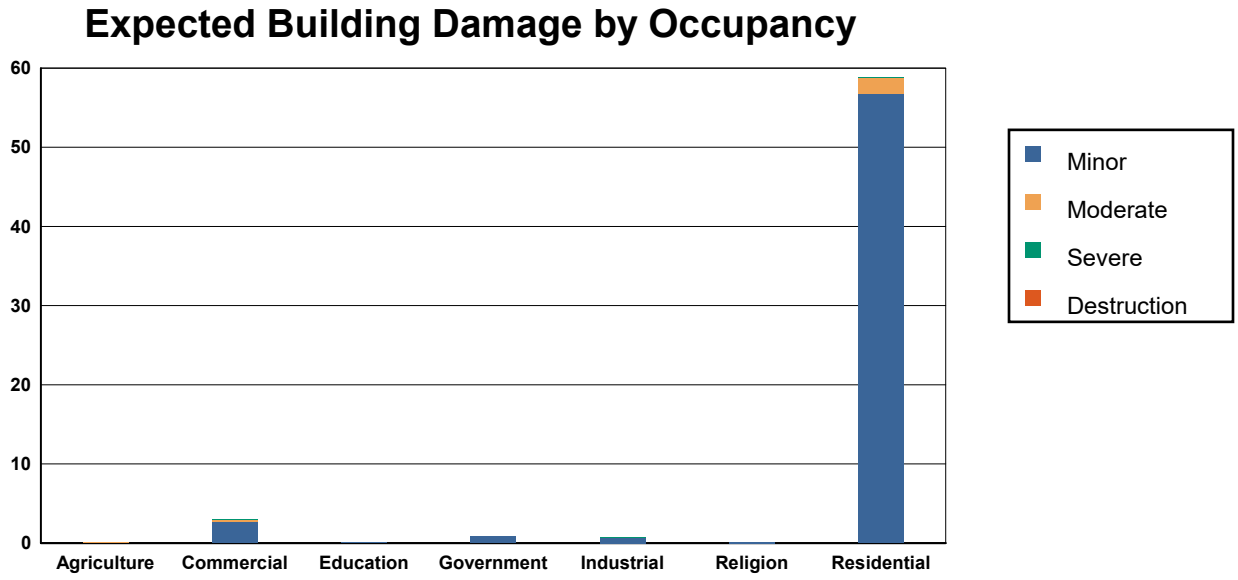


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	3.90	97.55	0.08	2.10	0.01	0.27	0.00	0.08	0.00	0.00
Commercial	150.97	98.03	2.64	1.71	0.37	0.24	0.02	0.02	0.00	0.00
Education	5.89	98.21	0.11	1.75	0.00	0.04	0.00	0.00	0.00	0.00
Government	45.17	98.20	0.81	1.77	0.01	0.03	0.00	0.00	0.00	0.00
Industrial	37.31	98.19	0.67	1.76	0.02	0.05	0.00	0.01	0.00	0.00
Religion	7.86	98.28	0.13	1.67	0.00	0.05	0.00	0.00	0.00	0.00
Residential	2,234.12	97.43	56.71	2.47	2.14	0.09	0.03	0.00	0.00	0.00
Total	**2,485.23**		**61.15**		**2.56**		**0.06**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	25	98.19	0	1.79	0	0.02	0	0.00	0	0.00
Masonry	171	97.54	4	2.26	0	0.19	0	0.01	0	0.00
MH	9	99.82	0	0.14	0	0.04	0	0.00	0	0.01
Steel	118	98.11	2	1.64	0	0.23	0	0.02	0	0.00
Wood	2,163	97.48	54	2.44	2	0.08	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

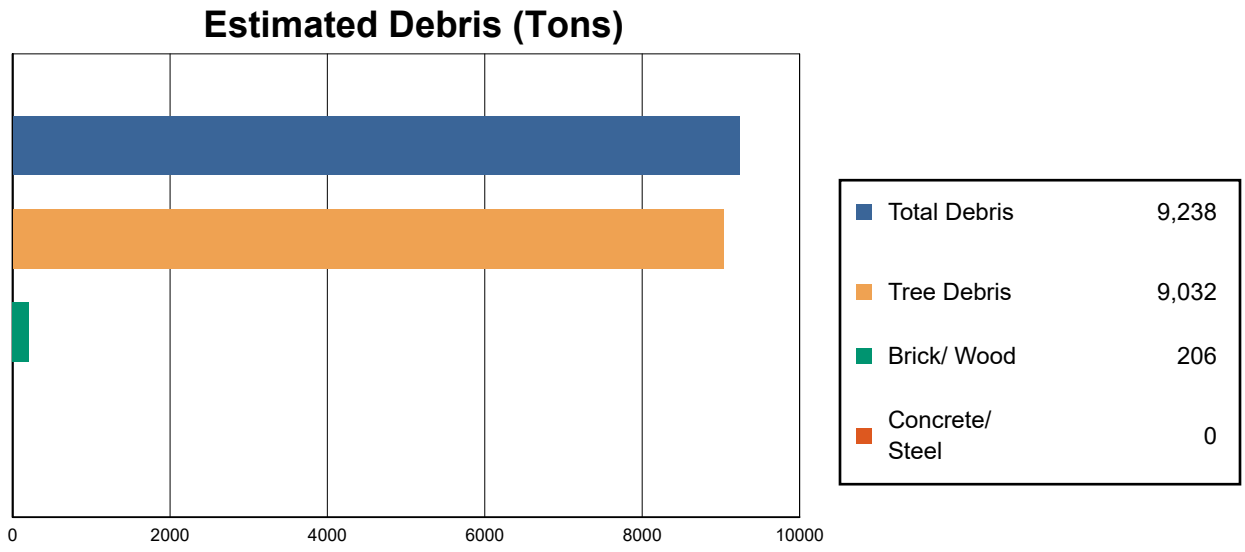
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

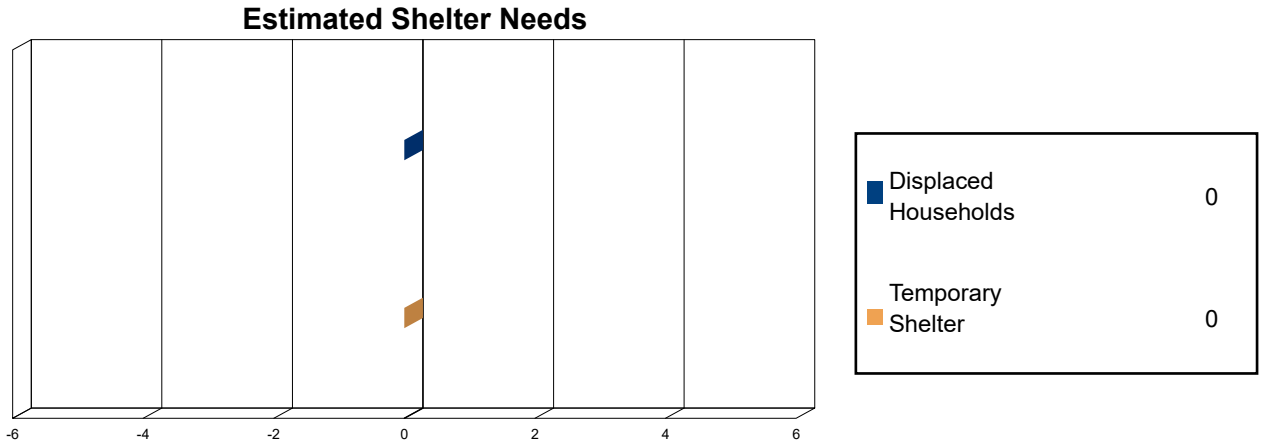


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 9,238 tons of debris will be generated. Of the total amount, 7,316 tons (79%) is Other Tree Debris. Of the remaining 1,922 tons, Brick/Wood comprises 11% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 8 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,716 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 6,133) will seek temporary shelter in public shelters.

Economic Loss

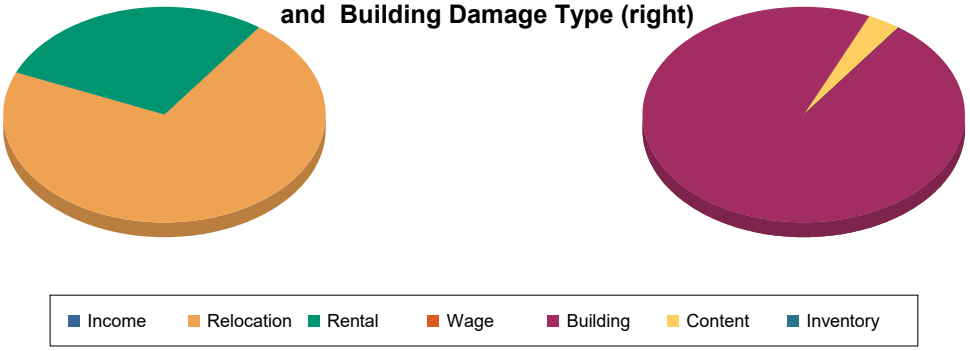
The total economic loss estimated for the hurricane is 3.6 million dollars, which represents 0.29 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 4 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

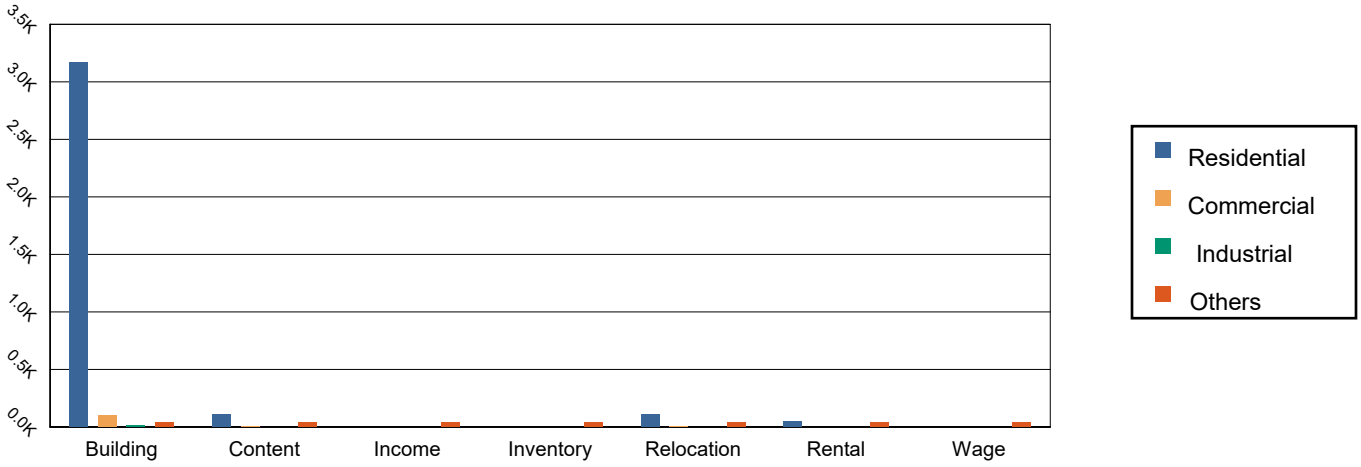


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,165.67	101.71	13.58	37.96	3,318.91
	Content	106.51	6.38	0.38	0.20	113.47
	Inventory	0.00	0.75	0.05	0.15	0.95
	Subtotal	**3,272.18**	**108.84**	**14.01**	**38.30**	**3,433.34**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	113.47	2.36	0.12	0.18	116.13
	Rental	46.58	0.00	0.00	0.00	46.58
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**160.05**	**2.36**	**0.12**	**0.18**	**162.71**

Total

Total	**3,432.24**	**111.20**	**14.13**	**38.49**	**3,596.05**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,414	250,539	1,234,953
Total	**6,133**	**984,414**	**250,539**	**1,234,953**
Study Region Total	**6,133**	**984,414**	**250,539**	**1,234,953**

Hazus: Hurricane Global Risk Report

Region Name:	Marlborough_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

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There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 90% of the buildings (and 80% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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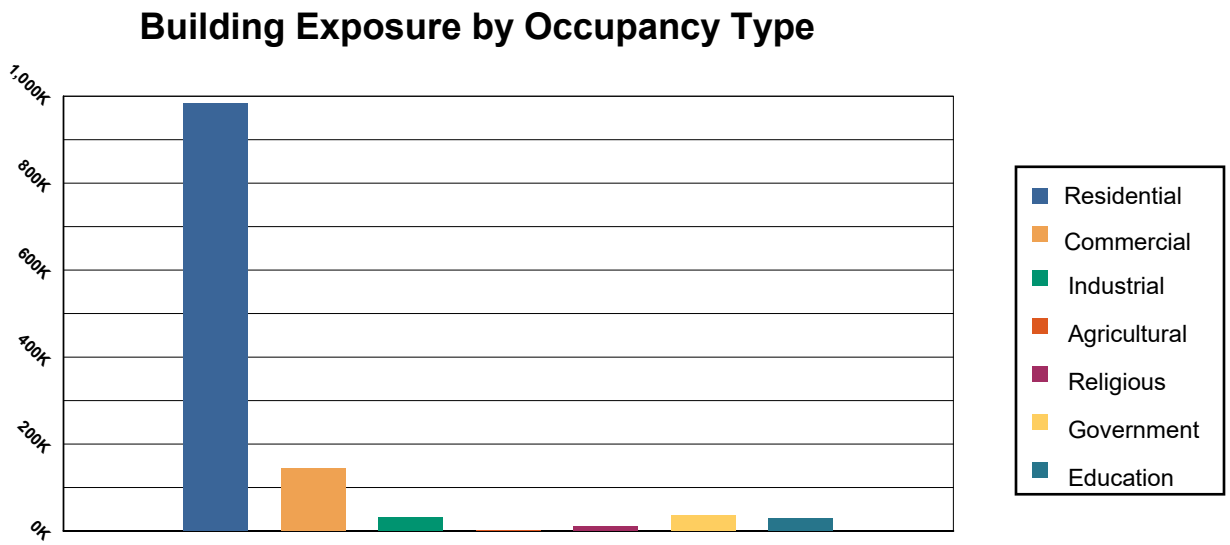

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
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Commercial	144,504	11.70%
Industrial	30,369	2.46%
Agricultural	1,006	0.08%
Religious	11,386	0.92%
Government	34,948	2.83%
Education	28,326	2.29%
Total	**1,234,953**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 14 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

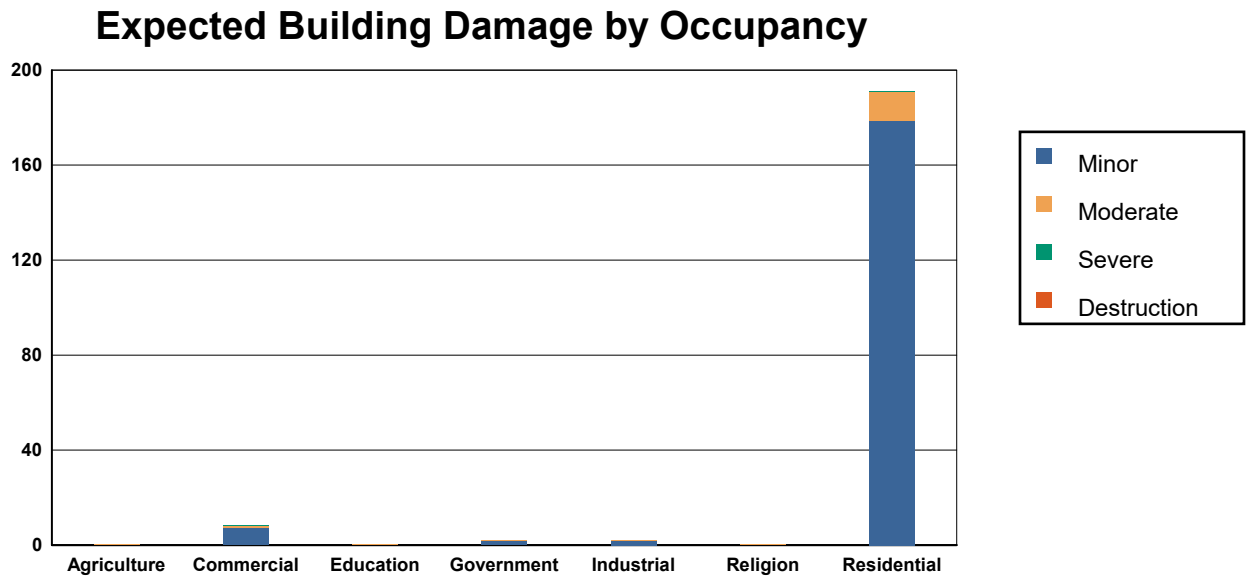


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	3.69	92.23	0.25	6.15	0.04	1.10	0.02	0.49	0.00	0.03
Commercial	145.44	94.44	7.08	4.60	1.28	0.83	0.21	0.14	0.00	0.00
Education	5.71	95.17	0.28	4.59	0.01	0.24	0.00	0.00	0.00	0.00
Government	43.83	95.28	2.07	4.49	0.11	0.23	0.00	0.00	0.00	0.00
Industrial	36.13	95.09	1.72	4.53	0.13	0.34	0.02	0.04	0.00	0.00
Religion	7.58	94.74	0.40	5.00	0.02	0.25	0.00	0.01	0.00	0.00
Residential	2,102.00	91.67	178.62	7.79	12.29	0.54	0.09	0.00	0.00	0.00
Total	**2,344.38**		**190.41**		**13.87**		**0.34**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	24	95.39	1	4.37	0	0.24	0	0.00	0	0.00
Masonry	163	93.36	10	5.85	1	0.75	0	0.03	0	0.00
MH	9	98.67	0	1.00	0	0.27	0	0.00	0	0.05
Steel	114	95.01	5	4.01	1	0.82	0	0.16	0	0.00
Wood	2,035	91.73	172	7.77	11	0.49	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

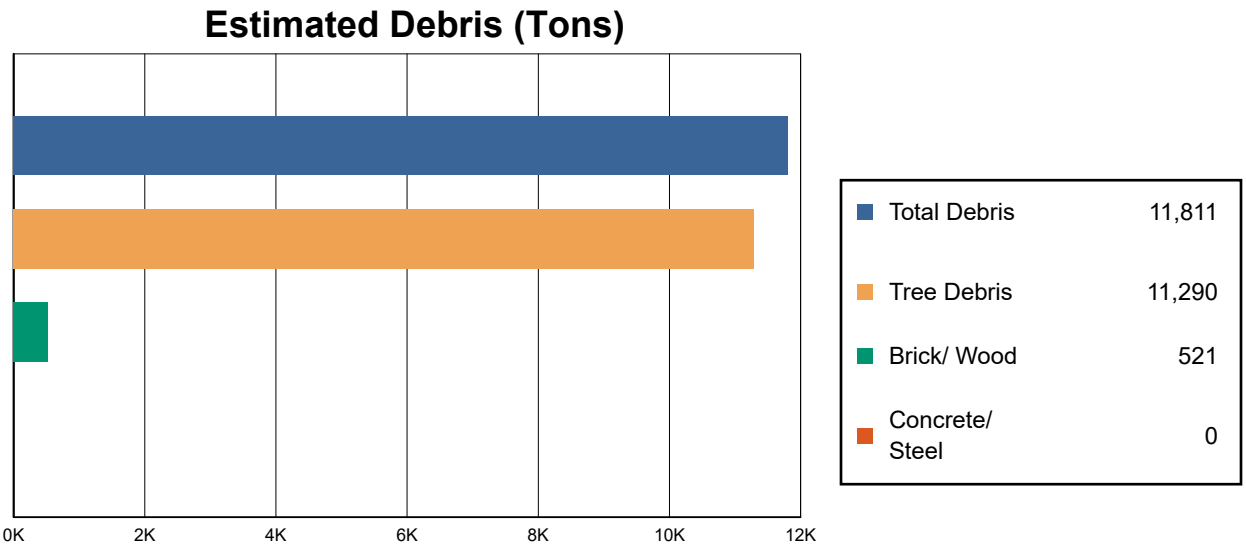
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

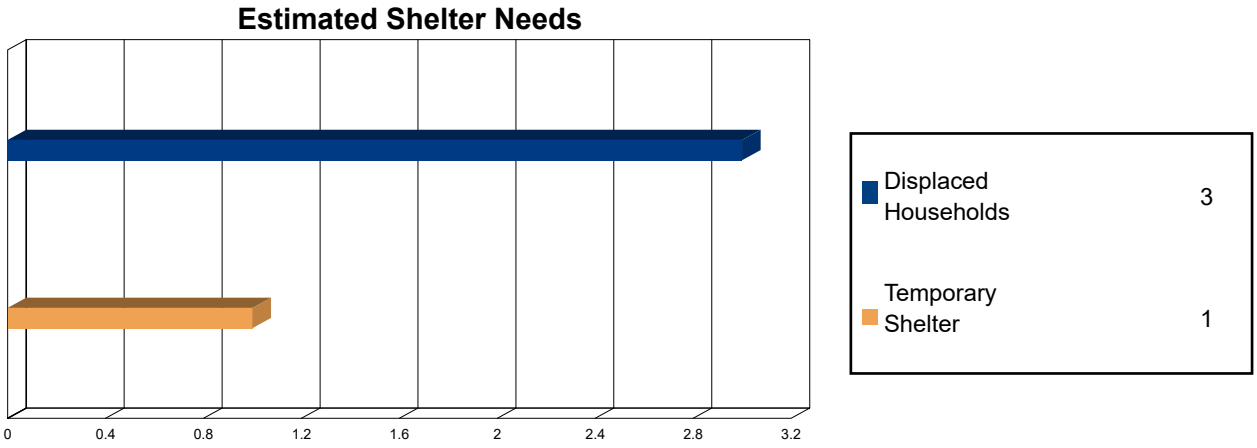


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 11,811 tons of debris will be generated. Of the total amount, 9,145 tons (77%) is Other Tree Debris. Of the remaining 2,666 tons, Brick/Wood comprises 20% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 21 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,145 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 3 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 6,133) will seek temporary shelter in public shelters.

Economic Loss

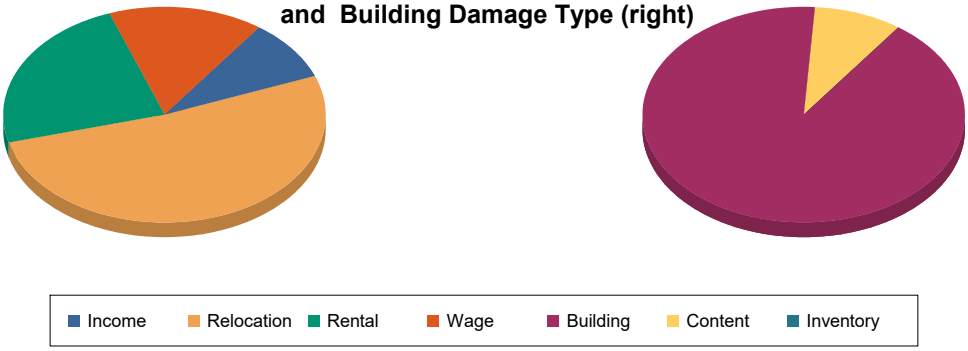
The total economic loss estimated for the hurricane is 7.6 million dollars, which represents 0.62 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 8 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 92% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

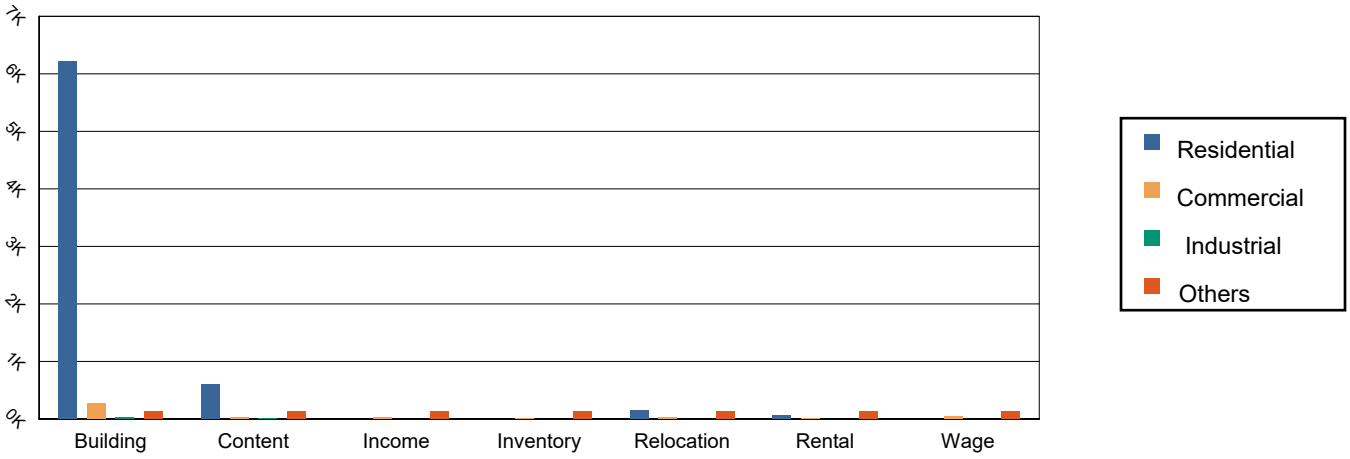


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	6,209.06	262.78	34.28	98.40	6,604.52
	Content	599.30	35.14	5.47	5.91	645.82
	Inventory	0.00	4.07	0.59	0.59	5.25
	Subtotal	**6,808.36**	**301.99**	**40.34**	**104.91**	**7,255.60**
Business Interruption Loss						
	Income	0.00	25.94	0.02	6.28	32.24
	Relocation	147.30	27.34	0.88	5.38	180.91
	Rental	67.34	13.86	0.02	0.46	81.67
	Wage	0.00	40.04	0.04	14.81	54.88
	Subtotal	**214.64**	**107.17**	**0.97**	**26.93**	**349.71**

Total

Total	7,023.00	409.17	41.31	131.83	7,605.31

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,414	250,539	1,234,953
Total	**6,133**	**984,414**	**250,539**	**1,234,953**
Study Region Total	**6,133**	**984,414**	**250,539**	**1,234,953**

Hazus: Hurricane Global Risk Report

Region Name:	Marlborough_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 6,133 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 90% of the buildings (and 80% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

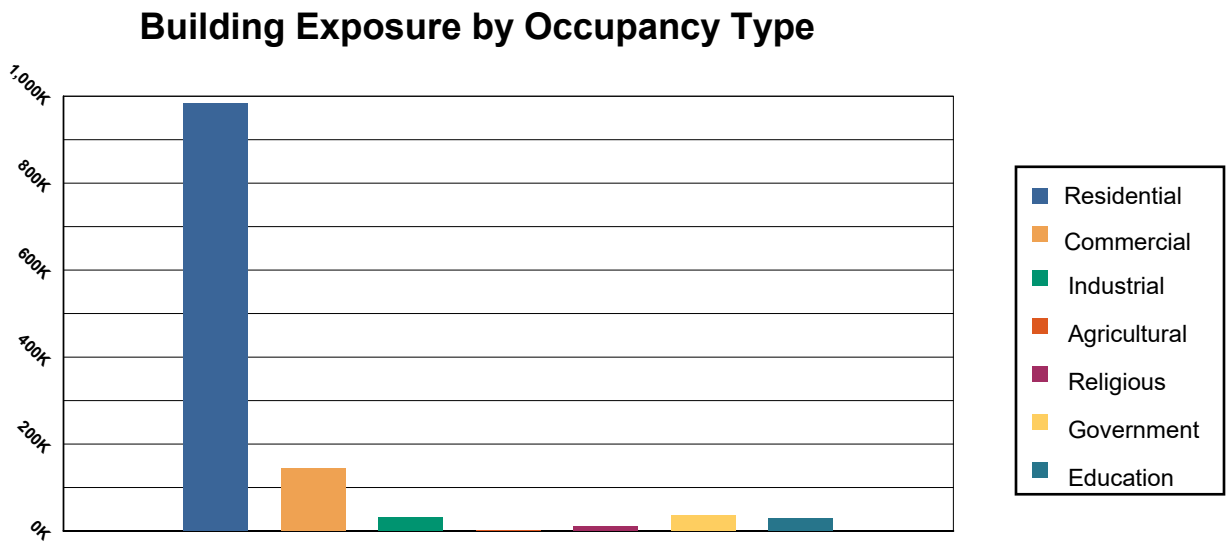


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	984,414	79.71%
Commercial	144,504	11.70%
Industrial	30,369	2.46%
Agricultural	1,006	0.08%
Religious	11,386	0.92%
Government	34,948	2.83%
Education	28,326	2.29%
Total	**1,234,953**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 47 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

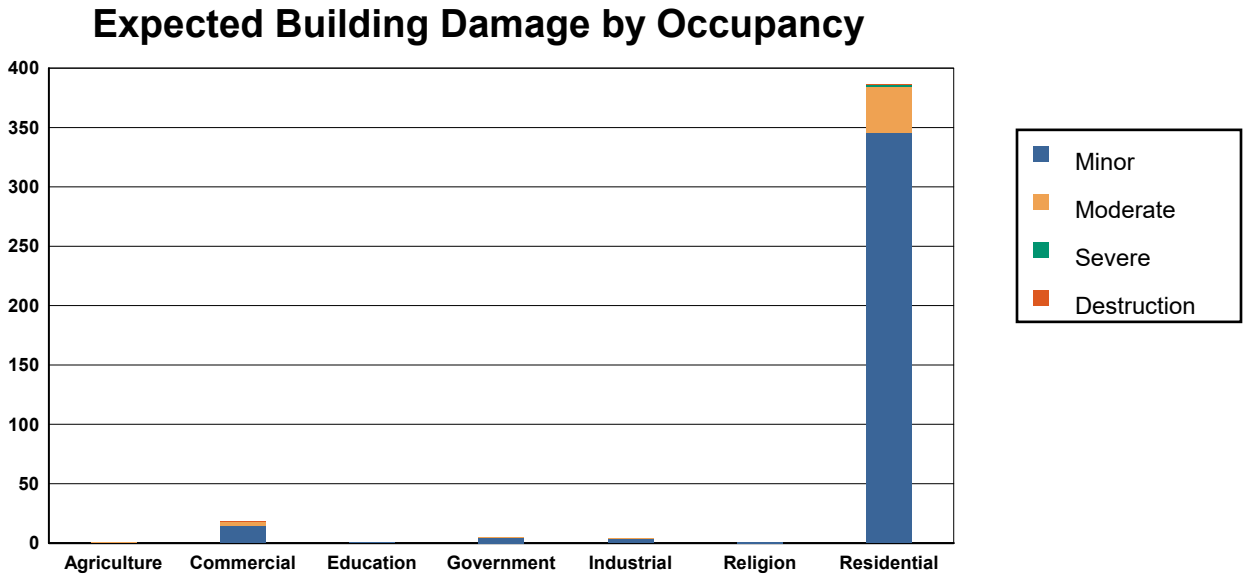


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	3.35	83.74	0.48	12.00	0.11	2.78	0.05	1.35	0.01	0.13
Commercial	135.41	87.93	14.57	9.46	3.27	2.12	0.75	0.49	0.00	0.00
Education	5.36	89.27	0.57	9.52	0.07	1.16	0.00	0.05	0.00	0.00
Government	41.19	89.54	4.26	9.25	0.54	1.17	0.02	0.04	0.00	0.00
Industrial	33.87	89.12	3.53	9.29	0.53	1.40	0.07	0.18	0.00	0.01
Religion	7.06	88.22	0.85	10.62	0.09	1.11	0.00	0.05	0.00	0.00
Residential	1,906.34	83.14	345.20	15.05	39.50	1.72	1.29	0.06	0.67	0.03
Total	**2,132.57**		**369.46**		**44.10**		**2.19**		**0.68**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	22	89.81	2	8.95	0	1.21	0	0.04	0	0.00
Masonry	151	86.46	20	11.30	4	2.12	0	0.11	0	0.01
MH	9	95.40	0	3.08	0	1.22	0	0.02	0	0.28
Steel	107	89.10	10	8.17	3	2.13	1	0.59	0	0.00
Wood	1,846	83.17	335	15.11	36	1.64	1	0.06	1	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

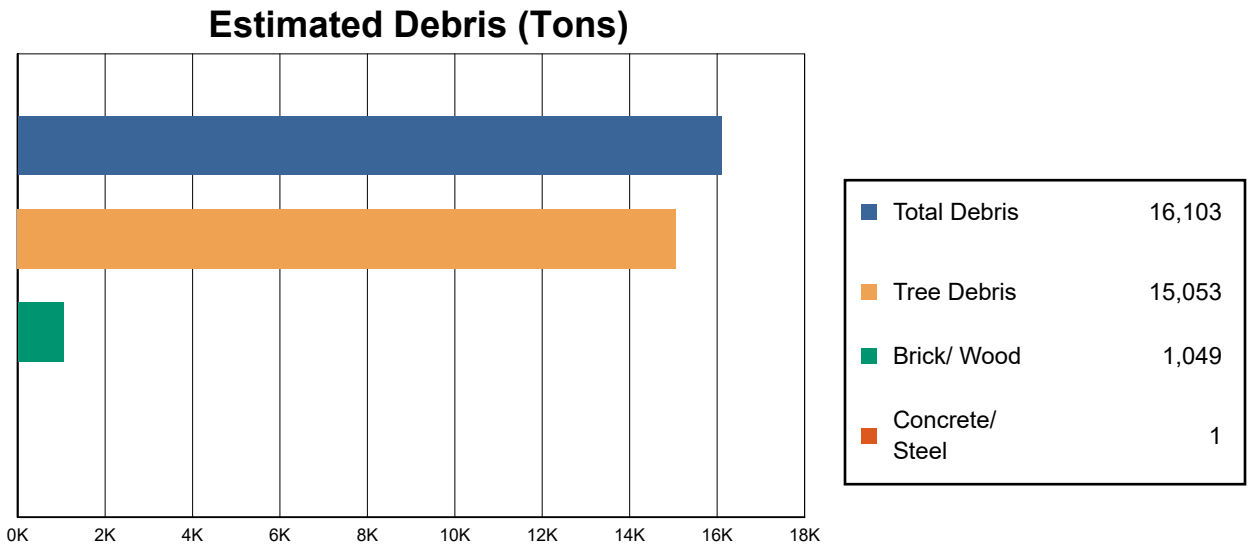
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

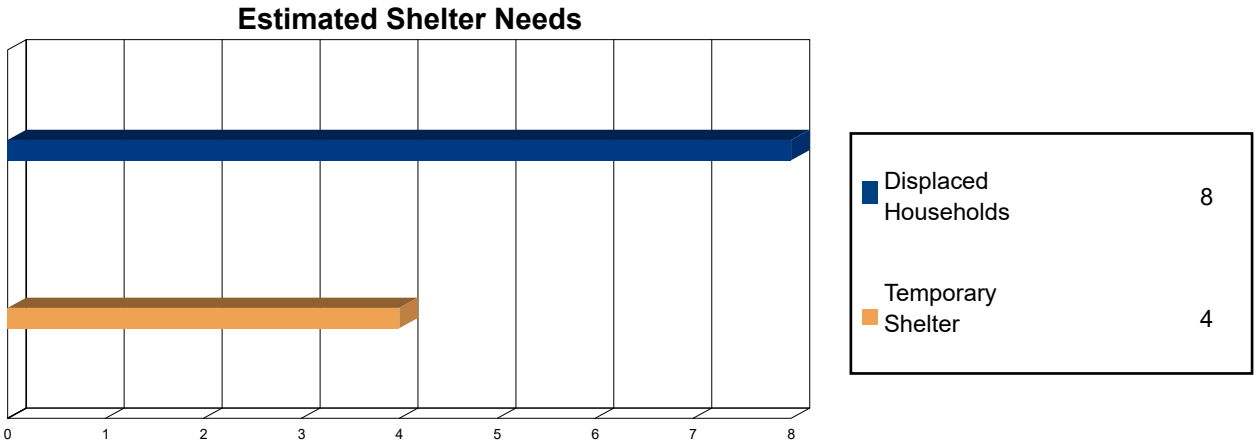


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 16,103 tons of debris will be generated. Of the total amount, 12,193 tons (76%) is Other Tree Debris. Of the remaining 3,910 tons, Brick/Wood comprises 27% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 42 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,860 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 8 households to be displaced due to the hurricane. Of these, 4 people (out of a total population of 6,133) will seek temporary shelter in public shelters.

Economic Loss

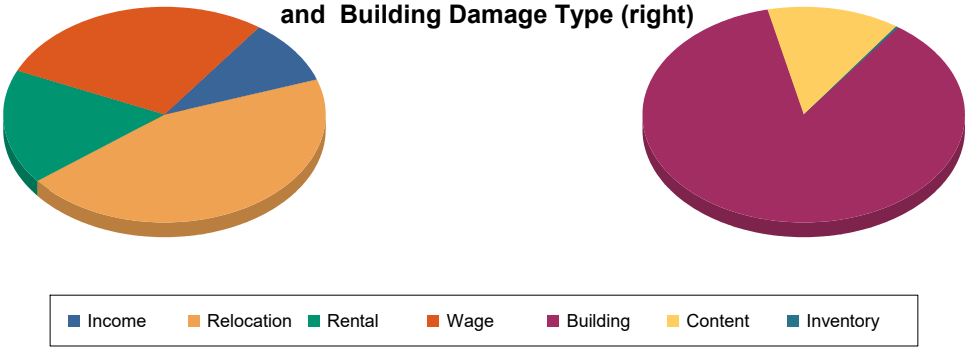
The total economic loss estimated for the hurricane is 15.1 million dollars, which represents 1.22 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 15 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

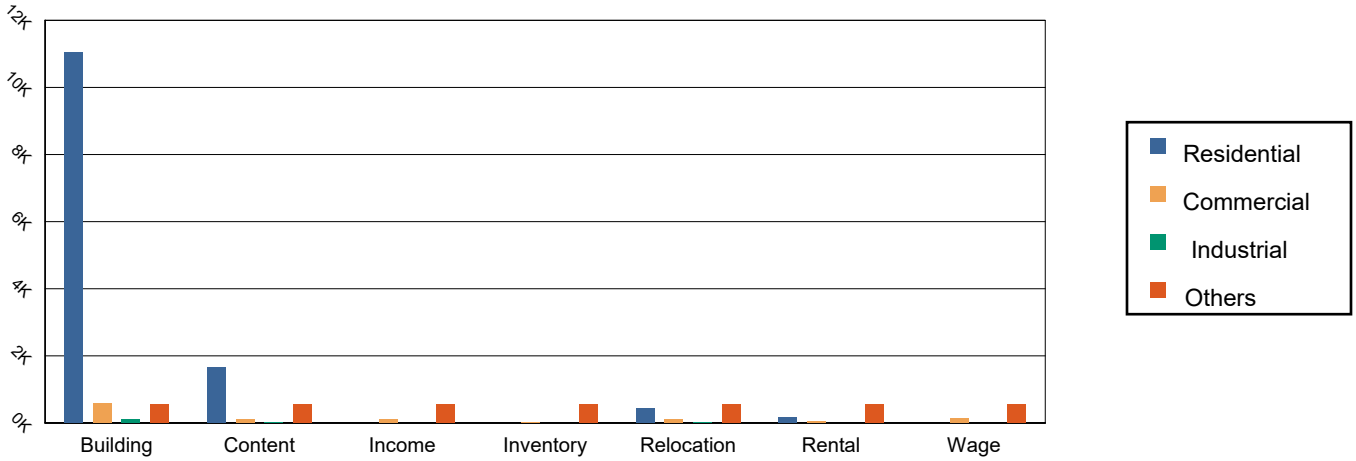


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	11,026.67	588.22	91.09	227.74	11,933.71
	Content	1,669.41	121.75	28.51	32.19	1,851.86
	Inventory	0.00	15.85	3.18	2.22	21.25
	Subtotal	**12,696.08**	**725.81**	**122.78**	**262.14**	**13,806.81**
Business Interruption Loss						
	Income	0.00	99.07	1.50	21.73	122.30
	Relocation	428.43	90.42	6.98	38.51	564.34
	Rental	157.87	50.74	0.89	7.59	217.09
	Wage	0.00	128.65	2.59	228.00	359.24
	Subtotal	**586.30**	**368.88**	**11.95**	**295.82**	**1,262.96**

Total

Total	**13,282.38**	**1,094.69**	**134.73**	**557.97**	**15,069.77**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,414	250,539	1,234,953
Total	**6,133**	**984,414**	**250,539**	**1,234,953**
Study Region Total	**6,133**	**984,414**	**250,539**	**1,234,953**

Hazus: Hurricane Global Risk Report

Region Name:	Marlborough_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 6,133 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 90% of the buildings (and 80% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

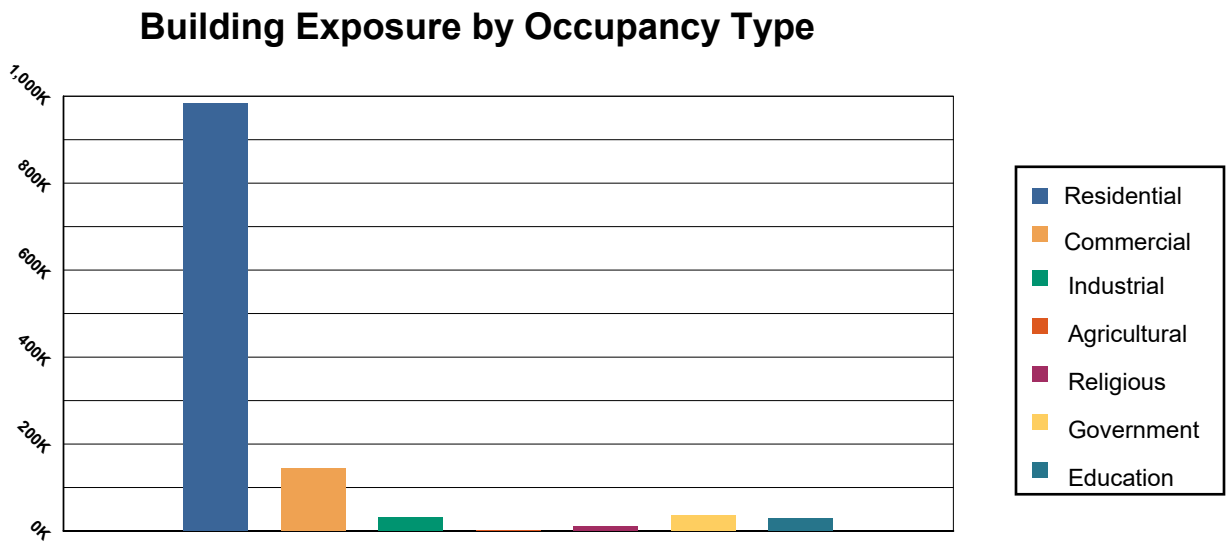


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	984,414	79.71%
Commercial	144,504	11.70%
Industrial	30,369	2.46%
Agricultural	1,006	0.08%
Religious	11,386	0.92%
Government	34,948	2.83%
Education	28,326	2.29%
Total	**1,234,953**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 130 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

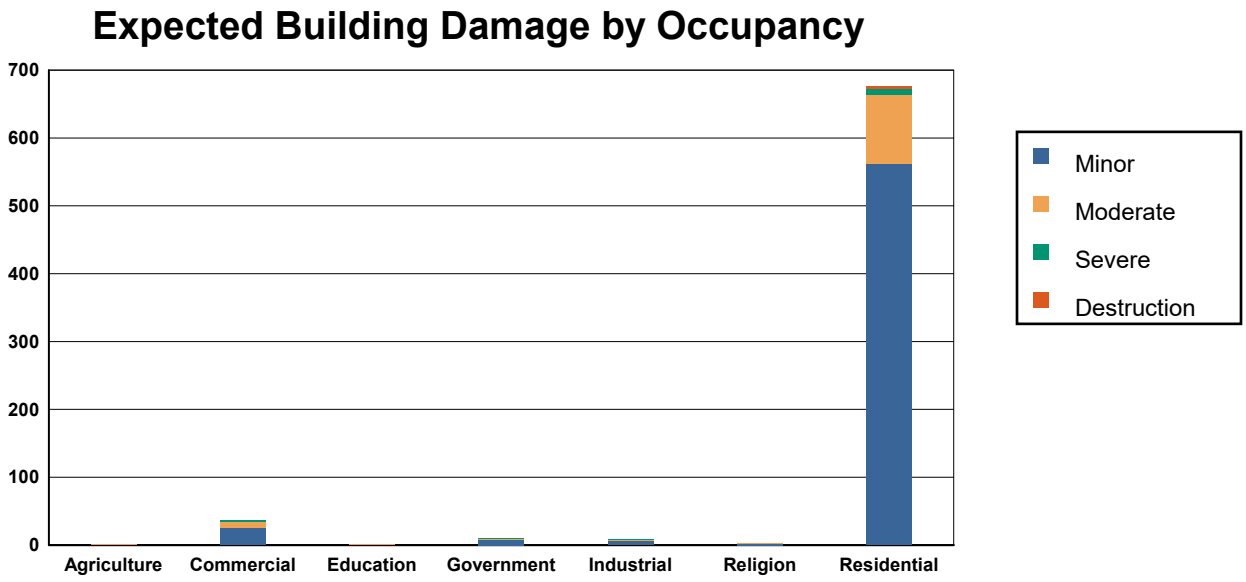


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	2.82	70.49	0.80	20.03	0.25	6.13	0.12	2.95	0.02	0.40
Commercial	117.43	76.25	25.99	16.87	8.58	5.57	1.99	1.29	0.02	0.01
Education	4.68	77.97	1.03	17.22	0.27	4.53	0.02	0.28	0.00	0.00
Government	36.03	78.34	7.70	16.75	2.13	4.64	0.13	0.28	0.00	0.00
Industrial	29.56	77.78	6.33	16.65	1.87	4.92	0.24	0.62	0.01	0.03
Religion	6.12	76.48	1.53	19.11	0.33	4.15	0.02	0.26	0.00	0.00
Residential	1,616.96	70.52	562.46	24.53	101.30	4.42	7.87	0.34	4.40	0.19
Total	**1,813.59**		**605.84**		**114.73**		**10.39**		**4.45**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	20	78.70	4	16.21	1	4.79	0	0.30	0	0.00
Masonry	131	74.73	33	19.08	10	5.70	1	0.43	0	0.07
MH	8	88.21	1	6.66	0	3.91	0	0.18	0	1.04
Steel	93	77.82	18	14.78	7	5.78	2	1.60	0	0.02
Wood	1,565	70.51	548	24.69	95	4.28	8	0.34	4	0.18

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

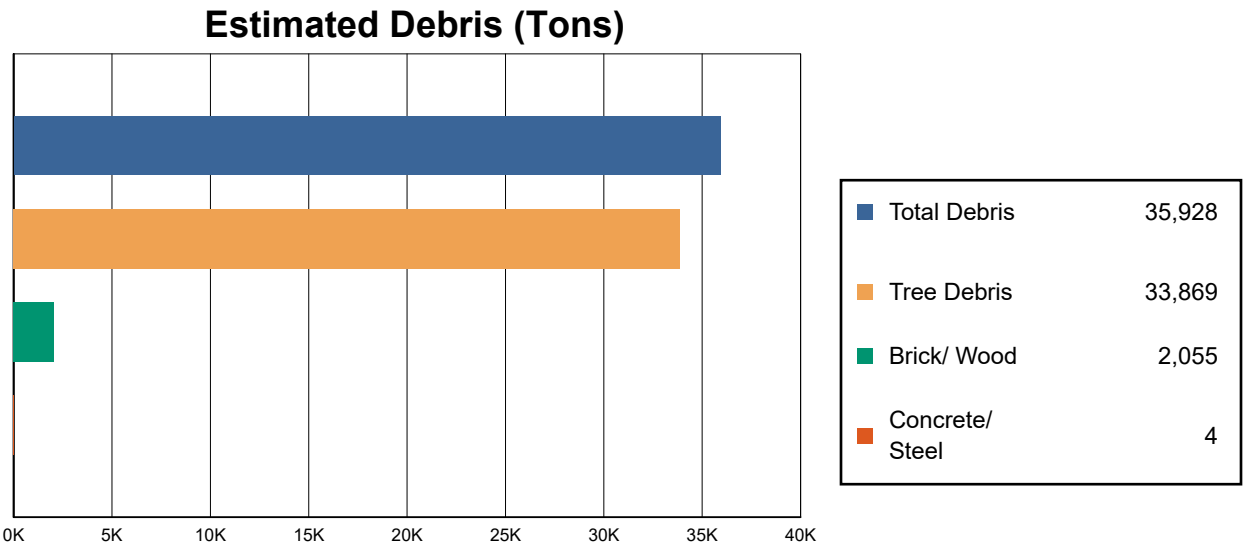
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	1	0	0	1

Induced Hurricane Damage

Debris Generation

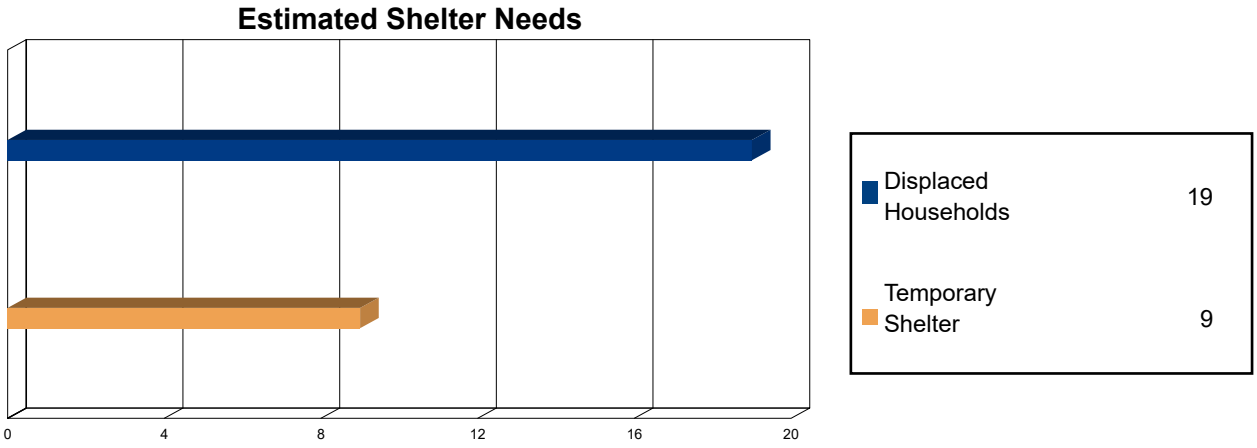


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 35,928 tons of debris will be generated. Of the total amount, 27,434 tons (76%) is Other Tree Debris. Of the remaining 8,494 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 82 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,435 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 19 households to be displaced due to the hurricane. Of these, 9 people (out of a total population of 6,133) will seek temporary shelter in public shelters.

Economic Loss

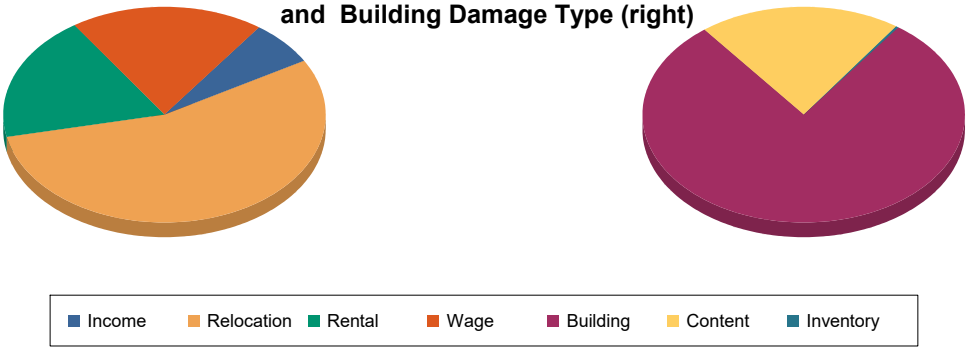
The total economic loss estimated for the hurricane is 33.0 million dollars, which represents 2.67 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 33 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

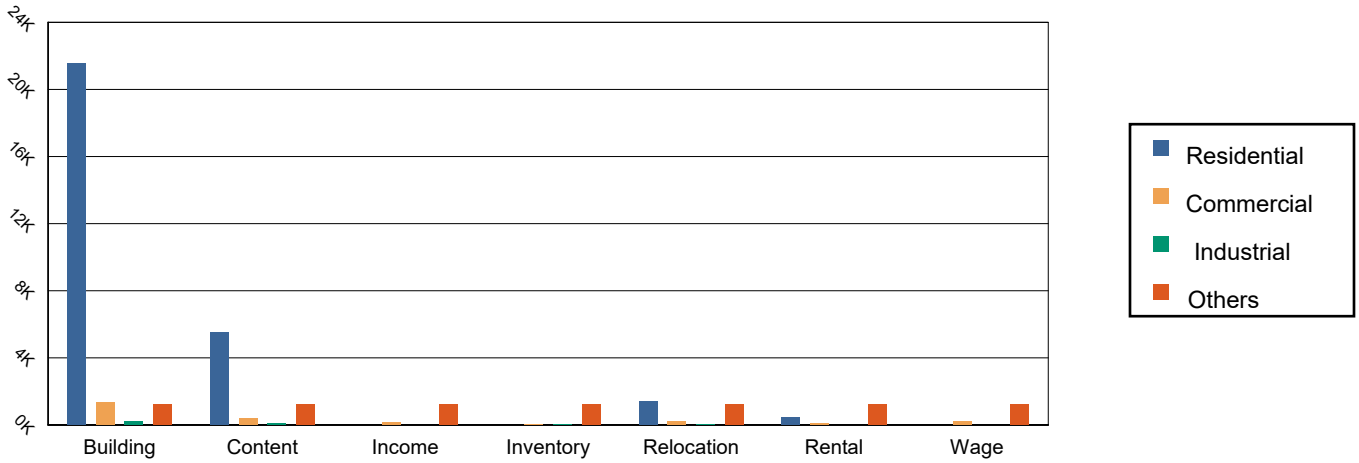


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	21,567.93	1,318.08	229.73	545.79	23,661.53
	Content	5,504.75	377.97	92.57	125.14	6,100.43
	Inventory	0.00	45.43	10.36	5.84	61.64
	Subtotal	**27,072.68**	**1,741.48**	**332.66**	**676.78**	**29,823.60**
Business Interruption Loss						
	Income	0.00	167.48	2.59	40.06	210.13
	Relocation	1,424.76	204.14	20.75	94.66	1,744.31
	Rental	469.01	107.58	1.96	15.66	594.22
	Wage	0.00	223.54	4.45	389.10	617.09
	Subtotal	**1,893.78**	**702.75**	**29.76**	**539.47**	**3,165.75**

Total

Total	**28,966.46**	**2,444.23**	**362.41**	**1,216.25**	**32,989.35**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,414	250,539	1,234,953
Total	**6,133**	**984,414**	**250,539**	**1,234,953**
Study Region Total	**6,133**	**984,414**	**250,539**	**1,234,953**

Hazus: Hurricane Global Risk Report

Region Name:	Marlborough_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 6,133 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,235 million dollars. Approximately 90% of the buildings (and 80% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,549 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

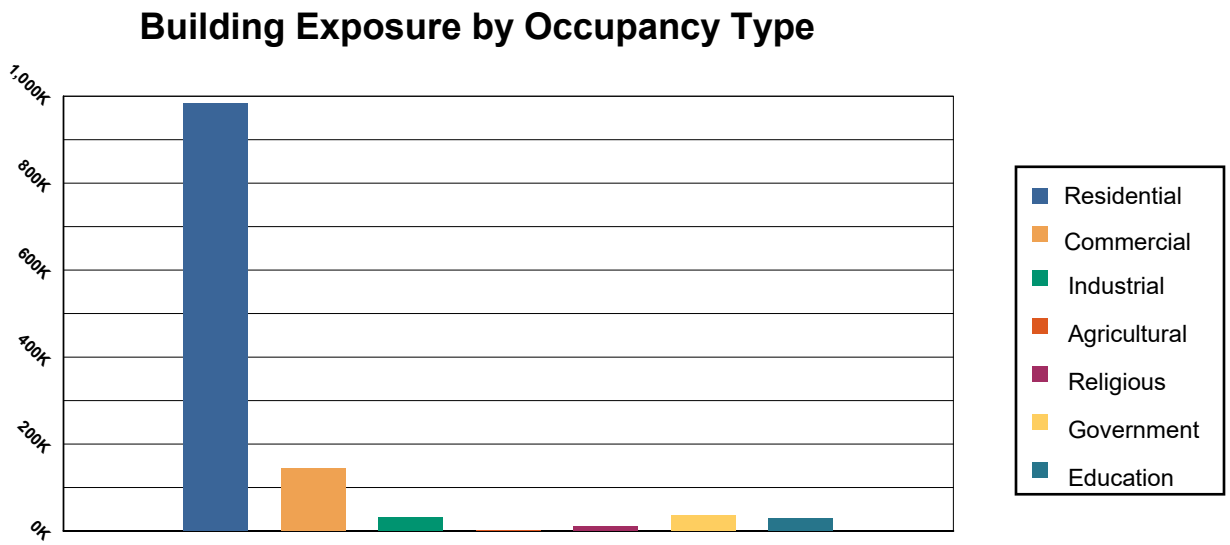


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	984,414	79.71%
Commercial	144,504	11.70%
Industrial	30,369	2.46%
Agricultural	1,006	0.08%
Religious	11,386	0.92%
Government	34,948	2.83%
Education	28,326	2.29%
Total	**1,234,953**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 206 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. There are an estimated 10 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

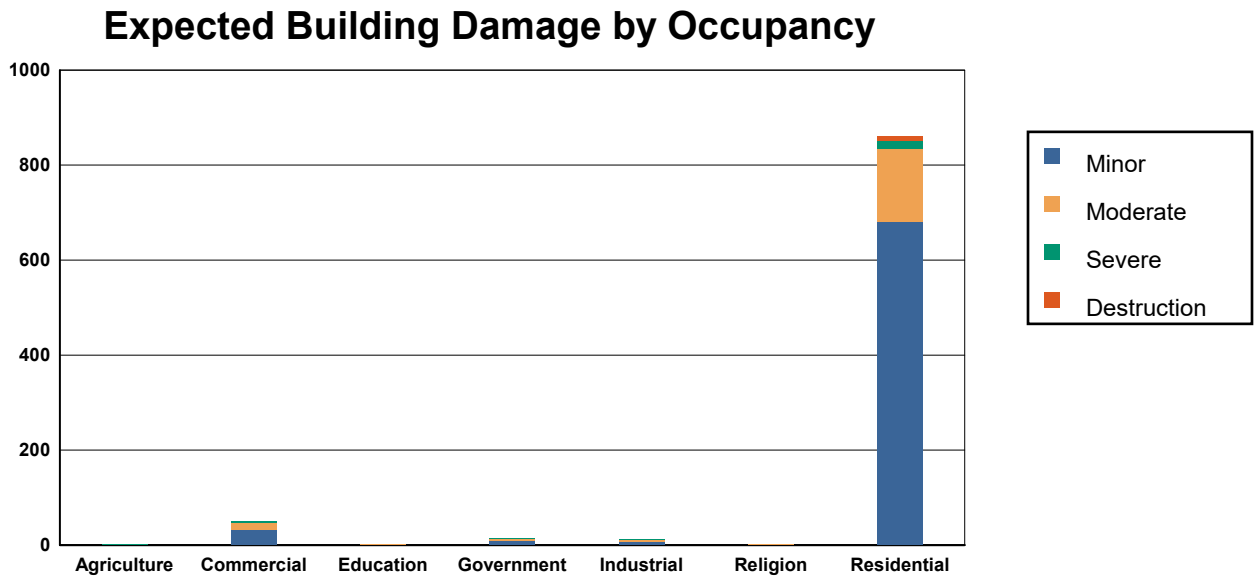


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	2.46	61.62	0.99	24.67	0.35	8.85	0.17	4.23	0.03	0.63
Commercial	104.23	67.68	32.71	21.24	13.76	8.94	3.27	2.13	0.03	0.02
Education	4.16	69.38	1.31	21.76	0.49	8.12	0.04	0.74	0.00	0.00
Government	32.08	69.74	9.73	21.16	3.84	8.35	0.35	0.76	0.00	0.00
Industrial	26.29	69.18	7.96	20.95	3.26	8.57	0.47	1.25	0.02	0.05
Religion	5.43	67.88	1.94	24.19	0.59	7.32	0.05	0.61	0.00	0.00
Residential	1,432.20	62.46	681.35	29.71	153.12	6.68	16.88	0.74	9.45	0.41
Total	**1,606.85**		**735.98**		**175.40**		**21.23**		**9.53**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	18	70.10	5	20.45	2	8.64	0	0.81	0	0.00
Masonry	116	66.42	41	23.45	16	9.10	2	0.90	0	0.14
MH	7	82.16	1	9.12	1	6.43	0	0.39	0	1.90
Steel	83	69.27	22	18.63	11	9.42	3	2.65	0	0.03
Wood	1,385	62.41	666	29.99	144	6.48	16	0.71	9	0.41

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

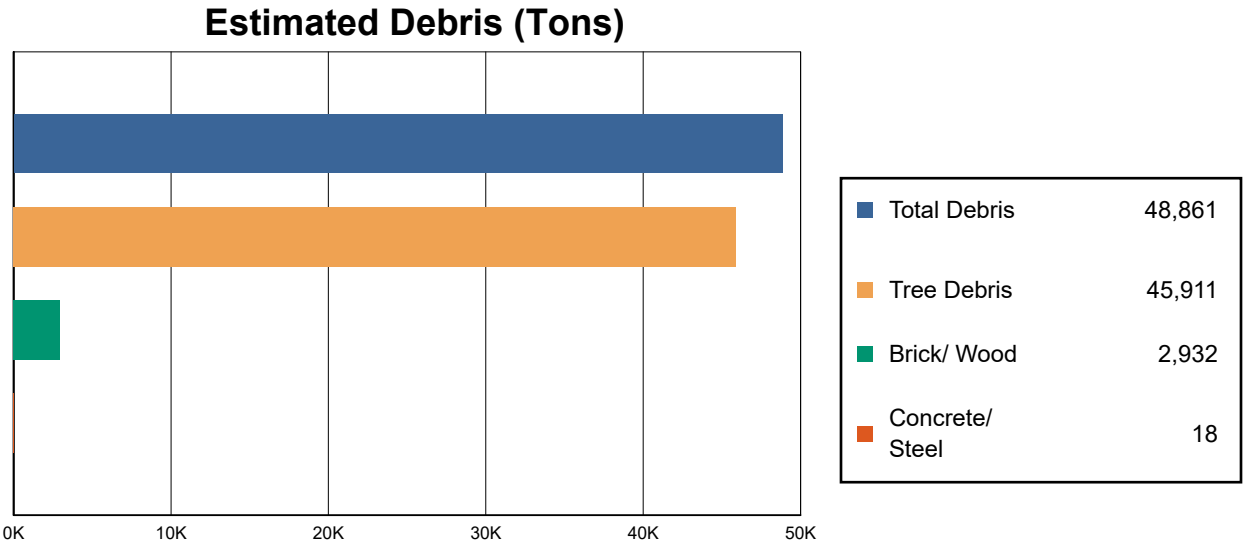
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	1	0	0	0

Induced Hurricane Damage

Debris Generation

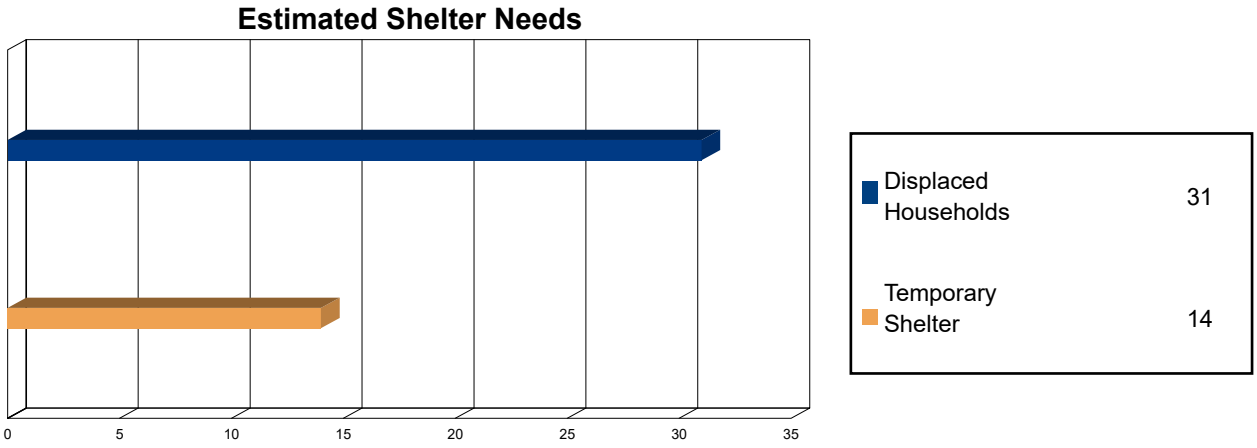


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 48,861 tons of debris will be generated. Of the total amount, 37,188 tons (76%) is Other Tree Debris. Of the remaining 11,673 tons, Brick/Wood comprises 25% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 118 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 8,723 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 31 households to be displaced due to the hurricane. Of these, 14 people (out of a total population of 6,133) will seek temporary shelter in public shelters.

Economic Loss

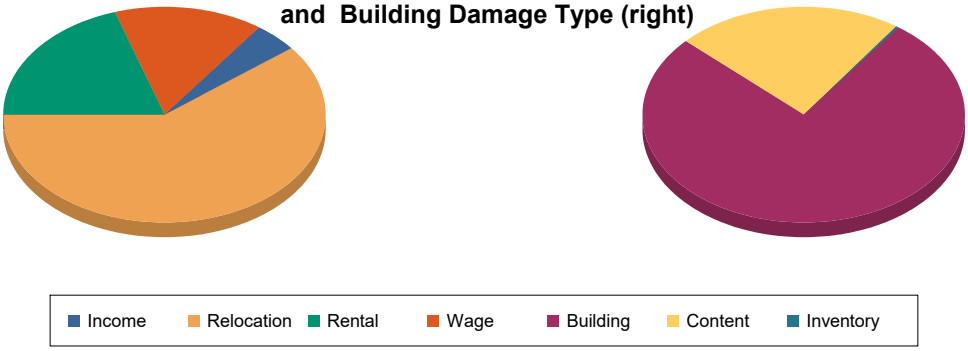
The total economic loss estimated for the hurricane is 50.2 million dollars, which represents 4.07 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 50 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

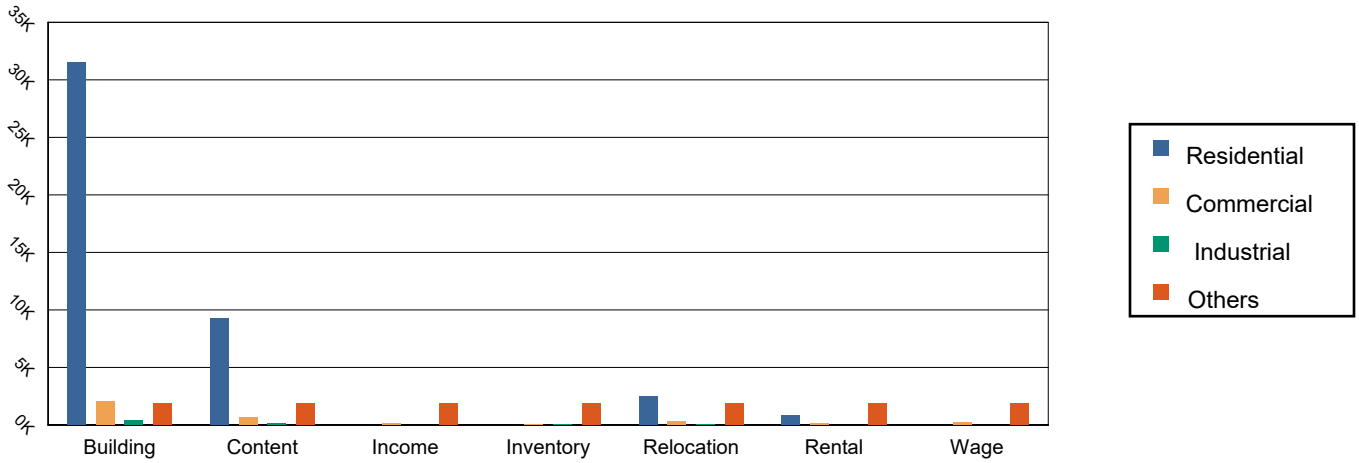


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	31,516.92	2,030.68	373.12	864.34	34,785.06
	Content	9,287.71	675.48	168.34	236.24	10,367.77
	Inventory	0.00	78.20	18.99	8.88	106.07
	Subtotal	**40,804.63**	**2,784.36**	**560.45**	**1,109.46**	**45,258.90**
Business Interruption Loss						
	Income	0.00	169.90	3.25	47.06	220.22
	Relocation	2,500.94	298.50	35.60	158.66	2,993.70
	Rental	799.05	151.23	3.01	26.67	979.97
	Wage	0.00	225.49	5.62	517.05	748.16
	Subtotal	**3,299.99**	**845.13**	**47.49**	**749.44**	**4,942.05**

Total

Total	**44,104.63**	**3,629.49**	**607.94**	**1,858.90**	**50,200.95**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	6,133	984,414	250,539	1,234,953
Total	**6,133**	**984,414**	**250,539**	**1,234,953**
Study Region Total	**6,133**	**984,414**	**250,539**	**1,234,953**

Hazus: Hurricane Global Risk Report

Region Name:	New_Britain_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.47 square miles and contains 21 census tracts. There are over 29 thousand households in the region and a total population of 74,135 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 10,341 million dollars. Approximately 89% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,863 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

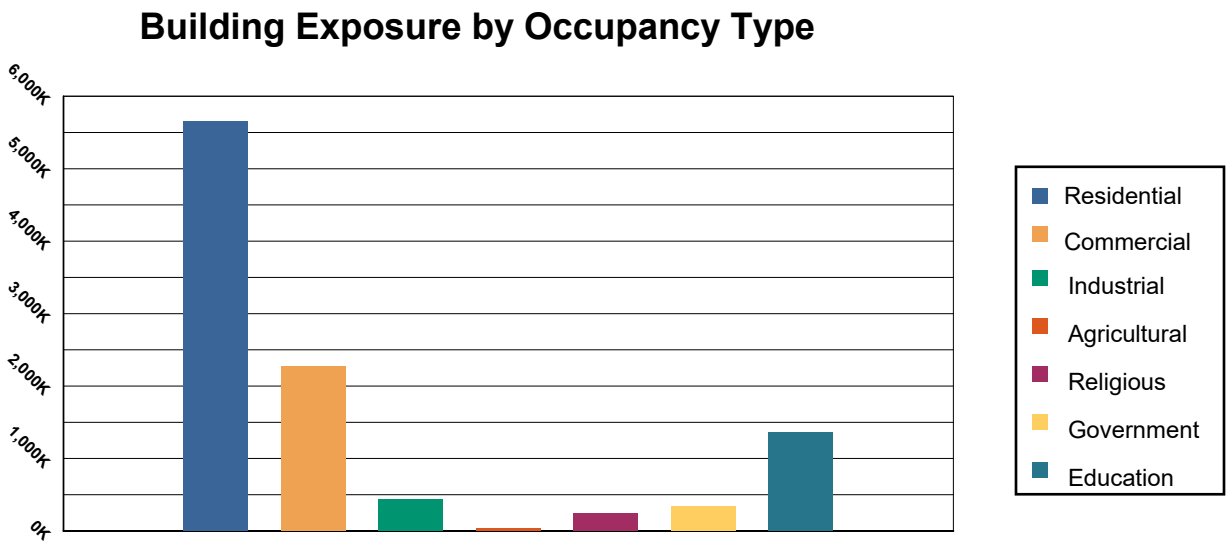


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,651,518	54.65%
Commercial	2,272,676	21.98%
Industrial	440,687	4.26%
Agricultural	29,144	0.28%
Religious	244,462	2.36%
Government	338,895	3.28%
Education	1,363,357	13.18%
Total	**10,340,739**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds. There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

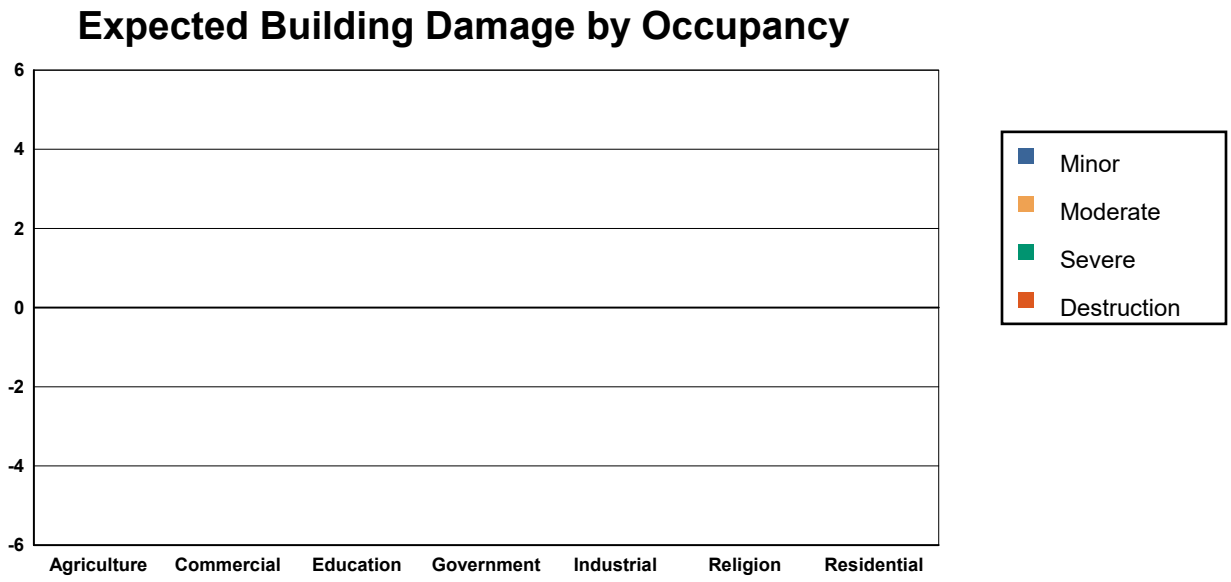


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	27.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1,277.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	35.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	187.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	252.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	153.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	14,932.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**16,863.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	427	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	2,738	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,008	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	12,668	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 457 hospital beds available for use. On the day of the hurricane, the model estimates that 457 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

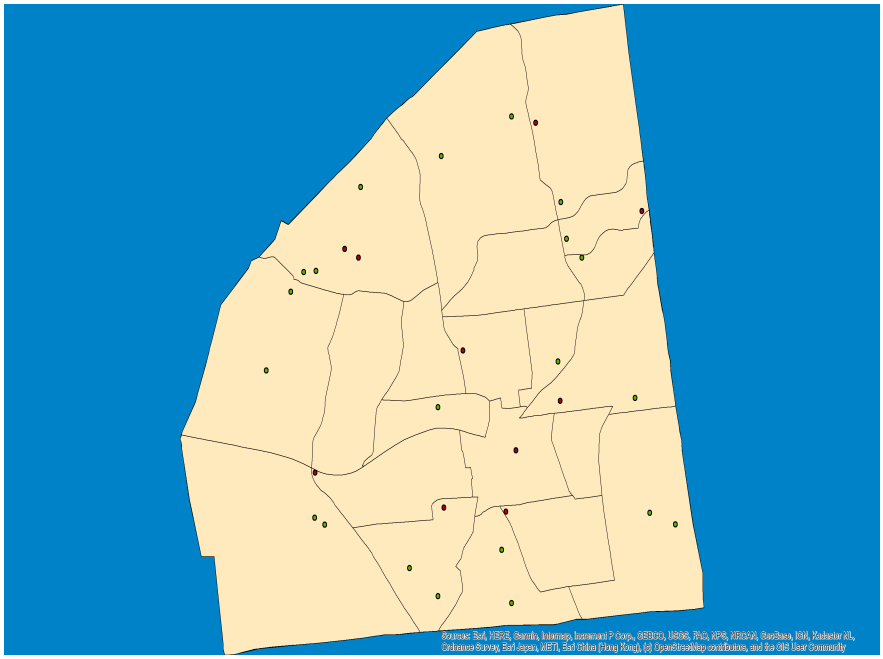
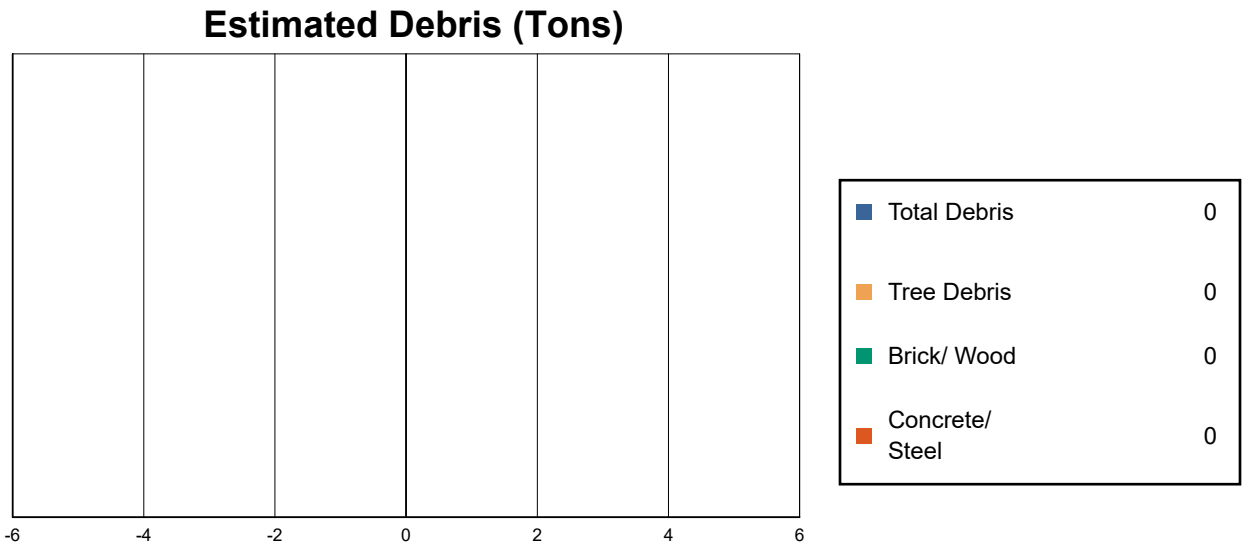


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	2	0	0	2
Police Stations	2	0	0	2
Schools	21	0	0	21

Induced Hurricane Damage

Debris Generation

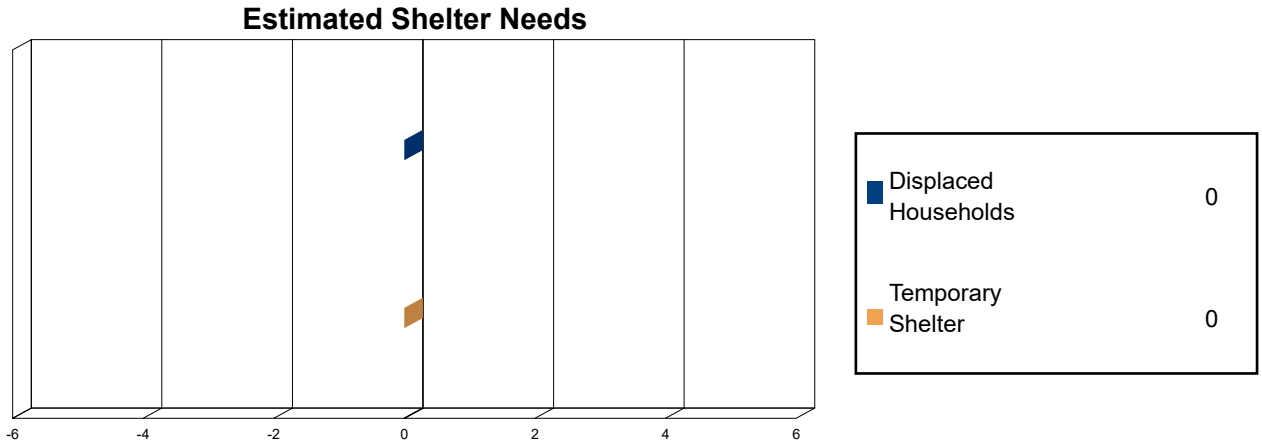


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 74,135) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

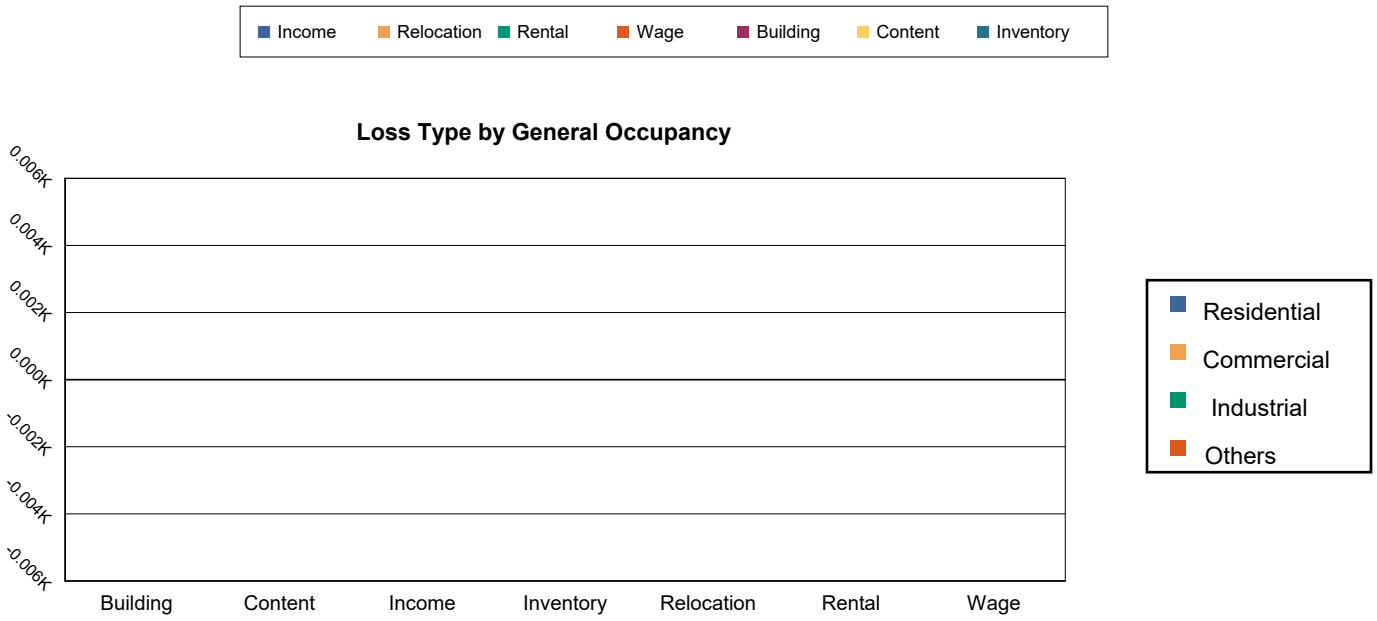


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	74,135	5,651,518	4,689,221	10,340,739
Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**
Study Region Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**

Hazus: Hurricane Global Risk Report

Region Name:	New_Britain_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.47 square miles and contains 21 census tracts. There are over 29 thousand households in the region and a total population of 74,135 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 10,341 million dollars. Approximately 89% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,863 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

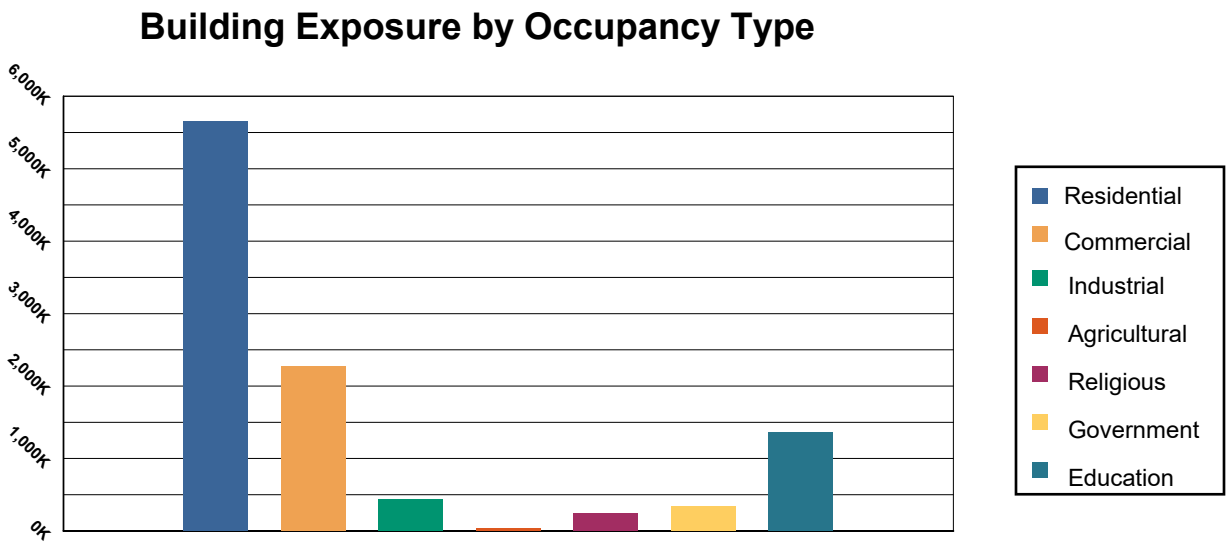


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,651,518	54.65%
Commercial	2,272,676	21.98%
Industrial	440,687	4.26%
Agricultural	29,144	0.28%
Religious	244,462	2.36%
Government	338,895	3.28%
Education	1,363,357	13.18%
Total	**10,340,739**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds. There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

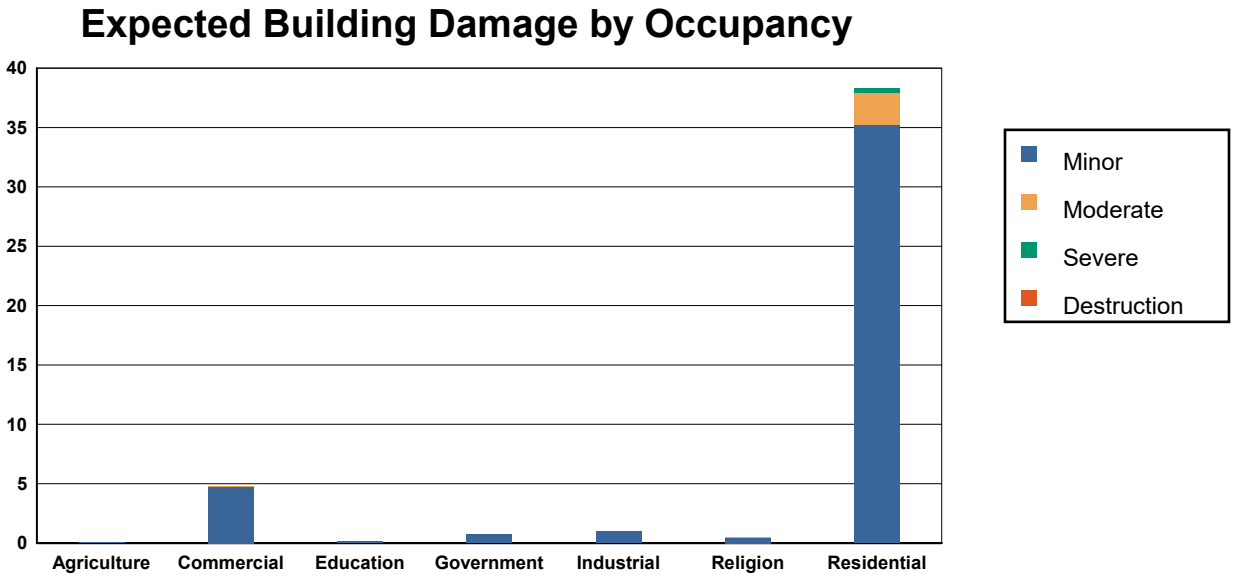


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	26.93	99.73	0.07	0.26	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	1,272.25	99.63	4.71	0.37	0.04	0.00	0.00	0.00	0.00	0.00
Education	34.87	99.63	0.13	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Government	186.27	99.61	0.73	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	251.00	99.60	1.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Religion	152.54	99.70	0.44	0.29	0.01	0.01	0.00	0.00	0.00	0.00
Residential	14,893.68	99.74	35.26	0.24	2.66	0.02	0.40	0.00	0.00	0.00
Total	**16,817.54**		**42.34**		**2.71**		**0.40**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	425	99.53	2	0.47	0	0.00	0	0.00	0	0.00
Masonry	2,719	99.31	18	0.66	1	0.03	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,004	99.59	4	0.41	0	0.00	0	0.00	0	0.00
Wood	12,656	99.90	11	0.09	1	0.01	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 457 hospital beds available for use. On the day of the hurricane, the model estimates that 457 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

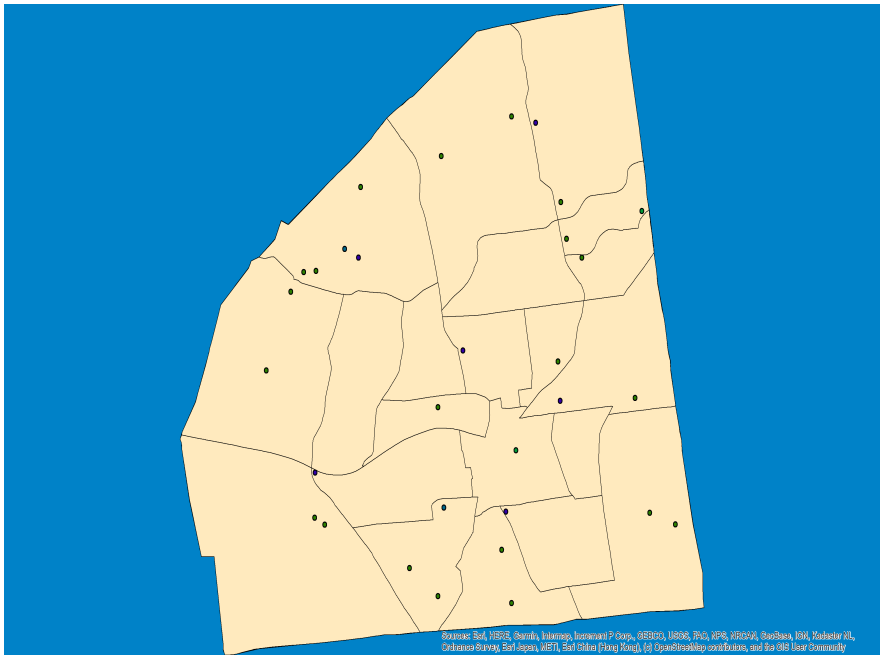
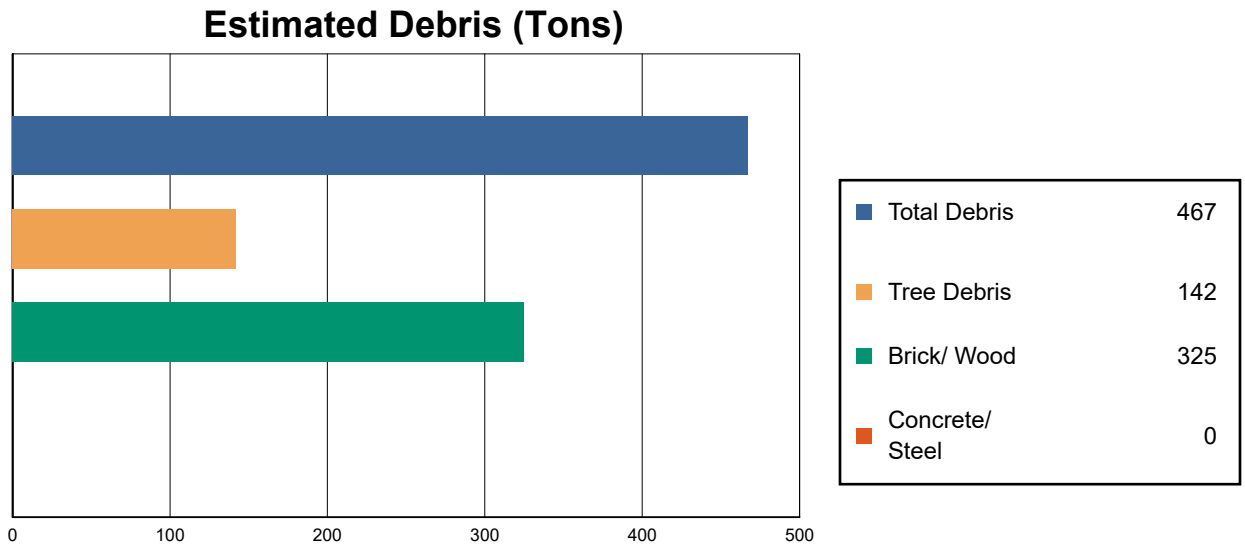


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	2	0	0	2
Police Stations	2	0	0	2
Schools	21	0	0	21

Induced Hurricane Damage

Debris Generation

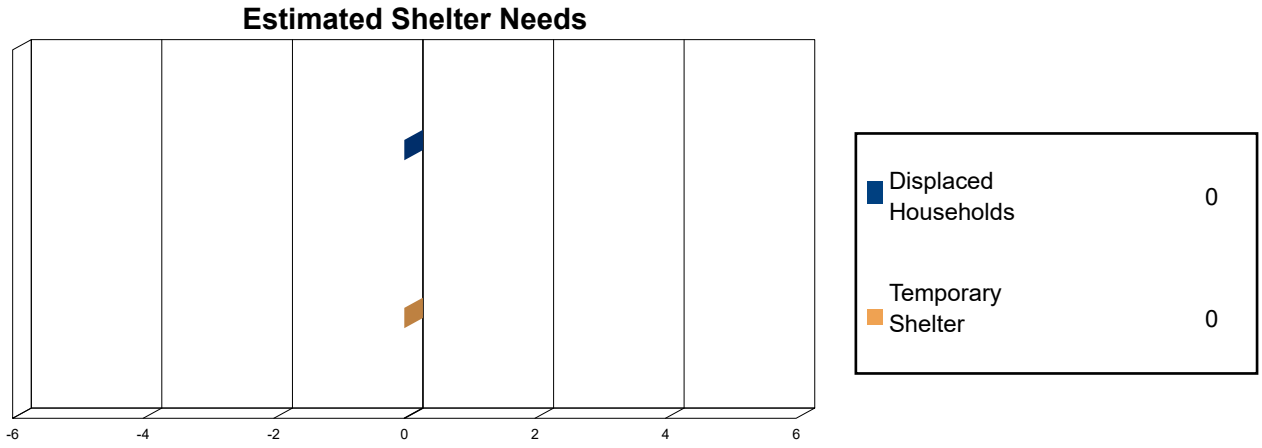


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 467 tons of debris will be generated. Of the total amount, 11 tons (2%) is Other Tree Debris. Of the remaining 456 tons, Brick/Wood comprises 71% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 13 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 131 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 74,135) will seek temporary shelter in public shelters.

Economic Loss

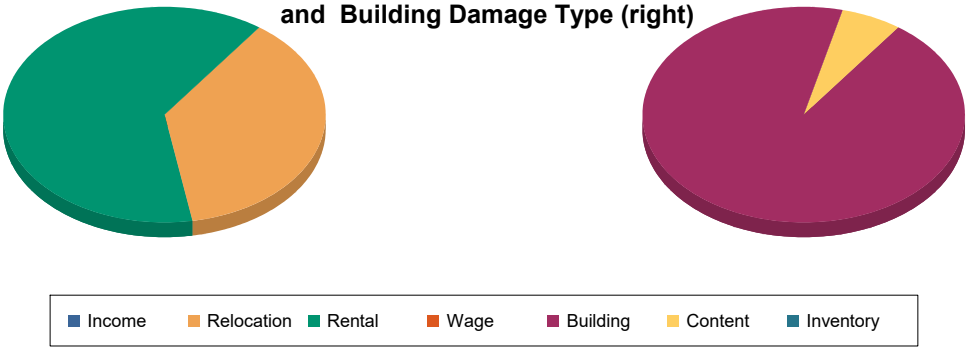
The total economic loss estimated for the hurricane is 3.3 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 3 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 86% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

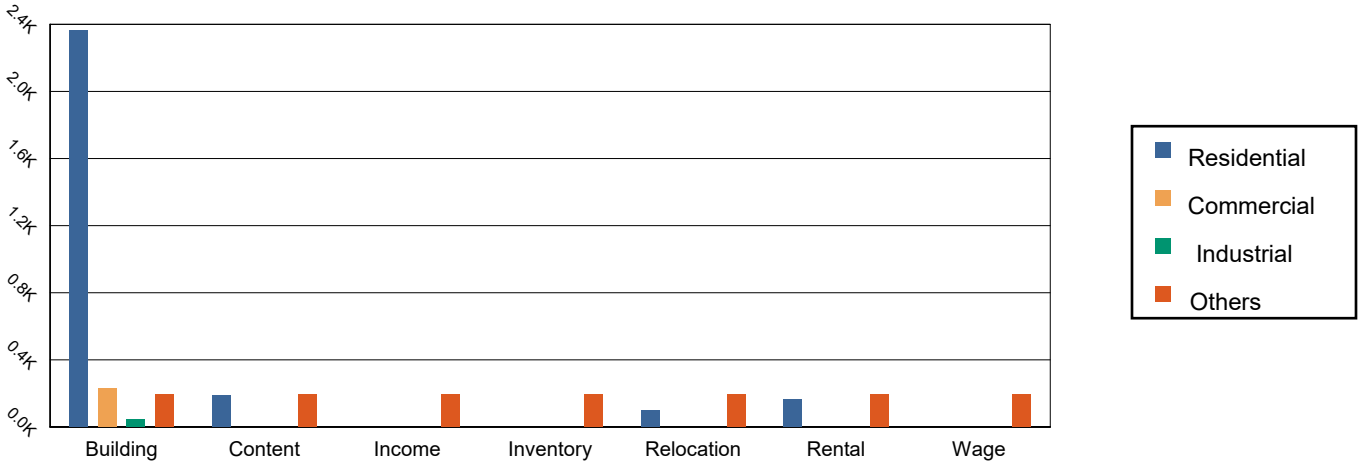


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,363.48	227.27	44.07	194.67	2,829.49
	Content	185.97	0.00	0.00	0.00	185.97
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2,549.45**	**227.27**	**44.07**	**194.67**	**3,015.46**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	98.08	0.42	0.00	0.13	98.62
	Rental	167.31	0.00	0.00	0.00	167.31
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**265.38**	**0.42**	**0.00**	**0.13**	**265.93**

Total

Total	**2,814.84**	**227.68**	**44.07**	**194.80**	**3,281.39**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	74,135	5,651,518	4,689,221	10,340,739
Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**
Study Region Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**

Hazus: Hurricane Global Risk Report

Region Name:	New_Britain_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

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There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 10,341 million dollars. Approximately 89% of the buildings (and 55% of the building value) are associated with residential housing.

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General Building Stock

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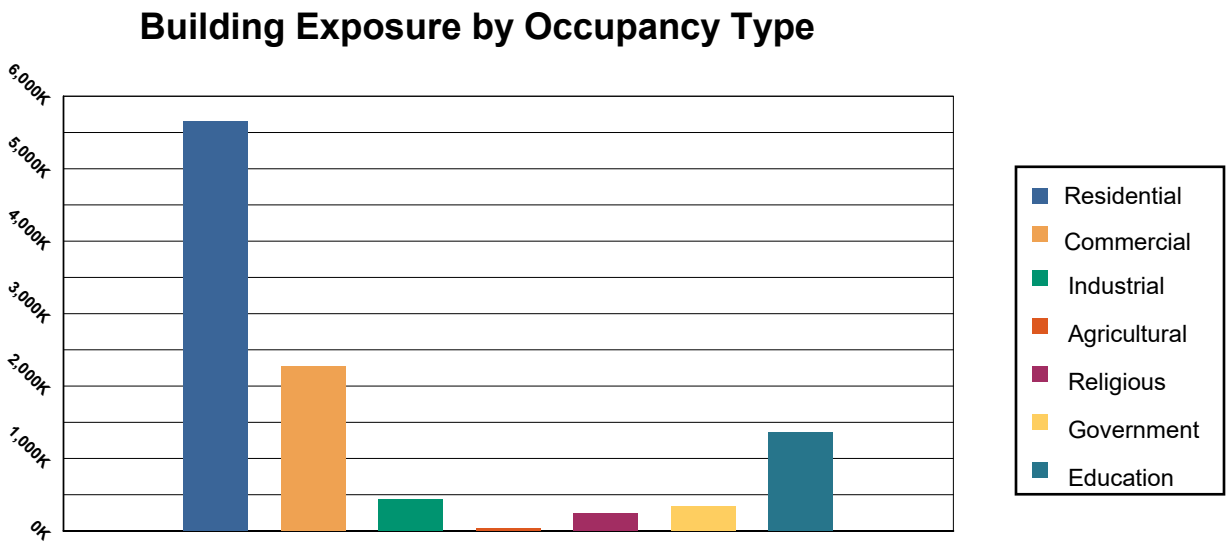

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Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,651,518	54.65%
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Industrial	440,687	4.26%
Agricultural	29,144	0.28%
Religious	244,462	2.36%
Government	338,895	3.28%
Education	1,363,357	13.18%
Total	**10,340,739**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds. There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 60 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

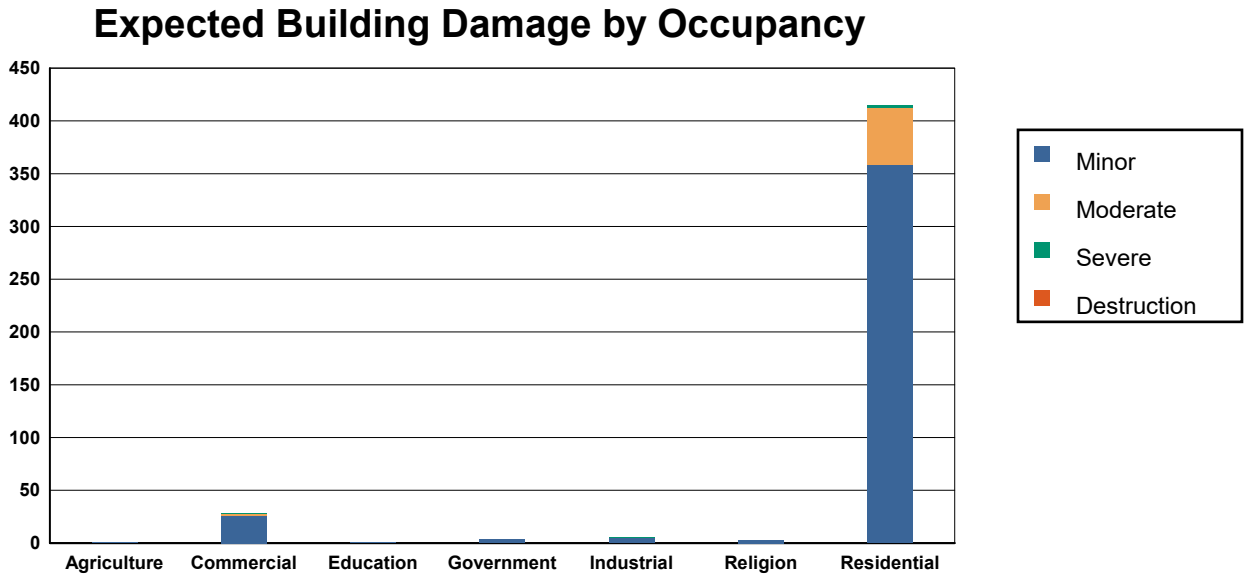


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	26.37	97.66	0.55	2.04	0.06	0.23	0.02	0.06	0.00	0.01
Commercial	1,249.27	97.83	25.64	2.01	1.97	0.15	0.12	0.01	0.00	0.00
Education	34.35	98.14	0.63	1.81	0.02	0.04	0.00	0.00	0.00	0.00
Government	183.38	98.06	3.54	1.89	0.08	0.04	0.00	0.00	0.00	0.00
Industrial	246.45	97.80	5.13	2.04	0.33	0.13	0.08	0.03	0.01	0.00
Religion	150.13	98.12	2.78	1.82	0.08	0.05	0.01	0.01	0.00	0.00
Residential	14,516.88	97.22	357.92	2.40	54.65	0.37	2.55	0.02	0.00	0.00
Total	**16,406.82**		**396.20**		**57.20**		**2.78**		**0.01**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	417	97.68	10	2.26	0	0.06	0	0.00	0	0.00
Masonry	2,615	95.50	96	3.49	27	0.98	1	0.03	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	987	97.94	19	1.92	1	0.13	0	0.01	0	0.00
Wood	12,413	97.98	241	1.90	13	0.10	2	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had 457 hospital beds available for use. On the day of the hurricane, the model estimates that 457 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

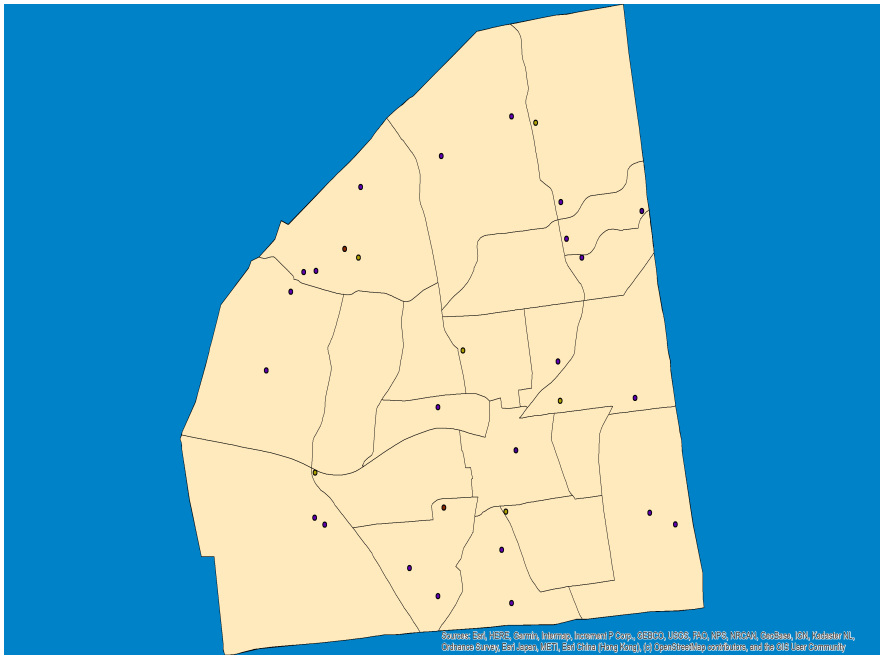
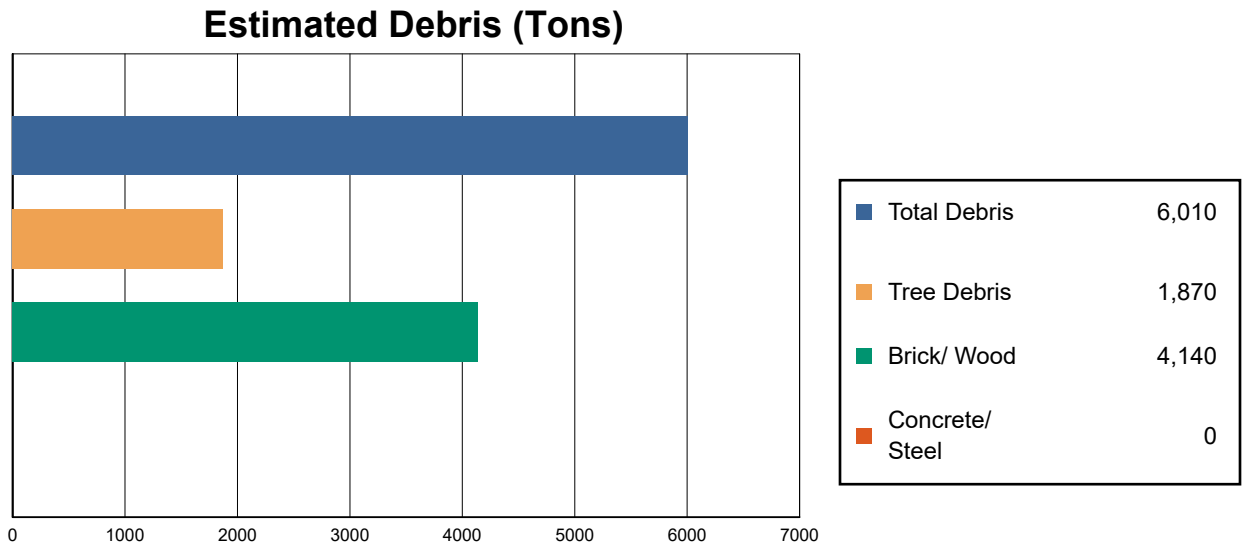


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	2	0	0	2
Police Stations	2	0	0	2
Schools	21	0	0	21

Induced Hurricane Damage

Debris Generation

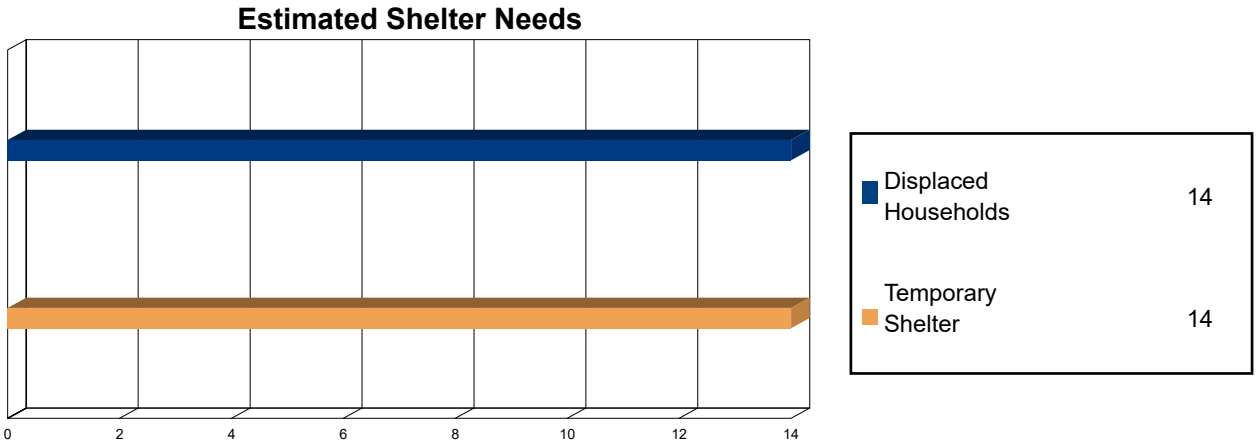


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,010 tons of debris will be generated. Of the total amount, 218 tons (4%) is Other Tree Debris. Of the remaining 5,792 tons, Brick/Wood comprises 71% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 166 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,652 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 14 households to be displaced due to the hurricane. Of these, 14 people (out of a total population of 74,135) will seek temporary shelter in public shelters.

Economic Loss

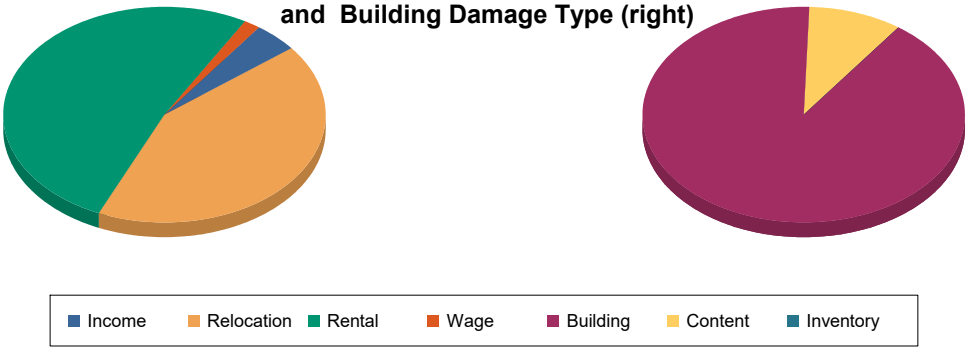
The total economic loss estimated for the hurricane is 33.1 million dollars, which represents 0.32 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 33 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

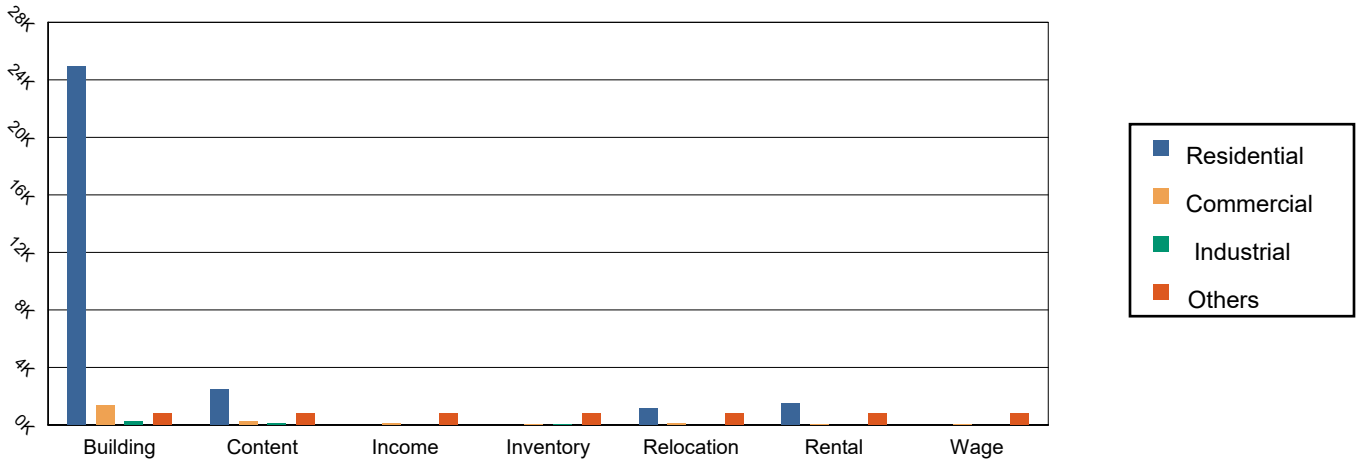


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	24,930.37	1,333.47	249.79	772.78	27,286.41
	Content	2,463.94	211.79	86.71	23.98	2,786.41
	Inventory	0.00	24.17	11.06	3.81	39.04
	Subtotal	**27,394.30**	**1,569.43**	**347.56**	**800.57**	**30,111.87**
Business Interruption Loss						
	Income	0.00	133.23	0.00	0.00	133.23
	Relocation	1,151.38	88.21	1.53	5.68	1,246.79
	Rental	1,480.65	54.36	0.00	0.00	1,535.01
	Wage	0.00	47.35	0.00	0.00	47.35
	Subtotal	**2,632.02**	**323.15**	**1.53**	**5.68**	**2,962.38**

Total

Total	30,026.32	1,892.58	349.09	806.24	33,074.24

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	74,135	5,651,518	4,689,221	10,340,739
Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**
Study Region Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**

Hazus: Hurricane Global Risk Report

Region Name:	New_Britain_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.47 square miles and contains 21 census tracts. There are over 29 thousand households in the region and a total population of 74,135 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 10,341 million dollars. Approximately 89% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,863 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

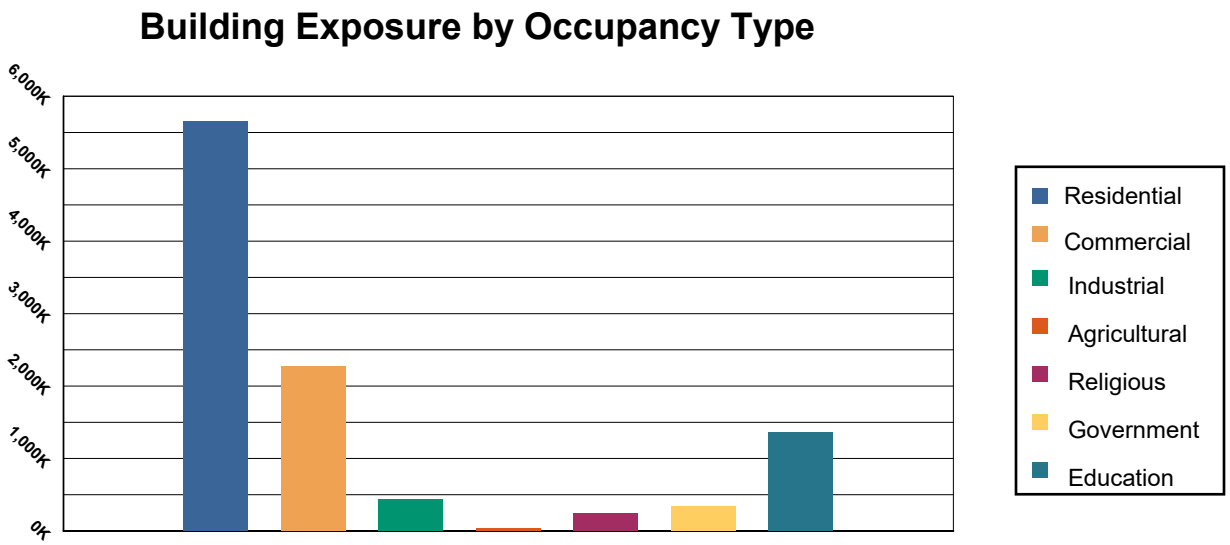


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,651,518	54.65%
Commercial	2,272,676	21.98%
Industrial	440,687	4.26%
Agricultural	29,144	0.28%
Religious	244,462	2.36%
Government	338,895	3.28%
Education	1,363,357	13.18%
Total	**10,340,739**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds. There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 247 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

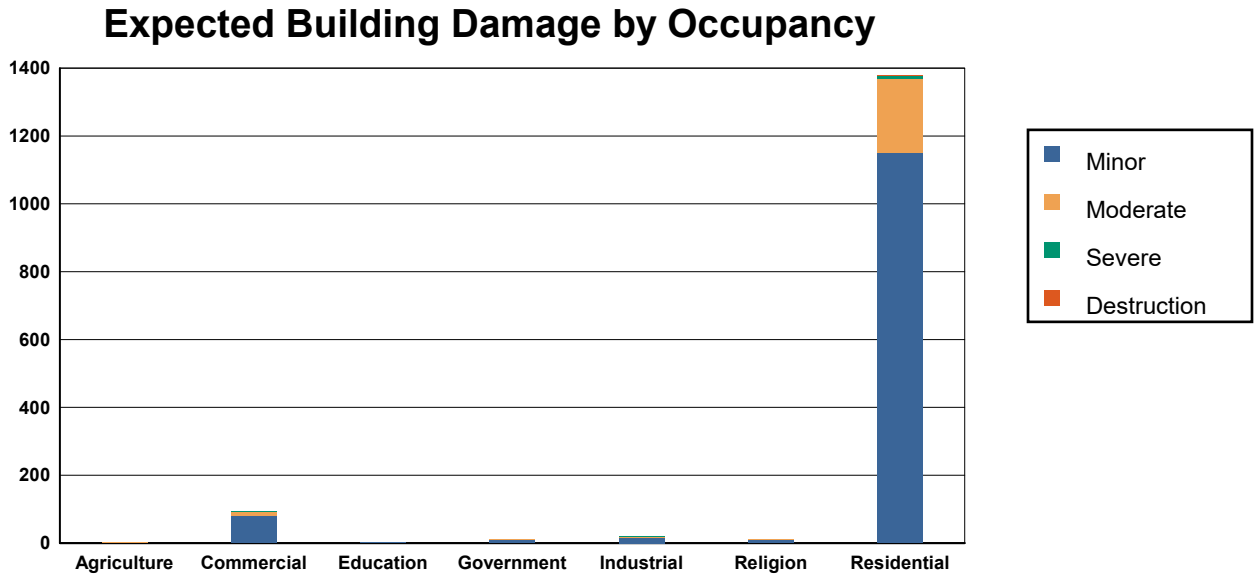


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	24.60	91.11	1.88	6.95	0.36	1.34	0.15	0.56	0.01	0.03
Commercial	1,182.93	92.63	80.18	6.28	12.64	0.99	1.24	0.10	0.00	0.00
Education	32.84	93.82	1.97	5.62	0.19	0.54	0.00	0.01	0.00	0.00
Government	174.81	93.48	11.02	5.89	1.15	0.61	0.02	0.01	0.00	0.00
Industrial	233.16	92.52	15.43	6.12	2.68	1.06	0.70	0.28	0.04	0.02
Religion	142.31	93.02	9.80	6.40	0.85	0.56	0.03	0.02	0.00	0.00
Residential	13,553.38	90.77	1,151.24	7.71	217.36	1.46	9.29	0.06	0.73	0.00
Total	**15,344.04**		**1,271.51**		**235.24**		**11.43**		**0.78**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	395	92.48	29	6.68	4	0.83	0	0.01	0	0.00
Masonry	2,409	87.98	224	8.19	100	3.66	4	0.16	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	939	93.20	58	5.72	10	0.96	1	0.11	0	0.00
Wood	11,666	92.09	928	7.32	67	0.53	6	0.05	1	0.01

Essential Facility Damage

Before the hurricane, the region had 457 hospital beds available for use. On the day of the hurricane, the model estimates that 457 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

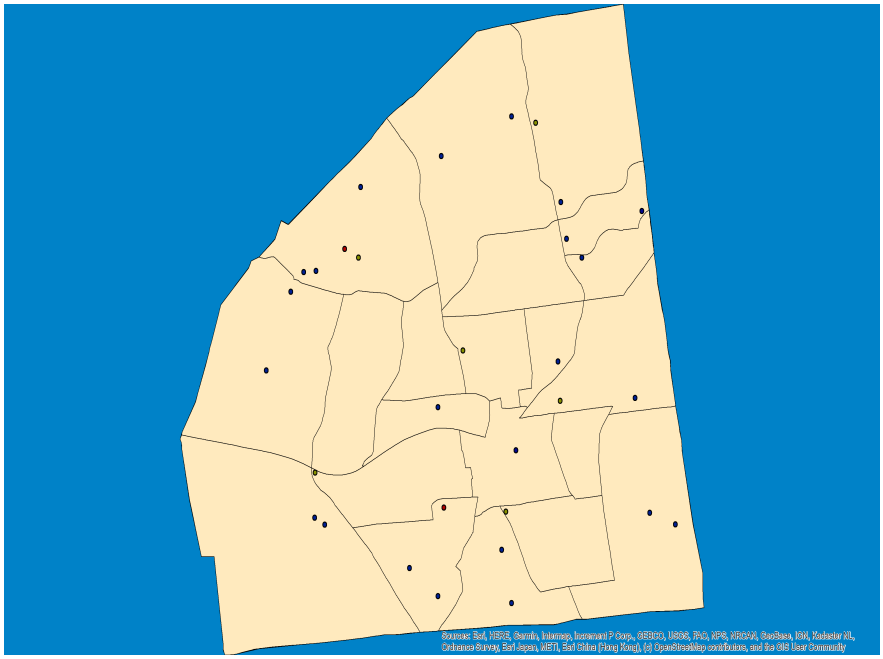
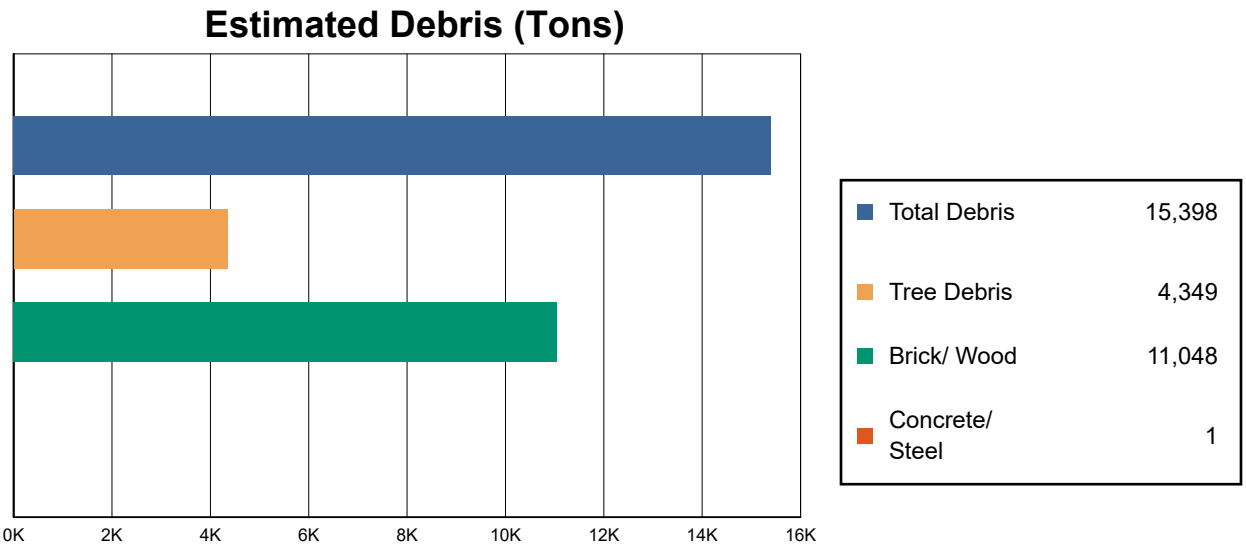


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	2	0	0	2
Police Stations	2	0	0	2
Schools	21	0	0	21

Induced Hurricane Damage

Debris Generation

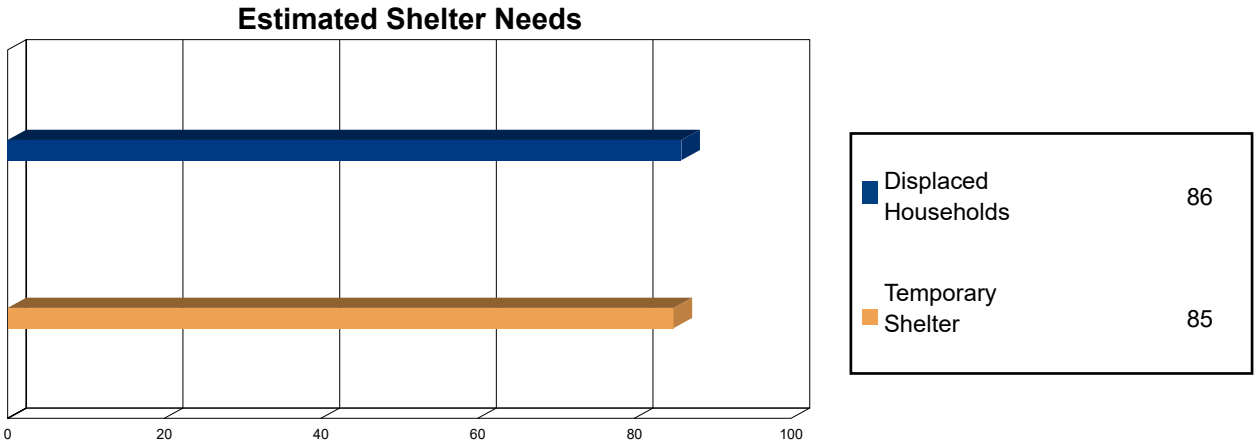


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15,398 tons of debris will be generated. Of the total amount, 541 tons (4%) is Other Tree Debris. Of the remaining 14,857 tons, Brick/Wood comprises 74% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 442 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,808 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 86 households to be displaced due to the hurricane. Of these, 85 people (out of a total population of 74,135) will seek temporary shelter in public shelters.

Economic Loss

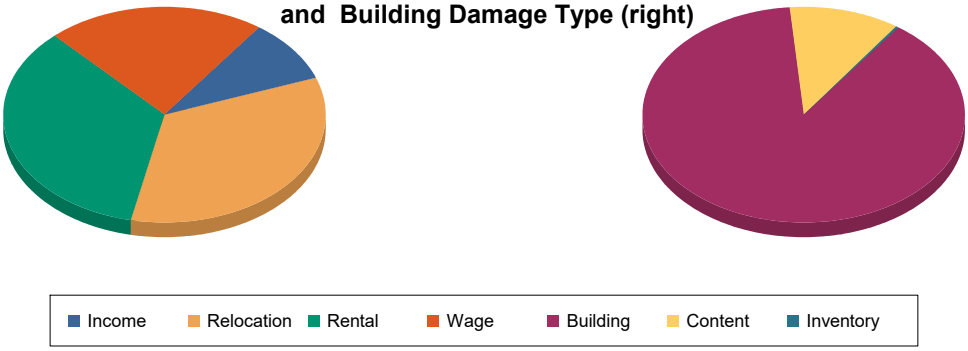
The total economic loss estimated for the hurricane is 95.2 million dollars, which represents 0.92 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 95 million dollars. 14% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

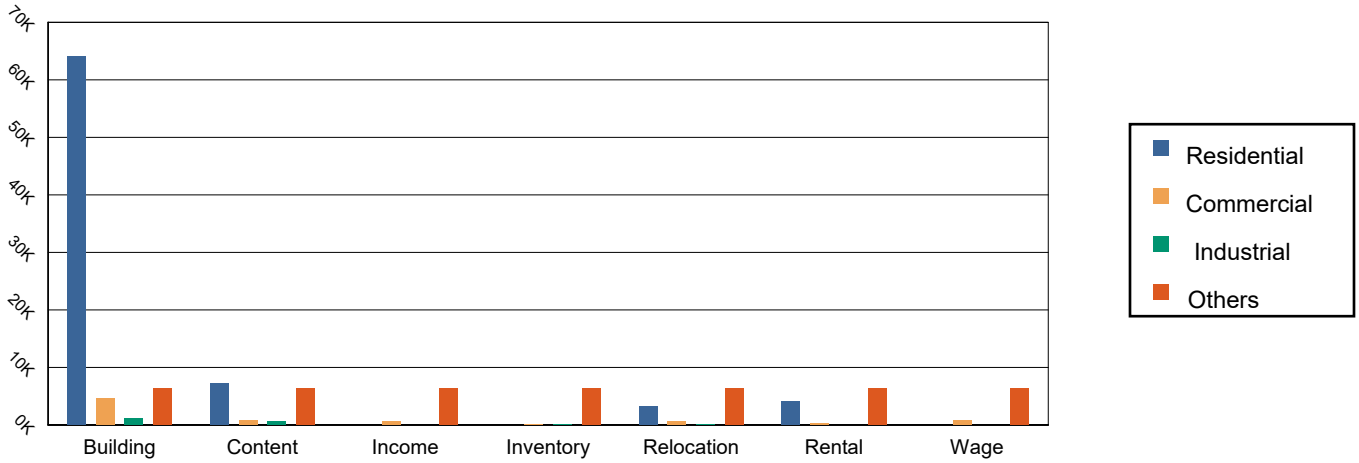


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	64,118.31	4,642.26	1,190.21	2,795.30	72,746.08
	Content	7,244.82	824.15	626.16	383.81	9,078.94
	Inventory	0.00	106.19	81.89	31.27	219.34
	Subtotal	**71,363.13**	**5,572.60**	**1,898.26**	**3,210.38**	**82,044.37**
Business Interruption Loss						
	Income	0.00	657.36	11.63	585.93	1,254.92
	Relocation	3,171.07	685.13	42.87	524.40	4,423.47
	Rental	4,156.27	342.03	8.12	60.10	4,566.53
	Wage	0.00	821.33	18.93	2,050.35	2,890.60
	Subtotal	**7,327.34**	**2,505.85**	**81.55**	**3,220.78**	**13,135.52**

Total

Total	**78,690.48**	**8,078.44**	**1,979.81**	**6,431.15**	**95,179.89**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	74,135	5,651,518	4,689,221	10,340,739
Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**
Study Region Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**

Hazus: Hurricane Global Risk Report

Region Name:	New_Britain_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Thursday, May 11, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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- Connecticut

Note:
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There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 10,341 million dollars. Approximately 89% of the buildings (and 55% of the building value) are associated with residential housing.

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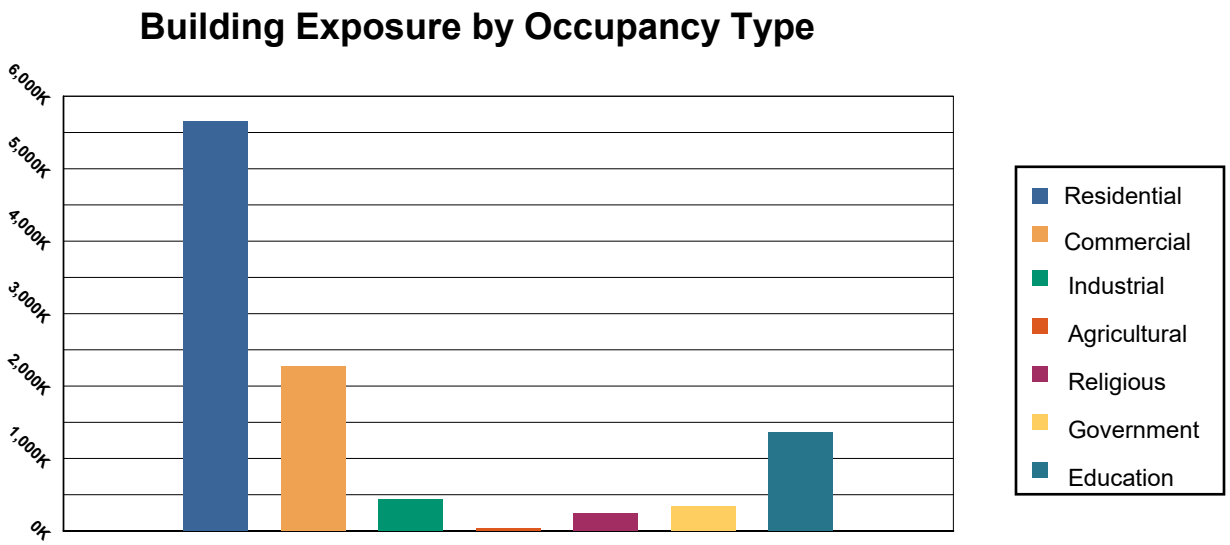

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Commercial	2,272,676	21.98%
Industrial	440,687	4.26%
Agricultural	29,144	0.28%
Religious	244,462	2.36%
Government	338,895	3.28%
Education	1,363,357	13.18%
Total	**10,340,739**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds. There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 601 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

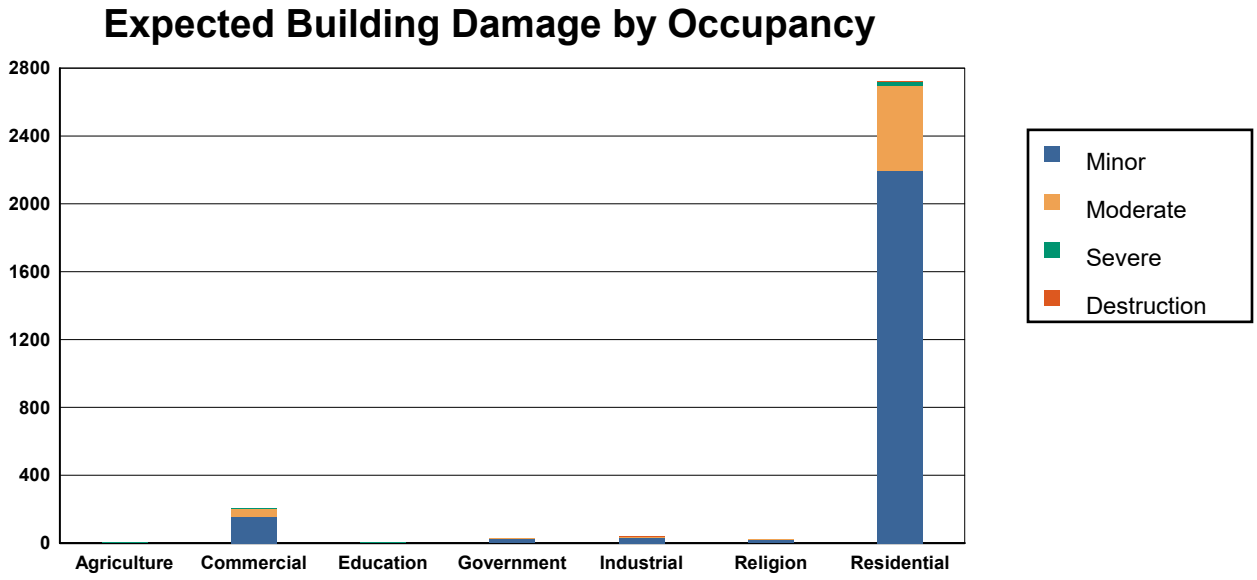


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.95	81.29	3.63	13.43	0.95	3.52	0.43	1.60	0.05	0.17
Commercial	1,071.72	83.92	158.59	12.42	42.00	3.29	4.67	0.37	0.01	0.00
Education	30.16	86.18	3.97	11.33	0.83	2.37	0.04	0.11	0.00	0.00
Government	159.68	85.39	22.00	11.77	5.07	2.71	0.25	0.13	0.00	0.00
Industrial	211.18	83.80	29.53	11.72	8.87	3.52	2.22	0.88	0.19	0.07
Religion	129.35	84.54	19.91	13.01	3.55	2.32	0.19	0.12	0.00	0.00
Residential	12,206.44	81.75	2,193.81	14.69	502.42	3.36	24.23	0.16	5.09	0.03
Total	**13,830.49**		**2,431.44**		**563.70**		**32.03**		**5.34**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	357	83.61	55	12.81	15	3.47	1	0.12	0	0.00
Masonry	2,141	78.18	373	13.62	212	7.74	12	0.44	1	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	856	84.90	113	11.26	34	3.38	5	0.46	0	0.00
Wood	10,564	83.39	1,877	14.82	205	1.62	16	0.13	5	0.04

Essential Facility Damage

Before the hurricane, the region had 457 hospital beds available for use. On the day of the hurricane, the model estimates that 457 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

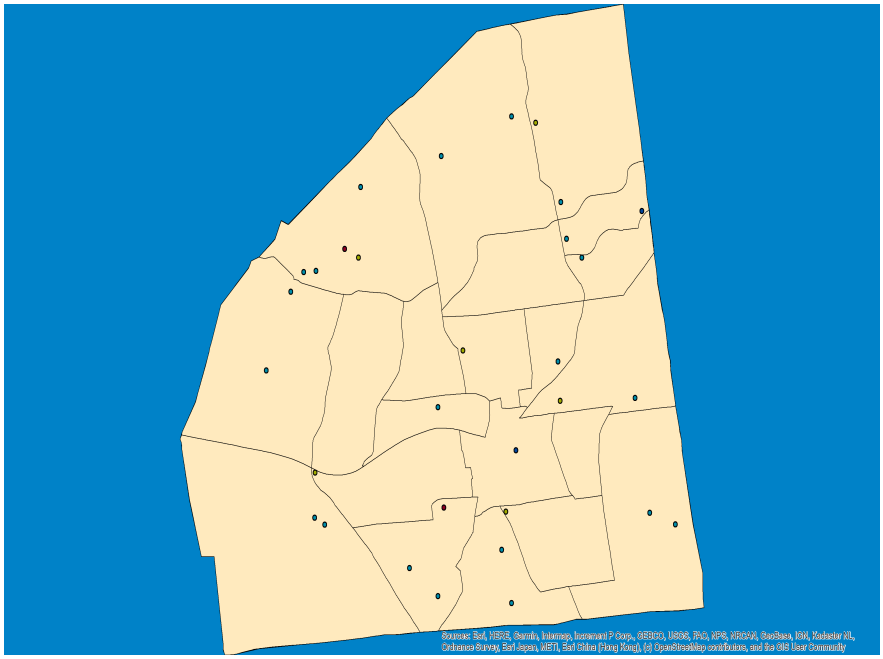
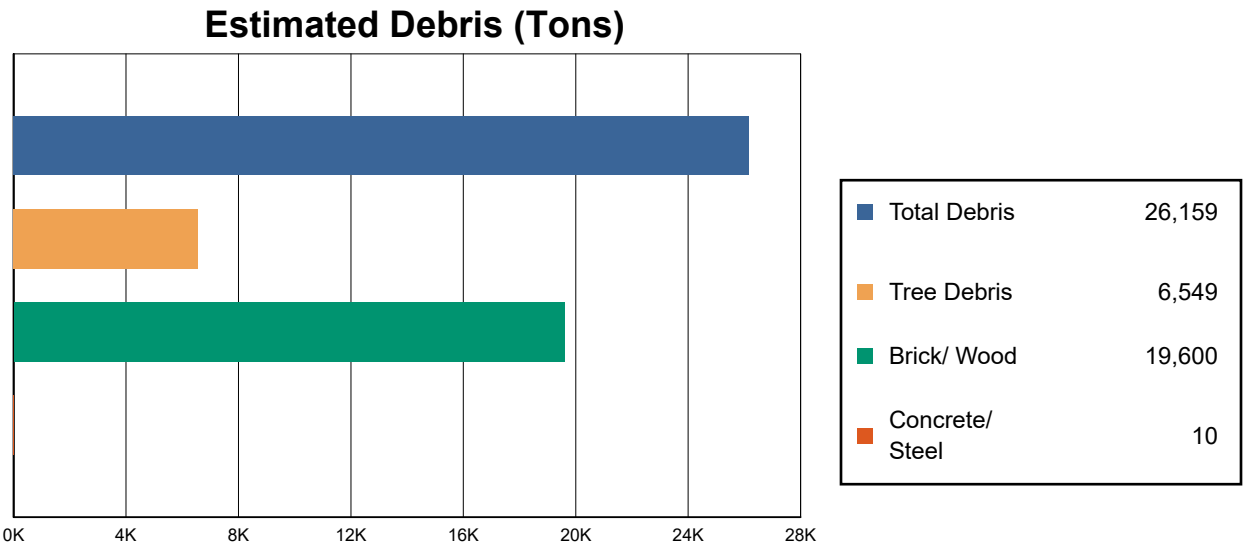


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	2	0	0	2
Police Stations	2	0	0	2
Schools	21	0	0	17

Induced Hurricane Damage

Debris Generation

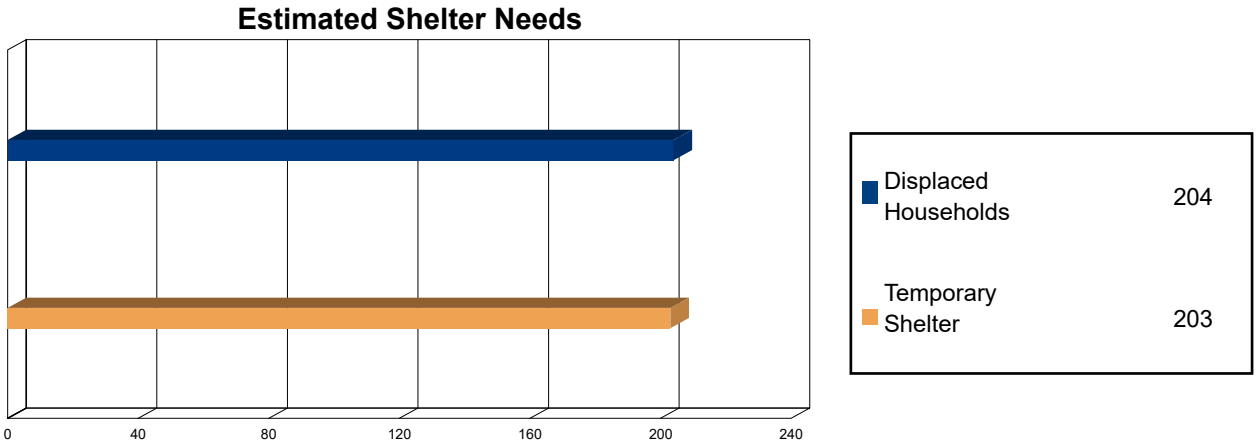


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 26,159 tons of debris will be generated. Of the total amount, 773 tons (3%) is Other Tree Debris. Of the remaining 25,386 tons, Brick/Wood comprises 77% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 784 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,776 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 204 households to be displaced due to the hurricane. Of these, 203 people (out of a total population of 74,135) will seek temporary shelter in public shelters.

Economic Loss

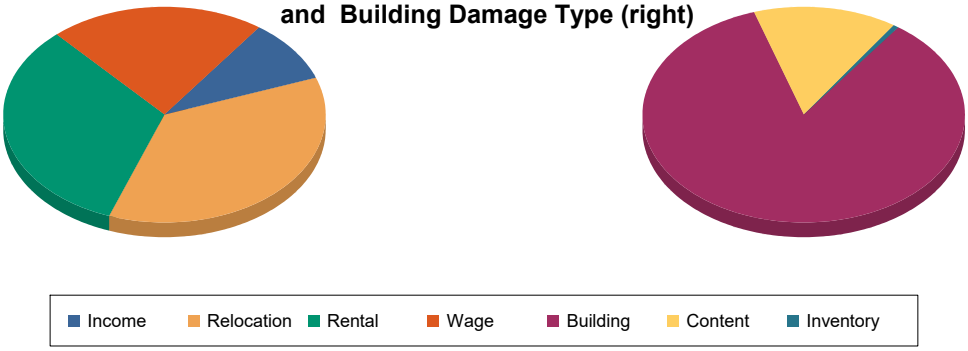
The total economic loss estimated for the hurricane is 184.1 million dollars, which represents 1.78 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 184 million dollars. 14% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 77% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

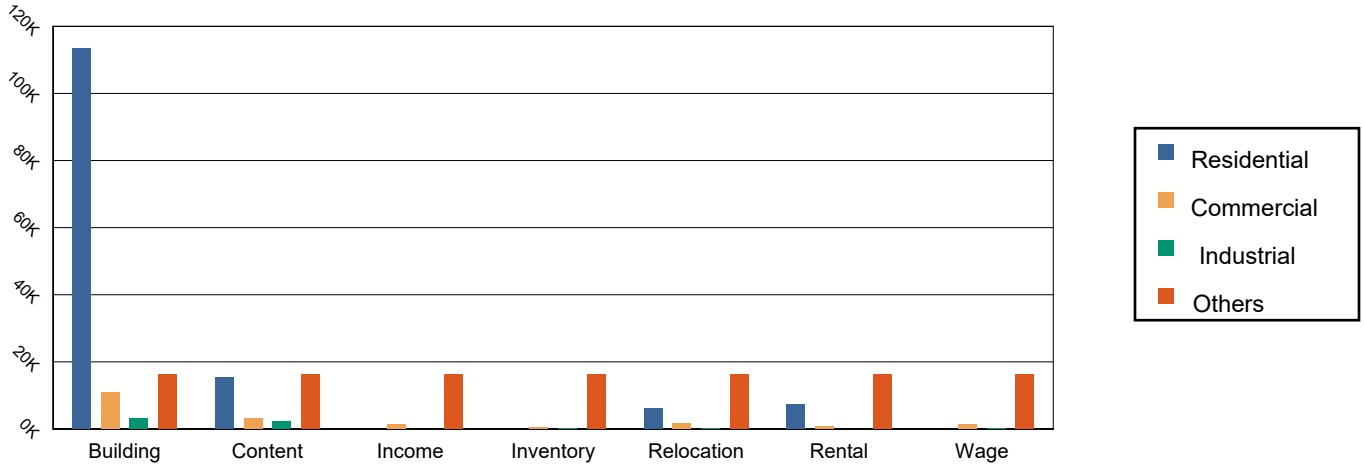


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	113,319.71	11,006.55	3,264.08	7,223.48	134,813.82
	Content	15,466.01	3,048.35	2,159.69	2,211.78	22,885.83
	Inventory	0.00	386.15	277.11	97.87	761.14
	Subtotal	**128,785.71**	**14,441.05**	**5,700.88**	**9,533.14**	**158,460.79**
Business Interruption Loss						
	Income	0.00	1,285.74	35.50	1,110.61	2,431.85
	Relocation	6,236.85	1,579.12	150.95	1,314.95	9,281.88
	Rental	7,458.95	727.81	25.87	137.93	8,350.55
	Wage	0.00	1,446.43	57.06	4,086.43	5,589.92
	Subtotal	**13,695.80**	**5,039.10**	**269.38**	**6,649.92**	**25,654.20**

Total

Total	142,481.51	19,480.15	5,970.27	16,183.06	184,114.99

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	74,135	5,651,518	4,689,221	10,340,739
Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**
Study Region Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**

Hazus: Hurricane Global Risk Report

Region Name:	New_Britain_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.47 square miles and contains 21 census tracts. There are over 29 thousand households in the region and a total population of 74,135 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 10,341 million dollars. Approximately 89% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,863 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

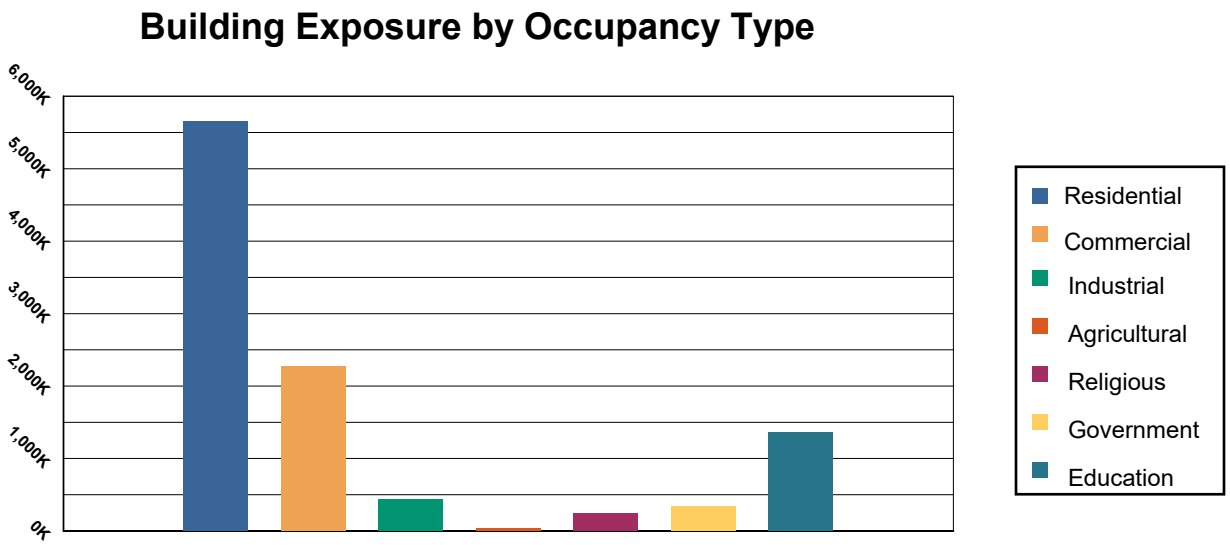


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	5,651,518	54.65%
Commercial	2,272,676	21.98%
Industrial	440,687	4.26%
Agricultural	29,144	0.28%
Religious	244,462	2.36%
Government	338,895	3.28%
Education	1,363,357	13.18%
Total	**10,340,739**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds. There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,445 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the region. There are an estimated 29 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

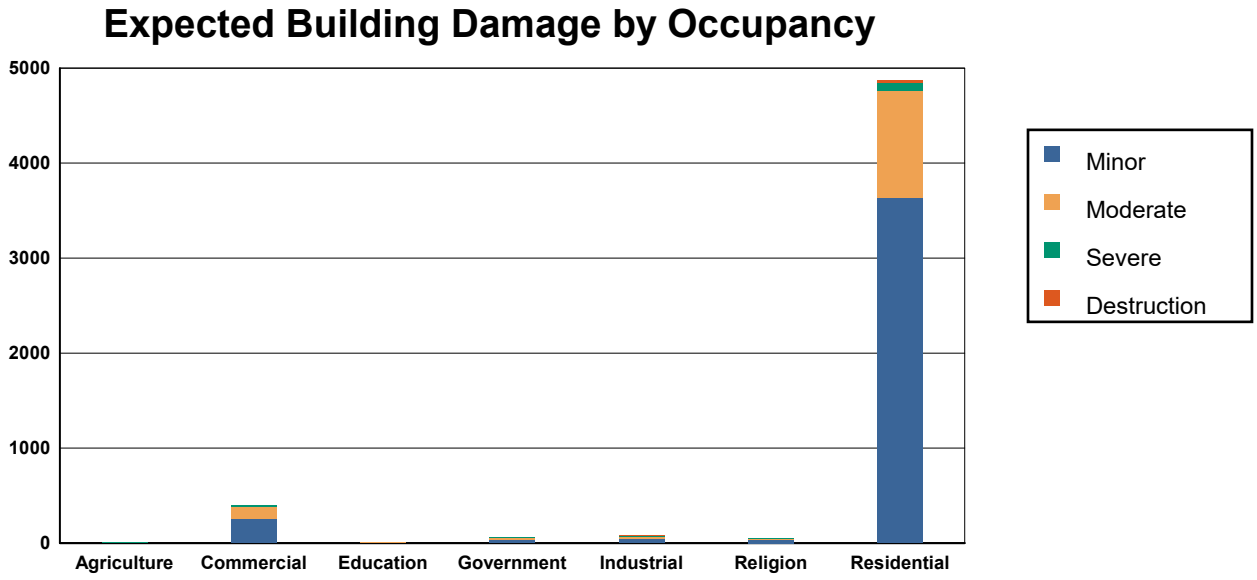


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.75	65.75	5.92	21.91	2.14	7.93	1.04	3.86	0.15	0.55
Commercial	877.83	68.74	258.24	20.22	121.48	9.51	19.31	1.51	0.14	0.01
Education	25.17	71.92	6.70	19.13	2.80	8.00	0.33	0.94	0.00	0.00
Government	132.36	70.78	36.08	19.29	16.53	8.84	2.03	1.08	0.00	0.00
Industrial	173.90	69.01	46.75	18.55	24.05	9.54	6.68	2.65	0.62	0.24
Religion	106.38	69.53	33.76	22.06	11.56	7.56	1.30	0.85	0.00	0.00
Residential	10,061.25	67.38	3,635.85	24.35	1,126.02	7.54	80.65	0.54	28.22	0.19
Total	**11,394.65**		**4,023.28**		**1,304.60**		**111.34**		**29.13**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	290	68.01	86	20.02	47	10.94	4	1.03	0	0.00
Masonry	1,740	63.57	545	19.91	416	15.19	34	1.24	2	0.09
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	706	70.02	183	18.11	100	9.95	19	1.91	0	0.02
Wood	8,746	69.04	3,246	25.63	591	4.66	57	0.45	28	0.22

Essential Facility Damage

Before the hurricane, the region had 457 hospital beds available for use. On the day of the hurricane, the model estimates that 457 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

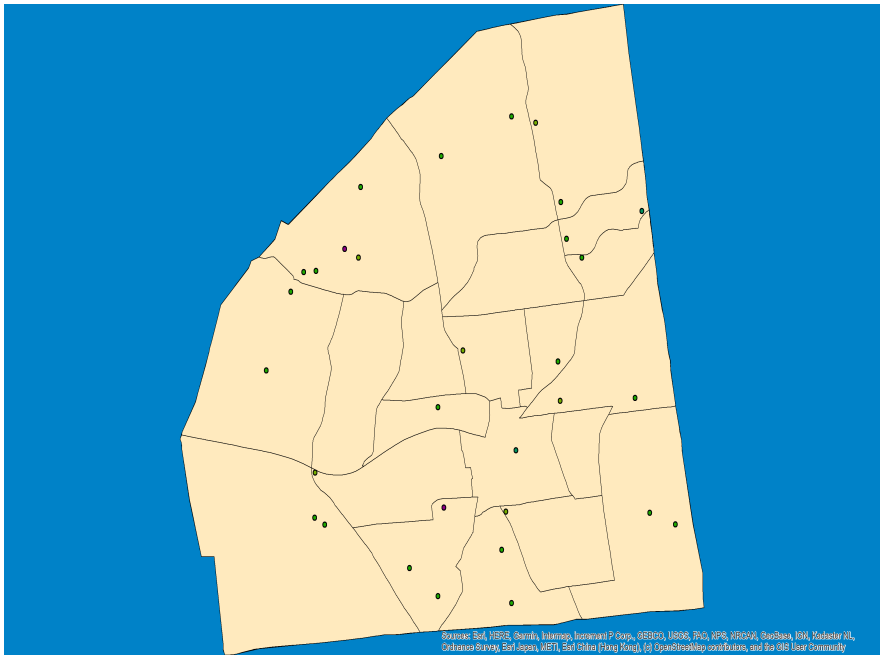
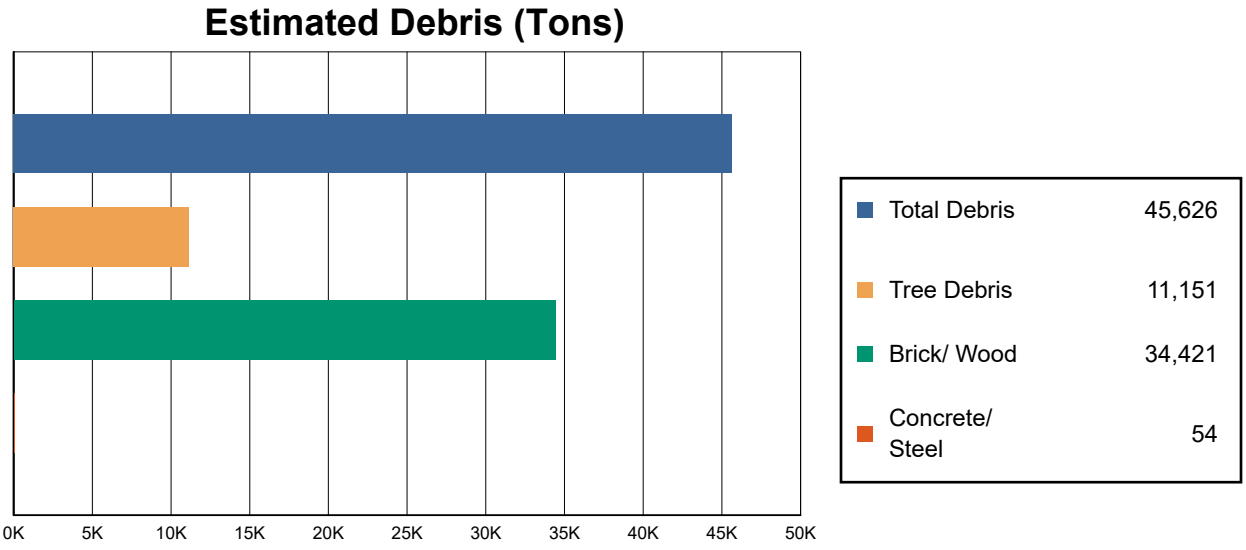


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	2	0	0	2
Police Stations	2	0	0	2
Schools	21	2	0	0

Induced Hurricane Damage

Debris Generation

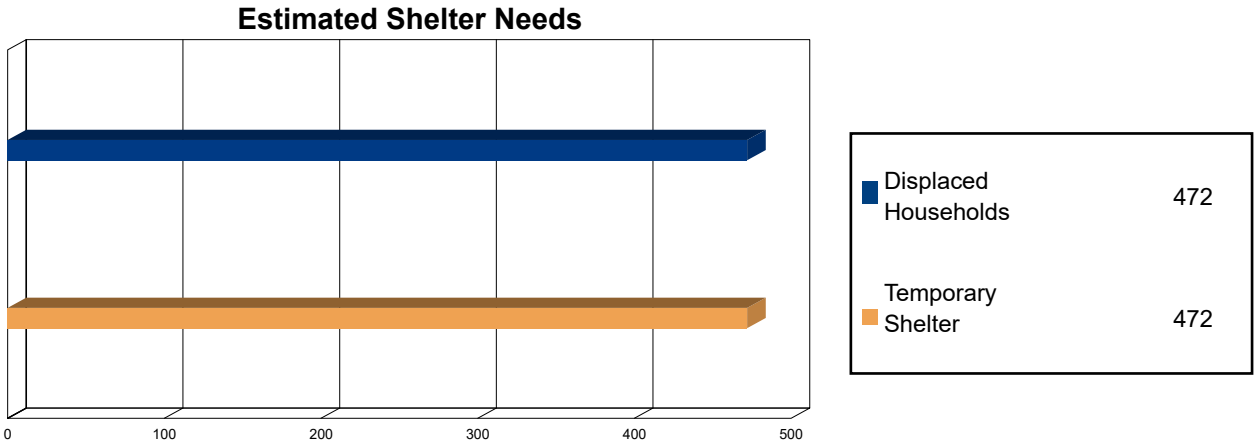


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 45,626 tons of debris will be generated. Of the total amount, 1,421 tons (3%) is Other Tree Debris. Of the remaining 44,205 tons, Brick/Wood comprises 78% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1379 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,730 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 472 households to be displaced due to the hurricane. Of these, 472 people (out of a total population of 74,135) will seek temporary shelter in public shelters.

Economic Loss

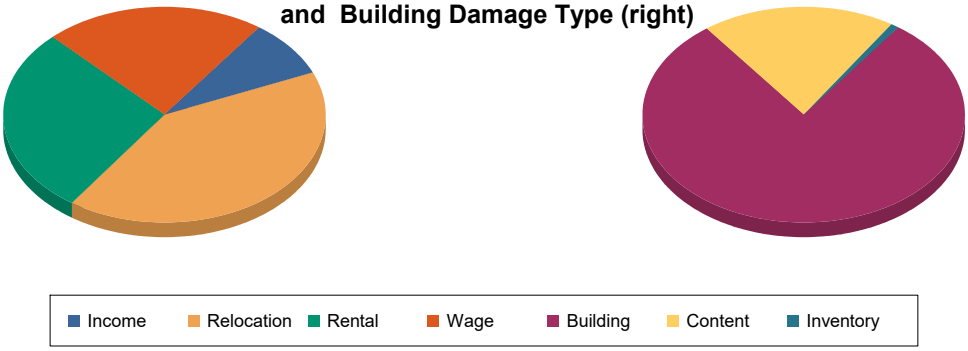
The total economic loss estimated for the hurricane is 387.7 million dollars, which represents 3.75 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 388 million dollars. 15% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 70% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

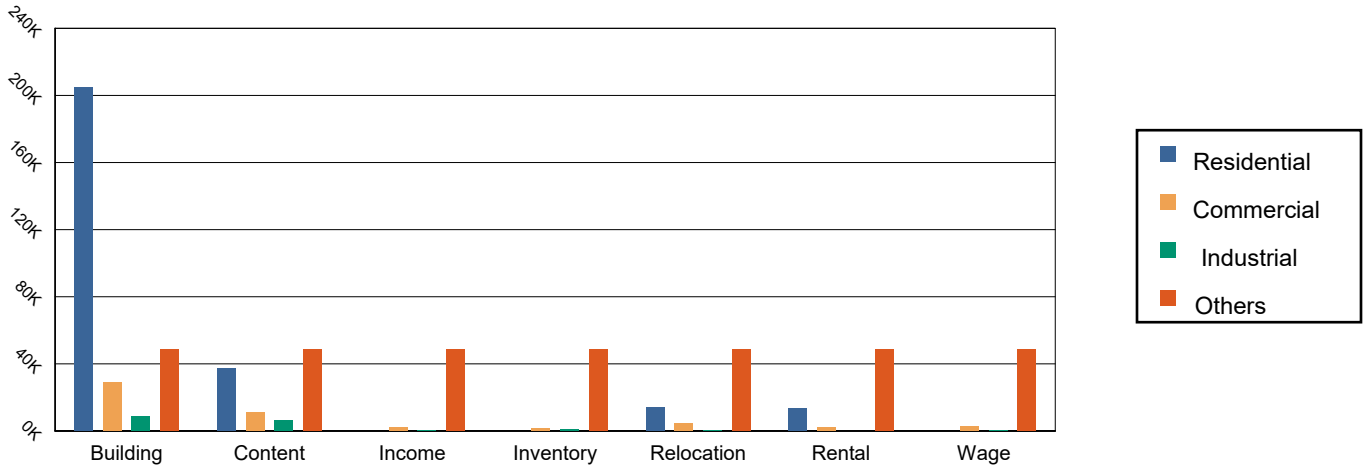


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	204,964.90	28,758.48	8,556.22	21,188.64	263,468.23
	Content	37,457.02	11,174.72	6,383.05	9,725.57	64,740.36
	Inventory	0.00	1,422.21	806.49	255.82	2,484.52
	Subtotal	**242,421.92**	**41,355.41**	**15,745.75**	**31,170.03**	**330,693.11**
Business Interruption Loss						
	Income	0.00	2,281.97	89.72	2,481.96	4,853.65
	Relocation	13,972.12	4,600.97	461.97	4,497.09	23,532.15
	Rental	13,281.52	2,054.70	75.53	495.39	15,907.15
	Wage	0.00	2,709.28	144.79	9,813.04	12,667.11
	Subtotal	**27,253.64**	**11,646.93**	**772.01**	**17,287.48**	**56,960.06**

Total

Total	**269,675.56**	**53,002.33**	**16,517.76**	**48,457.52**	**387,653.17**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	74,135	5,651,518	4,689,221	10,340,739
Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**
Study Region Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**

Hazus: Hurricane Global Risk Report

Region Name:	New_Britain_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 10,341 million dollars. Approximately 89% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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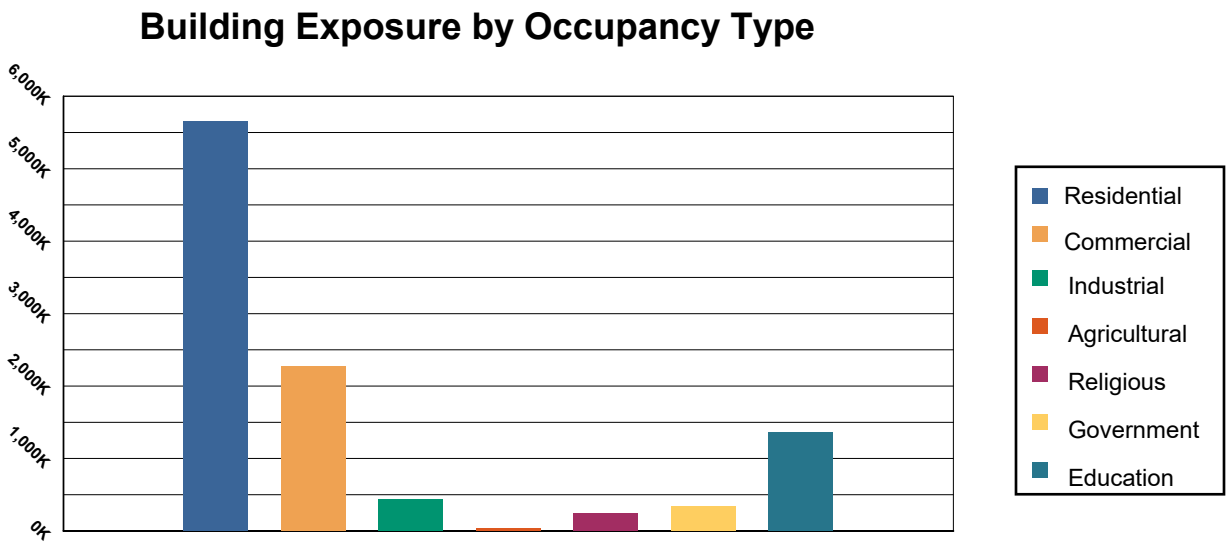

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Occupancy	Exposure ($1000)	Percent of Tot
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Agricultural	29,144	0.28%
Religious	244,462	2.36%
Government	338,895	3.28%
Education	1,363,357	13.18%
Total	**10,340,739**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds. There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2,234 buildings will be at least moderately damaged. This is over 13% of the total number of buildings in the region. There are an estimated 64 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

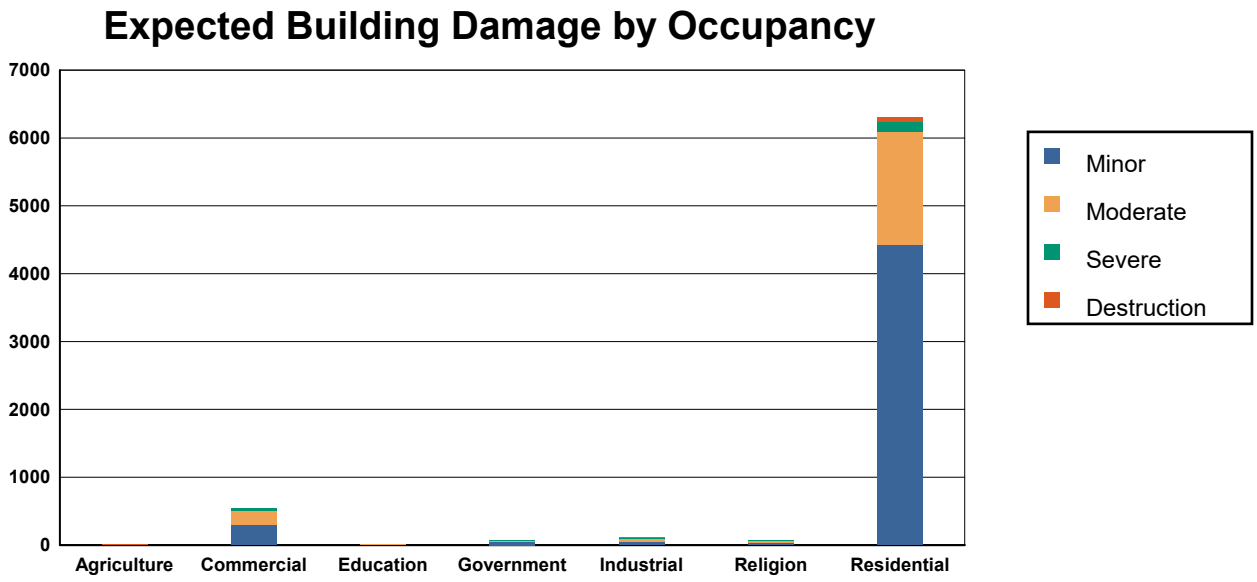


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	14.75	54.62	7.19	26.64	3.16	11.72	1.62	6.00	0.28	1.03
Commercial	738.28	57.81	304.01	23.81	191.08	14.96	43.27	3.39	0.36	0.03
Education	21.34	60.98	8.06	23.02	4.66	13.33	0.94	2.67	0.00	0.00
Government	111.30	59.52	42.72	22.85	27.21	14.55	5.78	3.09	0.00	0.00
Industrial	144.78	57.45	54.82	21.76	37.92	15.05	13.27	5.26	1.21	0.48
Religion	89.85	58.73	40.79	26.66	18.90	12.35	3.46	2.26	0.00	0.00
Residential	8,621.49	57.74	4,429.40	29.66	1,660.46	11.12	158.25	1.06	62.39	0.42
Total	**9,741.79**		**4,886.99**		**1,943.39**		**226.58**		**64.24**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	242	56.75	97	22.79	75	17.54	12	2.92	0	0.00
Masonry	1,472	53.77	625	22.82	570	20.82	66	2.41	5	0.18
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	594	58.93	212	21.03	158	15.69	43	4.31	0	0.04
Wood	7,508	59.27	4,023	31.76	963	7.60	113	0.89	61	0.48

Essential Facility Damage

Before the hurricane, the region had 457 hospital beds available for use. On the day of the hurricane, the model estimates that 457 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

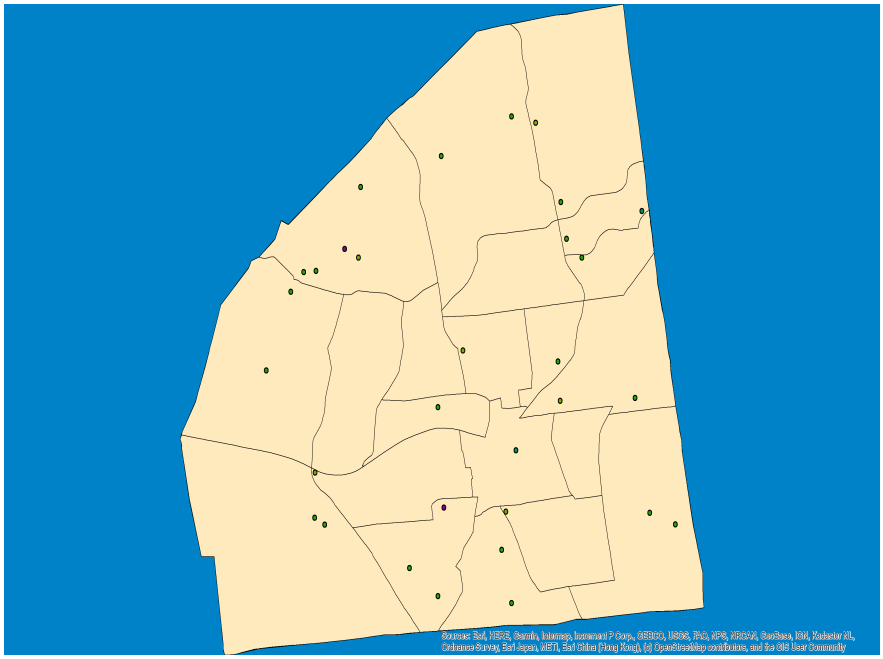
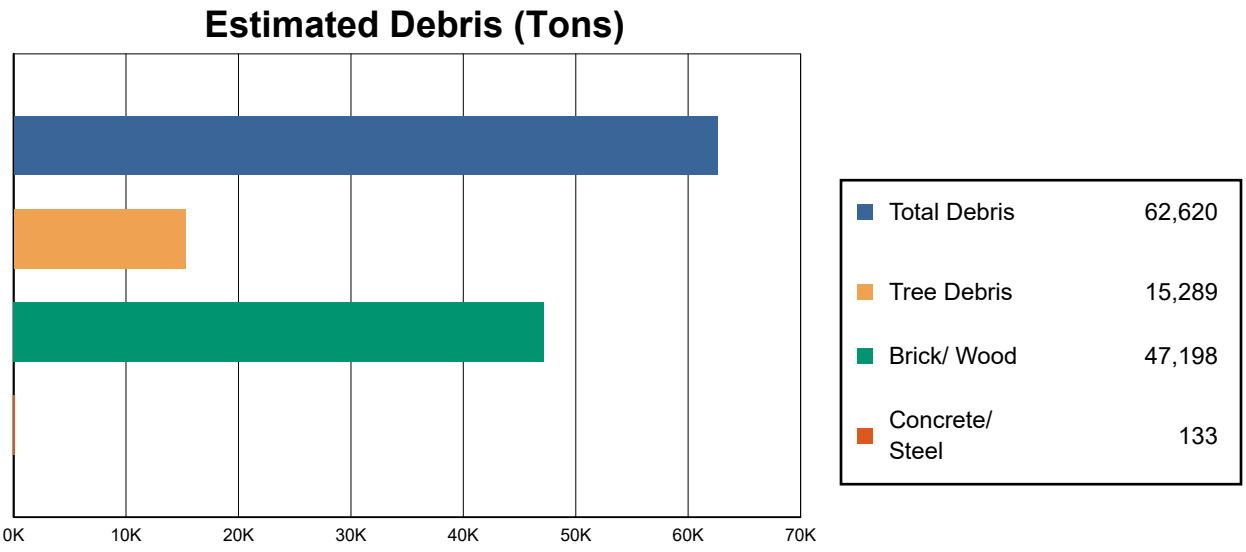


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	2	0	0	2
Police Stations	2	0	0	2
Schools	21	3	0	0

Induced Hurricane Damage

Debris Generation

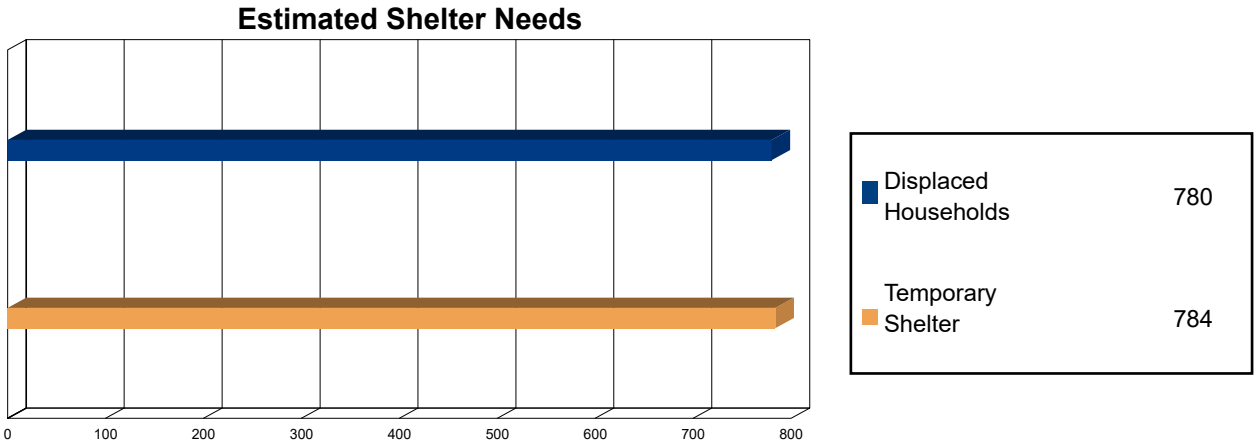


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 62,620 tons of debris will be generated. Of the total amount, 1,993 tons (3%) is Other Tree Debris. Of the remaining 60,627 tons, Brick/Wood comprises 78% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1893 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 13,296 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 780 households to be displaced due to the hurricane. Of these, 784 people (out of a total population of 74,135) will seek temporary shelter in public shelters.

Economic Loss

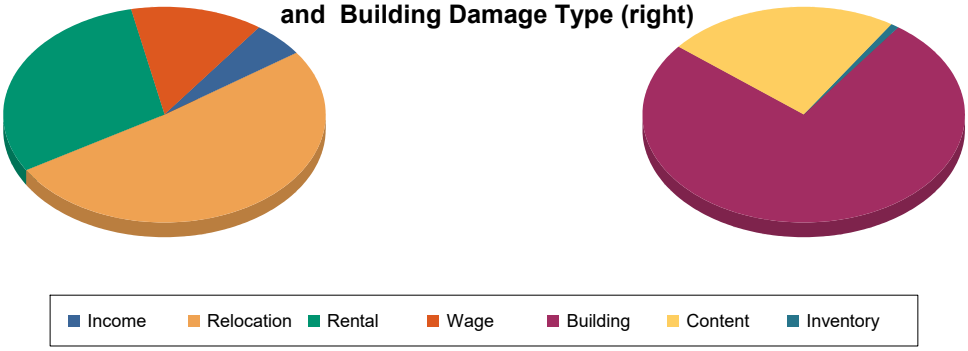
The total economic loss estimated for the hurricane is 599.2 million dollars, which represents 5.79 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 599 million dollars. 13% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 65% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

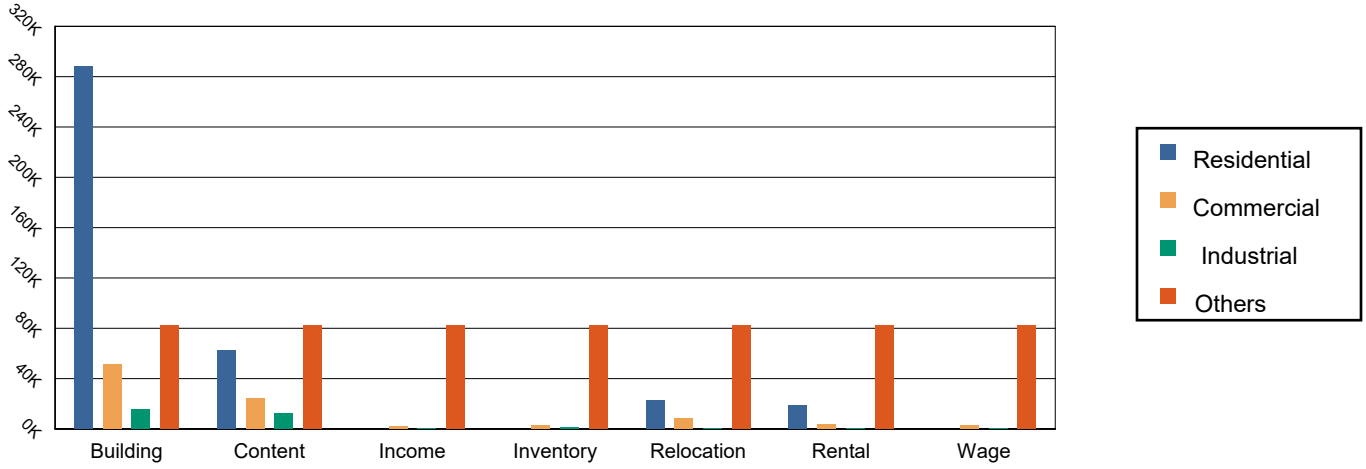


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	287,823.74	51,465.82	15,198.51	39,899.91	394,387.97
	Content	62,707.50	24,100.04	12,141.56	22,137.60	121,086.70
	Inventory	0.00	3,020.72	1,524.77	450.19	4,995.68
	Subtotal	**350,531.24**	**78,586.57**	**28,864.83**	**62,487.70**	**520,470.35**
Business Interruption Loss						
	Income	1.56	2,032.04	164.00	1,906.65	4,104.25
	Relocation	22,481.25	8,237.79	811.12	8,858.09	40,388.26
	Rental	18,822.84	3,752.53	134.55	1,005.20	23,715.12
	Wage	3.68	2,448.34	266.06	7,815.81	10,533.89
	Subtotal	**41,309.33**	**16,470.71**	**1,375.74**	**19,585.76**	**78,741.53**

Total

Total	391,840.57	95,057.28	30,240.57	82,073.45	599,211.88

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	74,135	5,651,518	4,689,221	10,340,739
Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**
Study Region Total	**74,135**	**5,651,518**	**4,689,221**	**10,340,739**

Hazus: Hurricane Global Risk Report

Region Name:	Newington_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Thursday, May 11, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.14 square miles and contains 7 census tracts. There are over 12 thousand households in the region and a total population of 30,536 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 88% of the buildings (and 53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,827 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

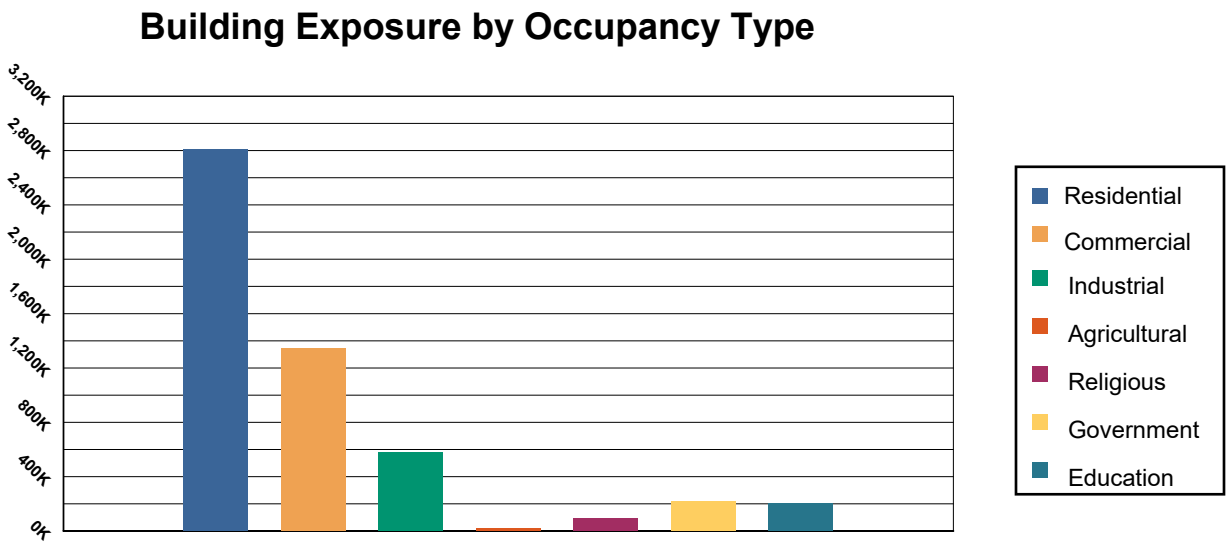


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,810,059	53.42%
Commercial	1,346,797	25.60%
Industrial	575,480	10.94%
Agricultural	18,219	0.35%
Religious	88,959	1.69%
Government	217,408	4.13%
Education	203,390	3.87%
Total	**5,260,312**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds. There are 8 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

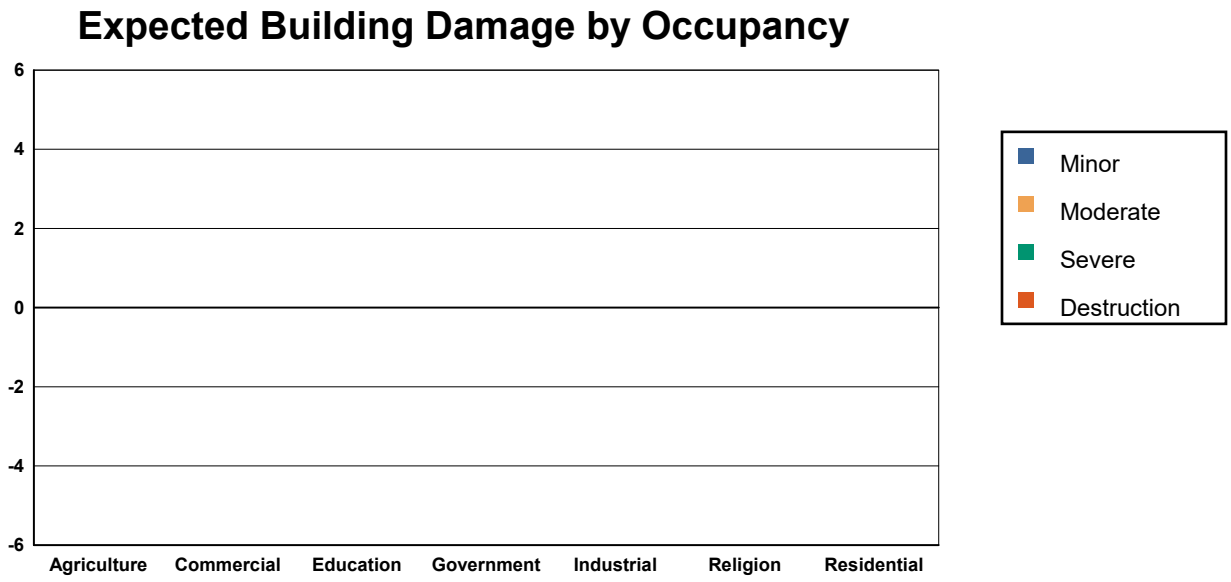


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	38.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	775.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	28.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	56.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	254.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	44.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	8,632.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**9,827.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	119	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	737	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	564	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	8,400	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

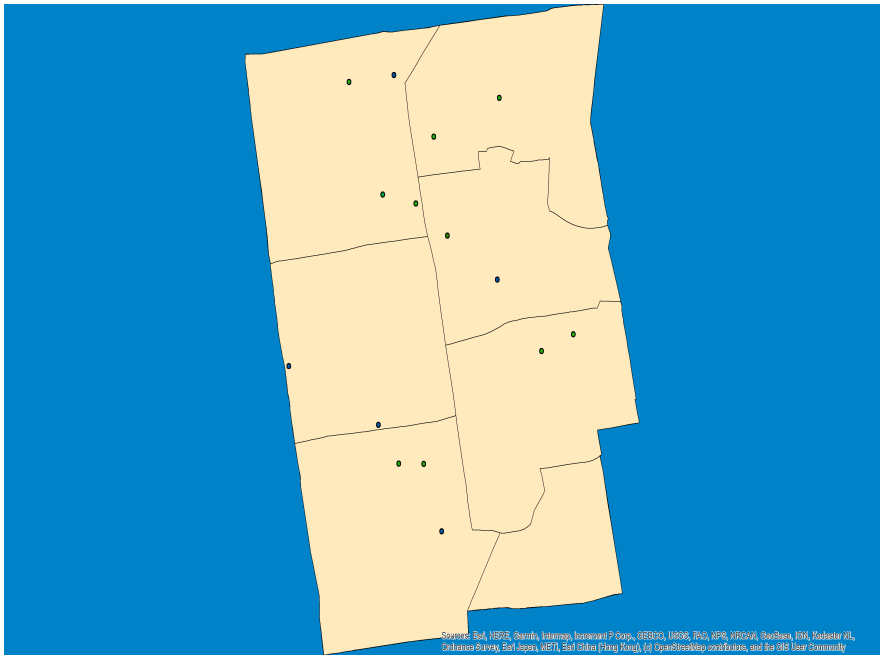
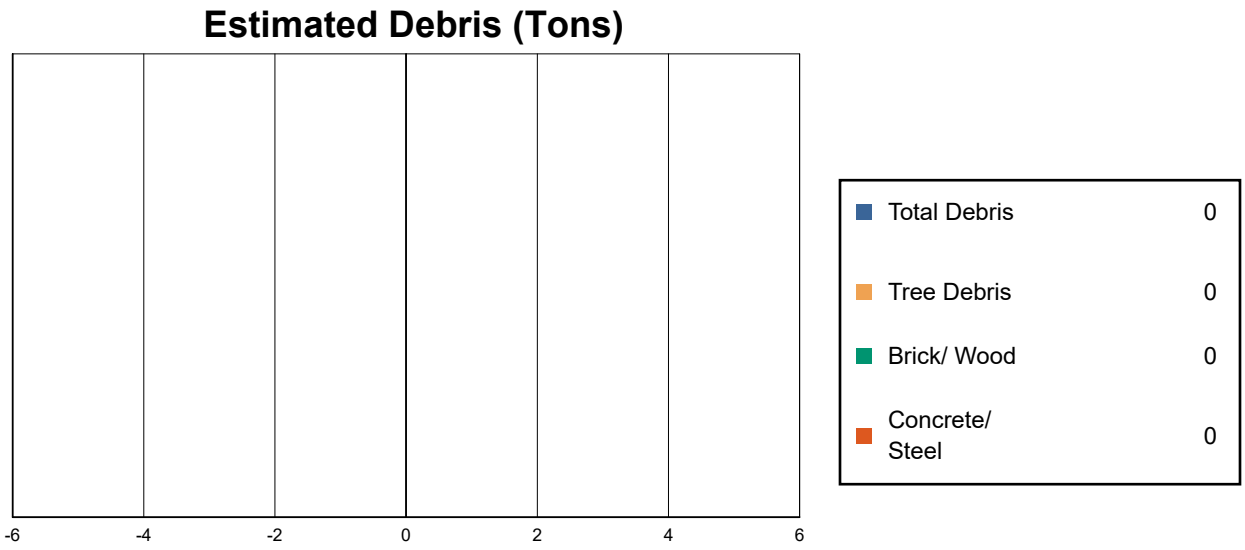


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

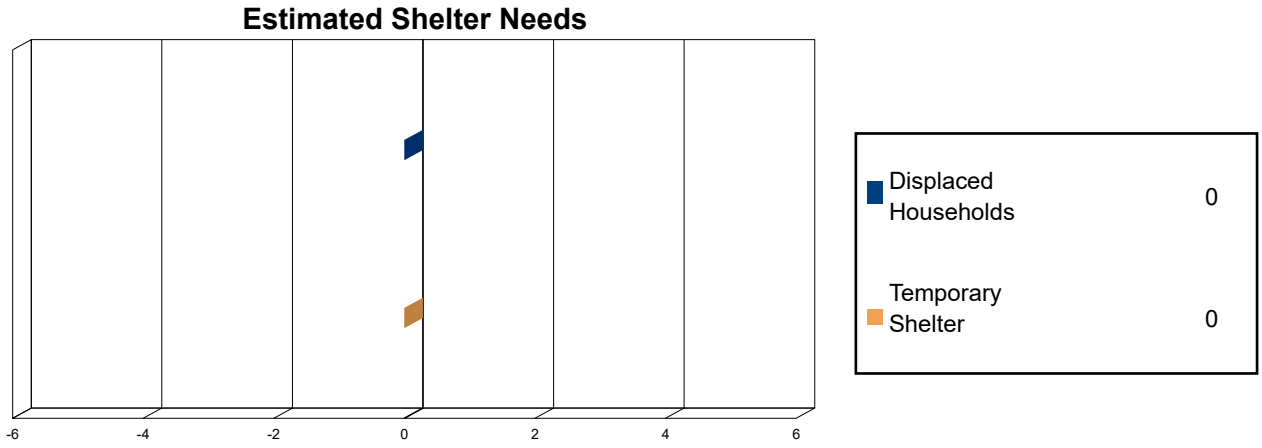


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 30,536) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

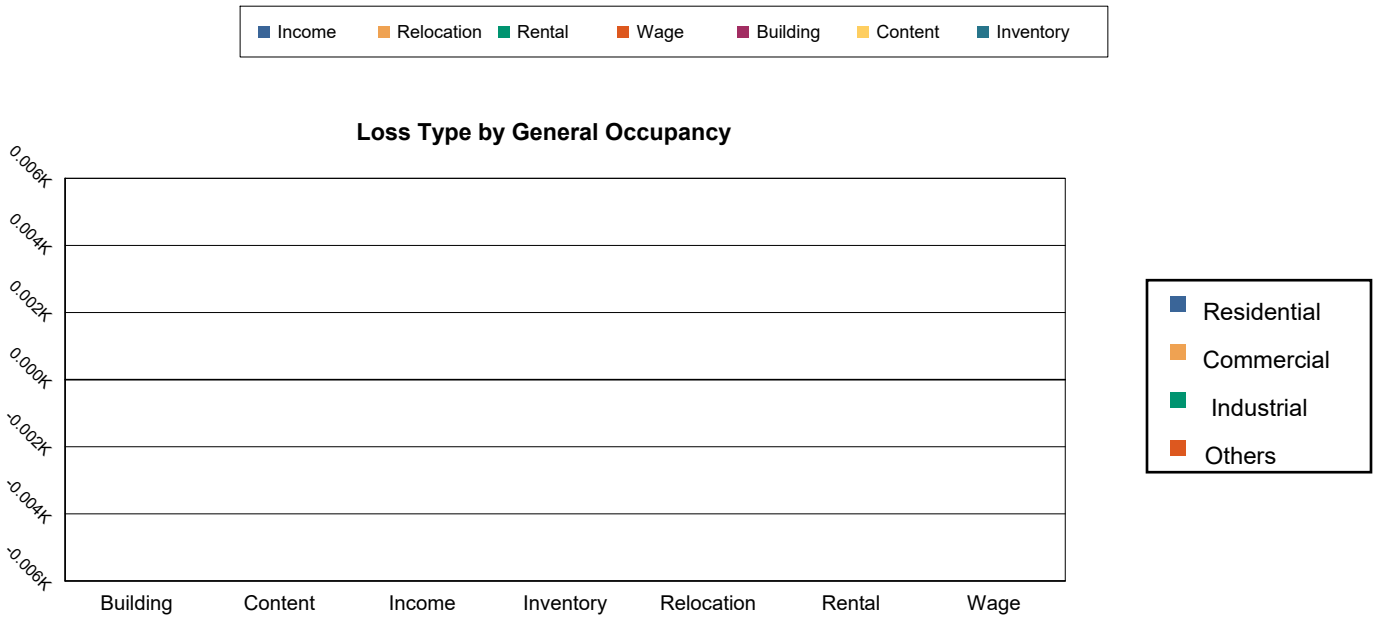


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	30,536	2,810,059	2,450,253	5,260,312
Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**
Study Region Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**

Hazus: Hurricane Global Risk Report

Region Name:	Newington_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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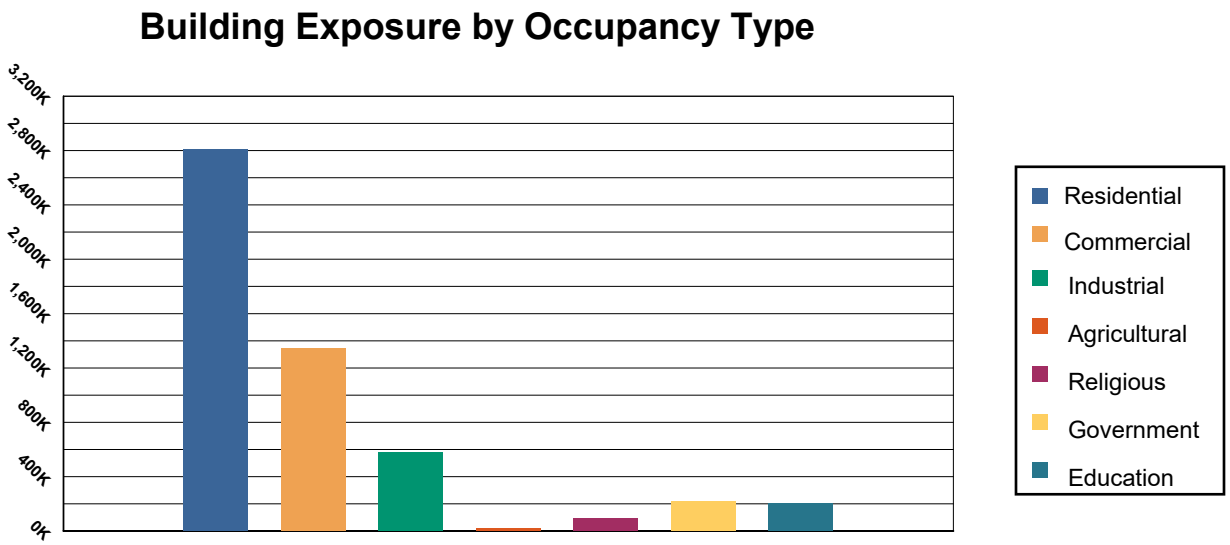

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Total	**5,260,312**	**100.00%**

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For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds. There are 8 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

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Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

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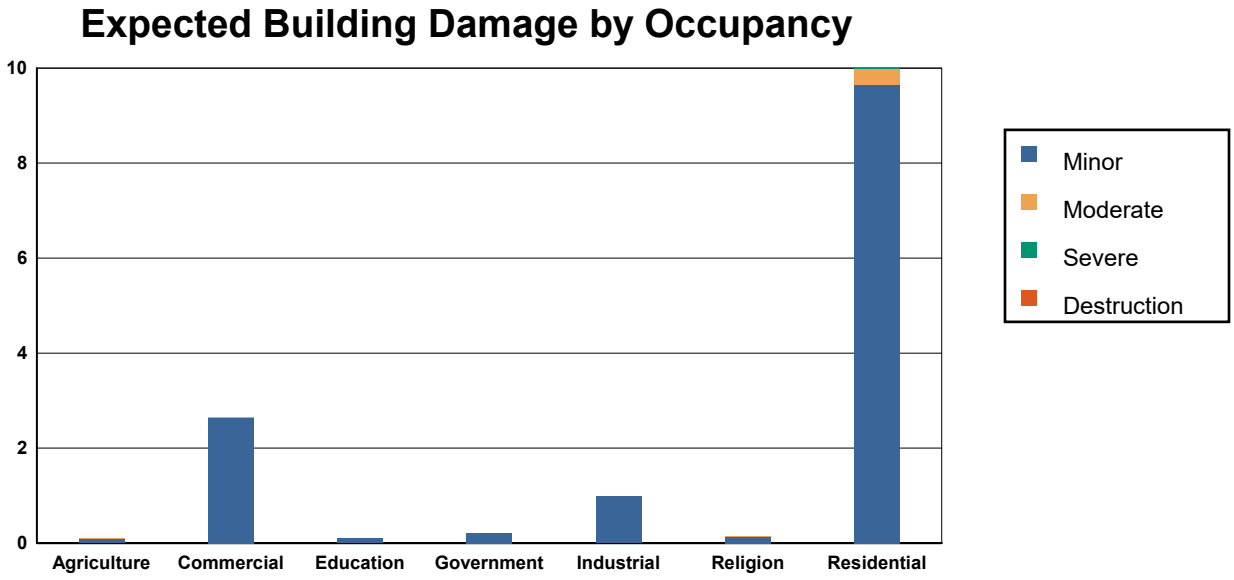


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	37.90	99.73	0.10	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	772.35	99.66	2.64	0.34	0.02	0.00	0.00	0.00	0.00	0.00
Education	27.90	99.63	0.10	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Government	55.79	99.62	0.21	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	253.01	99.61	0.99	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Religion	43.87	99.71	0.13	0.29	0.00	0.00	0.00	0.00	0.00	0.00
Residential	8,622.01	99.88	9.65	0.11	0.34	0.00	0.00	0.00	0.00	0.00
Total	**9,812.82**		**13.82**		**0.36**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	118	99.56	1	0.44	0	0.00	0	0.00	0	0.00
Masonry	733	99.46	4	0.53	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	562	99.62	2	0.38	0	0.00	0	0.00	0	0.00
Wood	8,396	99.95	4	0.05	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

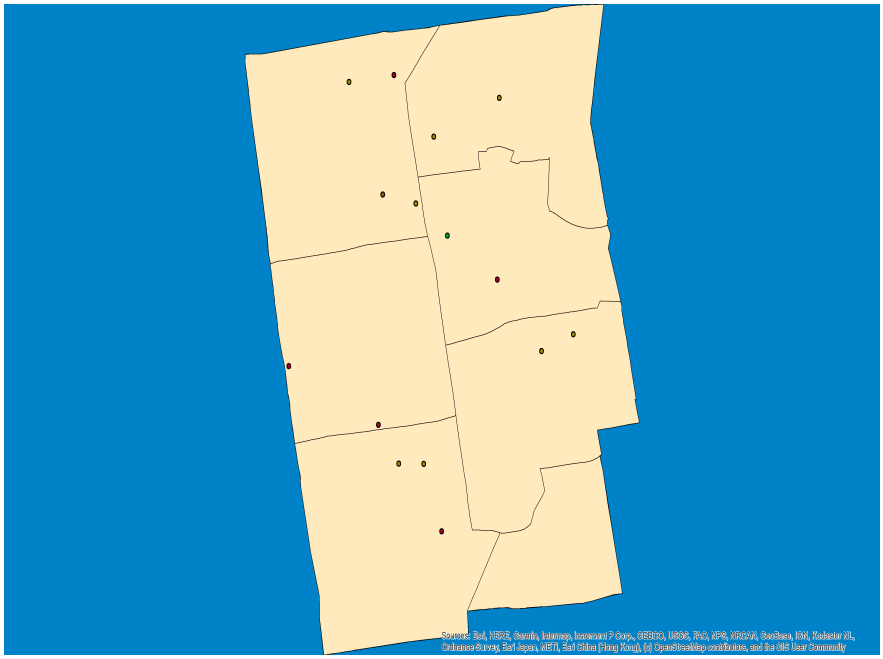
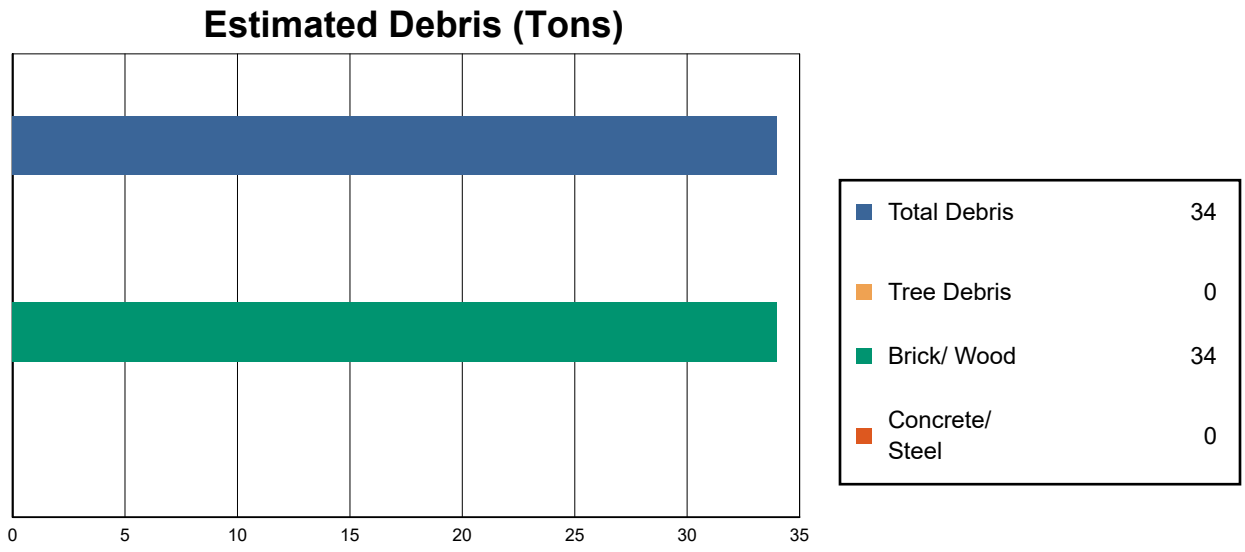


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

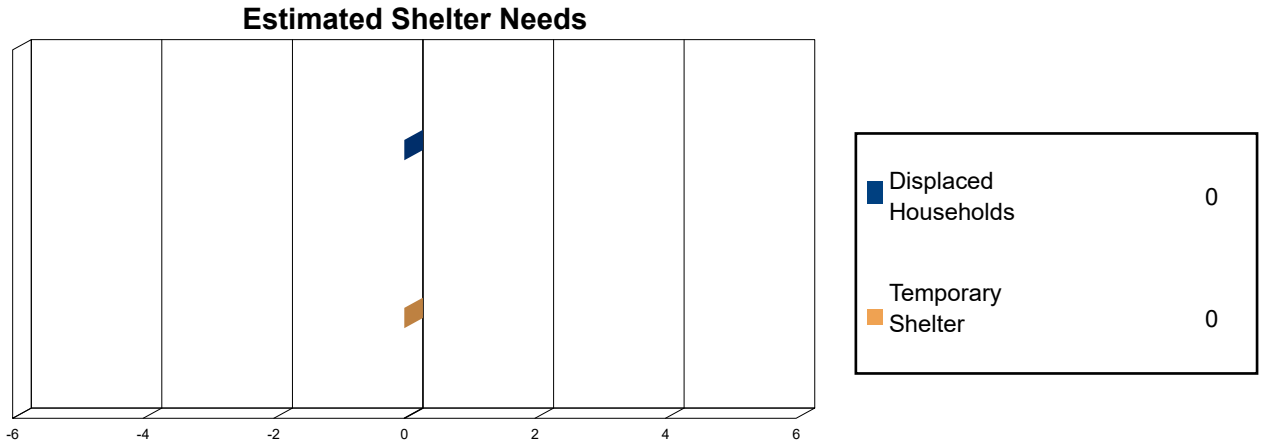


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 34 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 34 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 30,536) will seek temporary shelter in public shelters.

Economic Loss

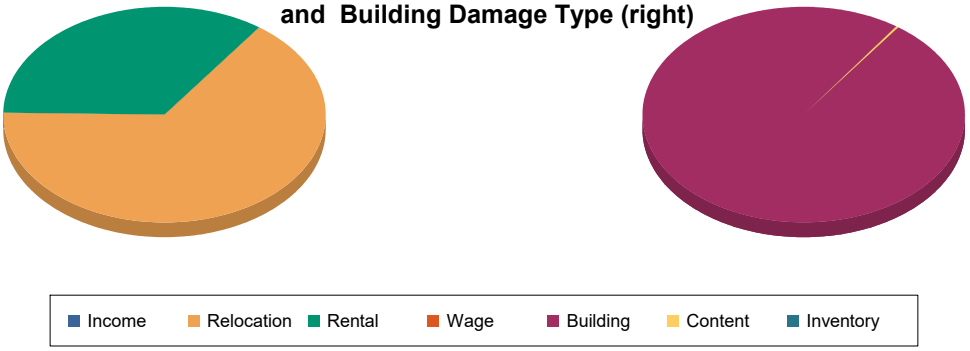
The total economic loss estimated for the hurricane is 1.2 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 80% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

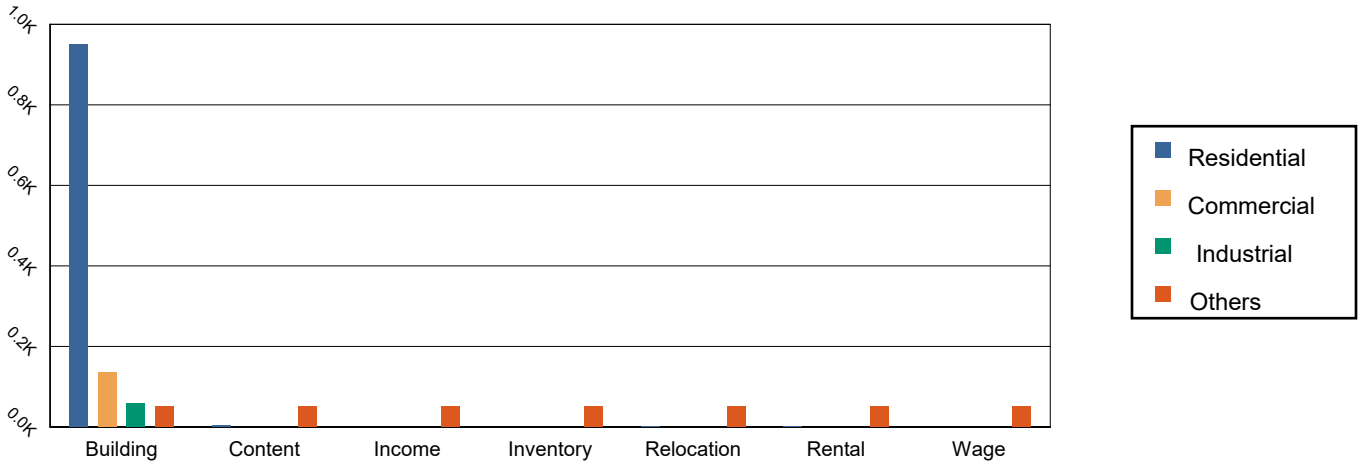


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	950.12	134.68	57.55	50.98	1,193.32
	Content	3.69	0.00	0.00	0.00	3.69
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**953.81**	**134.68**	**57.55**	**50.98**	**1,197.01**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	1.01	0.18	0.00	0.02	1.21
	Rental	0.64	0.00	0.00	0.00	0.64
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1.65**	**0.18**	**0.00**	**0.02**	**1.85**

Total

Total	**955.46**	**134.86**	**57.55**	**51.00**	**1,198.86**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
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Hartford	30,536	2,810,059	2,450,253	5,260,312
Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**
Study Region Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**

Hazus: Hurricane Global Risk Report

Region Name:	Newington_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Thursday, May 11, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
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General Building Stock	
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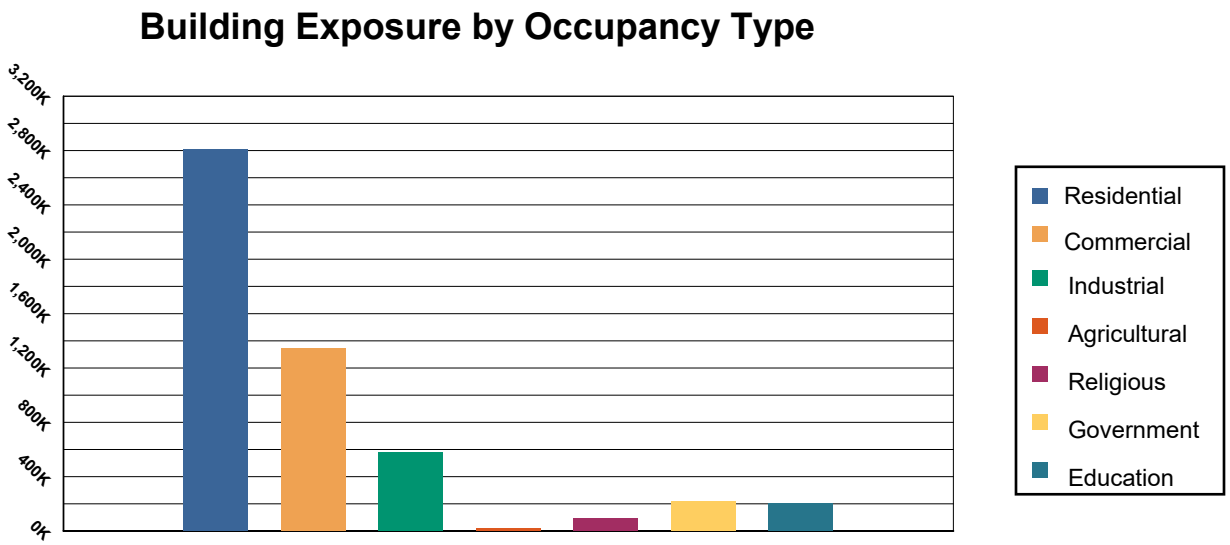

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Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 18 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

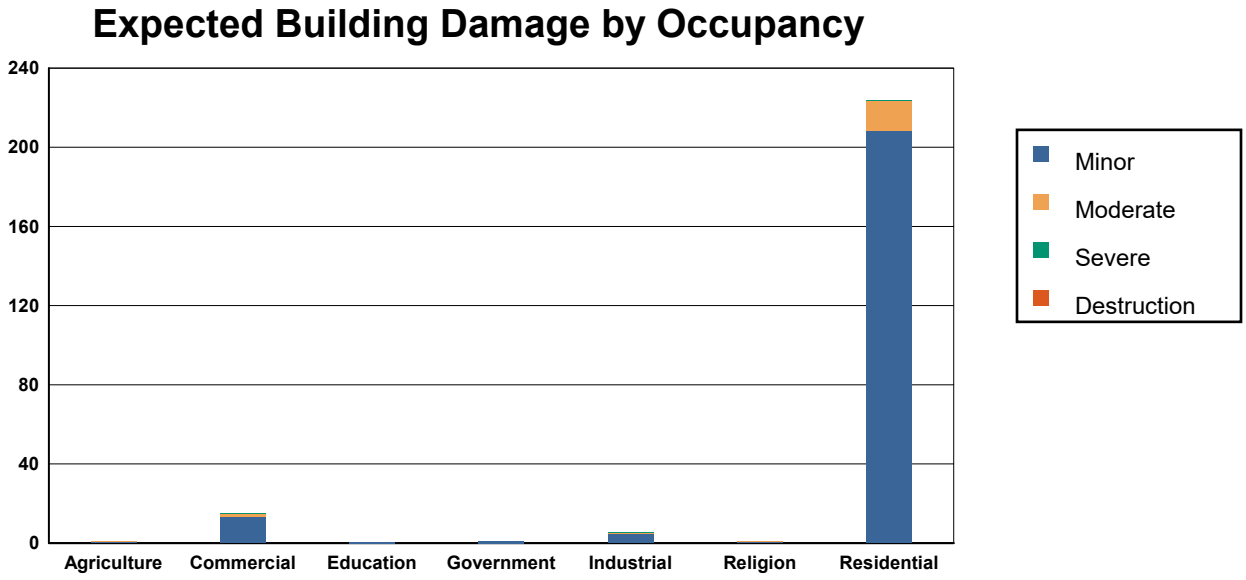


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	37.12	97.67	0.77	2.02	0.09	0.23	0.02	0.06	0.00	0.00
Commercial	760.00	98.06	13.36	1.72	1.54	0.20	0.10	0.01	0.00	0.00
Education	27.49	98.18	0.50	1.78	0.01	0.04	0.00	0.00	0.00	0.00
Government	54.98	98.18	1.00	1.79	0.02	0.04	0.00	0.00	0.00	0.00
Industrial	248.77	97.94	4.87	1.92	0.29	0.11	0.06	0.02	0.00	0.00
Religion	43.24	98.27	0.74	1.68	0.02	0.05	0.00	0.00	0.00	0.00
Residential	8,408.10	97.41	208.13	2.41	15.62	0.18	0.15	0.00	0.00	0.00
Total	**9,579.70**		**229.37**		**17.59**		**0.34**		**0.01**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	117	97.94	2	2.02	0	0.04	0	0.00	0	0.00
Masonry	712	96.64	21	2.84	4	0.50	0	0.02	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	553	98.10	10	1.71	1	0.17	0	0.01	0	0.00
Wood	8,218	97.84	176	2.09	6	0.07	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

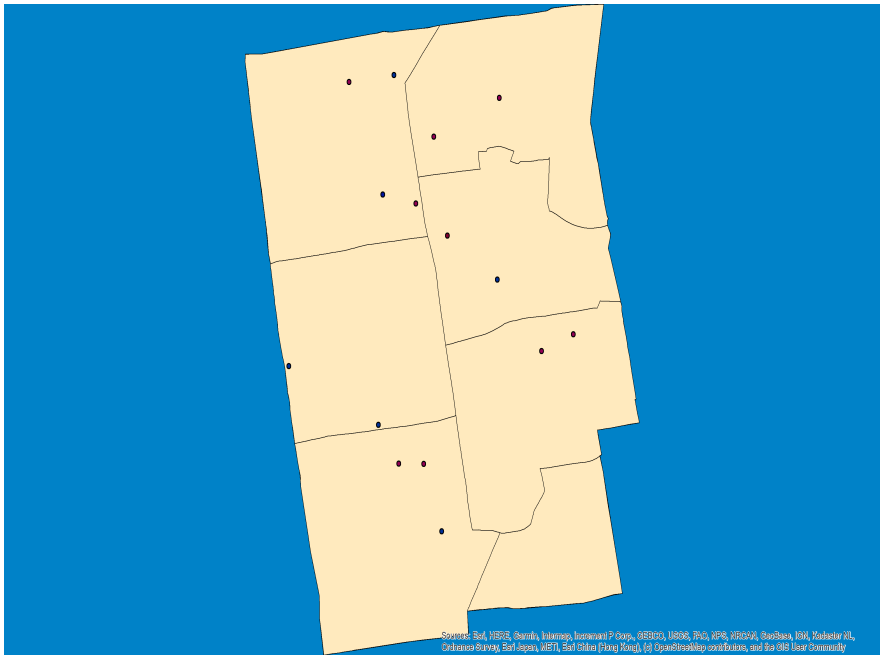
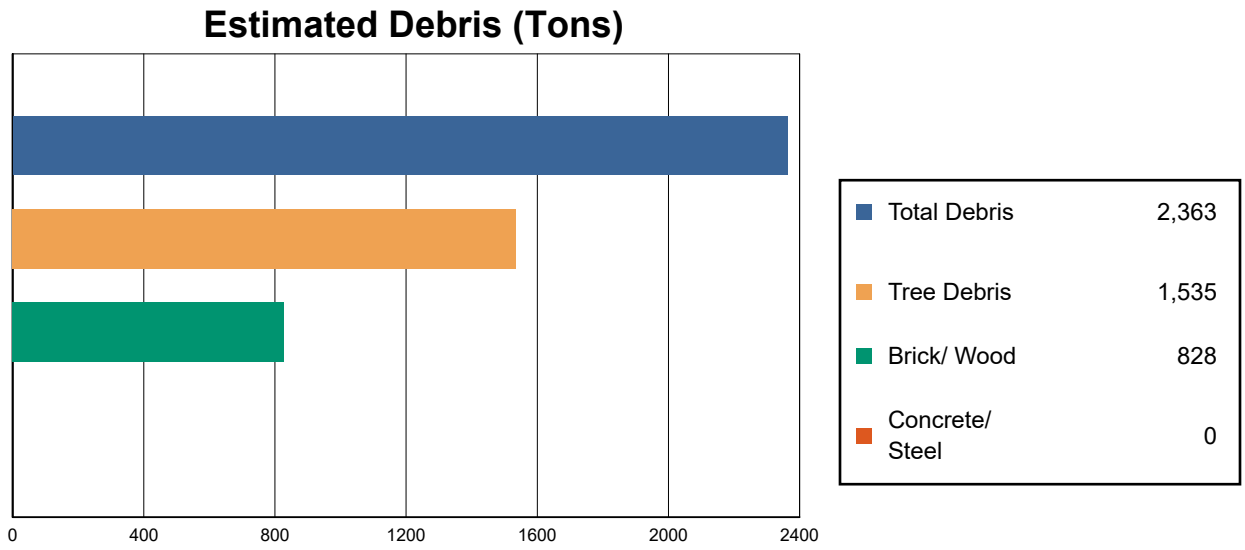


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

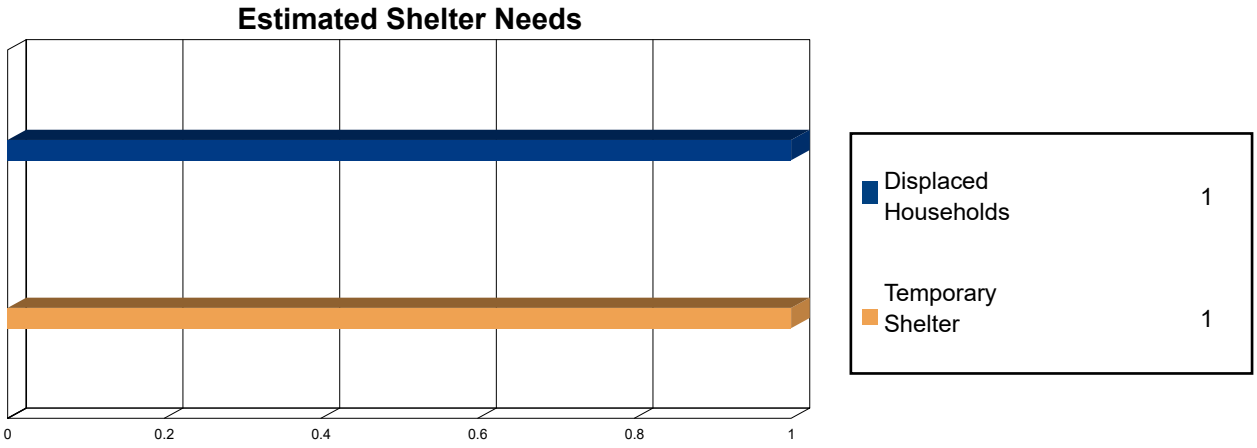


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,363 tons of debris will be generated. Of the total amount, 416 tons (18%) is Other Tree Debris. Of the remaining 1,947 tons, Brick/Wood comprises 43% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 33 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,119 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 30,536) will seek temporary shelter in public shelters.

Economic Loss

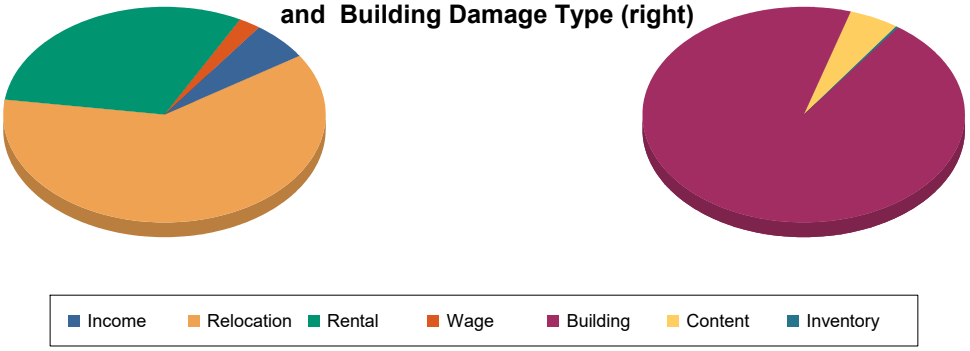
The total economic loss estimated for the hurricane is 11.1 million dollars, which represents 0.21 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 11 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 86% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

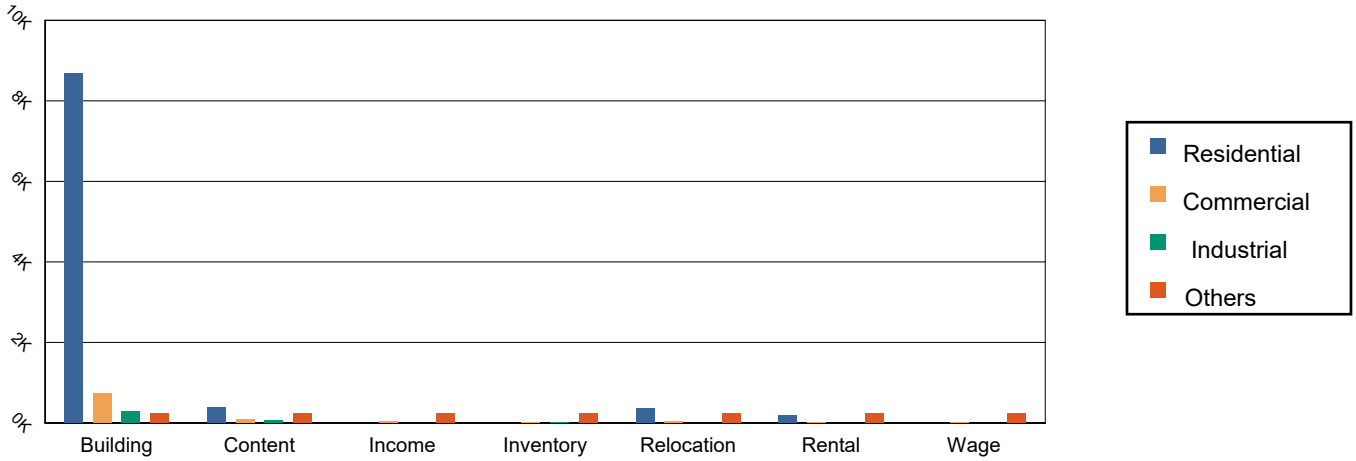


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	8,685.36	728.29	275.21	228.54	9,917.40
	Content	385.84	83.00	59.57	6.24	534.65
	Inventory	0.00	13.94	7.99	2.00	23.93
	Subtotal	**9,071.20**	**825.23**	**342.78**	**236.77**	**10,475.98**
Business Interruption Loss						
	Income	0.00	38.96	0.00	0.00	38.96
	Relocation	358.13	38.45	2.06	1.57	400.20
	Rental	185.42	15.91	0.00	0.00	201.33
	Wage	0.00	13.85	0.00	0.00	13.85
	Subtotal	**543.55**	**107.17**	**2.06**	**1.57**	**654.34**

Total

Total	**9,614.75**	**932.40**	**344.84**	**238.34**	**11,130.32**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	30,536	2,810,059	2,450,253	5,260,312
Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**
Study Region Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**

Hazus: Hurricane Global Risk Report

Region Name:	Newington_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.14 square miles and contains 7 census tracts. There are over 12 thousand households in the region and a total population of 30,536 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 88% of the buildings (and 53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,827 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

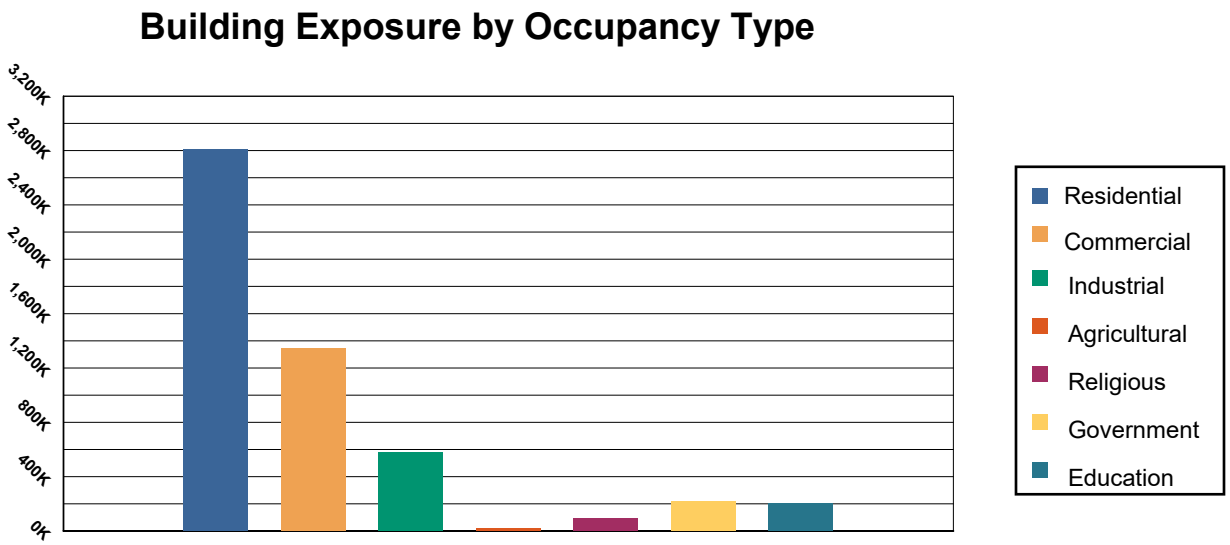


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,810,059	53.42%
Commercial	1,346,797	25.60%
Industrial	575,480	10.94%
Agricultural	18,219	0.35%
Religious	88,959	1.69%
Government	217,408	4.13%
Education	203,390	3.87%
Total	**5,260,312**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds. There are 8 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 97 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

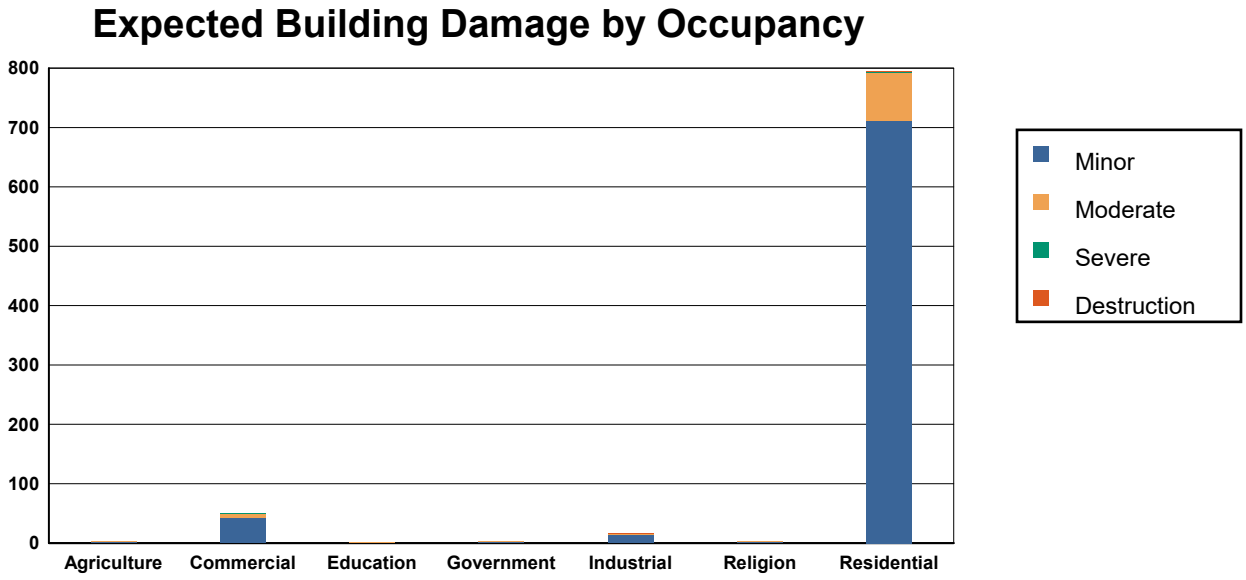


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	34.79	91.55	2.52	6.63	0.48	1.26	0.20	0.53	0.01	0.03
Commercial	724.11	93.43	41.87	5.40	7.85	1.01	1.17	0.15	0.00	0.00
Education	26.32	94.01	1.53	5.47	0.14	0.51	0.00	0.01	0.00	0.00
Government	52.75	94.19	2.97	5.31	0.27	0.49	0.01	0.01	0.00	0.00
Industrial	237.02	93.31	14.17	5.58	2.24	0.88	0.55	0.22	0.03	0.01
Religion	41.22	93.68	2.57	5.84	0.20	0.46	0.01	0.02	0.00	0.00
Residential	7,837.70	90.80	710.88	8.24	81.53	0.94	1.14	0.01	0.75	0.01
Total	**8,953.91**		**776.51**		**92.72**		**3.08**		**0.79**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	111	93.56	7	5.80	1	0.62	0	0.01	0	0.00
Masonry	666	90.38	53	7.22	16	2.21	1	0.18	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	529	93.87	28	4.98	6	1.00	1	0.16	0	0.00
Wood	7,698	91.64	657	7.82	43	0.51	1	0.02	1	0.01

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

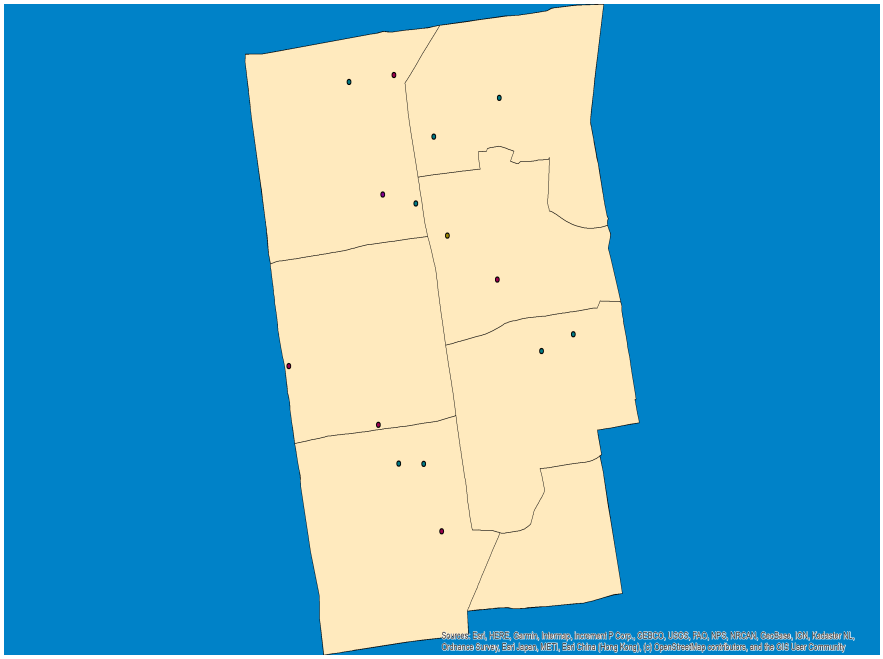
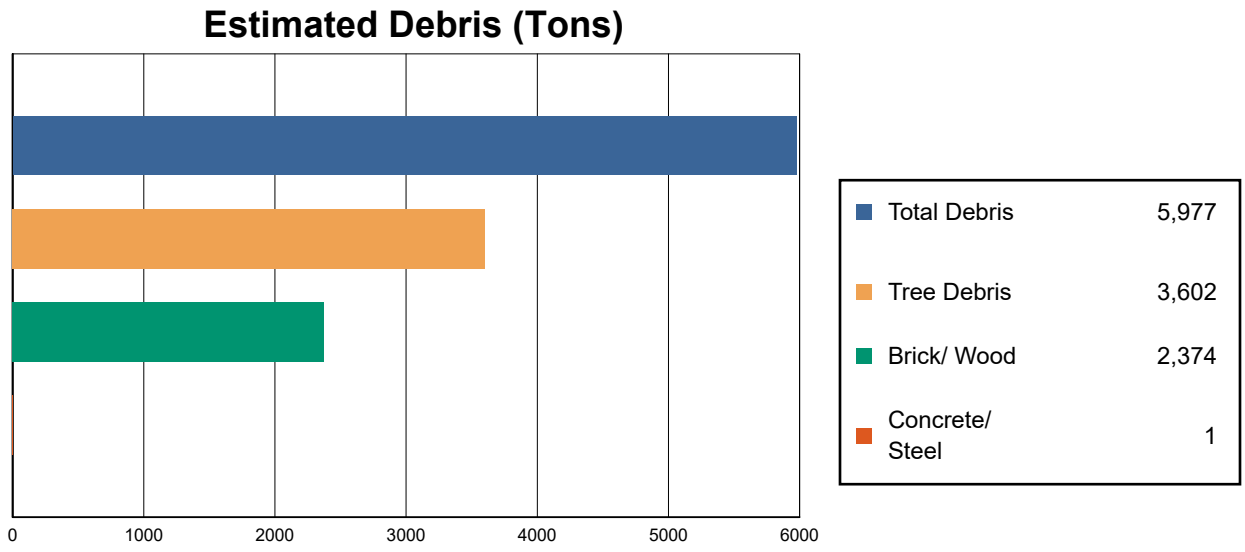


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

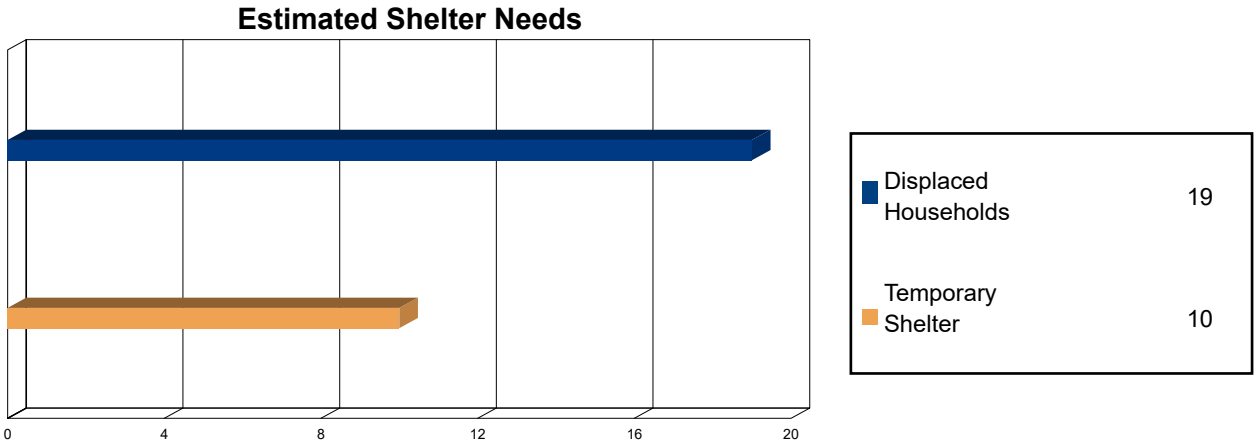


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,977 tons of debris will be generated. Of the total amount, 944 tons (16%) is Other Tree Debris. Of the remaining 5,033 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 95 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,658 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 19 households to be displaced due to the hurricane. Of these, 10 people (out of a total population of 30,536) will seek temporary shelter in public shelters.

Economic Loss

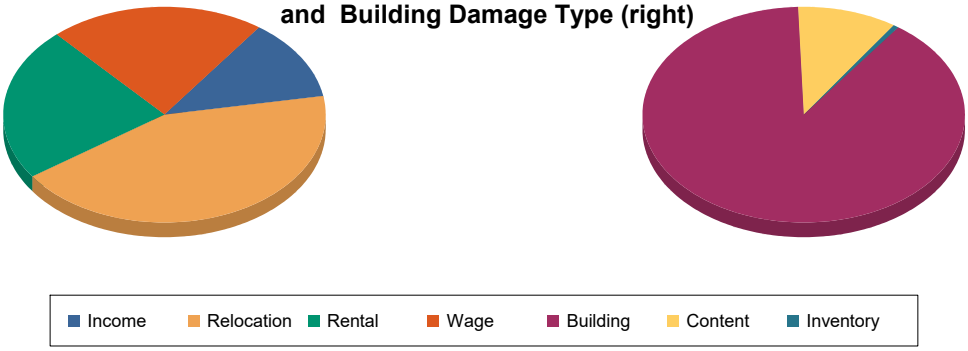
The total economic loss estimated for the hurricane is 29.7 million dollars, which represents 0.56 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 30 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 75% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

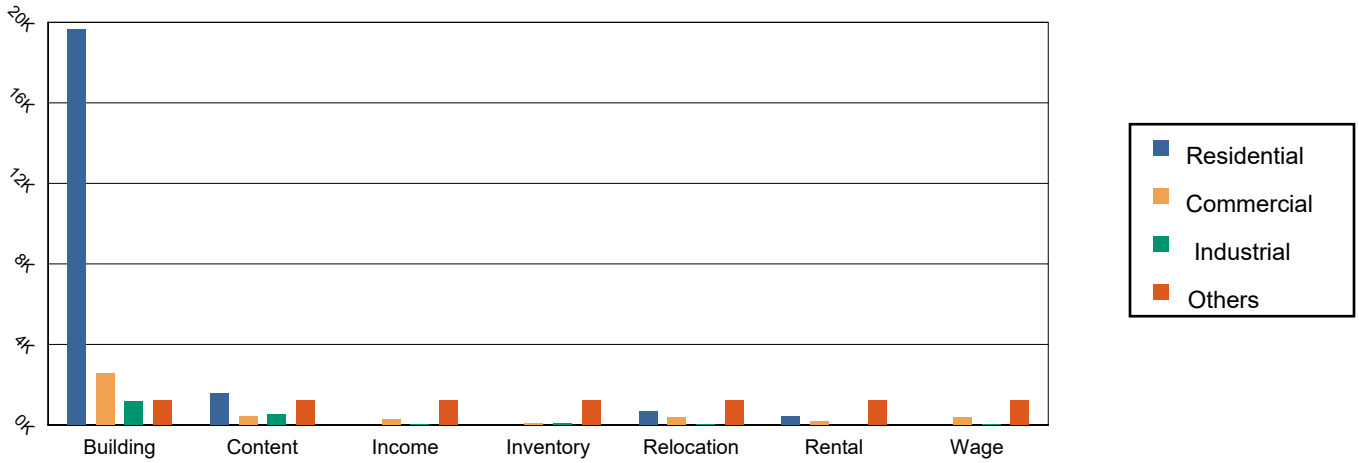


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	19,668.34	2,553.32	1,168.12	778.27	24,168.06
	Content	1,583.07	445.56	536.62	111.05	2,676.31
	Inventory	0.00	94.09	68.63	16.00	178.72
	Subtotal	**21,251.42**	**3,092.97**	**1,773.37**	**905.33**	**27,023.09**
Business Interruption Loss						
	Income	0.00	252.66	8.40	66.52	327.58
	Relocation	680.86	356.59	38.44	75.42	1,151.32
	Rental	426.26	186.27	5.43	6.23	624.20
	Wage	0.00	377.44	13.85	185.76	577.05
	Subtotal	**1,107.12**	**1,172.97**	**66.12**	**333.94**	**2,680.15**

Total

Total	**22,358.54**	**4,265.94**	**1,839.49**	**1,239.27**	**29,703.24**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	30,536	2,810,059	2,450,253	5,260,312
Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**
Study Region Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**

Hazus: Hurricane Global Risk Report

Region Name:	Newington_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.14 square miles and contains 7 census tracts. There are over 12 thousand households in the region and a total population of 30,536 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 88% of the buildings (and 53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,827 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

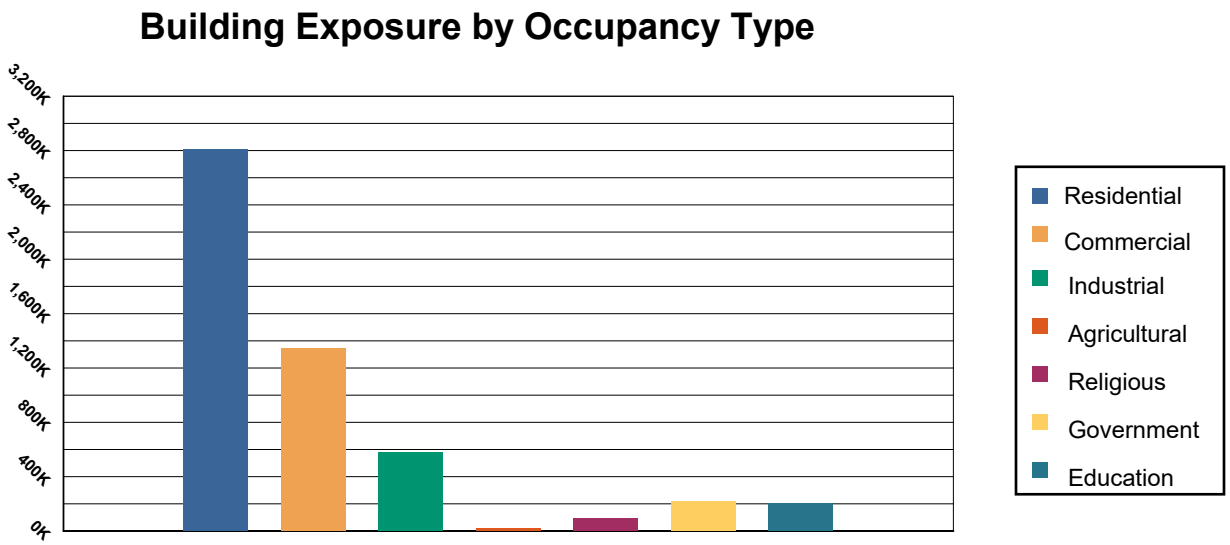


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,810,059	53.42%
Commercial	1,346,797	25.60%
Industrial	575,480	10.94%
Agricultural	18,219	0.35%
Religious	88,959	1.69%
Government	217,408	4.13%
Education	203,390	3.87%
Total	**5,260,312**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds. There are 8 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 281 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 6 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

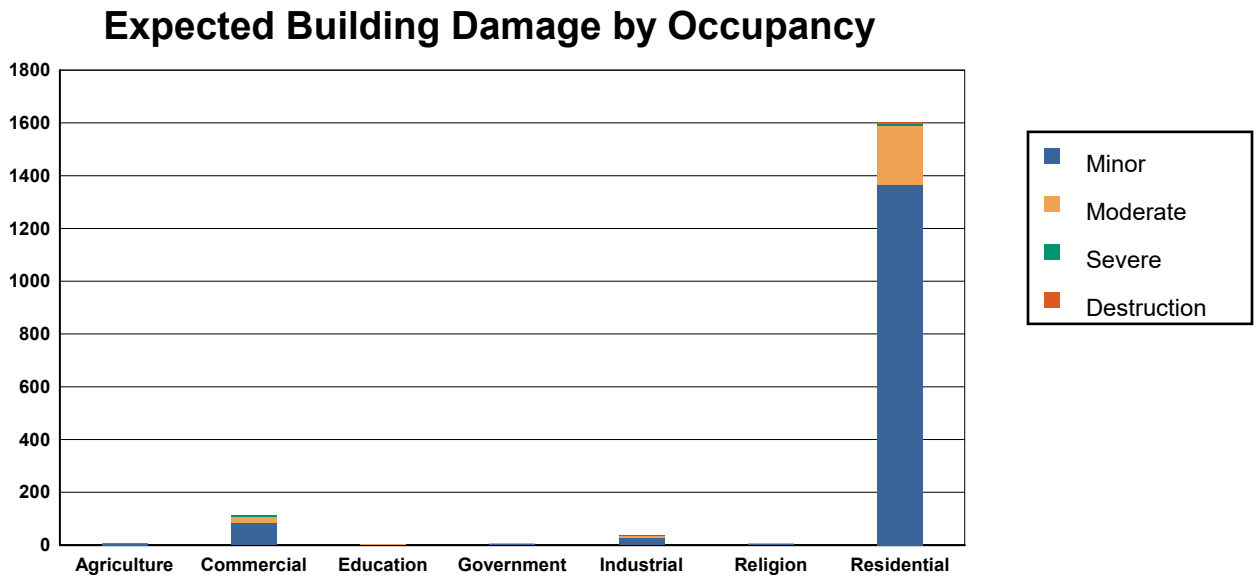


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	31.22	82.15	4.90	12.90	1.25	3.29	0.57	1.51	0.06	0.15
Commercial	662.20	85.44	84.73	10.93	23.76	3.07	4.31	0.56	0.01	0.00
Education	24.19	86.40	3.12	11.16	0.65	2.32	0.03	0.12	0.00	0.00
Government	48.47	86.56	6.15	10.98	1.31	2.35	0.07	0.12	0.00	0.00
Industrial	216.62	85.28	27.76	10.93	7.67	3.02	1.82	0.72	0.13	0.05
Religion	37.75	85.79	5.33	12.11	0.88	1.99	0.05	0.11	0.00	0.00
Residential	7,028.68	81.43	1,365.23	15.82	224.76	2.60	7.05	0.08	6.28	0.07
Total	**8,049.12**		**1,497.23**		**260.28**		**13.89**		**6.48**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	102	85.62	14	11.46	3	2.81	0	0.11	0	0.00
Masonry	598	81.09	94	12.79	40	5.49	4	0.57	0	0.06
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	486	86.22	56	9.98	18	3.18	3	0.62	0	0.00
Wood	6,935	82.56	1,308	15.57	144	1.72	7	0.09	6	0.07

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

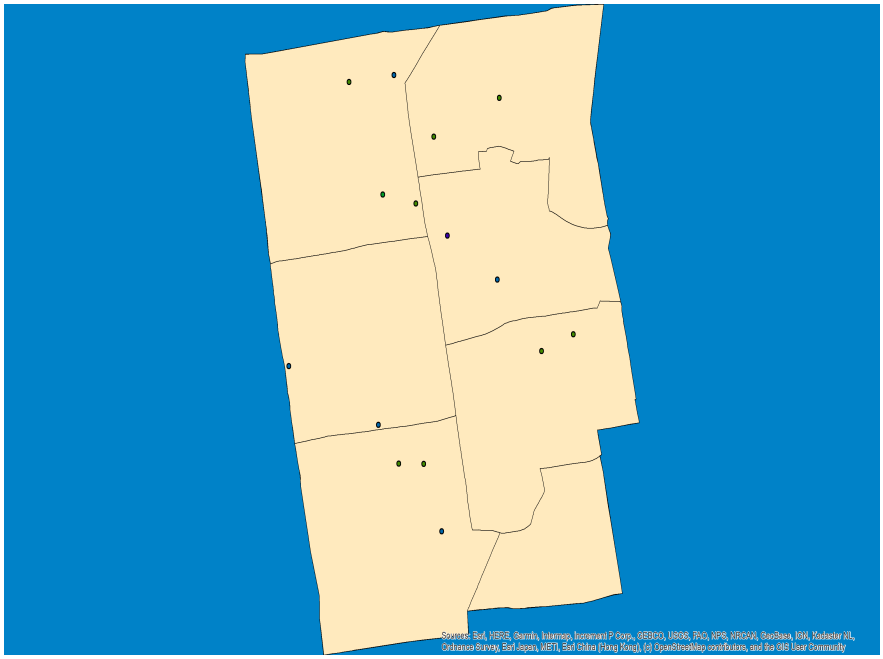
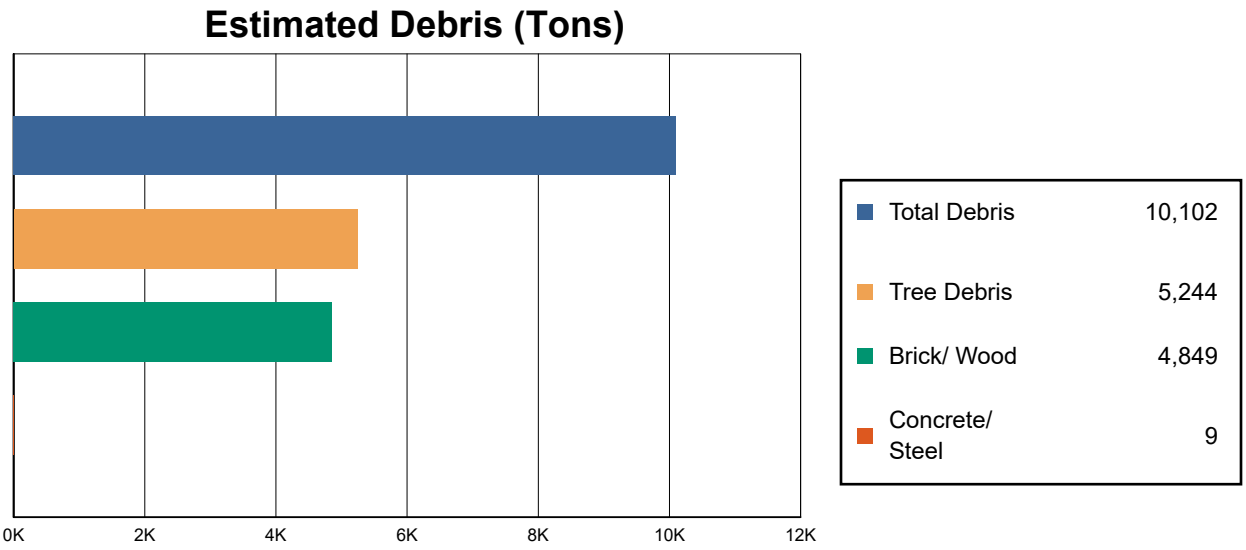


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

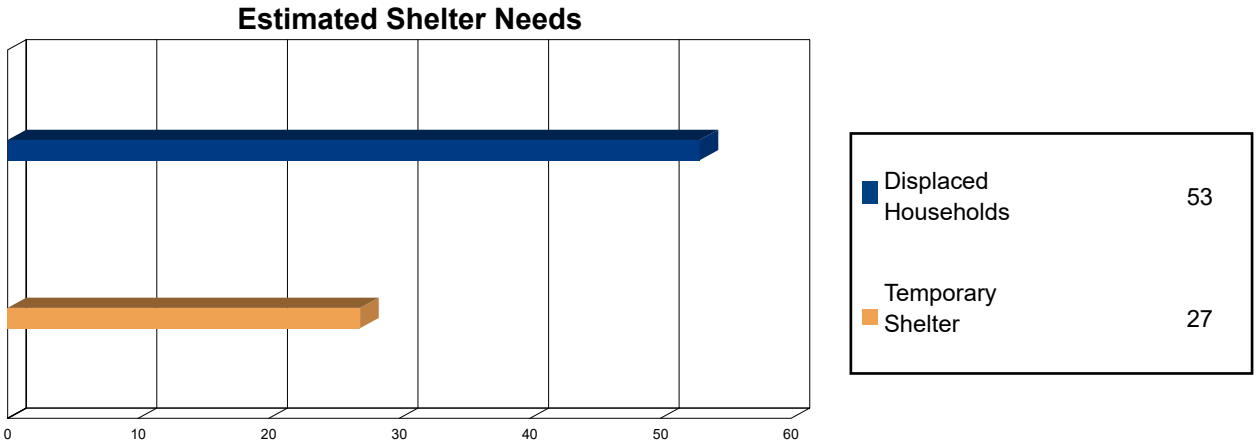


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 10,102 tons of debris will be generated. Of the total amount, 1,370 tons (14%) is Other Tree Debris. Of the remaining 8,732 tons, Brick/Wood comprises 56% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 194 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,874 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 53 households to be displaced due to the hurricane. Of these, 27 people (out of a total population of 30,536) will seek temporary shelter in public shelters.

Economic Loss

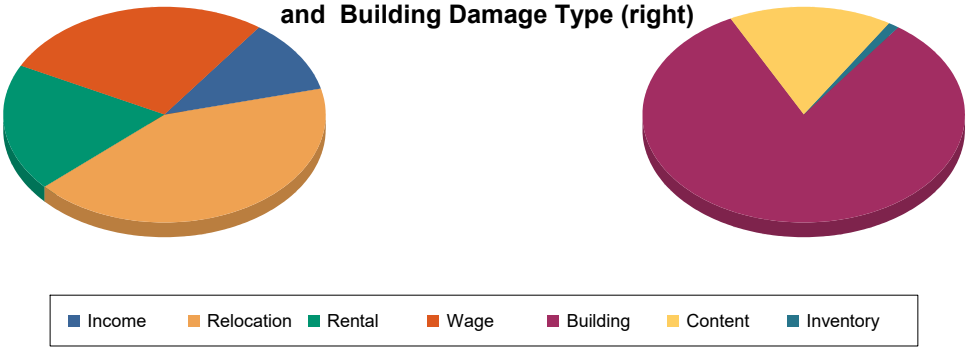
The total economic loss estimated for the hurricane is 65.8 million dollars, which represents 1.25 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 66 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 68% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

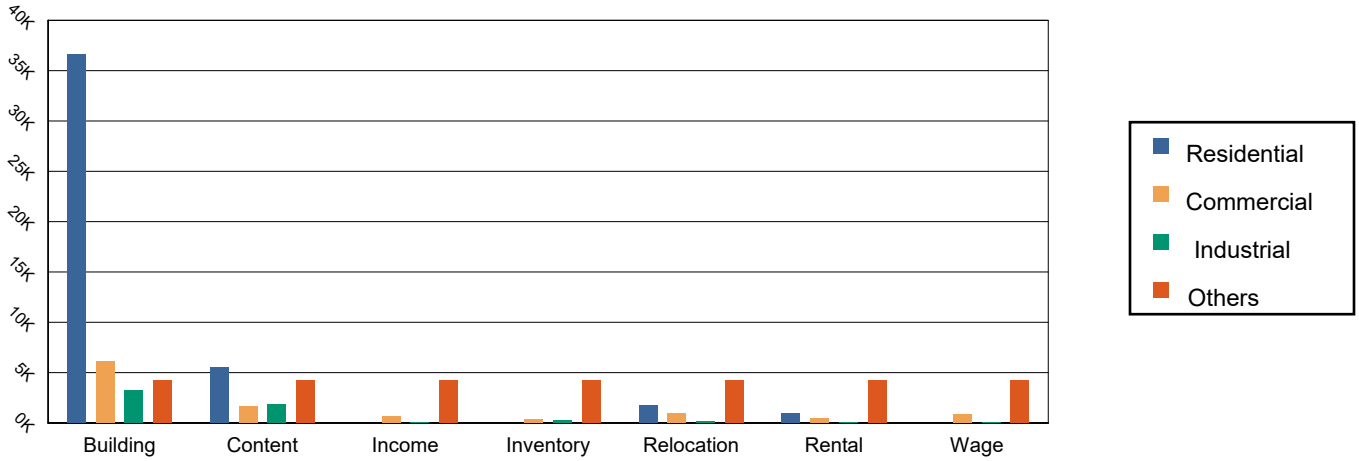


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	36,620.64	6,148.79	3,222.99	2,014.23	48,006.65
	Content	5,532.59	1,686.37	1,878.46	472.97	9,570.40
	Inventory	0.00	368.19	235.46	51.65	655.29
	Subtotal	**42,153.23**	**8,203.35**	**5,336.91**	**2,538.85**	**58,232.34**
Business Interruption Loss						
	Income	0.00	641.38	35.81	156.84	834.03
	Relocation	1,776.33	932.75	173.28	312.12	3,194.47
	Rental	911.71	454.08	26.32	49.87	1,441.98
	Wage	0.00	831.72	58.80	1,192.98	2,083.51
	Subtotal	**2,688.04**	**2,859.94**	**294.21**	**1,711.80**	**7,553.99**

Total

Total	**44,841.27**	**11,063.29**	**5,631.12**	**4,250.65**	**65,786.34**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	30,536	2,810,059	2,450,253	5,260,312
Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**
Study Region Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**

Hazus: Hurricane Global Risk Report

Region Name:	Newington_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.14 square miles and contains 7 census tracts. There are over 12 thousand households in the region and a total population of 30,536 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 88% of the buildings (and 53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,827 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

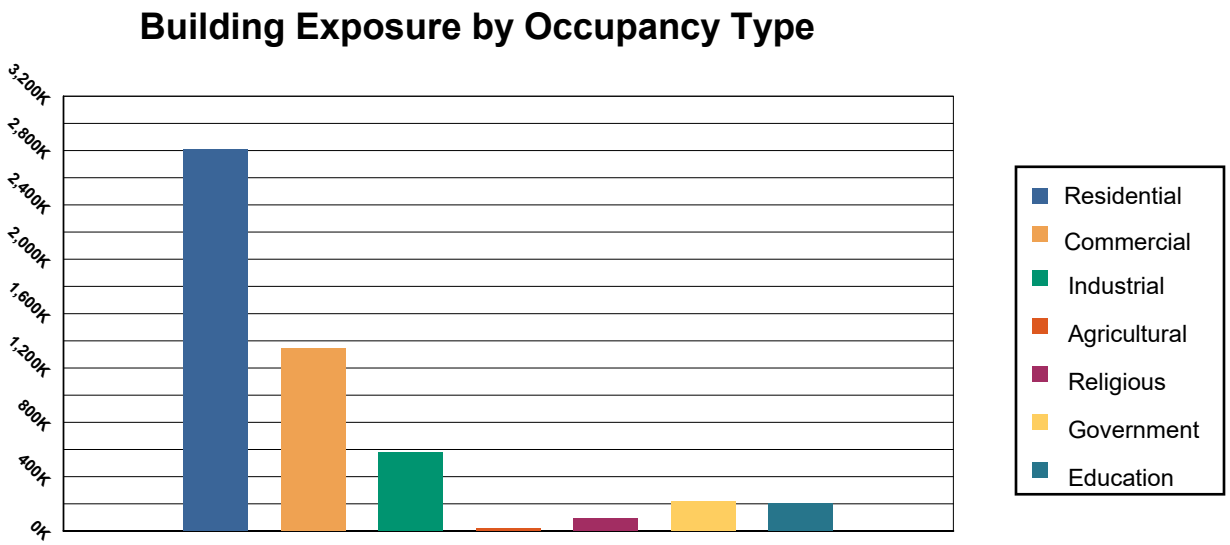


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,810,059	53.42%
Commercial	1,346,797	25.60%
Industrial	575,480	10.94%
Agricultural	18,219	0.35%
Religious	88,959	1.69%
Government	217,408	4.13%
Education	203,390	3.87%
Total	**5,260,312**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds. There are 8 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 740 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. There are an estimated 33 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

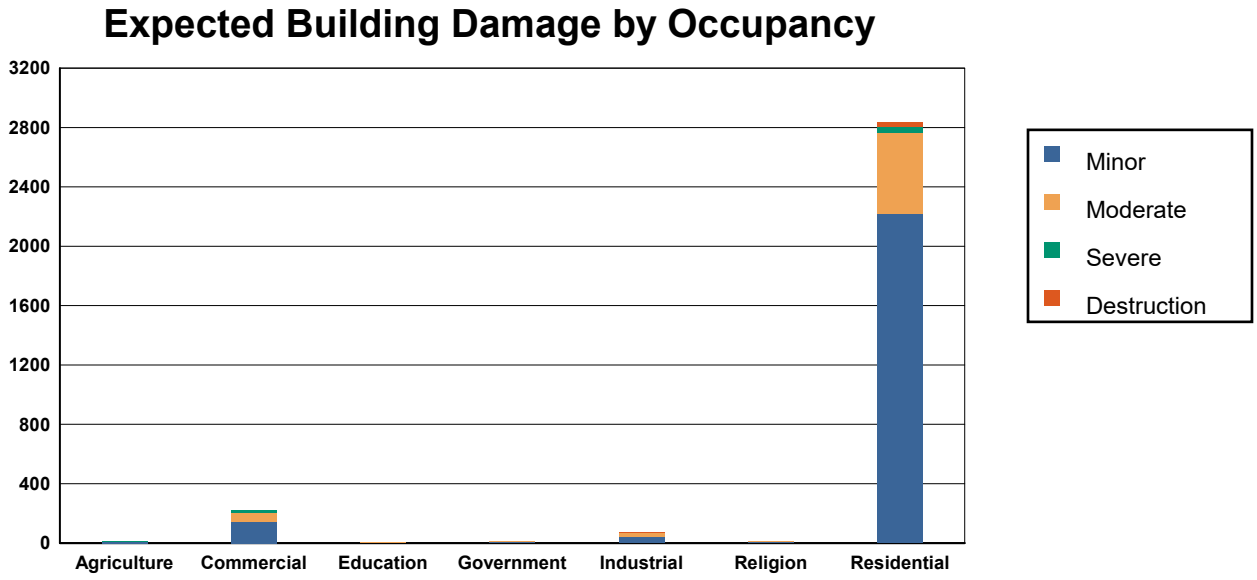


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	25.42	66.90	8.13	21.40	2.86	7.52	1.39	3.65	0.20	0.52
Commercial	553.30	71.39	142.87	18.43	64.26	8.29	14.43	1.86	0.14	0.02
Education	20.33	72.61	5.29	18.88	2.14	7.64	0.25	0.88	0.00	0.00
Government	41.03	73.26	10.26	18.32	4.23	7.56	0.48	0.86	0.00	0.00
Industrial	180.42	71.03	45.51	17.92	21.79	8.58	5.79	2.28	0.50	0.20
Religion	31.43	71.43	9.33	21.20	2.93	6.66	0.31	0.71	0.00	0.00
Residential	5,792.78	67.11	2,221.13	25.73	543.95	6.30	41.62	0.48	32.51	0.38
Total	**6,644.70**		**2,442.51**		**642.16**		**64.27**		**33.35**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	85	71.38	22	18.73	11	9.00	1	0.89	0	0.00
Masonry	489	66.38	143	19.37	90	12.23	13	1.79	2	0.23
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	408	72.35	94	16.61	50	8.83	12	2.18	0	0.02
Wood	5,744	68.38	2,185	26.02	403	4.80	38	0.45	30	0.35

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

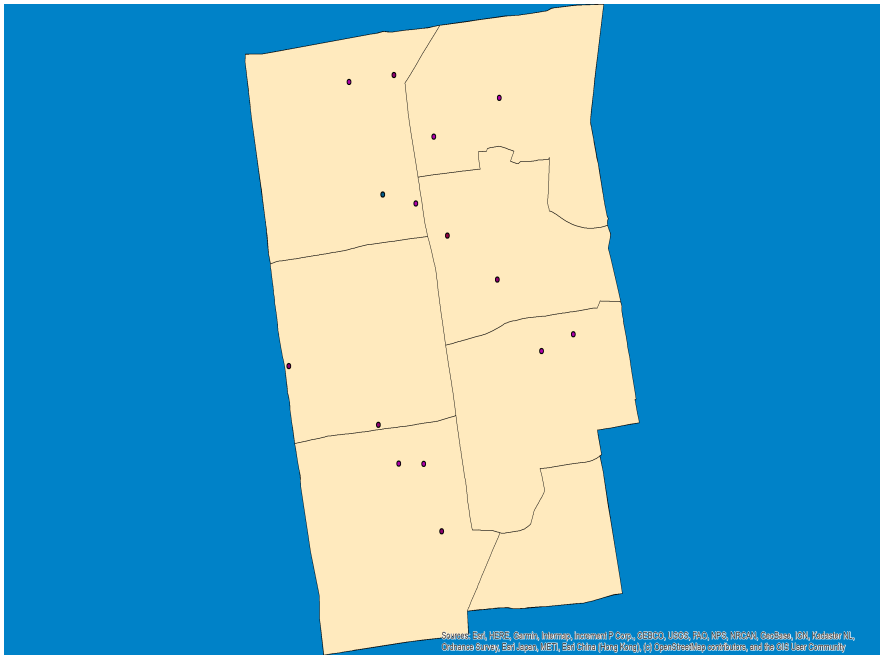
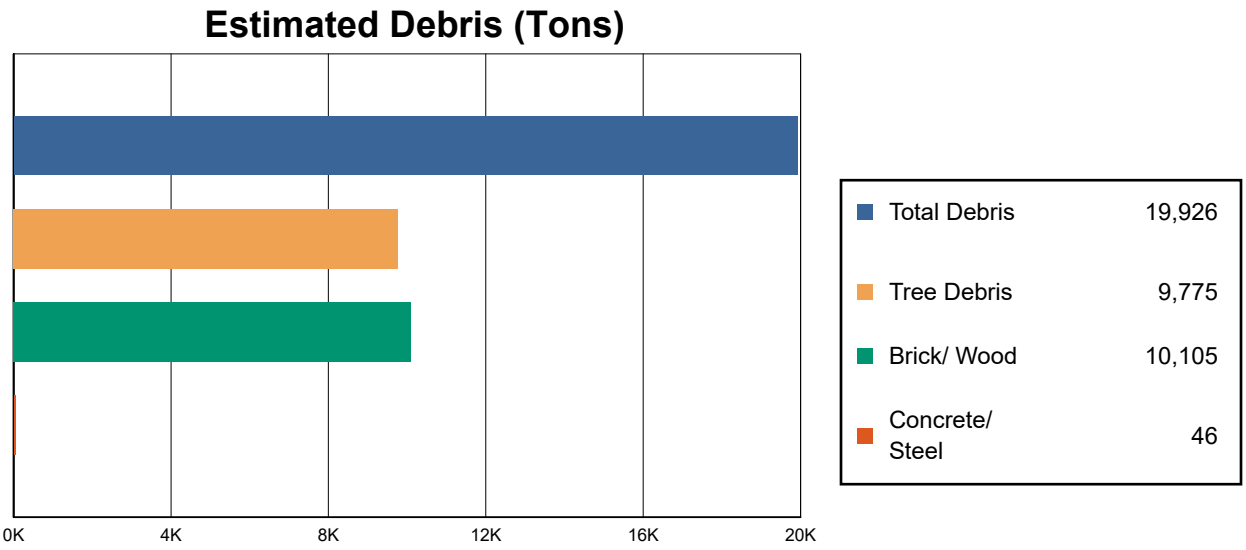


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	1

Induced Hurricane Damage

Debris Generation

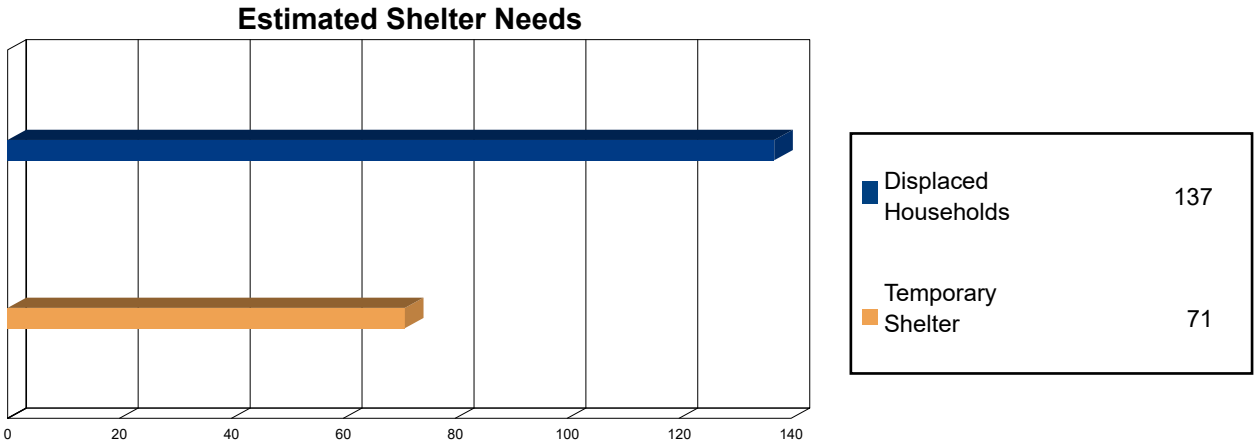


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 19,926 tons of debris will be generated. Of the total amount, 2,525 tons (13%) is Other Tree Debris. Of the remaining 17,401 tons, Brick/Wood comprises 58% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 406 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,250 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 137 households to be displaced due to the hurricane. Of these, 71 people (out of a total population of 30,536) will seek temporary shelter in public shelters.

Economic Loss

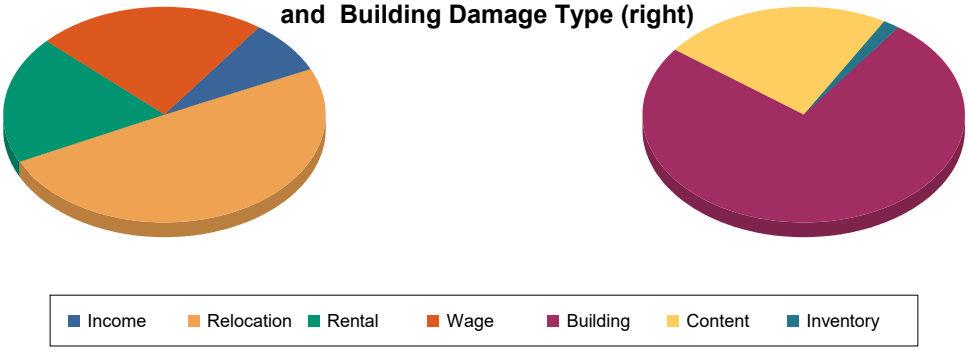
The total economic loss estimated for the hurricane is 161.3 million dollars, which represents 3.07 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 161 million dollars. 13% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 64% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

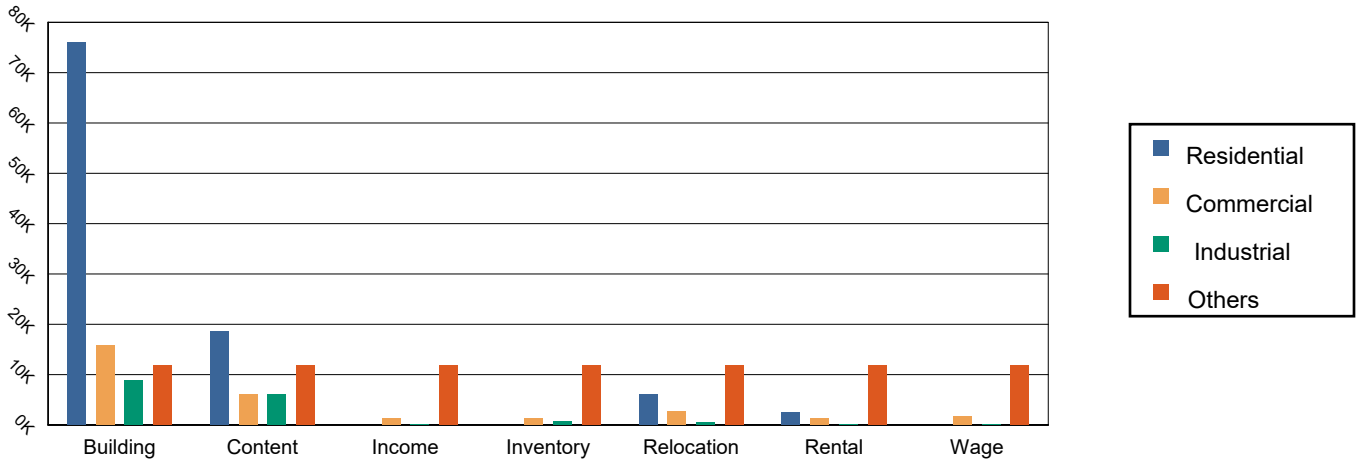


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	75,882.10	15,830.05	8,819.81	5,414.91	105,946.87
	Content	18,675.62	5,963.20	6,063.19	1,815.96	32,517.96
	Inventory	0.00	1,313.86	753.29	142.39	2,209.54
	Subtotal	**94,557.72**	**23,107.11**	**15,636.29**	**7,373.25**	**140,674.38**
Business Interruption Loss						
	Income	0.00	1,215.95	90.99	348.66	1,655.59
	Relocation	6,099.16	2,606.11	539.10	1,034.26	10,278.62
	Rental	2,468.14	1,248.83	77.37	172.47	3,966.81
	Wage	0.00	1,652.64	149.05	2,952.86	4,754.54
	Subtotal	**8,567.29**	**6,723.53**	**856.50**	**4,508.24**	**20,655.57**

Total

Total	**103,125.01**	**29,830.64**	**16,492.79**	**11,881.50**	**161,329.95**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	30,536	2,810,059	2,450,253	5,260,312
Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**
Study Region Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**

Hazus: Hurricane Global Risk Report

Region Name:	Newington_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.14 square miles and contains 7 census tracts. There are over 12 thousand households in the region and a total population of 30,536 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,260 million dollars. Approximately 88% of the buildings (and 53% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,827 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

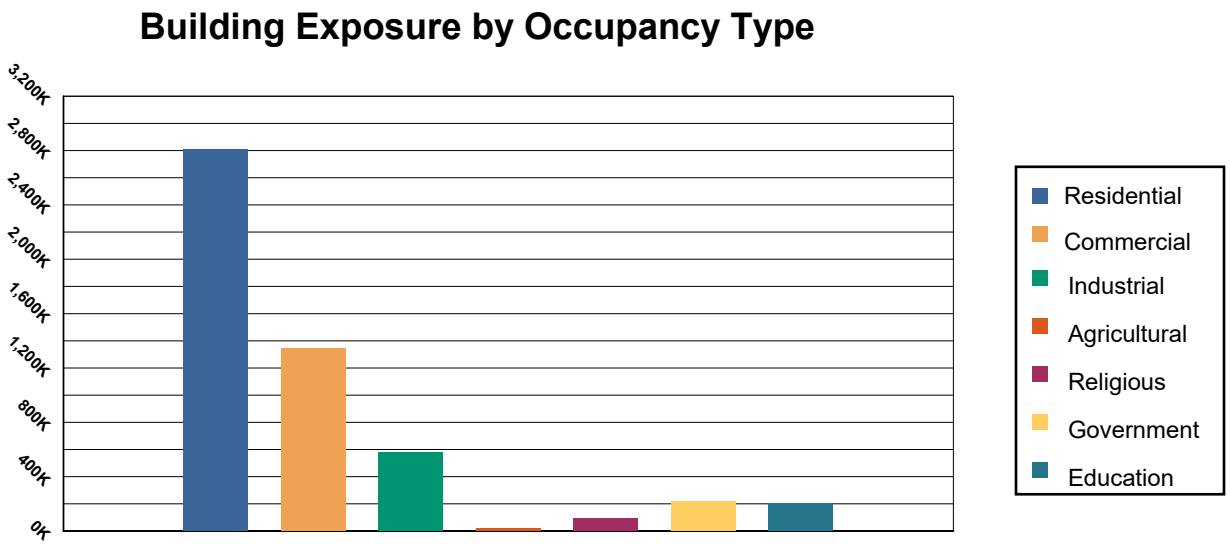


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,810,059	53.42%
Commercial	1,346,797	25.60%
Industrial	575,480	10.94%
Agricultural	18,219	0.35%
Religious	88,959	1.69%
Government	217,408	4.13%
Education	203,390	3.87%
Total	**5,260,312**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of no beds. There are 8 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,189 buildings will be at least moderately damaged. This is over 12% of the total number of buildings in the region. There are an estimated 74 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

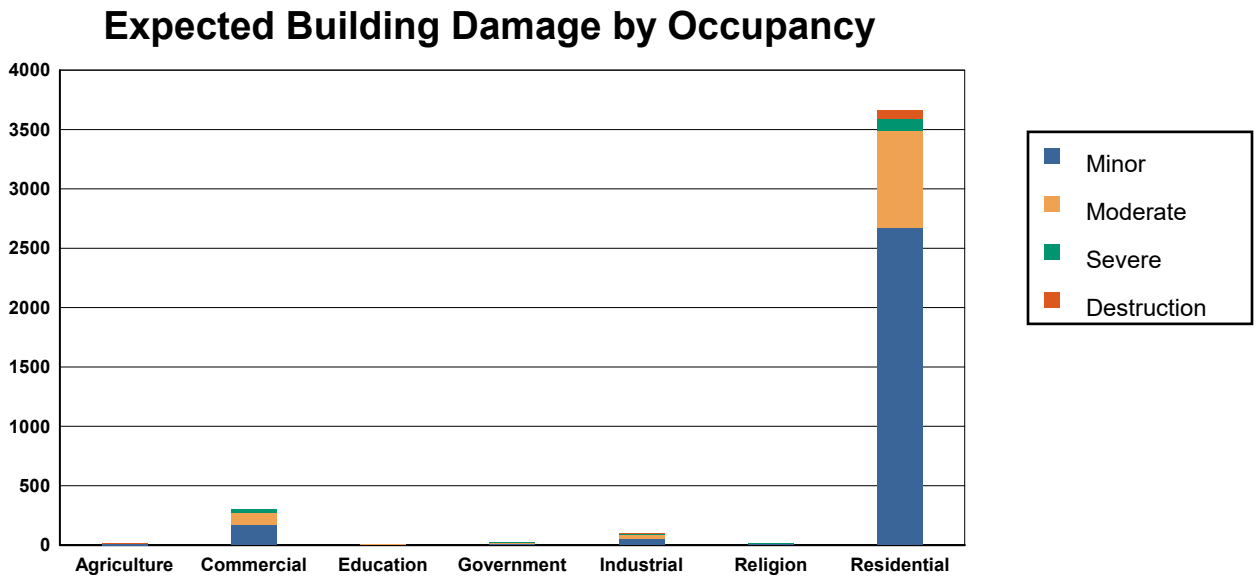


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.49	56.55	9.87	25.98	4.17	10.98	2.11	5.56	0.35	0.93
Commercial	476.24	61.45	171.18	22.09	99.27	12.81	27.99	3.61	0.31	0.04
Education	17.46	62.35	6.36	22.70	3.52	12.55	0.67	2.40	0.00	0.00
Government	35.00	62.49	12.45	22.23	7.17	12.80	1.39	2.48	0.00	0.00
Industrial	154.84	60.96	53.74	21.16	33.76	13.29	10.79	4.25	0.87	0.34
Religion	27.08	61.54	11.33	25.74	4.79	10.89	0.81	1.83	0.00	0.00
Residential	4,973.03	57.61	2,667.93	30.91	824.15	9.55	94.73	1.10	72.16	0.84
Total	**5,705.13**		**2,932.86**		**976.82**		**138.49**		**73.70**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	73	61.07	26	21.89	17	14.58	3	2.45	0	0.00
Masonry	415	56.36	163	22.16	130	17.68	25	3.38	3	0.42
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	351	62.30	111	19.65	77	13.69	24	4.31	0	0.05
Wood	4,944	58.86	2,662	31.70	643	7.66	85	1.01	65	0.78

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

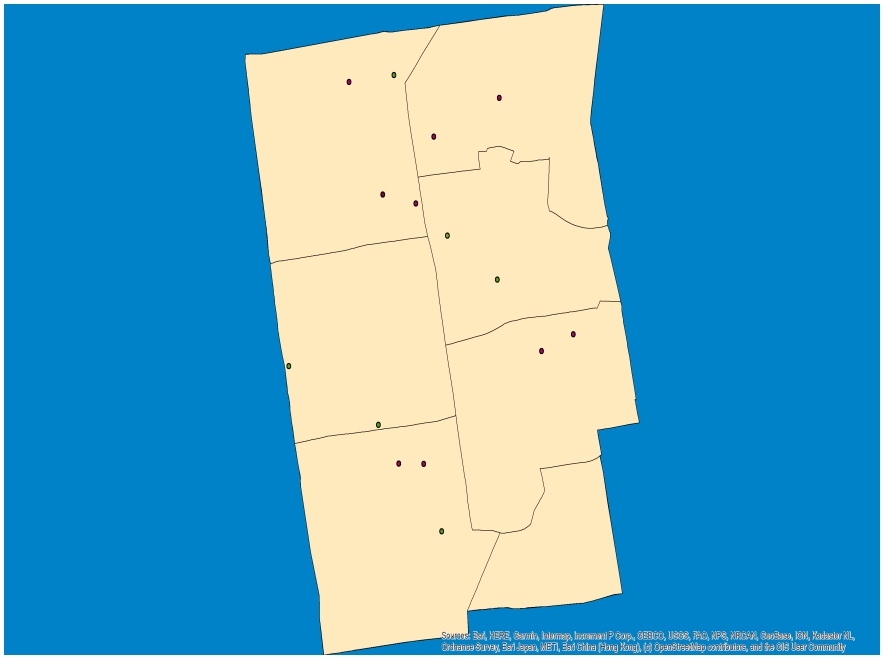
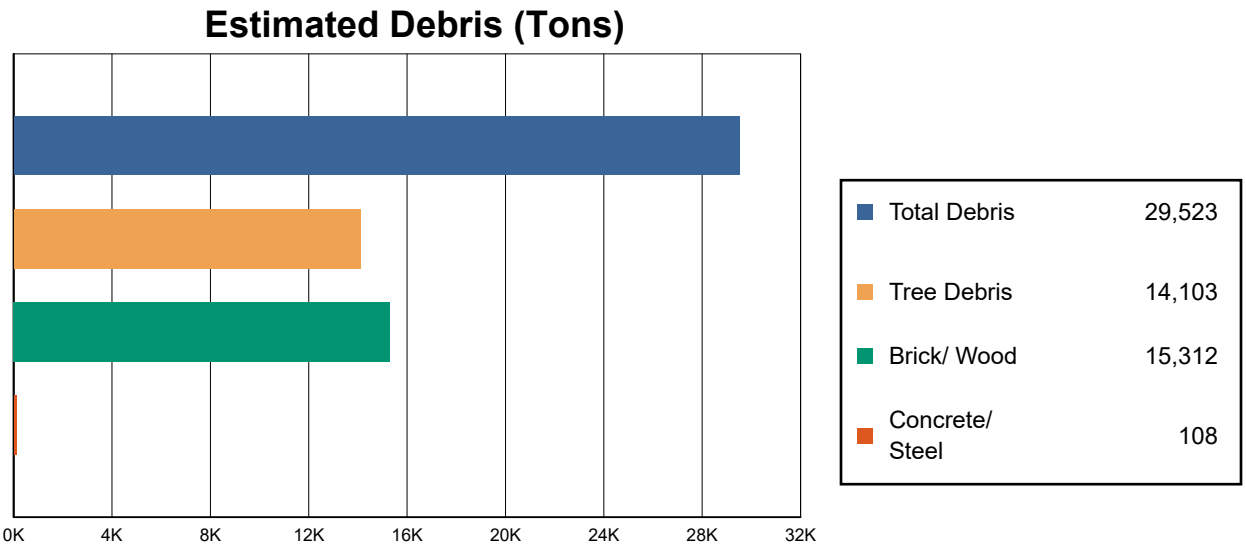


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	2	0	0	0
Police Stations	1	0	0	1
Schools	8	1	0	0

Induced Hurricane Damage

Debris Generation

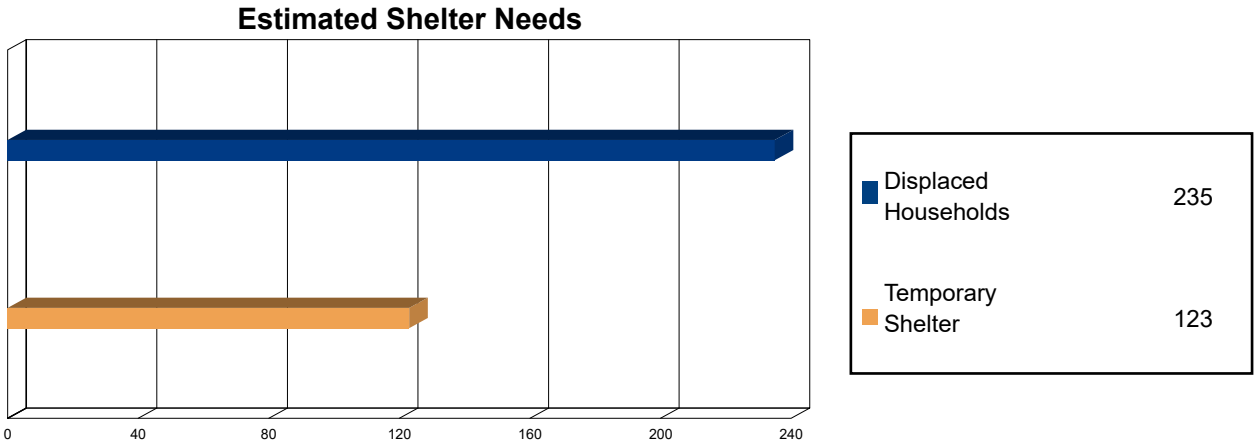


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 29,523 tons of debris will be generated. Of the total amount, 3,680 tons (12%) is Other Tree Debris. Of the remaining 25,843 tons, Brick/Wood comprises 59% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 617 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 10,423 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 235 households to be displaced due to the hurricane. Of these, 123 people (out of a total population of 30,536) will seek temporary shelter in public shelters.

Economic Loss

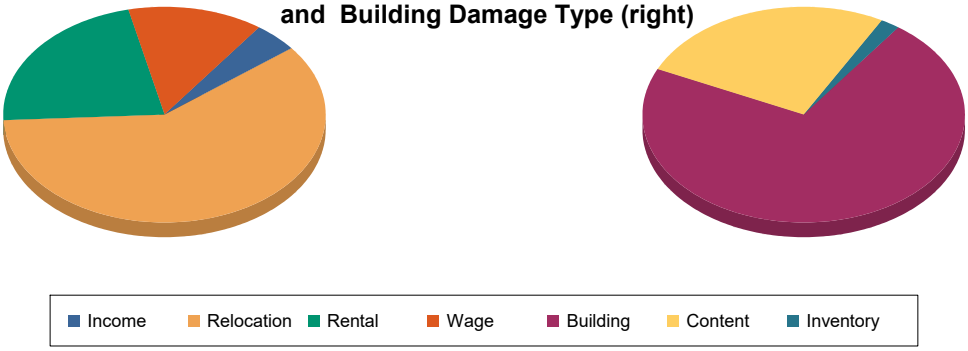
The total economic loss estimated for the hurricane is 266.5 million dollars, which represents 5.07 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 267 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 63% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

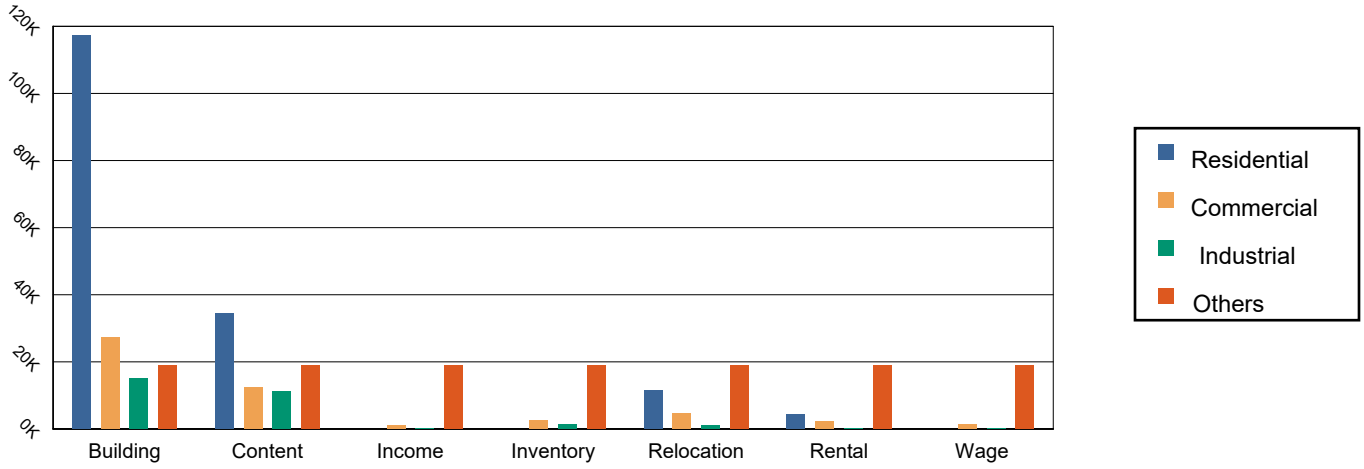


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	117,180.97	27,323.54	15,025.67	9,770.51	169,300.69
	Content	34,381.17	12,248.43	11,050.87	3,964.99	61,645.46
	Inventory	0.00	2,681.14	1,350.15	238.81	4,270.10
	Subtotal	**151,562.14**	**42,253.11**	**27,426.69**	**13,974.31**	**235,216.25**
Business Interruption Loss						
	Income	2.07	999.65	136.88	291.97	1,430.57
	Relocation	11,396.48	4,479.96	962.74	1,874.71	18,713.89
	Rental	4,301.75	2,184.74	139.99	320.86	6,947.34
	Wage	4.87	1,392.50	224.27	2,614.73	4,236.37
	Subtotal	**15,705.16**	**9,056.85**	**1,463.89**	**5,102.27**	**31,328.17**

Total

Total	**167,267.30**	**51,309.96**	**28,890.58**	**19,076.58**	**266,544.42**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	30,536	2,810,059	2,450,253	5,260,312
Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**
Study Region Total	**30,536**	**2,810,059**	**2,450,253**	**5,260,312**

Hazus: Hurricane Global Risk Report

Region Name:	Plainville_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.78 square miles and contains 5 census tracts. There are over 7 thousand households in the region and a total population of 17,525 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

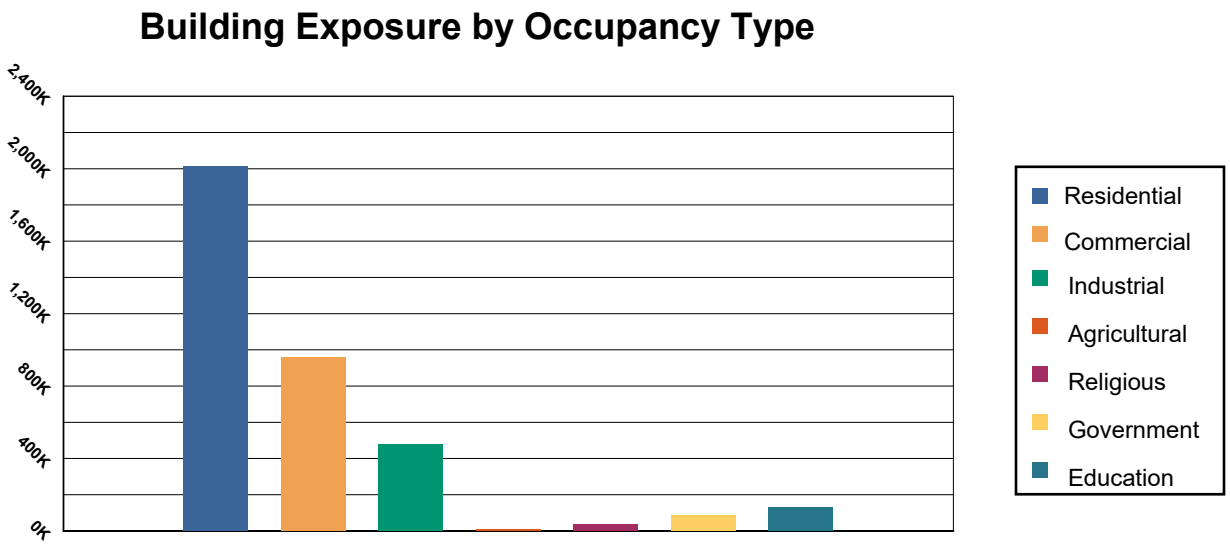


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,011,988	54.24%
Commercial	956,453	25.78%
Industrial	478,962	12.91%
Agricultural	8,114	0.22%
Religious	34,692	0.94%
Government	88,503	2.39%
Education	130,637	3.52%
Total	**3,709,349**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 7 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

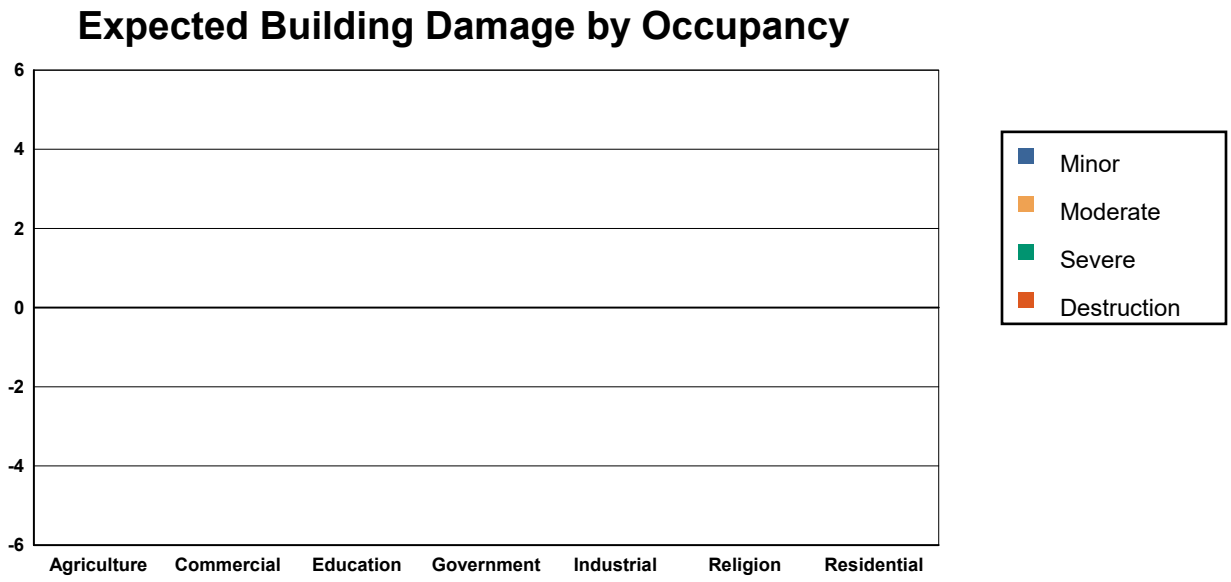


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	605.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	12.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	73.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	223.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	29.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	6,594.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**7,555.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	129	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	697	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	175	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	462	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	6,092	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

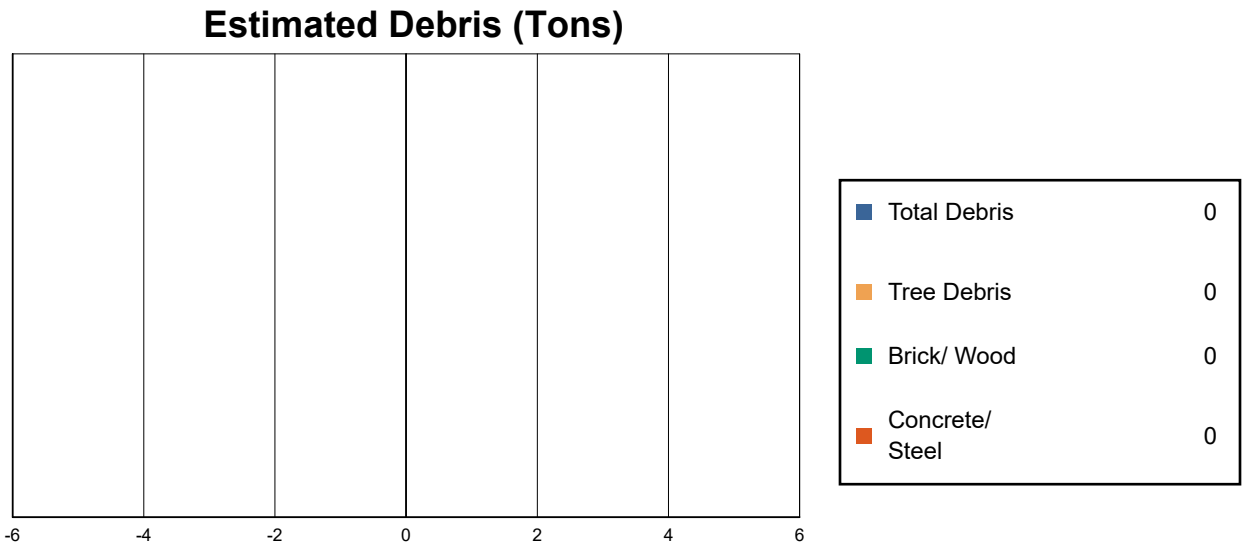
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

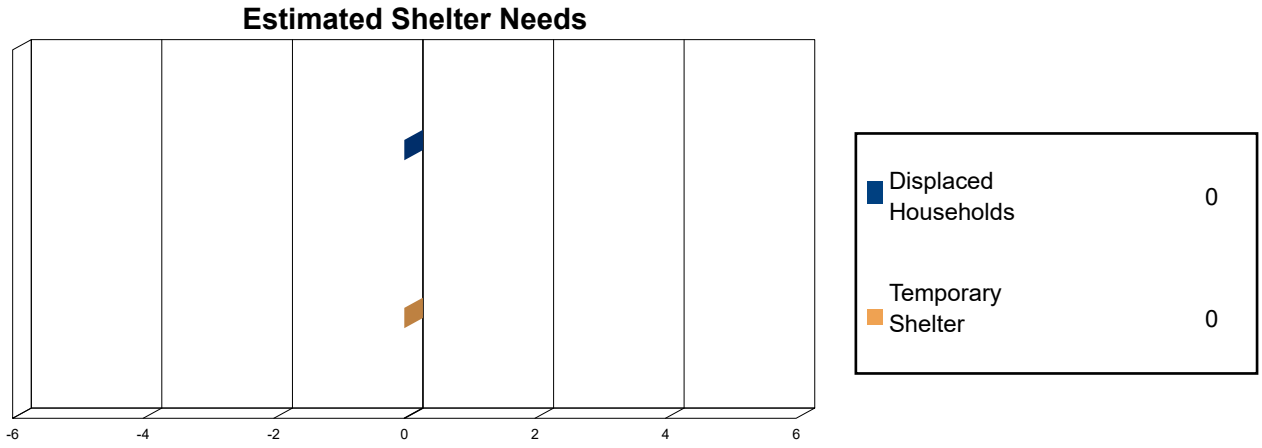


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 17,525) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

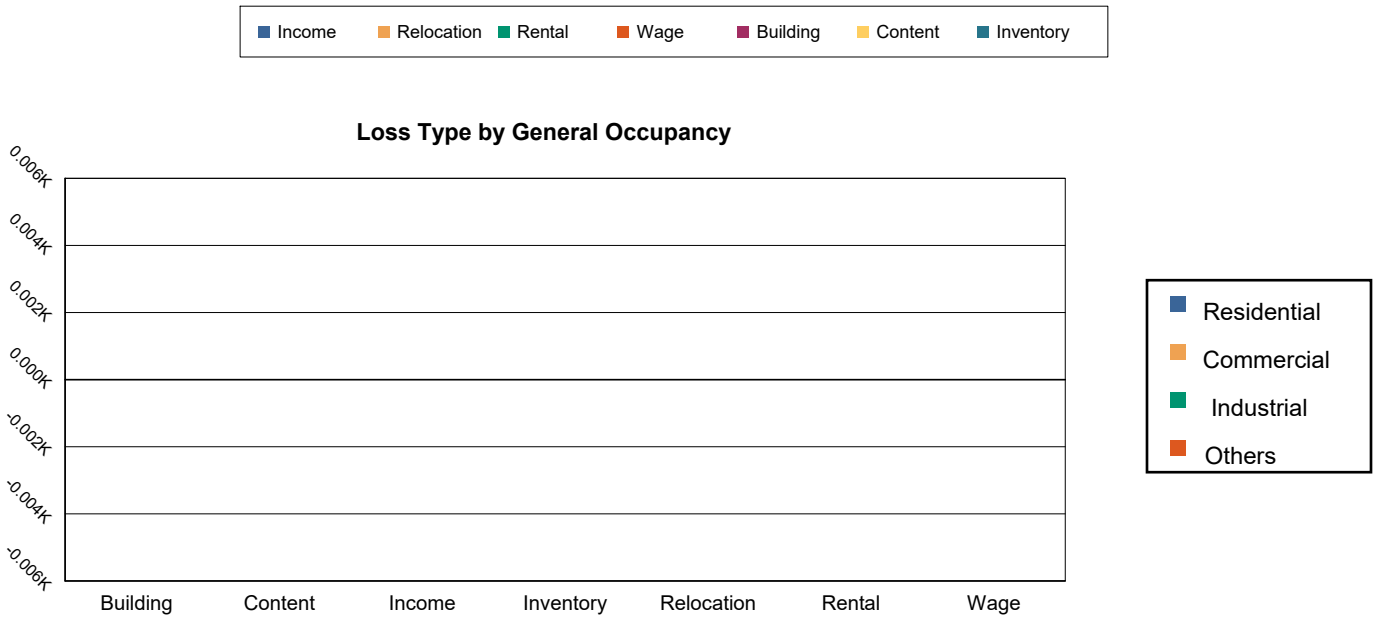


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	17,525	2,011,988	1,697,361	3,709,349
Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**
Study Region Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**

Hazus: Hurricane Global Risk Report

Region Name:	Plainville_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Thursday, May 11, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
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Building Losses	
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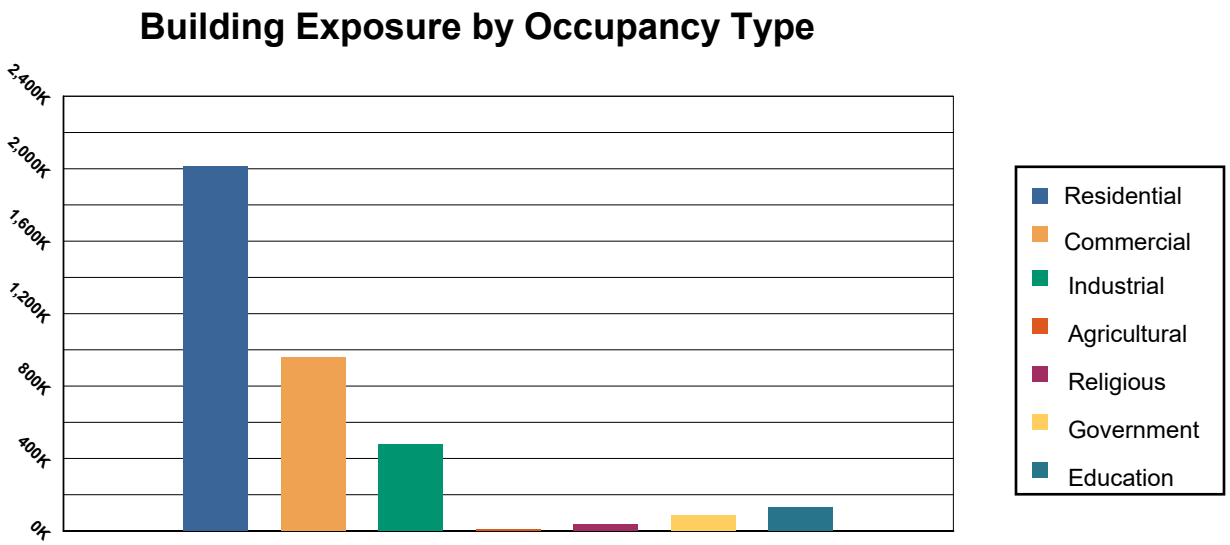

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Agricultural	8,114	0.22%
Religious	34,692	0.94%
Government	88,503	2.39%
Education	130,637	3.52%
Total	**3,709,349**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 7 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

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Scenario Name:	Probabilistic
Type:	Probabilistic

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General Building Stock Damage

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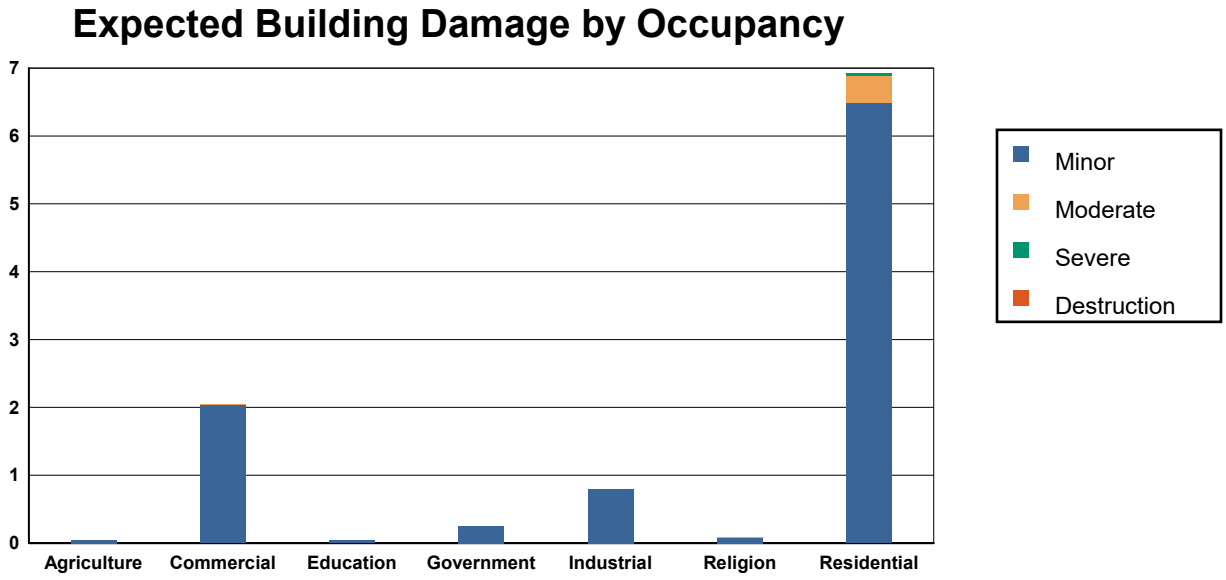


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	18.95	99.75	0.05	0.24	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	602.95	99.66	2.03	0.34	0.02	0.00	0.00	0.00	0.00	0.00
Education	11.96	99.65	0.04	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Government	72.75	99.65	0.25	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	222.21	99.64	0.79	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Religion	28.92	99.74	0.08	0.26	0.00	0.01	0.00	0.00	0.00	0.00
Residential	6,587.08	99.90	6.49	0.10	0.39	0.01	0.03	0.00	0.00	0.00
Total	**7,544.82**		**9.74**		**0.41**		**0.03**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	128	99.55	1	0.45	0	0.00	0	0.00	0	0.00
Masonry	694	99.51	3	0.47	0	0.01	0	0.00	0	0.00
MH	175	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	460	99.65	2	0.35	0	0.00	0	0.00	0	0.00
Wood	6,089	99.96	2	0.04	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

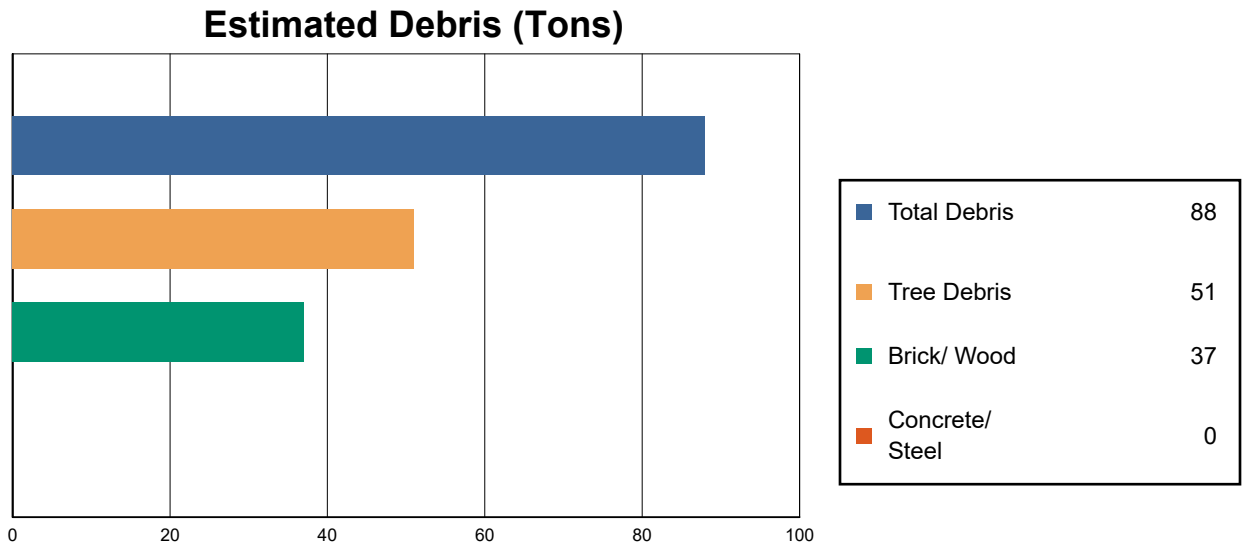
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

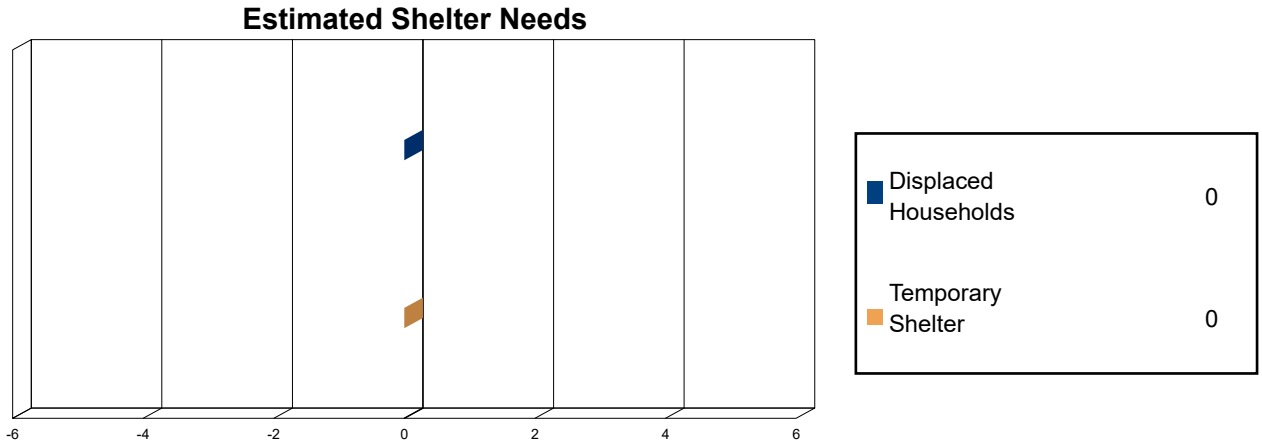


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 88 tons of debris will be generated. Of the total amount, 5 tons (6%) is Other Tree Debris. Of the remaining 83 tons, Brick/Wood comprises 45% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 46 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 17,525) will seek temporary shelter in public shelters.

Economic Loss

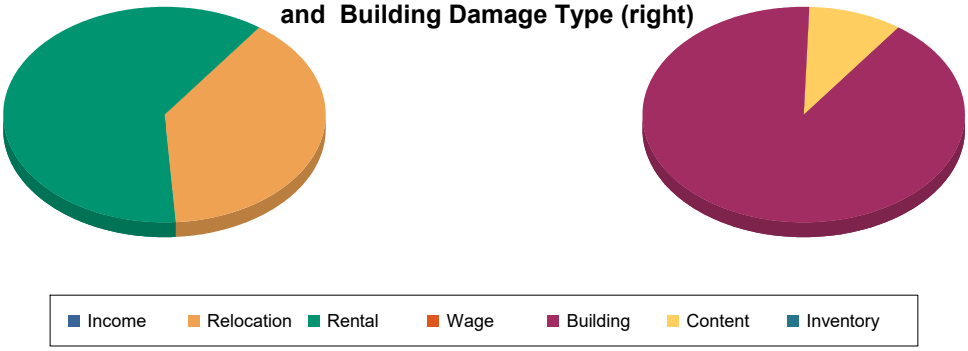
The total economic loss estimated for the hurricane is 0.9 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 82% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

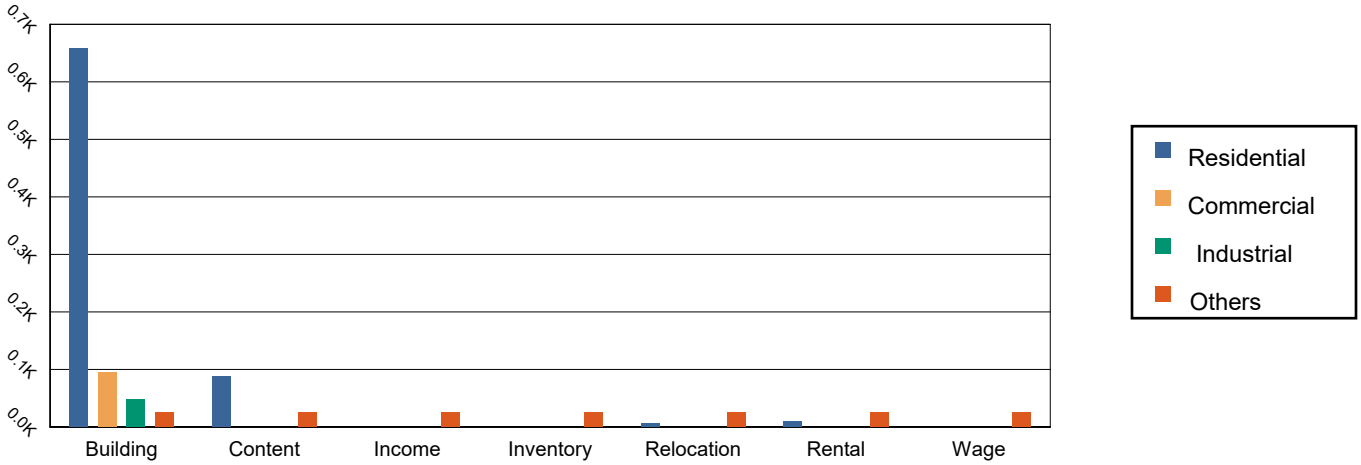


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	657.55	95.65	47.90	25.38	826.47
	Content	87.27	0.00	0.00	0.00	87.27
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**744.82**	**95.65**	**47.90**	**25.38**	**913.74**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	6.00	0.13	0.00	0.01	6.13
	Rental	9.68	0.00	0.00	0.00	9.68
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**15.68**	**0.13**	**0.00**	**0.01**	**15.82**

Total

Total	760.50	95.77	47.90	25.39	929.56

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	17,525	2,011,988	1,697,361	3,709,349
Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**
Study Region Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**

Hazus: Hurricane Global Risk Report

Region Name:	Plainville_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.78 square miles and contains 5 census tracts. There are over 7 thousand households in the region and a total population of 17,525 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

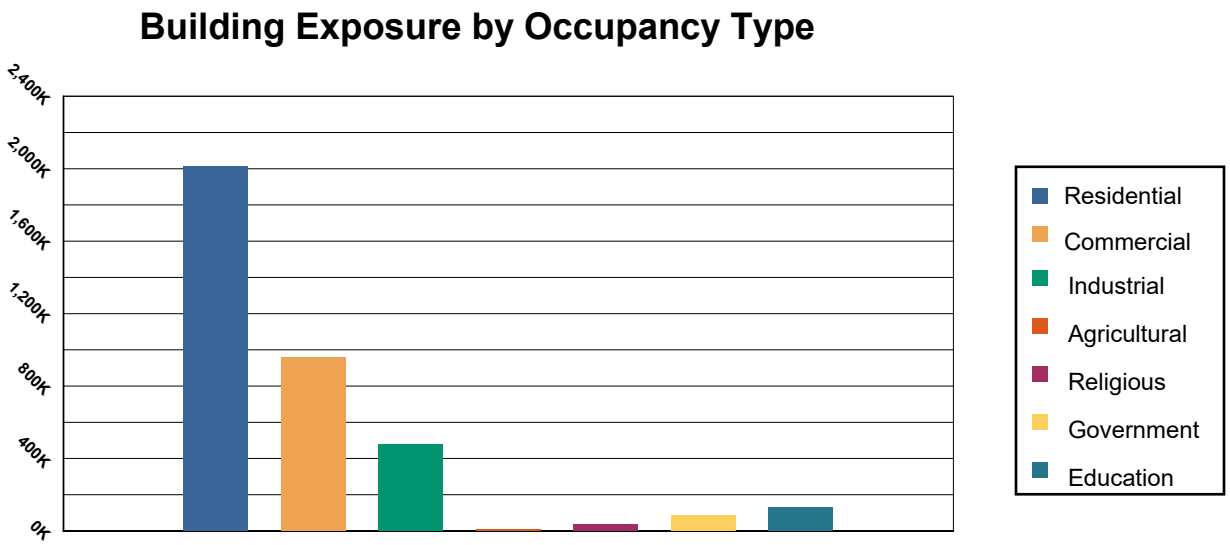


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,011,988	54.24%
Commercial	956,453	25.78%
Industrial	478,962	12.91%
Agricultural	8,114	0.22%
Religious	34,692	0.94%
Government	88,503	2.39%
Education	130,637	3.52%
Total	**3,709,349**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 7 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

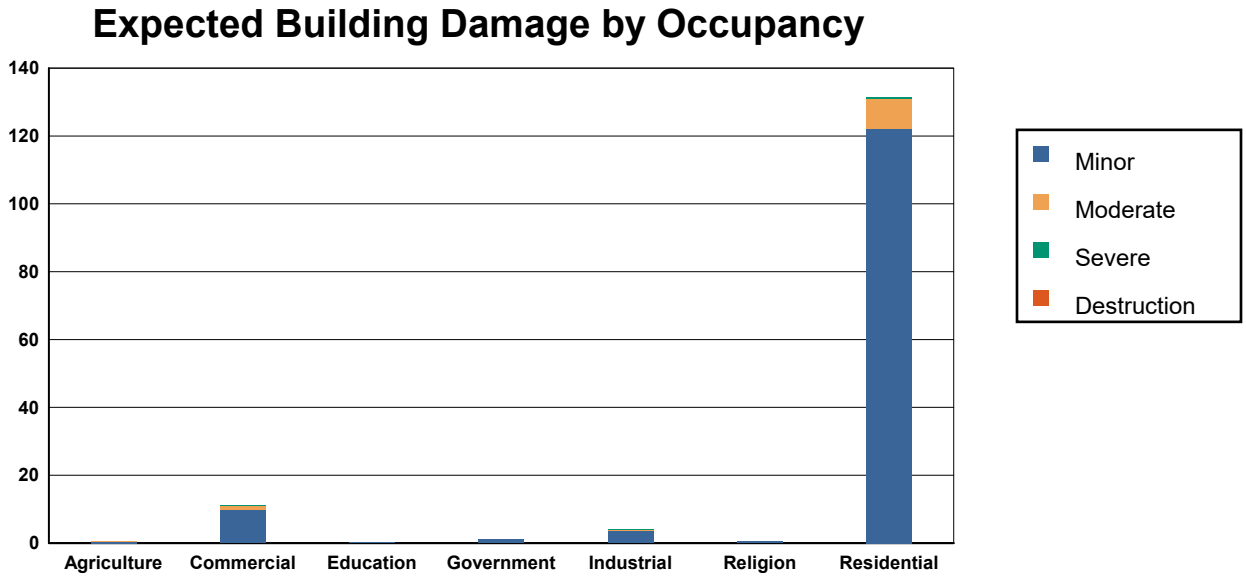


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	18.63	98.06	0.32	1.71	0.03	0.17	0.01	0.05	0.00	0.00
Commercial	594.02	98.18	9.93	1.64	1.01	0.17	0.05	0.01	0.00	0.00
Education	11.81	98.40	0.19	1.56	0.00	0.03	0.00	0.00	0.00	0.00
Government	71.87	98.45	1.11	1.52	0.02	0.02	0.00	0.00	0.00	0.00
Industrial	219.07	98.24	3.69	1.66	0.19	0.09	0.04	0.02	0.00	0.00
Religion	28.57	98.53	0.41	1.42	0.01	0.05	0.00	0.00	0.00	0.00
Residential	6,462.53	98.01	122.07	1.85	9.09	0.14	0.29	0.00	0.01	0.00
Total	**7,406.51**		**137.73**		**10.36**		**0.39**		**0.01**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	126	97.87	3	2.08	0	0.05	0	0.00	0	0.00
Masonry	677	97.15	17	2.42	3	0.40	0	0.02	0	0.00
MH	175	99.82	0	0.14	0	0.03	0	0.00	0	0.01
Steel	454	98.31	7	1.52	1	0.15	0	0.01	0	0.00
Wood	5,989	98.32	99	1.63	3	0.05	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

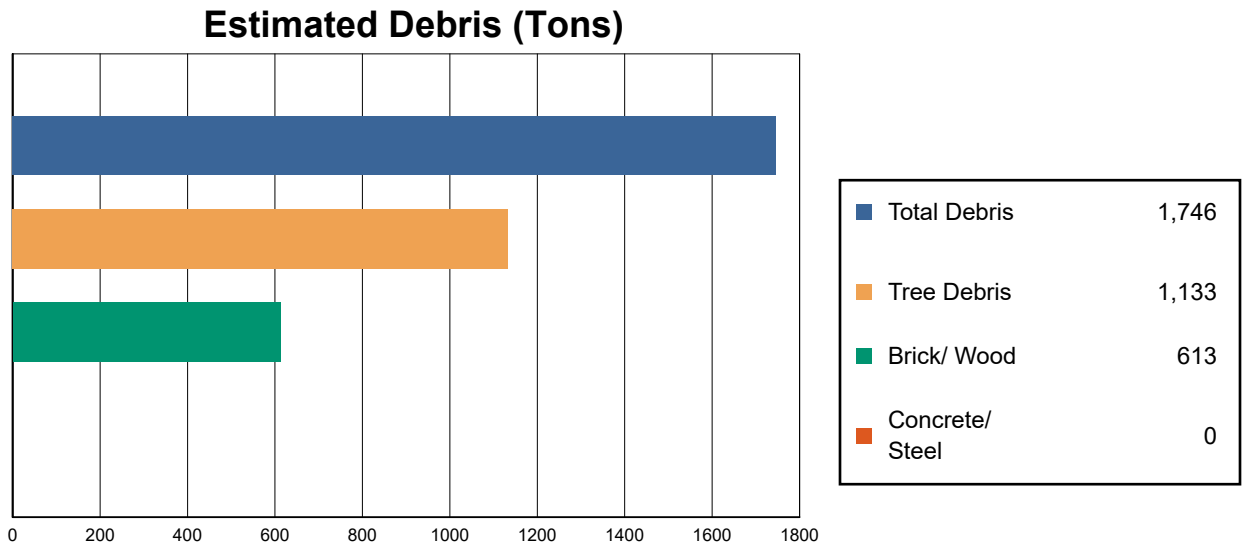
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

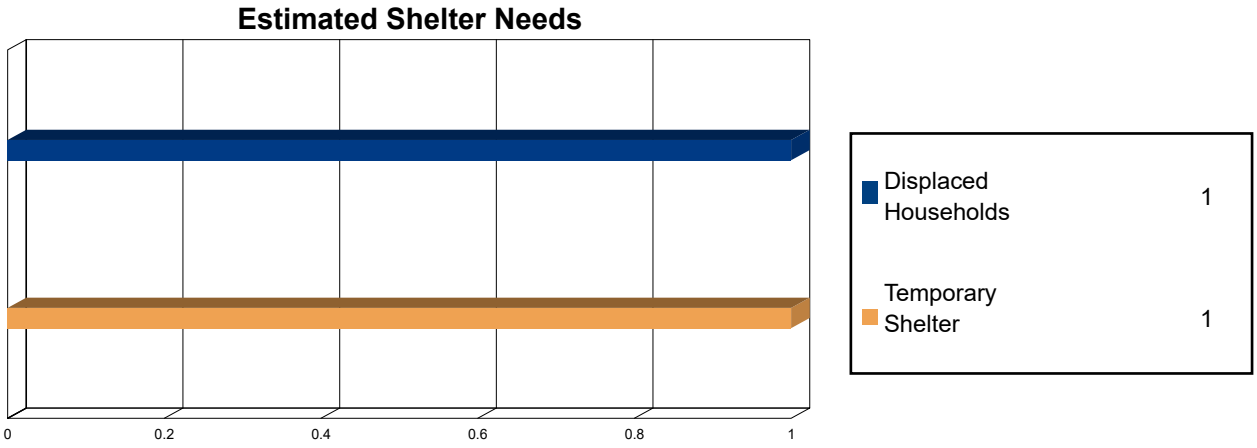


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,746 tons of debris will be generated. Of the total amount, 379 tons (22%) is Other Tree Debris. Of the remaining 1,367 tons, Brick/Wood comprises 45% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 25 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 754 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 17,525) will seek temporary shelter in public shelters.

Economic Loss

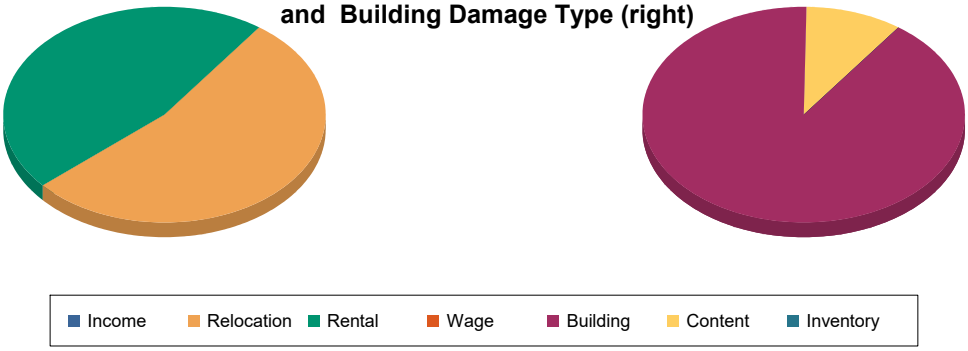
The total economic loss estimated for the hurricane is 7.7 million dollars, which represents 0.21 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 8 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 89% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

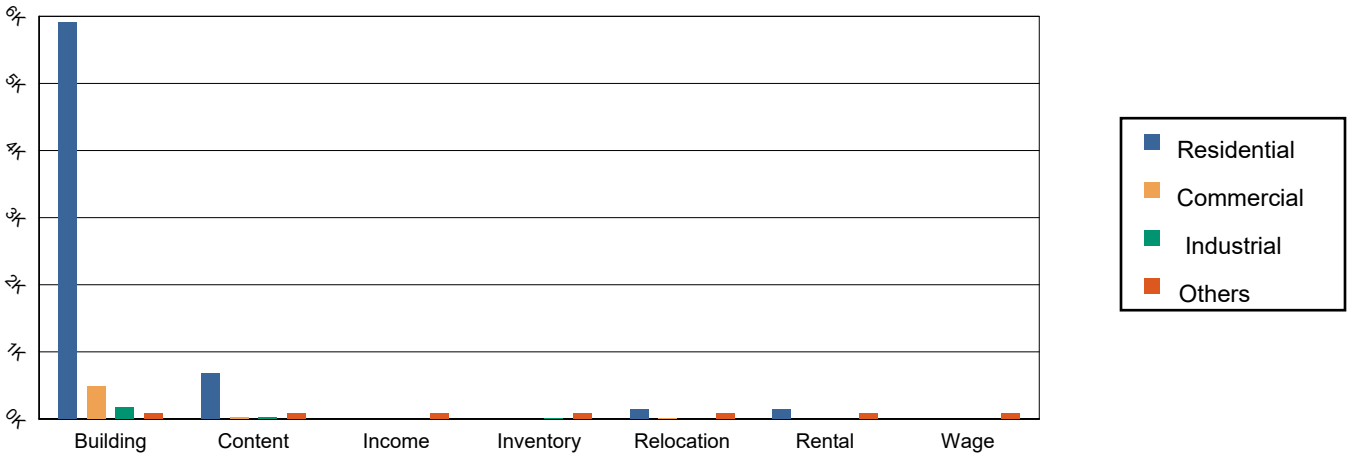


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,908.05	490.67	177.69	87.33	6,663.74
	Content	674.15	18.70	22.12	0.81	715.79
	Inventory	0.00	1.31	3.06	0.60	4.97
	Subtotal	**6,582.21**	**510.68**	**202.87**	**88.74**	**7,384.50**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	147.00	12.38	1.14	0.57	161.09
	Rental	138.91	0.00	0.00	0.00	138.91
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**285.91**	**12.38**	**1.14**	**0.57**	**300.00**

Total

Total	6,868.12	523.06	204.01	89.31	7,684.50

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	17,525	2,011,988	1,697,361	3,709,349
Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**
Study Region Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**

Hazus: Hurricane Global Risk Report

Region Name:	Plainville_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.78 square miles and contains 5 census tracts. There are over 7 thousand households in the region and a total population of 17,525 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

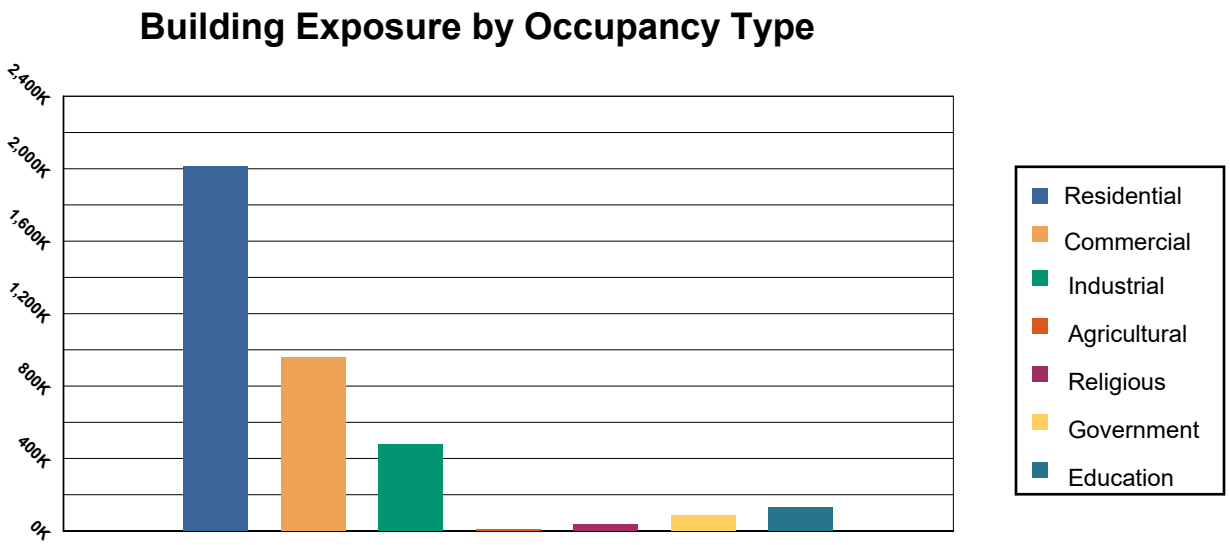


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,011,988	54.24%
Commercial	956,453	25.78%
Industrial	478,962	12.91%
Agricultural	8,114	0.22%
Religious	34,692	0.94%
Government	88,503	2.39%
Education	130,637	3.52%
Total	**3,709,349**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 7 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 59 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

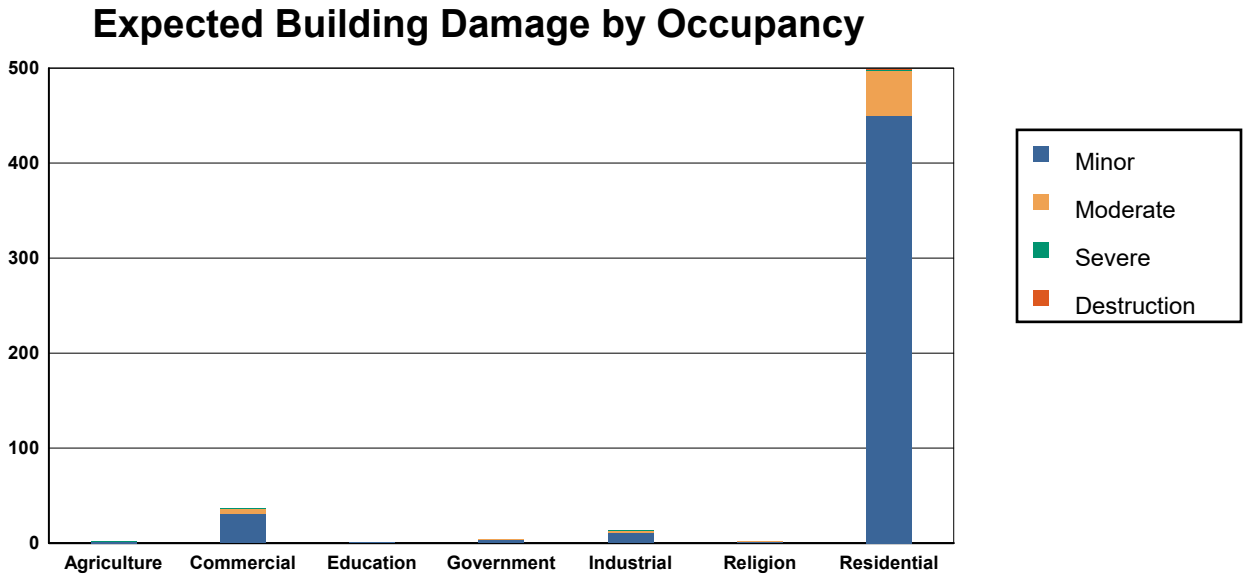


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.59	92.56	1.12	5.90	0.20	1.07	0.08	0.44	0.00	0.03
Commercial	567.86	93.86	30.92	5.11	5.53	0.91	0.69	0.11	0.00	0.00
Education	11.37	94.73	0.58	4.86	0.05	0.40	0.00	0.01	0.00	0.00
Government	69.32	94.95	3.41	4.67	0.27	0.37	0.00	0.01	0.00	0.00
Industrial	209.89	94.12	11.09	4.97	1.61	0.72	0.40	0.18	0.02	0.01
Religion	27.37	94.36	1.52	5.24	0.11	0.38	0.01	0.02	0.00	0.00
Residential	6,094.76	92.43	449.61	6.82	47.81	0.73	1.18	0.02	0.65	0.01
Total	**6,998.15**		**498.25**		**55.57**		**2.36**		**0.67**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	120	93.41	8	5.94	1	0.64	0	0.01	0	0.00
Masonry	639	91.72	44	6.31	13	1.81	1	0.15	0	0.01
MH	172	98.44	2	1.12	1	0.31	0	0.00	0	0.13
Steel	437	94.48	21	4.48	4	0.90	1	0.14	0	0.00
Wood	5,663	92.95	404	6.63	24	0.40	1	0.02	0	0.01

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

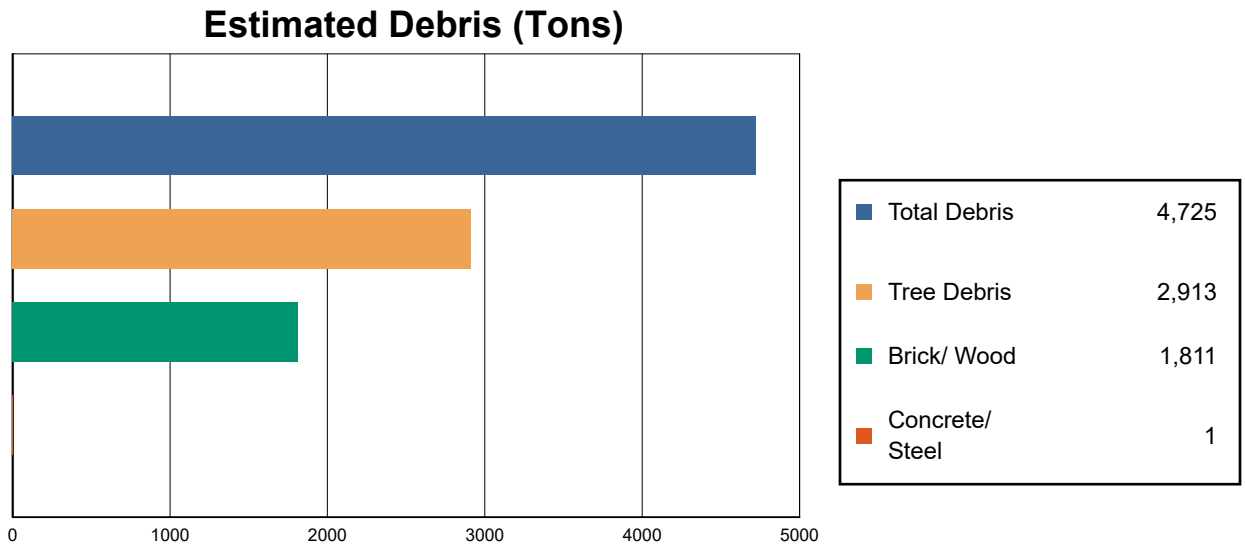
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

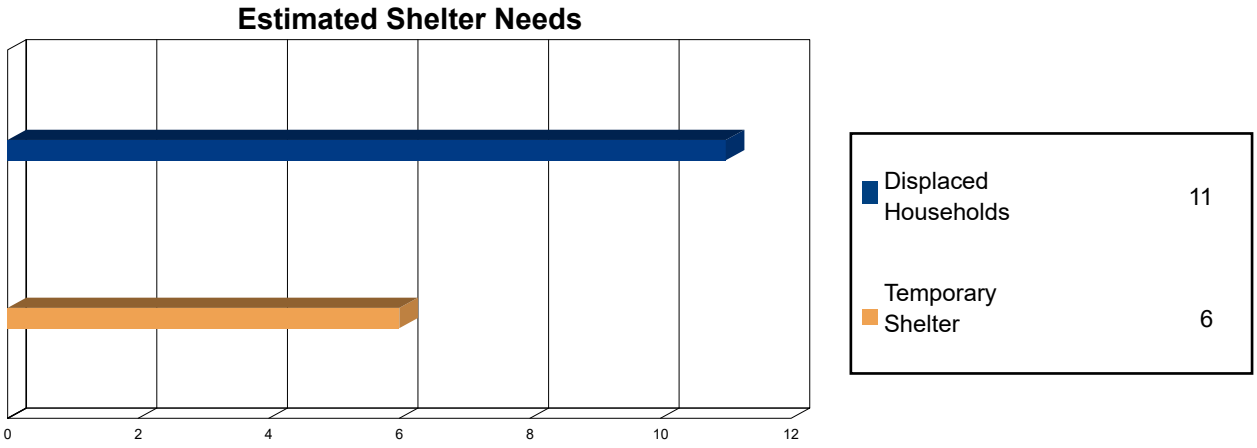


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 4,725 tons of debris will be generated. Of the total amount, 1,005 tons (21%) is Other Tree Debris. Of the remaining 3,720 tons, Brick/Wood comprises 49% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 72 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,908 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 11 households to be displaced due to the hurricane. Of these, 6 people (out of a total population of 17,525) will seek temporary shelter in public shelters.

Economic Loss

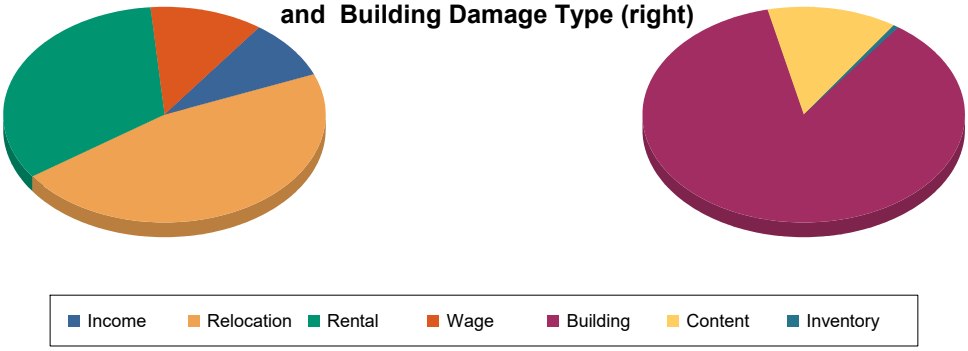
The total economic loss estimated for the hurricane is 21.1 million dollars, which represents 0.57 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 21 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 81% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

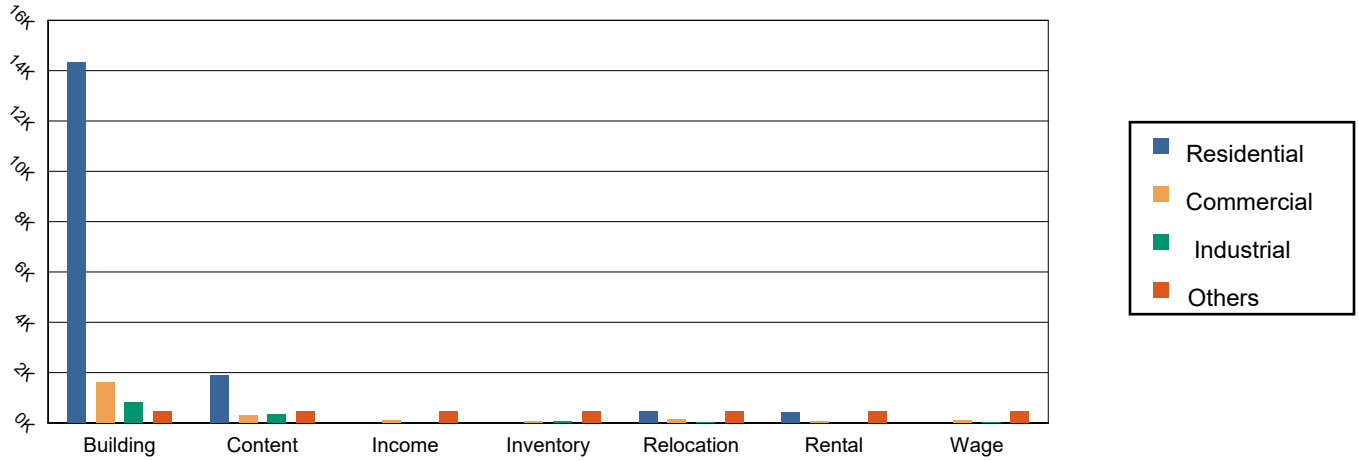


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	14,310.60	1,606.34	811.76	336.39	17,065.09
	Content	1,891.40	286.43	341.76	43.61	2,563.19
	Inventory	0.00	53.14	44.15	6.15	103.44
	Subtotal	**16,202.00**	**1,945.90**	**1,197.67**	**386.15**	**19,731.72**
Business Interruption Loss						
	Income	0.00	106.27	4.83	13.64	124.74
	Relocation	464.16	143.41	24.69	16.72	648.97
	Rental	408.07	58.03	3.47	1.05	470.62
	Wage	0.00	118.24	7.98	32.17	158.39
	Subtotal	**872.22**	**425.95**	**40.97**	**63.59**	**1,402.73**

Total

Total	**17,074.22**	**2,371.85**	**1,238.64**	**449.74**	**21,134.45**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	17,525	2,011,988	1,697,361	3,709,349
Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**
Study Region Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**

Hazus: Hurricane Global Risk Report

Region Name:	Plainville_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.78 square miles and contains 5 census tracts. There are over 7 thousand households in the region and a total population of 17,525 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

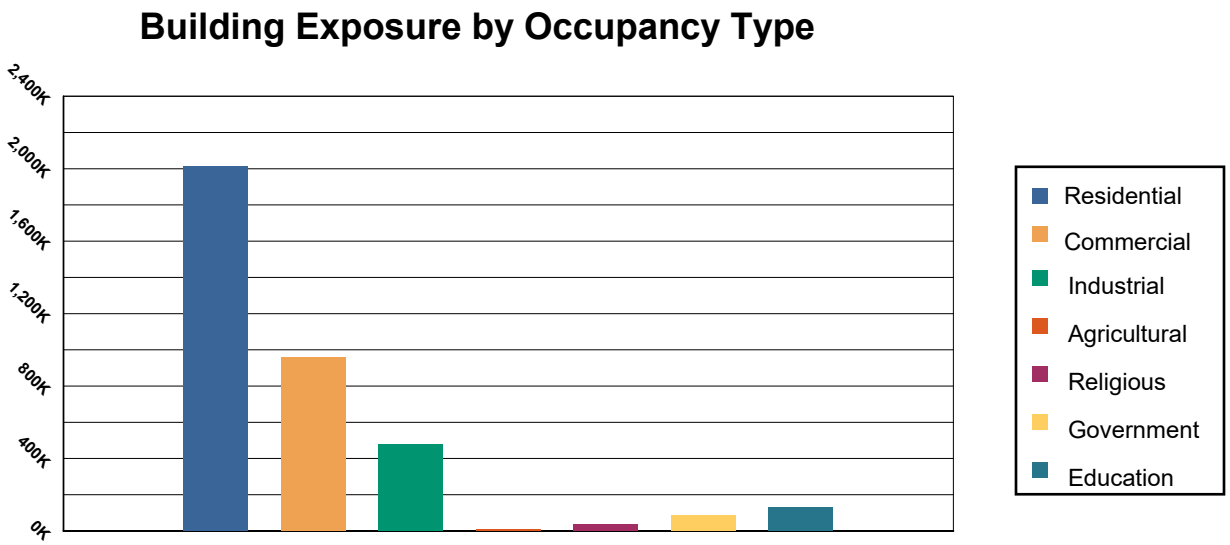


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,011,988	54.24%
Commercial	956,453	25.78%
Industrial	478,962	12.91%
Agricultural	8,114	0.22%
Religious	34,692	0.94%
Government	88,503	2.39%
Education	130,637	3.52%
Total	**3,709,349**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 7 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 170 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 3 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

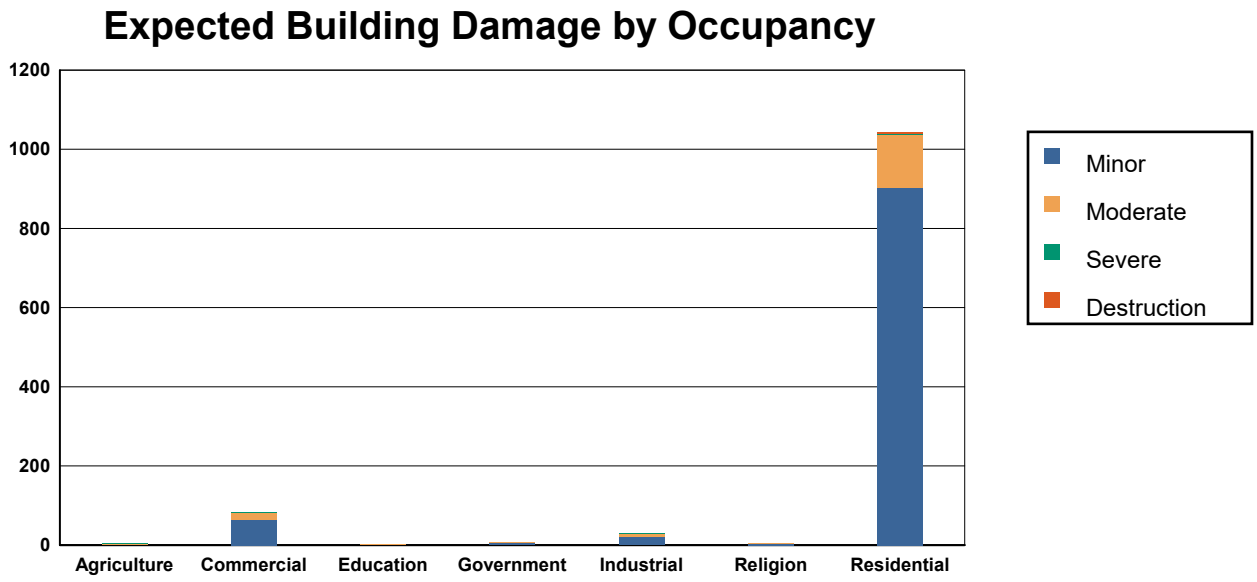


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15.93	83.83	2.25	11.87	0.55	2.88	0.25	1.30	0.02	0.12
Commercial	522.29	86.33	63.41	10.48	16.76	2.77	2.53	0.42	0.01	0.00
Education	10.57	88.11	1.20	10.01	0.22	1.81	0.01	0.07	0.00	0.00
Government	64.89	88.89	6.87	9.41	1.20	1.64	0.04	0.06	0.00	0.00
Industrial	194.21	87.09	21.97	9.85	5.45	2.44	1.28	0.58	0.09	0.04
Religion	25.46	87.78	3.09	10.64	0.44	1.50	0.02	0.07	0.00	0.00
Residential	5,550.43	84.17	902.46	13.69	133.14	2.02	4.62	0.07	3.35	0.05
Total	**6,383.77**		**1,001.26**		**157.74**		**8.75**		**3.47**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	110	85.48	15	11.71	4	2.76	0	0.06	0	0.00
Masonry	582	83.56	80	11.51	31	4.44	3	0.45	0	0.04
MH	166	94.89	6	3.22	2	1.31	0	0.03	1	0.54
Steel	405	87.63	42	9.06	13	2.76	2	0.54	0	0.00
Wood	5,167	84.81	837	13.75	81	1.34	4	0.07	2	0.04

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

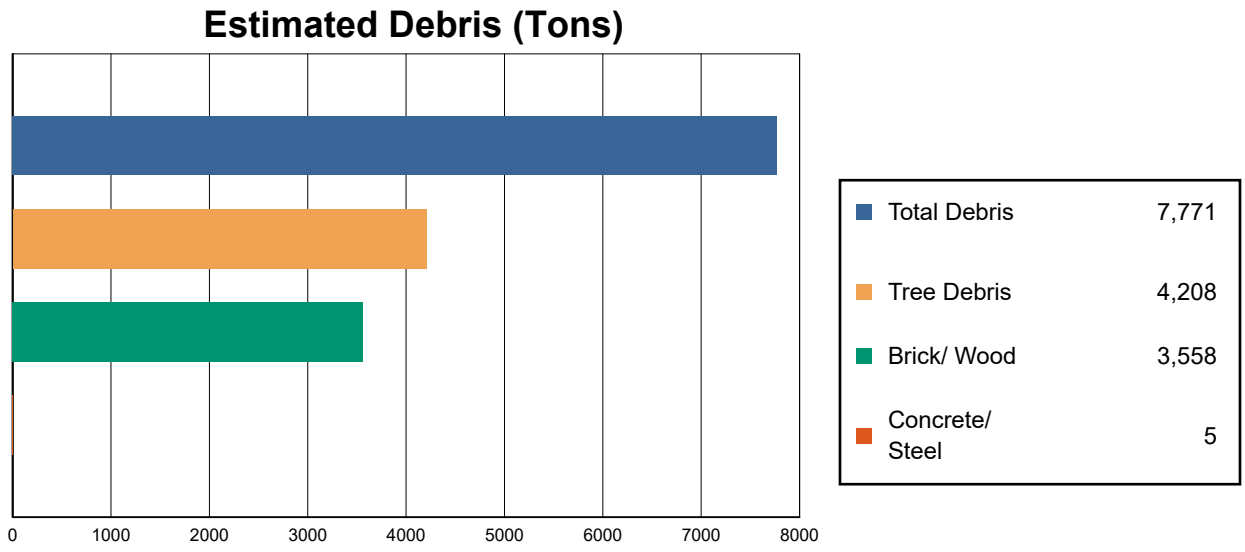
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

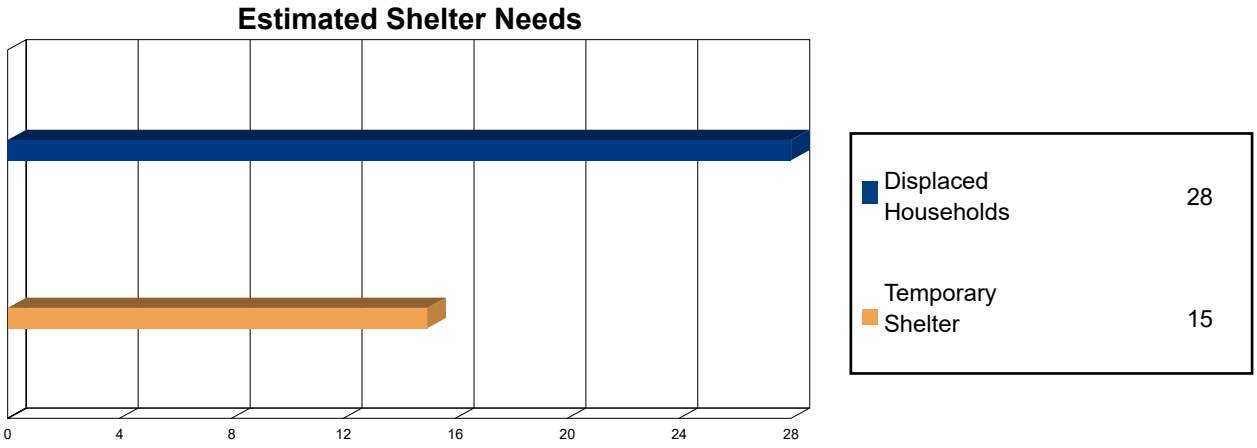


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7,771 tons of debris will be generated. Of the total amount, 1,347 tons (17%) is Other Tree Debris. Of the remaining 6,424 tons, Brick/Wood comprises 55% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 143 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,861 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 28 households to be displaced due to the hurricane. Of these, 15 people (out of a total population of 17,525) will seek temporary shelter in public shelters.

Economic Loss

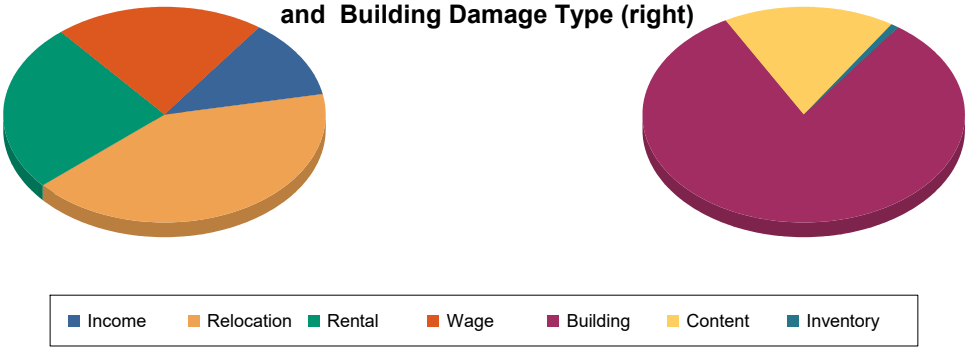
The total economic loss estimated for the hurricane is 44.0 million dollars, which represents 1.19 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 44 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 73% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

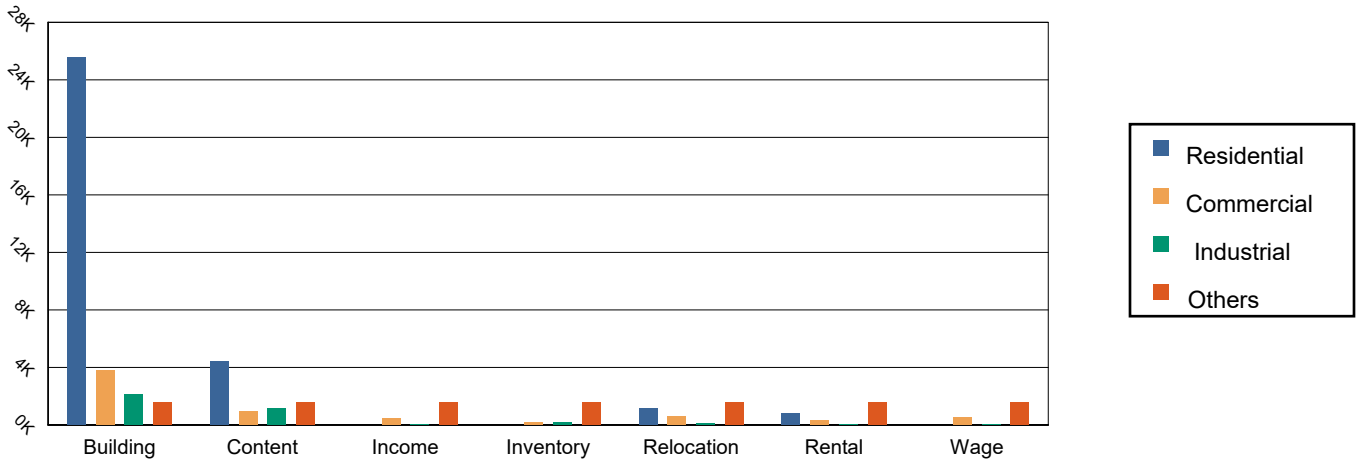


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	25,581.33	3,781.97	2,116.31	789.19	32,268.80
	Content	4,443.42	967.15	1,178.48	169.86	6,758.90
	Inventory	0.00	182.14	148.92	20.01	351.07
	Subtotal	**30,024.75**	**4,931.25**	**3,443.71**	**979.06**	**39,378.77**
Business Interruption Loss						
	Income	0.00	461.70	23.72	64.88	550.29
	Relocation	1,126.40	587.36	110.92	113.33	1,938.01
	Rental	835.96	299.66	17.43	14.12	1,167.16
	Wage	0.00	521.73	39.79	417.44	978.96
	Subtotal	**1,962.36**	**1,870.45**	**191.85**	**609.77**	**4,634.43**

Total

Total	**31,987.11**	**6,801.70**	**3,635.56**	**1,588.83**	**44,013.19**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	17,525	2,011,988	1,697,361	3,709,349
Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**
Study Region Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**

Hazus: Hurricane Global Risk Report

Region Name:	Plainville_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.78 square miles and contains 5 census tracts. There are over 7 thousand households in the region and a total population of 17,525 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

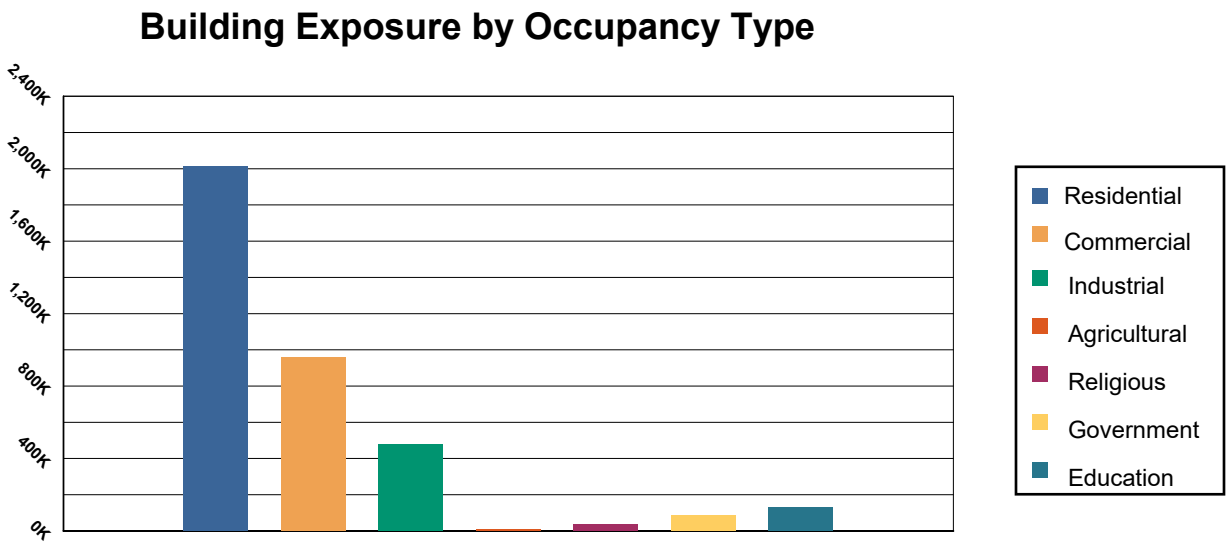


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,011,988	54.24%
Commercial	956,453	25.78%
Industrial	478,962	12.91%
Agricultural	8,114	0.22%
Religious	34,692	0.94%
Government	88,503	2.39%
Education	130,637	3.52%
Total	**3,709,349**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 7 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 482 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 19 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

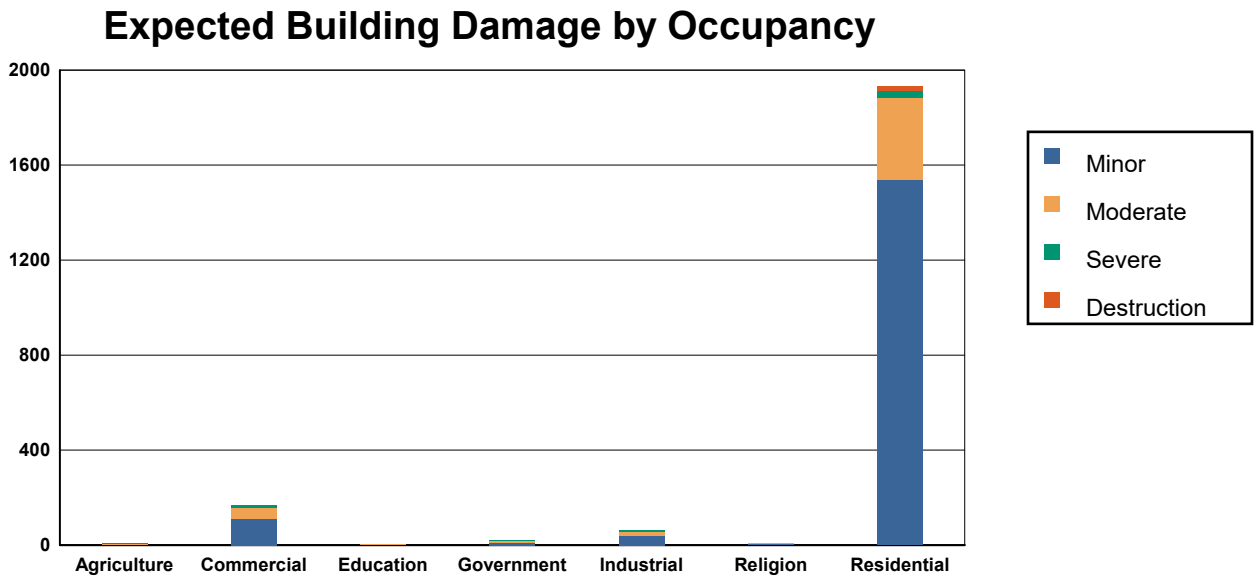


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	13.08	68.86	3.87	20.38	1.32	6.93	0.64	3.36	0.09	0.46
Commercial	437.70	72.35	109.22	18.05	48.63	8.04	9.39	1.55	0.07	0.01
Education	8.95	74.57	2.14	17.85	0.82	6.83	0.09	0.74	0.00	0.00
Government	55.20	75.62	12.56	17.20	4.74	6.49	0.50	0.68	0.00	0.00
Industrial	163.16	73.17	37.88	16.99	17.08	7.66	4.49	2.01	0.39	0.18
Religion	21.21	73.15	5.86	20.21	1.75	6.03	0.18	0.61	0.00	0.00
Residential	4,663.22	70.72	1,538.46	23.33	347.84	5.28	25.68	0.39	18.80	0.29
Total	**5,362.54**		**1,709.99**		**422.16**		**40.96**		**19.35**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	91	70.76	25	19.13	12	9.45	1	0.66	0	0.00
Masonry	485	69.62	127	18.28	73	10.46	10	1.47	1	0.16
MH	151	86.53	12	6.91	8	4.44	0	0.23	3	1.90
Steel	342	74.02	73	15.72	38	8.20	9	2.03	0	0.02
Wood	4,346	71.33	1,463	24.02	247	4.05	21	0.35	15	0.24

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

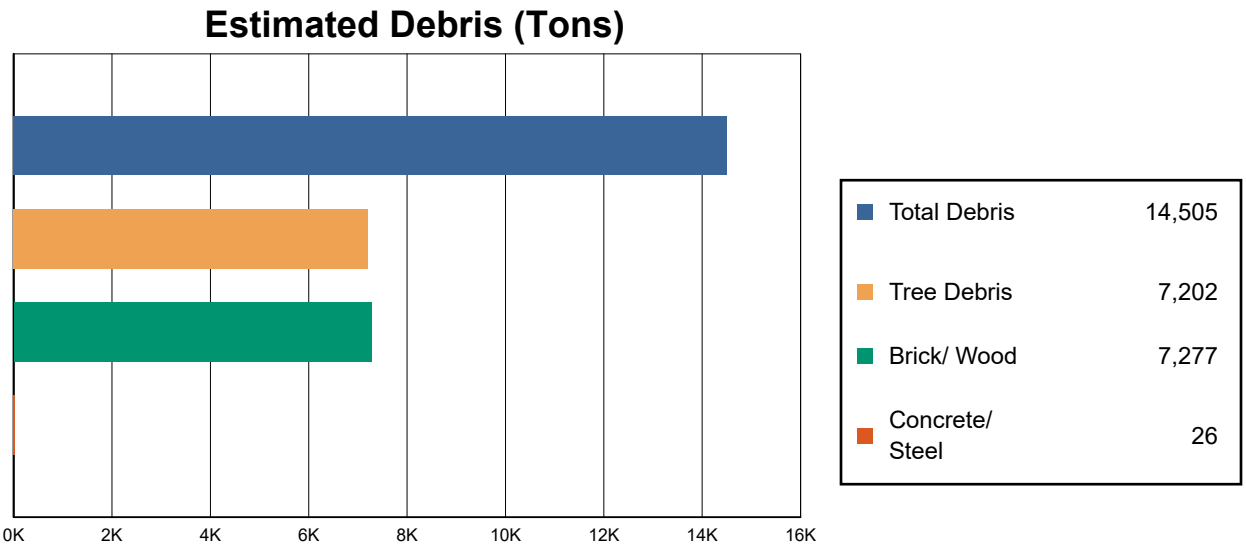
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	0

Induced Hurricane Damage

Debris Generation

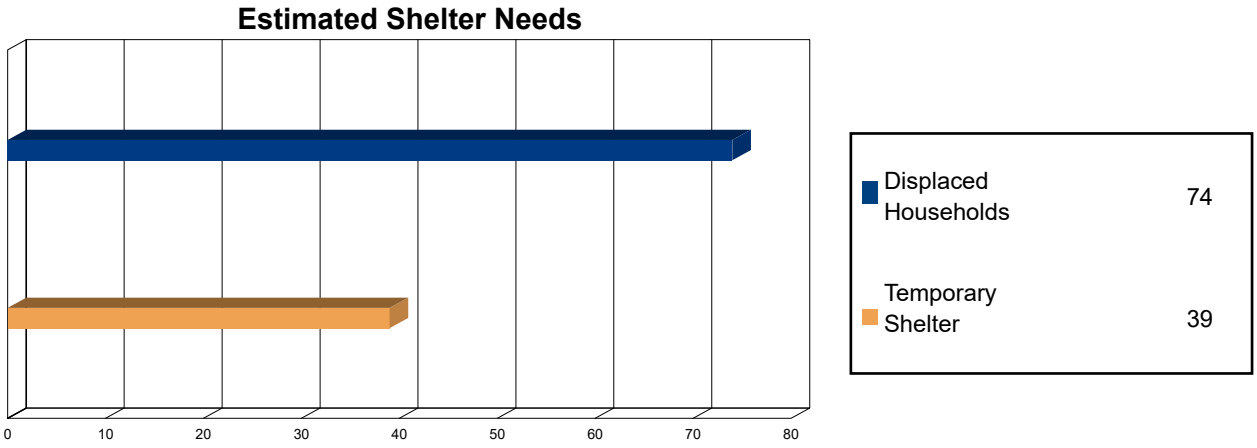


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 14,505 tons of debris will be generated. Of the total amount, 2,329 tons (16%) is Other Tree Debris. Of the remaining 12,176 tons, Brick/Wood comprises 60% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 292 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,873 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 74 households to be displaced due to the hurricane. Of these, 39 people (out of a total population of 17,525) will seek temporary shelter in public shelters.

Economic Loss

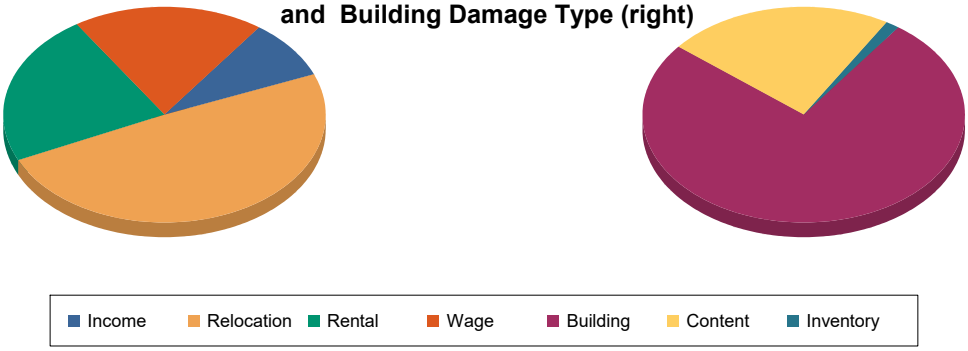
The total economic loss estimated for the hurricane is 105.8 million dollars, which represents 2.85 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 106 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 66% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

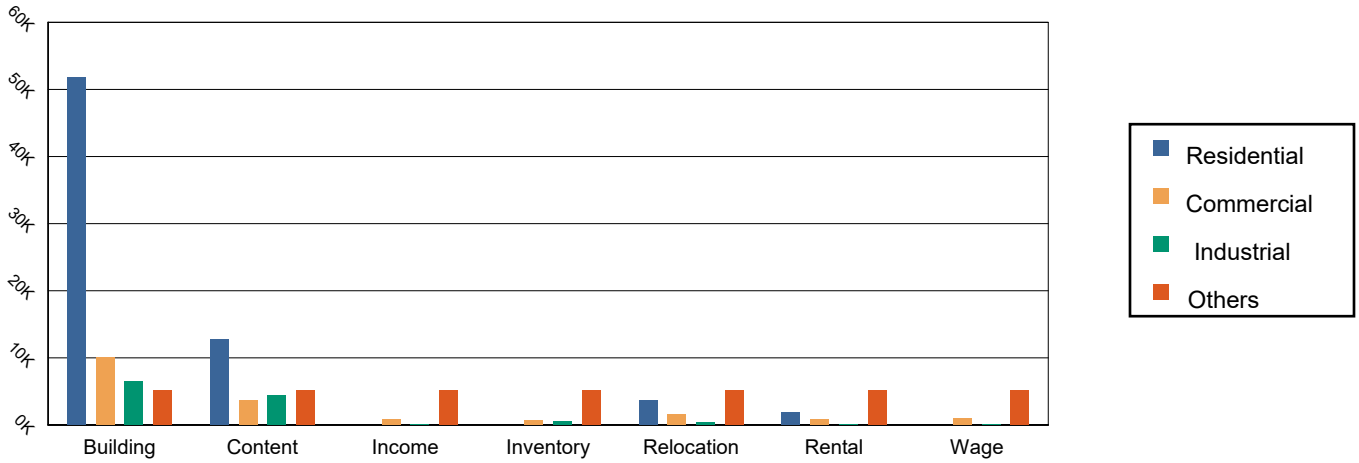


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	51,859.10	10,072.17	6,470.03	2,360.16	70,761.46
	Content	12,736.90	3,610.66	4,342.78	771.02	21,461.36
	Inventory	0.00	656.55	541.53	60.05	1,258.13
	Subtotal	**64,596.00**	**14,339.37**	**11,354.34**	**3,191.23**	**93,480.95**
Business Interruption Loss						
	Income	0.00	853.17	69.09	171.88	1,094.14
	Relocation	3,629.41	1,599.73	405.51	438.23	6,072.89
	Rental	1,922.11	791.65	59.70	60.53	2,833.98
	Wage	0.00	1,016.17	116.09	1,233.56	2,365.82
	Subtotal	**5,551.52**	**4,260.72**	**650.39**	**1,904.19**	**12,366.82**

Total

Total	70,147.52	18,600.10	12,004.73	5,095.42	105,847.77

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	17,525	2,011,988	1,697,361	3,709,349
Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**
Study Region Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**

Hazus: Hurricane Global Risk Report

Region Name:	Plainville_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.78 square miles and contains 5 census tracts. There are over 7 thousand households in the region and a total population of 17,525 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 3,709 million dollars. Approximately 87% of the buildings (and 54% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,555 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

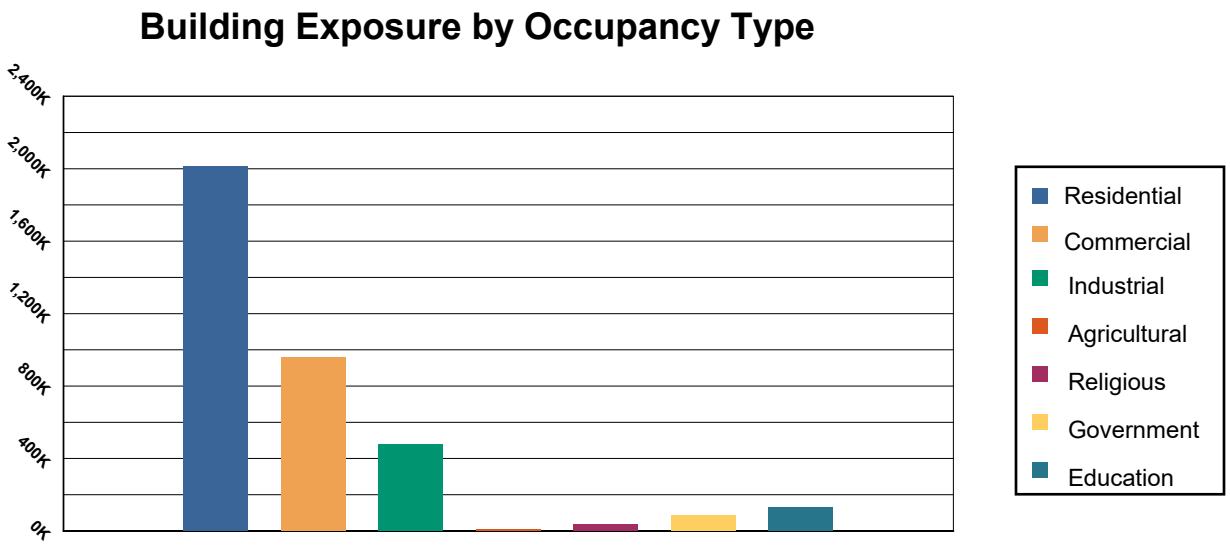


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,011,988	54.24%
Commercial	956,453	25.78%
Industrial	478,962	12.91%
Agricultural	8,114	0.22%
Religious	34,692	0.94%
Government	88,503	2.39%
Education	130,637	3.52%
Total	**3,709,349**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 7 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 836 buildings will be at least moderately damaged. This is over 11% of the total number of buildings in the region. There are an estimated 47 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

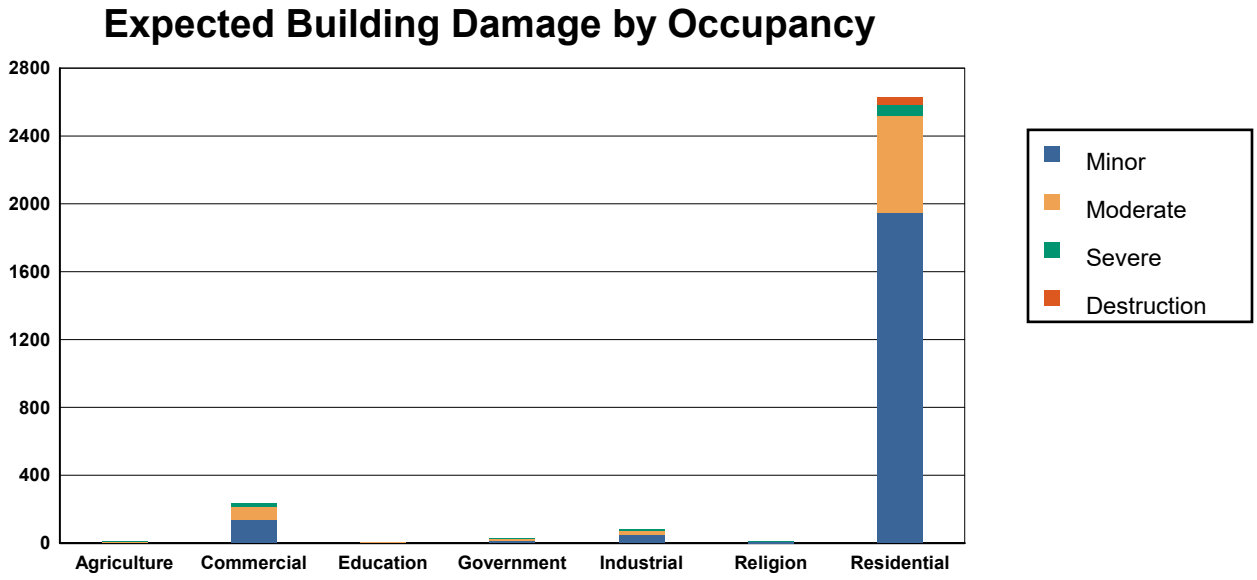


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	10.95	57.63	4.85	25.53	2.02	10.61	1.02	5.35	0.17	0.89
Commercial	369.87	61.14	134.69	22.26	80.49	13.30	19.76	3.27	0.19	0.03
Education	7.65	63.71	2.66	22.16	1.43	11.94	0.26	2.19	0.00	0.00
Government	47.61	65.21	15.63	21.41	8.30	11.37	1.46	2.00	0.00	0.00
Industrial	139.09	62.37	46.34	20.78	28.04	12.57	8.80	3.95	0.74	0.33
Religion	18.34	63.23	7.25	25.00	2.94	10.15	0.47	1.62	0.00	0.00
Residential	3,967.13	60.16	1,947.17	29.53	571.38	8.67	62.65	0.95	45.66	0.69
Total	**4,560.63**		**2,158.59**		**694.60**		**94.42**		**46.76**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	76	59.12	29	22.55	21	16.31	3	2.01	0	0.00
Masonry	410	58.81	153	21.96	112	16.01	20	2.91	2	0.32
MH	136	77.96	17	9.77	14	7.90	1	0.59	7	3.78
Steel	292	63.10	89	19.21	62	13.42	20	4.22	0	0.05
Wood	3,697	60.69	1,876	30.80	429	7.04	52	0.85	37	0.61

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

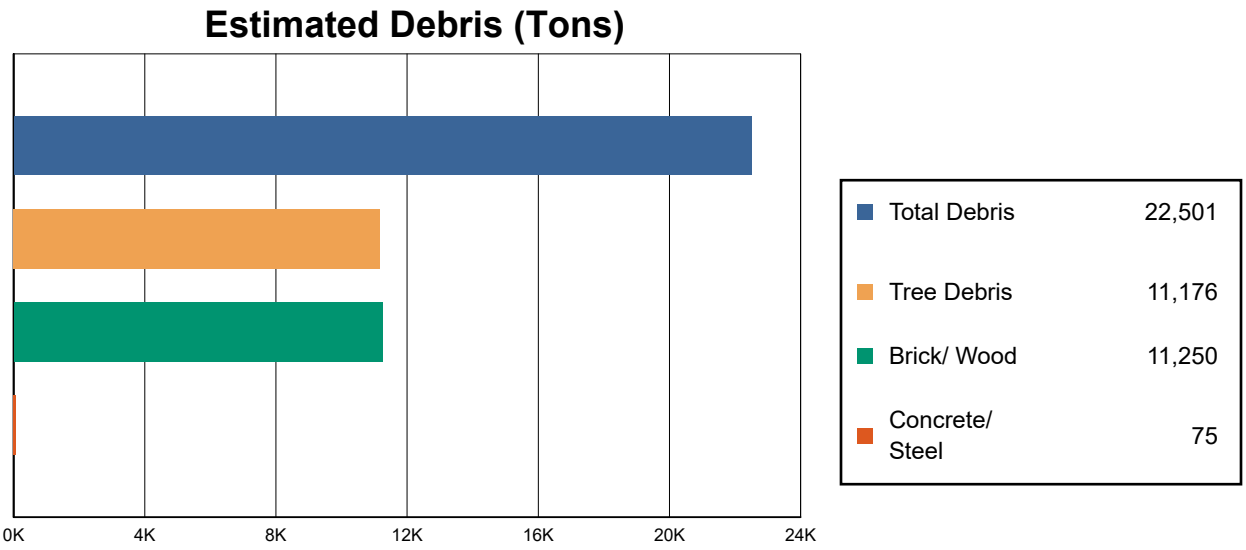
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	0

Induced Hurricane Damage

Debris Generation

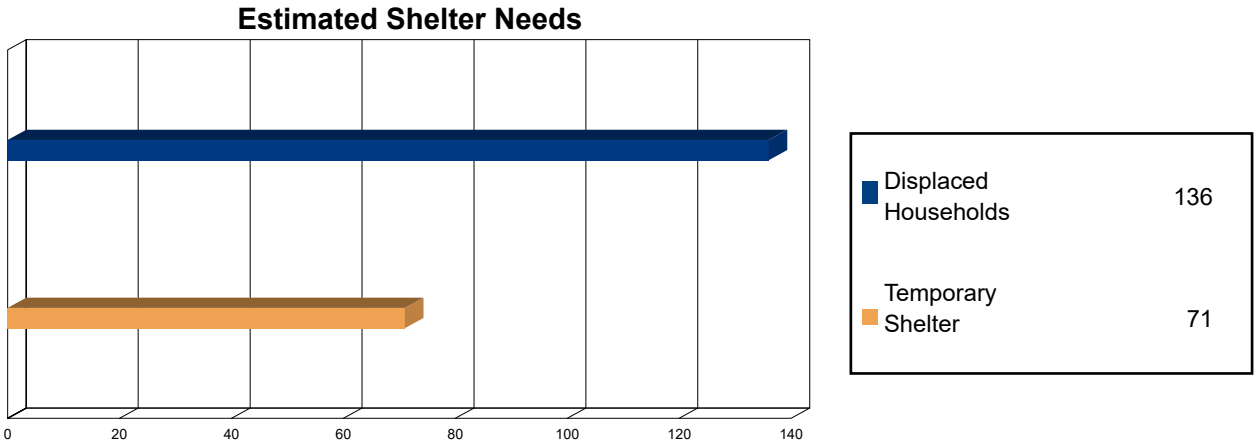


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 22,501 tons of debris will be generated. Of the total amount, 3,935 tons (17%) is Other Tree Debris. Of the remaining 18,566 tons, Brick/Wood comprises 61% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 453 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,241 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 136 households to be displaced due to the hurricane. Of these, 71 people (out of a total population of 17,525) will seek temporary shelter in public shelters.

Economic Loss

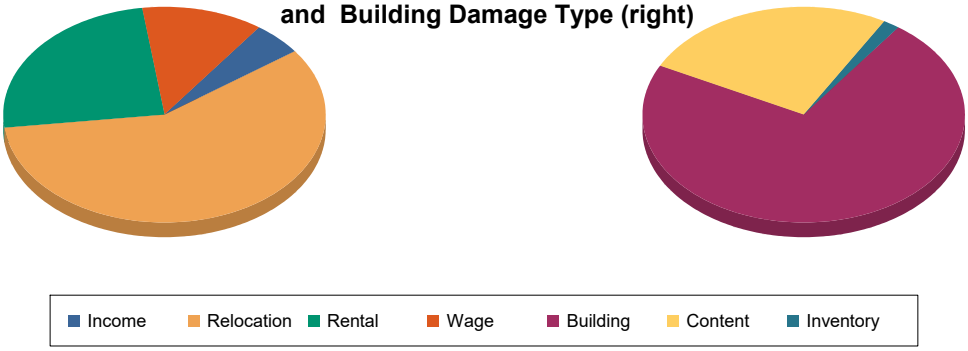
The total economic loss estimated for the hurricane is 180.6 million dollars, which represents 4.87 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 181 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 65% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

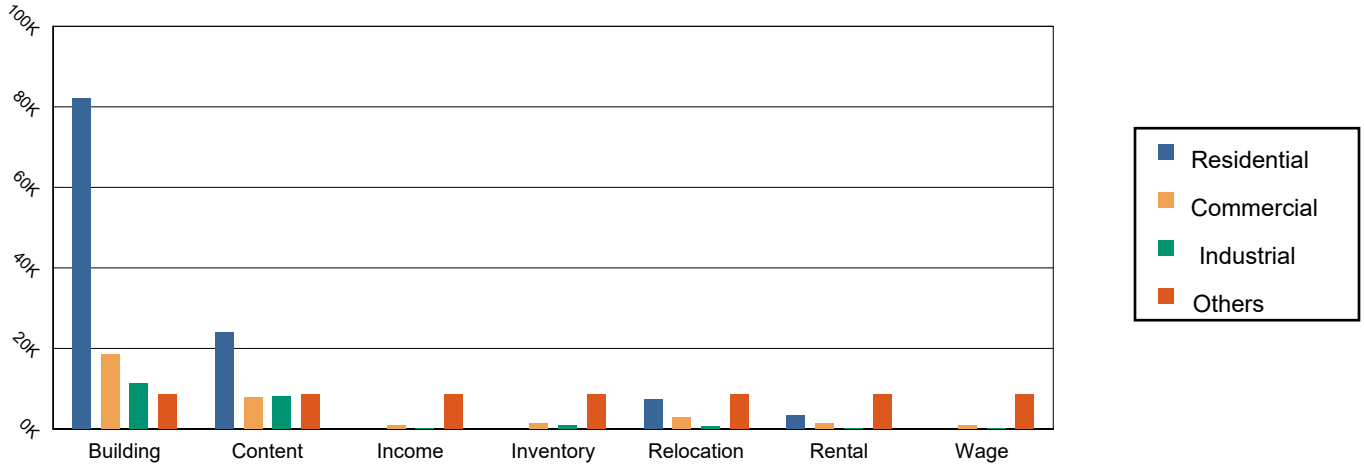


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	82,004.28	18,478.89	11,233.62	4,312.41	116,029.20
	Content	23,944.12	7,908.52	8,065.66	1,713.07	41,631.36
	Inventory	0.00	1,494.75	997.67	102.98	2,595.40
	Subtotal	**105,948.40**	**27,882.16**	**20,296.95**	**6,128.46**	**160,255.97**
Business Interruption Loss						
	Income	0.43	766.22	103.83	169.53	1,040.01
	Relocation	7,295.22	2,953.78	721.28	808.41	11,778.69
	Rental	3,350.67	1,499.20	103.48	115.06	5,068.41
	Wage	1.02	979.37	173.90	1,323.17	2,477.46
	Subtotal	**10,647.34**	**6,198.57**	**1,102.49**	**2,416.16**	**20,364.56**

Total

Total	**116,595.74**	**34,080.73**	**21,399.44**	**8,544.62**	**180,620.53**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	17,525	2,011,988	1,697,361	3,709,349
Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**
Study Region Total	**17,525**	**2,011,988**	**1,697,361**	**3,709,349**

Hazus: Hurricane Global Risk Report

Region Name:	Rocky_Hill_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.85 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,845 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,943 million dollars. Approximately 83% of the buildings (and 61% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

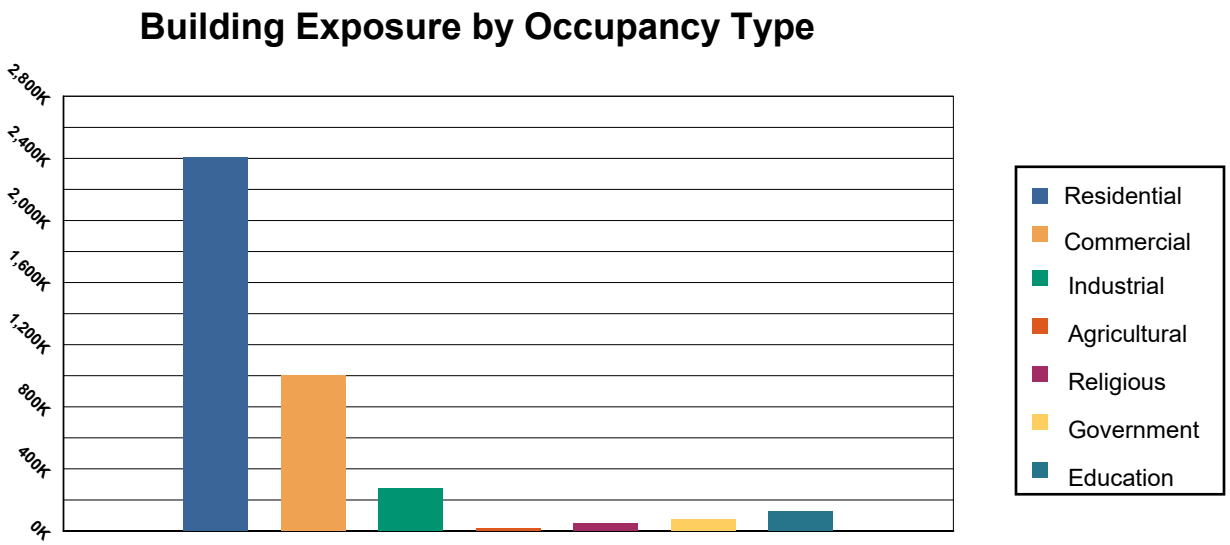


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,406,440	61.04%
Commercial	999,733	25.36%
Industrial	271,931	6.90%
Agricultural	16,834	0.43%
Religious	51,274	1.30%
Government	70,740	1.79%
Education	125,563	3.18%
Total	**3,942,515**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds. There are 6 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

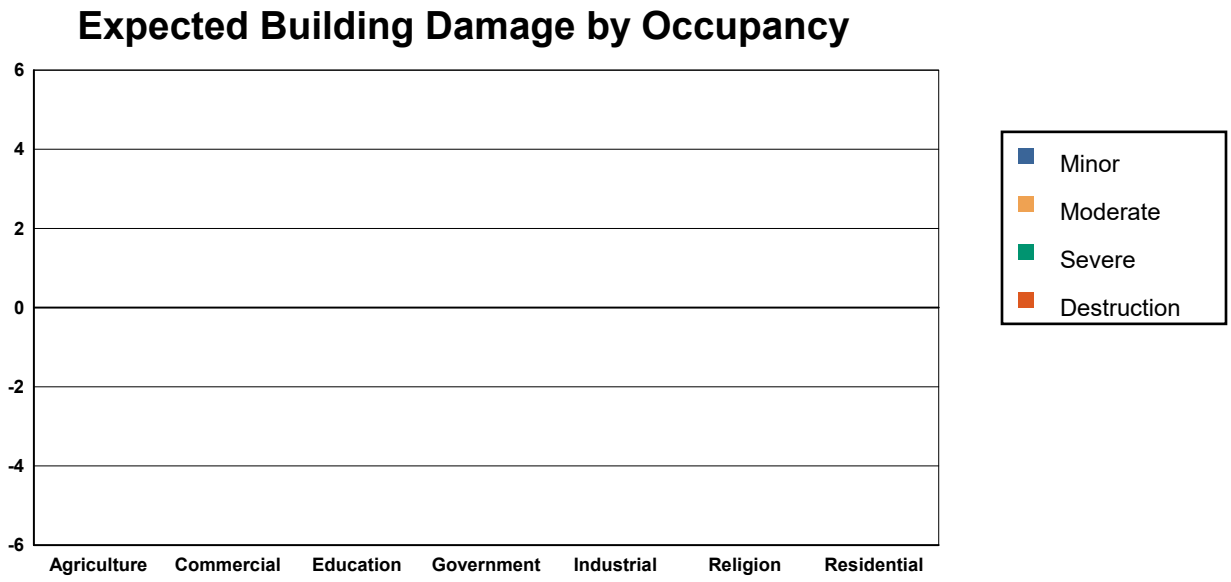


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	27.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	631.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	19.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	77.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	161.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	43.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	4,749.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**5,707.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	115	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	618	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	456	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	4,519	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 125 hospital beds available for use. On the day of the hurricane, the model estimates that 125 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

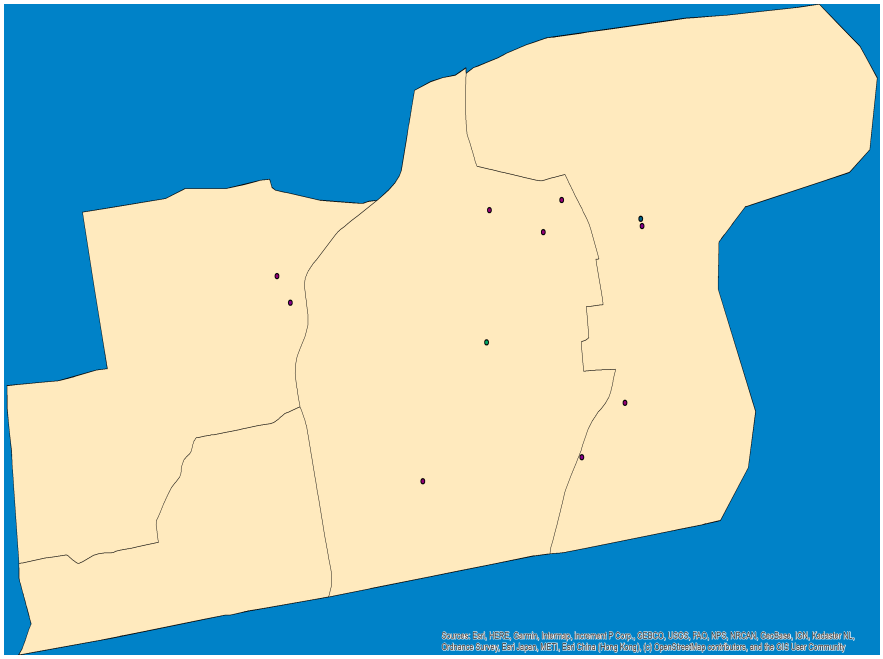
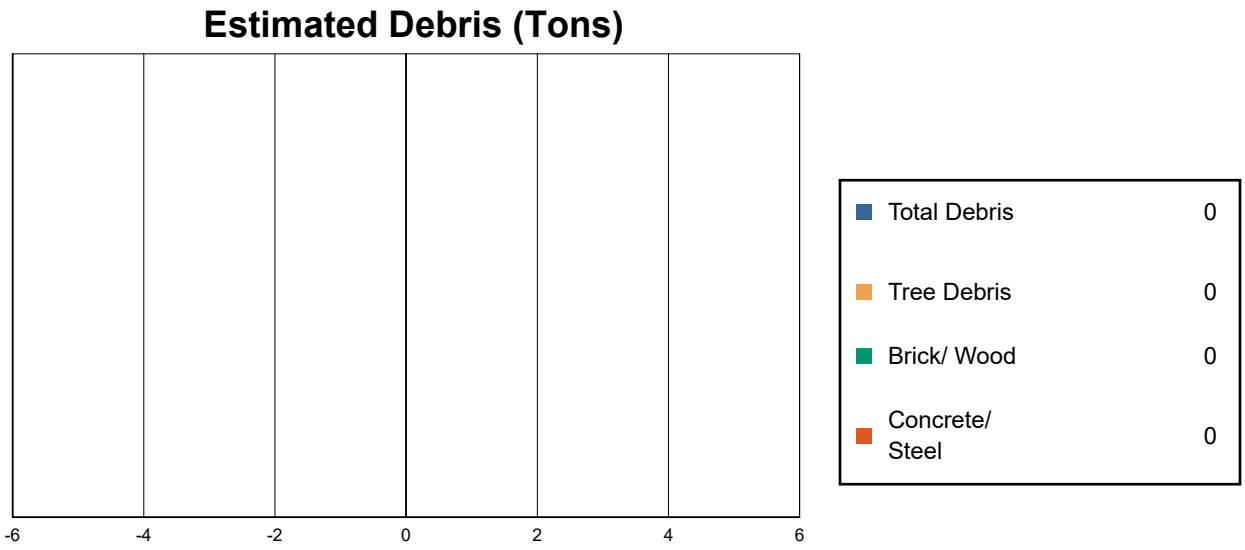


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	6	0	0	6

Induced Hurricane Damage

Debris Generation

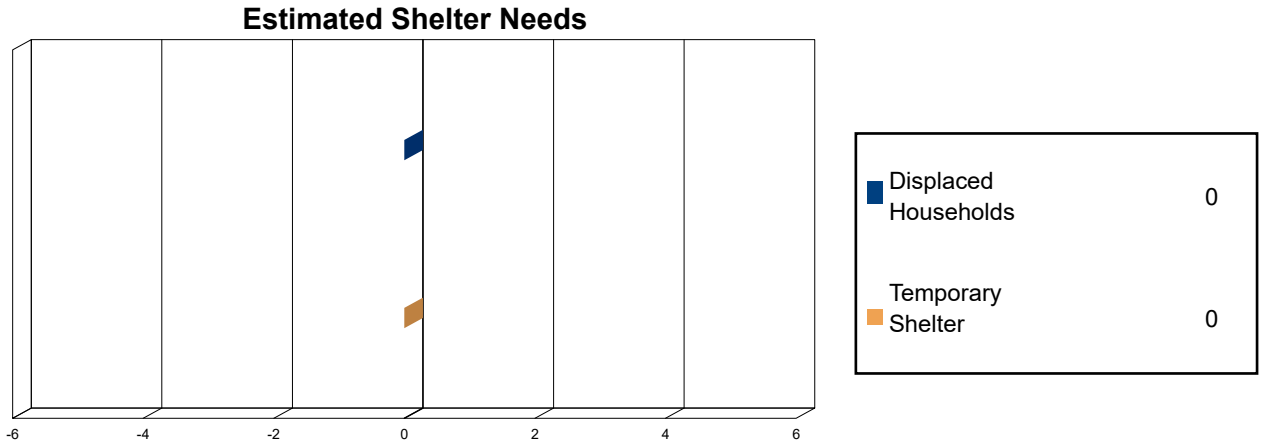


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 20,845) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

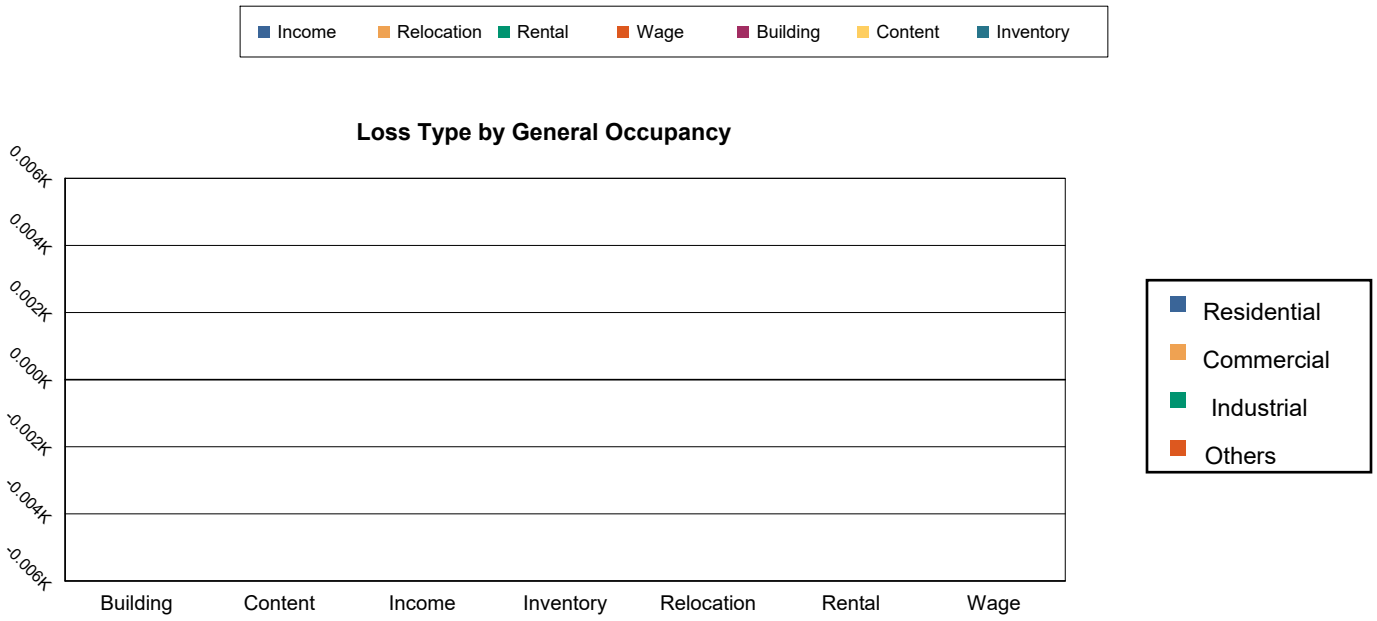


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,440	1,536,075	3,942,515
Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**
Study Region Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**

Hazus: Hurricane Global Risk Report

Region Name:	Rocky_Hill_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.85 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,845 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,943 million dollars. Approximately 83% of the buildings (and 61% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

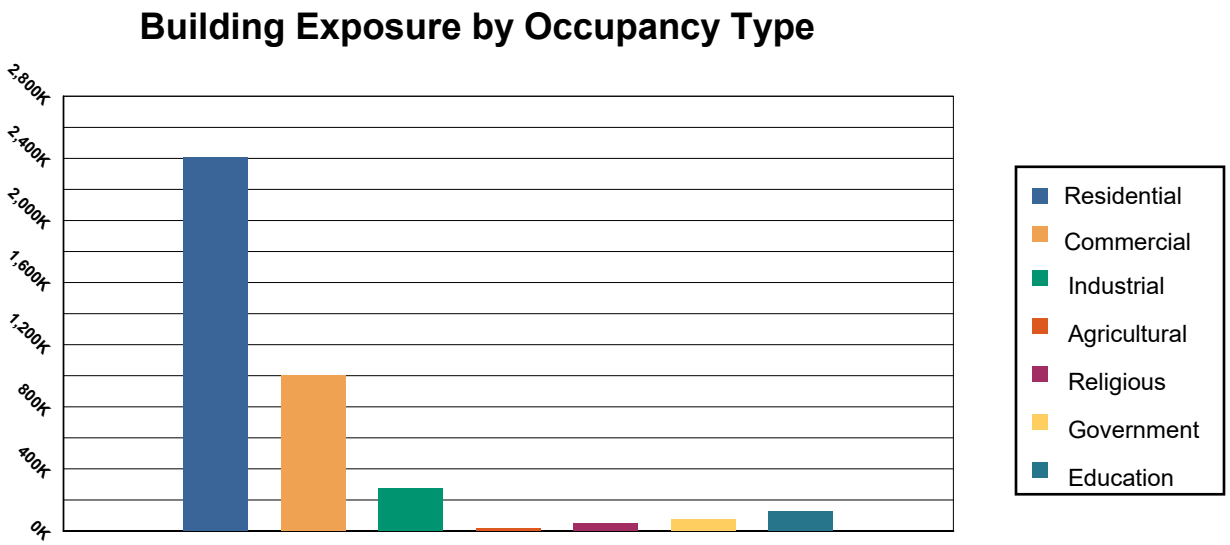


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,406,440	61.04%
Commercial	999,733	25.36%
Industrial	271,931	6.90%
Agricultural	16,834	0.43%
Religious	51,274	1.30%
Government	70,740	1.79%
Education	125,563	3.18%
Total	**3,942,515**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds. There are 6 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

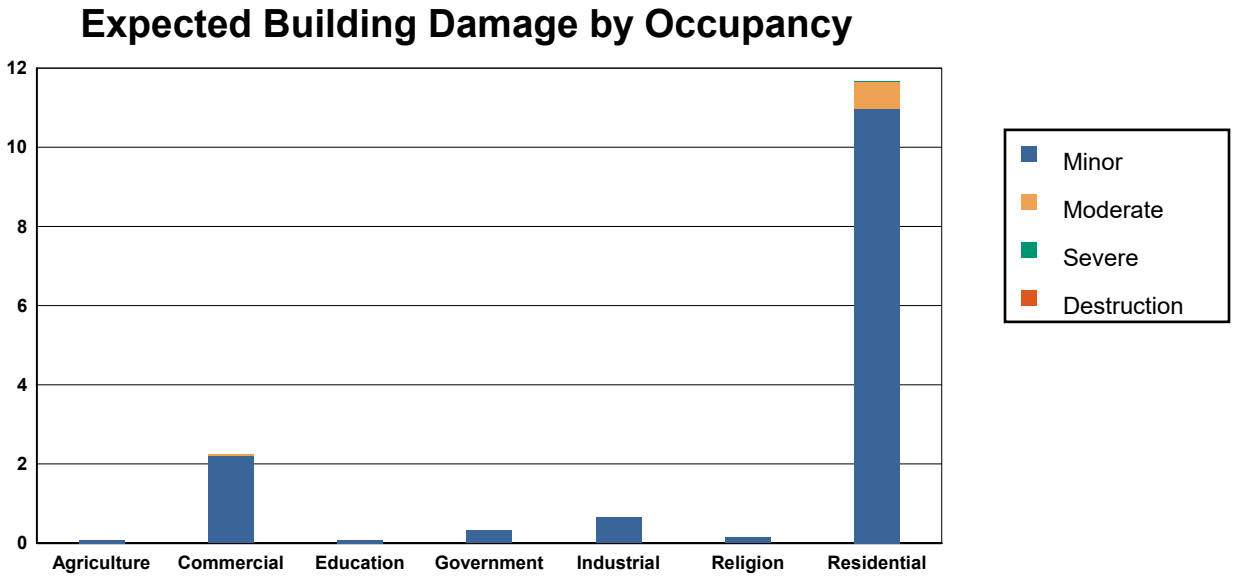


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	26.92	99.70	0.08	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	628.75	99.64	2.22	0.35	0.03	0.01	0.00	0.00	0.00	0.00
Education	18.93	99.61	0.07	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Government	76.68	99.59	0.32	0.41	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	160.36	99.60	0.64	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Religion	42.86	99.68	0.14	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Residential	4,737.33	99.75	10.96	0.23	0.70	0.01	0.01	0.00	0.00	0.00
Total	**5,691.83**		**14.43**		**0.74**		**0.01**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	114	99.51	1	0.49	0	0.00	0	0.00	0	0.00
Masonry	613	99.21	5	0.76	0	0.03	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	454	99.62	2	0.37	0	0.00	0	0.00	0	0.00
Wood	4,515	99.91	4	0.08	0	0.01	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 125 hospital beds available for use. On the day of the hurricane, the model estimates that 125 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

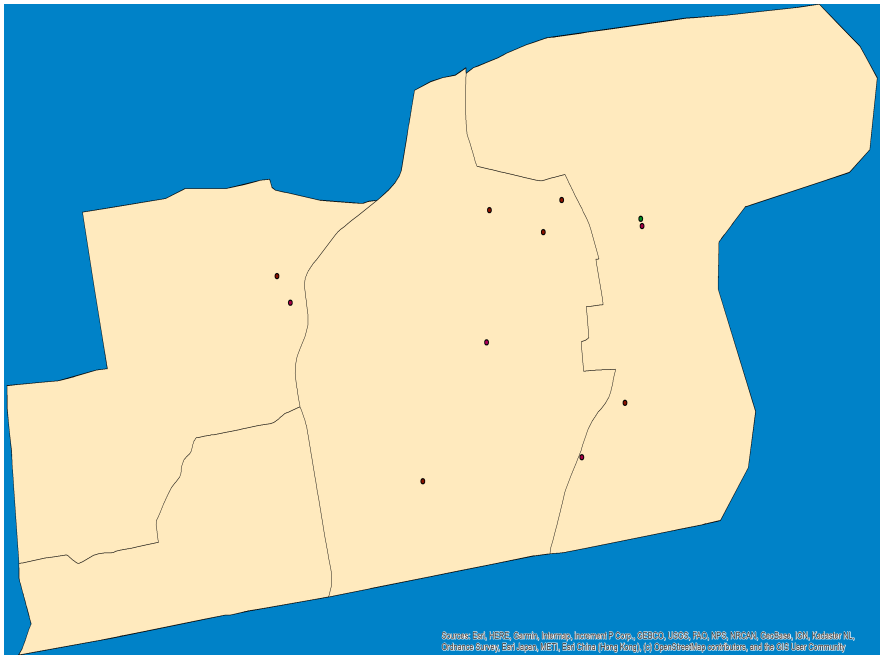
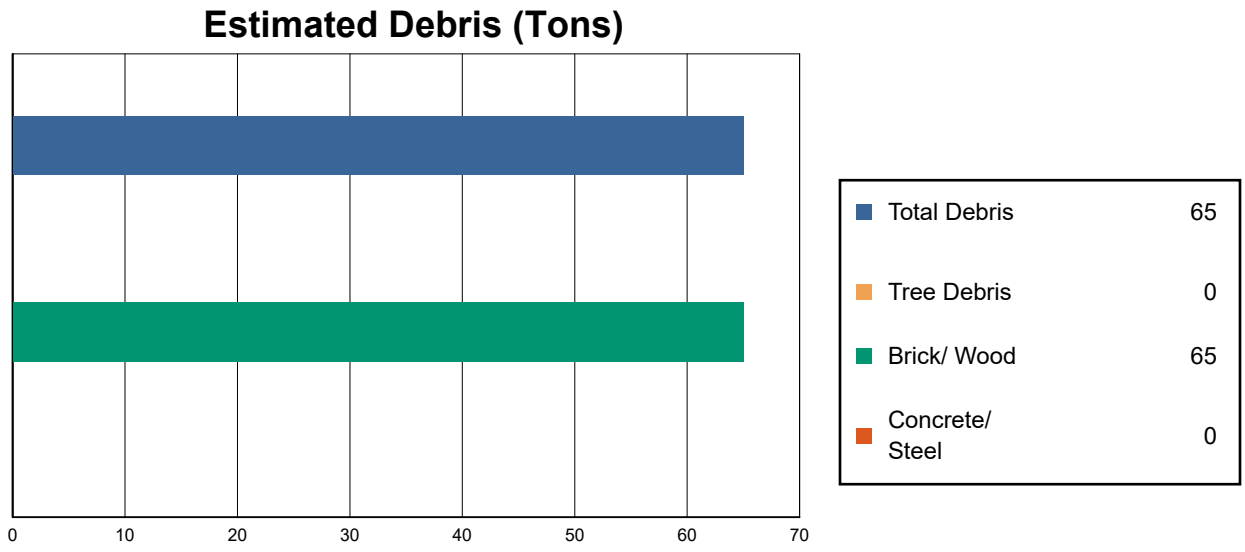


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	6	0	0	6

Induced Hurricane Damage

Debris Generation

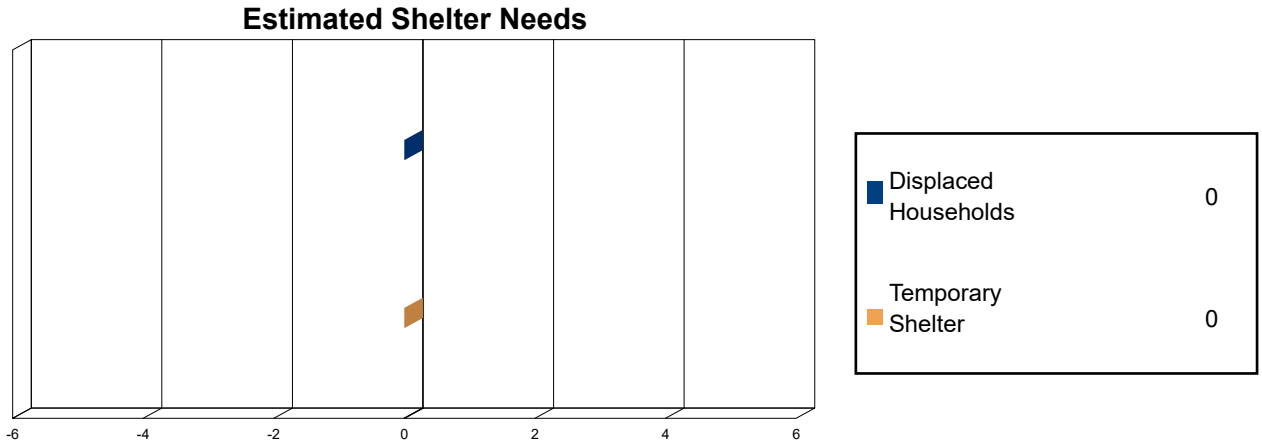


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 65 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 65 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 20,845) will seek temporary shelter in public shelters.

Economic Loss

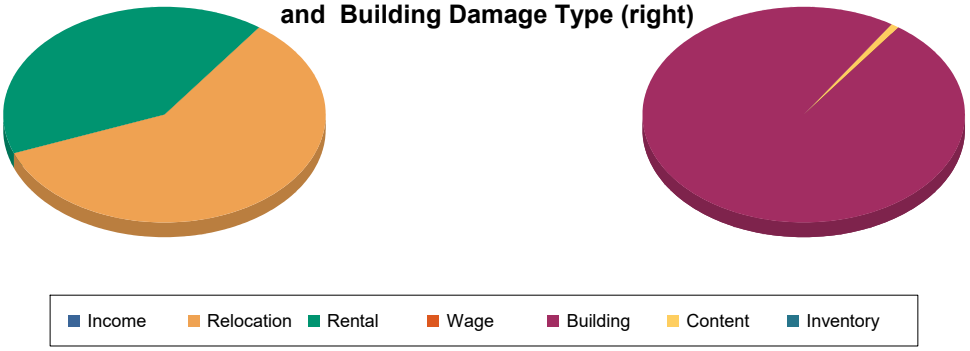
The total economic loss estimated for the hurricane is 1.2 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

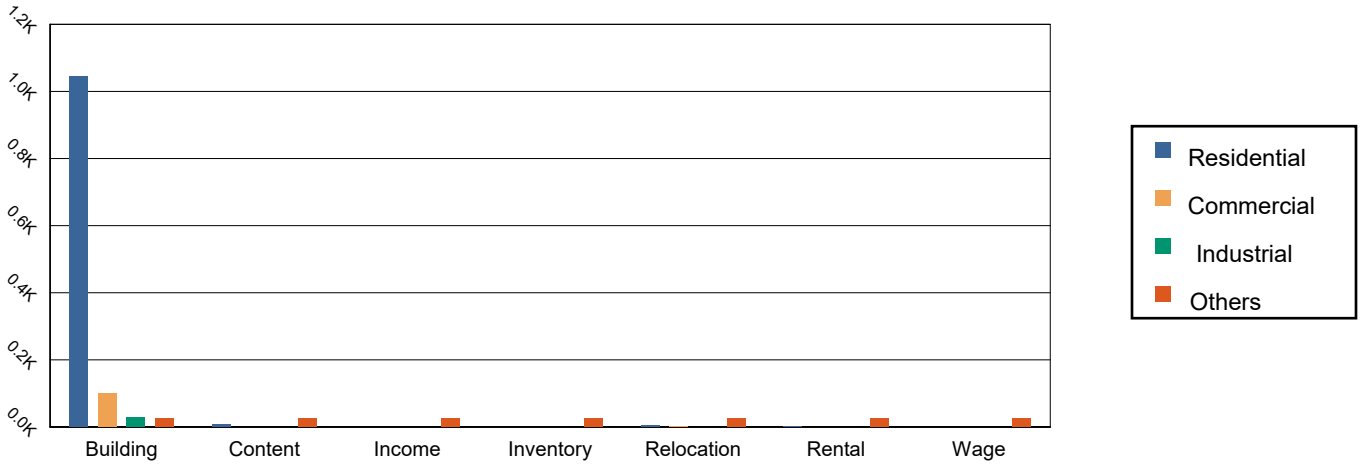


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,043.06	99.97	27.19	24.76	1,194.98
	Content	8.34	0.00	0.00	0.00	8.34
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,051.39**	**99.97**	**27.19**	**24.76**	**1,203.32**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	3.50	0.40	0.00	0.01	3.91
	Rental	2.70	0.00	0.00	0.00	2.70
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**6.20**	**0.40**	**0.00**	**0.01**	**6.62**

Total

Total	**1,057.60**	**100.37**	**27.19**	**24.77**	**1,209.93**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,440	1,536,075	3,942,515
Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**
Study Region Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**

Hazus: Hurricane Global Risk Report

Region Name:	Rocky_Hill_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.85 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,845 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,943 million dollars. Approximately 83% of the buildings (and 61% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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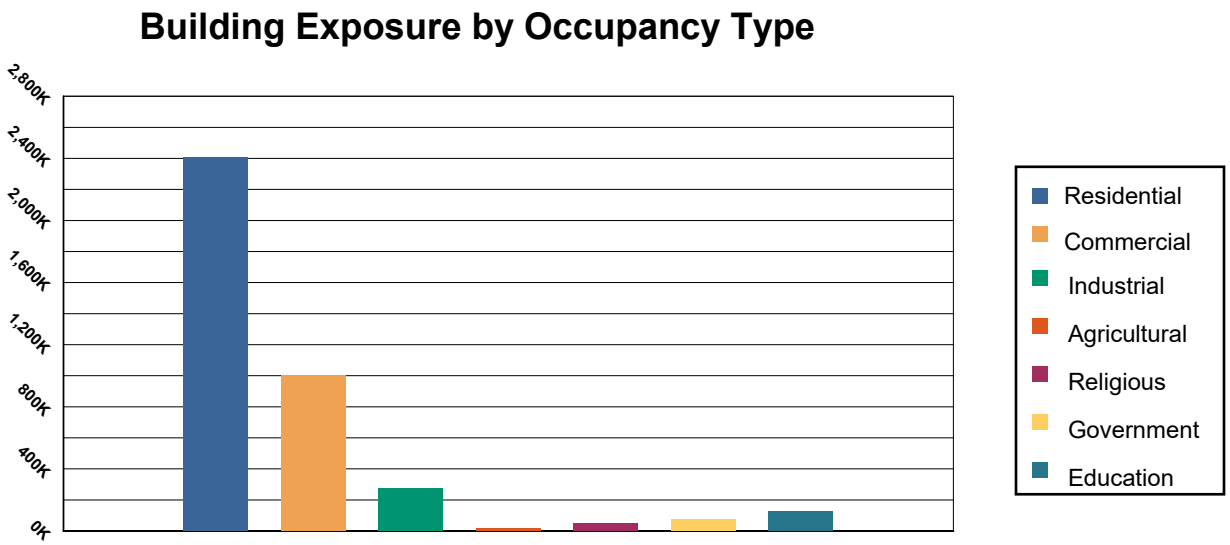

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Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,406,440	61.04%
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Industrial	271,931	6.90%
Agricultural	16,834	0.43%
Religious	51,274	1.30%
Government	70,740	1.79%
Education	125,563	3.18%
Total	**3,942,515**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds. There are 6 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 24 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

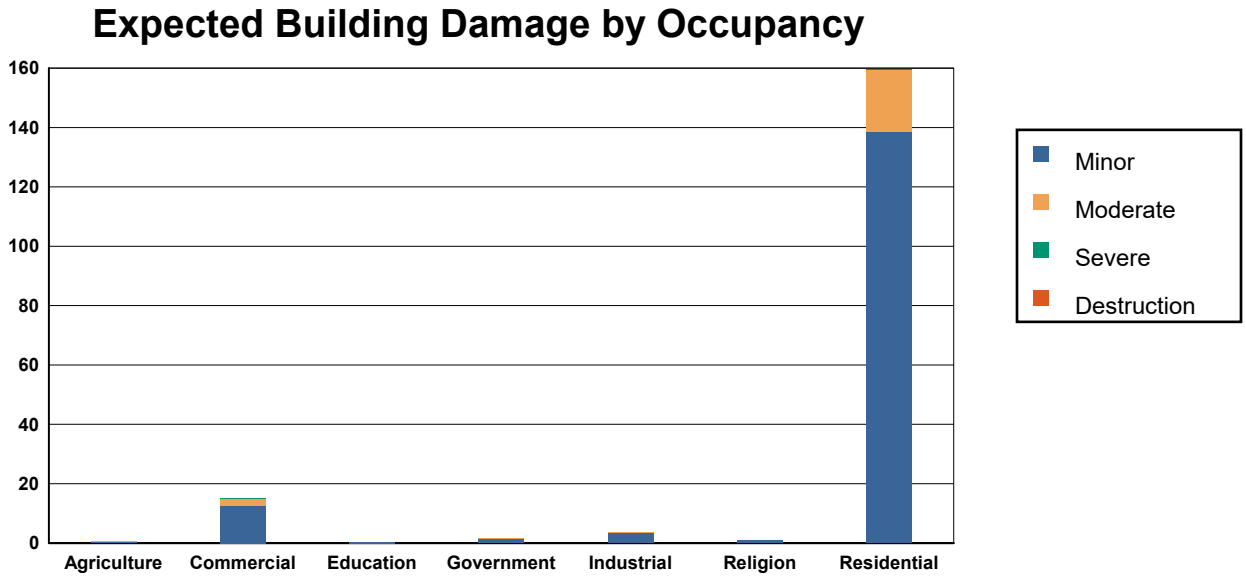


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	26.24	97.20	0.65	2.40	0.08	0.30	0.03	0.10	0.00	0.00
Commercial	616.06	97.63	12.54	1.99	2.23	0.35	0.18	0.03	0.00	0.00
Education	18.60	97.90	0.39	2.04	0.01	0.06	0.00	0.00	0.00	0.00
Government	75.31	97.81	1.65	2.14	0.04	0.05	0.00	0.00	0.00	0.00
Industrial	157.29	97.70	3.45	2.15	0.22	0.14	0.04	0.02	0.00	0.00
Religion	42.08	97.86	0.89	2.07	0.03	0.07	0.00	0.00	0.00	0.00
Residential	4,589.38	96.64	138.70	2.92	20.61	0.43	0.31	0.01	0.00	0.00
Total	**5,524.96**		**158.26**		**23.21**		**0.56**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	112	97.44	3	2.48	0	0.08	0	0.00	0	0.00
Masonry	585	94.71	25	4.05	8	1.23	0	0.02	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	445	97.68	9	1.86	2	0.41	0	0.04	0	0.00
Wood	4,410	97.59	104	2.31	4	0.10	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had 125 hospital beds available for use. On the day of the hurricane, the model estimates that 125 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

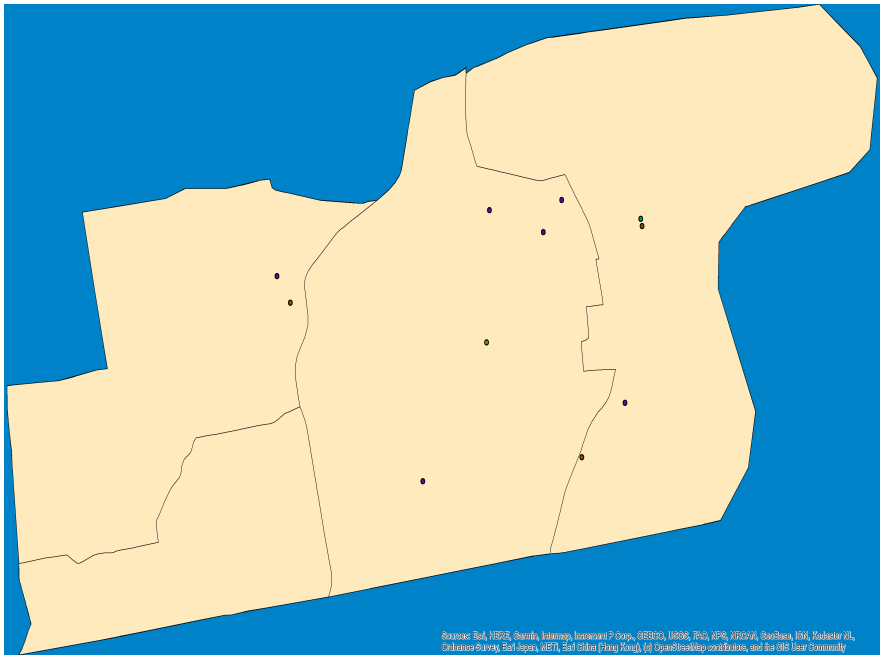
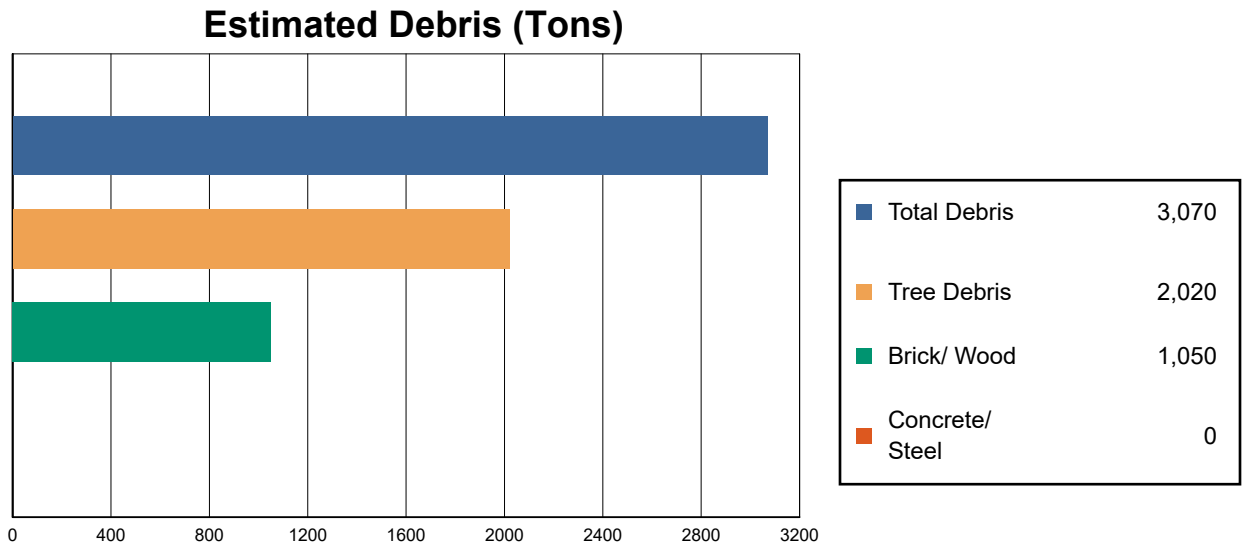


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	6	0	0	6

Induced Hurricane Damage

Debris Generation

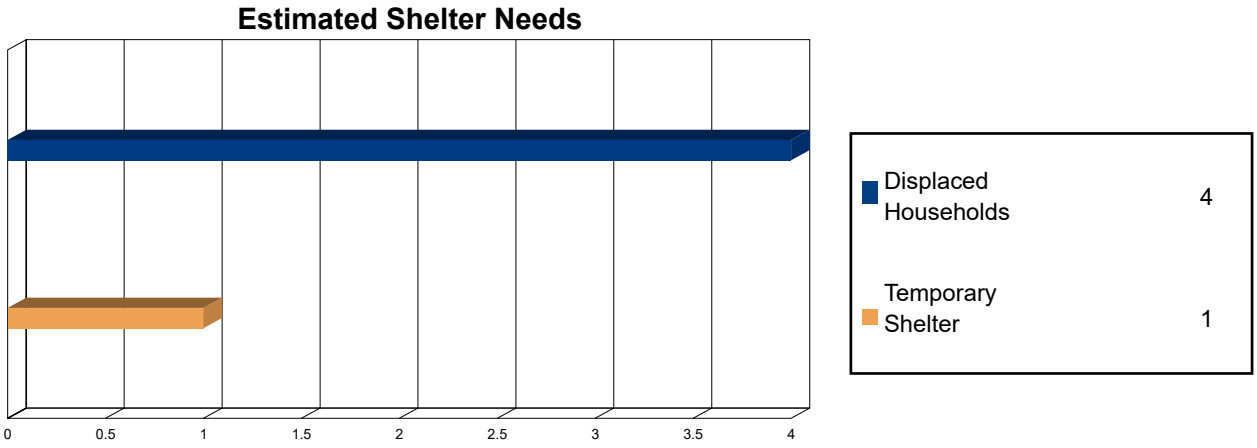


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,070 tons of debris will be generated. Of the total amount, 876 tons (29%) is Other Tree Debris. Of the remaining 2,194 tons, Brick/Wood comprises 48% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 42 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,144 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 4 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 20,845) will seek temporary shelter in public shelters.

Economic Loss

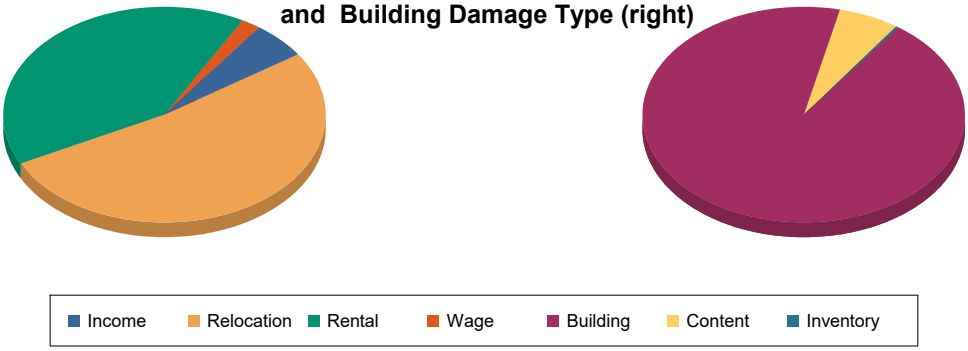
The total economic loss estimated for the hurricane is 11.7 million dollars, which represents 0.30 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 12 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 89% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

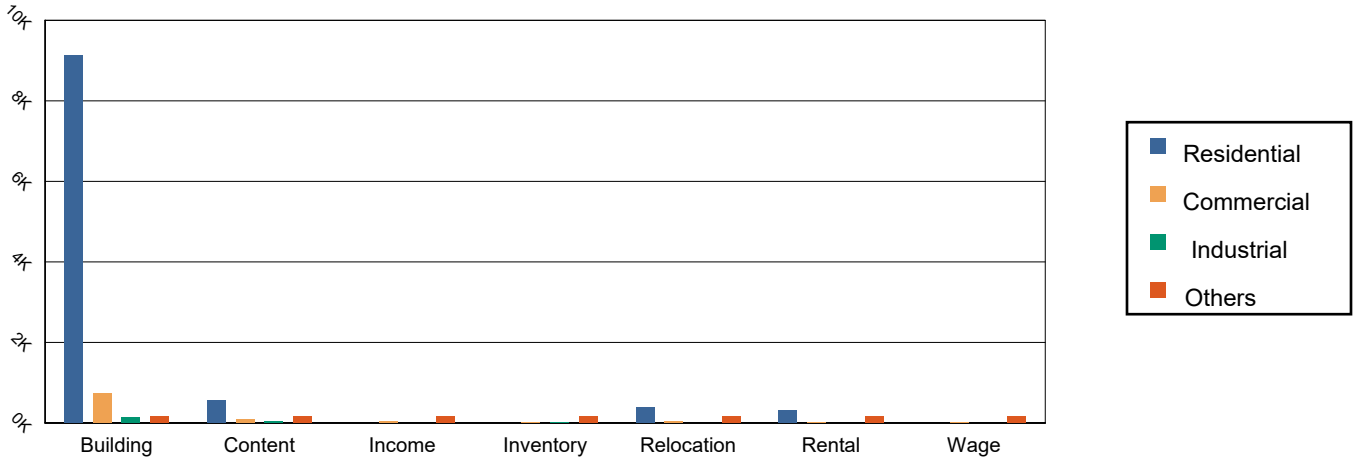


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	9,129.10	732.60	149.46	142.84	10,153.99
	Content	548.32	77.43	33.36	5.65	664.76
	Inventory	0.00	10.57	4.03	2.36	16.95
	Subtotal	**9,677.42**	**820.59**	**186.84**	**150.85**	**10,835.70**
Business Interruption Loss						
	Income	0.00	47.73	0.00	0.00	47.73
	Relocation	385.50	50.64	1.92	1.23	439.28
	Rental	324.39	19.64	0.00	0.00	344.03
	Wage	0.00	16.96	0.00	0.00	16.96
	Subtotal	**709.89**	**134.97**	**1.92**	**1.23**	**848.01**

Total

Total	10,387.31	955.57	188.76	152.07	11,683.71

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,440	1,536,075	3,942,515
Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**
Study Region Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**

Hazus: Hurricane Global Risk Report

Region Name:	Rocky_Hill_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.85 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,845 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,943 million dollars. Approximately 83% of the buildings (and 61% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

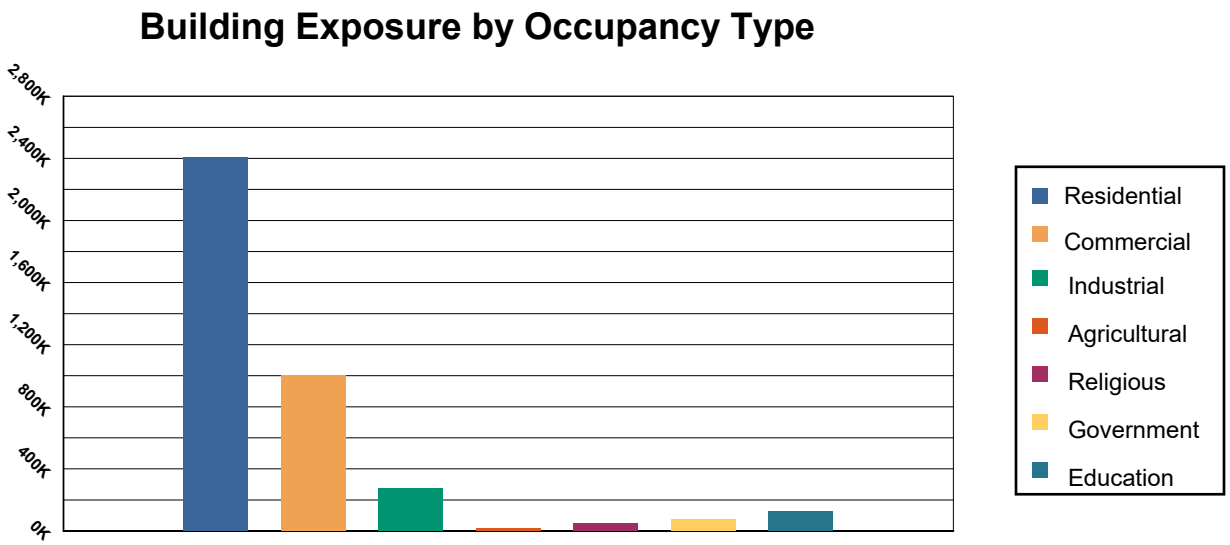


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,406,440	61.04%
Commercial	999,733	25.36%
Industrial	271,931	6.90%
Agricultural	16,834	0.43%
Religious	51,274	1.30%
Government	70,740	1.79%
Education	125,563	3.18%
Total	**3,942,515**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds. There are 6 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 95 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

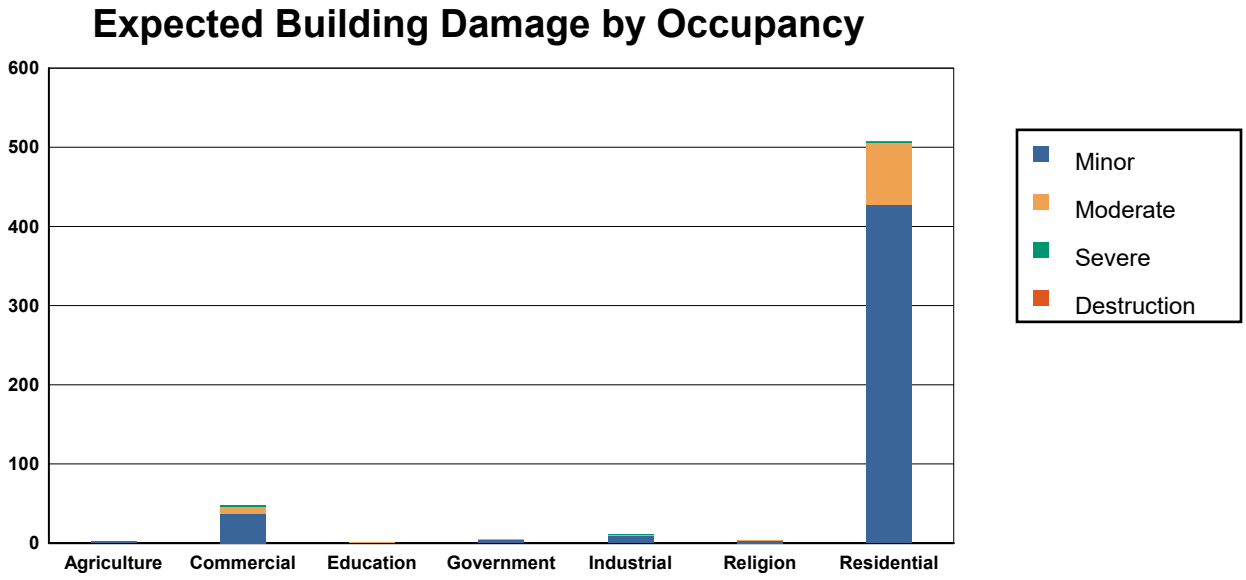


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	24.44	90.52	1.99	7.38	0.39	1.44	0.17	0.62	0.01	0.04
Commercial	583.44	92.46	36.76	5.83	9.16	1.45	1.64	0.26	0.00	0.00
Education	17.74	93.36	1.15	6.03	0.11	0.59	0.00	0.01	0.00	0.00
Government	71.84	93.30	4.67	6.06	0.48	0.63	0.01	0.01	0.00	0.00
Industrial	149.37	92.78	9.73	6.04	1.57	0.97	0.32	0.20	0.01	0.01
Religion	39.92	92.84	2.83	6.59	0.24	0.55	0.01	0.02	0.00	0.00
Residential	4,240.81	89.30	427.33	9.00	79.05	1.66	1.34	0.03	0.46	0.01
Total	**5,127.57**		**484.45**		**91.00**		**3.49**		**0.49**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	106	92.39	8	6.76	1	0.84	0	0.01	0	0.00
Masonry	537	86.83	55	8.84	26	4.23	1	0.10	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	423	92.76	24	5.17	8	1.70	2	0.37	0	0.00
Wood	4,113	91.01	378	8.37	26	0.58	1	0.03	0	0.01

Essential Facility Damage

Before the hurricane, the region had 125 hospital beds available for use. On the day of the hurricane, the model estimates that 125 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

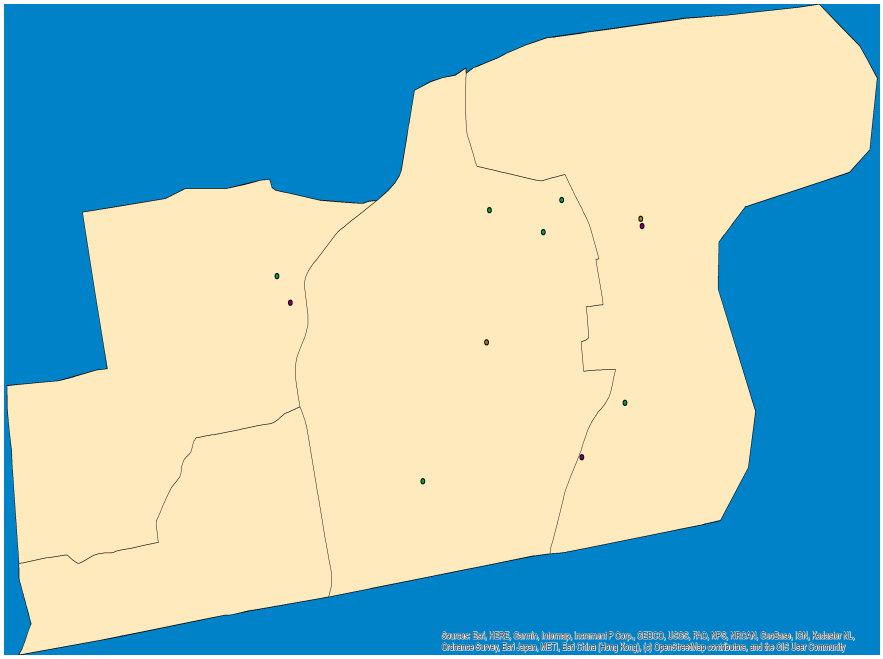
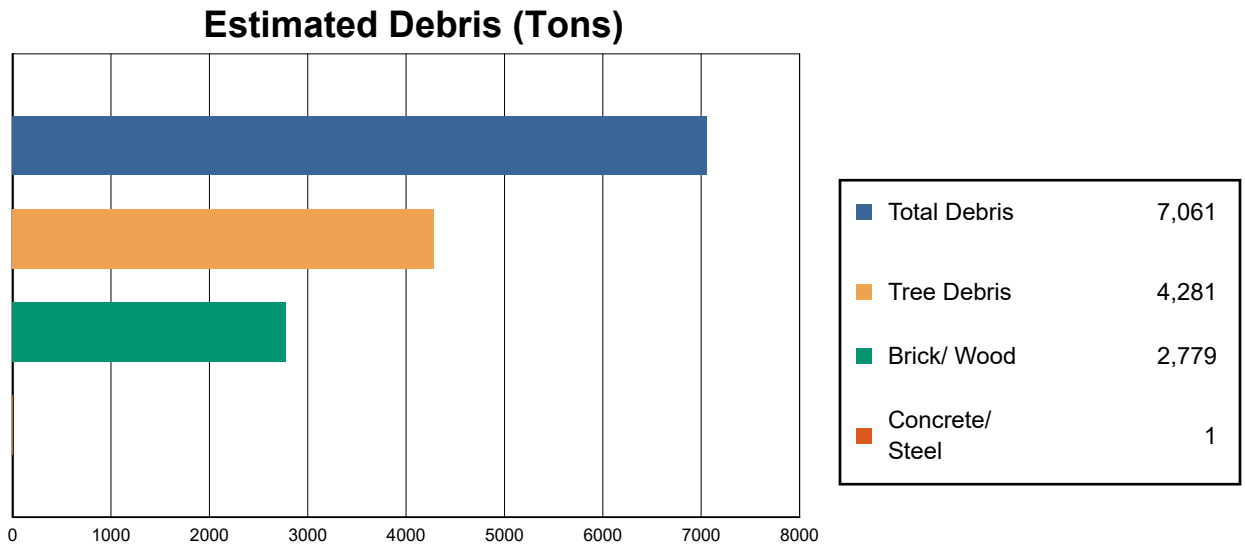


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	6	0	0	6

Induced Hurricane Damage

Debris Generation

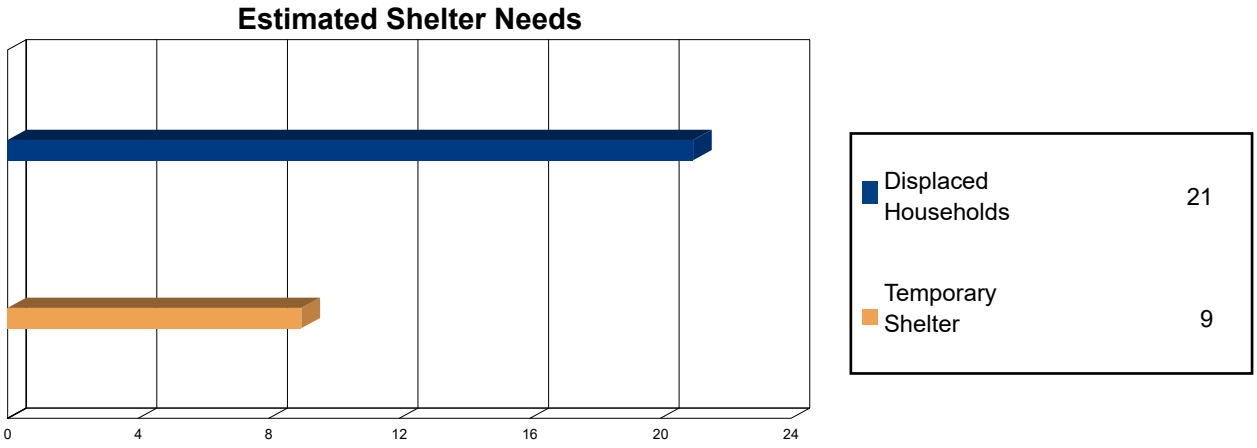


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7,061 tons of debris will be generated. Of the total amount, 1,849 tons (26%) is Other Tree Debris. Of the remaining 5,212 tons, Brick/Wood comprises 53% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 111 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,432 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 21 households to be displaced due to the hurricane. Of these, 9 people (out of a total population of 20,845) will seek temporary shelter in public shelters.

Economic Loss

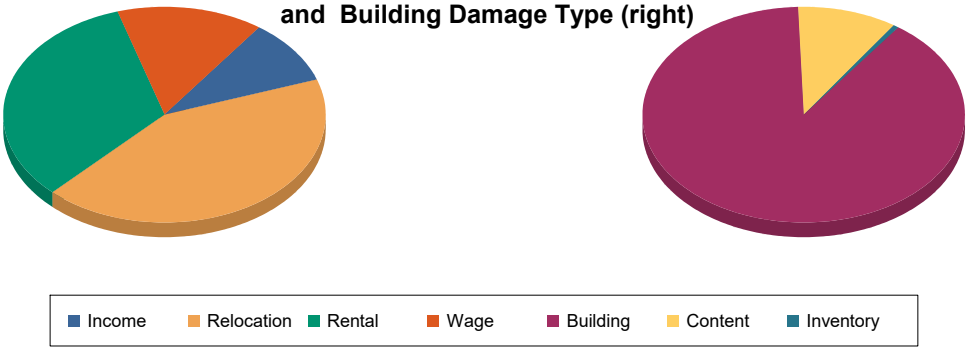
The total economic loss estimated for the hurricane is 30.8 million dollars, which represents 0.78 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 31 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 82% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

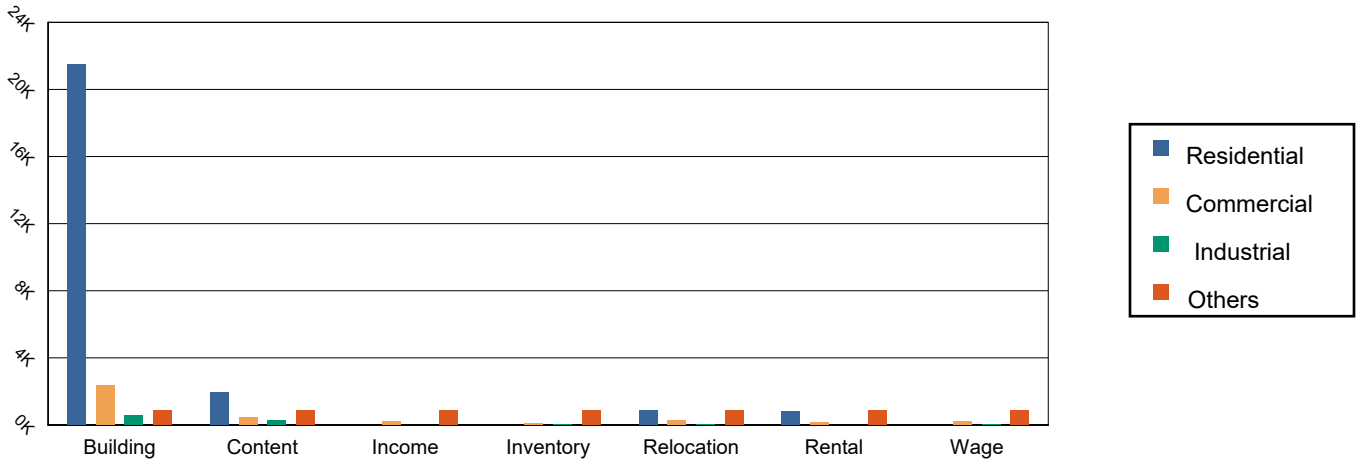


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	21,515.23	2,333.80	588.51	475.82	24,913.36
	Content	1,969.26	473.21	259.65	84.84	2,786.96
	Inventory	0.00	76.45	30.83	16.46	123.74
	Subtotal	**23,484.49**	**2,883.47**	**878.98**	**577.12**	**27,824.06**
Business Interruption Loss						
	Income	0.00	232.56	6.18	44.44	283.18
	Relocation	866.73	288.73	32.49	59.61	1,247.54
	Rental	833.15	129.83	4.93	7.21	975.11
	Wage	0.00	239.20	9.91	181.97	431.09
	Subtotal	**1,699.88**	**890.31**	**53.51**	**293.23**	**2,936.92**

Total

Total	**25,184.37**	**3,773.78**	**932.49**	**870.35**	**30,760.98**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,440	1,536,075	3,942,515
Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**
Study Region Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**

Hazus: Hurricane Global Risk Report

Region Name:	Rocky_Hill_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Thursday, May 11, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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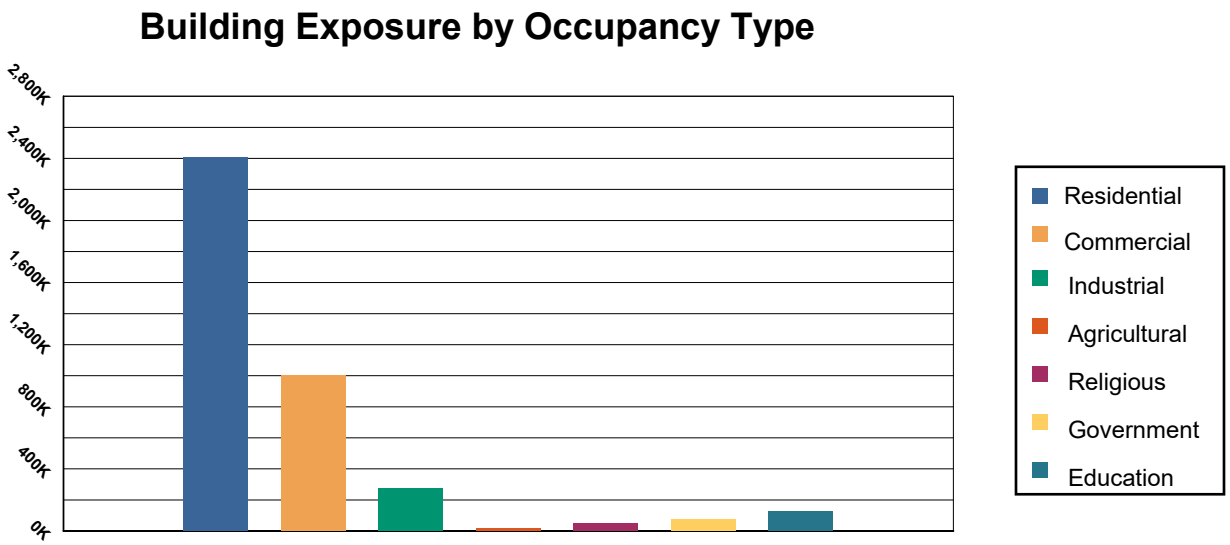

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Agricultural	16,834	0.43%
Religious	51,274	1.30%
Government	70,740	1.79%
Education	125,563	3.18%
Total	**3,942,515**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds. There are 6 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 239 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

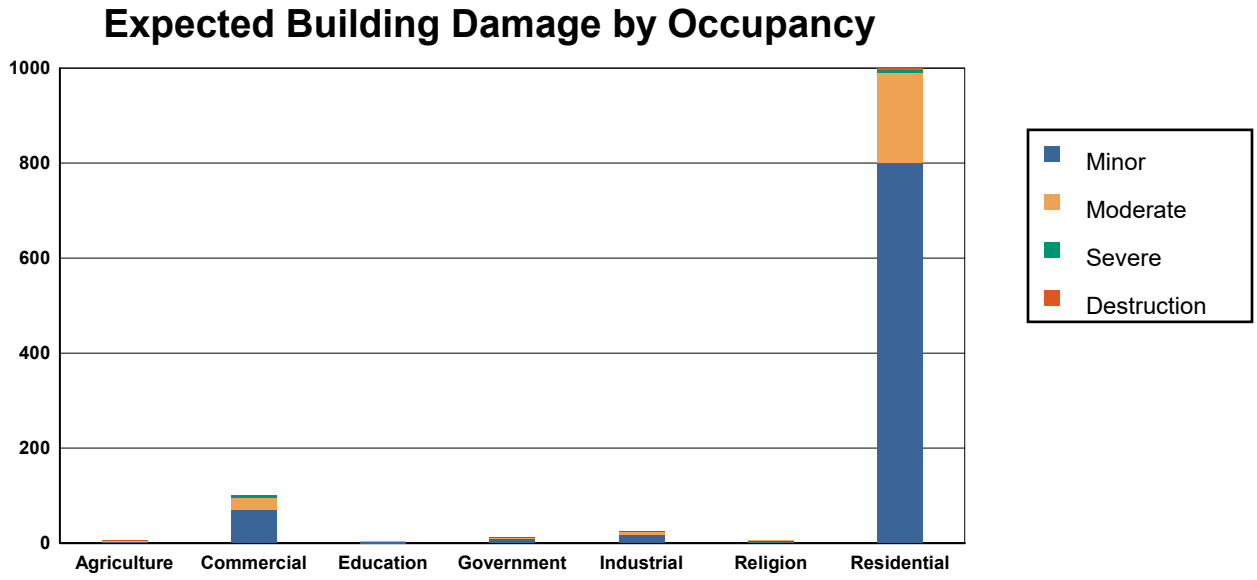


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.85	80.93	3.68	13.63	0.97	3.59	0.45	1.67	0.05	0.17
Commercial	531.14	84.17	70.71	11.21	23.72	3.76	5.42	0.86	0.02	0.00
Education	16.21	85.32	2.26	11.89	0.50	2.63	0.03	0.16	0.00	0.00
Government	66.14	85.89	8.78	11.40	1.98	2.57	0.11	0.14	0.00	0.00
Industrial	136.50	84.78	18.10	11.24	5.24	3.25	1.10	0.68	0.06	0.04
Religion	36.59	85.10	5.41	12.59	0.94	2.19	0.05	0.13	0.00	0.00
Residential	3,749.49	78.95	801.37	16.87	188.06	3.96	6.29	0.13	3.79	0.08
Total	**4,557.93**		**910.31**		**221.40**		**13.44**		**3.92**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	96	83.89	14	12.54	4	3.43	0	0.14	0	0.00
Masonry	474	76.62	88	14.20	54	8.81	2	0.33	0	0.03
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	386	84.70	45	9.79	20	4.28	6	1.23	0	0.01
Wood	3,667	81.15	752	16.64	90	2.00	6	0.13	4	0.08

Essential Facility Damage

Before the hurricane, the region had 125 hospital beds available for use. On the day of the hurricane, the model estimates that 125 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

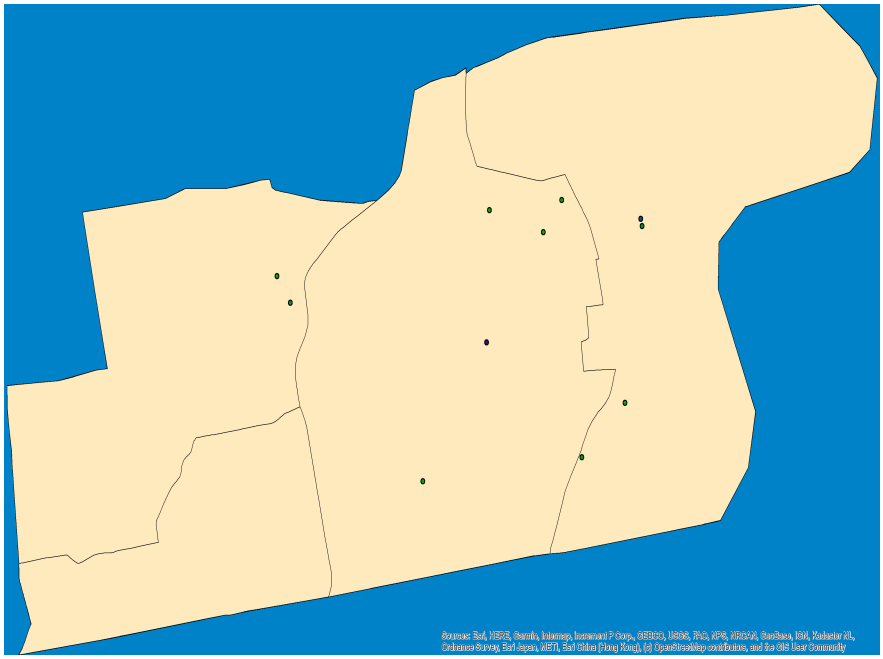
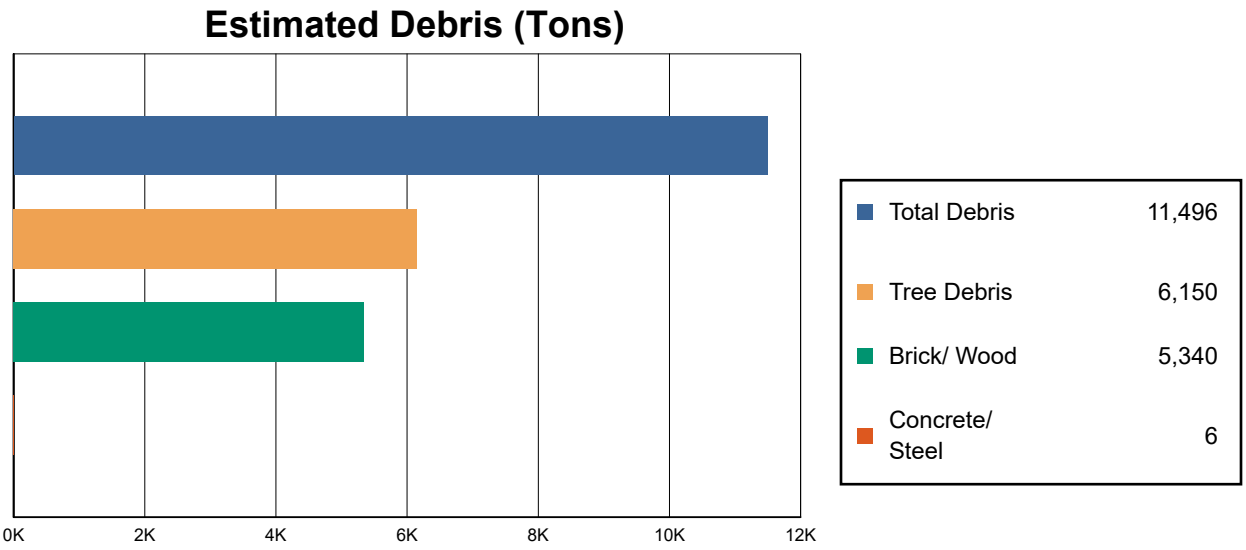


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	6	0	0	1

Induced Hurricane Damage

Debris Generation

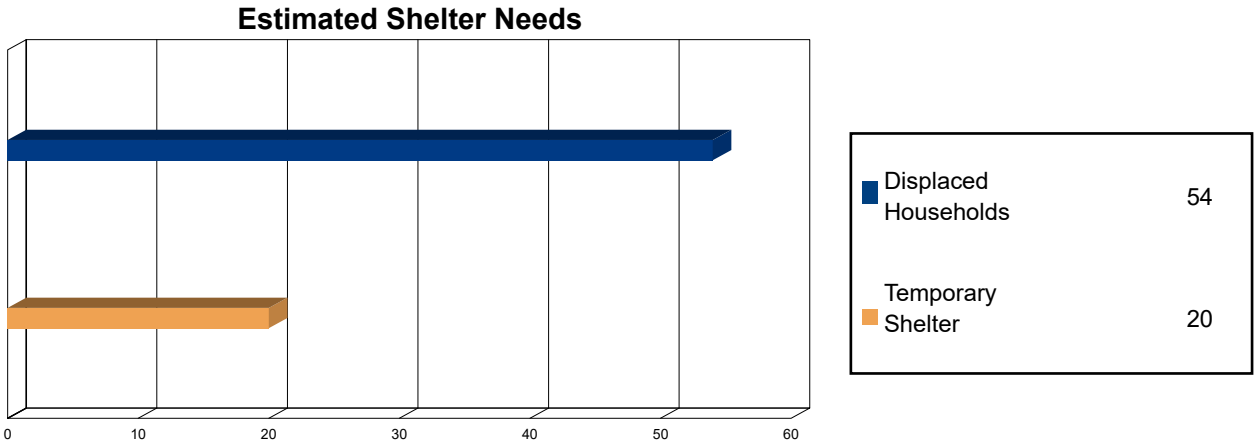


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 11,496 tons of debris will be generated. Of the total amount, 2,648 tons (23%) is Other Tree Debris. Of the remaining 8,848 tons, Brick/Wood comprises 60% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 214 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,502 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 54 households to be displaced due to the hurricane. Of these, 20 people (out of a total population of 20,845) will seek temporary shelter in public shelters.

Economic Loss

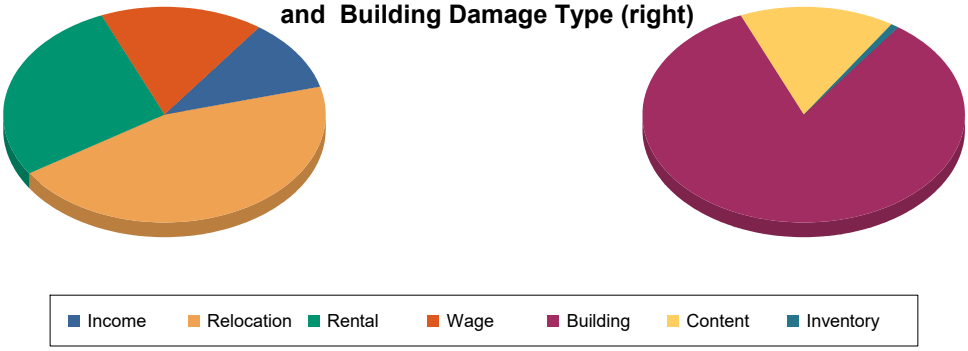
The total economic loss estimated for the hurricane is 65.9 million dollars, which represents 1.67 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 66 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 77% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

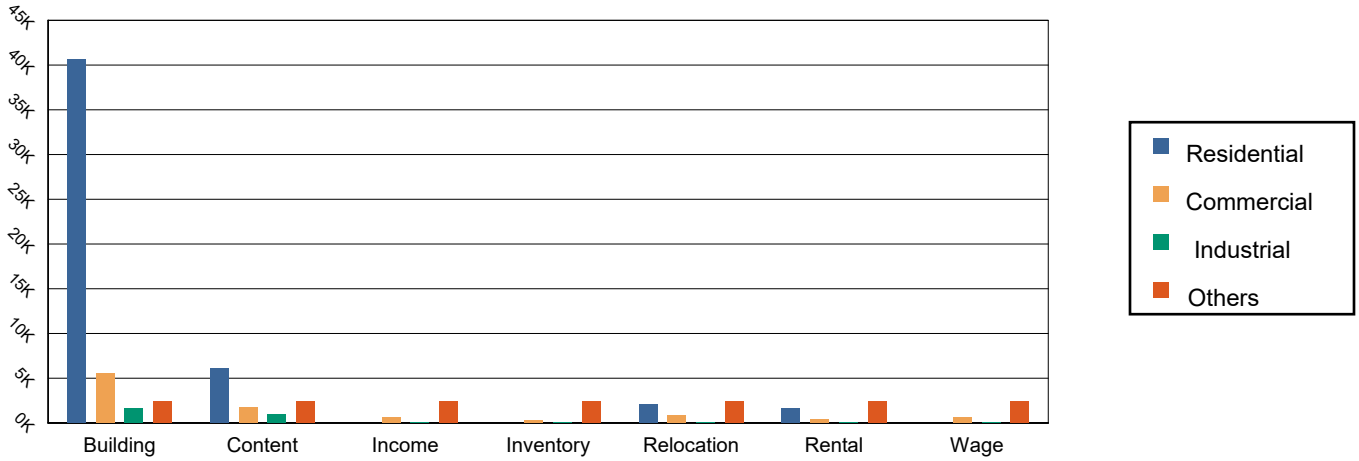


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	40,669.90	5,531.31	1,595.49	1,223.13	49,019.83
	Content	6,125.36	1,702.76	961.99	321.29	9,111.40
	Inventory	0.00	274.29	111.09	53.25	438.62
	Subtotal	**46,795.26**	**7,508.35**	**2,668.57**	**1,597.67**	**58,569.85**
Business Interruption Loss						
	Income	0.00	667.22	19.54	106.68	793.44
	Relocation	2,100.29	850.03	119.14	195.93	3,265.38
	Rental	1,585.00	410.84	17.11	22.11	2,035.06
	Wage	0.00	638.13	31.64	521.37	1,191.14
	Subtotal	**3,685.28**	**2,566.22**	**187.42**	**846.09**	**7,285.01**

Total

Total	**50,480.54**	**10,074.57**	**2,855.99**	**2,443.76**	**65,854.87**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,440	1,536,075	3,942,515
Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**
Study Region Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**

Hazus: Hurricane Global Risk Report

Region Name:	Rocky_Hill_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.85 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,845 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,943 million dollars. Approximately 83% of the buildings (and 61% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

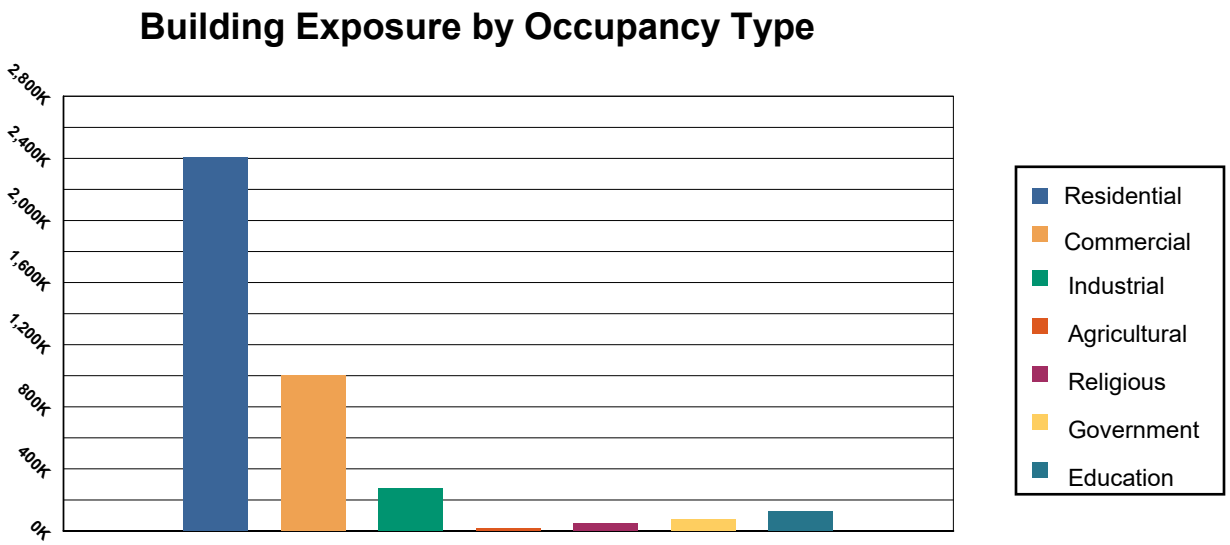


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,406,440	61.04%
Commercial	999,733	25.36%
Industrial	271,931	6.90%
Agricultural	16,834	0.43%
Religious	51,274	1.30%
Government	70,740	1.79%
Education	125,563	3.18%
Total	**3,942,515**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds. There are 6 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 528 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the region. There are an estimated 15 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

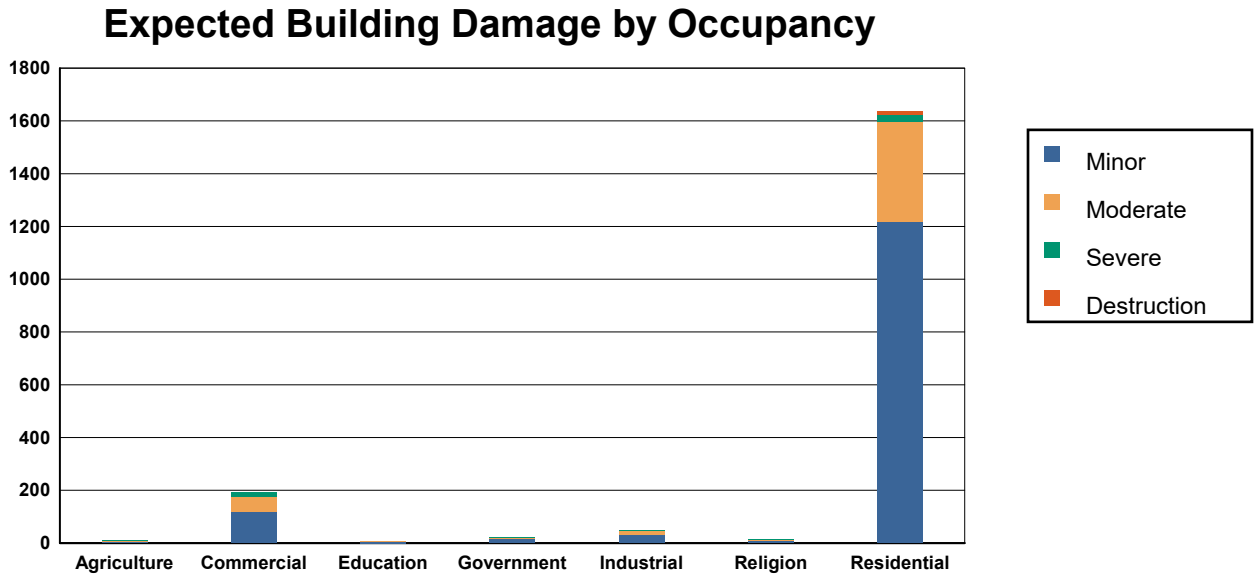


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.58	65.10	6.03	22.34	2.18	8.06	1.06	3.93	0.16	0.58
Commercial	438.95	69.56	117.29	18.59	58.11	9.21	16.48	2.61	0.16	0.03
Education	13.57	71.40	3.73	19.62	1.53	8.03	0.18	0.95	0.00	0.00
Government	54.77	71.13	14.88	19.32	6.55	8.51	0.80	1.04	0.00	0.00
Industrial	112.60	69.94	29.62	18.40	14.83	9.21	3.71	2.30	0.24	0.15
Religion	30.11	70.02	9.46	22.00	3.09	7.18	0.34	0.80	0.00	0.00
Residential	3,112.56	65.54	1,217.53	25.64	380.95	8.02	23.26	0.49	14.71	0.31
Total	**3,780.13**		**1,398.54**		**467.24**		**45.83**		**15.26**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	79	68.88	23	19.83	12	10.33	1	0.95	0	0.00
Masonry	383	61.92	124	19.99	104	16.83	7	1.15	1	0.11
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	320	70.09	73	15.95	47	10.21	17	3.70	0	0.05
Wood	3,070	67.94	1,192	26.39	221	4.89	21	0.47	14	0.31

Essential Facility Damage

Before the hurricane, the region had 125 hospital beds available for use. On the day of the hurricane, the model estimates that 125 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

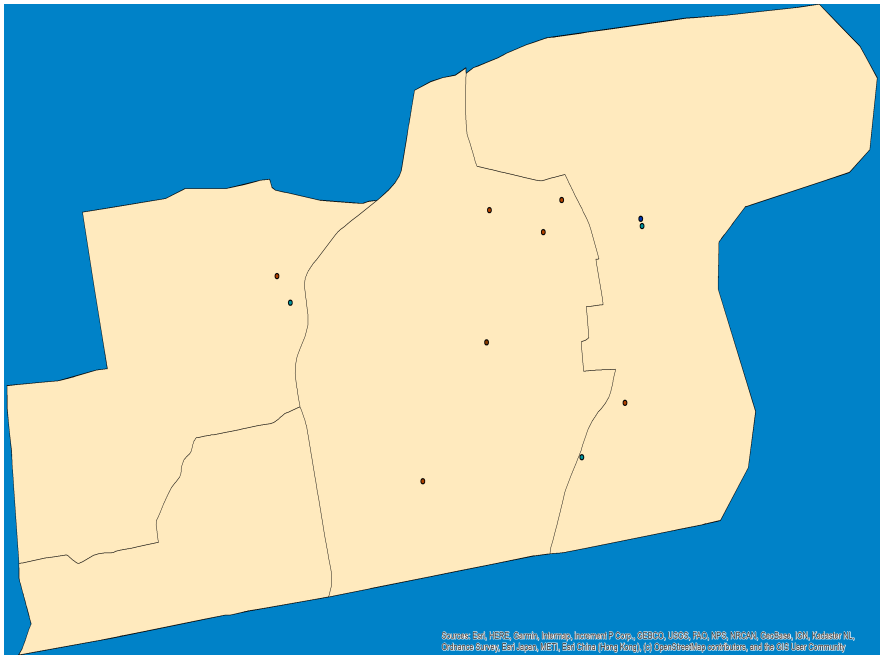
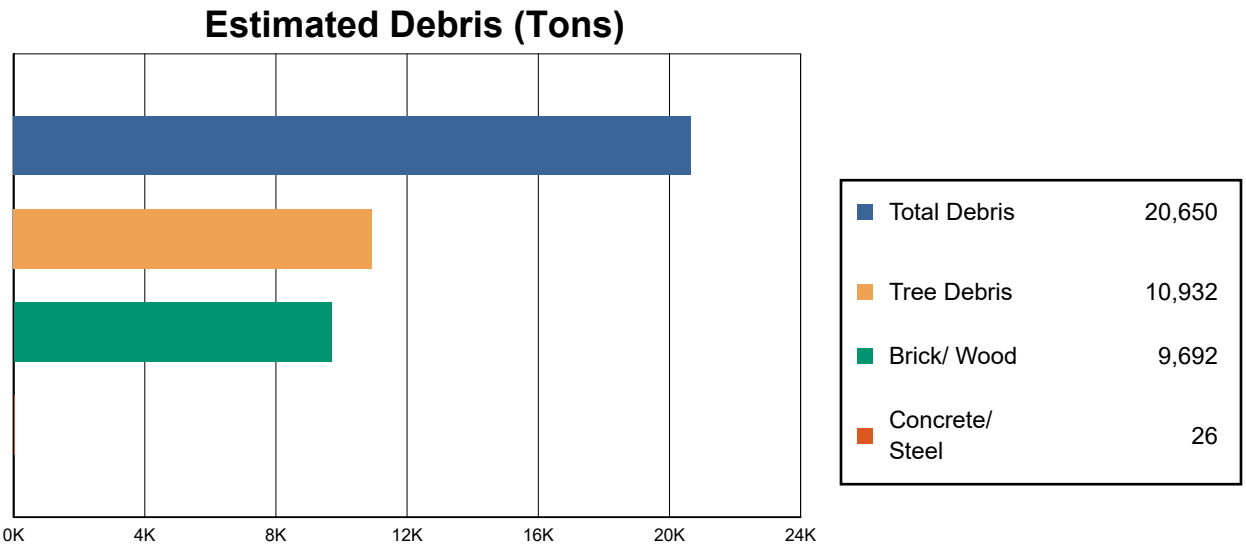


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	6	0	0	0

Induced Hurricane Damage

Debris Generation

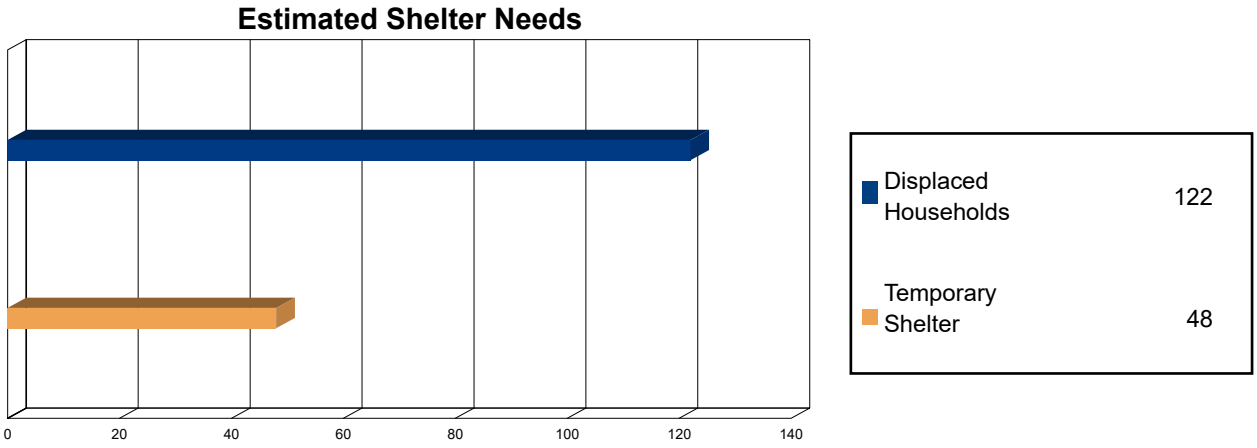


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 20,650 tons of debris will be generated. Of the total amount, 4,727 tons (23%) is Other Tree Debris. Of the remaining 15,923 tons, Brick/Wood comprises 61% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 389 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,205 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 122 households to be displaced due to the hurricane. Of these, 48 people (out of a total population of 20,845) will seek temporary shelter in public shelters.

Economic Loss

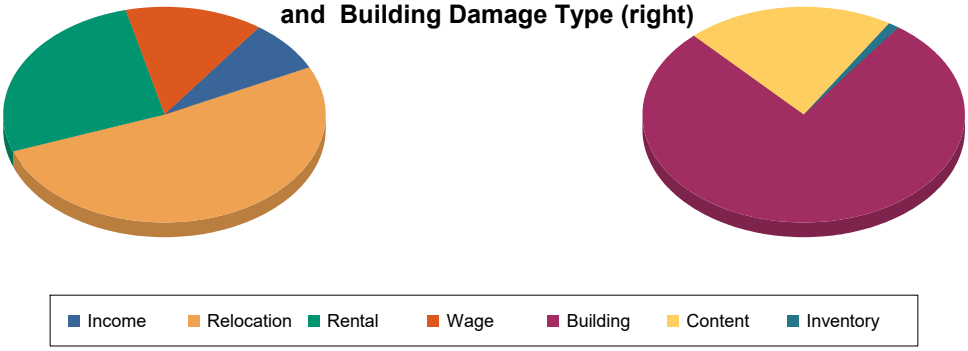
The total economic loss estimated for the hurricane is 137.5 million dollars, which represents 3.49 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 137 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 71% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

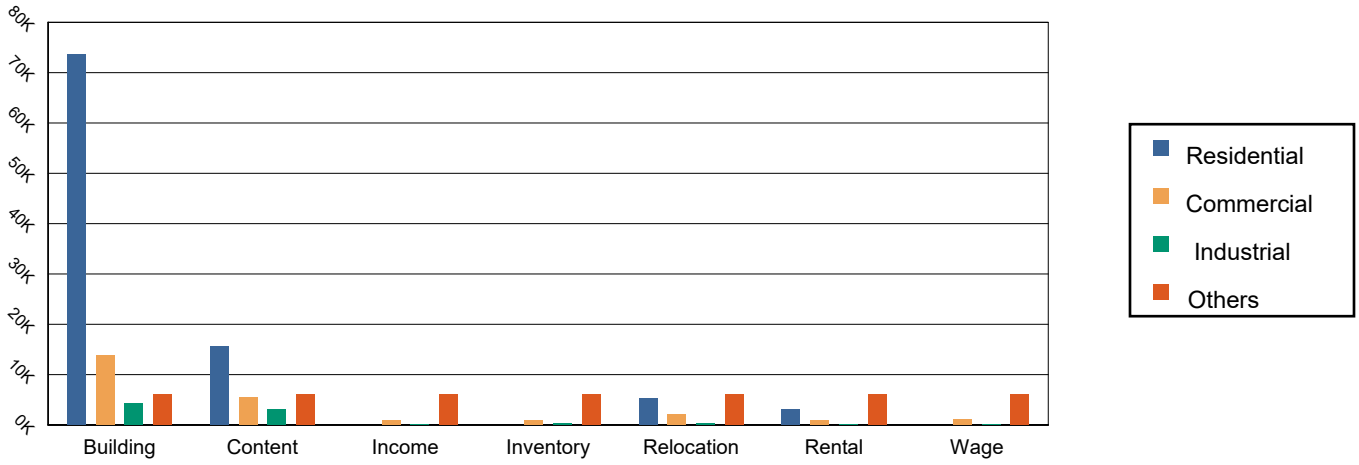


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	73,701.06	13,722.20	4,339.54	3,079.50	94,842.30
	Content	15,671.37	5,461.99	3,039.14	1,069.47	25,241.96
	Inventory	0.00	890.53	345.43	142.88	1,378.84
	Subtotal	**89,372.43**	**20,074.72**	**7,724.11**	**4,291.85**	**121,463.11**
Business Interruption Loss						
	Income	0.00	1,008.17	36.78	186.05	1,231.00
	Relocation	5,338.74	2,083.96	341.80	543.46	8,307.96
	Rental	3,182.81	981.60	44.83	67.80	4,277.04
	Wage	0.00	1,079.09	59.45	1,065.86	2,204.40
	Subtotal	**8,521.55**	**5,152.83**	**482.85**	**1,863.17**	**16,020.40**

Total

Total	**97,893.98**	**25,227.55**	**8,206.96**	**6,155.02**	**137,483.51**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,440	1,536,075	3,942,515
Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**
Study Region Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**

Hazus: Hurricane Global Risk Report

Region Name: Rocky_Hill_HU

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

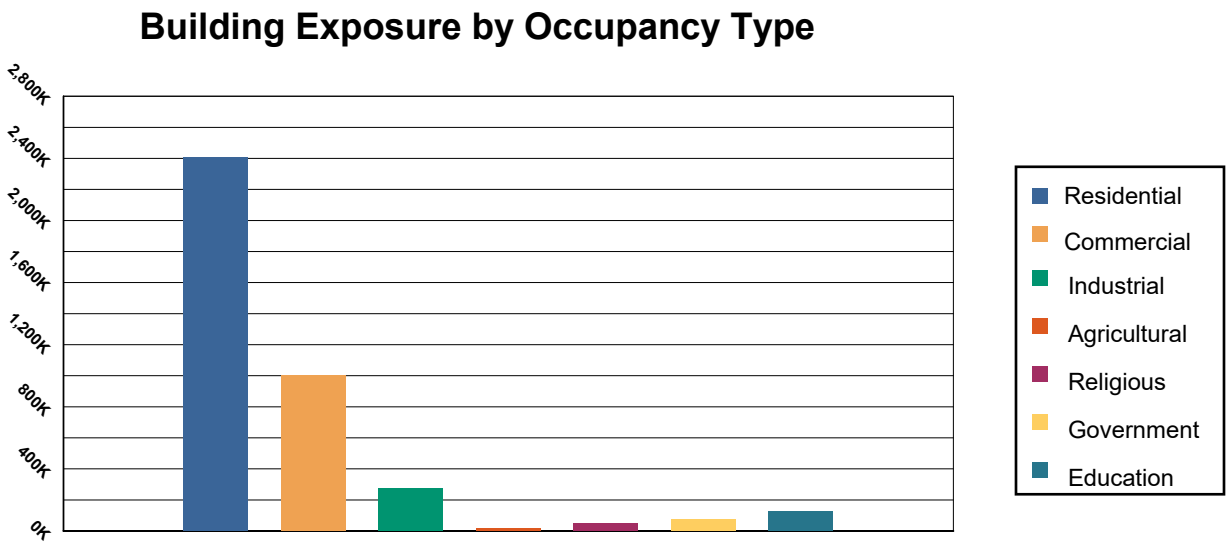
The geographical size of the region is 13.85 square miles and contains 4 census tracts. There are over 8 thousand households in the region and a total population of 20,845 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,943 million dollars. Approximately 83% of the buildings (and 61% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,707 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.



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Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,406,440	61.04%
Commercial	999,733	25.36%
Industrial	271,931	6.90%
Agricultural	16,834	0.43%
Religious	51,274	1.30%
Government	70,740	1.79%
Education	125,563	3.18%
Total	**3,942,515**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds. There are 6 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 825 buildings will be at least moderately damaged. This is over 14% of the total number of buildings in the region. There are an estimated 36 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

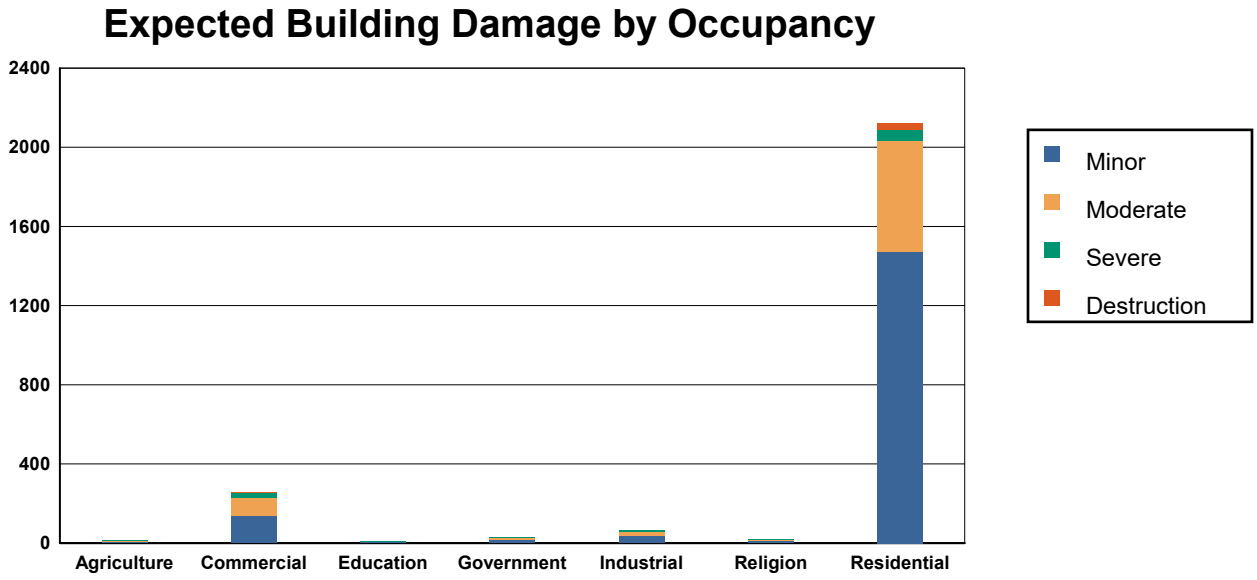


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	14.76	54.68	7.23	26.79	3.14	11.61	1.60	5.92	0.27	1.01
Commercial	373.26	59.15	139.79	22.15	87.61	13.88	29.98	4.75	0.36	0.06
Education	11.54	60.72	4.46	23.50	2.50	13.17	0.50	2.62	0.00	0.00
Government	46.69	60.63	17.57	22.82	10.58	13.73	2.17	2.82	0.00	0.00
Industrial	95.78	59.49	34.62	21.50	22.92	14.24	7.25	4.50	0.44	0.27
Religion	25.63	59.60	11.42	26.57	5.05	11.74	0.90	2.09	0.00	0.00
Residential	2,627.44	55.33	1,471.46	30.98	561.99	11.83	53.62	1.13	34.49	0.73
Total	**3,195.08**		**1,686.57**		**693.79**		**96.01**		**35.56**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	67	58.02	26	22.75	19	16.56	3	2.67	0	0.00
Masonry	320	51.78	139	22.43	142	23.02	16	2.55	1	0.22
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	272	59.68	85	18.63	69	15.07	30	6.51	0	0.11
Wood	2,604	57.62	1,471	32.55	364	8.05	47	1.05	33	0.73

Essential Facility Damage

Before the hurricane, the region had 125 hospital beds available for use. On the day of the hurricane, the model estimates that 125 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

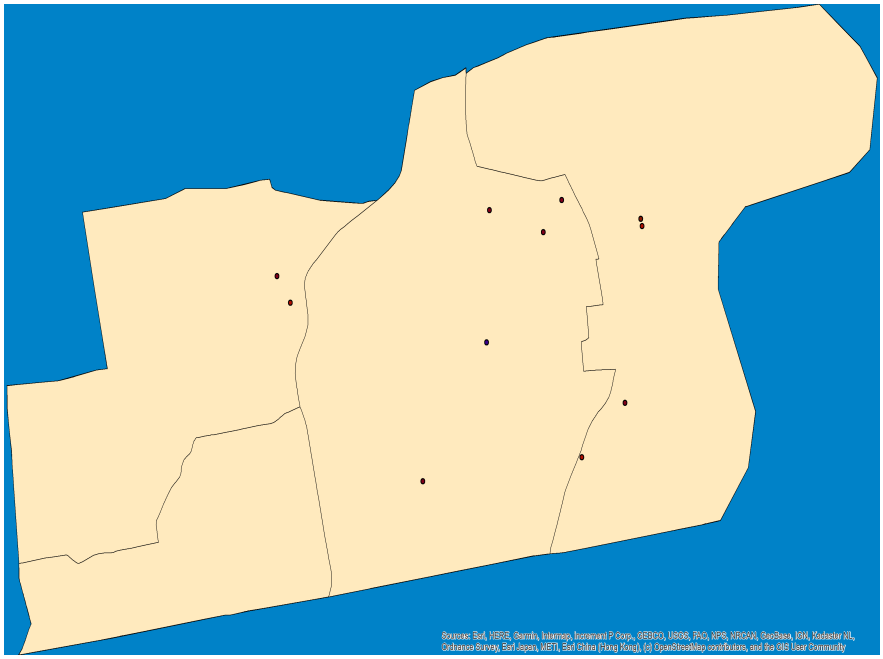
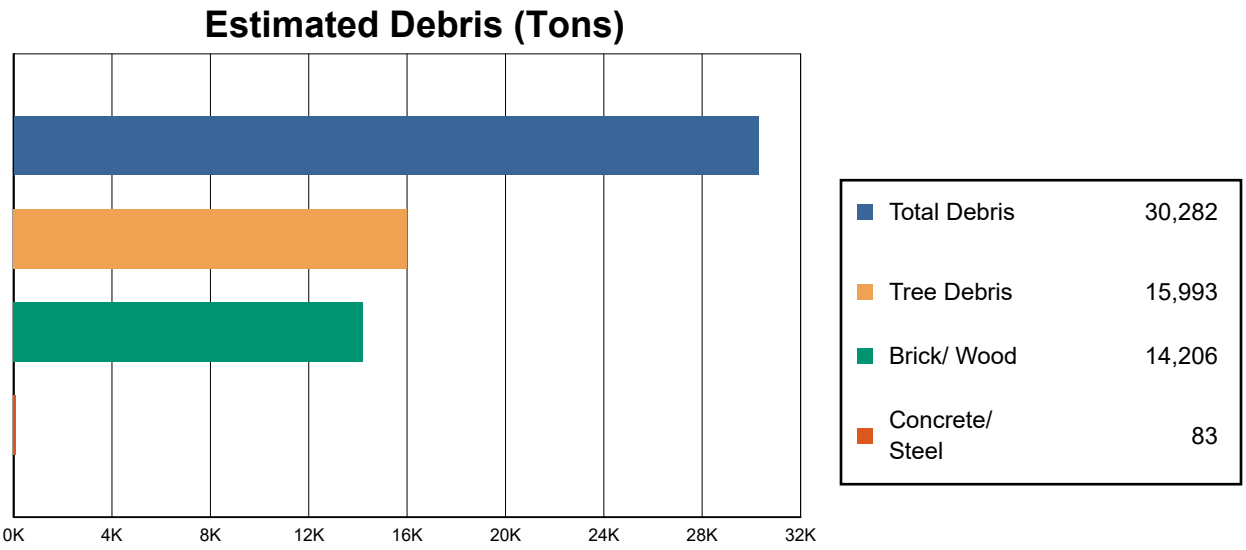


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	6	0	0	0

Induced Hurricane Damage

Debris Generation

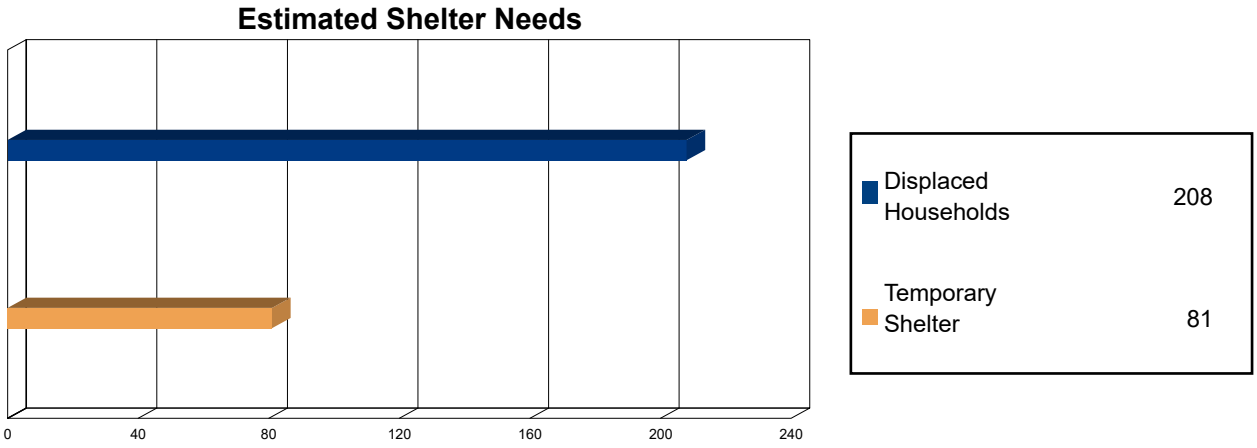


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 30,282 tons of debris will be generated. Of the total amount, 6,900 tons (23%) is Other Tree Debris. Of the remaining 23,382 tons, Brick/Wood comprises 61% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 572 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,093 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 208 households to be displaced due to the hurricane. Of these, 81 people (out of a total population of 20,845) will seek temporary shelter in public shelters.

Economic Loss

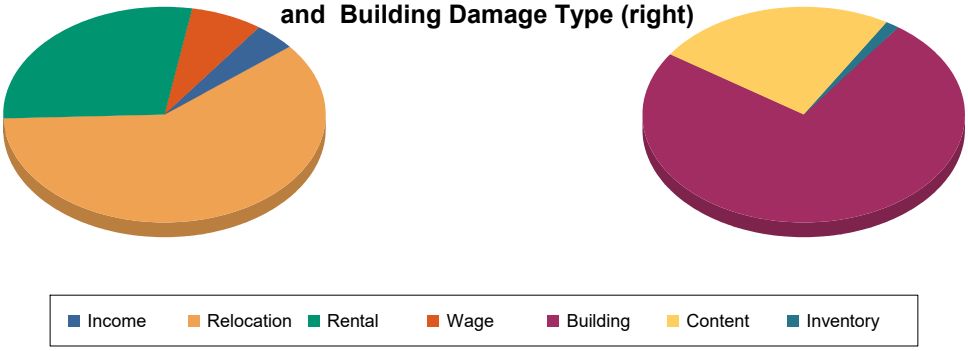
The total economic loss estimated for the hurricane is 223.9 million dollars, which represents 5.68 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 224 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 70% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

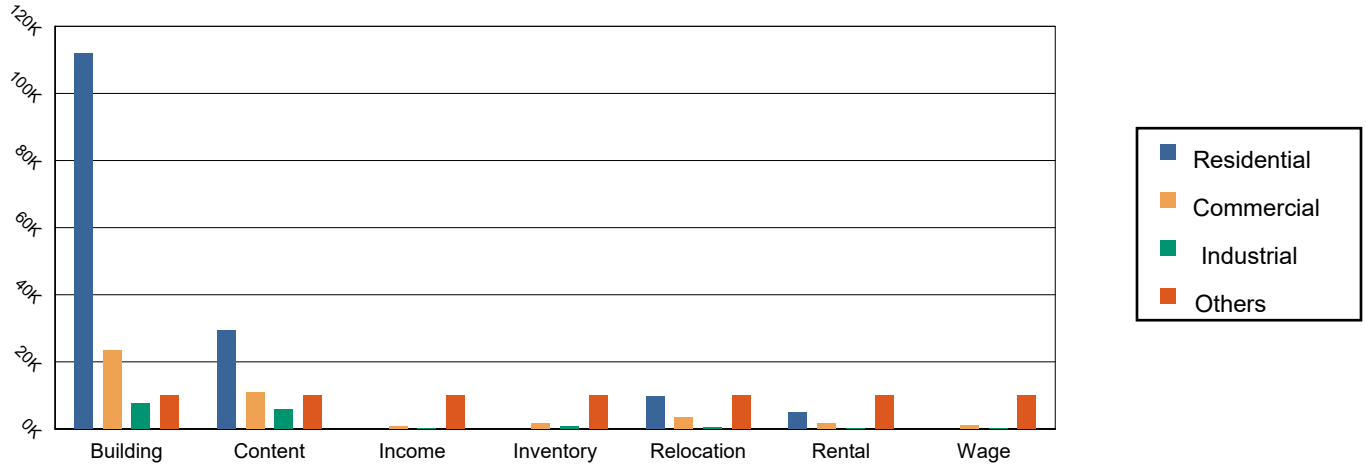


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	111,836.44	23,454.10	7,574.26	5,531.26	148,396.06
	Content	29,244.32	10,876.18	5,779.94	2,286.90	48,187.35
	Inventory	0.00	1,693.34	655.47	231.85	2,580.66
	Subtotal	**141,080.76**	**36,023.62**	**14,009.67**	**8,050.02**	**199,164.07**
Business Interruption Loss						
	Income	4.96	817.92	52.20	137.27	1,012.35
	Relocation	9,796.37	3,508.78	594.94	987.89	14,887.99
	Rental	5,052.93	1,724.19	82.04	128.94	6,988.10
	Wage	11.69	918.91	84.45	794.78	1,809.81
	Subtotal	**14,865.95**	**6,969.81**	**813.62**	**2,048.88**	**24,698.26**

Total

Total	155,946.70	42,993.43	14,823.30	10,098.90	223,862.33

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	20,845	2,406,440	1,536,075	3,942,515
Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**
Study Region Total	**20,845**	**2,406,440**	**1,536,075**	**3,942,515**

Hazus: Hurricane Global Risk Report

Region Name:	Simsbury_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.30 square miles and contains 6 census tracts. There are over 9 thousand households in the region and a total population of 24,517 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,617 million dollars. Approximately 86% of the buildings (and 71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,907 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

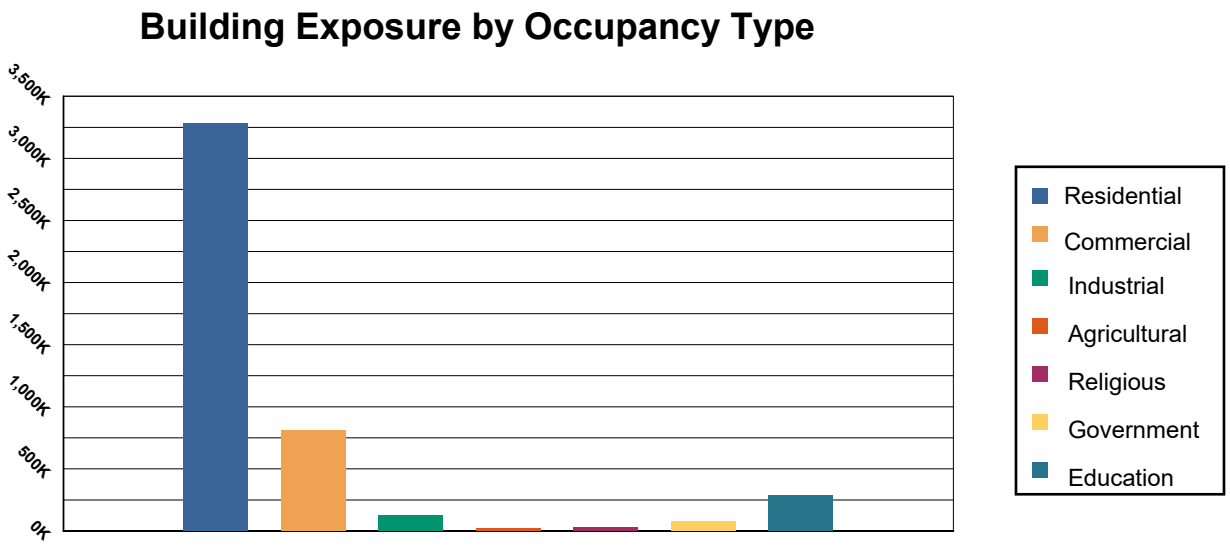


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,283,287	71.12%
Commercial	806,210	17.46%
Industrial	121,254	2.63%
Agricultural	18,882	0.41%
Religious	25,889	0.56%
Government	77,938	1.69%
Education	283,094	6.13%
Total	**4,616,554**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

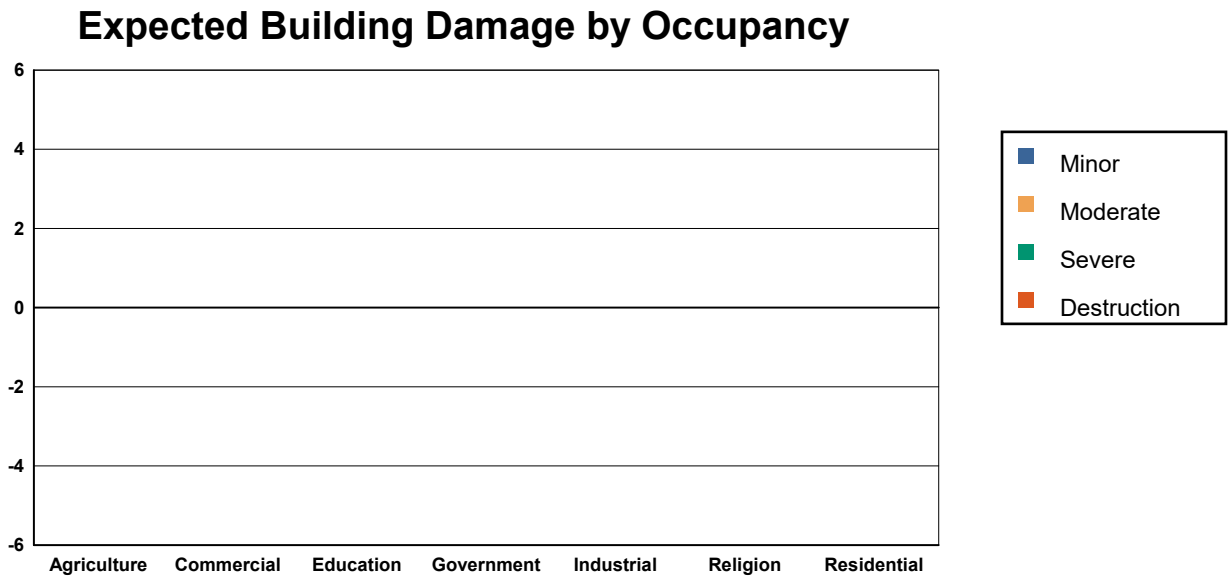


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	28.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	663.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	23.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	125.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	117.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	18.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	5,933.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**6,907.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	122	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	714	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	463	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	5,609	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

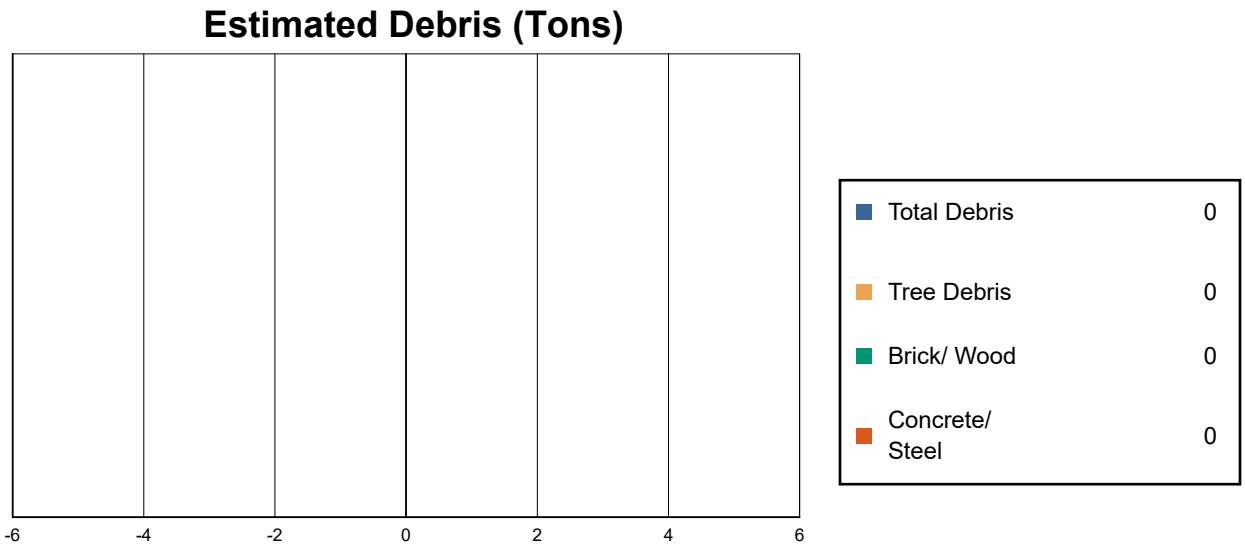
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

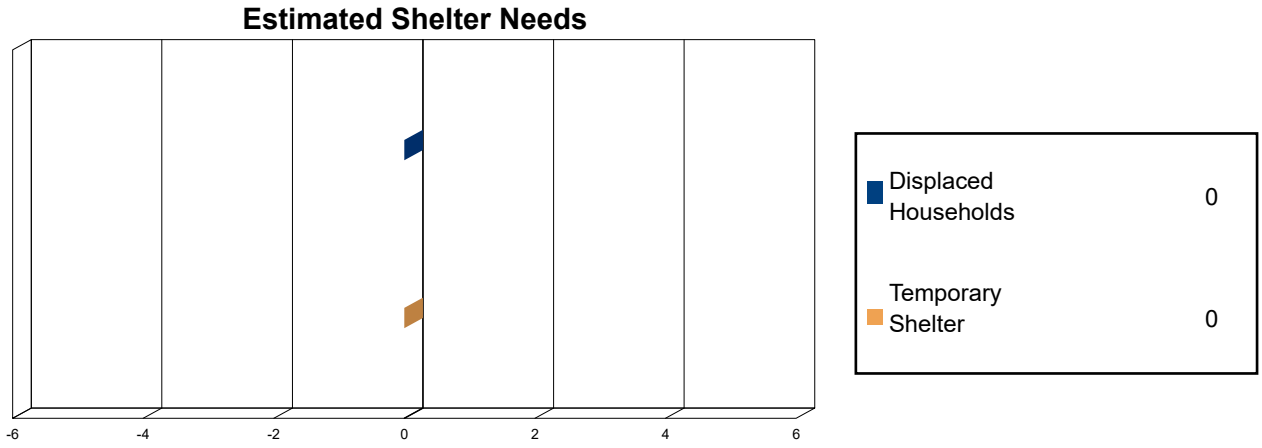


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 24,517) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

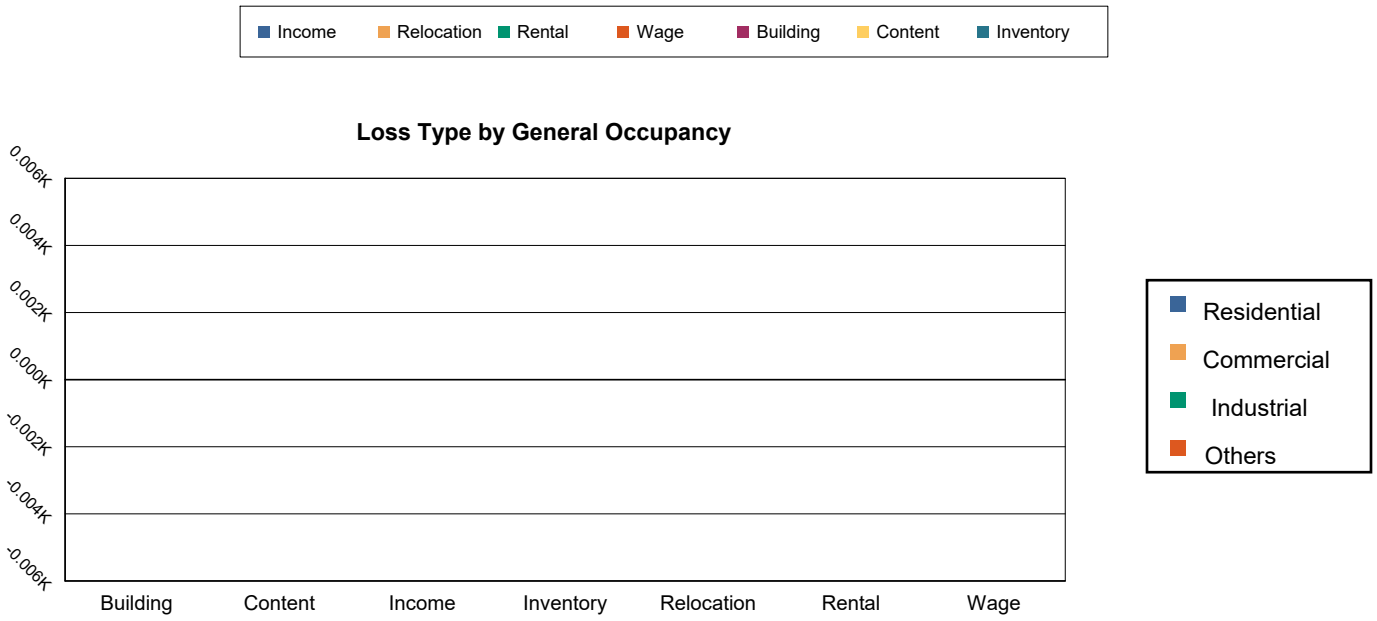


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
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Hartford	24,517	3,283,287	1,333,267	4,616,554
Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**
Study Region Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**

Hazus: Hurricane Global Risk Report

Region Name:	Simsbury_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
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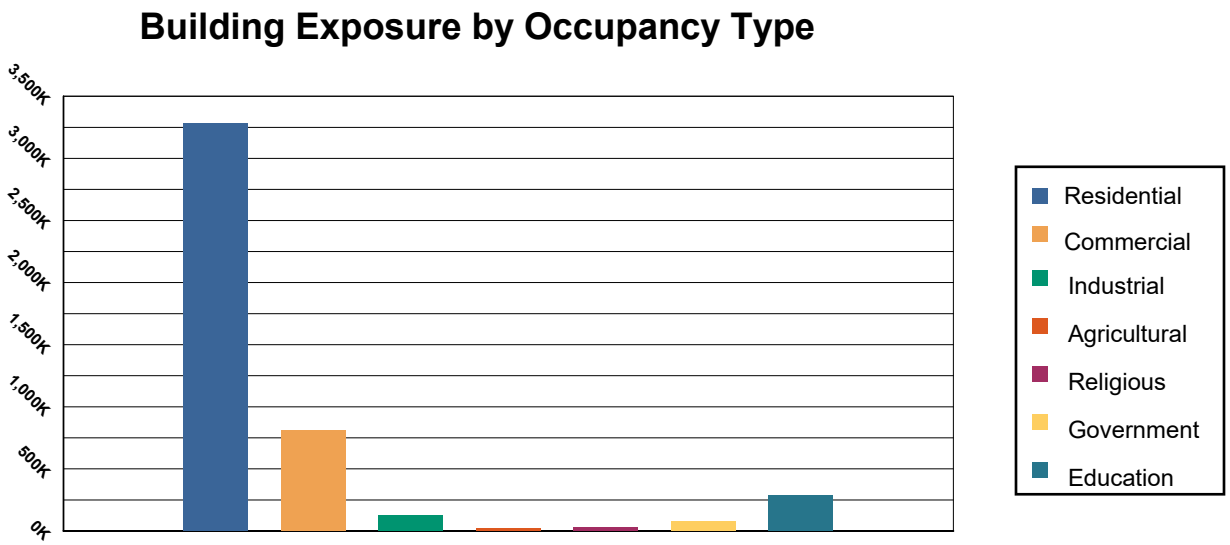

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For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

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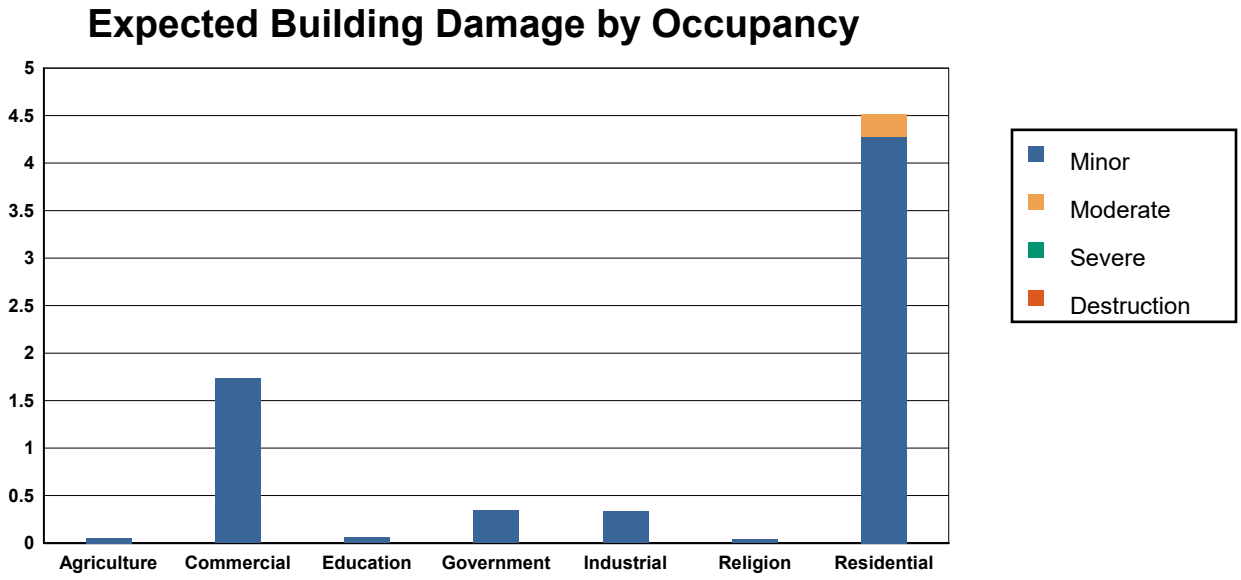


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	27.95	99.81	0.05	0.19	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	661.27	99.74	1.73	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Education	22.94	99.73	0.06	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Government	124.65	99.72	0.35	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	116.67	99.72	0.33	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Religion	17.96	99.79	0.04	0.21	0.00	0.00	0.00	0.00	0.00	0.00
Residential	5,928.49	99.92	4.28	0.07	0.24	0.00	0.00	0.00	0.00	0.00
Total	**6,899.92**		**6.84**		**0.24**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	122	99.66	0	0.34	0	0.00	0	0.00	0	0.00
Masonry	711	99.59	3	0.40	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	462	99.71	1	0.29	0	0.00	0	0.00	0	0.00
Wood	5,608	99.97	1	0.02	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

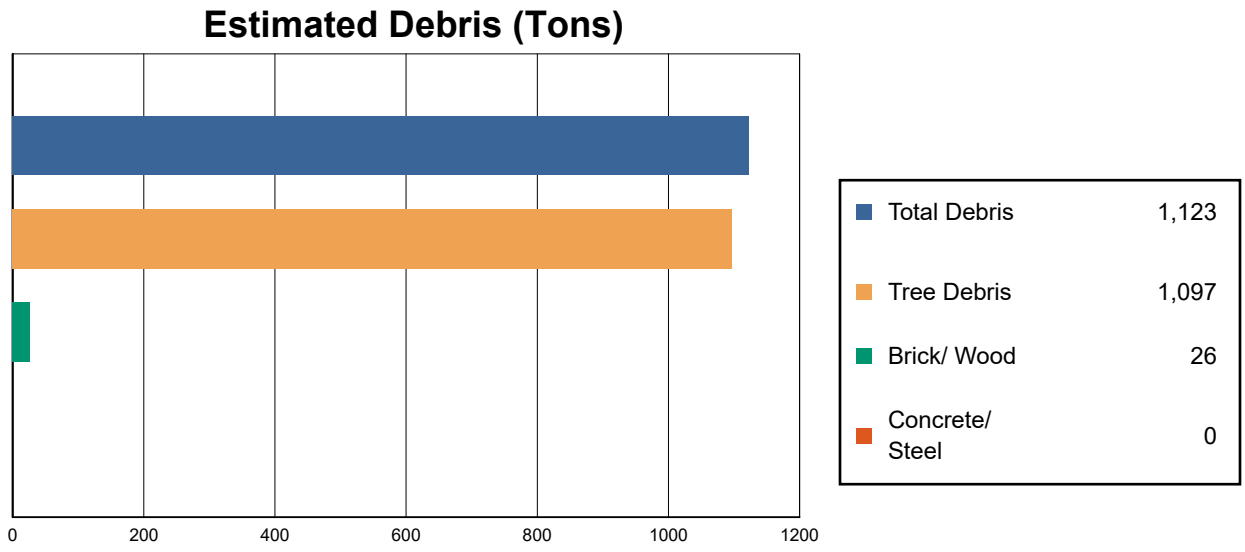
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

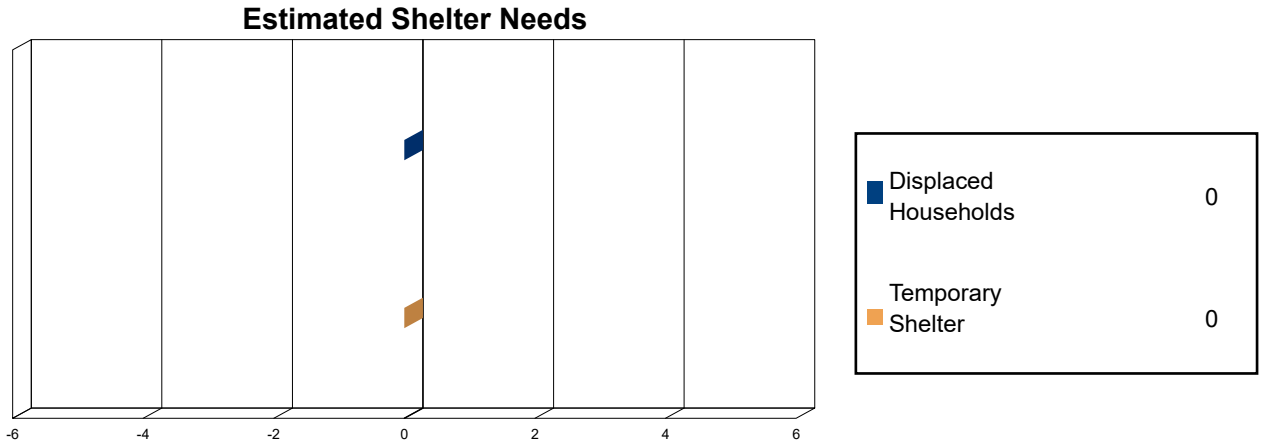


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,123 tons of debris will be generated. Of the total amount, 695 tons (62%) is Other Tree Debris. Of the remaining 428 tons, Brick/Wood comprises 6% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 402 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 24,517) will seek temporary shelter in public shelters.

Economic Loss

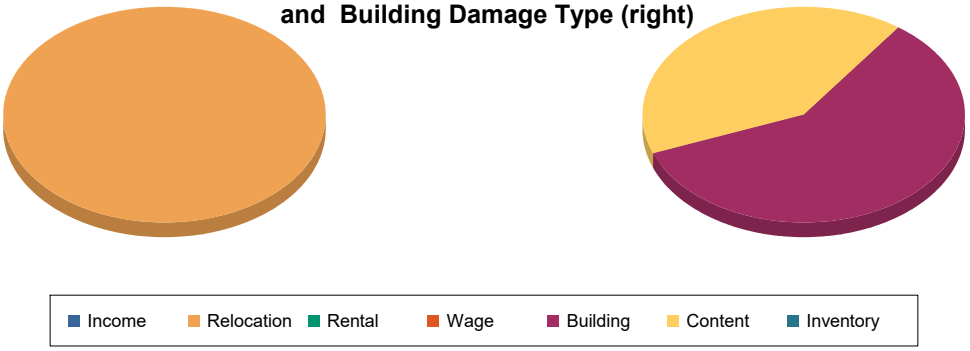
The total economic loss estimated for the hurricane is 2.3 million dollars, which represents 0.05 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

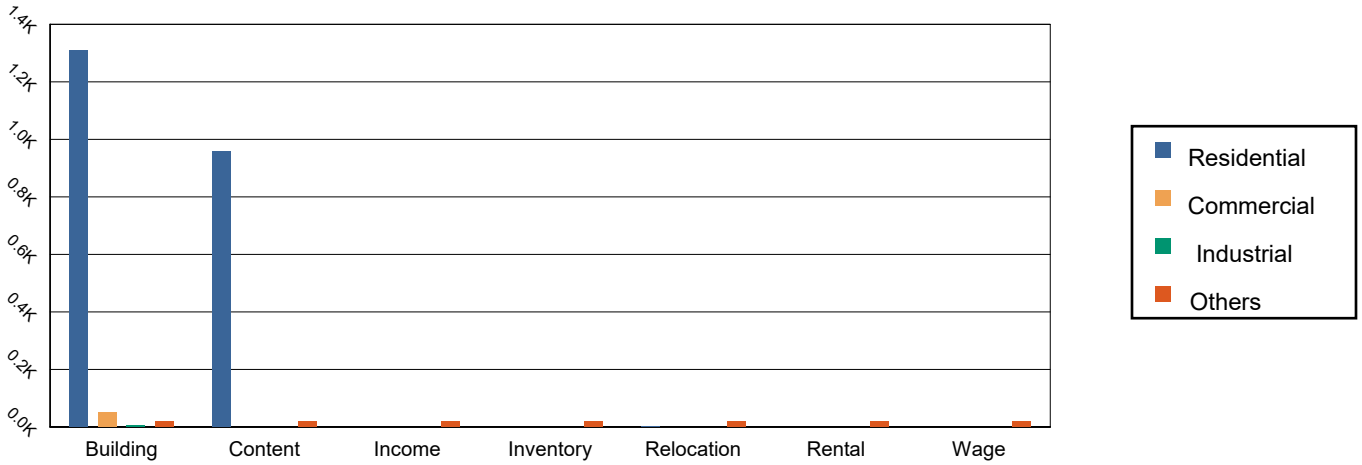


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,307.89	50.97	5.55	20.44	1,384.85
	Content	956.81	0.00	0.00	0.00	956.81
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2,264.70**	**50.97**	**5.55**	**20.44**	**2,341.66**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.66	0.00	0.00	0.00	0.66
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.66**	**0.00**	**0.00**	**0.00**	**0.66**

Total

Total	**2,265.36**	**50.97**	**5.55**	**20.44**	**2,342.32**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	24,517	3,283,287	1,333,267	4,616,554
Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**
Study Region Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**

Hazus: Hurricane Global Risk Report

Region Name:	Simsbury_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Thursday, May 11, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
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Hurricane Scenario Parameters	5
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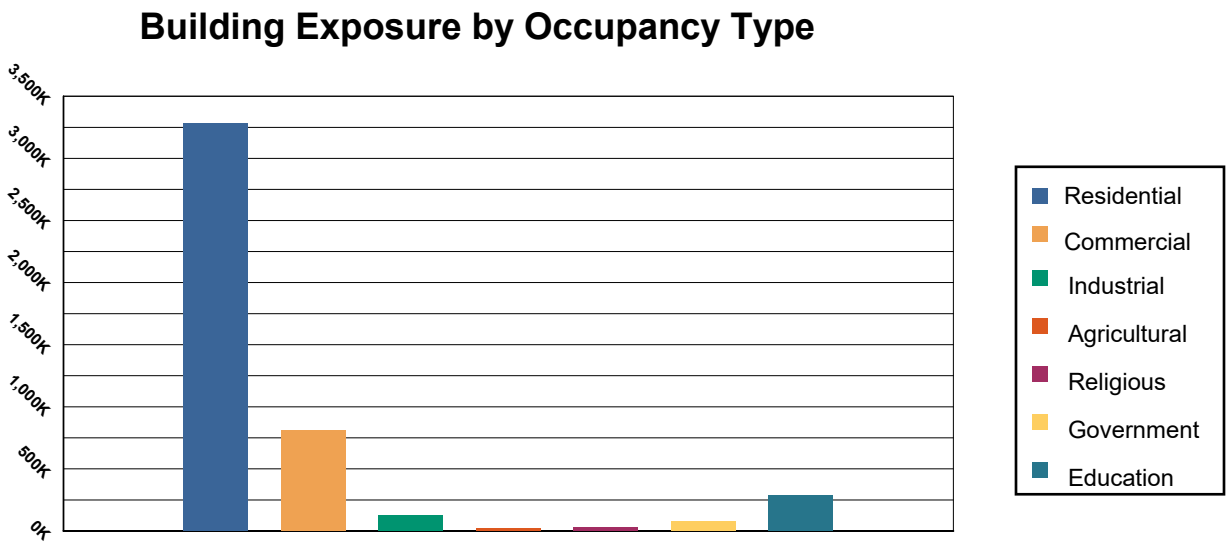

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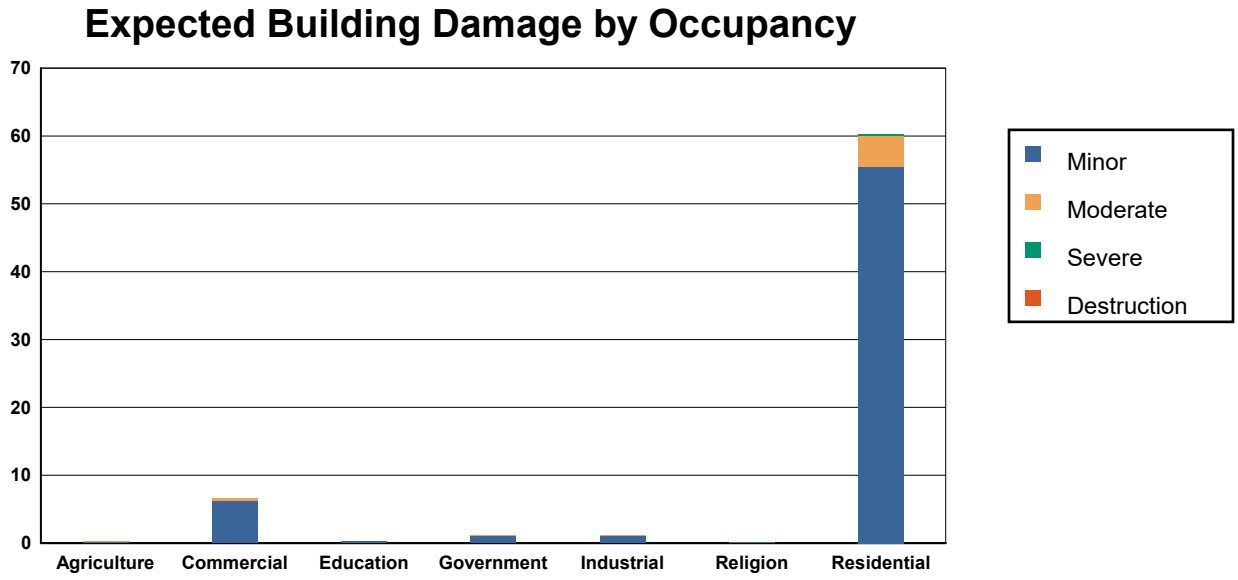


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	27.73	99.04	0.25	0.88	0.02	0.06	0.00	0.01	0.00	0.00
Commercial	656.37	99.00	6.24	0.94	0.39	0.06	0.00	0.00	0.00	0.00
Education	22.79	99.08	0.21	0.91	0.00	0.01	0.00	0.00	0.00	0.00
Government	123.81	99.05	1.18	0.94	0.01	0.01	0.00	0.00	0.00	0.00
Industrial	115.80	98.97	1.17	1.00	0.03	0.02	0.00	0.00	0.00	0.00
Religion	17.86	99.21	0.14	0.77	0.00	0.02	0.00	0.00	0.00	0.00
Residential	5,872.85	98.99	55.57	0.94	4.42	0.07	0.17	0.00	0.00	0.00
Total	**6,837.20**		**64.75**		**4.88**		**0.17**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	121	98.84	1	1.15	0	0.01	0	0.00	0	0.00
Masonry	699	97.87	13	1.82	2	0.30	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	458	98.99	4	0.96	0	0.04	0	0.00	0	0.00
Wood	5,567	99.25	41	0.73	1	0.02	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

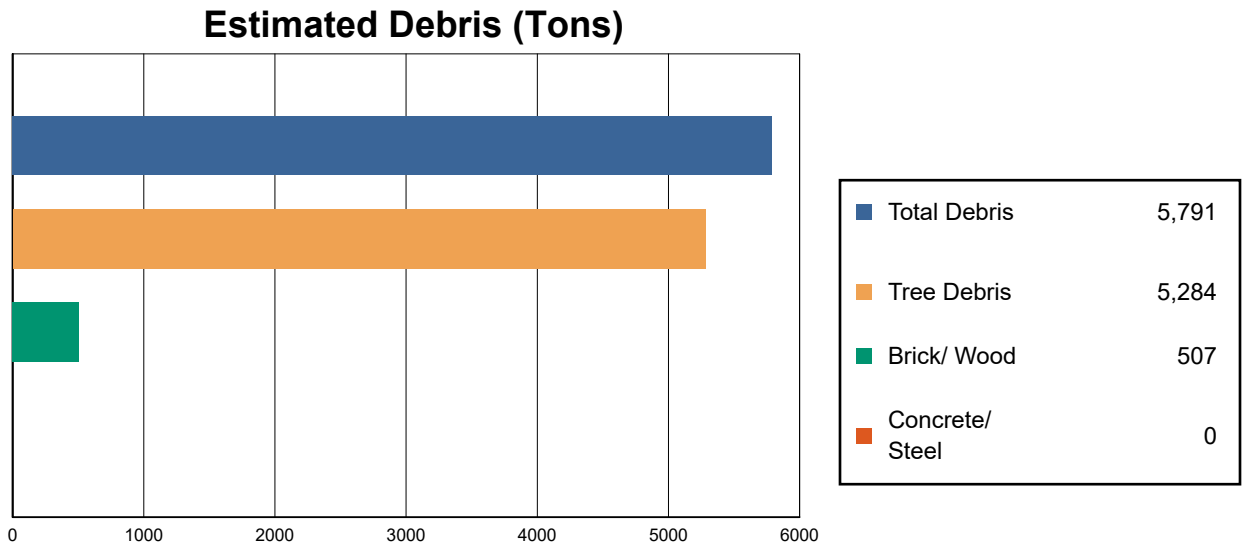
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

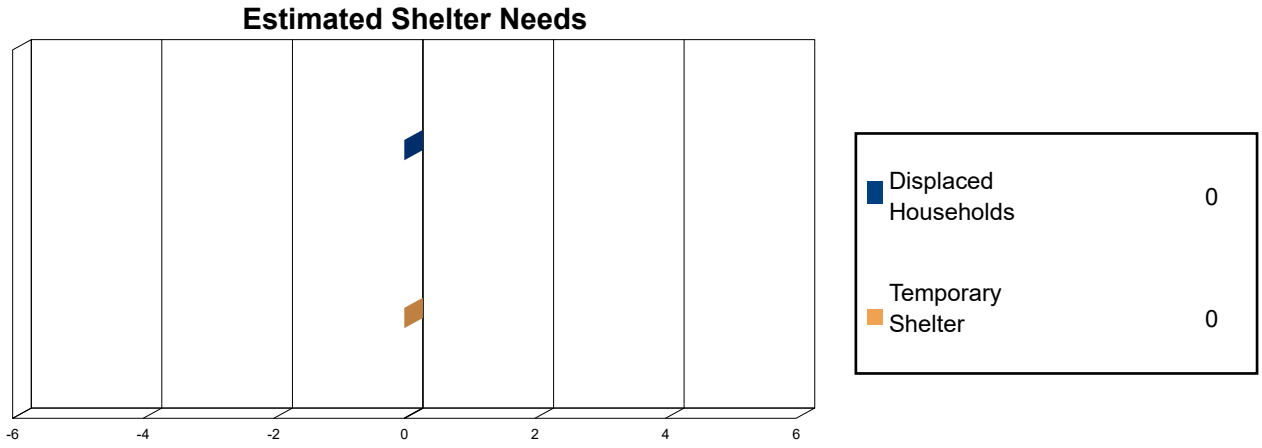


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,791 tons of debris will be generated. Of the total amount, 3,316 tons (57%) is Other Tree Debris. Of the remaining 2,475 tons, Brick/Wood comprises 20% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 20 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,968 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 24,517) will seek temporary shelter in public shelters.

Economic Loss

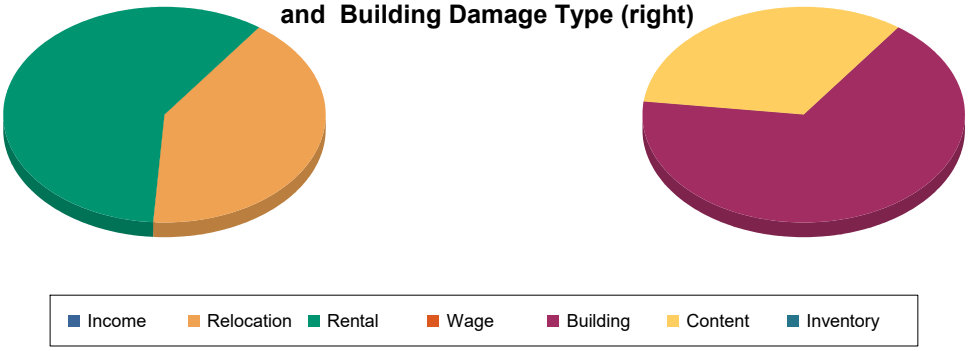
The total economic loss estimated for the hurricane is 16.5 million dollars, which represents 0.36 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 17 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

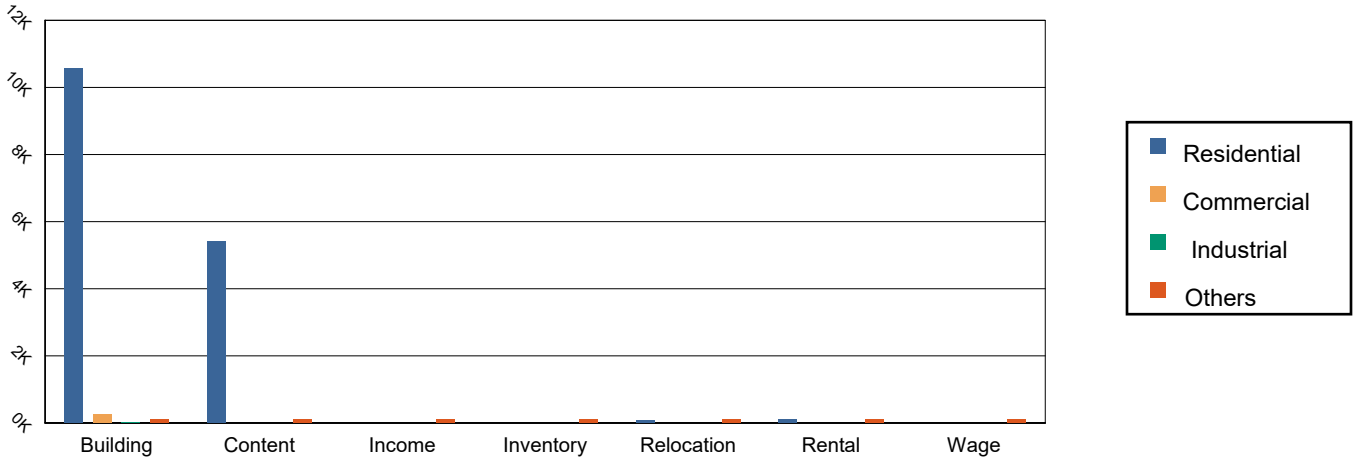


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	10,558.84	255.39	28.06	110.33	10,952.63
	Content	5,403.36	0.00	0.00	0.00	5,403.36
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**15,962.20**	**255.39**	**28.06**	**110.33**	**16,355.99**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	66.23	2.97	0.09	0.31	69.59
	Rental	99.14	0.00	0.00	0.00	99.14
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**165.36**	**2.97**	**0.09**	**0.31**	**168.73**

Total

Total	**16,127.56**	**258.36**	**28.15**	**110.64**	**16,524.72**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	24,517	3,283,287	1,333,267	4,616,554
Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**
Study Region Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**

Hazus: Hurricane Global Risk Report

Region Name:	Simsbury_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.30 square miles and contains 6 census tracts. There are over 9 thousand households in the region and a total population of 24,517 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,617 million dollars. Approximately 86% of the buildings (and 71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,907 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

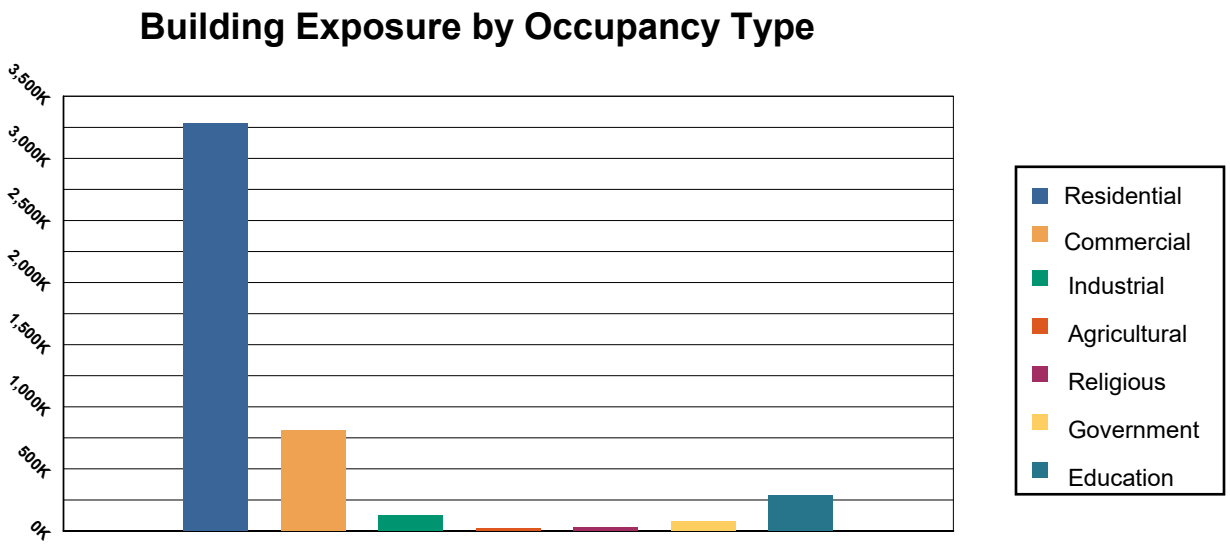


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,283,287	71.12%
Commercial	806,210	17.46%
Industrial	121,254	2.63%
Agricultural	18,882	0.41%
Religious	25,889	0.56%
Government	77,938	1.69%
Education	283,094	6.13%
Total	**4,616,554**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 28 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

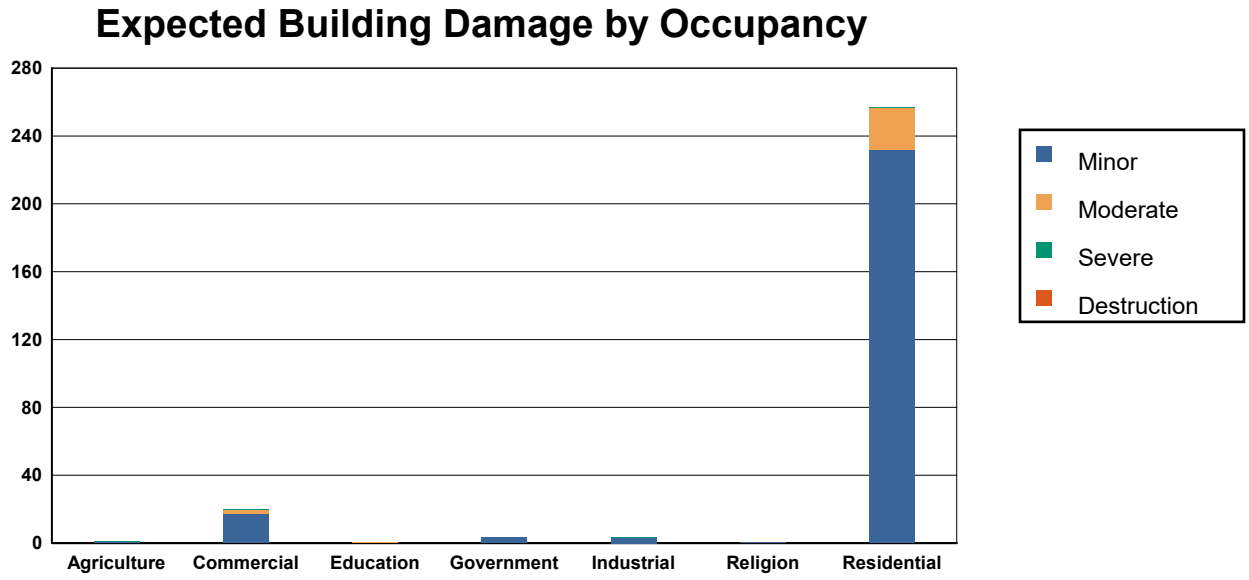


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	26.91	96.10	0.91	3.25	0.13	0.47	0.05	0.18	0.00	0.00
Commercial	643.32	97.03	17.57	2.65	1.97	0.30	0.14	0.02	0.00	0.00
Education	22.42	97.47	0.57	2.46	0.02	0.07	0.00	0.00	0.00	0.00
Government	121.79	97.43	3.13	2.50	0.08	0.06	0.00	0.00	0.00	0.00
Industrial	113.64	97.13	3.11	2.66	0.20	0.17	0.05	0.04	0.00	0.00
Religion	17.52	97.35	0.46	2.56	0.01	0.08	0.00	0.01	0.00	0.00
Residential	5,676.15	95.67	231.89	3.91	24.50	0.41	0.45	0.01	0.00	0.00
Total	**6,621.75**		**257.64**		**26.92**		**0.69**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	118	96.97	4	2.93	0	0.10	0	0.00	0	0.00
Masonry	672	94.16	31	4.37	10	1.44	0	0.03	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	451	97.30	11	2.44	1	0.23	0	0.02	0	0.00
Wood	5,398	96.25	202	3.59	9	0.15	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

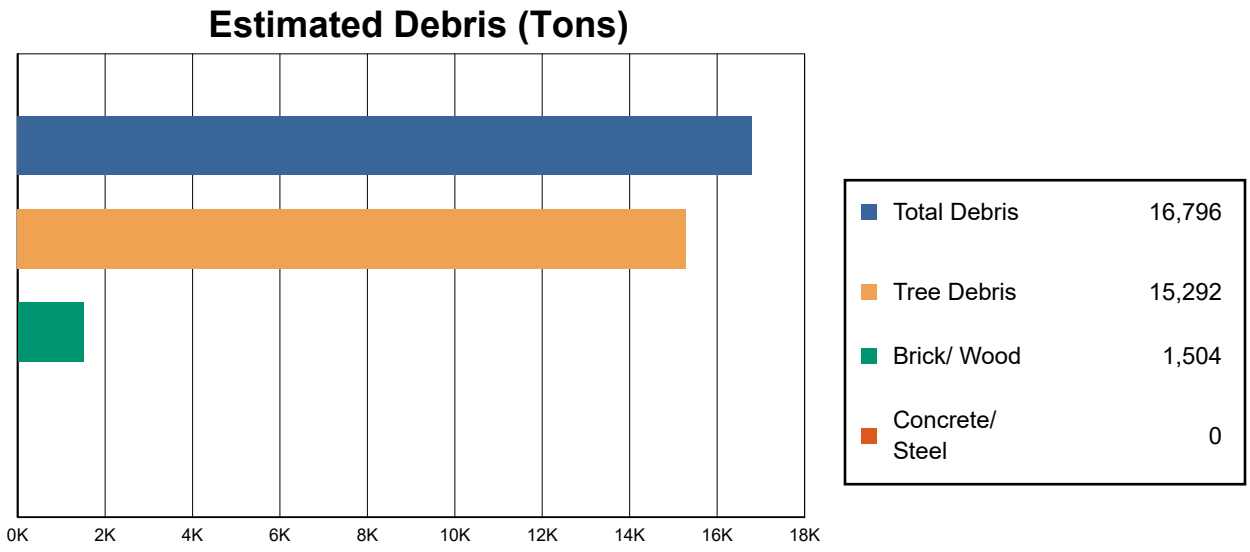
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

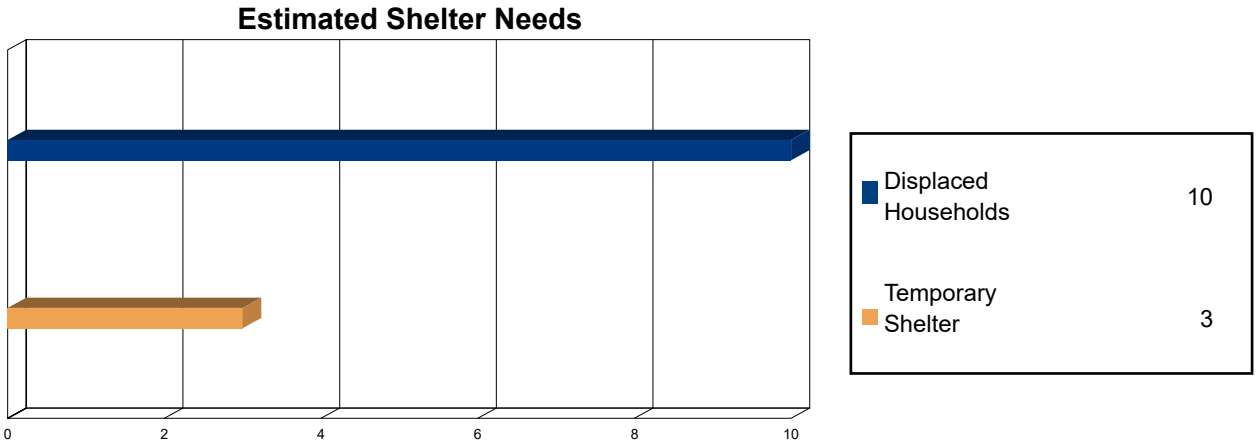


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 16,796 tons of debris will be generated. Of the total amount, 9,644 tons (57%) is Other Tree Debris. Of the remaining 7,152 tons, Brick/Wood comprises 21% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 60 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,648 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 10 households to be displaced due to the hurricane. Of these, 3 people (out of a total population of 24,517) will seek temporary shelter in public shelters.

Economic Loss

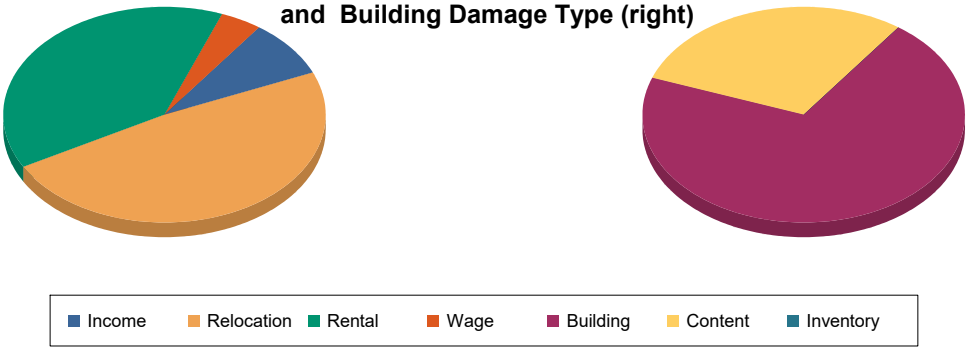
The total economic loss estimated for the hurricane is 36.3 million dollars, which represents 0.79 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 36 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

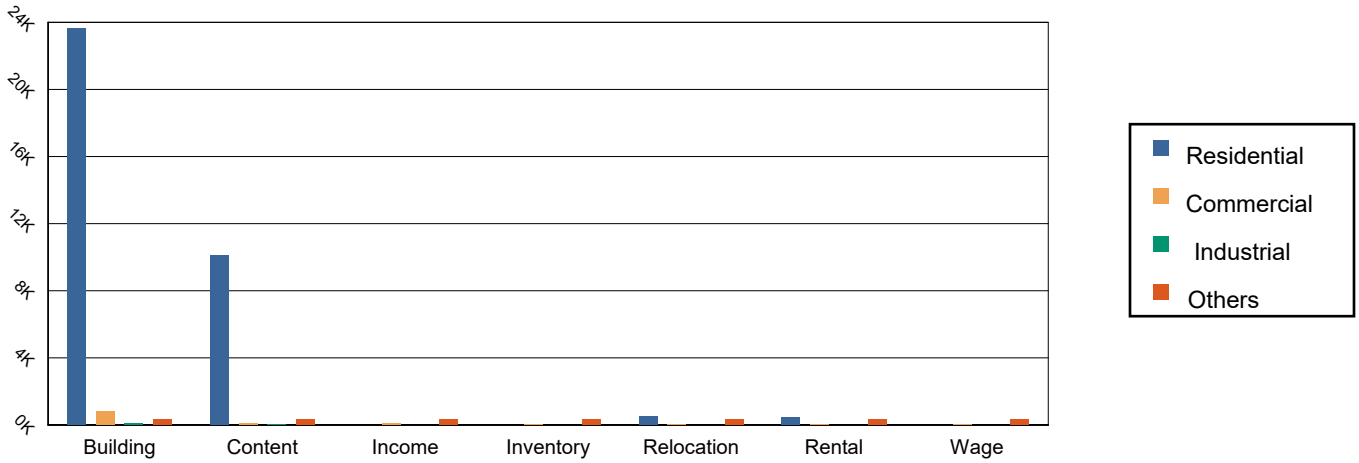


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	23,615.40	800.16	89.21	274.39	24,779.16
	Content	10,129.94	107.79	15.36	8.35	10,261.44
	Inventory	0.00	8.72	1.98	4.23	14.93
	Subtotal	**33,745.34**	**916.68**	**106.54**	**286.97**	**35,055.54**
Business Interruption Loss						
	Income	0.00	96.21	0.54	7.46	104.21
	Relocation	522.31	64.25	1.82	6.76	595.13
	Rental	432.33	40.11	0.36	0.51	473.31
	Wage	0.00	34.19	0.89	17.60	52.68
	Subtotal	**954.64**	**234.76**	**3.60**	**32.32**	**1,225.32**

Total

Total	**34,699.98**	**1,151.44**	**110.14**	**319.30**	**36,280.86**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	24,517	3,283,287	1,333,267	4,616,554
Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**
Study Region Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**

Hazus: Hurricane Global Risk Report

Region Name:	Simsbury_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,617 million dollars. Approximately 86% of the buildings (and 71% of the building value) are associated with residential housing.

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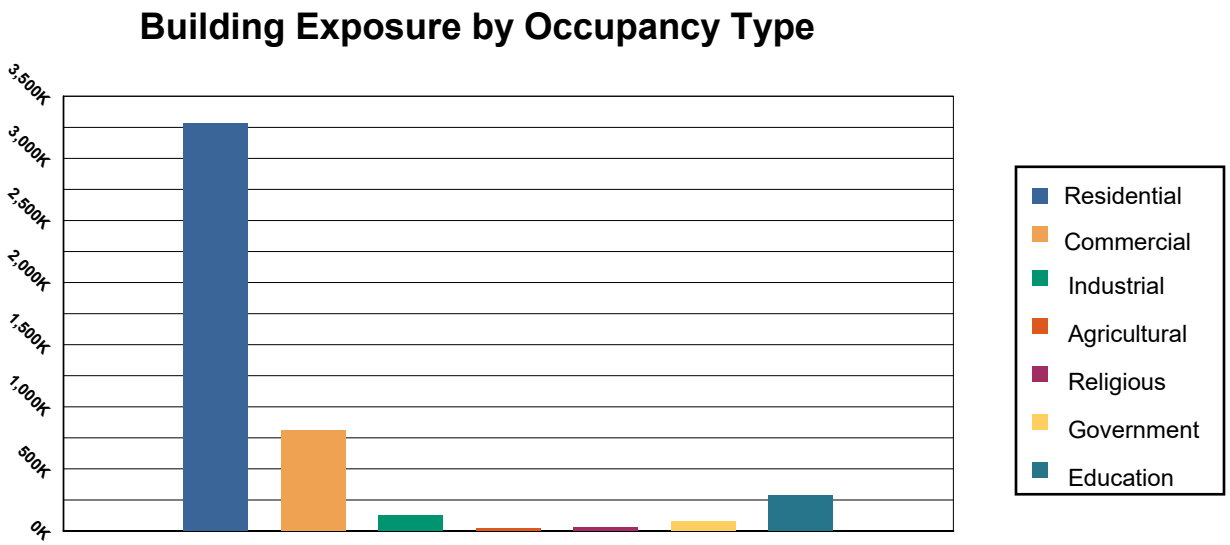

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Religious	25,889	0.56%
Government	77,938	1.69%
Education	283,094	6.13%
Total	**4,616,554**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 79 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

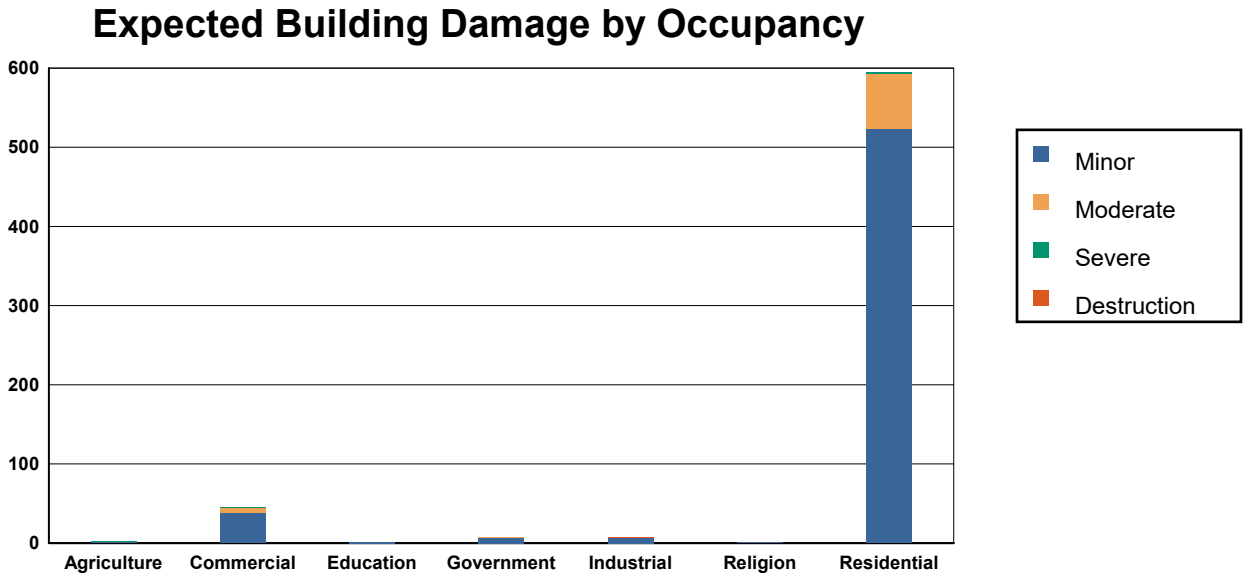


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	25.40	90.70	2.03	7.25	0.39	1.39	0.17	0.62	0.01	0.04
Commercial	618.07	93.22	38.45	5.80	5.83	0.88	0.65	0.10	0.00	0.00
Education	21.66	94.18	1.25	5.44	0.09	0.37	0.00	0.01	0.00	0.00
Government	117.90	94.32	6.63	5.30	0.47	0.38	0.00	0.00	0.00	0.00
Industrial	109.50	93.59	6.51	5.56	0.80	0.68	0.18	0.16	0.01	0.01
Religion	16.85	93.64	1.08	5.98	0.07	0.37	0.00	0.02	0.00	0.00
Residential	5,338.58	89.98	523.95	8.83	68.88	1.16	1.54	0.03	0.04	0.00
Total	**6,247.96**		**579.90**		**76.52**		**2.56**		**0.06**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	114	93.38	7	6.03	1	0.59	0	0.00	0	0.00
Masonry	634	88.80	56	7.82	23	3.29	1	0.09	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	435	94.05	23	5.07	4	0.76	1	0.11	0	0.00
Wood	5,091	90.76	483	8.61	34	0.61	1	0.02	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

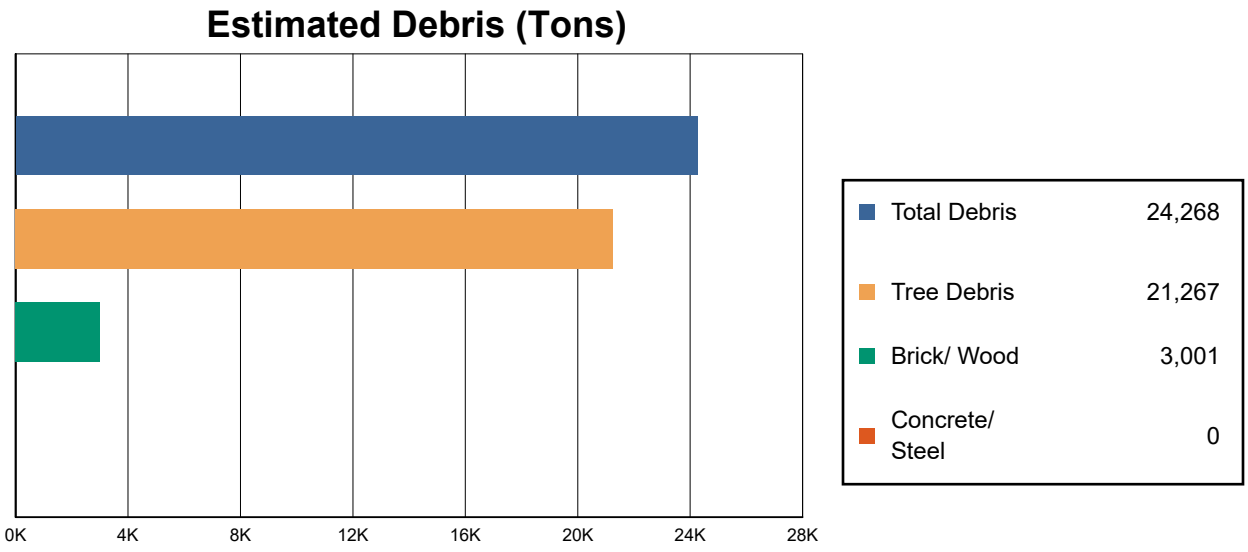
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

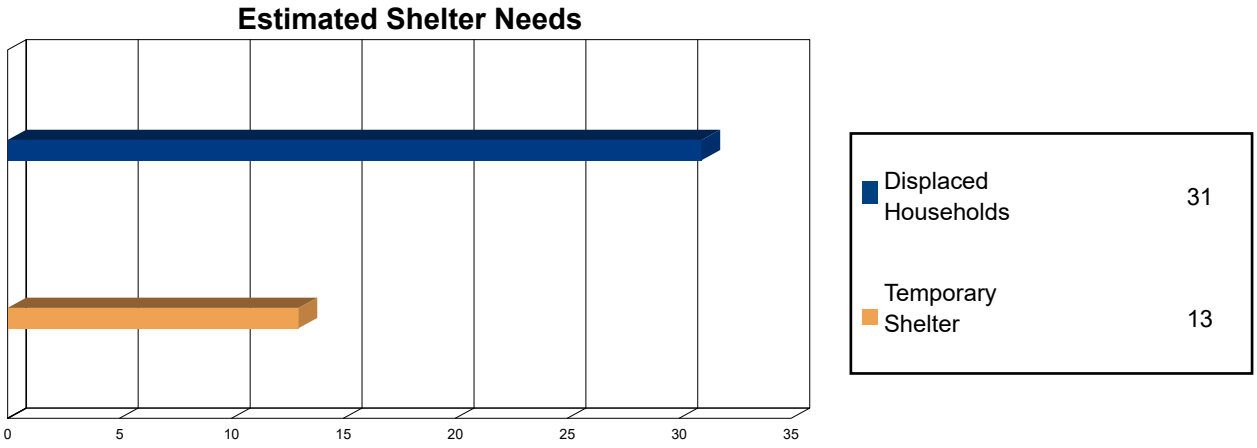


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 24,268 tons of debris will be generated. Of the total amount, 13,475 tons (56%) is Other Tree Debris. Of the remaining 10,793 tons, Brick/Wood comprises 28% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 120 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,792 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 31 households to be displaced due to the hurricane. Of these, 13 people (out of a total population of 24,517) will seek temporary shelter in public shelters.

Economic Loss

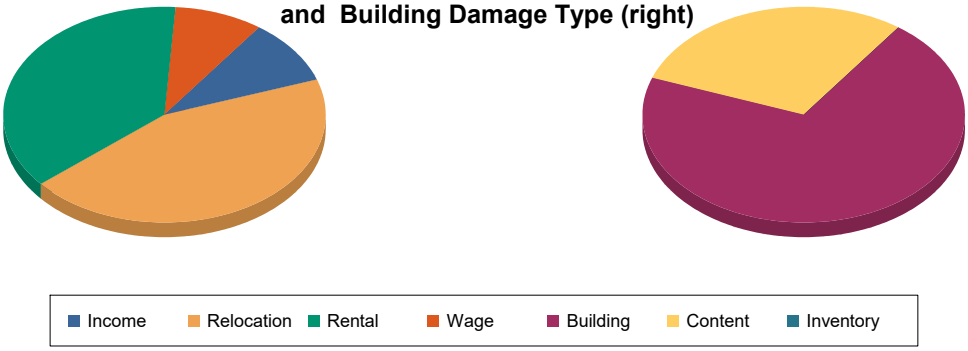
The total economic loss estimated for the hurricane is 64.0 million dollars, which represents 1.39 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 64 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

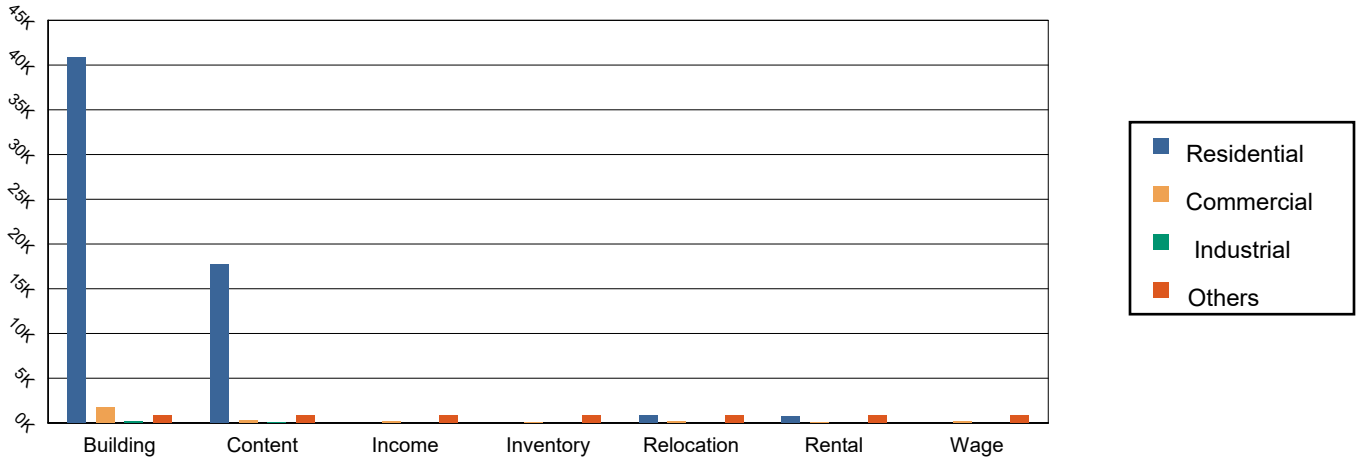


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	40,815.74	1,771.69	223.40	634.13	43,444.95
	Content	17,749.13	248.32	73.77	59.52	18,130.75
	Inventory	0.00	22.13	9.63	16.90	48.66
	Subtotal	**58,564.87**	**2,042.13**	**306.80**	**710.55**	**61,624.36**
Business Interruption Loss						
	Income	0.00	215.09	1.17	14.05	230.30
	Relocation	827.49	186.09	6.44	26.63	1,046.65
	Rental	773.74	110.58	0.87	1.41	886.60
	Wage	0.00	173.45	1.93	33.12	208.50
	Subtotal	**1,601.24**	**685.20**	**10.41**	**75.20**	**2,372.05**

Total

Total	**60,166.11**	**2,727.34**	**317.21**	**785.76**	**63,996.41**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	24,517	3,283,287	1,333,267	4,616,554
Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**
Study Region Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**

Hazus: Hurricane Global Risk Report

Region Name:	Simsbury_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.30 square miles and contains 6 census tracts. There are over 9 thousand households in the region and a total population of 24,517 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,617 million dollars. Approximately 86% of the buildings (and 71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 6,907 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

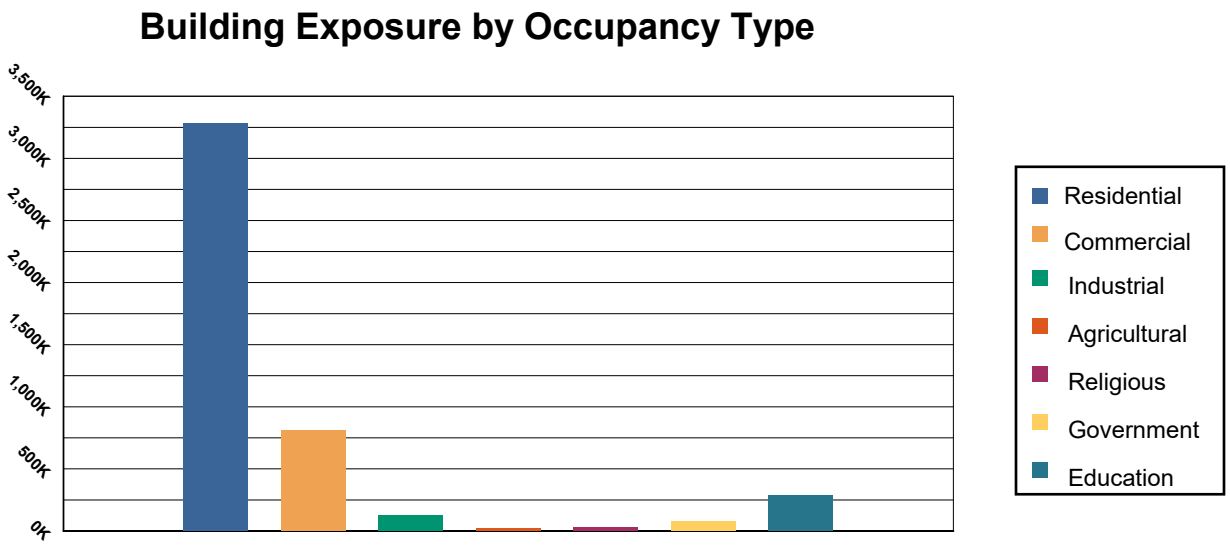


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,283,287	71.12%
Commercial	806,210	17.46%
Industrial	121,254	2.63%
Agricultural	18,882	0.41%
Religious	25,889	0.56%
Government	77,938	1.69%
Education	283,094	6.13%
Total	**4,616,554**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 221 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 3 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

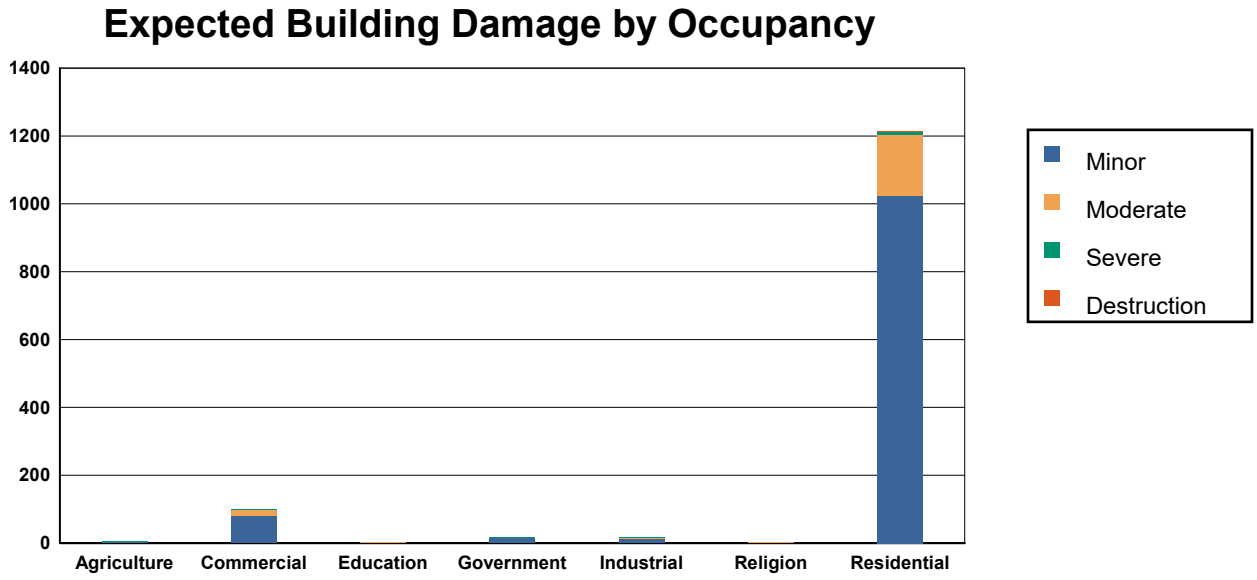


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.43	80.11	4.03	14.38	1.00	3.58	0.49	1.75	0.05	0.18
Commercial	561.60	84.71	80.70	12.17	18.19	2.74	2.50	0.38	0.01	0.00
Education	19.89	86.48	2.67	11.63	0.42	1.81	0.02	0.08	0.00	0.00
Government	108.37	86.69	14.17	11.34	2.36	1.89	0.10	0.08	0.00	0.00
Industrial	99.76	85.27	13.50	11.54	3.02	2.58	0.66	0.56	0.05	0.05
Religion	15.33	85.15	2.34	13.00	0.32	1.76	0.02	0.09	0.00	0.00
Residential	4,718.01	79.52	1,023.32	17.25	182.10	3.07	6.77	0.11	2.80	0.05
Total	**5,545.39**		**1,140.74**		**207.40**		**10.55**		**2.92**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	104	85.00	15	12.29	3	2.64	0	0.07	0	0.00
Masonry	564	78.94	98	13.78	50	6.97	2	0.29	0	0.03
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	399	86.24	49	10.67	12	2.61	2	0.47	0	0.00
Wood	4,512	80.44	973	17.34	116	2.07	6	0.11	3	0.05

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

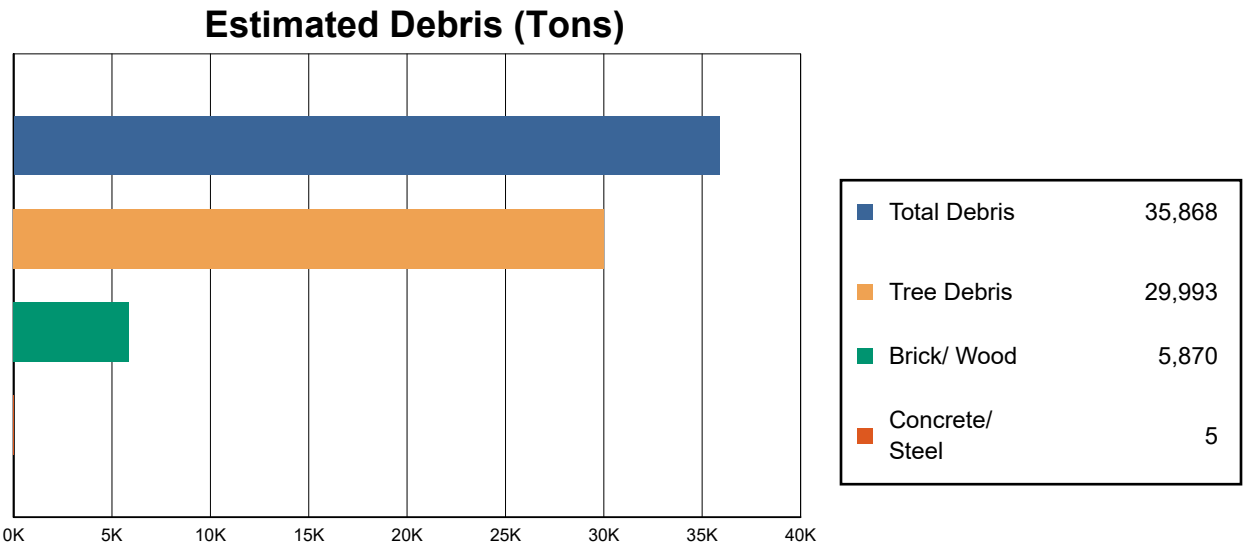
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

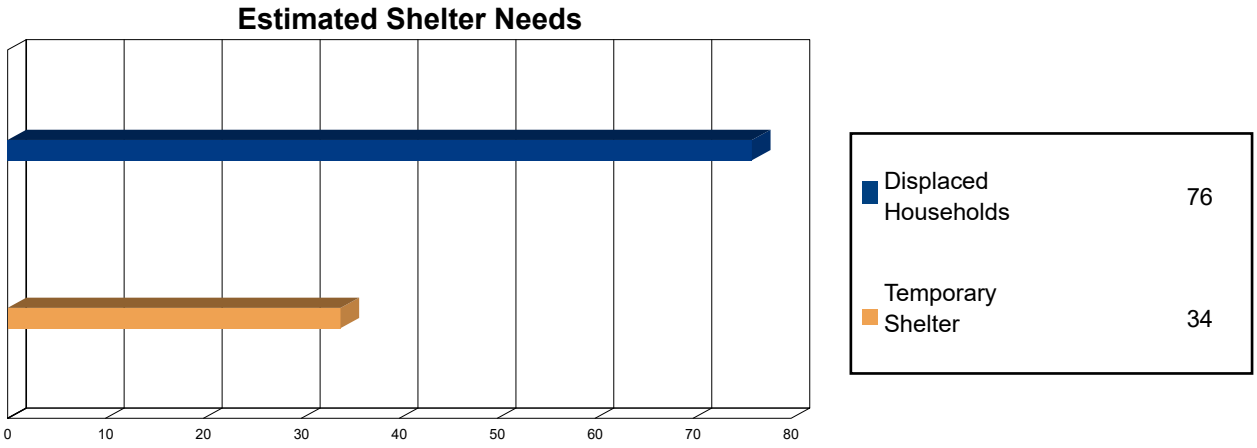


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 35,868 tons of debris will be generated. Of the total amount, 18,934 tons (53%) is Other Tree Debris. Of the remaining 16,934 tons, Brick/Wood comprises 35% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 235 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 11,059 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 76 households to be displaced due to the hurricane. Of these, 34 people (out of a total population of 24,517) will seek temporary shelter in public shelters.

Economic Loss

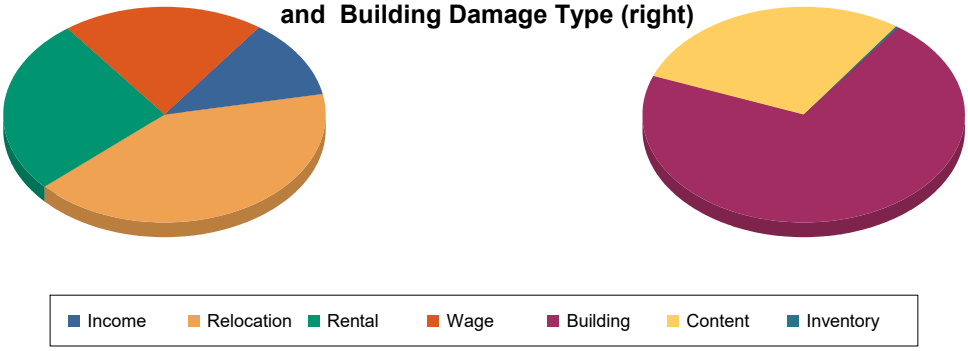
The total economic loss estimated for the hurricane is 116.2 million dollars, which represents 2.52 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 116 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

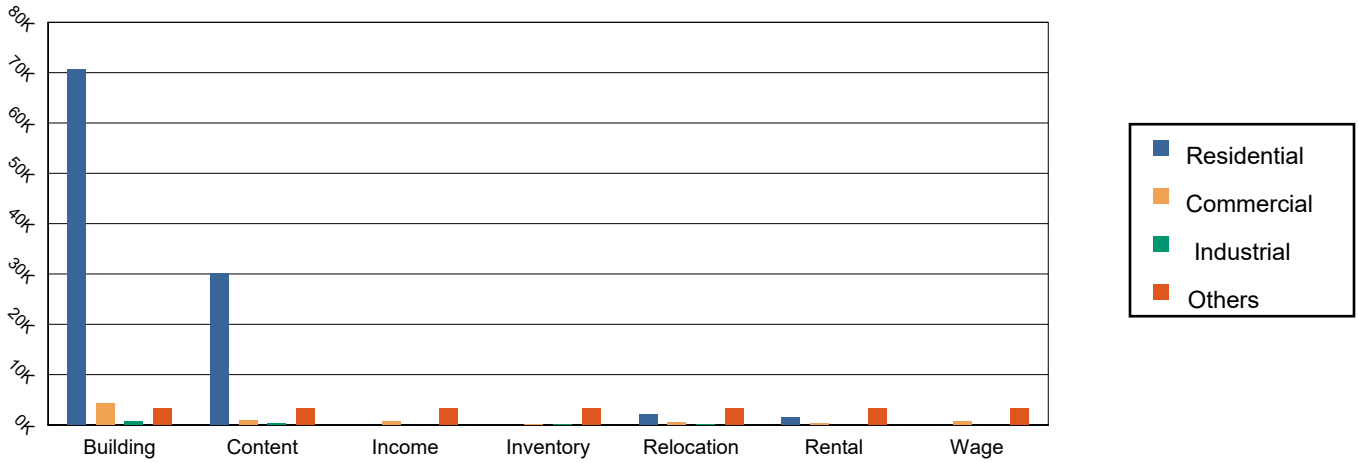


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	70,733.31	4,220.04	656.98	1,611.42	77,221.76
	Content	30,144.96	869.24	325.11	291.90	31,631.21
	Inventory	0.00	88.90	42.38	55.55	186.83
	Subtotal	**100,878.27**	**5,178.18**	**1,024.47**	**1,958.87**	**109,039.80**
Business Interruption Loss						
	Income	0.00	676.27	8.49	162.82	847.57
	Relocation	2,085.15	582.09	35.61	272.59	2,975.44
	Rental	1,512.24	349.85	6.42	25.37	1,893.88
	Wage	0.00	624.29	14.39	807.42	1,446.09
	Subtotal	**3,597.39**	**2,232.49**	**64.91**	**1,268.19**	**7,162.98**

Total

Total	**104,475.66**	**7,410.67**	**1,089.39**	**3,227.06**	**116,202.78**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	24,517	3,283,287	1,333,267	4,616,554
Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**
Study Region Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**

Hazus: Hurricane Global Risk Report

Region Name:	Simsbury_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Thursday, May 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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Note:
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There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,617 million dollars. Approximately 86% of the buildings (and 71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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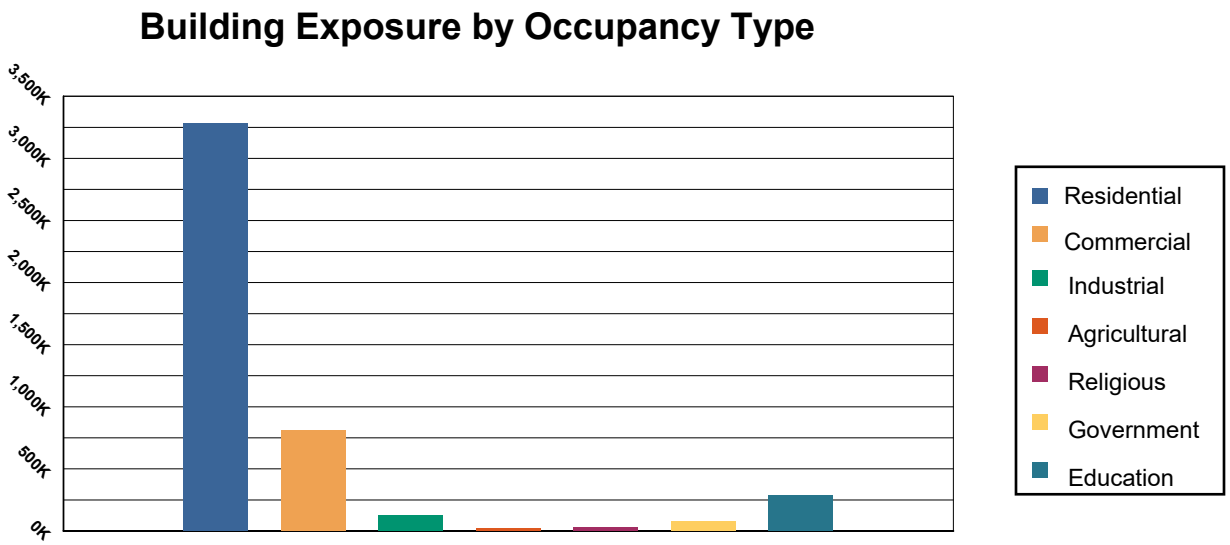

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
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Agricultural	18,882	0.41%
Religious	25,889	0.56%
Government	77,938	1.69%
Education	283,094	6.13%
Total	**4,616,554**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 389 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 8 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

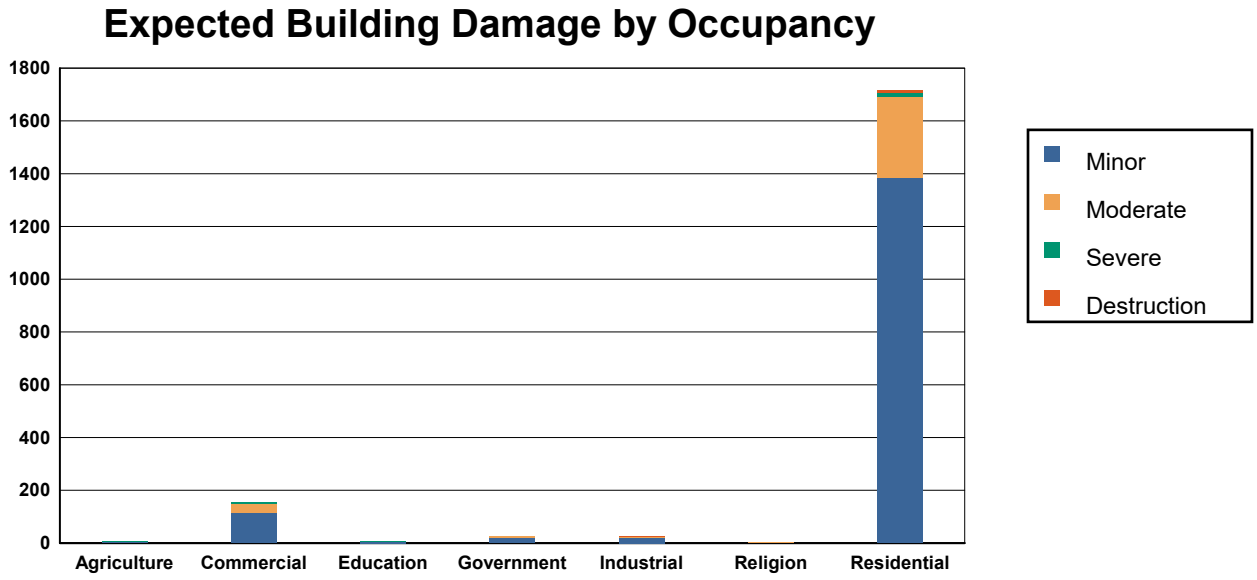


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.91	71.09	5.52	19.70	1.67	5.96	0.80	2.86	0.11	0.39
Commercial	507.37	76.53	115.17	17.37	35.53	5.36	4.91	0.74	0.03	0.00
Education	18.07	78.55	3.90	16.94	0.98	4.27	0.05	0.23	0.00	0.00
Government	98.53	78.82	20.63	16.50	5.54	4.43	0.31	0.25	0.00	0.00
Industrial	90.24	77.13	19.24	16.45	6.18	5.28	1.23	1.05	0.11	0.09
Religion	13.85	76.94	3.38	18.80	0.72	4.02	0.04	0.25	0.00	0.00
Residential	4,217.17	71.08	1,384.76	23.34	305.01	5.14	17.85	0.30	8.20	0.14
Total	**4,965.13**		**1,552.59**		**355.63**		**25.19**		**8.45**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	94	76.64	21	17.34	7	5.78	0	0.24	0	0.00
Masonry	504	70.58	130	18.23	75	10.57	4	0.56	0	0.06
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	362	78.28	72	15.44	25	5.34	4	0.94	0	0.01
Wood	4,039	72.02	1,331	23.73	215	3.83	16	0.29	8	0.14

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

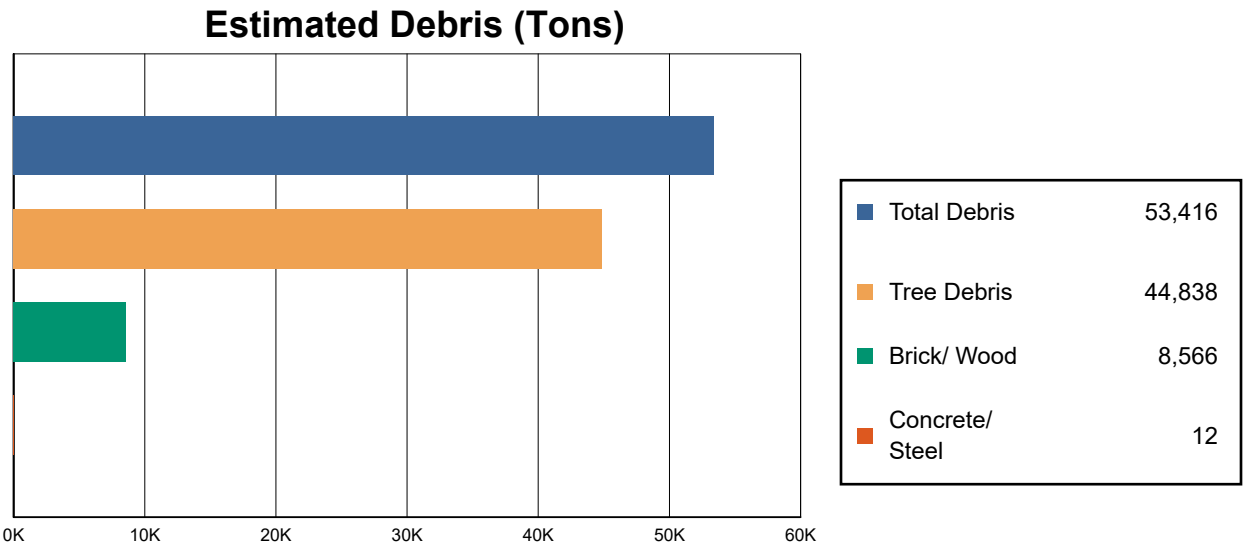
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Police Stations	1	0	0	1
Schools	10	0	0	10

Induced Hurricane Damage

Debris Generation

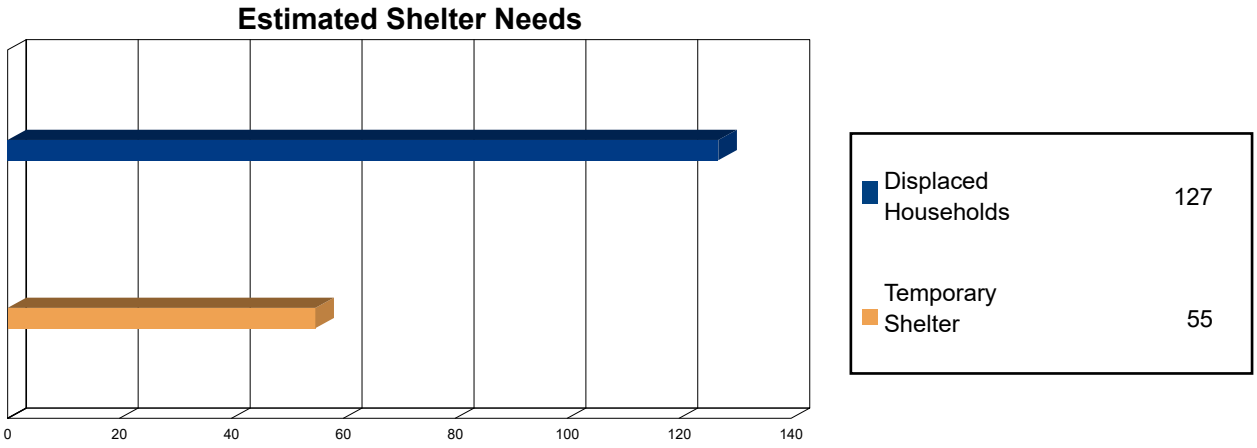


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 53,416 tons of debris will be generated. Of the total amount, 28,324 tons (53%) is Other Tree Debris. Of the remaining 25,092 tons, Brick/Wood comprises 34% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 343 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 16,514 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 127 households to be displaced due to the hurricane. Of these, 55 people (out of a total population of 24,517) will seek temporary shelter in public shelters.

Economic Loss

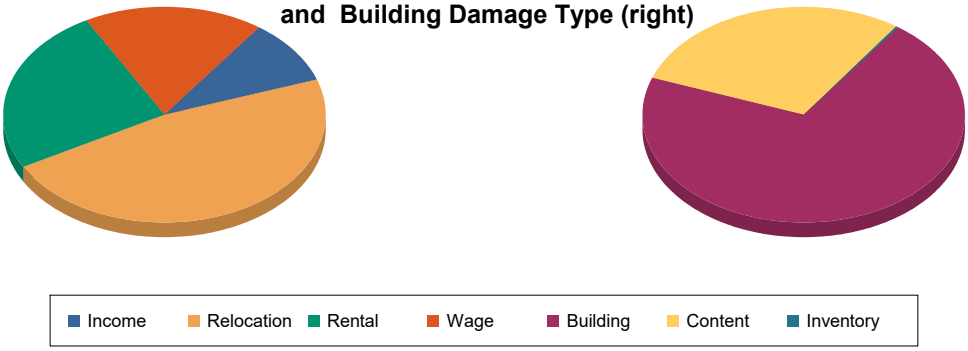
The total economic loss estimated for the hurricane is 170.5 million dollars, which represents 3.69 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 171 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

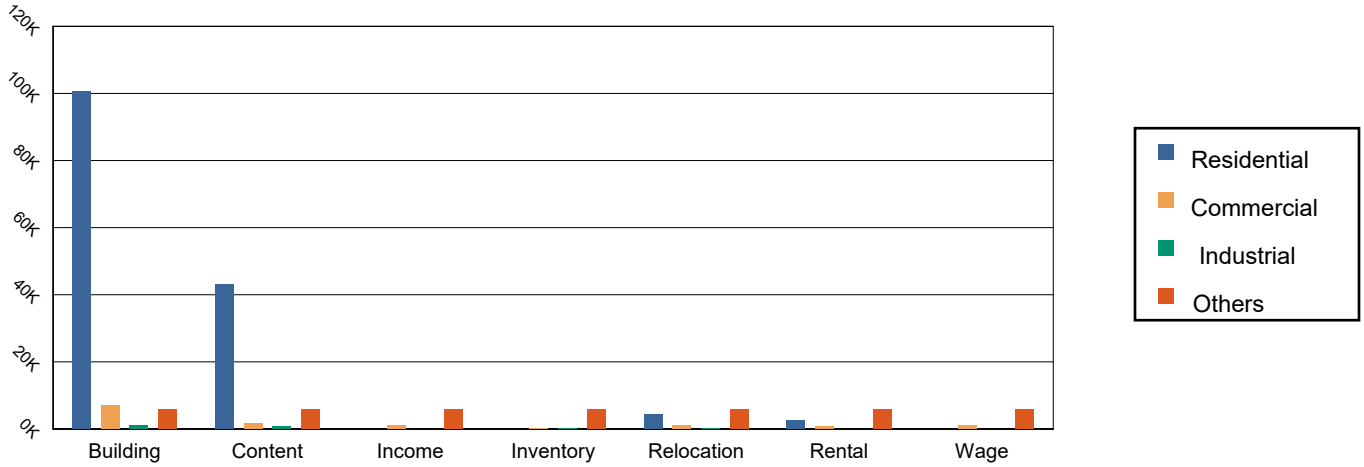


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	100,510.97	6,950.16	1,166.62	2,853.29	111,481.05
	Content	43,111.81	1,717.15	634.11	685.10	46,148.16
	Inventory	0.00	181.82	82.43	104.93	369.18
	Subtotal	**143,622.78**	**8,849.13**	**1,883.16**	**3,643.32**	**157,998.39**
Business Interruption Loss						
	Income	0.00	972.41	13.49	236.64	1,222.54
	Relocation	4,302.98	1,042.88	71.02	494.33	5,911.20
	Rental	2,464.53	610.22	11.13	46.59	3,132.48
	Wage	0.00	929.48	22.88	1,290.28	2,242.64
	Subtotal	**6,767.51**	**3,554.99**	**118.51**	**2,067.85**	**12,508.86**

Total

Total	**150,390.29**	**12,404.12**	**2,001.67**	**5,711.17**	**170,507.24**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	24,517	3,283,287	1,333,267	4,616,554
Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**
Study Region Total	**24,517**	**3,283,287**	**1,333,267**	**4,616,554**

Hazus: Hurricane Global Risk Report

Region Name:	Somers_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.58 square miles and contains 3 census tracts. There are over 3 thousand households in the region and a total population of 10,255 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

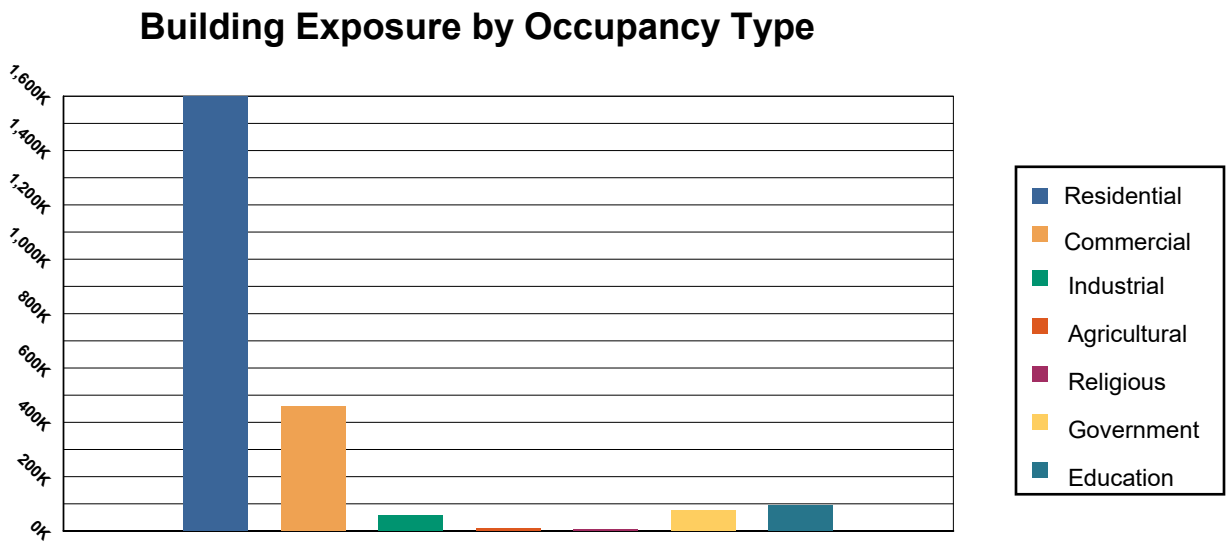


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,597,984	69.36%
Commercial	459,233	19.93%
Industrial	58,810	2.55%
Agricultural	9,497	0.41%
Religious	7,166	0.31%
Government	77,235	3.35%
Education	93,903	4.08%
Total	**2,303,828**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

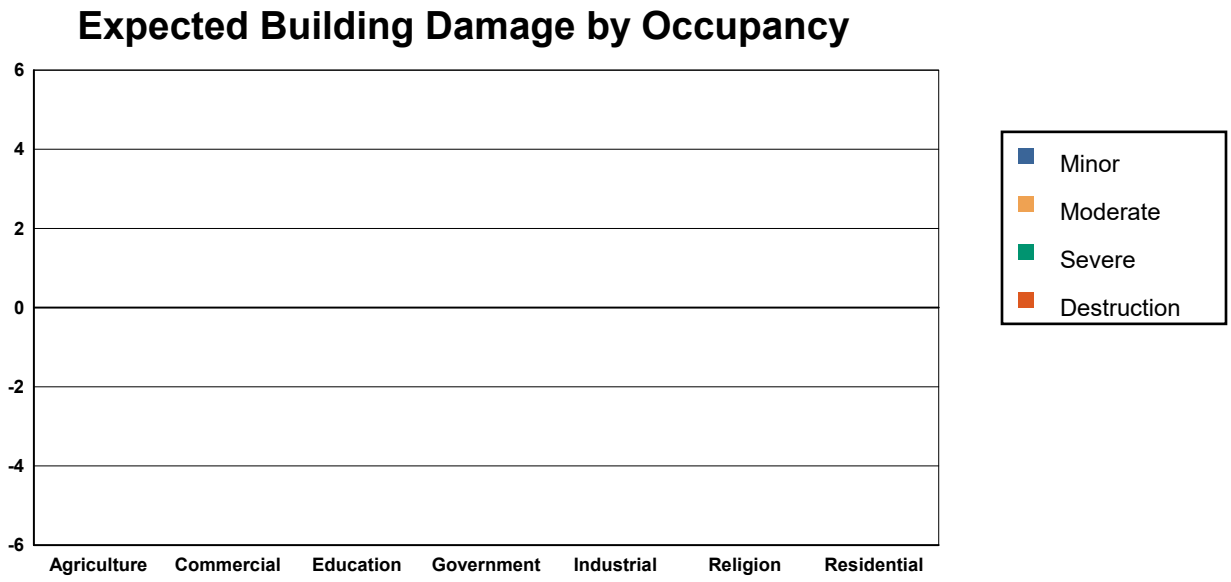


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	286.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	11.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	61.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	60.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	9.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	3,296.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**3,732.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	52	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	315	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	210	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	3,149	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

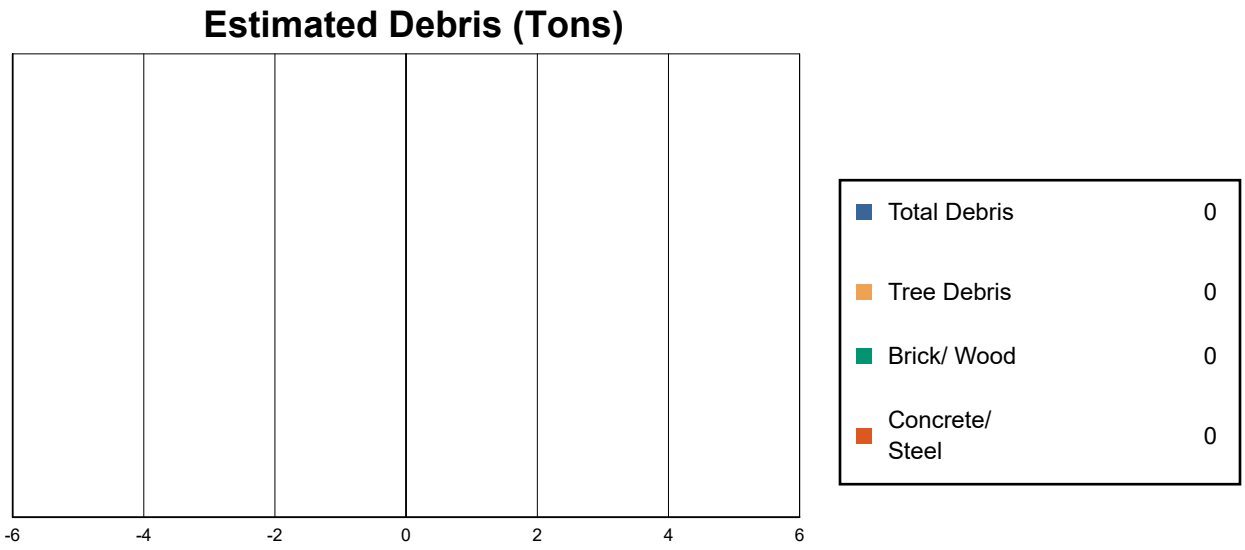
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

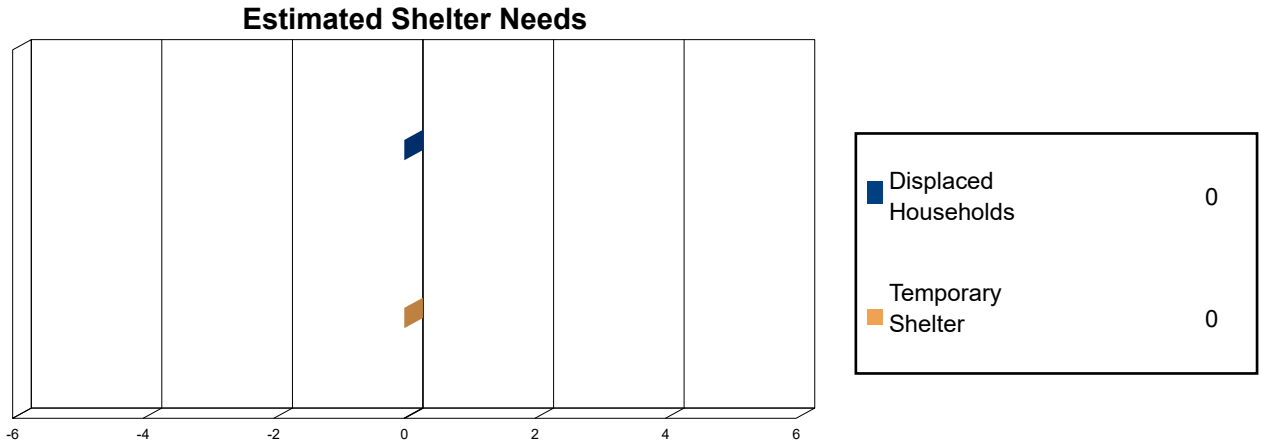


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,255) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

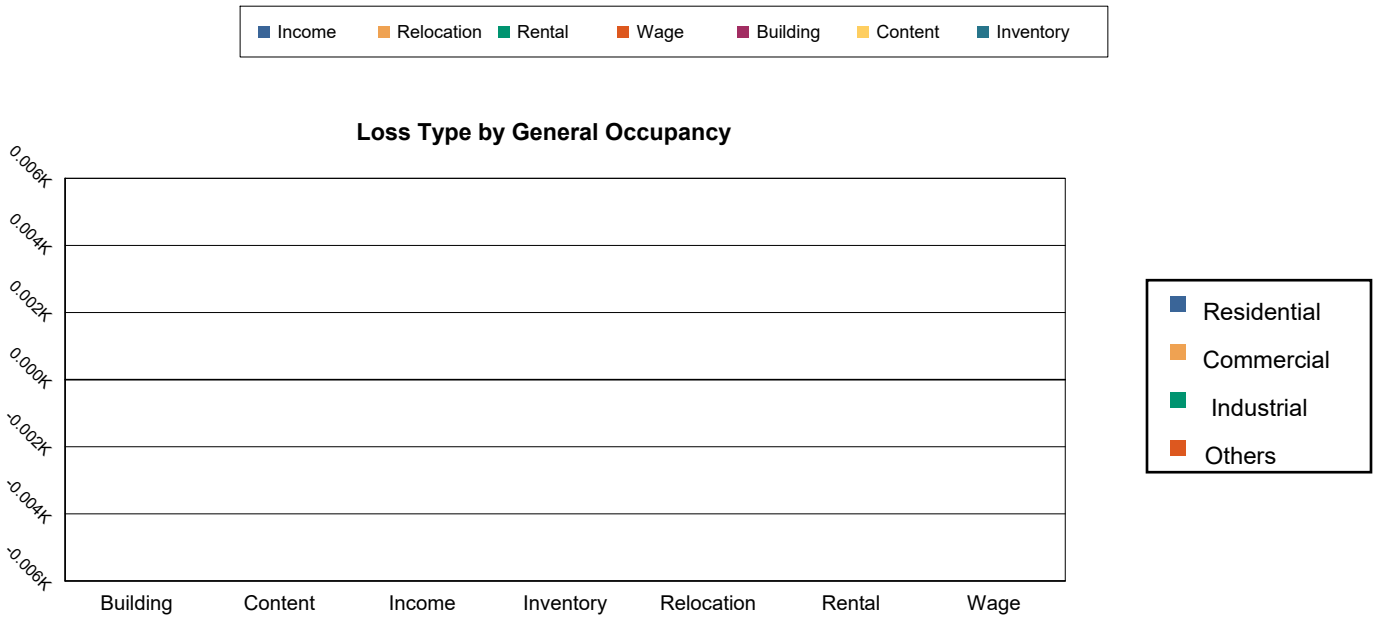


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,984	705,844	2,303,828
Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**
Study Region Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**

Hazus: Hurricane Global Risk Report

Region Name:	Somers_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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Note:
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Building Inventory

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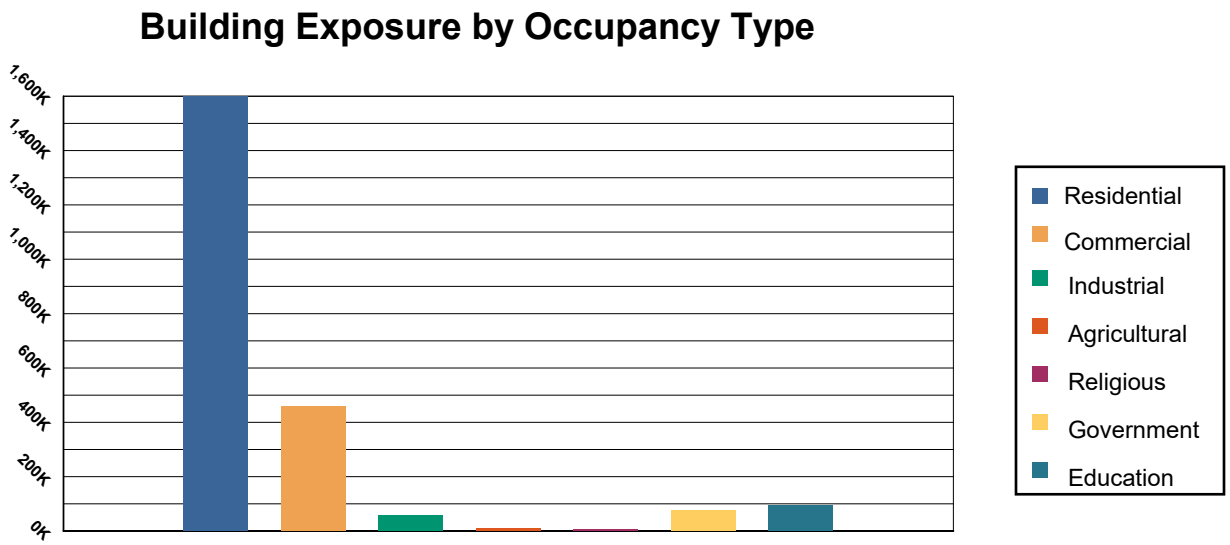


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,597,984	69.36%
Commercial	459,233	19.93%
Industrial	58,810	2.55%
Agricultural	9,497	0.41%
Religious	7,166	0.31%
Government	77,235	3.35%
Education	93,903	4.08%
Total	**2,303,828**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

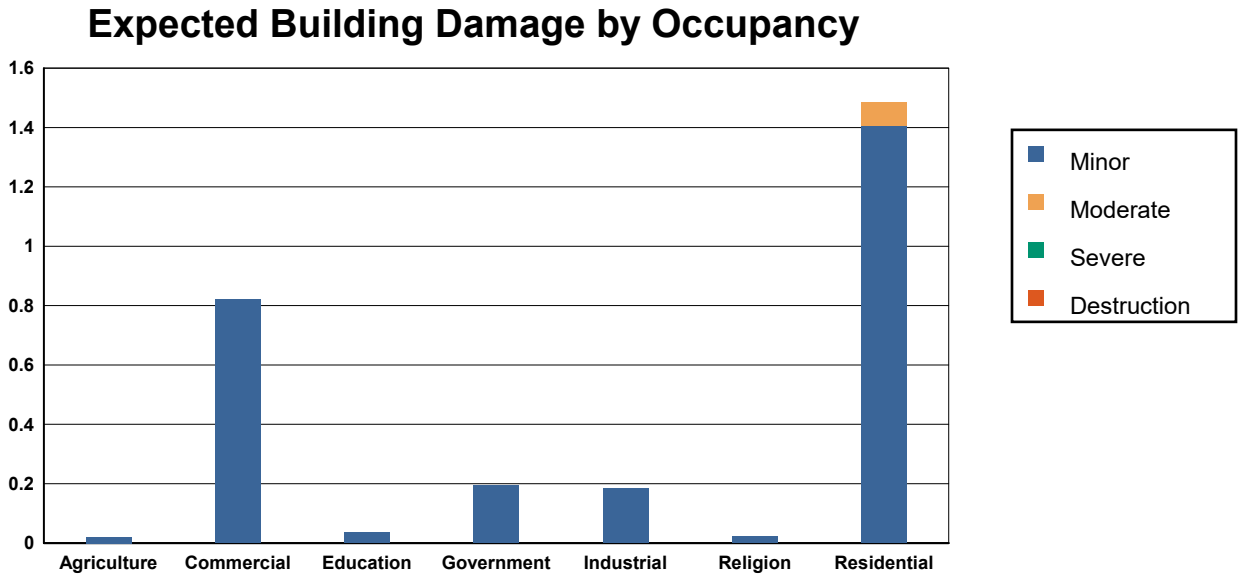


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8.98	99.77	0.02	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	285.18	99.71	0.82	0.29	0.00	0.00	0.00	0.00	0.00	0.00
Education	10.96	99.67	0.04	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Government	60.81	99.68	0.19	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	59.82	99.69	0.18	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Religion	8.98	99.75	0.02	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Residential	3,294.51	99.95	1.41	0.04	0.08	0.00	0.00	0.00	0.00	0.00
Total	**3,729.23**		**2.69**		**0.08**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	52	99.61	0	0.39	0	0.00	0	0.00	0	0.00
Masonry	314	99.66	1	0.34	0	0.01	0	0.00	0	0.00
MH	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	209	99.69	1	0.30	0	0.00	0	0.00	0	0.00
Wood	3,148	99.97	1	0.02	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

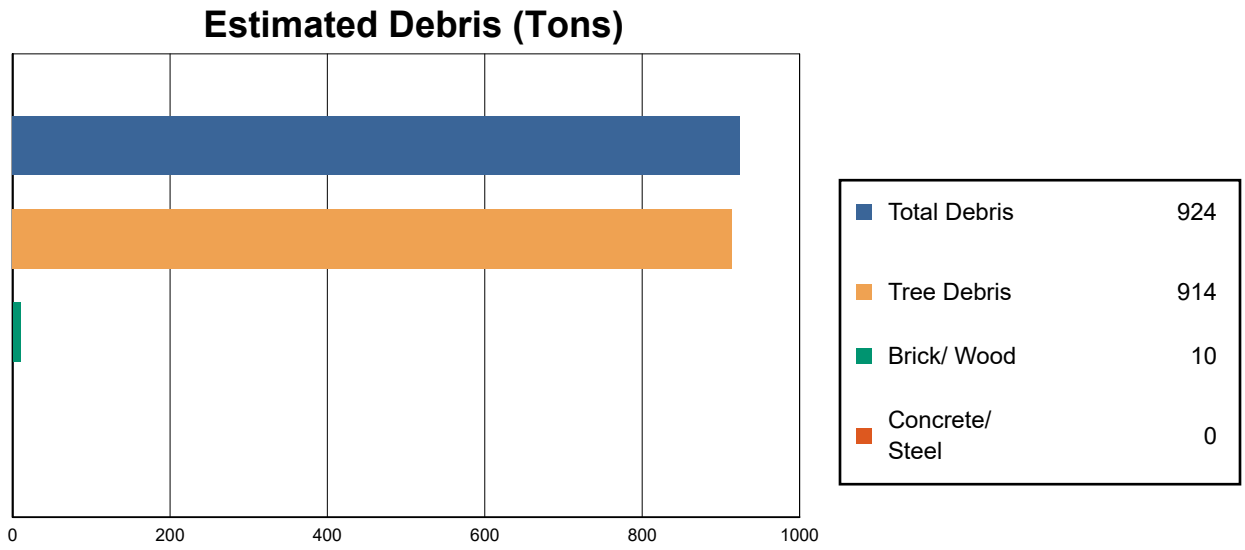
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

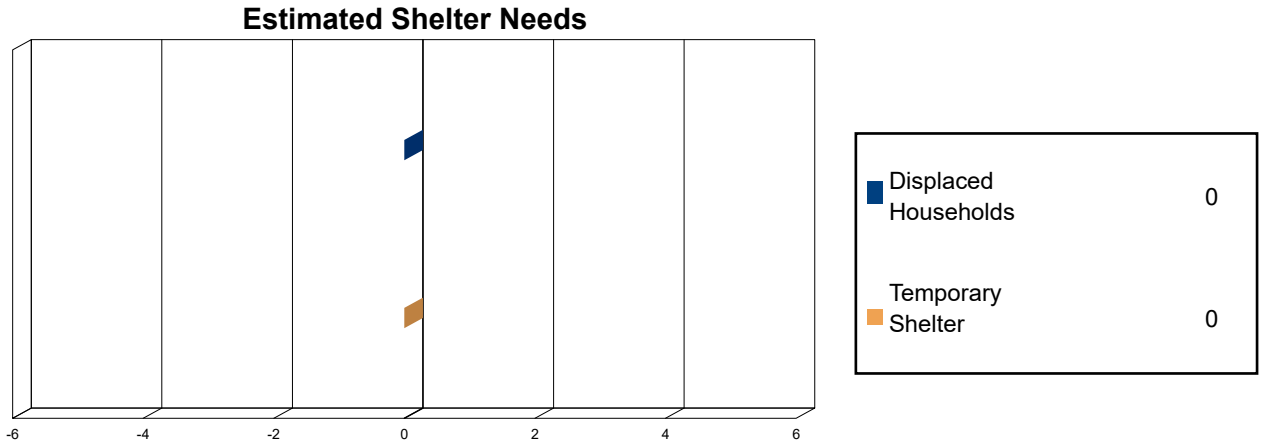


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 924 tons of debris will be generated. Of the total amount, 700 tons (76%) is Other Tree Debris. Of the remaining 224 tons, Brick/Wood comprises 4% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 214 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,255) will seek temporary shelter in public shelters.

Economic Loss

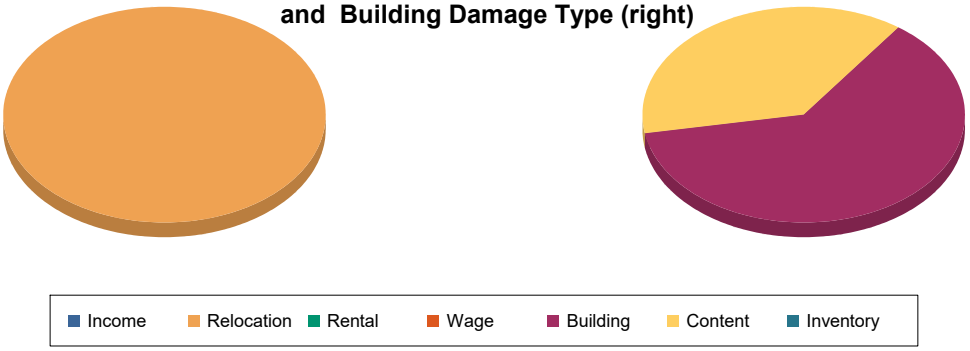
The total economic loss estimated for the hurricane is 1.3 million dollars, which represents 0.06 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

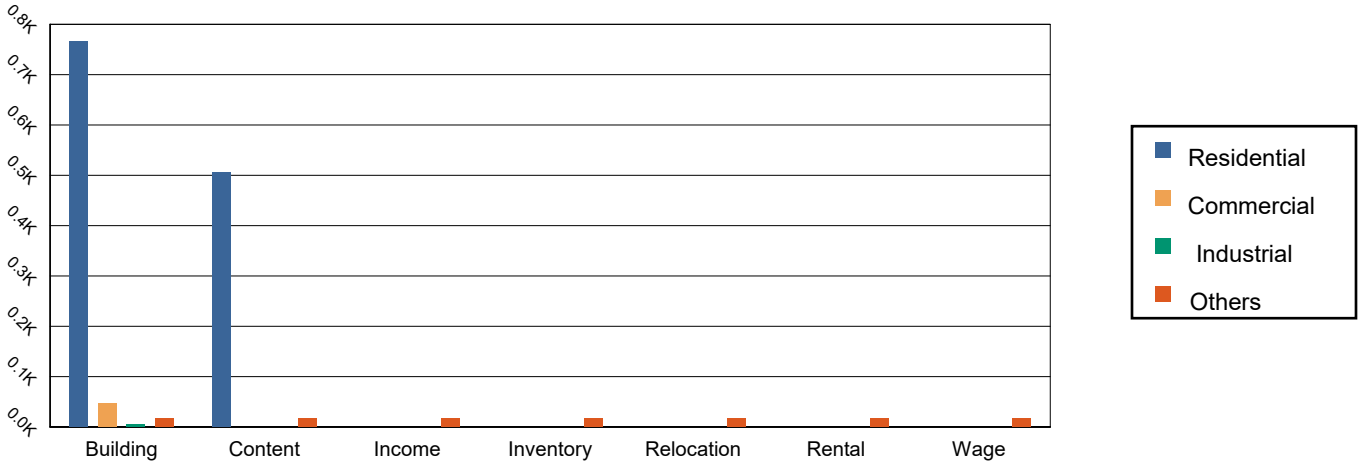


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	765.55	45.92	5.88	17.83	835.19
	Content	506.51	0.00	0.00	0.00	506.51
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,272.06**	**45.92**	**5.88**	**17.83**	**1,341.69**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.20	0.00	0.00	0.00	0.20
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.20**	**0.00**	**0.00**	**0.00**	**0.20**

Total

Total	**1,272.26**	**45.92**	**5.88**	**17.83**	**1,341.89**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,984	705,844	2,303,828
Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**
Study Region Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**

Hazus: Hurricane Global Risk Report

Region Name:	Somers_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.58 square miles and contains 3 census tracts. There are over 3 thousand households in the region and a total population of 10,255 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

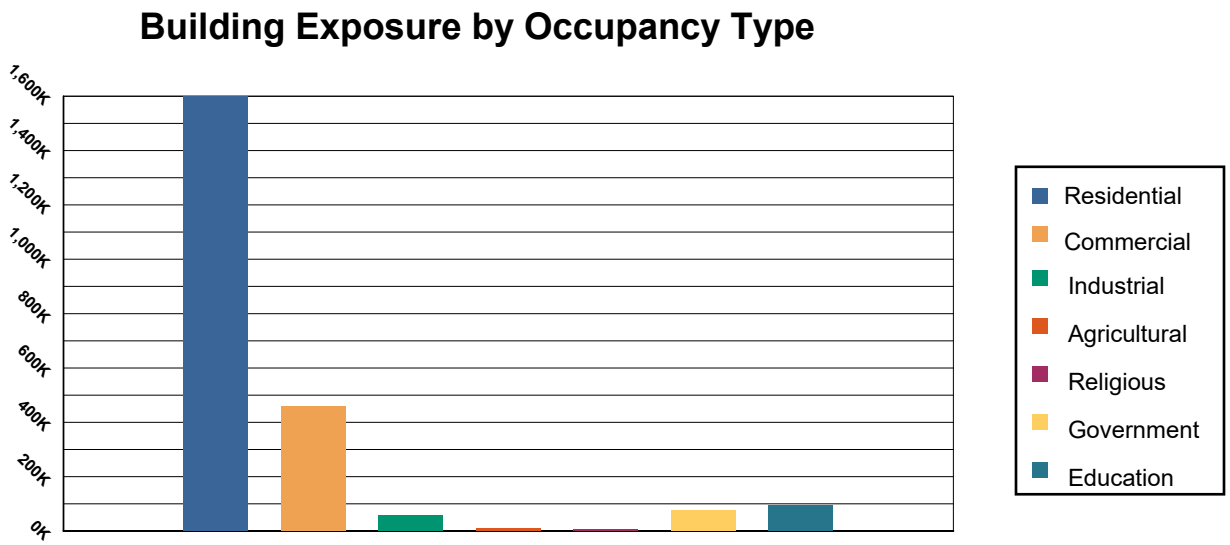


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,597,984	69.36%
Commercial	459,233	19.93%
Industrial	58,810	2.55%
Agricultural	9,497	0.41%
Religious	7,166	0.31%
Government	77,235	3.35%
Education	93,903	4.08%
Total	**2,303,828**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

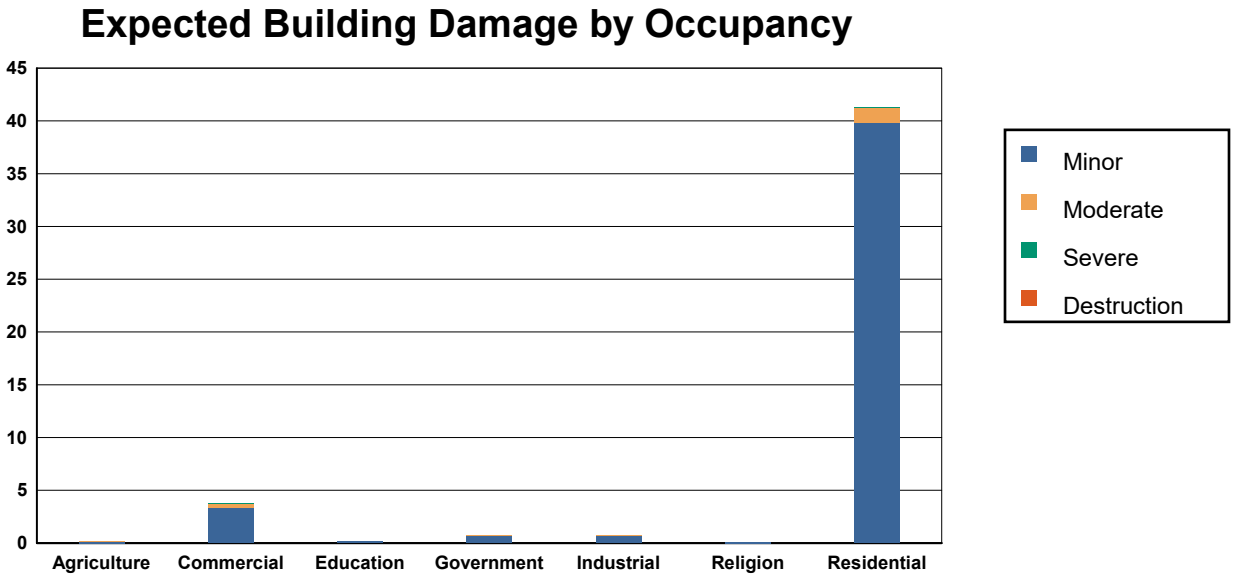


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8.87	98.59	0.11	1.27	0.01	0.11	0.00	0.03	0.00	0.00
Commercial	282.24	98.69	3.35	1.17	0.40	0.14	0.01	0.00	0.00	0.00
Education	10.85	98.62	0.15	1.36	0.00	0.02	0.00	0.00	0.00	0.00
Government	60.28	98.81	0.71	1.17	0.01	0.01	0.00	0.00	0.00	0.00
Industrial	59.26	98.76	0.73	1.21	0.02	0.03	0.00	0.00	0.00	0.00
Religion	8.89	98.83	0.10	1.14	0.00	0.03	0.00	0.00	0.00	0.00
Residential	3,254.69	98.75	39.77	1.21	1.49	0.05	0.04	0.00	0.00	0.00
Total	**3,685.08**		**44.93**		**1.93**		**0.06**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	51	98.50	1	1.49	0	0.02	0	0.00	0	0.00
Masonry	310	98.32	5	1.54	0	0.14	0	0.01	0	0.00
MH	2	99.88	0	0.10	0	0.02	0	0.00	0	0.00
Steel	207	98.71	2	1.14	0	0.15	0	0.01	0	0.00
Wood	3,112	98.83	36	1.14	1	0.03	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

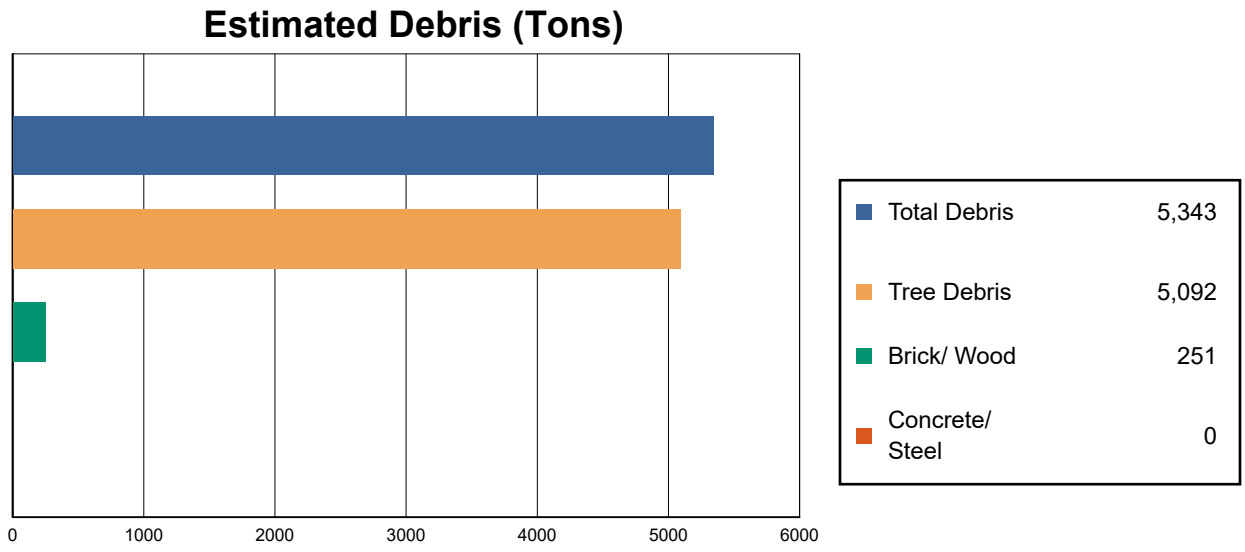
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

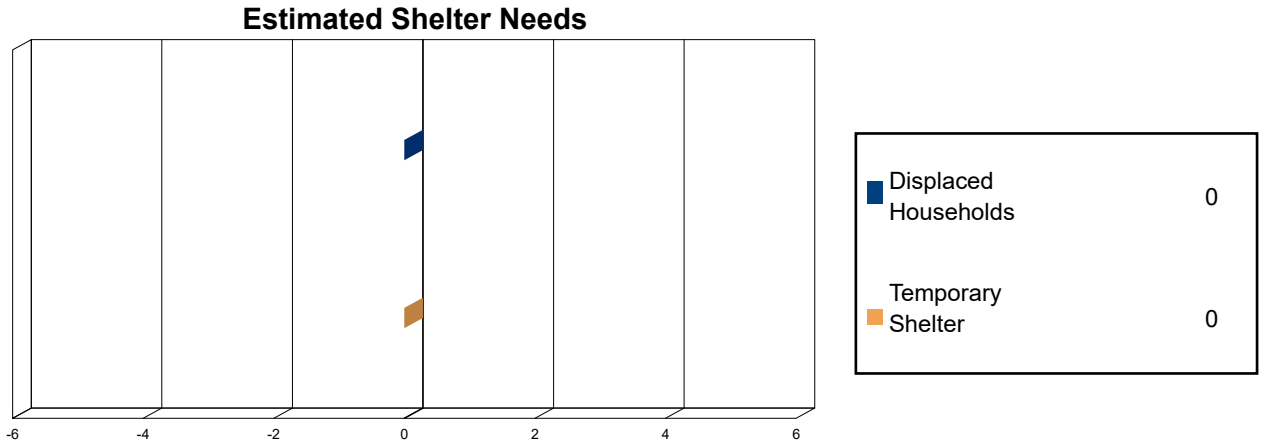


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,343 tons of debris will be generated. Of the total amount, 3,890 tons (73%) is Other Tree Debris. Of the remaining 1,453 tons, Brick/Wood comprises 17% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 10 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,202 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,255) will seek temporary shelter in public shelters.

Economic Loss

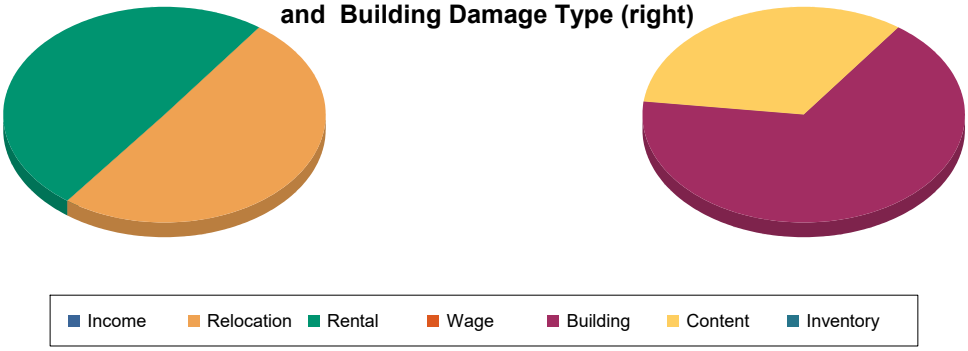
The total economic loss estimated for the hurricane is 9.2 million dollars, which represents 0.40 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 9 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

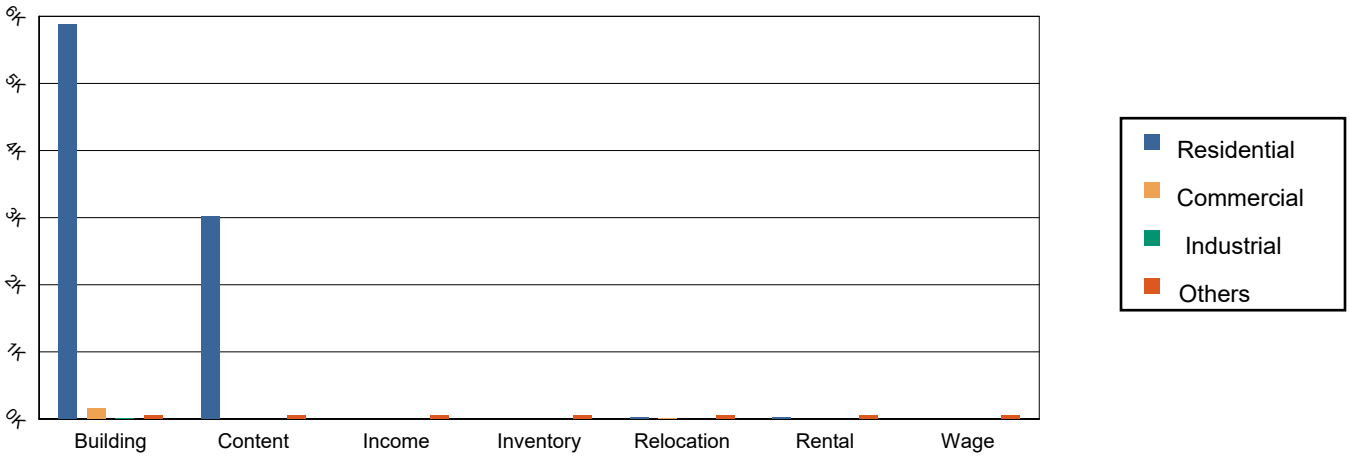


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,882.72	160.04	11.85	47.83	6,102.43
	Content	3,011.68	0.00	0.00	0.00	3,011.68
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**8,894.40**	**160.04**	**11.85**	**47.83**	**9,114.11**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	16.43	5.03	0.13	0.29	21.89
	Rental	21.67	0.00	0.00	0.00	21.67
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**38.10**	**5.03**	**0.13**	**0.29**	**43.55**

Total

Total	8,932.50	165.07	11.98	48.11	9,157.66

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,984	705,844	2,303,828
Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**
Study Region Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**

Hazus: Hurricane Global Risk Report

Region Name: Somers_HU

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

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There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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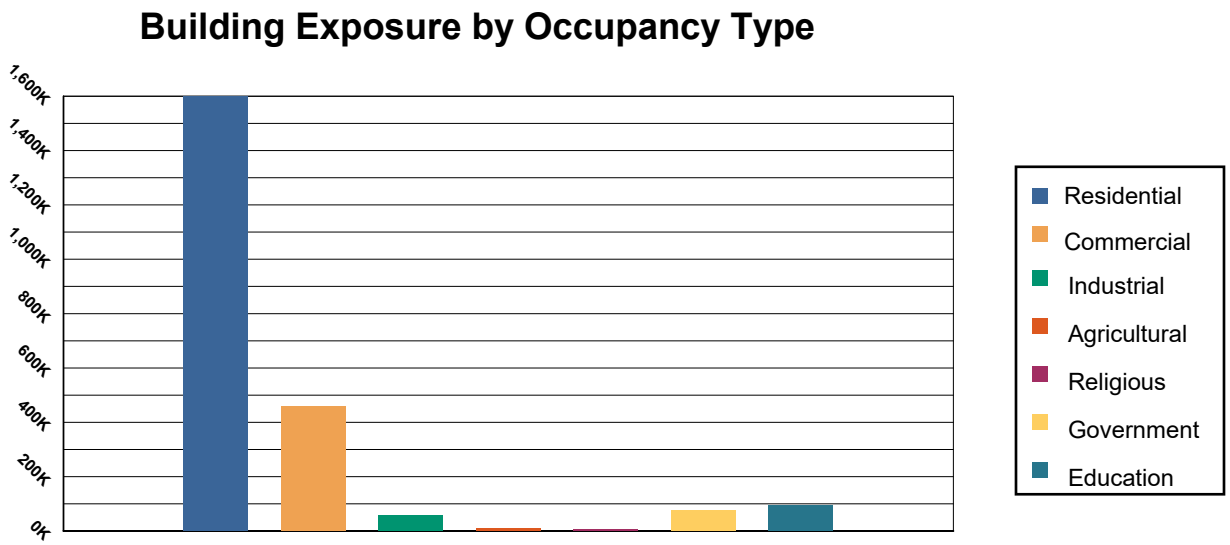

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,597,984	69.36%
Commercial	459,233	19.93%
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Agricultural	9,497	0.41%
Religious	7,166	0.31%
Government	77,235	3.35%
Education	93,903	4.08%
Total	**2,303,828**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 12 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

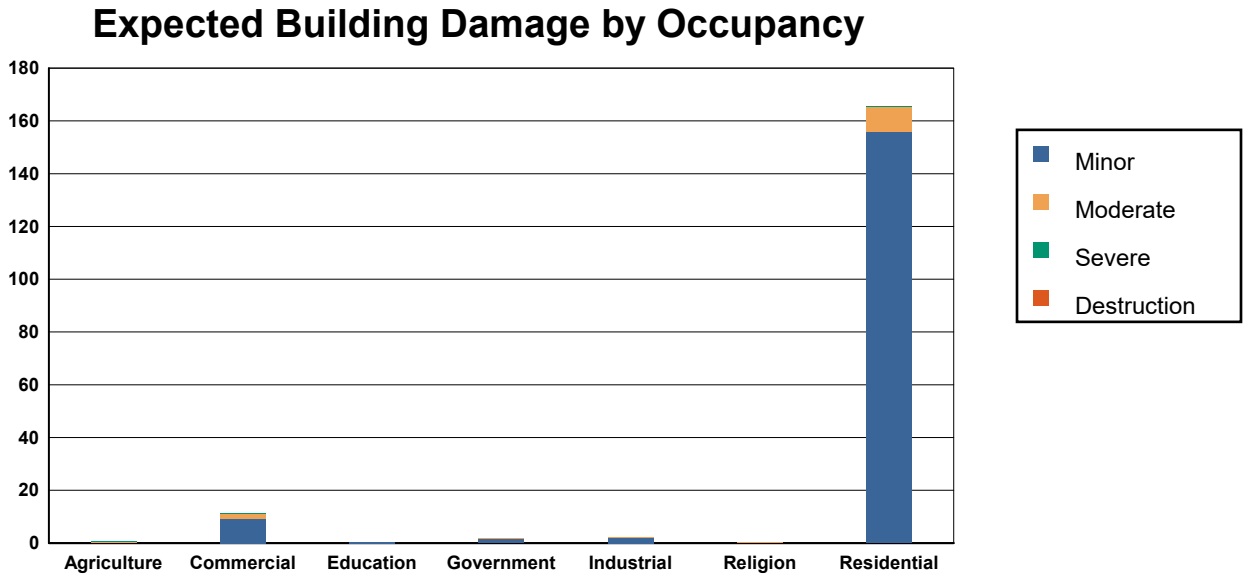


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8.56	95.12	0.36	4.02	0.06	0.61	0.02	0.24	0.00	0.01
Commercial	274.77	96.08	9.14	3.20	1.88	0.66	0.21	0.07	0.00	0.00
Education	10.59	96.31	0.39	3.51	0.02	0.18	0.00	0.00	0.00	0.00
Government	59.05	96.80	1.88	3.08	0.08	0.12	0.00	0.00	0.00	0.00
Industrial	57.94	96.56	1.92	3.20	0.13	0.22	0.01	0.02	0.00	0.00
Religion	8.68	96.39	0.31	3.43	0.01	0.17	0.00	0.01	0.00	0.00
Residential	3,130.43	94.98	156.08	4.74	9.27	0.28	0.22	0.01	0.00	0.00
Total	**3,550.02**		**170.07**		**11.44**		**0.46**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	50	96.17	2	3.63	0	0.19	0	0.00	0	0.00
Masonry	300	95.37	13	4.02	2	0.58	0	0.03	0	0.00
MH	2	99.10	0	0.69	0	0.15	0	0.00	0	0.06
Steel	202	96.28	6	2.86	2	0.77	0	0.09	0	0.00
Wood	2,996	95.14	146	4.64	7	0.21	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

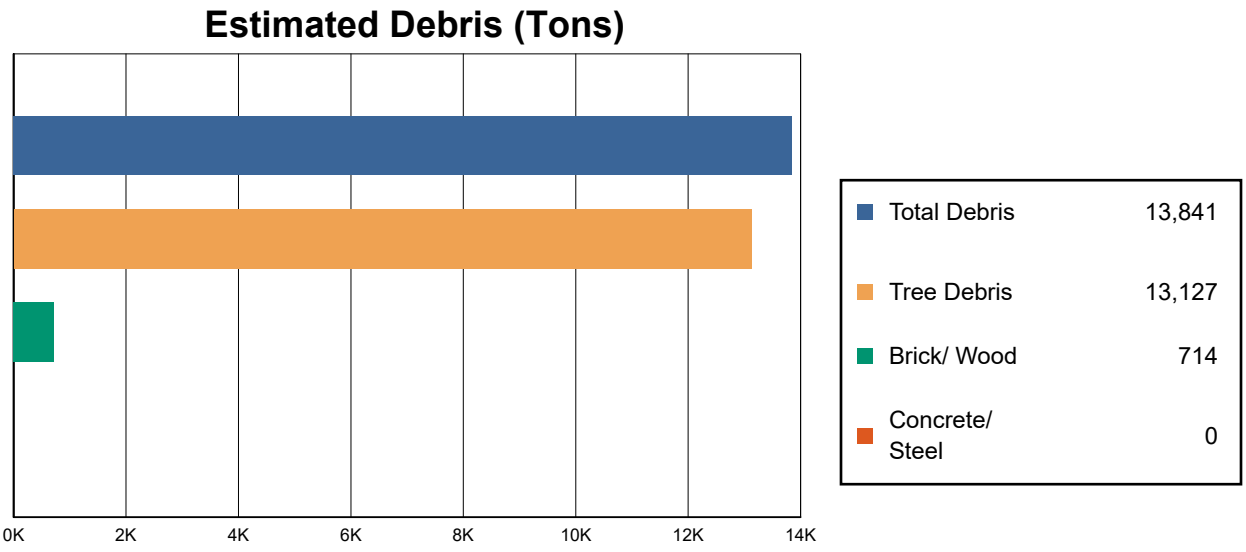
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

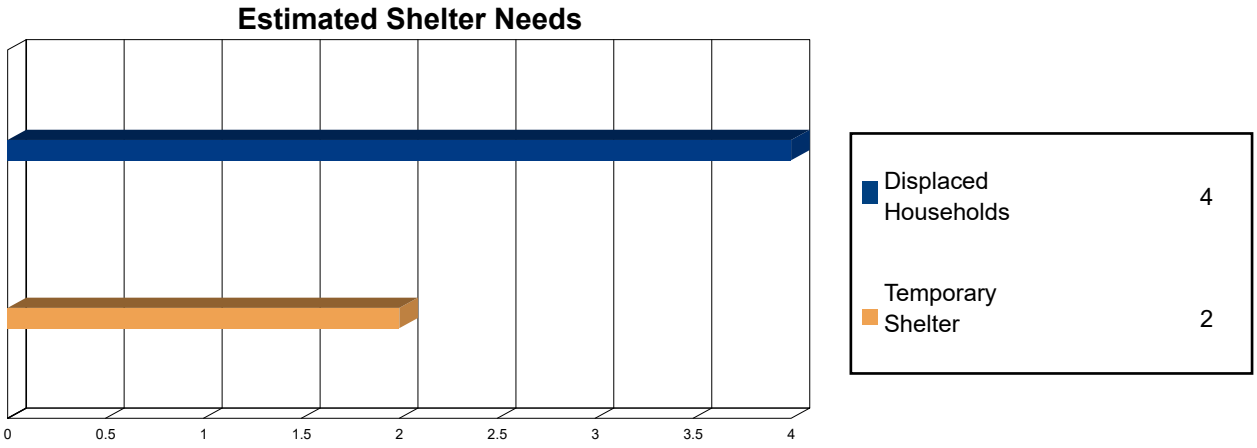


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 13,841 tons of debris will be generated. Of the total amount, 10,079 tons (73%) is Other Tree Debris. Of the remaining 3,762 tons, Brick/Wood comprises 19% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 29 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,048 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 4 households to be displaced due to the hurricane. Of these, 2 people (out of a total population of 10,255) will seek temporary shelter in public shelters.

Economic Loss

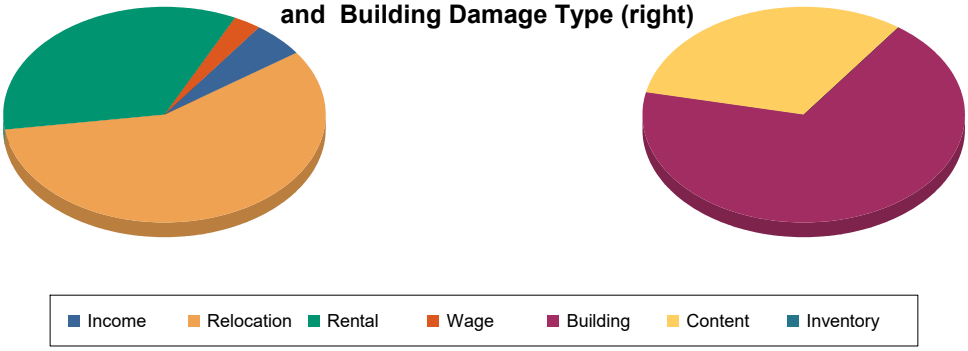
The total economic loss estimated for the hurricane is 19.2 million dollars, which represents 0.83 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 19 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

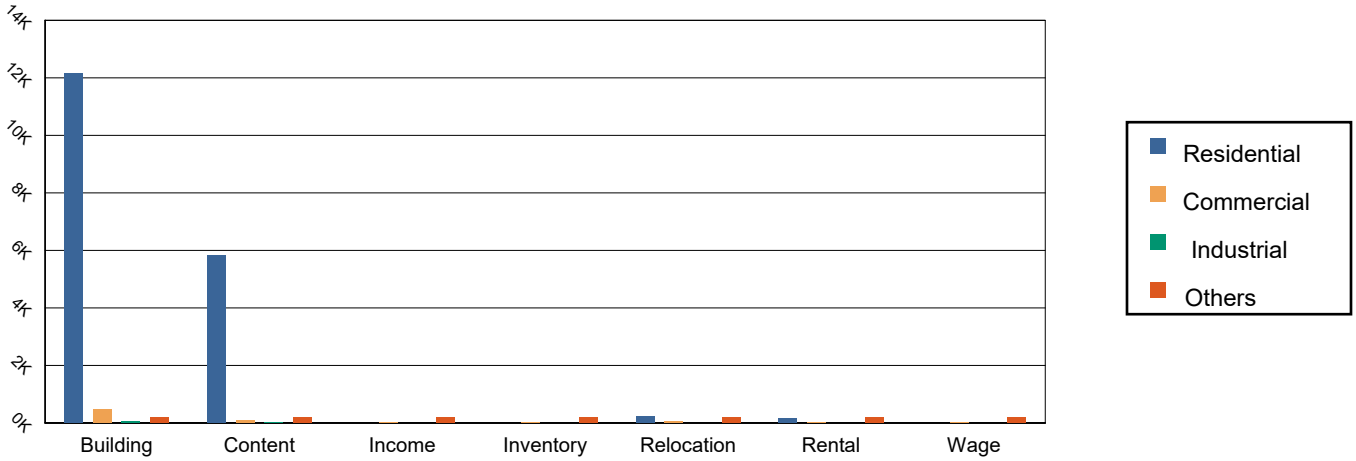


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	12,139.90	477.72	41.85	157.96	12,817.43
	Content	5,821.04	72.76	8.19	6.20	5,908.19
	Inventory	0.00	14.16	0.76	4.04	18.96
	Subtotal	**17,960.94**	**564.64**	**50.80**	**168.20**	**18,744.58**
Business Interruption Loss						
	Income	0.00	22.72	0.01	2.06	24.79
	Relocation	224.10	38.71	1.17	3.52	267.50
	Rental	151.51	9.56	0.01	0.14	161.22
	Wage	0.00	8.08	0.01	4.85	12.94
	Subtotal	**375.62**	**79.07**	**1.20**	**10.56**	**466.44**

Total

Total	**18,336.56**	**643.71**	**52.00**	**178.76**	**19,211.02**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,984	705,844	2,303,828
Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**
Study Region Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**

Hazus: Hurricane Global Risk Report

Region Name:	Somers_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.58 square miles and contains 3 census tracts. There are over 3 thousand households in the region and a total population of 10,255 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

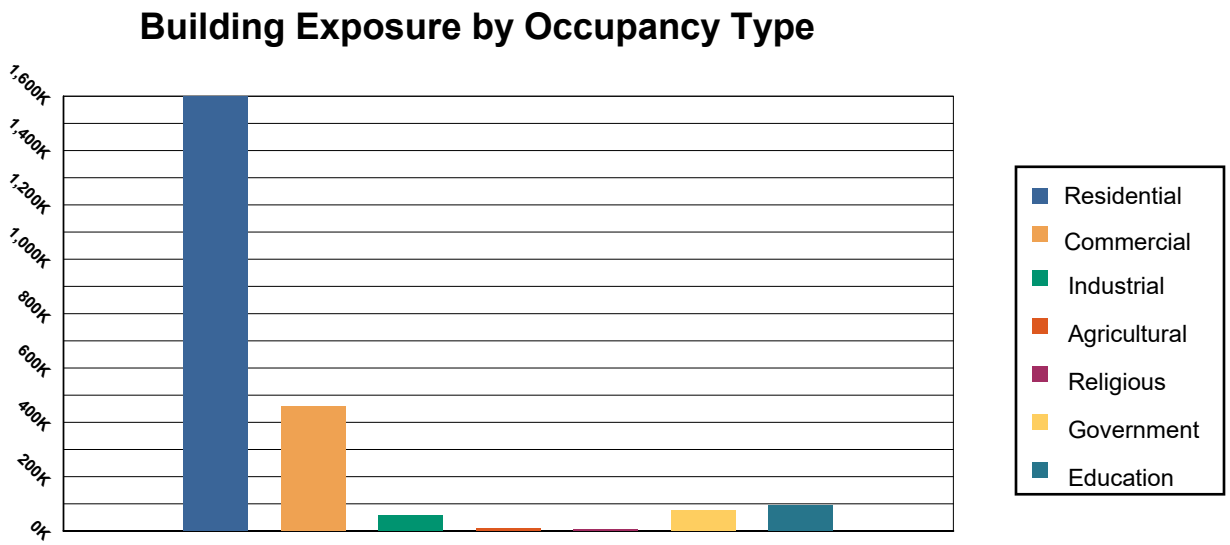


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,597,984	69.36%
Commercial	459,233	19.93%
Industrial	58,810	2.55%
Agricultural	9,497	0.41%
Religious	7,166	0.31%
Government	77,235	3.35%
Education	93,903	4.08%
Total	**2,303,828**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 42 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

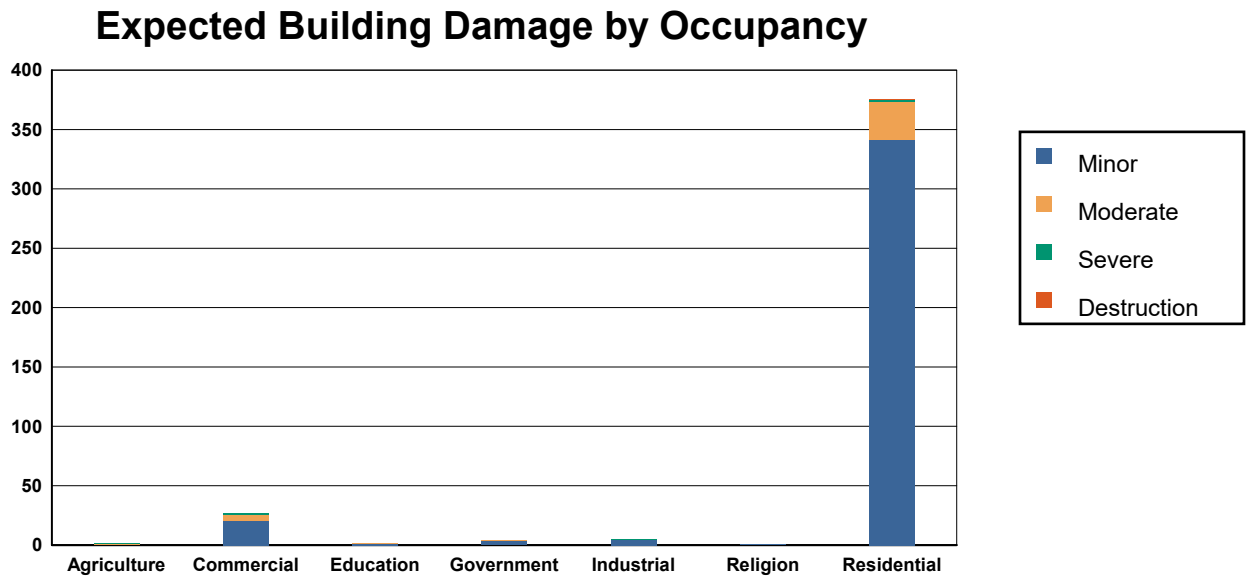


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.95	88.38	0.79	8.80	0.17	1.91	0.08	0.84	0.01	0.06
Commercial	259.20	90.63	20.35	7.12	5.49	1.92	0.96	0.34	0.00	0.00
Education	9.96	90.52	0.90	8.22	0.13	1.22	0.00	0.04	0.00	0.00
Government	56.55	92.70	3.97	6.51	0.47	0.77	0.01	0.02	0.00	0.00
Industrial	54.98	91.63	4.24	7.07	0.70	1.16	0.08	0.14	0.00	0.00
Religion	8.18	90.88	0.74	8.17	0.08	0.91	0.00	0.04	0.00	0.00
Residential	2,920.70	88.61	341.15	10.35	32.44	0.98	1.20	0.04	0.51	0.02
Total	**3,317.52**		**372.15**		**39.48**		**2.33**		**0.51**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	47	91.00	4	7.75	1	1.23	0	0.02	0	0.00
Masonry	283	89.91	26	8.21	6	1.75	0	0.12	0	0.01
MH	2	96.26	0	2.44	0	0.91	0	0.01	0	0.37
Steel	192	91.21	13	6.20	5	2.16	1	0.44	0	0.00
Wood	2,796	88.79	325	10.32	27	0.84	1	0.03	1	0.02

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

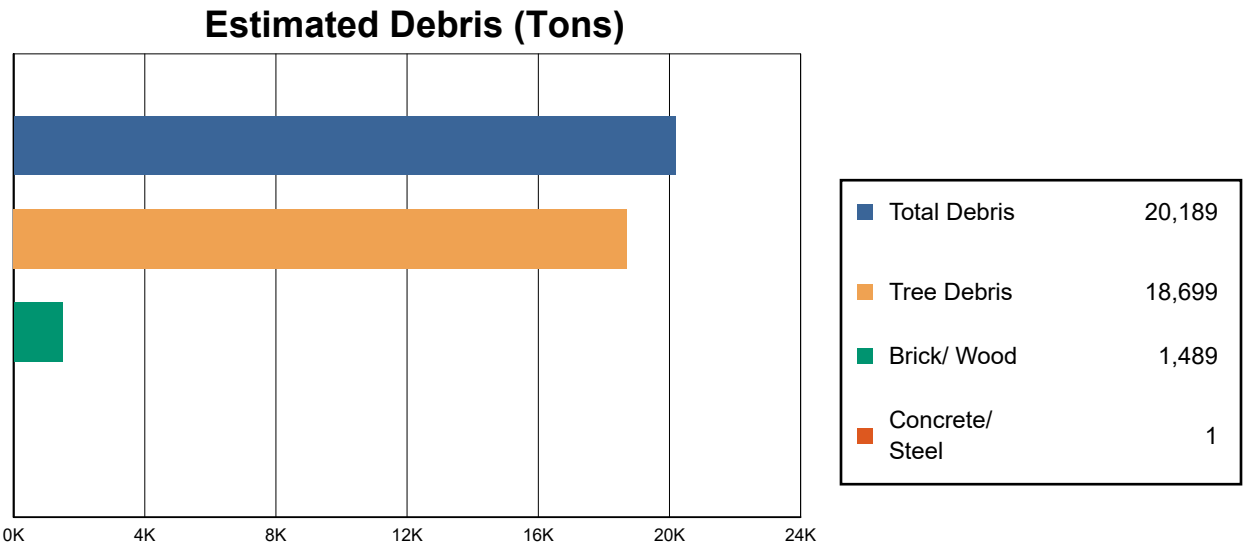
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

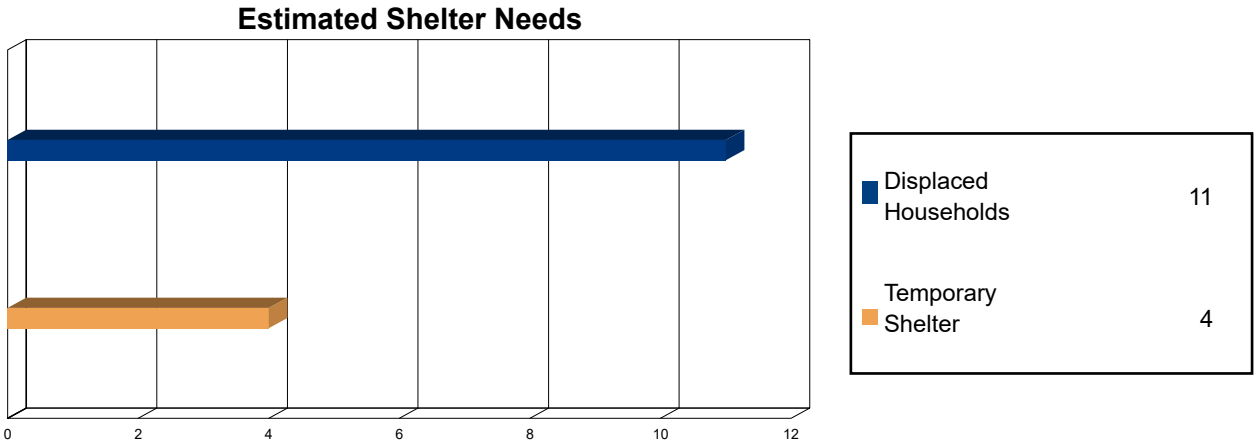


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 20,189 tons of debris will be generated. Of the total amount, 14,324 tons (71%) is Other Tree Debris. Of the remaining 5,865 tons, Brick/Wood comprises 25% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 60 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,375 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 11 households to be displaced due to the hurricane. Of these, 4 people (out of a total population of 10,255) will seek temporary shelter in public shelters.

Economic Loss

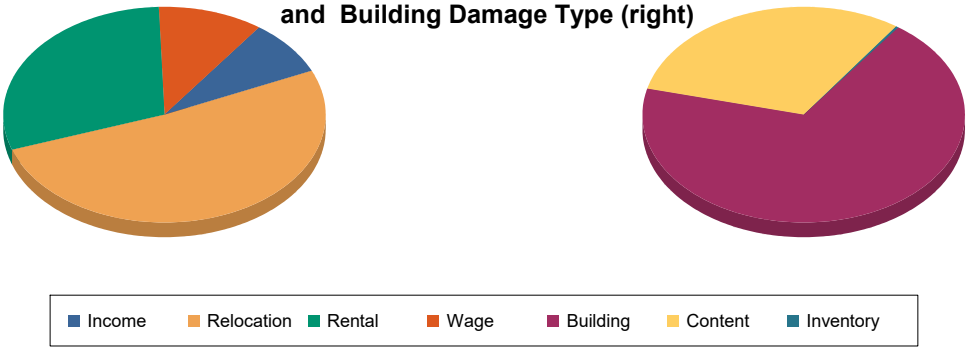
The total economic loss estimated for the hurricane is 33.4 million dollars, which represents 1.45 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 33 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 92% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

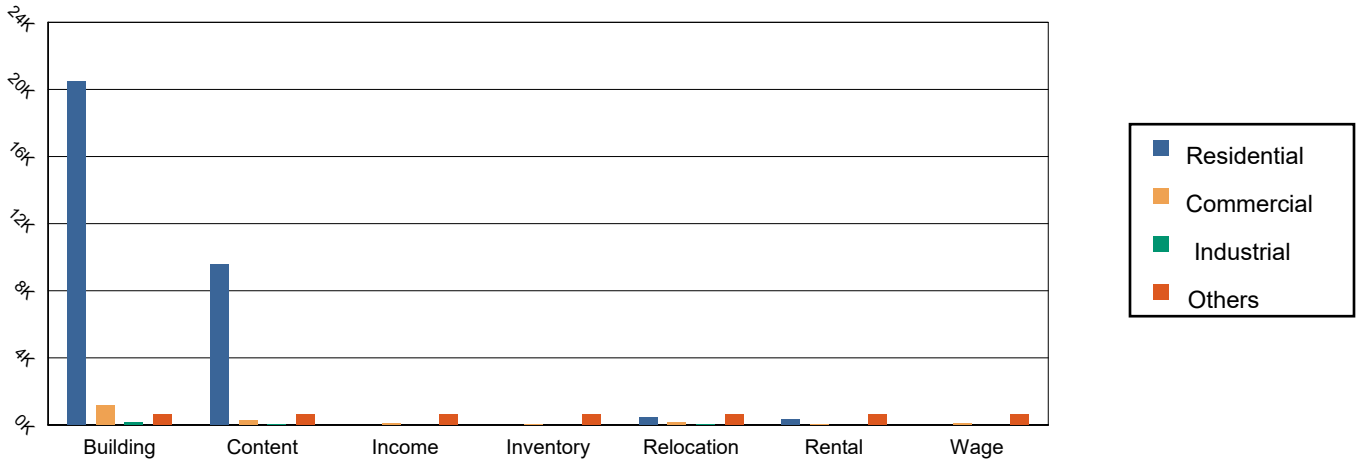


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	20,473.15	1,154.28	122.27	415.68	22,165.38
	Content	9,562.94	259.22	39.96	77.59	9,939.71
	Inventory	0.00	48.44	3.91	16.04	68.40
	Subtotal	**30,036.09**	**1,461.94**	**166.14**	**509.32**	**32,173.49**
Business Interruption Loss						
	Income	0.00	81.63	0.50	17.04	99.16
	Relocation	432.50	137.95	7.85	35.64	613.95
	Rental	304.03	49.93	0.50	1.33	355.79
	Wage	0.00	83.49	0.83	40.04	124.36
	Subtotal	**736.53**	**353.00**	**9.69**	**94.04**	**1,193.26**

Total

Total	**30,772.62**	**1,814.94**	**175.83**	**603.36**	**33,366.75**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,984	705,844	2,303,828
Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**
Study Region Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**

Hazus: Hurricane Global Risk Report

Region Name:	Somers_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.58 square miles and contains 3 census tracts. There are over 3 thousand households in the region and a total population of 10,255 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

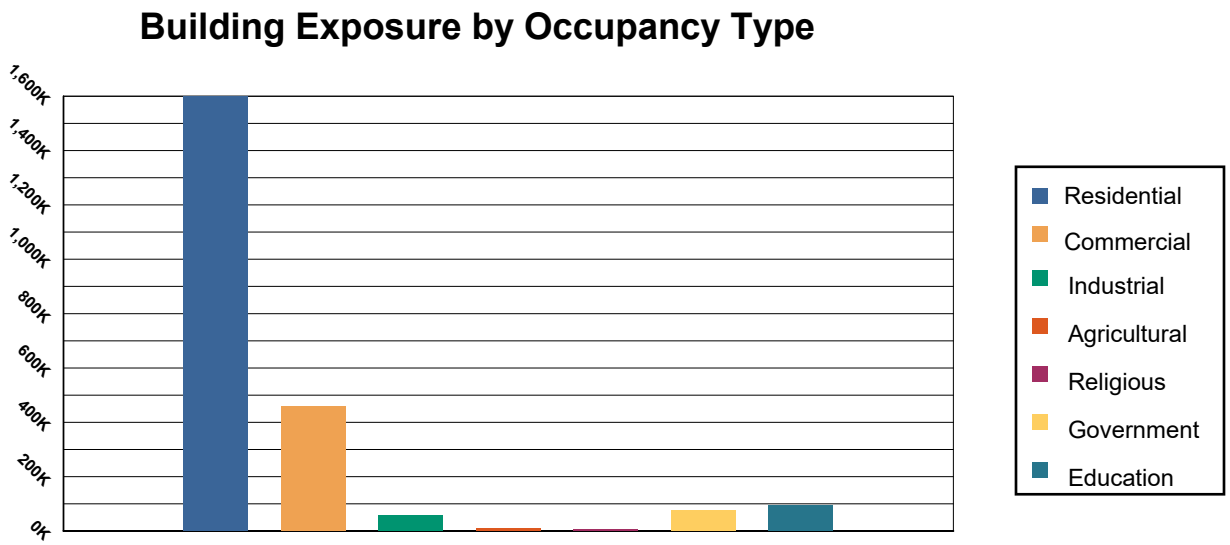


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,597,984	69.36%
Commercial	459,233	19.93%
Industrial	58,810	2.55%
Agricultural	9,497	0.41%
Religious	7,166	0.31%
Government	77,235	3.35%
Education	93,903	4.08%
Total	**2,303,828**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 124 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

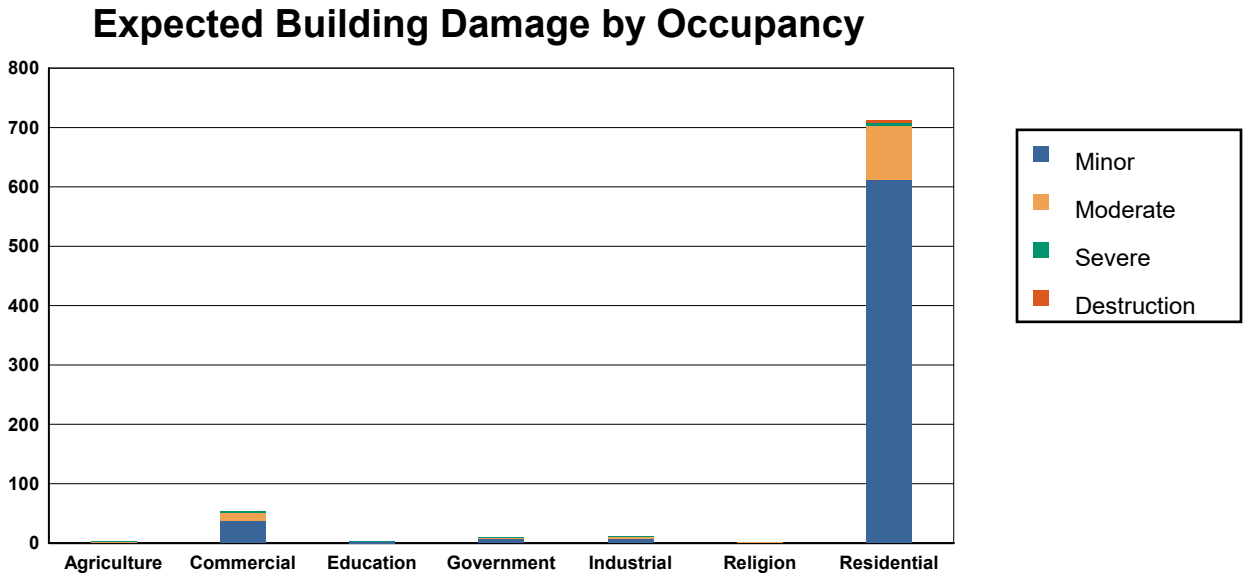


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.96	77.29	1.43	15.84	0.40	4.48	0.19	2.14	0.02	0.25
Commercial	231.20	80.84	37.58	13.14	14.02	4.90	3.20	1.12	0.02	0.01
Education	8.81	80.05	1.67	15.20	0.49	4.42	0.04	0.34	0.00	0.00
Government	51.54	84.49	7.54	12.37	1.80	2.95	0.12	0.19	0.00	0.00
Industrial	49.43	82.38	7.87	13.12	2.35	3.91	0.35	0.58	0.01	0.02
Religion	7.29	81.01	1.39	15.50	0.29	3.26	0.02	0.23	0.00	0.00
Residential	2,583.24	78.37	612.50	18.58	90.94	2.76	5.31	0.16	4.01	0.12
Total	**2,938.45**		**669.98**		**110.28**		**9.22**		**4.06**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	42	81.26	7	14.05	2	4.45	0	0.24	0	0.00
Masonry	253	80.43	46	14.53	14	4.60	1	0.39	0	0.04
MH	2	90.04	0	5.53	0	3.06	0	0.10	0	1.27
Steel	172	81.73	24	11.37	11	5.39	3	1.49	0	0.01
Wood	2,473	78.54	589	18.71	78	2.49	5	0.15	4	0.11

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

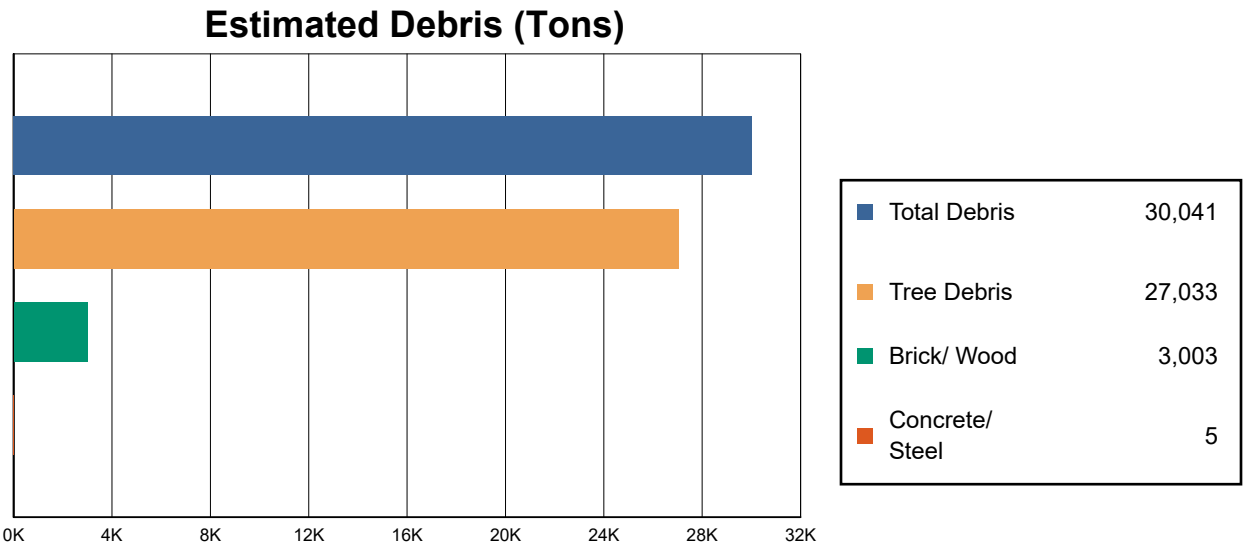
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

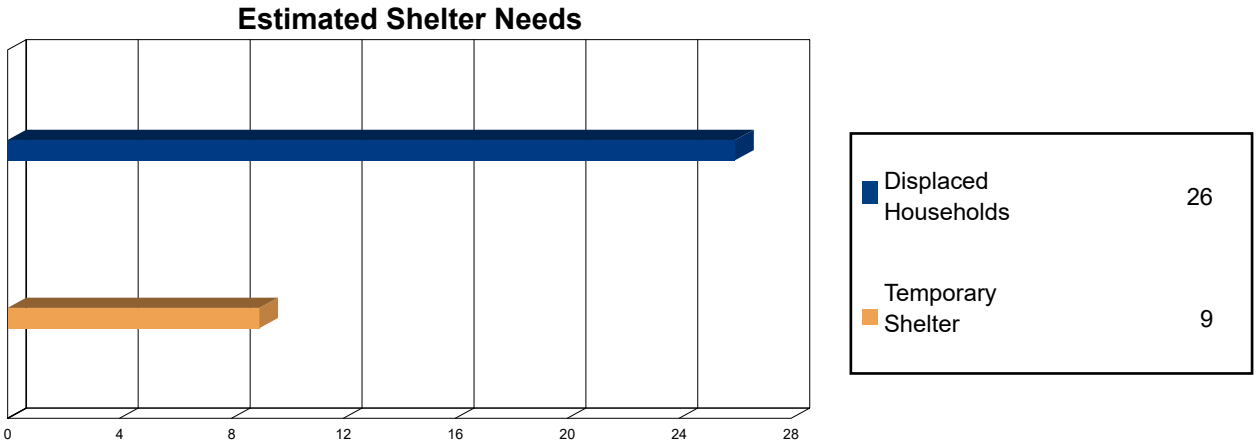


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 30,041 tons of debris will be generated. Of the total amount, 20,686 tons (69%) is Other Tree Debris. Of the remaining 9,355 tons, Brick/Wood comprises 32% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 120 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,347 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 26 households to be displaced due to the hurricane. Of these, 9 people (out of a total population of 10,255) will seek temporary shelter in public shelters.

Economic Loss

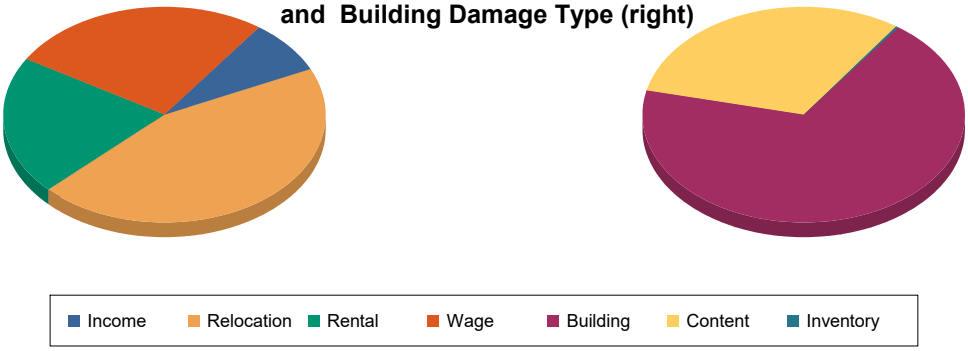
The total economic loss estimated for the hurricane is 62.0 million dollars, which represents 2.69 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 62 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

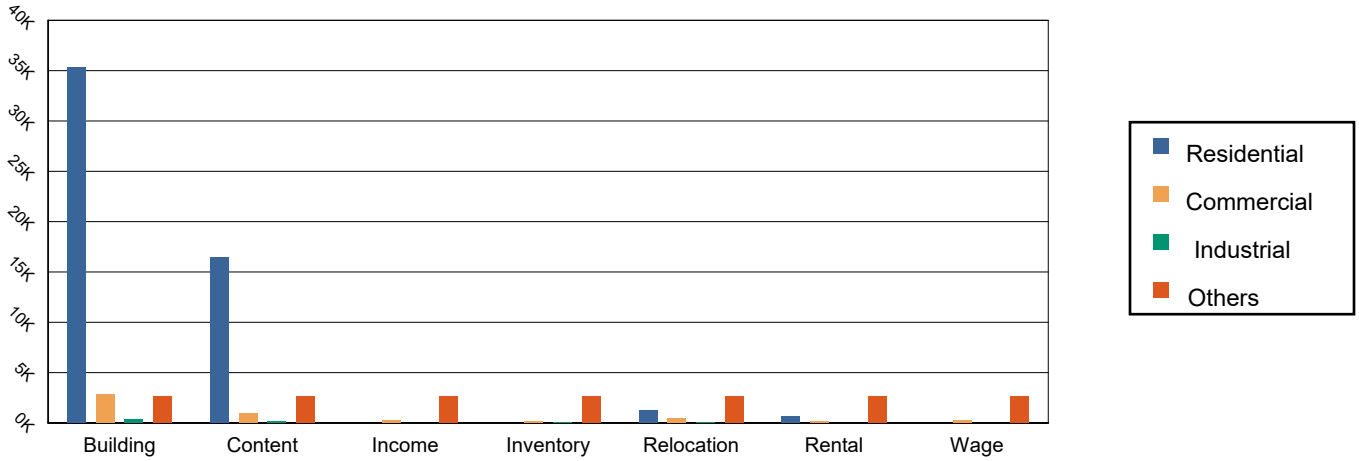


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	35,335.03	2,824.55	335.42	1,088.05	39,583.06
	Content	16,421.64	935.87	169.79	344.61	17,871.91
	Inventory	0.00	166.26	16.91	46.29	229.46
	Subtotal	**51,756.67**	**3,926.68**	**522.12**	**1,478.95**	**57,684.43**
Business Interruption Loss						
	Income	0.00	262.26	3.90	78.28	344.44
	Relocation	1,273.01	422.87	33.97	193.14	1,922.98
	Rental	690.49	180.43	3.41	26.83	901.17
	Wage	0.00	288.32	6.75	841.36	1,136.44
	Subtotal	**1,963.50**	**1,153.88**	**48.03**	**1,139.62**	**4,305.02**

Total

Total	**53,720.17**	**5,080.56**	**570.15**	**2,618.56**	**61,989.45**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,984	705,844	2,303,828
Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**
Study Region Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**

Hazus: Hurricane Global Risk Report

Region Name:	Somers_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.58 square miles and contains 3 census tracts. There are over 3 thousand households in the region and a total population of 10,255 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,304 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,732 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

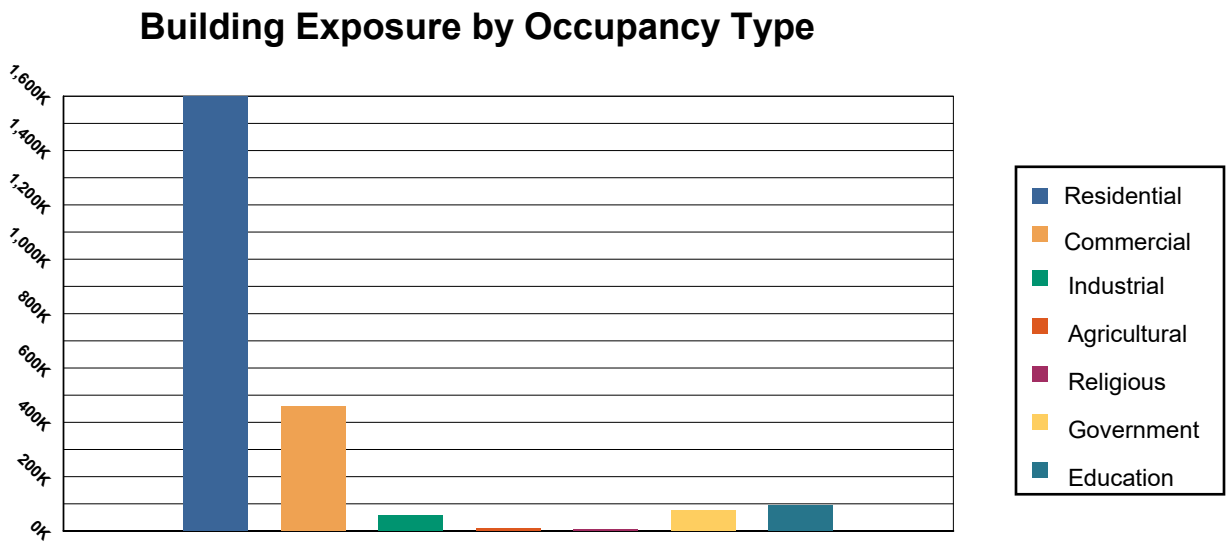


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,597,984	69.36%
Commercial	459,233	19.93%
Industrial	58,810	2.55%
Agricultural	9,497	0.41%
Religious	7,166	0.31%
Government	77,235	3.35%
Education	93,903	4.08%
Total	**2,303,828**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 233 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 10 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

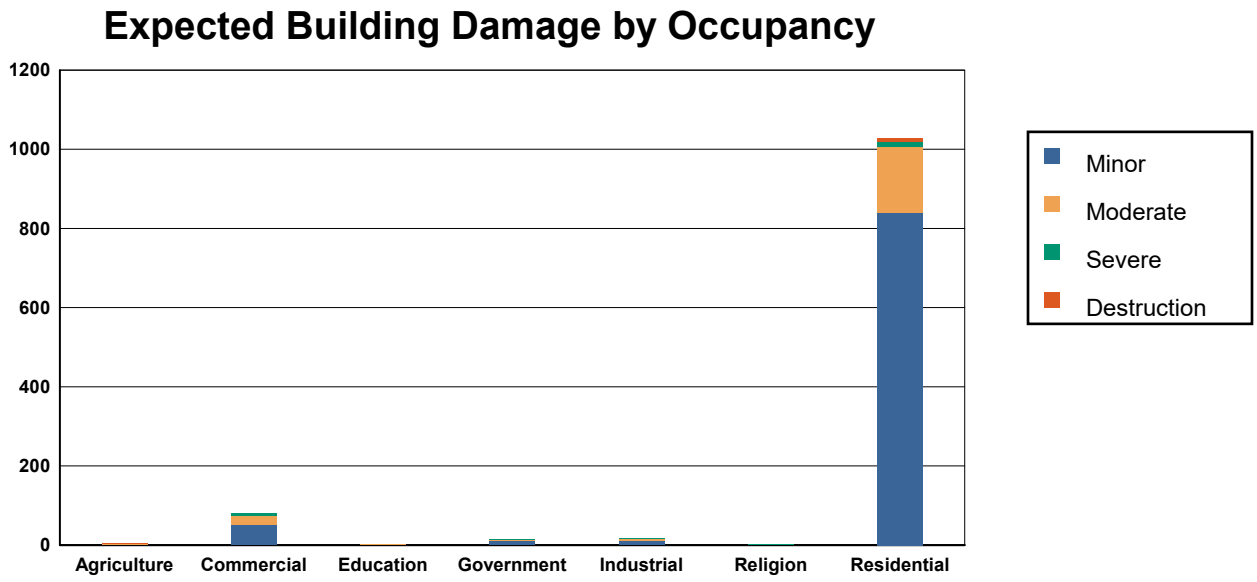


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.06	67.39	1.92	21.33	0.65	7.26	0.32	3.52	0.04	0.50
Commercial	205.23	71.76	50.45	17.64	23.73	8.30	6.55	2.29	0.05	0.02
Education	7.96	72.41	2.09	19.02	0.84	7.68	0.10	0.89	0.00	0.00
Government	45.81	75.09	10.95	17.95	3.88	6.36	0.36	0.60	0.00	0.00
Industrial	44.06	73.43	10.72	17.86	4.44	7.39	0.76	1.27	0.02	0.04
Religion	6.50	72.19	1.89	20.95	0.56	6.23	0.06	0.63	0.00	0.00
Residential	2,266.23	68.76	839.00	25.46	166.00	5.04	14.68	0.45	10.09	0.31
Total	**2,581.85**		**917.02**		**200.10**		**22.83**		**10.21**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	38	72.51	10	18.61	4	8.18	0	0.70	0	0.00
Masonry	225	71.43	62	19.59	25	8.05	3	0.84	0	0.09
MH	2	84.49	0	7.73	0	5.23	0	0.29	0	2.25
Steel	153	72.64	32	15.23	19	8.99	7	3.11	0	0.03
Wood	2,169	68.87	811	25.76	147	4.67	13	0.42	9	0.29

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

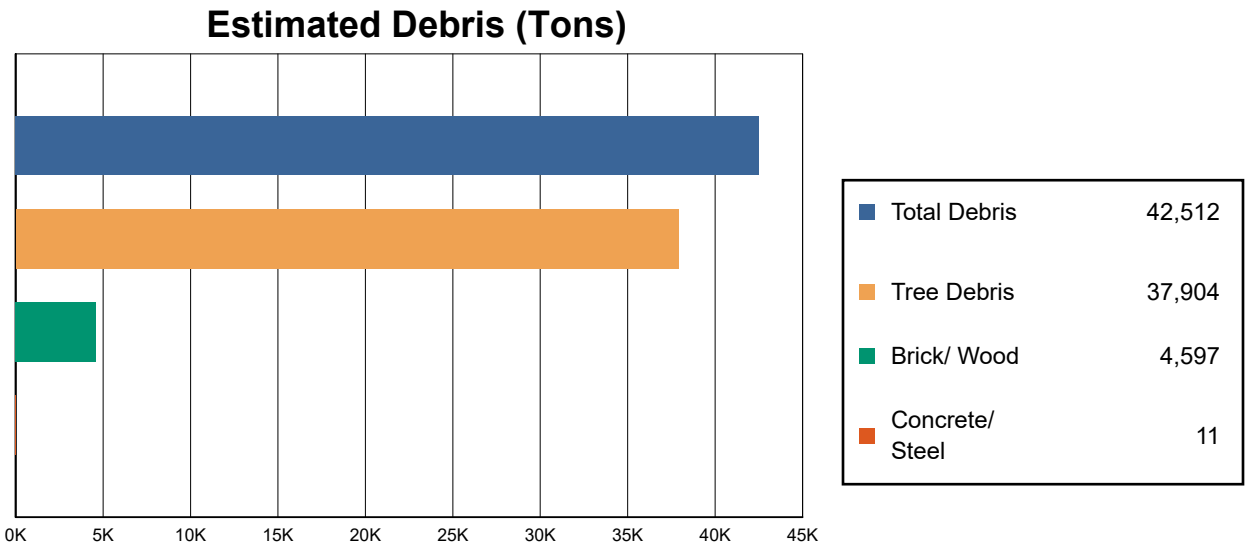
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

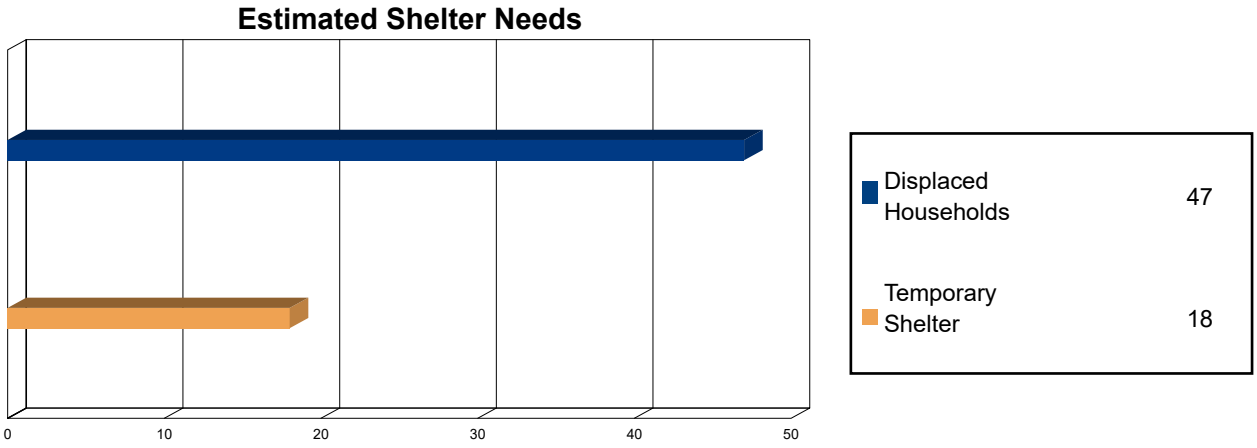


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 42,512 tons of debris will be generated. Of the total amount, 29,111 tons (68%) is Other Tree Debris. Of the remaining 13,401 tons, Brick/Wood comprises 34% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 184 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 8,793 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 47 households to be displaced due to the hurricane. Of these, 18 people (out of a total population of 10,255) will seek temporary shelter in public shelters.

Economic Loss

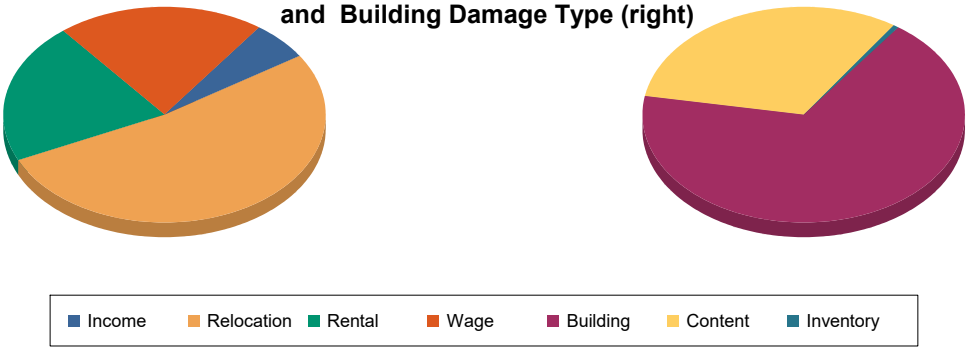
The total economic loss estimated for the hurricane is 96.4 million dollars, which represents 4.18 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 96 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 85% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

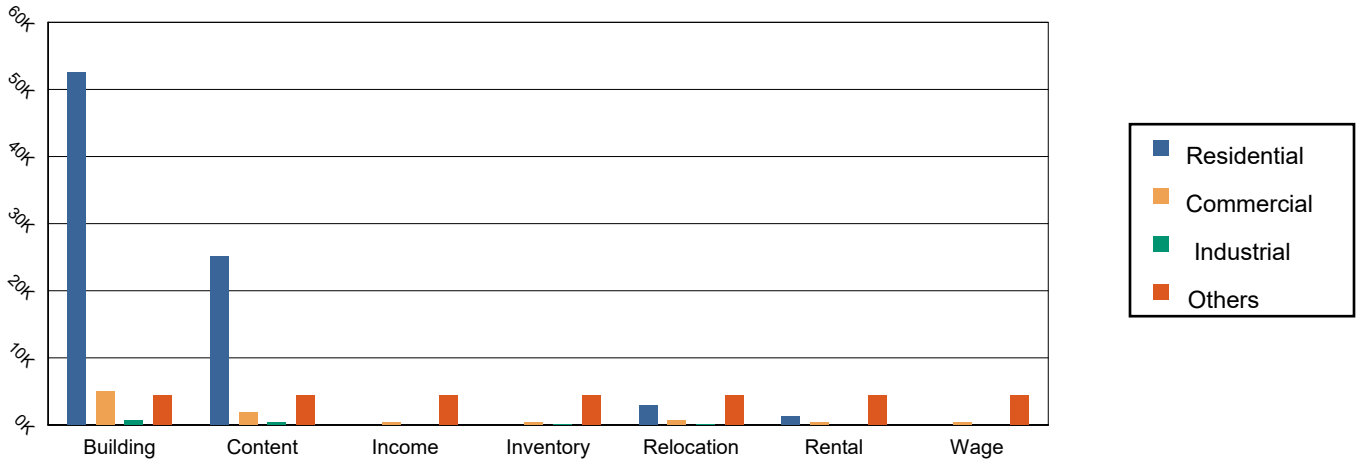


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	52,549.90	5,041.93	613.77	1,903.93	60,109.54
	Content	25,045.52	1,941.06	338.46	691.34	28,016.38
	Inventory	0.00	377.66	34.04	77.14	488.84
	Subtotal	**77,595.42**	**7,360.66**	**986.26**	**2,672.41**	**88,614.76**
Business Interruption Loss						
	Income	0.00	340.21	5.26	116.60	462.08
	Relocation	2,862.24	745.21	65.43	363.10	4,035.98
	Rental	1,248.96	317.83	6.23	49.15	1,622.17
	Wage	0.00	389.31	9.18	1,224.82	1,623.31
	Subtotal	**4,111.21**	**1,792.57**	**86.09**	**1,753.68**	**7,743.55**

Total

Total	**81,706.63**	**9,153.23**	**1,072.36**	**4,426.08**	**96,358.30**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	10,255	1,597,984	705,844	2,303,828
Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**
Study Region Total	**10,255**	**1,597,984**	**705,844**	**2,303,828**

Hazus: Hurricane Global Risk Report

Region Name:	Southington_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 36.62 square miles and contains 12 census tracts. There are over 17 thousand households in the region and a total population of 43,501 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 15 thousand buildings in the region with a total building replacement value (excluding contents) of 8,844 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 15,820 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

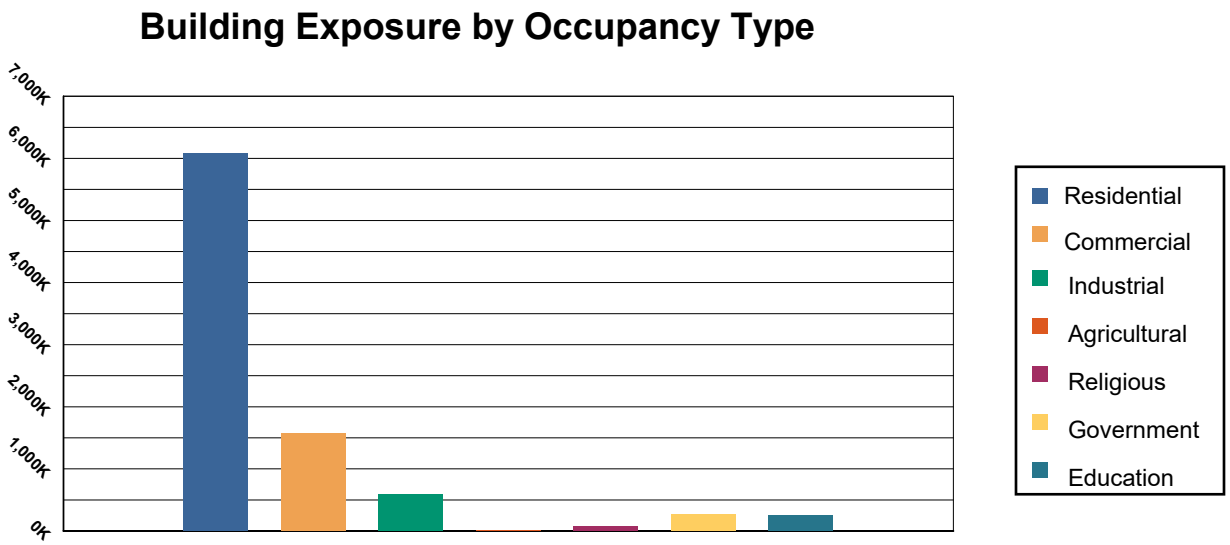


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	6,079,184	68.74%
Commercial	1,571,988	17.77%
Industrial	587,373	6.64%
Agricultural	16,304	0.18%
Religious	73,688	0.83%
Government	263,667	2.98%
Education	251,903	2.85%
Total	**8,844,107**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 15 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

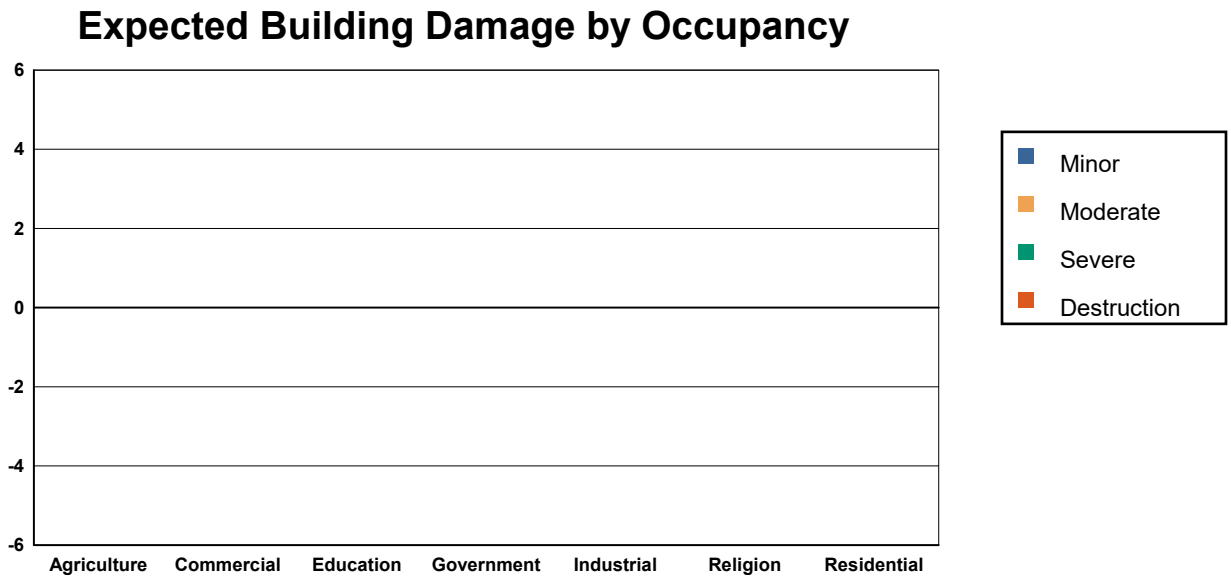


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	47.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1,120.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	27.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	278.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	350.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	63.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	13,935.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**15,820.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	257	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	1,472	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	322	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	941	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	12,821	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

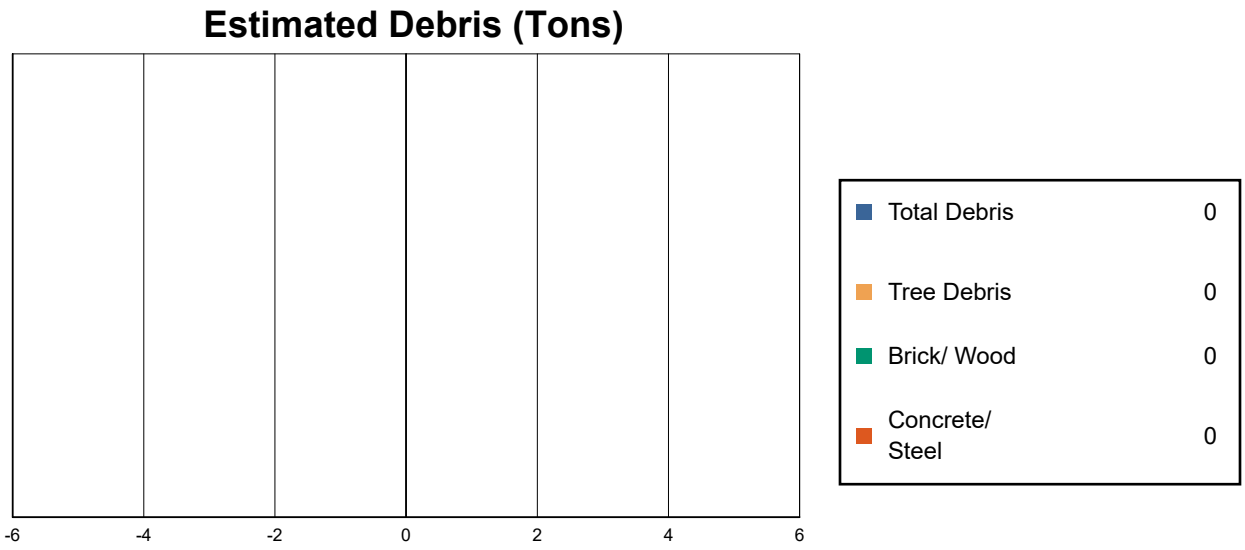
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	15	0	0	15

Induced Hurricane Damage

Debris Generation

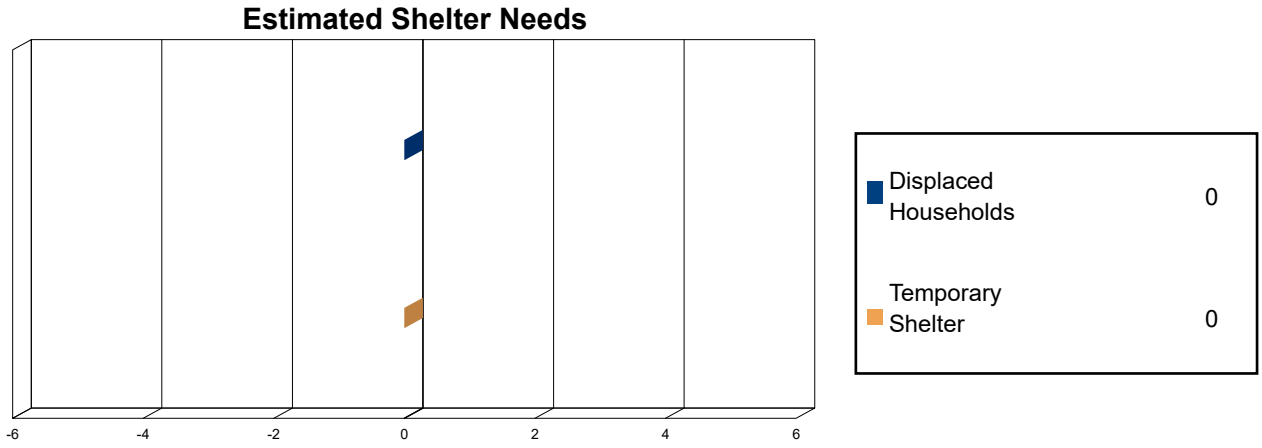


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 43,501) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

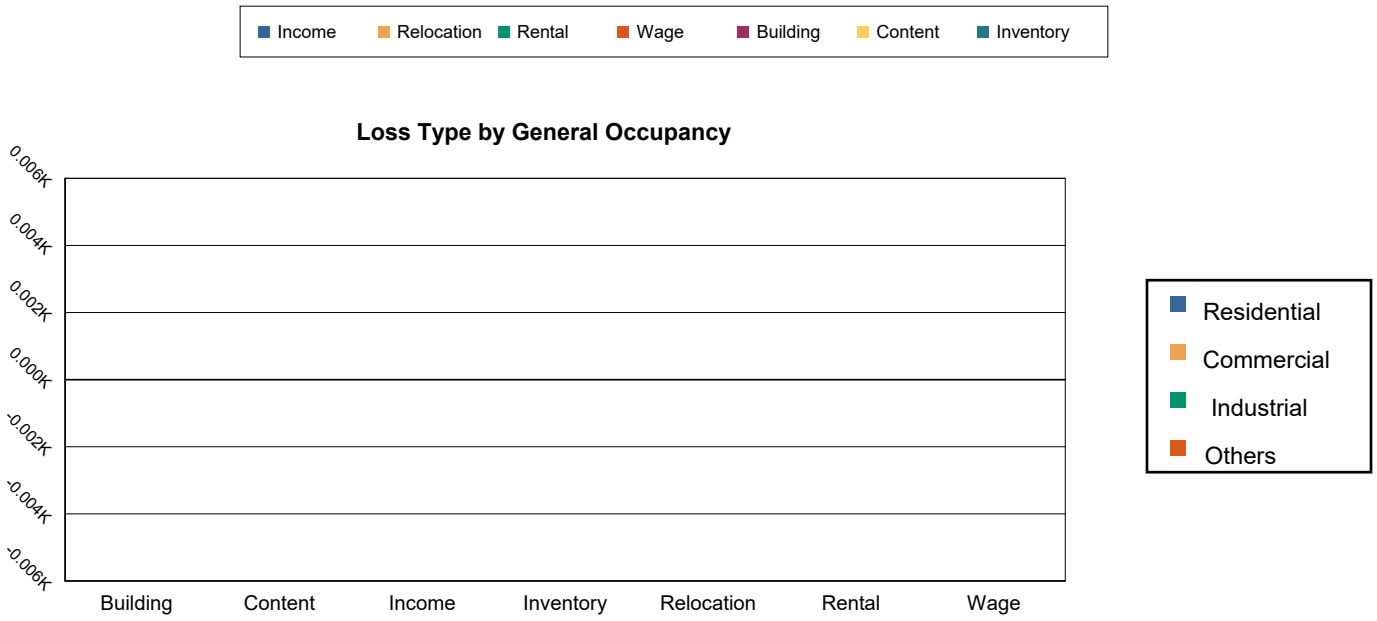


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,079,184	2,764,923	8,844,107
Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**
Study Region Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**

Hazus: Hurricane Global Risk Report

Region Name:	Southington_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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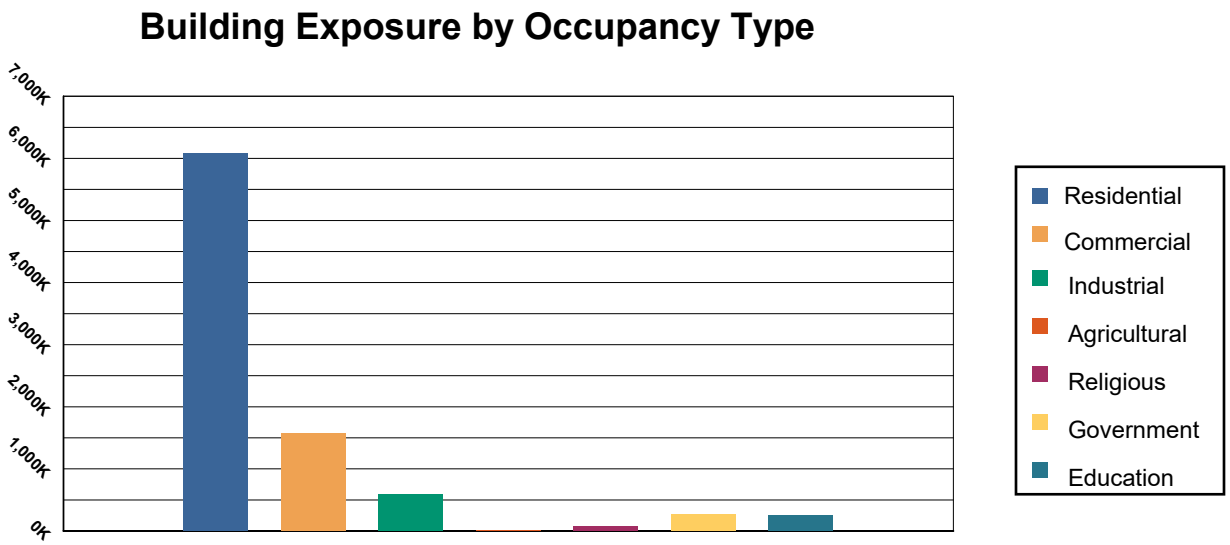

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Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 15 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

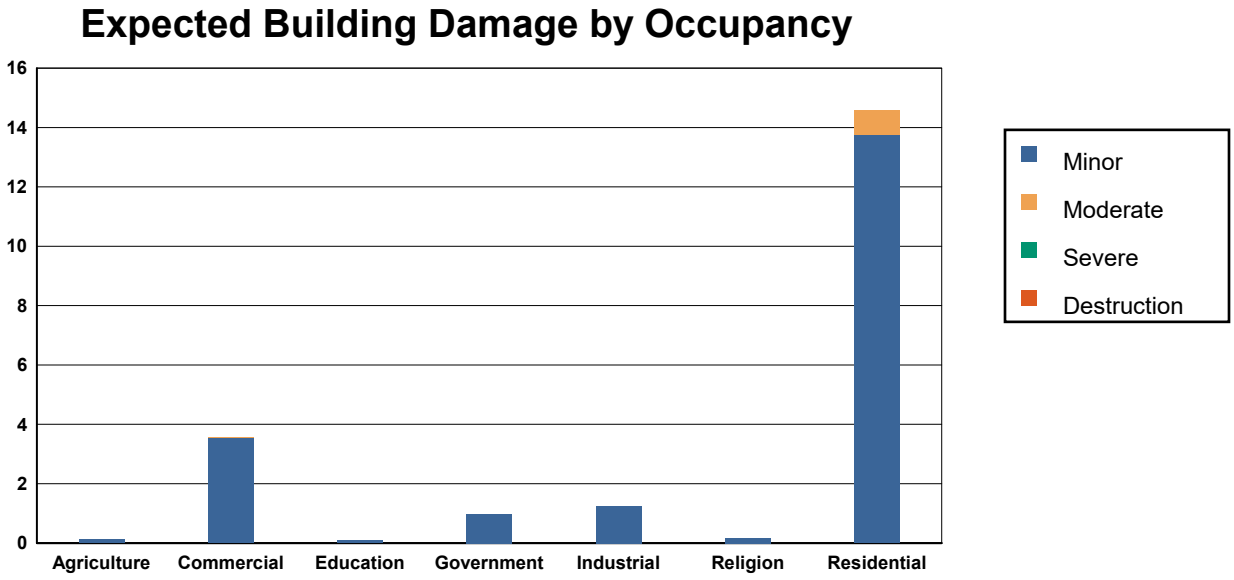


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	46.89	99.76	0.11	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1,116.43	99.68	3.57	0.32	0.01	0.00	0.00	0.00	0.00	0.00
Education	26.91	99.67	0.09	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Government	277.02	99.65	0.98	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	348.75	99.64	1.25	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Religion	62.83	99.73	0.17	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Residential	13,920.43	99.90	13.76	0.10	0.81	0.01	0.00	0.00	0.00	0.00
Total	**15,799.26**		**19.93**		**0.82**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	256	99.59	1	0.41	0	0.00	0	0.00	0	0.00
Masonry	1,465	99.51	7	0.47	0	0.02	0	0.00	0	0.00
MH	322	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	938	99.65	3	0.35	0	0.00	0	0.00	0	0.00
Wood	12,815	99.96	5	0.04	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

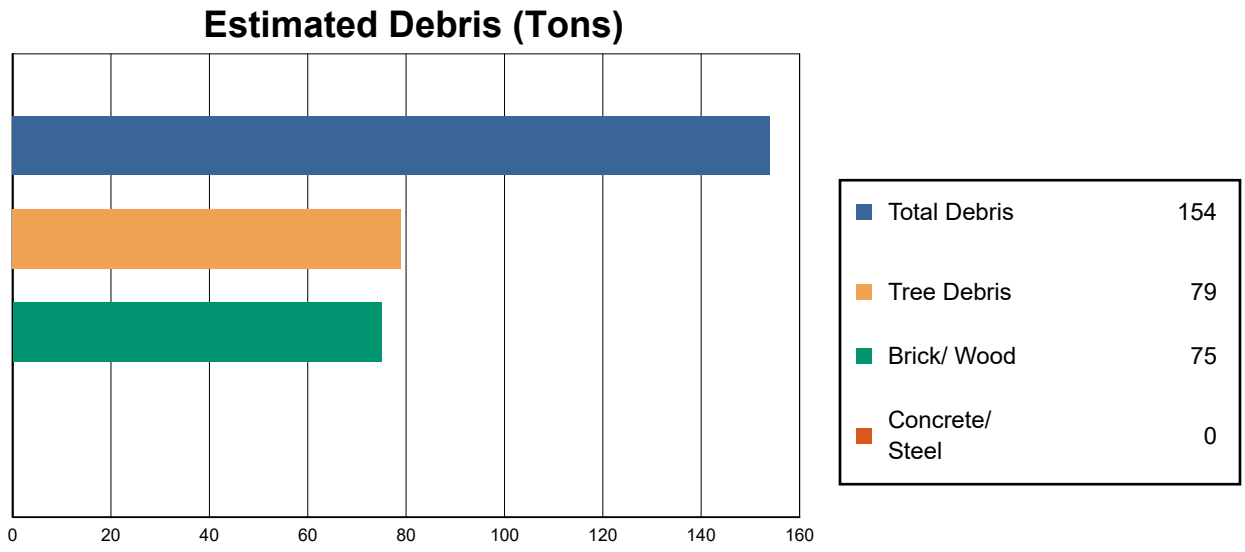
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	15	0	0	15

Induced Hurricane Damage

Debris Generation

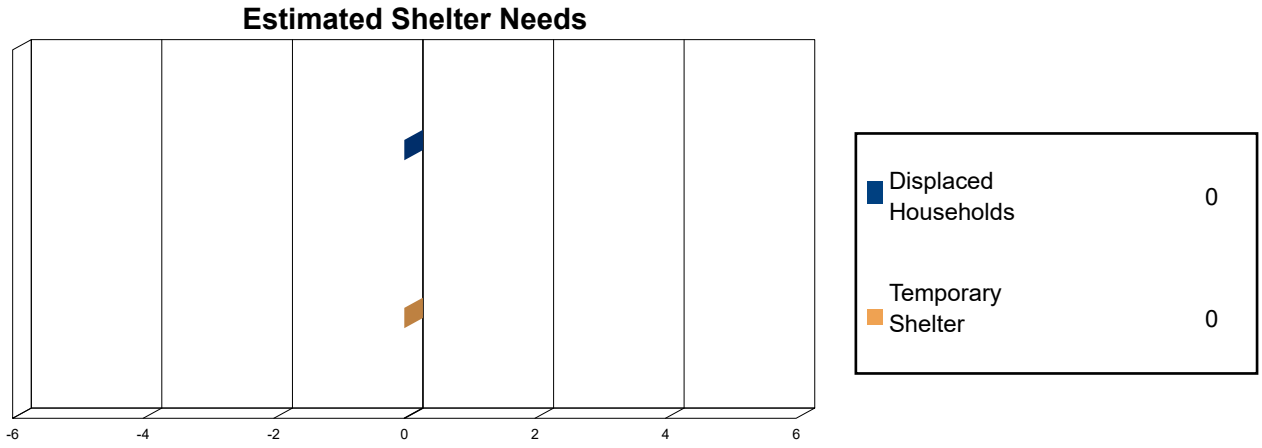


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 154 tons of debris will be generated. Of the total amount, 29 tons (19%) is Other Tree Debris. Of the remaining 125 tons, Brick/Wood comprises 60% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 50 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 43,501) will seek temporary shelter in public shelters.

Economic Loss

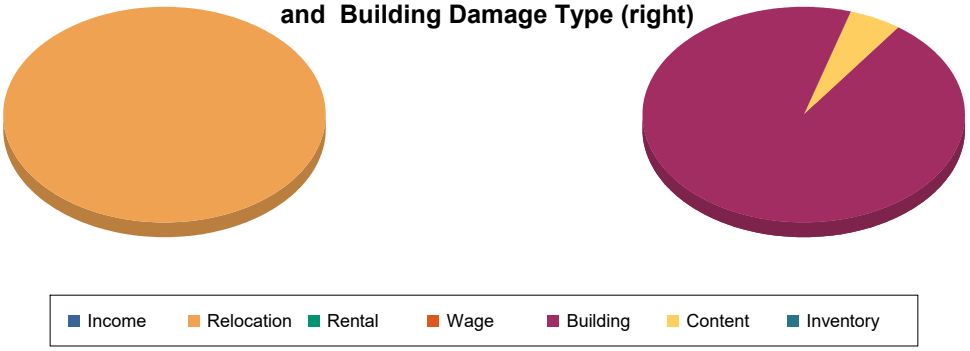
The total economic loss estimated for the hurricane is 2.1 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

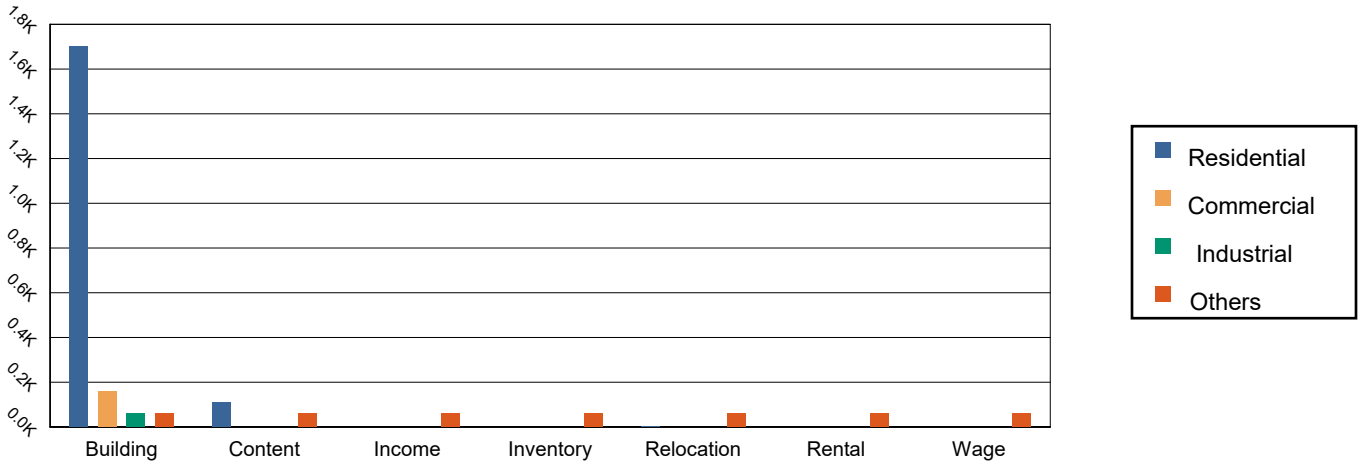


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,702.16	157.20	58.74	58.93	1,977.02
	Content	108.35	0.00	0.00	0.00	108.35
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,810.50**	**157.20**	**58.74**	**58.93**	**2,085.36**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	1.88	0.05	0.00	0.00	1.93
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1.88**	**0.05**	**0.00**	**0.00**	**1.93**

Total

Total	**1,812.38**	**157.25**	**58.74**	**58.93**	**2,087.29**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,079,184	2,764,923	8,844,107
Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**
Study Region Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**

Hazus: Hurricane Global Risk Report

Region Name: Southington_HU

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 36.62 square miles and contains 12 census tracts. There are over 17 thousand households in the region and a total population of 43,501 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 15 thousand buildings in the region with a total building replacement value (excluding contents) of 8,844 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 15,820 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

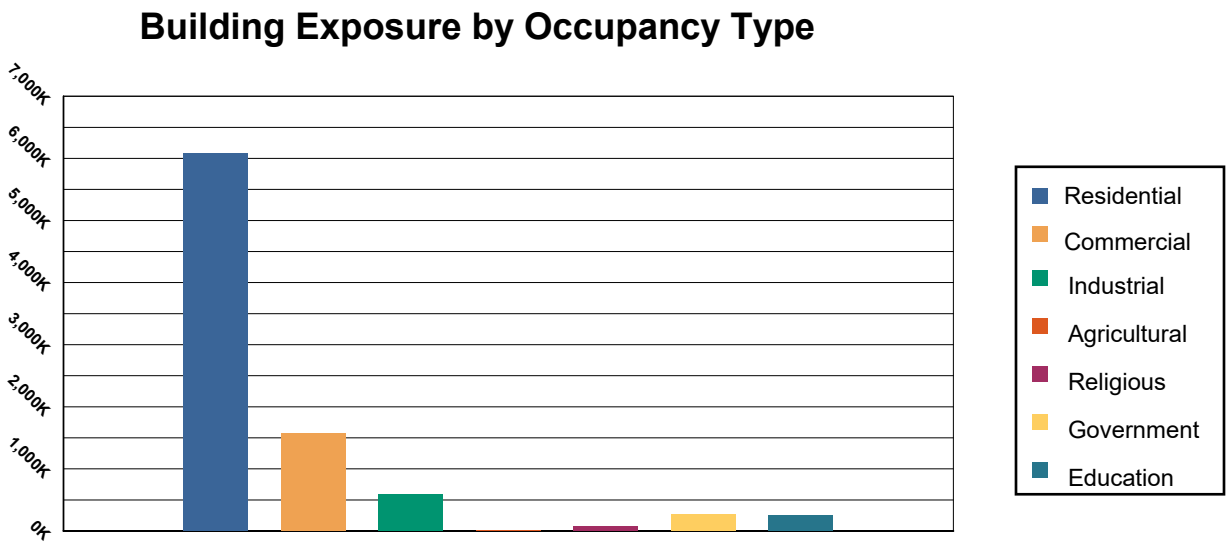


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	6,079,184	68.74%
Commercial	1,571,988	17.77%
Industrial	587,373	6.64%
Agricultural	16,304	0.18%
Religious	73,688	0.83%
Government	263,667	2.98%
Education	251,903	2.85%
Total	**8,844,107**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 15 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 25 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

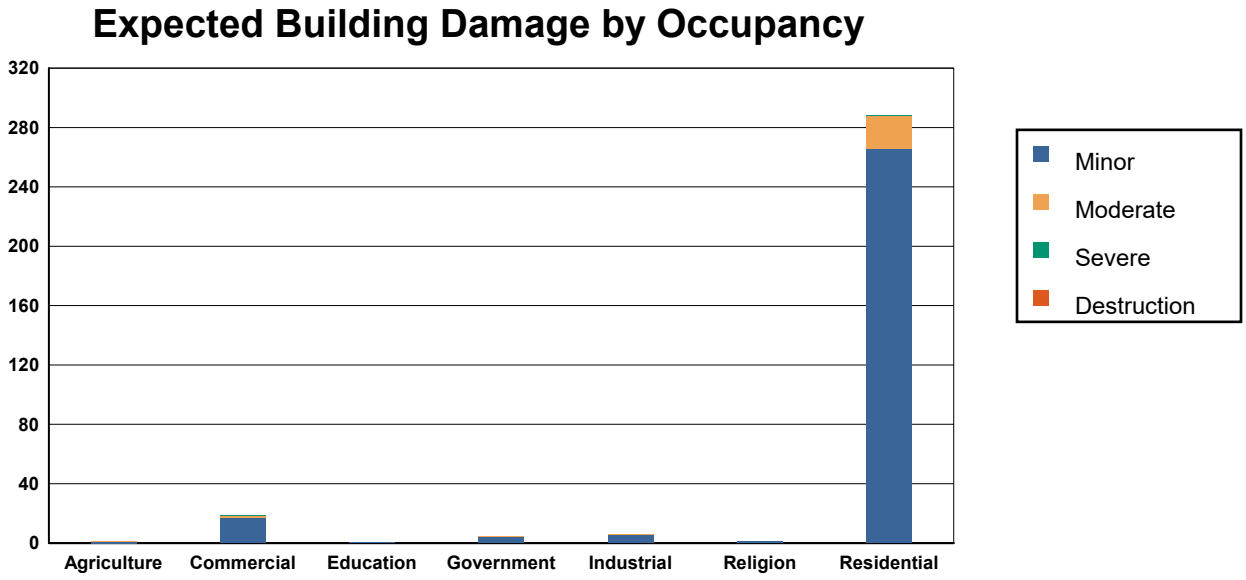


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	46.10	98.09	0.79	1.68	0.08	0.18	0.02	0.05	0.00	0.00
Commercial	1,101.08	98.31	17.16	1.53	1.69	0.15	0.07	0.01	0.00	0.00
Education	26.57	98.41	0.42	1.56	0.01	0.03	0.00	0.00	0.00	0.00
Government	273.61	98.42	4.31	1.55	0.08	0.03	0.00	0.00	0.00	0.00
Industrial	343.87	98.25	5.76	1.65	0.31	0.09	0.06	0.02	0.00	0.00
Religion	62.07	98.53	0.90	1.43	0.03	0.04	0.00	0.00	0.00	0.00
Residential	13,646.86	97.93	265.39	1.90	22.05	0.16	0.67	0.00	0.02	0.00
Total	**15,500.17**		**294.74**		**24.24**		**0.83**		**0.02**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	252	98.15	5	1.82	0	0.03	0	0.00	0	0.00
Masonry	1,425	96.78	39	2.64	8	0.56	0	0.02	0	0.00
MH	322	99.85	0	0.11	0	0.03	0	0.00	0	0.01
Steel	925	98.35	14	1.51	1	0.14	0	0.01	0	0.00
Wood	12,595	98.24	218	1.70	7	0.06	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

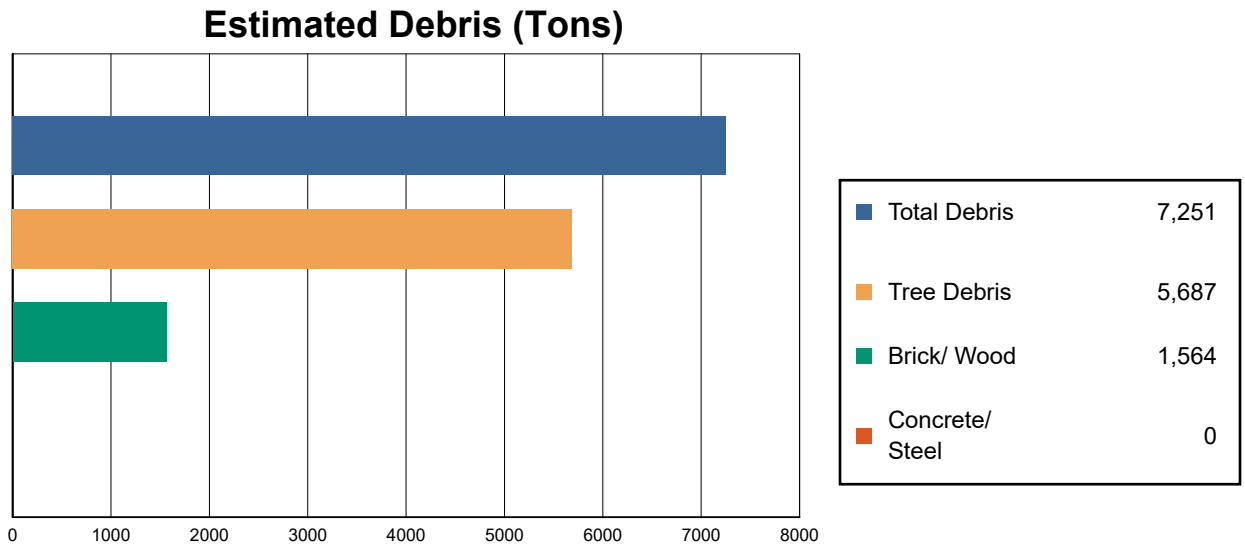
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	15	0	0	15

Induced Hurricane Damage

Debris Generation

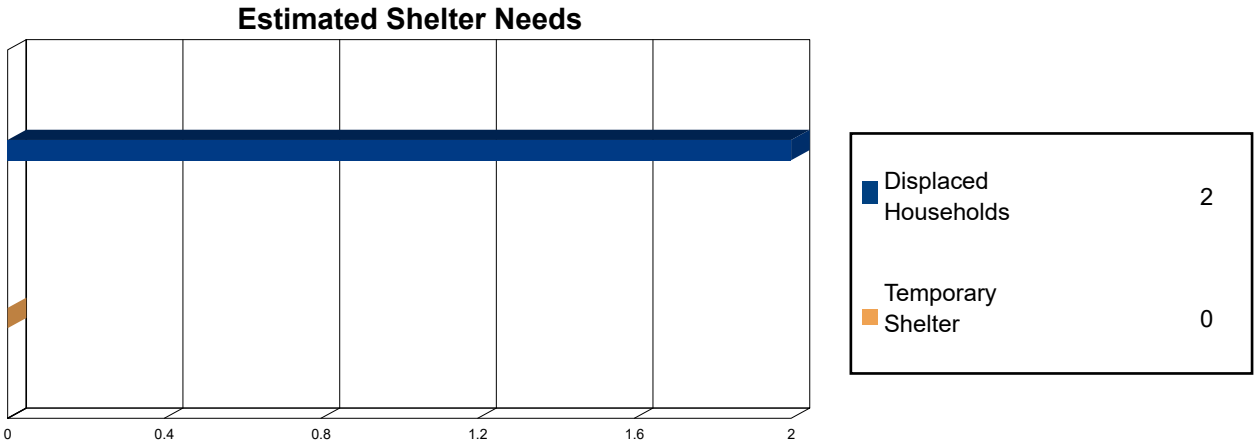


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7,251 tons of debris will be generated. Of the total amount, 2,680 tons (37%) is Other Tree Debris. Of the remaining 4,571 tons, Brick/Wood comprises 34% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 63 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,007 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 43,501) will seek temporary shelter in public shelters.

Economic Loss

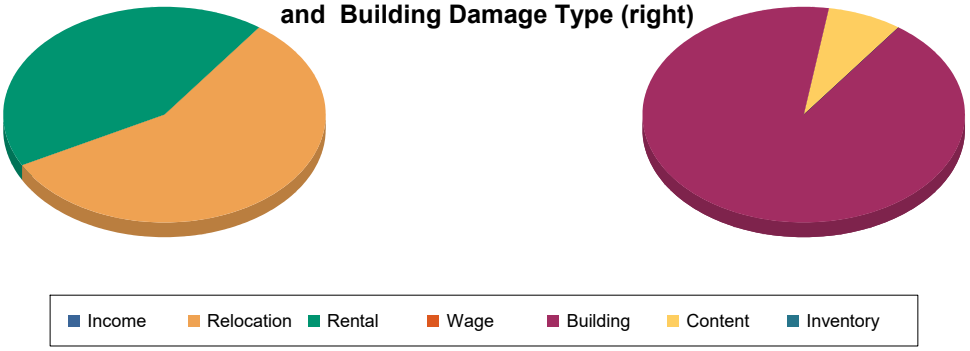
The total economic loss estimated for the hurricane is 21.6 million dollars, which represents 0.24 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 22 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

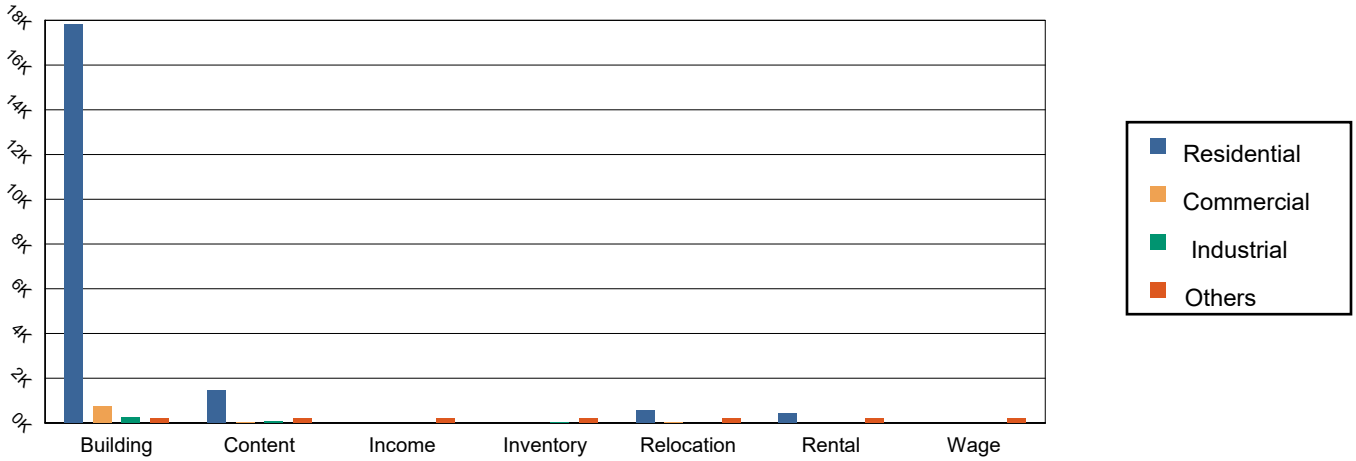


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	17,827.49	760.88	241.66	215.60	19,045.62
	Content	1,457.25	29.47	50.89	1.55	1,539.16
	Inventory	0.00	2.07	7.04	1.14	10.25
	Subtotal	**19,284.75**	**792.41**	**299.59**	**218.29**	**20,595.04**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	541.73	17.04	0.93	1.33	561.04
	Rental	418.73	0.00	0.00	0.00	418.73
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**960.46**	**17.04**	**0.93**	**1.33**	**979.77**

Total

Total	**20,245.20**	**809.45**	**300.52**	**219.63**	**21,574.80**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,079,184	2,764,923	8,844,107
Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**
Study Region Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**

Hazus: Hurricane Global Risk Report

Region Name:	Southington_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
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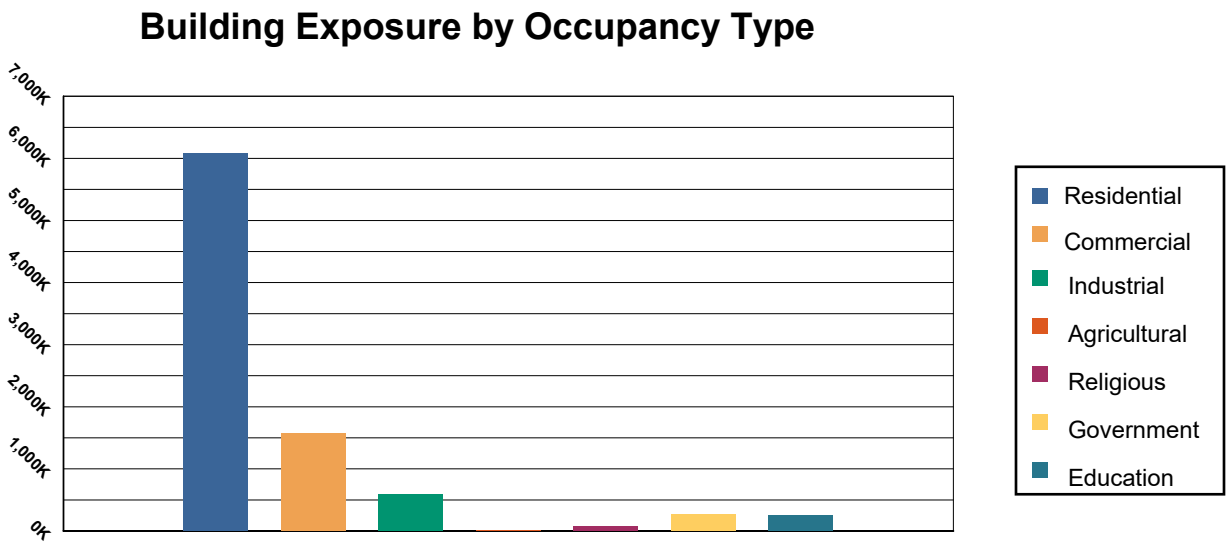

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Agricultural	16,304	0.18%
Religious	73,688	0.83%
Government	263,667	2.98%
Education	251,903	2.85%
Total	**8,844,107**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 15 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 127 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

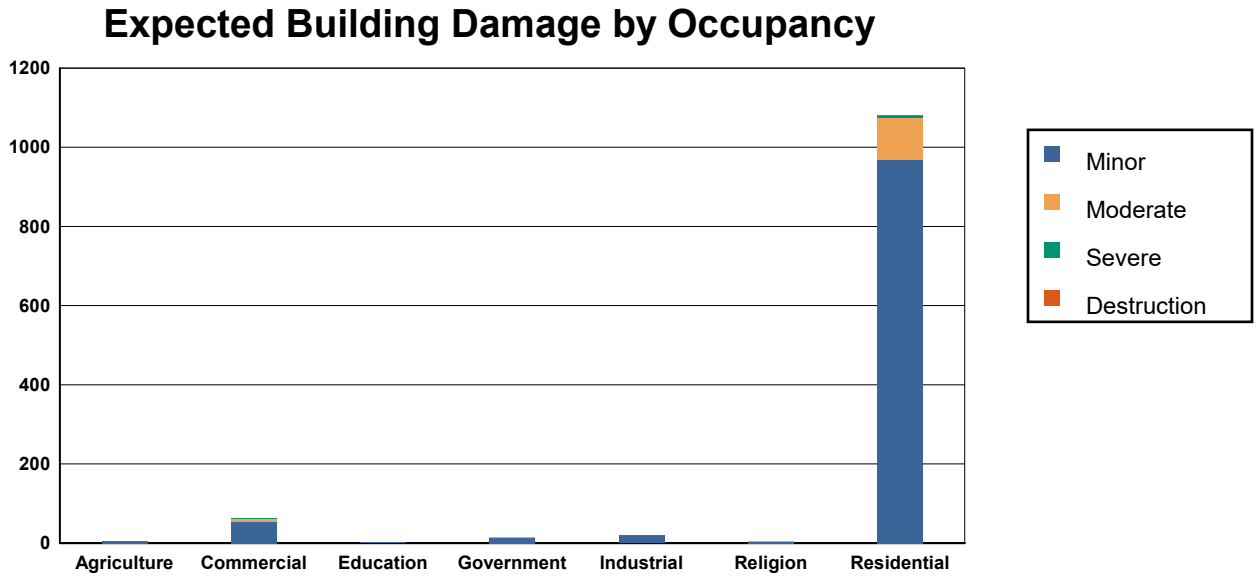


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	43.60	92.77	2.70	5.75	0.49	1.03	0.20	0.43	0.01	0.02
Commercial	1,056.45	94.33	53.36	4.76	8.97	0.80	1.22	0.11	0.00	0.00
Education	25.62	94.88	1.28	4.75	0.10	0.37	0.00	0.01	0.00	0.00
Government	264.28	95.07	12.75	4.59	0.95	0.34	0.02	0.01	0.00	0.00
Industrial	330.17	94.33	16.82	4.81	2.36	0.67	0.63	0.18	0.03	0.01
Religion	59.68	94.72	3.11	4.94	0.20	0.32	0.01	0.02	0.00	0.00
Residential	12,855.45	92.25	967.81	6.95	108.42	0.78	2.53	0.02	0.79	0.01
Total	**14,635.24**		**1,057.83**		**121.48**		**4.62**		**0.83**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	243	94.38	13	5.14	1	0.47	0	0.01	0	0.00
Masonry	1,338	90.92	98	6.69	33	2.25	2	0.13	0	0.01
MH	318	98.67	3	0.97	1	0.26	0	0.00	0	0.09
Steel	892	94.78	41	4.32	7	0.78	1	0.11	0	0.00
Wood	11,890	92.74	874	6.82	53	0.42	2	0.02	1	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

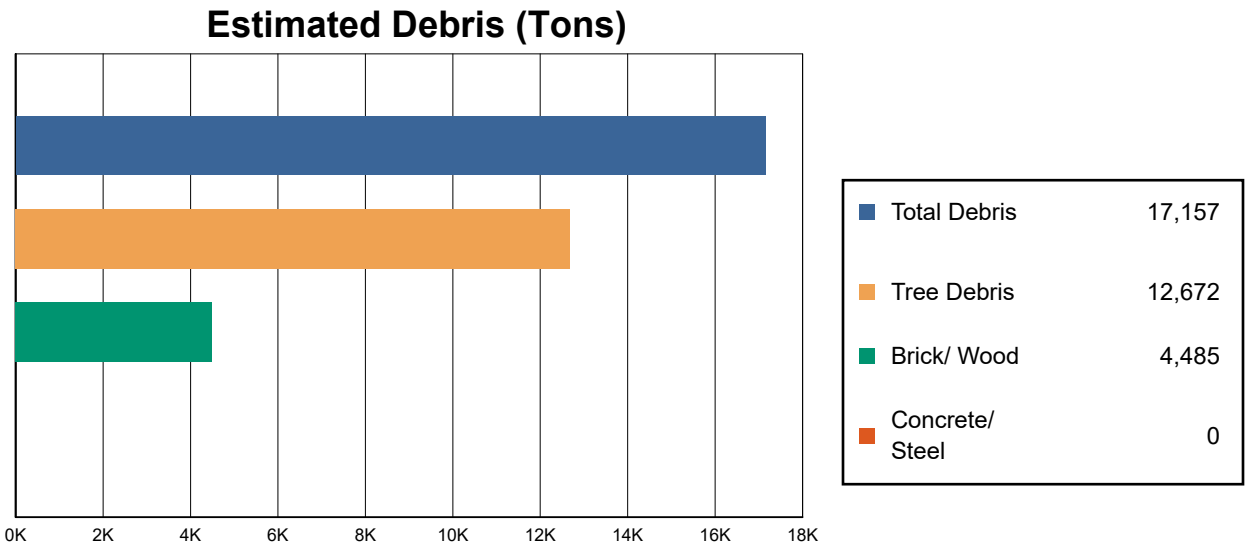
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	15	0	0	15

Induced Hurricane Damage

Debris Generation

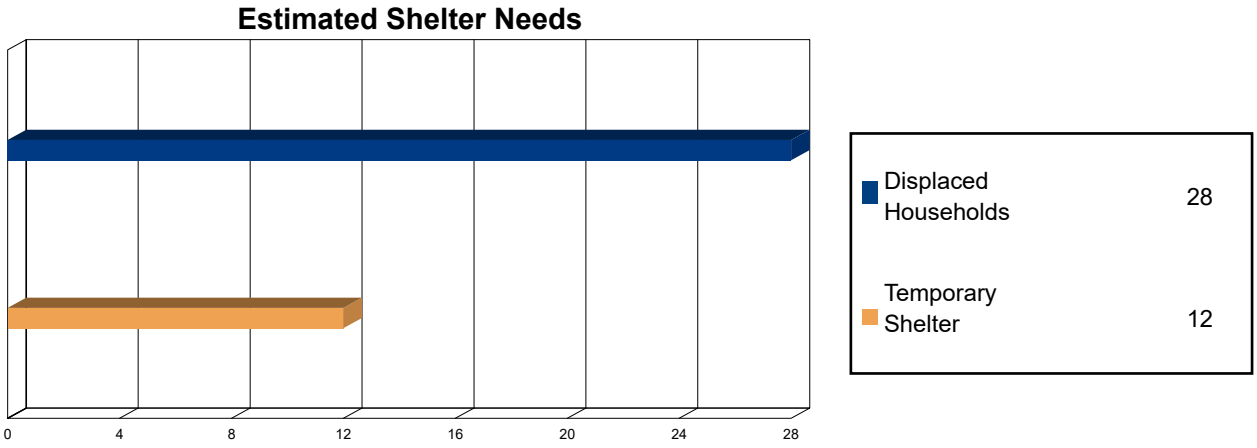


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 17,157 tons of debris will be generated. Of the total amount, 5,873 tons (34%) is Other Tree Debris. Of the remaining 11,284 tons, Brick/Wood comprises 40% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 179 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,799 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 28 households to be displaced due to the hurricane. Of these, 12 people (out of a total population of 43,501) will seek temporary shelter in public shelters.

Economic Loss

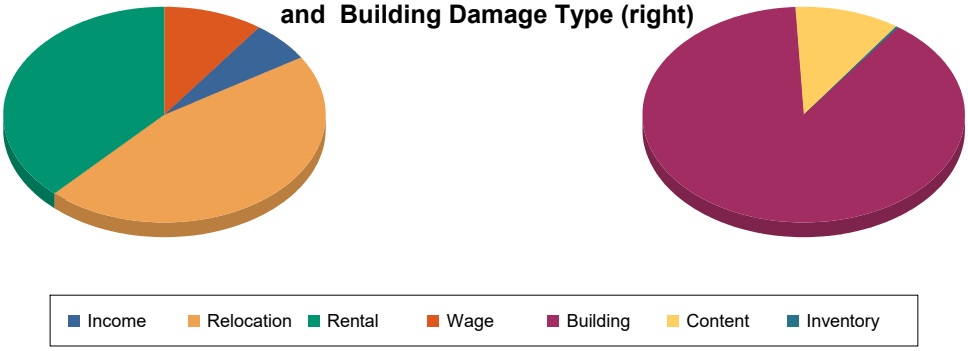
The total economic loss estimated for the hurricane is 55.5 million dollars, which represents 0.63 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 56 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

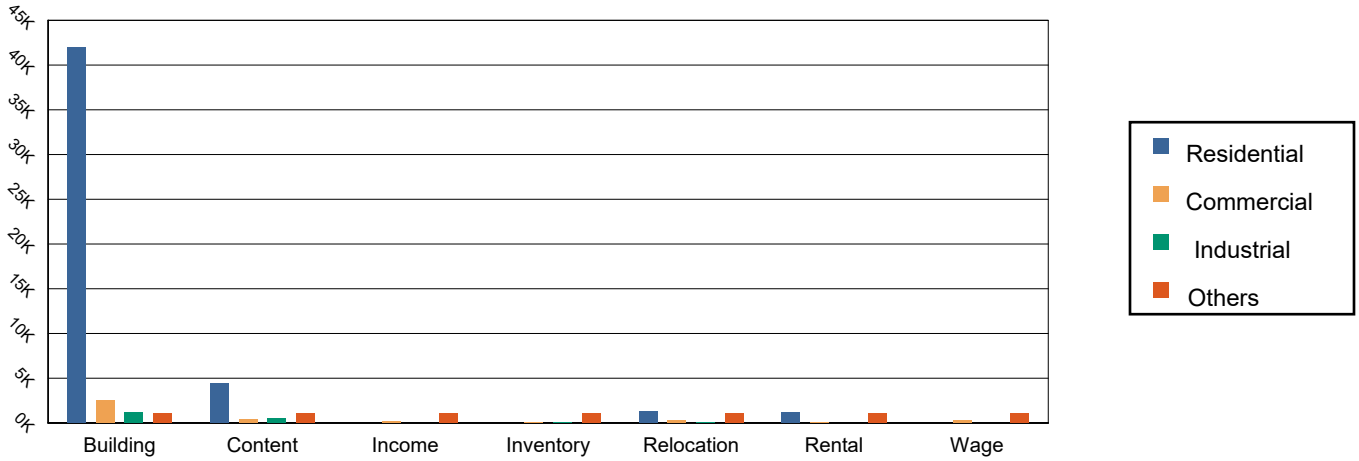


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	41,959.25	2,510.38	1,145.45	766.62	46,381.69
	Content	4,449.75	442.71	507.14	104.54	5,504.14
	Inventory	0.00	78.61	67.83	11.13	157.57
	Subtotal	**46,409.00**	**3,031.70**	**1,720.41**	**882.29**	**52,043.40**
Business Interruption Loss						
	Income	0.00	163.82	5.98	38.48	208.28
	Relocation	1,285.39	238.25	22.56	42.48	1,588.68
	Rental	1,210.18	104.65	4.02	2.90	1,321.75
	Wage	0.00	241.30	9.89	90.74	341.93
	Subtotal	**2,495.58**	**748.02**	**42.44**	**174.60**	**3,460.65**

Total

Total	**48,904.58**	**3,779.72**	**1,762.85**	**1,056.89**	**55,504.05**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,079,184	2,764,923	8,844,107
Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**
Study Region Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**

Hazus: Hurricane Global Risk Report

Region Name:	Southington_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 36.62 square miles and contains 12 census tracts. There are over 17 thousand households in the region and a total population of 43,501 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 15 thousand buildings in the region with a total building replacement value (excluding contents) of 8,844 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 15,820 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

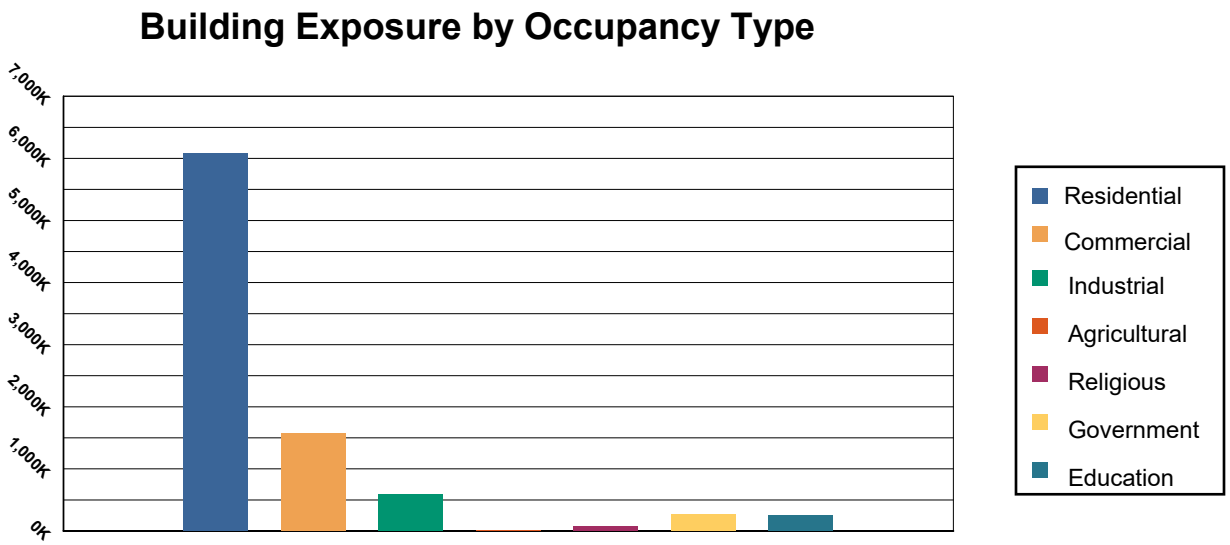


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	6,079,184	68.74%
Commercial	1,571,988	17.77%
Industrial	587,373	6.64%
Agricultural	16,304	0.18%
Religious	73,688	0.83%
Government	263,667	2.98%
Education	251,903	2.85%
Total	**8,844,107**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 15 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 358 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 6 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

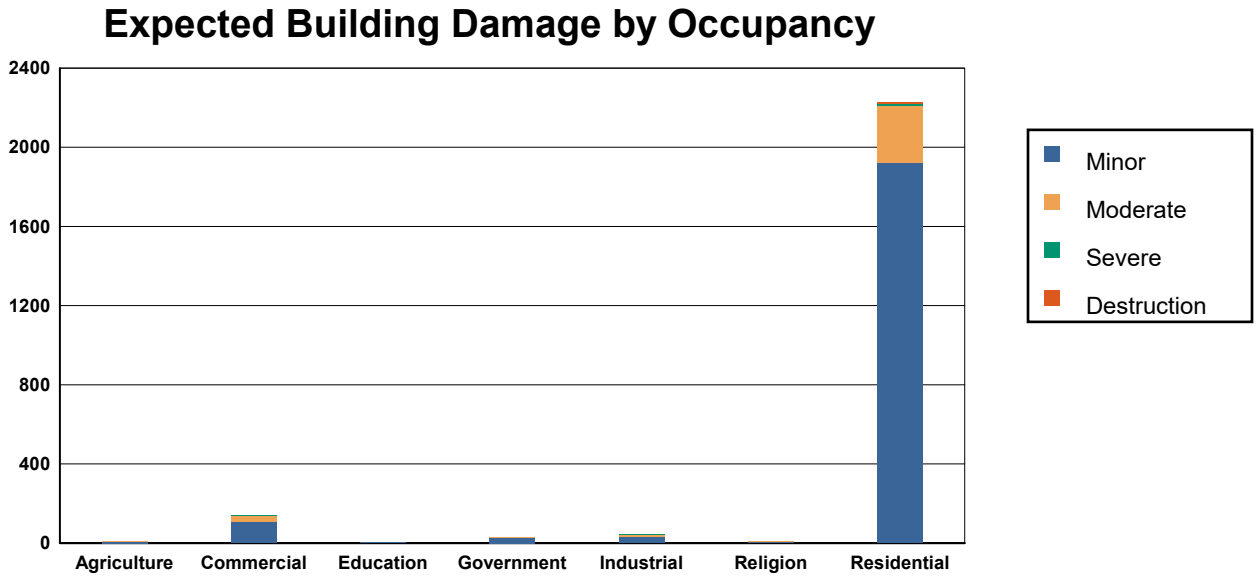


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	39.70	84.46	5.38	11.46	1.27	2.71	0.59	1.26	0.05	0.12
Commercial	979.81	87.48	109.13	9.74	26.63	2.38	4.43	0.40	0.00	0.00
Education	23.91	88.54	2.63	9.75	0.44	1.64	0.02	0.08	0.00	0.00
Government	246.84	88.79	26.45	9.51	4.51	1.62	0.19	0.07	0.00	0.00
Industrial	306.71	87.63	33.25	9.50	7.88	2.25	2.01	0.57	0.15	0.04
Religion	55.48	88.06	6.60	10.47	0.88	1.39	0.05	0.07	0.00	0.00
Residential	11,707.47	84.01	1,918.99	13.77	292.26	2.10	10.39	0.07	5.88	0.04
Total	**13,359.92**		**2,102.44**		**333.88**		**17.68**		**6.09**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	225	87.64	26	10.20	5	2.09	0	0.07	0	0.00
Masonry	1,217	82.67	174	11.85	75	5.06	6	0.38	0	0.03
MH	309	95.98	9	2.65	3	1.00	0	0.02	1	0.36
Steel	832	88.39	82	8.75	23	2.41	4	0.45	0	0.00
Wood	10,842	84.56	1,785	13.92	181	1.41	9	0.07	5	0.04

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

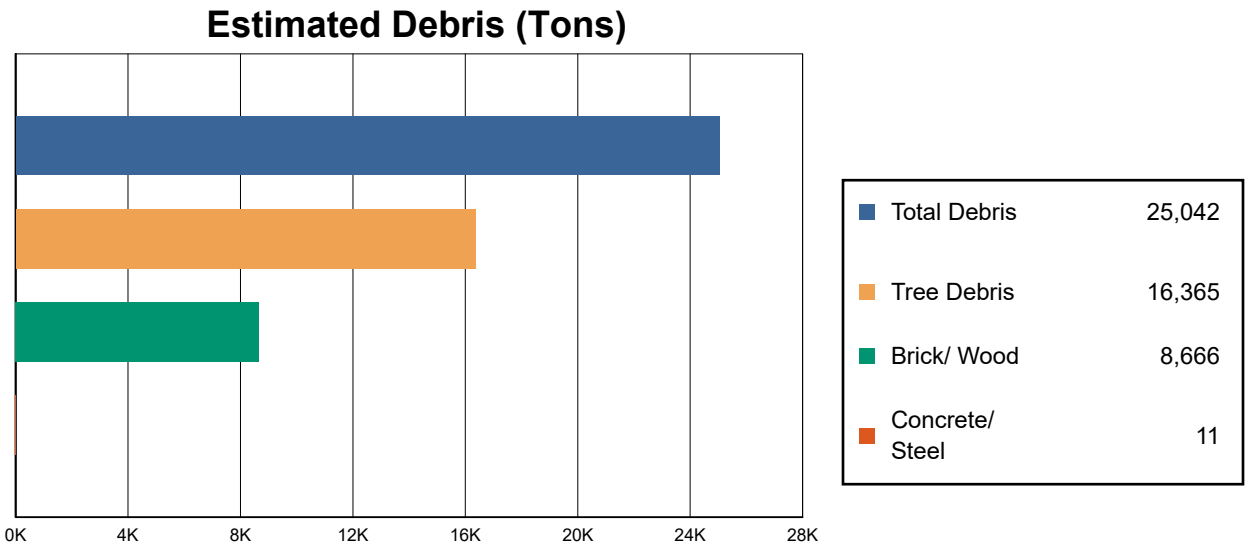
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	15	0	0	14

Induced Hurricane Damage

Debris Generation

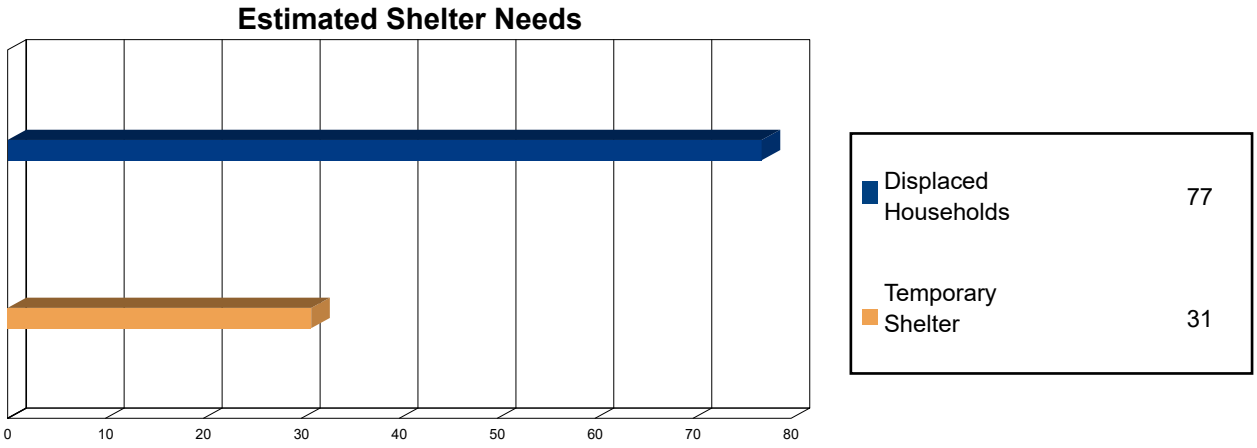


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 25,042 tons of debris will be generated. Of the total amount, 7,502 tons (30%) is Other Tree Debris. Of the remaining 17,540 tons, Brick/Wood comprises 49% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 347 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 8,863 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 77 households to be displaced due to the hurricane. Of these, 31 people (out of a total population of 43,501) will seek temporary shelter in public shelters.

Economic Loss

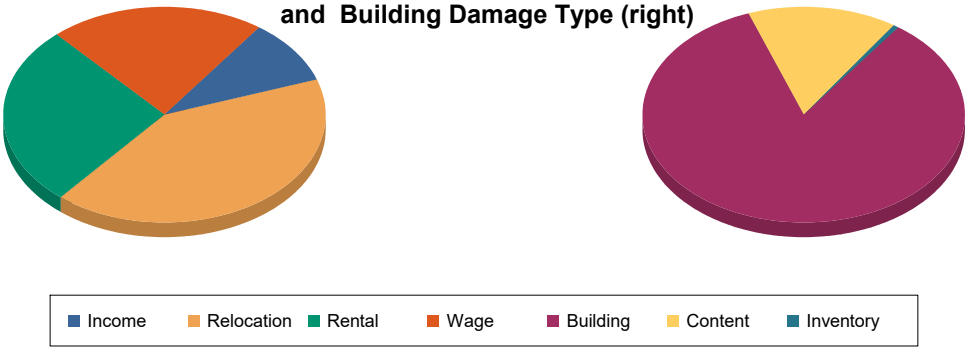
The total economic loss estimated for the hurricane is 112.4 million dollars, which represents 1.27 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 112 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 82% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

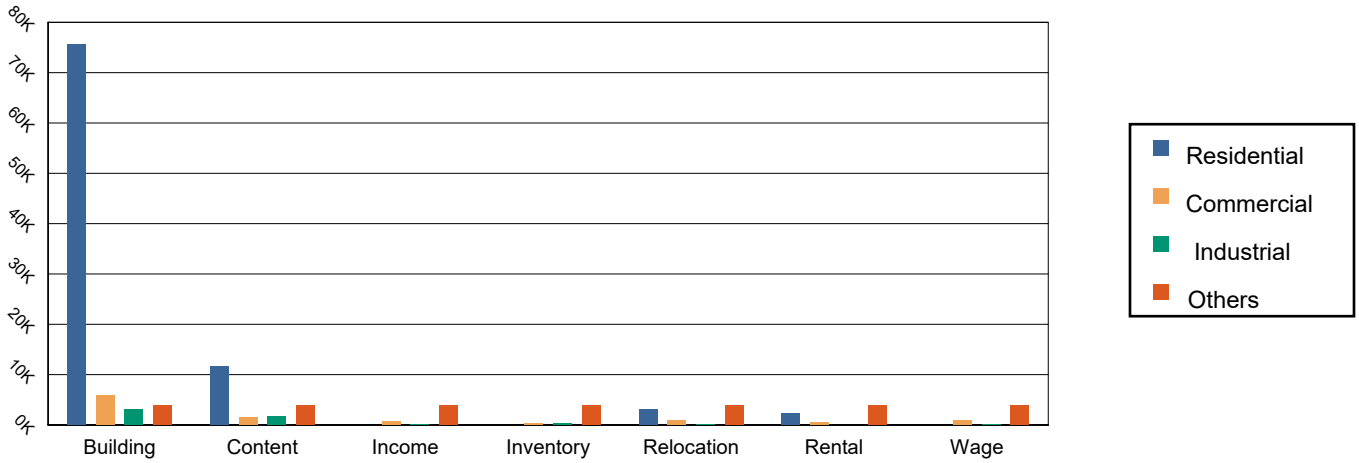


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	75,602.23	5,825.89	2,984.53	1,854.44	86,267.09
	Content	11,640.16	1,468.00	1,745.39	367.60	15,221.15
	Inventory	0.00	251.12	231.18	37.37	519.67
	Subtotal	**87,242.39**	**7,545.02**	**4,961.10**	**2,259.41**	**102,007.92**
Business Interruption Loss						
	Income	0.00	817.03	36.32	158.81	1,012.16
	Relocation	2,993.66	878.30	119.18	297.45	4,288.59
	Rental	2,323.14	454.46	25.07	49.41	2,852.08
	Wage	0.00	991.13	59.02	1,189.87	2,240.02
	Subtotal	**5,316.80**	**3,140.92**	**239.59**	**1,695.54**	**10,392.85**

Total

Total	**92,559.19**	**10,685.94**	**5,200.68**	**3,954.96**	**112,400.77**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,079,184	2,764,923	8,844,107
Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**
Study Region Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**

Hazus: Hurricane Global Risk Report

Region Name:	Southington_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 36.62 square miles and contains 12 census tracts. There are over 17 thousand households in the region and a total population of 43,501 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 15 thousand buildings in the region with a total building replacement value (excluding contents) of 8,844 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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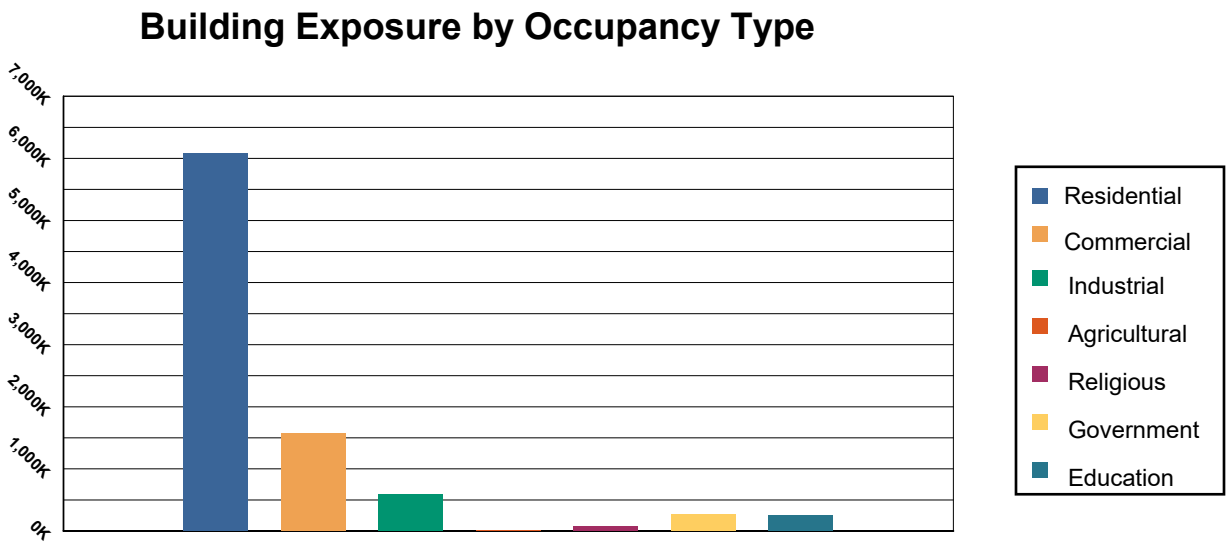


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	6,079,184	68.74%
Commercial	1,571,988	17.77%
Industrial	587,373	6.64%
Agricultural	16,304	0.18%
Religious	73,688	0.83%
Government	263,667	2.98%
Education	251,903	2.85%
Total	**8,844,107**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 15 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 955 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 33 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

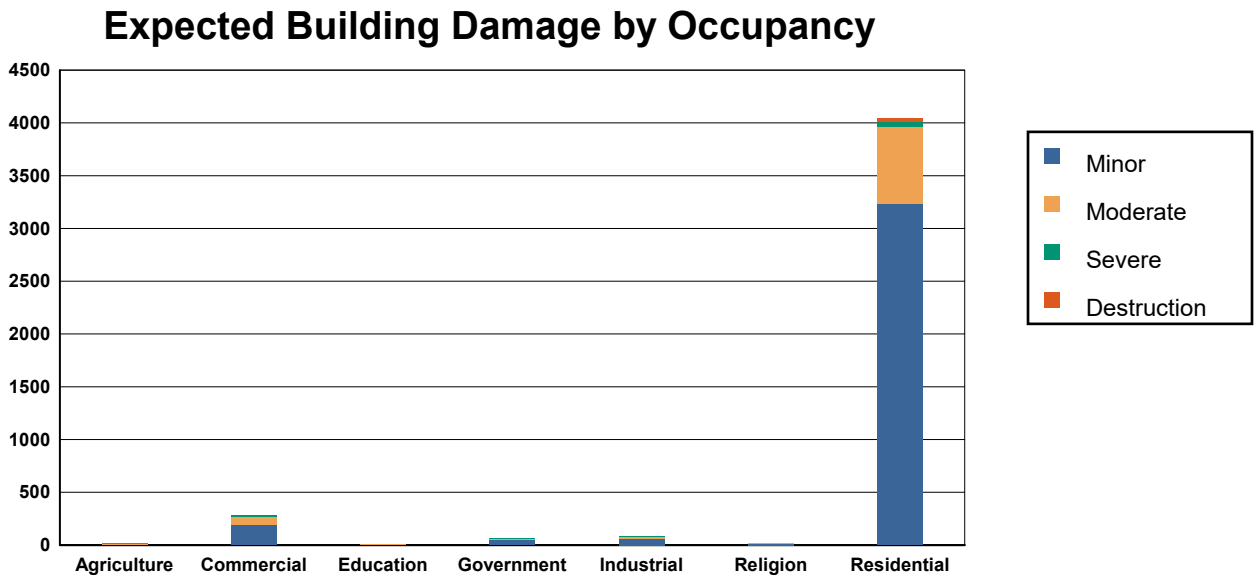


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	33.11	70.46	9.26	19.70	2.98	6.35	1.45	3.08	0.20	0.42
Commercial	836.05	74.65	192.63	17.20	75.87	6.77	15.33	1.37	0.12	0.01
Education	20.46	75.78	4.75	17.59	1.63	6.02	0.16	0.60	0.00	0.00
Government	213.44	76.78	46.87	16.86	16.14	5.81	1.55	0.56	0.00	0.00
Industrial	262.68	75.05	57.30	16.37	23.27	6.65	6.18	1.76	0.57	0.16
Religion	47.37	75.18	12.12	19.24	3.22	5.11	0.29	0.47	0.00	0.00
Residential	9,890.53	70.98	3,238.24	23.24	722.42	5.18	51.41	0.37	32.40	0.23
Total	**11,303.65**		**3,561.16**		**845.54**		**76.36**		**33.30**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	192	74.69	45	17.47	19	7.25	2	0.58	0	0.00
Masonry	1,024	69.55	274	18.64	155	10.54	17	1.14	2	0.14
MH	282	87.58	21	6.61	13	4.07	1	0.20	5	1.55
Steel	715	76.01	145	15.37	66	7.01	15	1.59	0	0.01
Wood	9,168	71.51	3,065	23.90	517	4.03	43	0.34	28	0.22

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

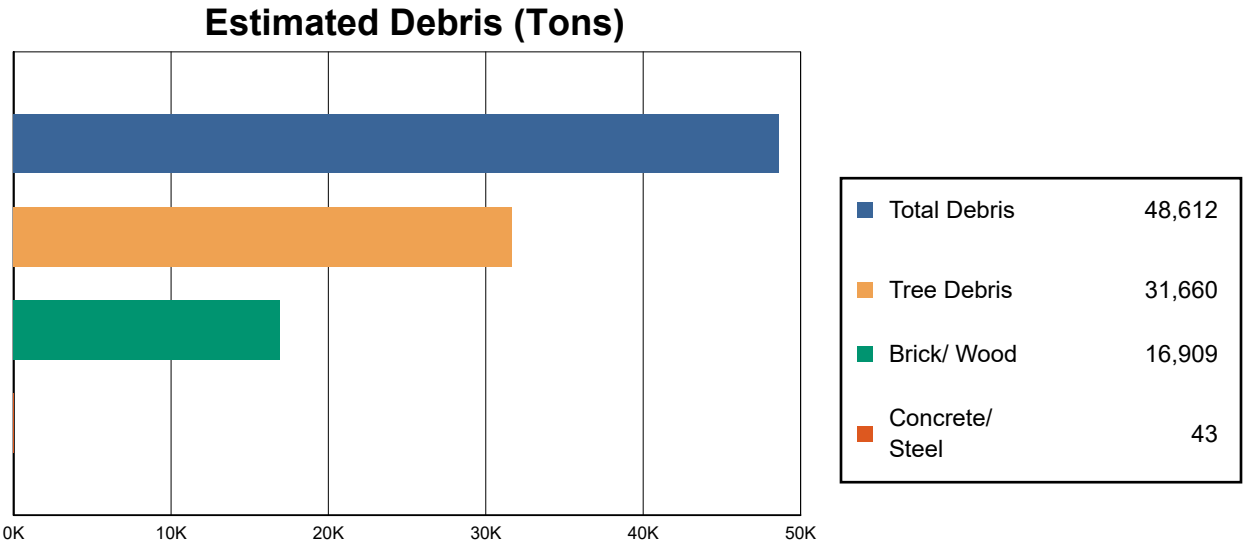
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	15	1	0	0

Induced Hurricane Damage

Debris Generation

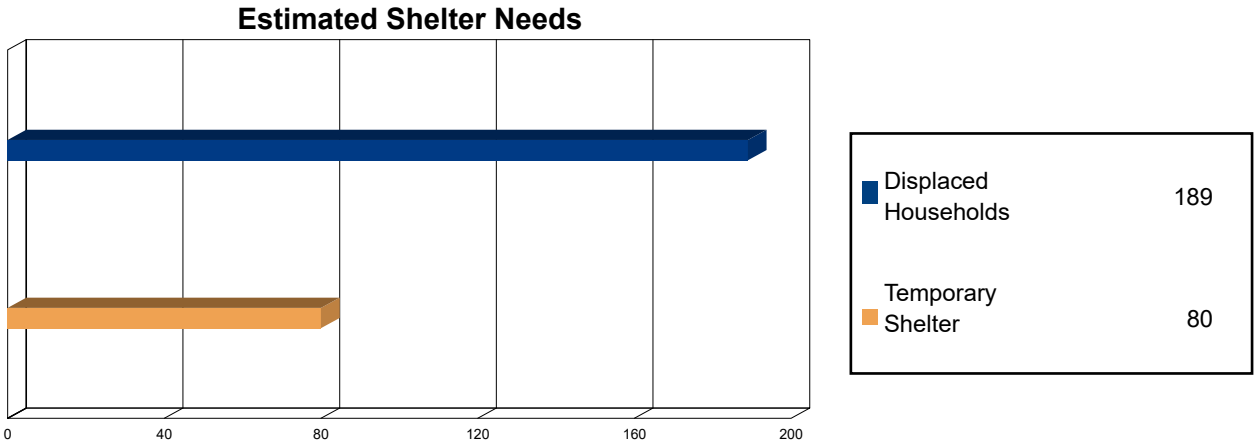


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 48,612 tons of debris will be generated. Of the total amount, 14,645 tons (30%) is Other Tree Debris. Of the remaining 33,967 tons, Brick/Wood comprises 50% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 678 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 17,015 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 189 households to be displaced due to the hurricane. Of these, 80 people (out of a total population of 43,501) will seek temporary shelter in public shelters.

Economic Loss

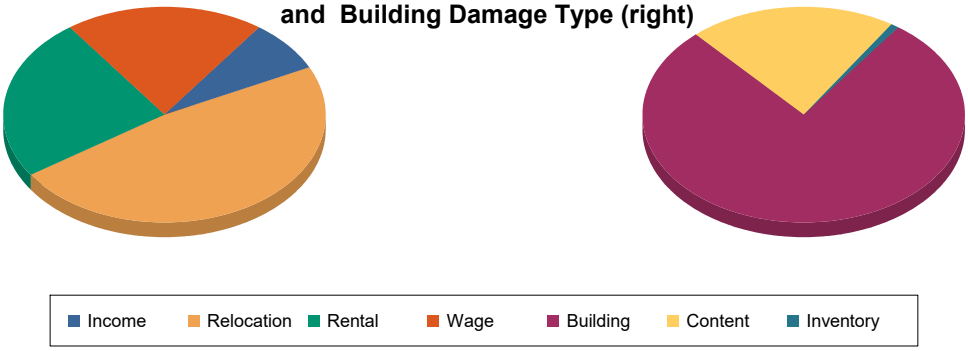
The total economic loss estimated for the hurricane is 252.7 million dollars, which represents 2.86 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 253 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 78% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

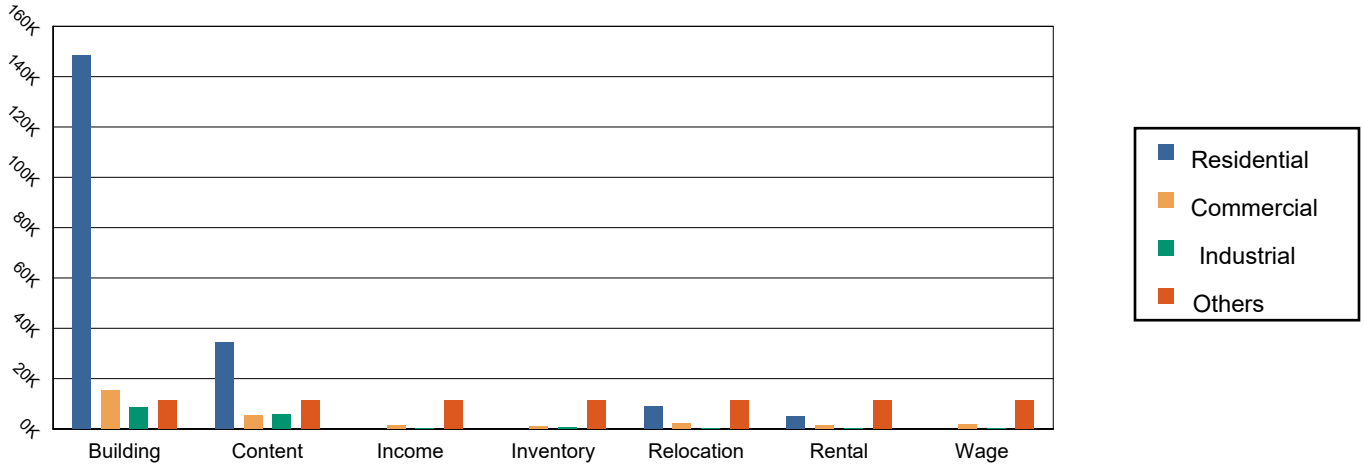


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	148,448.86	15,360.92	8,421.02	5,161.09	177,391.89
	Content	34,290.23	5,320.95	5,867.22	1,581.90	47,060.30
	Inventory	0.00	961.34	771.37	105.53	1,838.24
	Subtotal	**182,739.09**	**21,643.20**	**15,059.61**	**6,848.53**	**226,290.43**
Business Interruption Loss						
	Income	0.00	1,593.45	94.57	349.16	2,037.17
	Relocation	8,890.58	2,397.59	372.63	958.32	12,619.12
	Rental	5,104.28	1,200.66	71.16	158.17	6,534.27
	Wage	0.00	1,961.92	153.87	3,135.95	5,251.75
	Subtotal	**13,994.86**	**7,153.62**	**692.23**	**4,601.60**	**26,442.31**

Total

Total	**196,733.95**	**28,796.82**	**15,751.84**	**11,450.13**	**252,732.73**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,079,184	2,764,923	8,844,107
Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**
Study Region Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**

Hazus: Hurricane Global Risk Report

Region Name: Southington_HU

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 36.62 square miles and contains 12 census tracts. There are over 17 thousand households in the region and a total population of 43,501 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 15 thousand buildings in the region with a total building replacement value (excluding contents) of 8,844 million dollars. Approximately 88% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 15,820 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

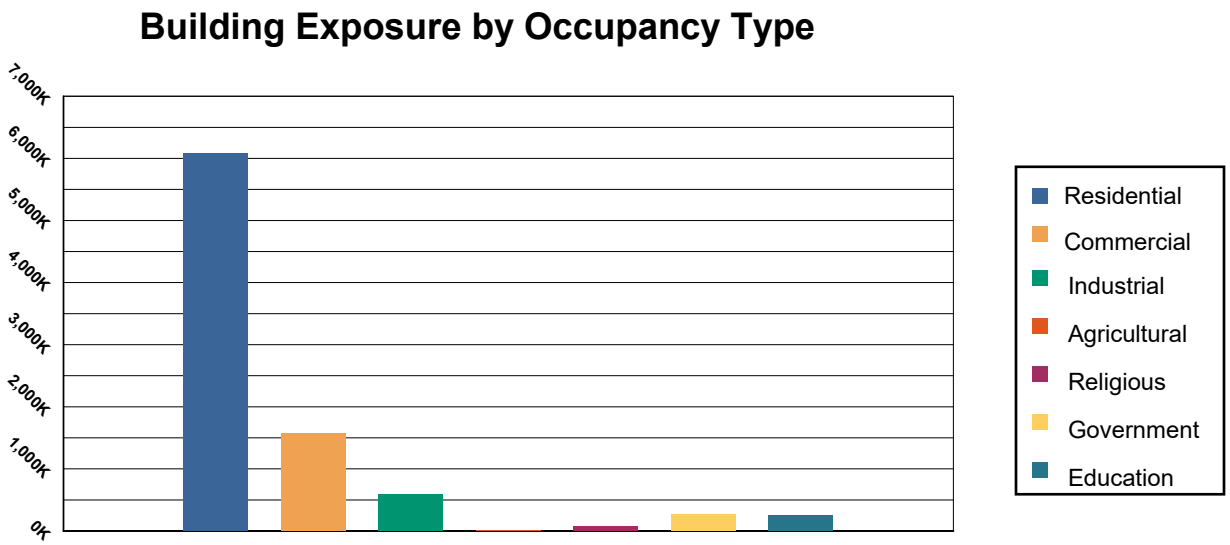


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	6,079,184	68.74%
Commercial	1,571,988	17.77%
Industrial	587,373	6.64%
Agricultural	16,304	0.18%
Religious	73,688	0.83%
Government	263,667	2.98%
Education	251,903	2.85%
Total	**8,844,107**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 15 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,637 buildings will be at least moderately damaged. This is over 10% of the total number of buildings in the region. There are an estimated 83 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

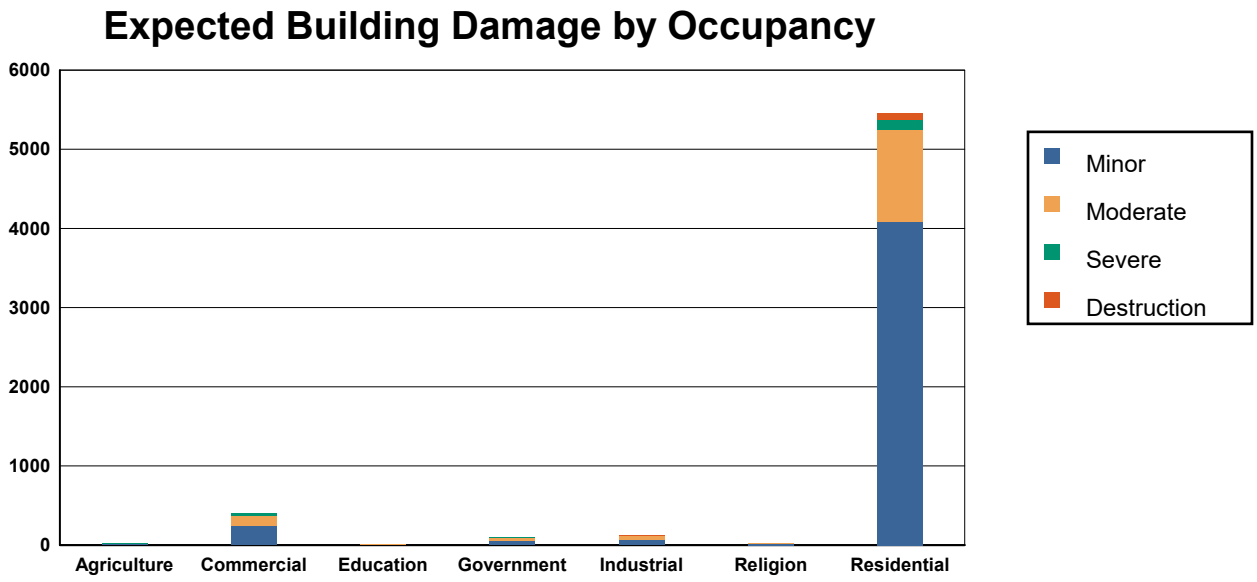


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	27.86	59.28	11.79	25.08	4.66	9.92	2.32	4.93	0.37	0.80
Commercial	714.36	63.78	243.92	21.78	129.04	11.52	32.35	2.89	0.33	0.03
Education	17.53	64.92	6.02	22.31	2.95	10.93	0.50	1.85	0.00	0.00
Government	183.39	65.97	59.83	21.52	29.90	10.75	4.89	1.76	0.00	0.00
Industrial	224.27	64.08	72.16	20.62	40.14	11.47	12.30	3.52	1.12	0.32
Religion	40.63	64.49	15.60	24.76	5.91	9.38	0.86	1.37	0.00	0.00
Residential	8,483.29	60.88	4,082.04	29.29	1,165.10	8.36	123.88	0.89	80.69	0.58
Total	**9,691.33**		**4,491.37**		**1,377.69**		**177.10**		**82.51**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	163	63.53	55	21.58	33	13.03	5	1.85	0	0.00
Masonry	871	59.19	333	22.60	230	15.63	34	2.28	4	0.30
MH	257	79.72	30	9.41	23	7.27	2	0.51	10	3.09
Steel	613	65.16	182	19.36	113	12.02	32	3.42	0	0.04
Wood	7,862	61.33	3,898	30.40	883	6.89	106	0.83	71	0.56

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

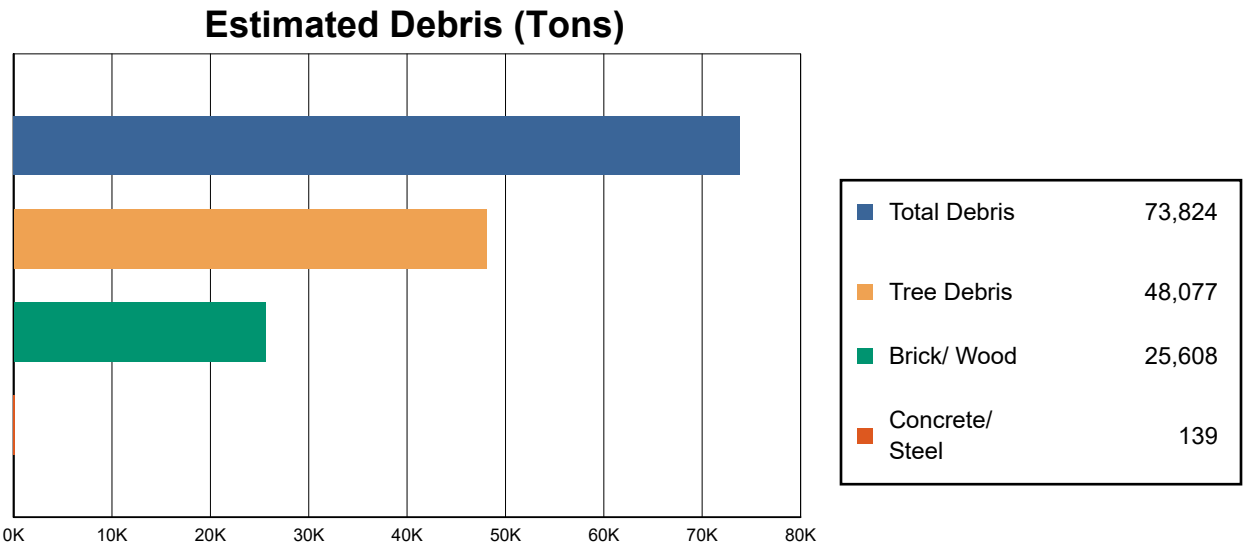
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Police Stations	1	0	0	1
Schools	15	1	0	0

Induced Hurricane Damage

Debris Generation

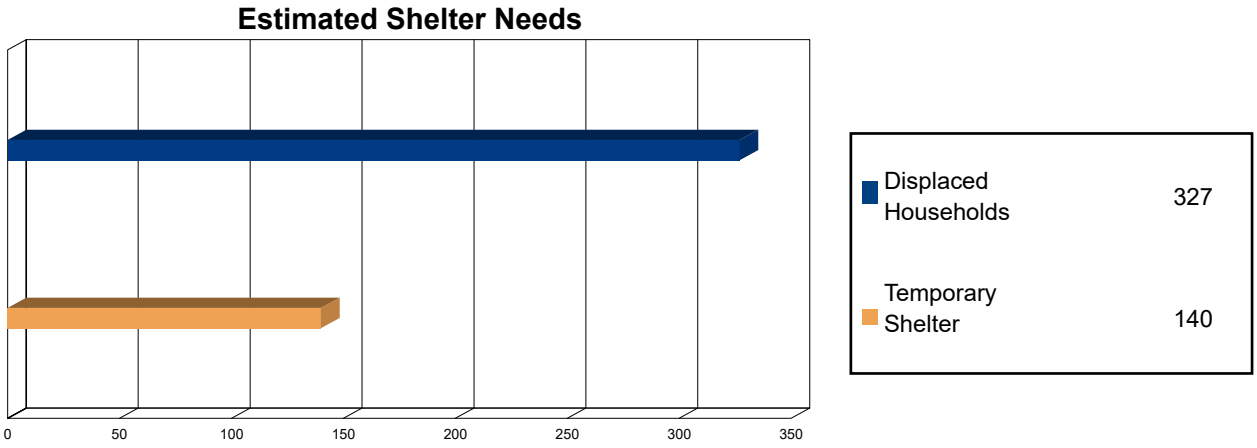


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 73,824 tons of debris will be generated. Of the total amount, 22,402 tons (30%) is Other Tree Debris. Of the remaining 51,422 tons, Brick/Wood comprises 50% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1030 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 25,675 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 327 households to be displaced due to the hurricane. Of these, 140 people (out of a total population of 43,501) will seek temporary shelter in public shelters.

Economic Loss

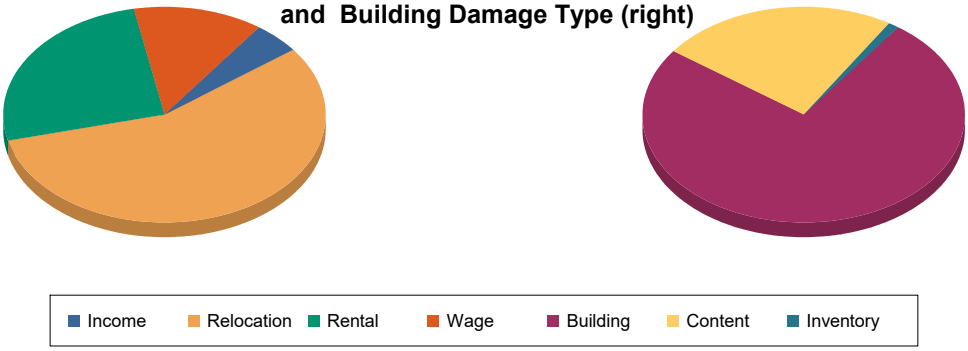
The total economic loss estimated for the hurricane is 424.9 million dollars, which represents 4.80 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 425 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 76% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

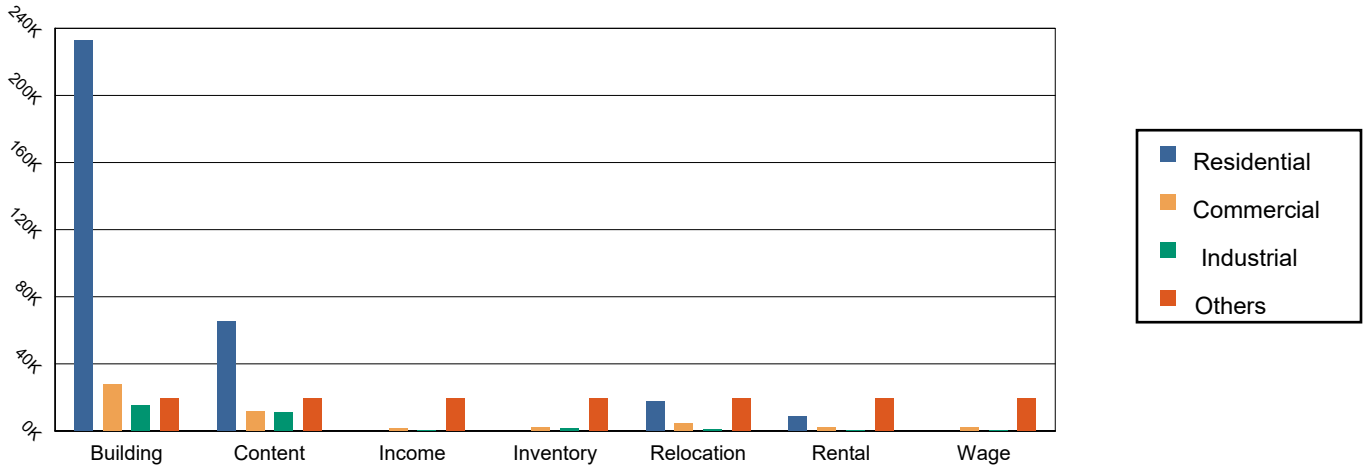


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	232,744.52	27,915.56	15,143.40	9,678.76	285,482.24
	Content	65,138.22	11,788.92	11,298.28	3,716.33	91,941.75
	Inventory	0.00	2,092.88	1,476.95	185.11	3,754.94
	Subtotal	**297,882.74**	**41,797.36**	**27,918.63**	**13,580.20**	**381,178.93**
Business Interruption Loss						
	Income	4.34	1,548.87	165.13	358.42	2,076.75
	Relocation	17,820.56	4,299.91	686.76	1,830.49	24,637.72
	Rental	8,696.35	2,158.47	127.39	311.90	11,294.12
	Wage	10.22	1,943.17	269.59	3,460.32	5,683.30
	Subtotal	**26,531.47**	**9,950.42**	**1,248.87**	**5,961.13**	**43,691.88**

Total

Total	324,414.21	51,747.77	29,167.50	19,541.32	424,870.81

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	43,501	6,079,184	2,764,923	8,844,107
Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**
Study Region Total	**43,501**	**6,079,184**	**2,764,923**	**8,844,107**

Hazus: Hurricane Global Risk Report

Region Name:	Stafford_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 58.78 square miles and contains 3 census tracts. There are over 4 thousand households in the region and a total population of 11,472 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,218 million dollars. Approximately 89% of the buildings (and 65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

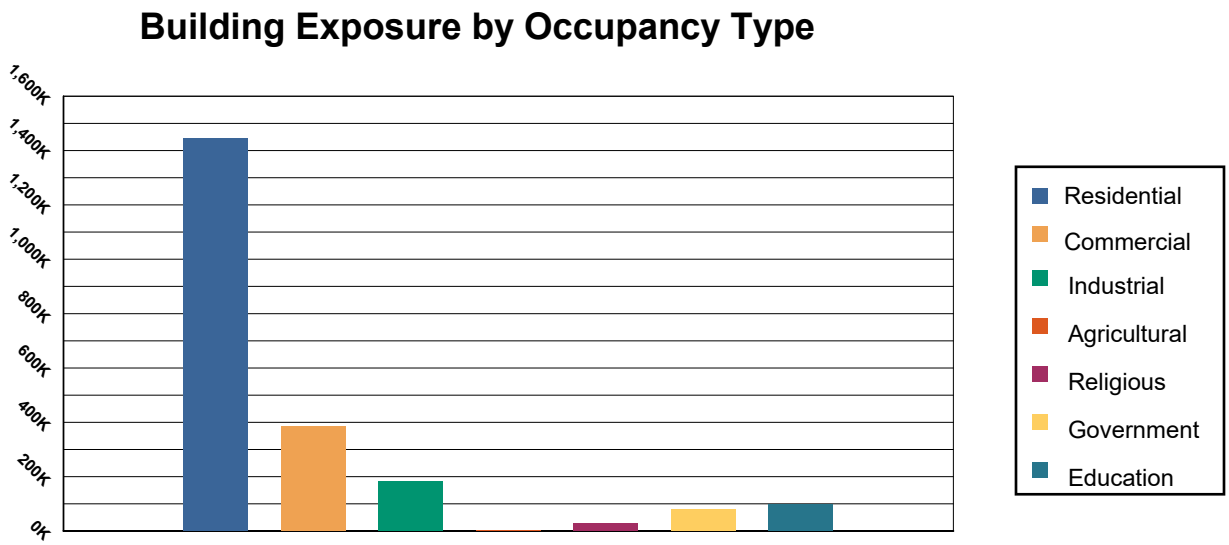


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,444,151	65.12%
Commercial	386,331	17.42%
Industrial	181,631	8.19%
Agricultural	900	0.04%
Religious	26,595	1.20%
Government	80,532	3.63%
Education	97,485	4.40%
Total	**2,217,625**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

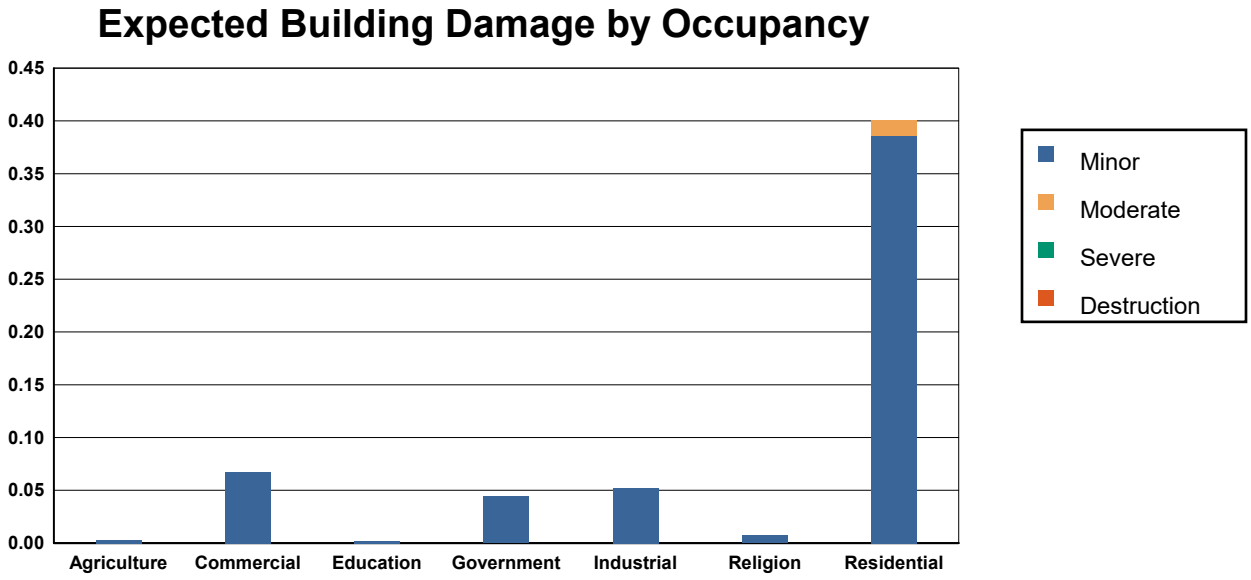


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.00	99.95	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	294.93	99.98	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Education	7.00	99.97	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Government	63.96	99.93	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	110.95	99.95	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Religion	30.99	99.98	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Residential	4,223.60	99.99	0.39	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Total	**4,737.42**		**0.56**		**0.01**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	68	99.94	0	0.06	0	0.00	0	0.00	0	0.00
Masonry	437	99.95	0	0.05	0	0.00	0	0.00	0	0.00
MH	21	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	259	99.96	0	0.04	0	0.00	0	0.00	0	0.00
Wood	3,950	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 72 hospital beds available for use. On the day of the hurricane, the model estimates that 72 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

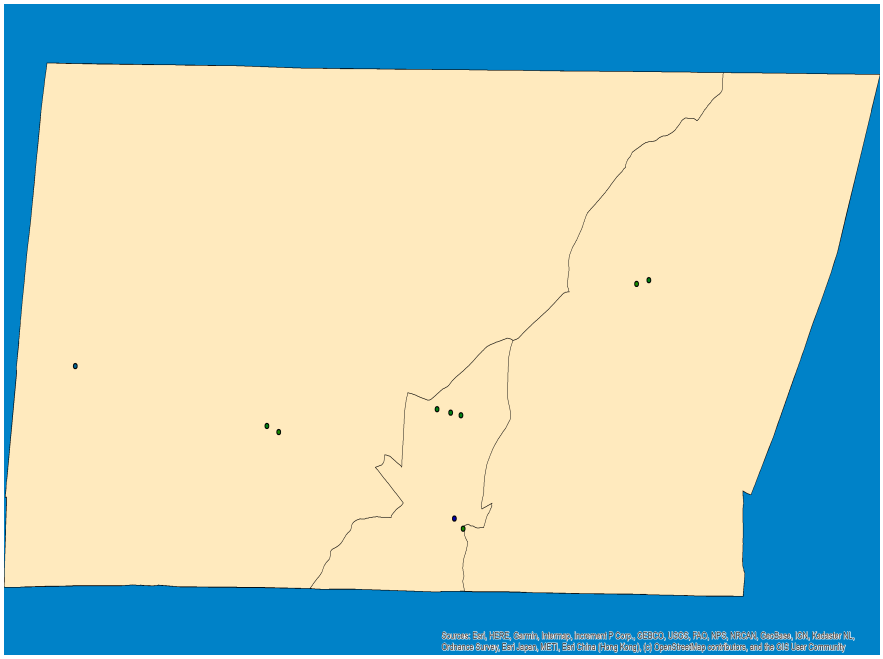
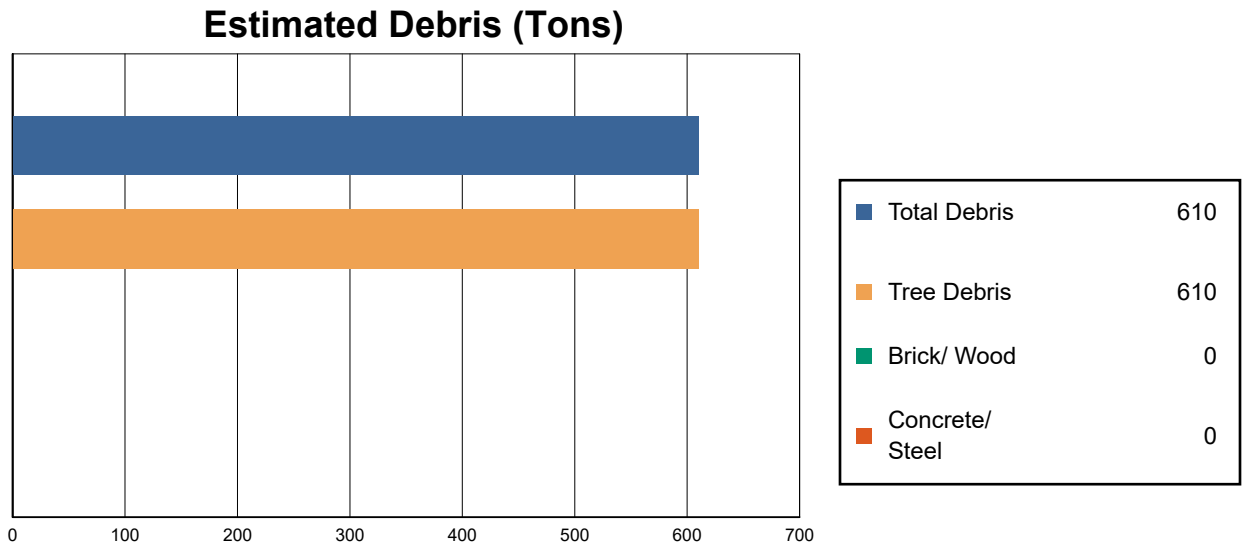


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

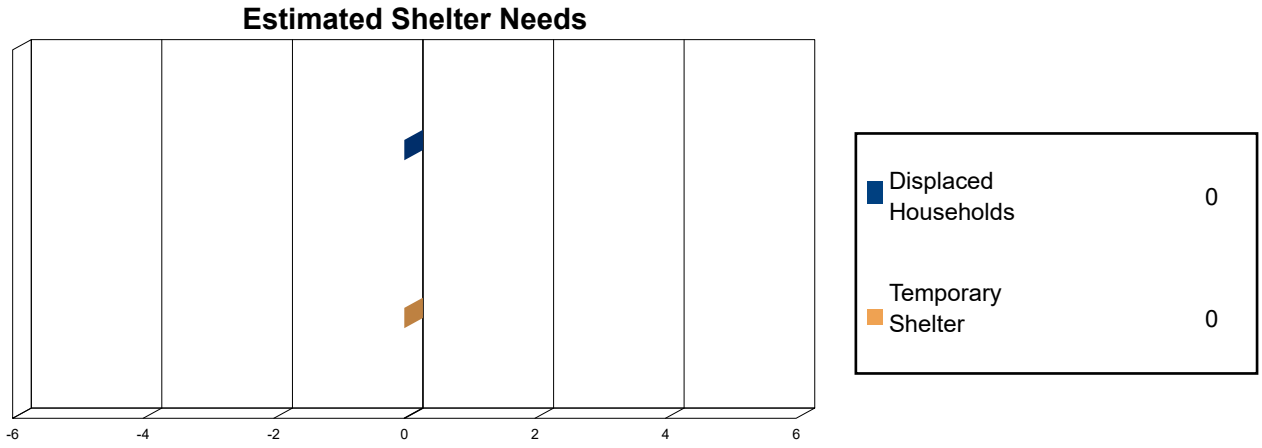


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 610 tons of debris will be generated. Of the total amount, 519 tons (85%) is Other Tree Debris. Of the remaining 92 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 92 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 11,472) will seek temporary shelter in public shelters.

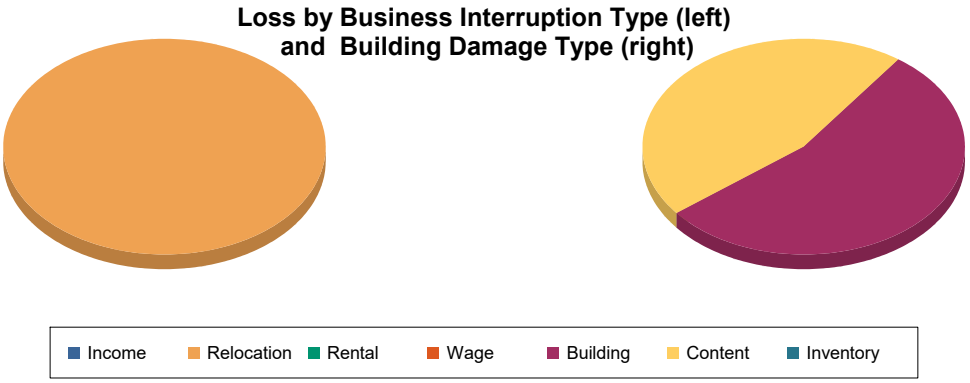
Economic Loss

The total economic loss estimated for the hurricane is 0.2 million dollars, which represents 0.01 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.



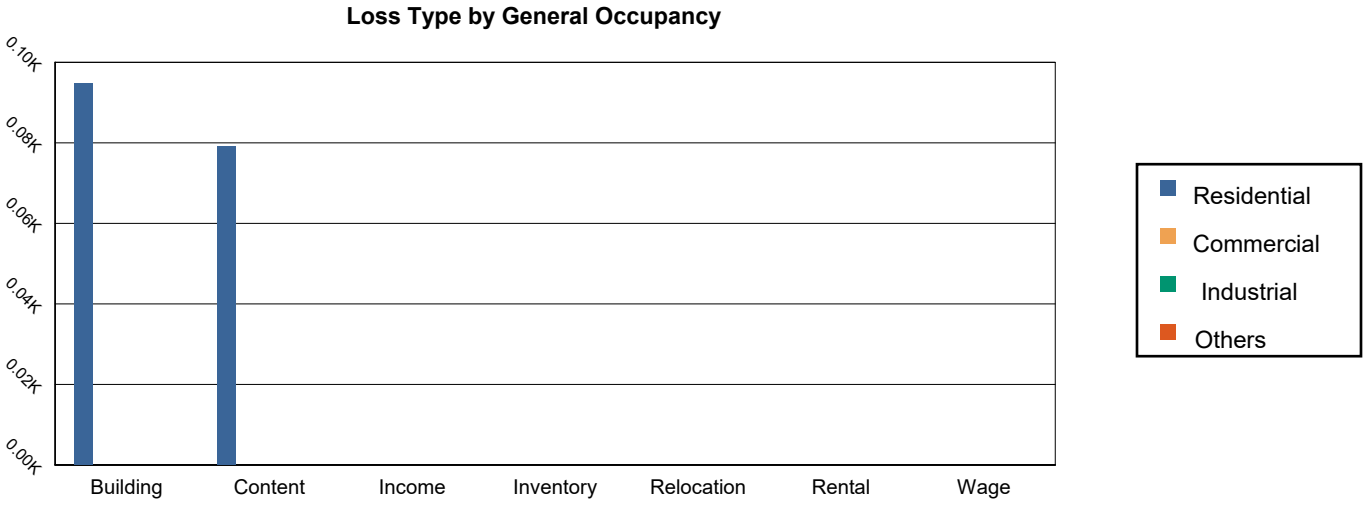


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	94.83	0.00	0.00	0.00	94.83
	Content	79.00	0.00	0.00	0.00	79.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**173.83**	**0.00**	**0.00**	**0.00**	**173.83**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.03	0.00	0.00	0.00	0.03
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.03**	**0.00**	**0.00**	**0.00**	**0.03**

Total

Total	**173.86**	**0.00**	**0.00**	**0.00**	**173.86**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,444,151	773,474	2,217,625
Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**
Study Region Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**

Hazus: Hurricane Global Risk Report

Region Name:	Stafford_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 58.78 square miles and contains 3 census tracts. There are over 4 thousand households in the region and a total population of 11,472 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,218 million dollars. Approximately 89% of the buildings (and 65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

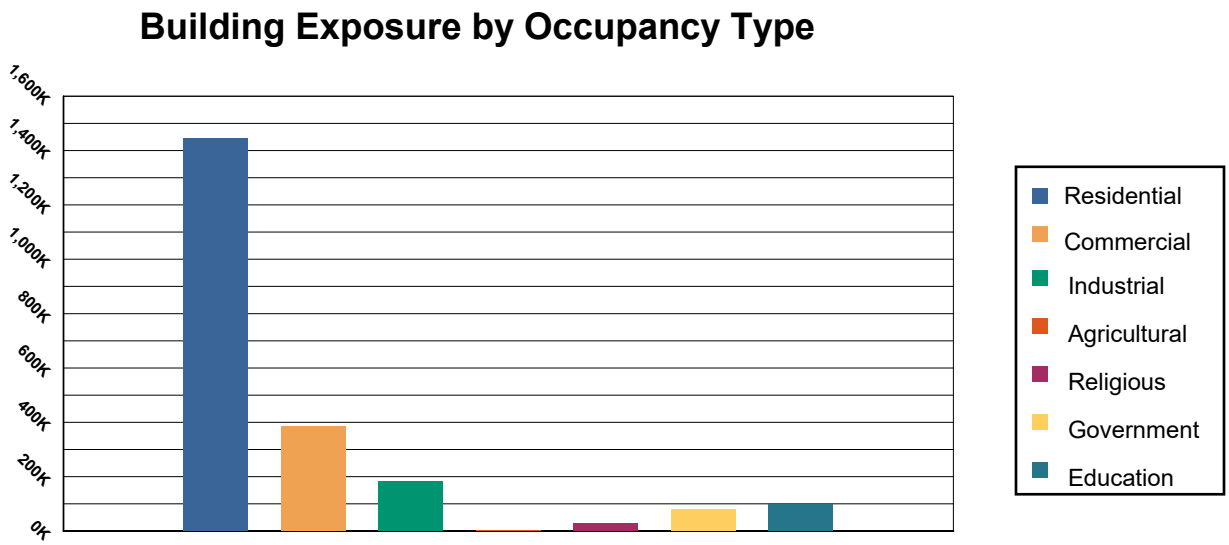


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,444,151	65.12%
Commercial	386,331	17.42%
Industrial	181,631	8.19%
Agricultural	900	0.04%
Religious	26,595	1.20%
Government	80,532	3.63%
Education	97,485	4.40%
Total	**2,217,625**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

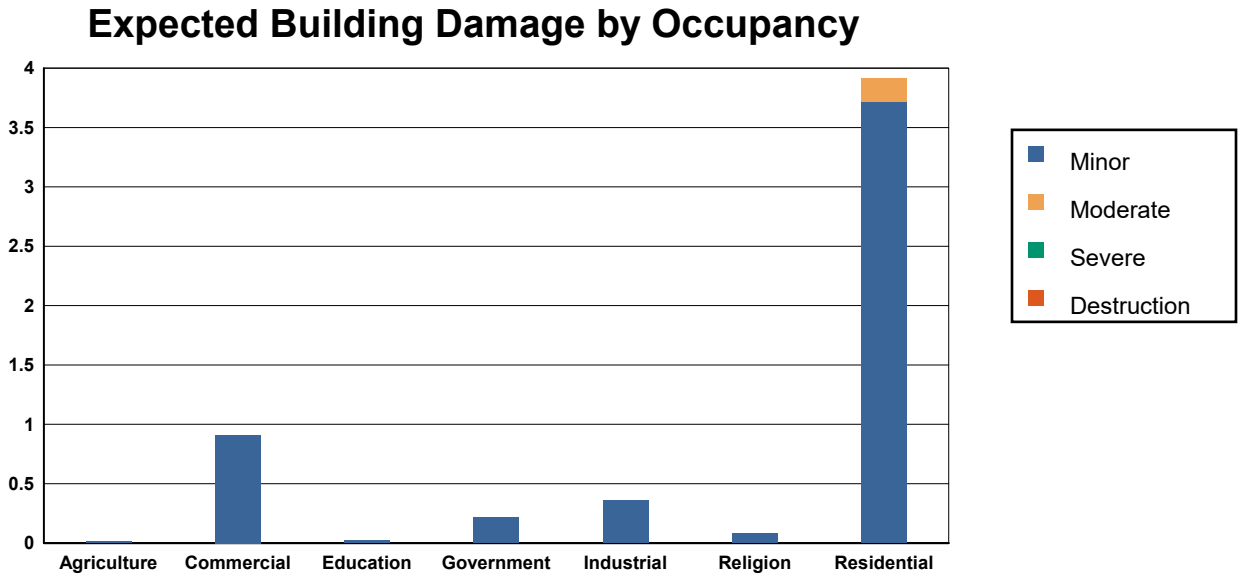


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	5.99	99.76	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	294.09	99.69	0.91	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Education	6.98	99.68	0.02	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Government	63.78	99.66	0.22	0.34	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	110.64	99.68	0.36	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Religion	30.92	99.73	0.08	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Residential	4,220.09	99.91	3.71	0.09	0.20	0.00	0.00	0.00	0.00	0.00
Total	**4,732.49**		**5.32**		**0.20**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	68	99.58	0	0.42	0	0.00	0	0.00	0	0.00
Masonry	435	99.56	2	0.42	0	0.01	0	0.00	0	0.00
MH	21	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	258	99.69	1	0.31	0	0.00	0	0.00	0	0.00
Wood	3,948	99.96	1	0.04	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 72 hospital beds available for use. On the day of the hurricane, the model estimates that 72 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

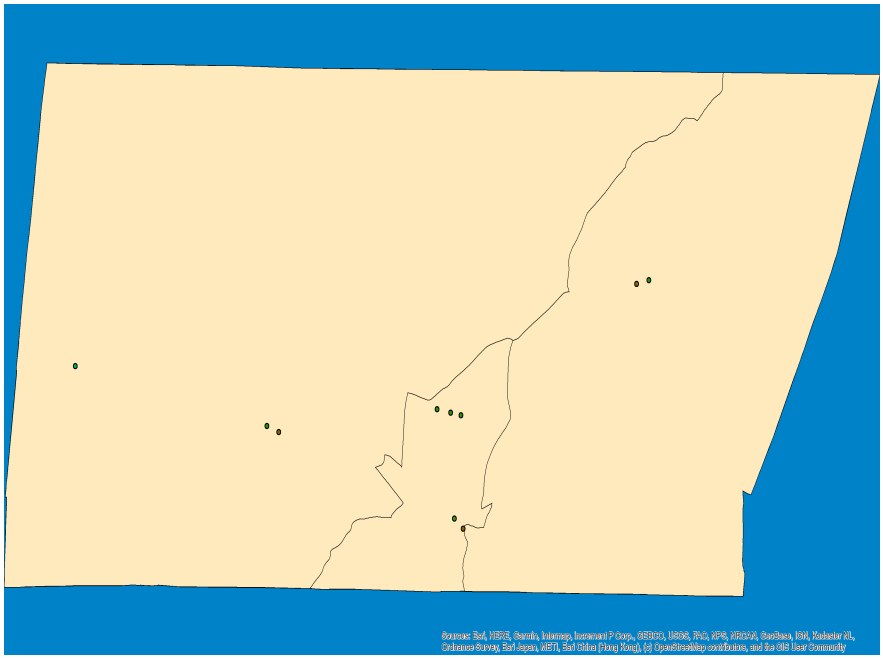
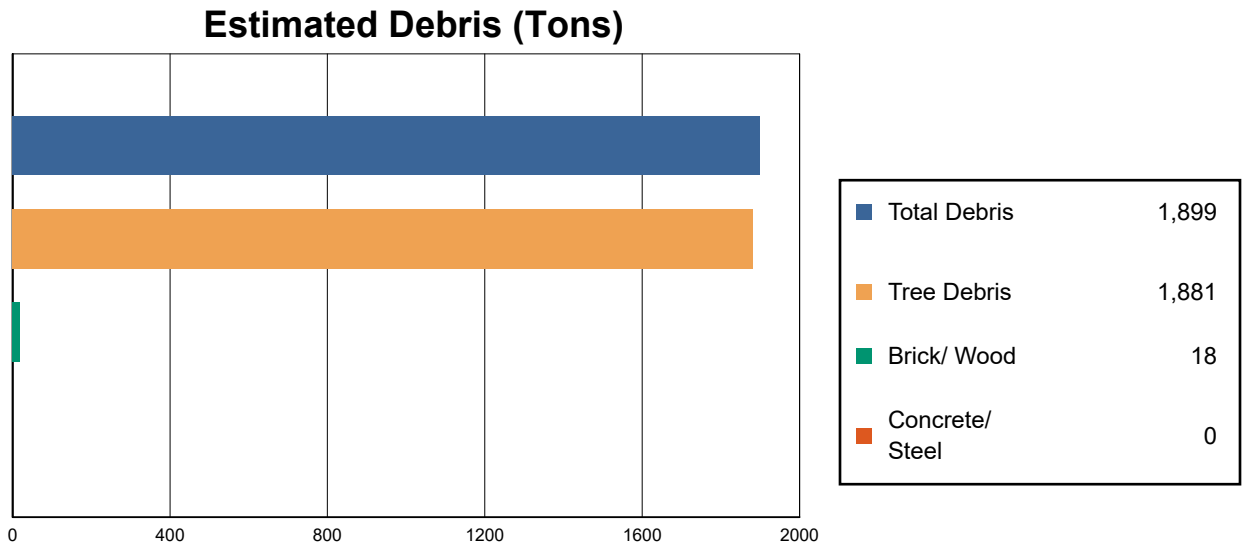


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

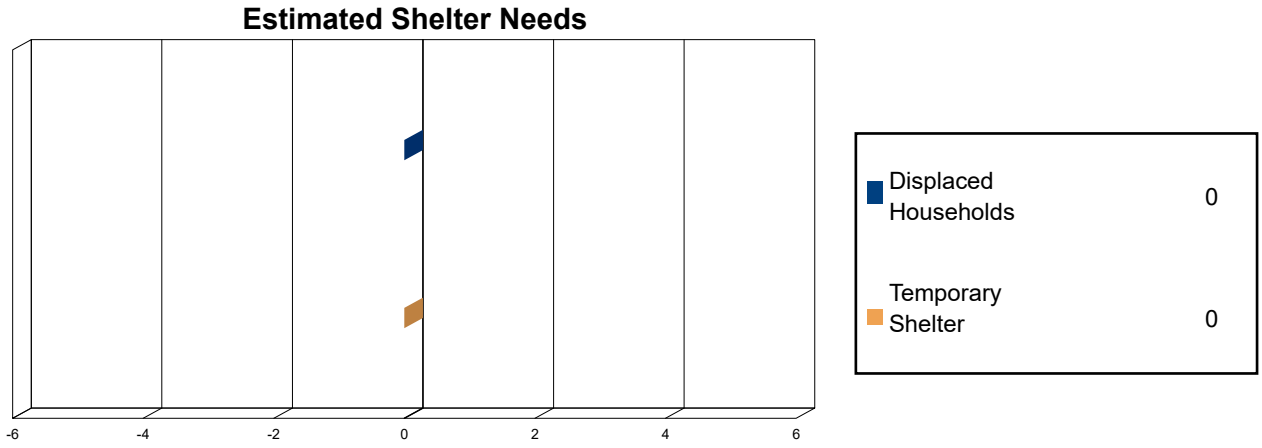


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,899 tons of debris will be generated. Of the total amount, 1,601 tons (84%) is Other Tree Debris. Of the remaining 298 tons, Brick/Wood comprises 6% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 280 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 11,472) will seek temporary shelter in public shelters.

Economic Loss

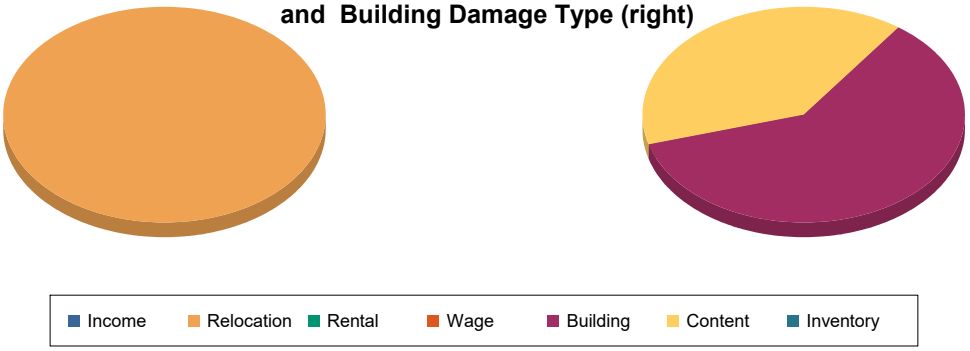
The total economic loss estimated for the hurricane is 1.8 million dollars, which represents 0.08 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

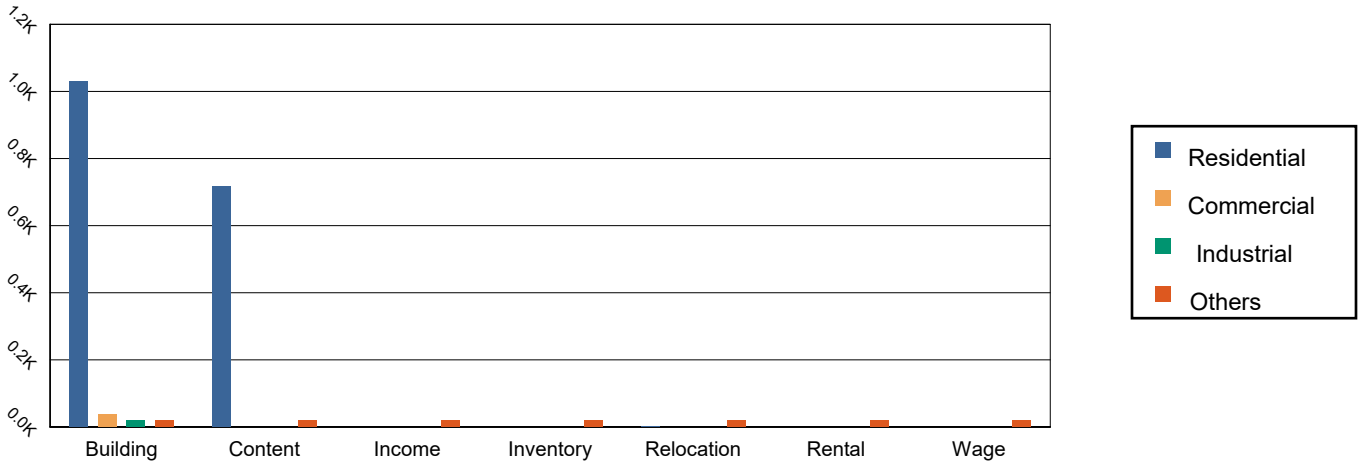


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,030.00	38.63	18.16	20.46	1,107.26
	Content	717.63	0.00	0.00	0.00	717.63
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,747.63**	**38.63**	**18.16**	**20.46**	**1,824.89**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.40	0.00	0.00	0.00	0.40
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.40**	**0.00**	**0.00**	**0.00**	**0.40**

Total

Total	**1,748.04**	**38.63**	**18.16**	**20.46**	**1,825.29**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,444,151	773,474	2,217,625
Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**
Study Region Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**

Hazus: Hurricane Global Risk Report

Region Name:	Stafford_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 58.78 square miles and contains 3 census tracts. There are over 4 thousand households in the region and a total population of 11,472 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,218 million dollars. Approximately 89% of the buildings (and 65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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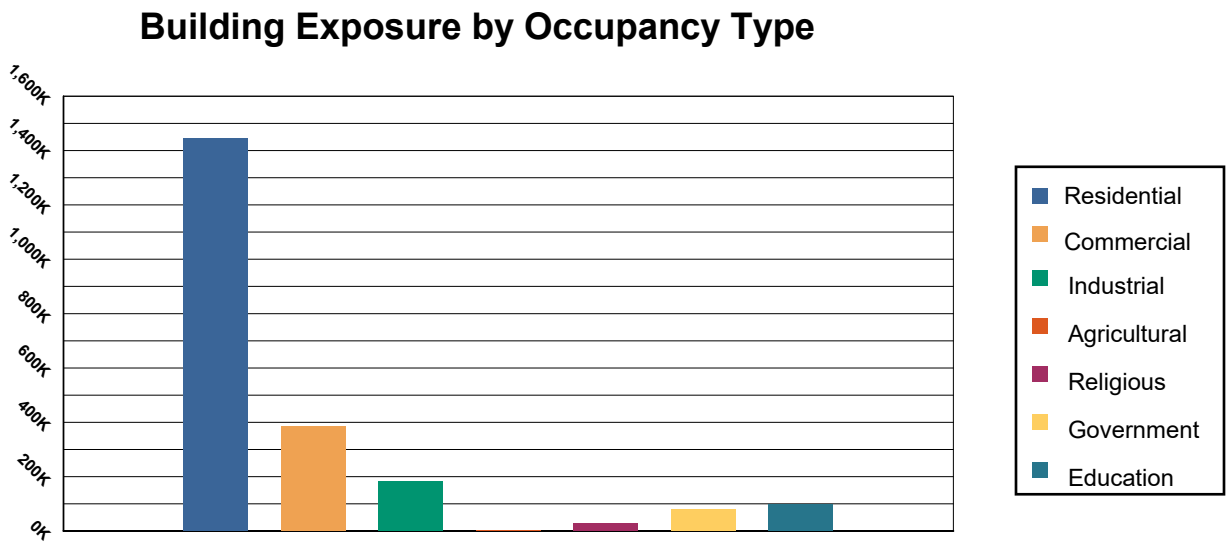

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Occupancy	Exposure ($1000)	Percent of Tot
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Agricultural	900	0.04%
Religious	26,595	1.20%
Government	80,532	3.63%
Education	97,485	4.40%
Total	**2,217,625**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 5 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

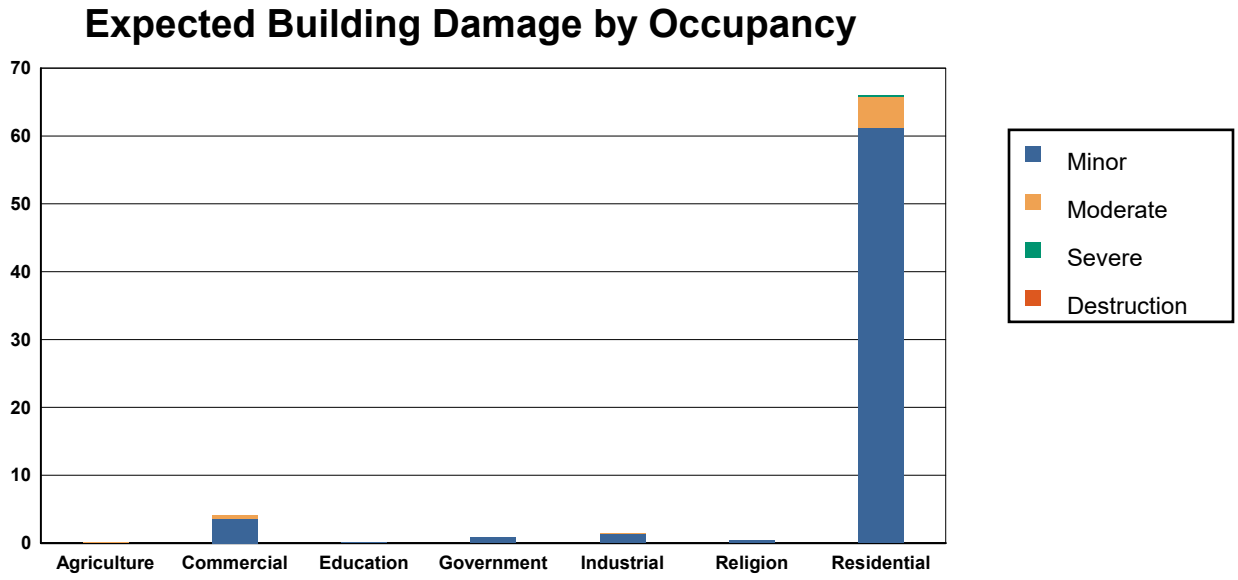


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	5.92	98.63	0.07	1.22	0.01	0.12	0.00	0.03	0.00	0.00
Commercial	290.90	98.61	3.57	1.21	0.51	0.17	0.02	0.01	0.00	0.00
Education	6.91	98.66	0.09	1.31	0.00	0.03	0.00	0.00	0.00	0.00
Government	63.15	98.67	0.84	1.31	0.01	0.02	0.00	0.00	0.00	0.00
Industrial	109.57	98.71	1.37	1.23	0.06	0.05	0.01	0.01	0.00	0.00
Religion	30.62	98.78	0.37	1.18	0.01	0.04	0.00	0.00	0.00	0.00
Residential	4,158.03	98.44	61.24	1.45	4.56	0.11	0.16	0.00	0.00	0.00
Total	**4,665.10**		**67.55**		**5.17**		**0.19**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	67	98.36	1	1.62	0	0.02	0	0.00	0	0.00
Masonry	427	97.68	9	1.98	1	0.32	0	0.01	0	0.00
MH	21	99.92	0	0.06	0	0.02	0	0.00	0	0.00
Steel	256	98.67	3	1.16	0	0.16	0	0.01	0	0.00
Wood	3,898	98.69	50	1.26	2	0.04	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 72 hospital beds available for use. On the day of the hurricane, the model estimates that 72 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

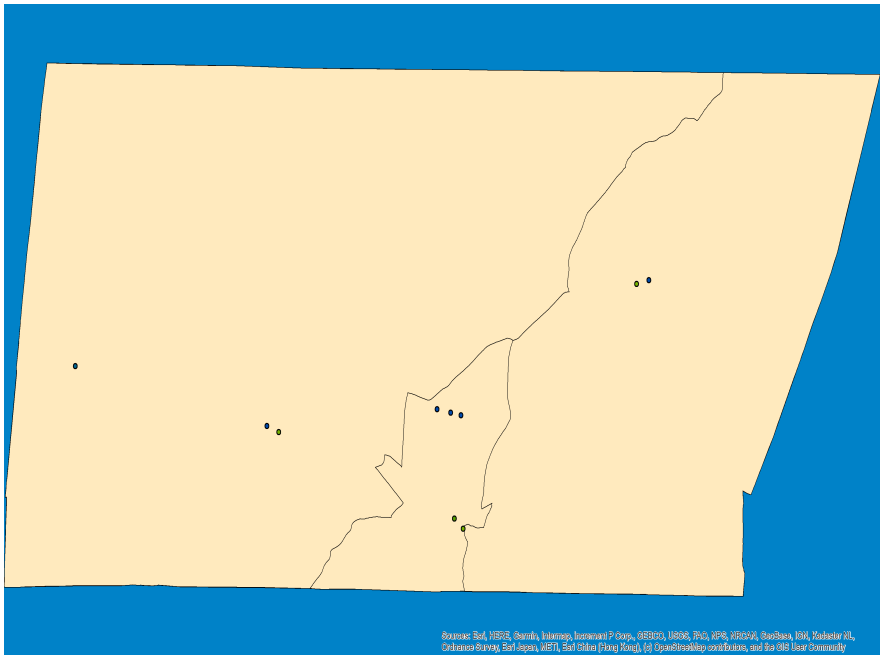
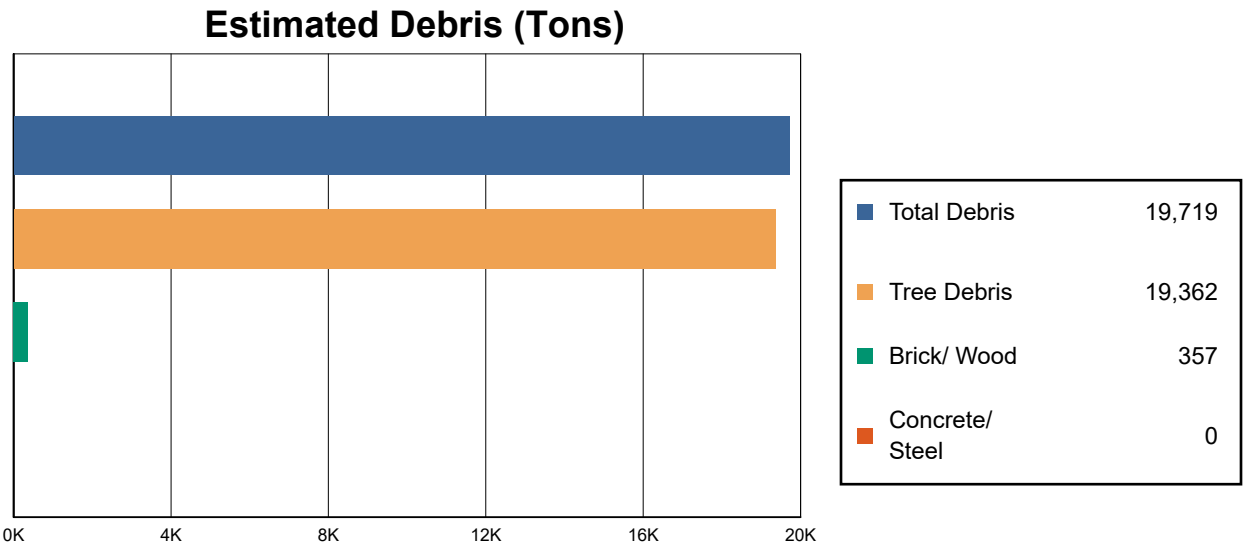


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

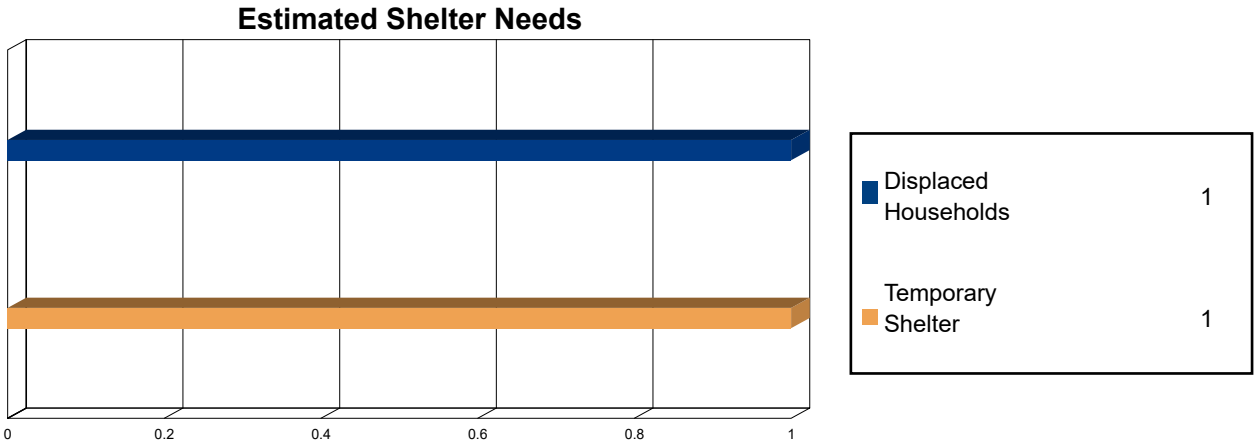


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 19,719 tons of debris will be generated. Of the total amount, 16,474 tons (84%) is Other Tree Debris. Of the remaining 3,245 tons, Brick/Wood comprises 11% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 14 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,888 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 11,472) will seek temporary shelter in public shelters.

Economic Loss

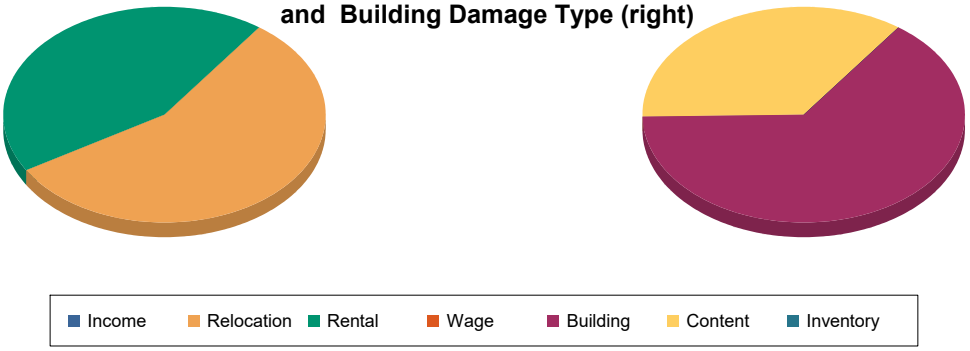
The total economic loss estimated for the hurricane is 11.5 million dollars, which represents 0.52 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 11 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

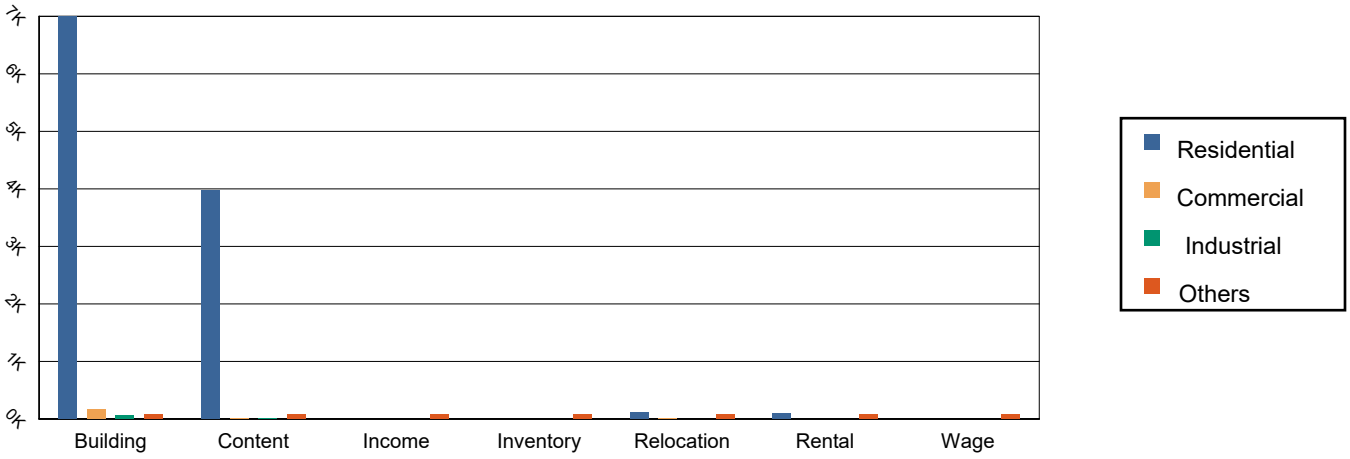


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	6,990.76	166.96	63.37	72.77	7,293.85
	Content	3,979.28	10.83	4.75	0.04	3,994.91
	Inventory	0.00	1.73	0.66	0.03	2.42
	Subtotal	**10,970.04**	**179.53**	**68.78**	**72.84**	**11,291.18**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	110.33	5.11	0.45	0.31	116.20
	Rental	89.60	0.00	0.00	0.00	89.60
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**199.93**	**5.11**	**0.45**	**0.31**	**205.80**

Total

Total	11,169.97	184.64	69.23	73.14	11,496.98

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,444,151	773,474	2,217,625
Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**
Study Region Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**

Hazus: Hurricane Global Risk Report

Region Name:	Stafford_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 58.78 square miles and contains 3 census tracts. There are over 4 thousand households in the region and a total population of 11,472 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,218 million dollars. Approximately 89% of the buildings (and 65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

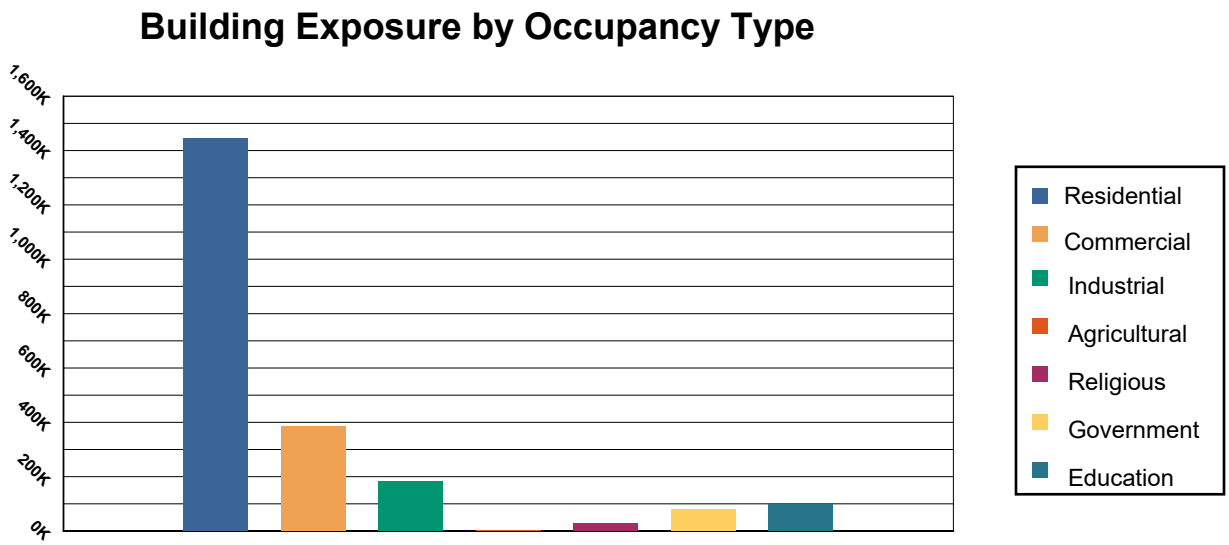


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,444,151	65.12%
Commercial	386,331	17.42%
Industrial	181,631	8.19%
Agricultural	900	0.04%
Religious	26,595	1.20%
Government	80,532	3.63%
Education	97,485	4.40%
Total	**2,217,625**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 23 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

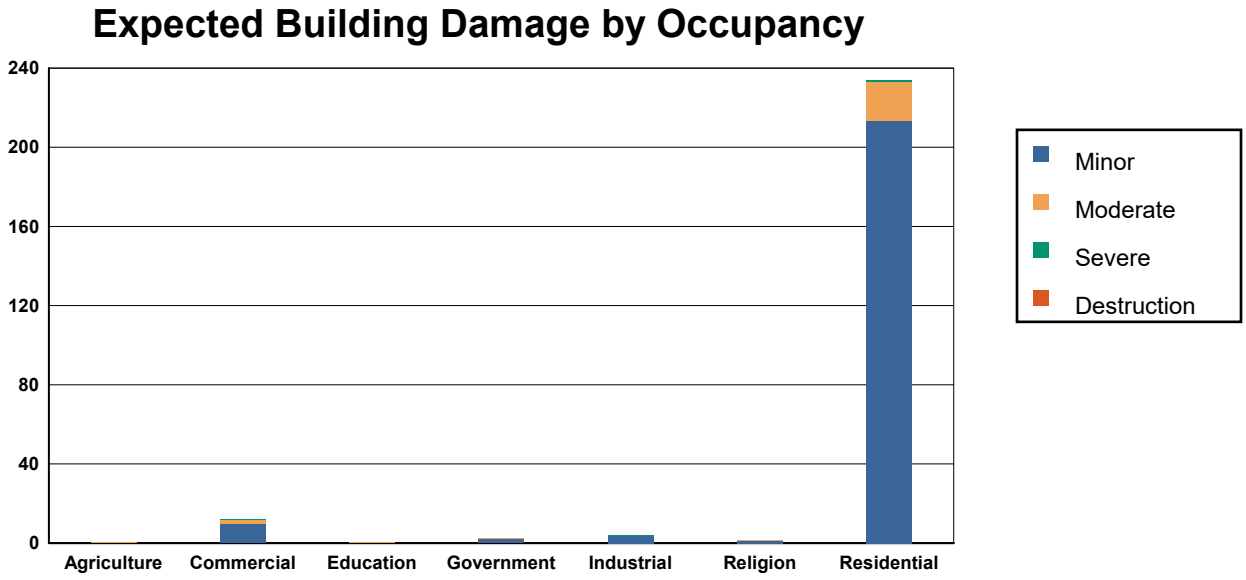


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	5.72	95.35	0.23	3.82	0.04	0.58	0.01	0.24	0.00	0.00
Commercial	283.18	95.99	9.49	3.22	2.06	0.70	0.27	0.09	0.00	0.00
Education	6.74	96.35	0.24	3.47	0.01	0.17	0.00	0.00	0.00	0.00
Government	61.79	96.55	2.12	3.31	0.09	0.14	0.00	0.00	0.00	0.00
Industrial	107.10	96.49	3.49	3.14	0.33	0.30	0.08	0.07	0.00	0.00
Religion	29.82	96.21	1.12	3.61	0.05	0.17	0.00	0.01	0.00	0.00
Residential	3,990.35	94.47	213.23	5.05	19.84	0.47	0.57	0.01	0.01	0.00
Total	**4,484.71**		**229.92**		**22.42**		**0.94**		**0.01**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	65	95.82	3	3.94	0	0.24	0	0.00	0	0.00
Masonry	411	94.11	20	4.66	5	1.17	0	0.06	0	0.00
MH	21	99.30	0	0.54	0	0.13	0	0.00	0	0.03
Steel	250	96.37	7	2.86	2	0.67	0	0.10	0	0.00
Wood	3,748	94.89	192	4.85	10	0.25	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had 72 hospital beds available for use. On the day of the hurricane, the model estimates that 72 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

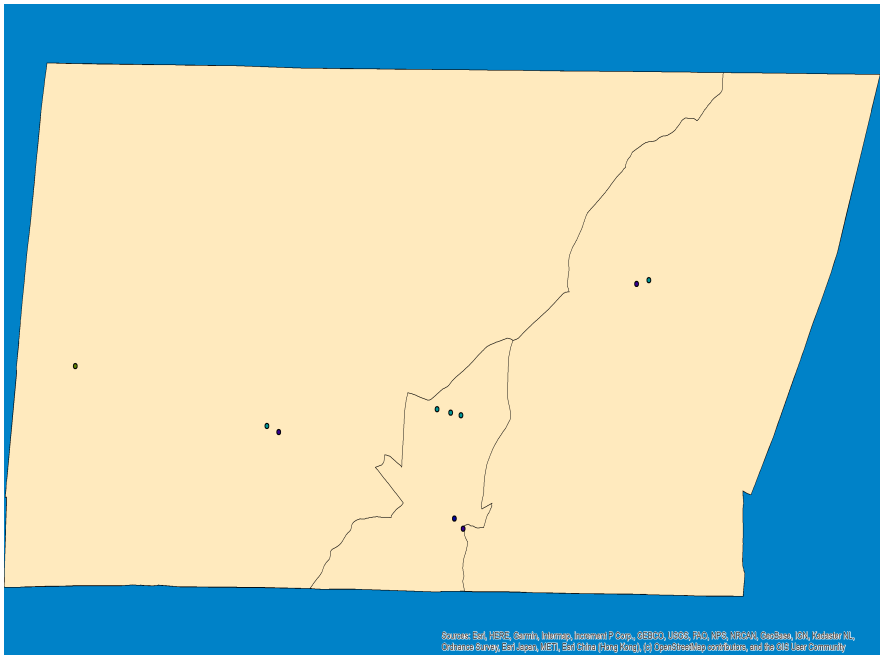
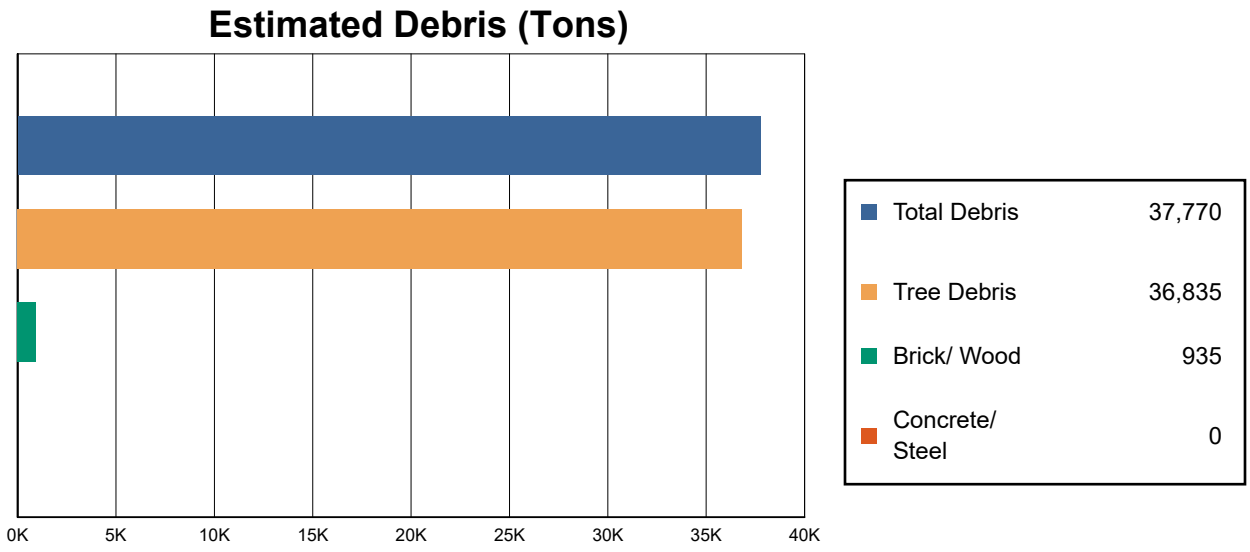


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

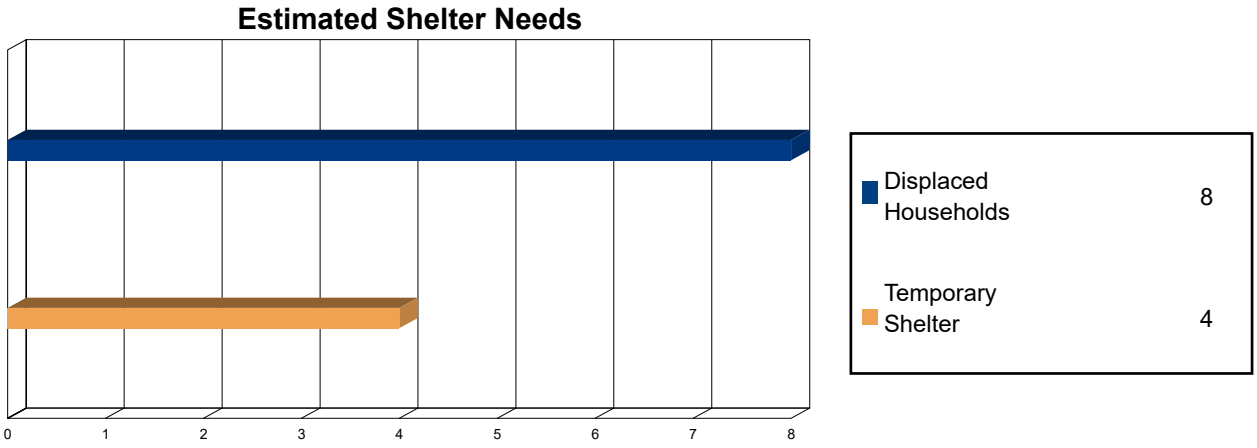


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 37,770 tons of debris will be generated. Of the total amount, 31,378 tons (83%) is Other Tree Debris. Of the remaining 6,392 tons, Brick/Wood comprises 15% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 37 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,457 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 8 households to be displaced due to the hurricane. Of these, 4 people (out of a total population of 11,472) will seek temporary shelter in public shelters.

Economic Loss

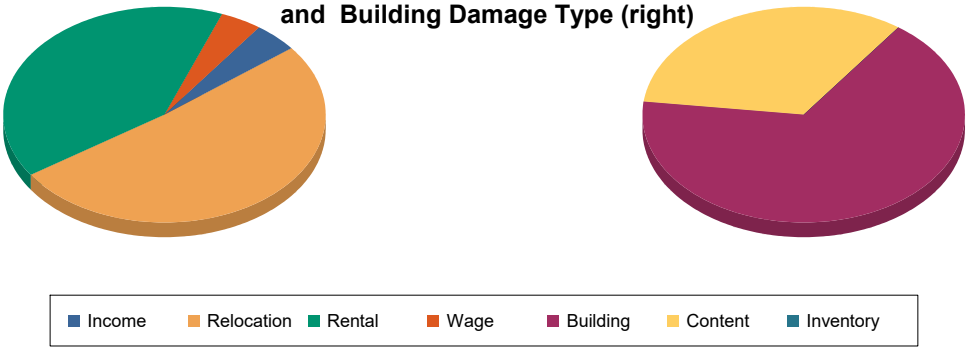
The total economic loss estimated for the hurricane is 22.7 million dollars, which represents 1.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 23 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

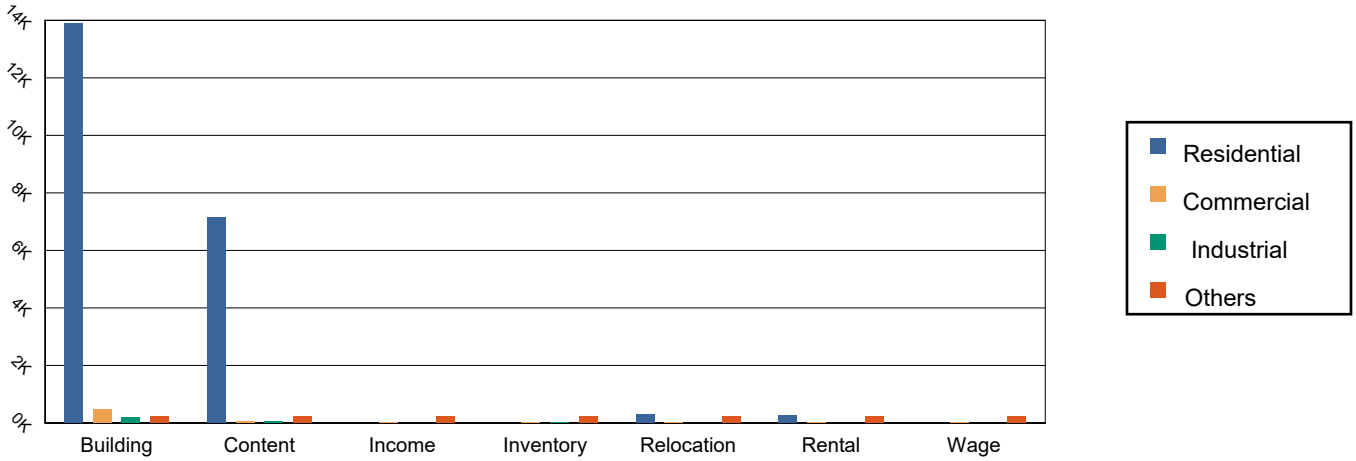


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	13,887.80	480.82	200.23	189.91	14,758.75
	Content	7,136.13	69.80	53.94	3.06	7,262.92
	Inventory	0.00	14.98	6.50	0.29	21.77
	Subtotal	**21,023.92**	**565.59**	**260.66**	**193.26**	**22,043.44**
Business Interruption Loss						
	Income	0.00	19.77	0.62	7.56	27.95
	Relocation	282.71	32.51	4.46	6.72	326.40
	Rental	248.50	8.40	0.42	0.52	257.84
	Wage	0.00	7.02	1.03	17.82	25.87
	Subtotal	**531.21**	**67.70**	**6.53**	**32.61**	**638.06**

Total

Total	**21,555.13**	**633.29**	**267.19**	**225.88**	**22,681.49**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,444,151	773,474	2,217,625
Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**
Study Region Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**

Hazus: Hurricane Global Risk Report

Region Name:	Stafford_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 58.78 square miles and contains 3 census tracts. There are over 4 thousand households in the region and a total population of 11,472 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,218 million dollars. Approximately 89% of the buildings (and 65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

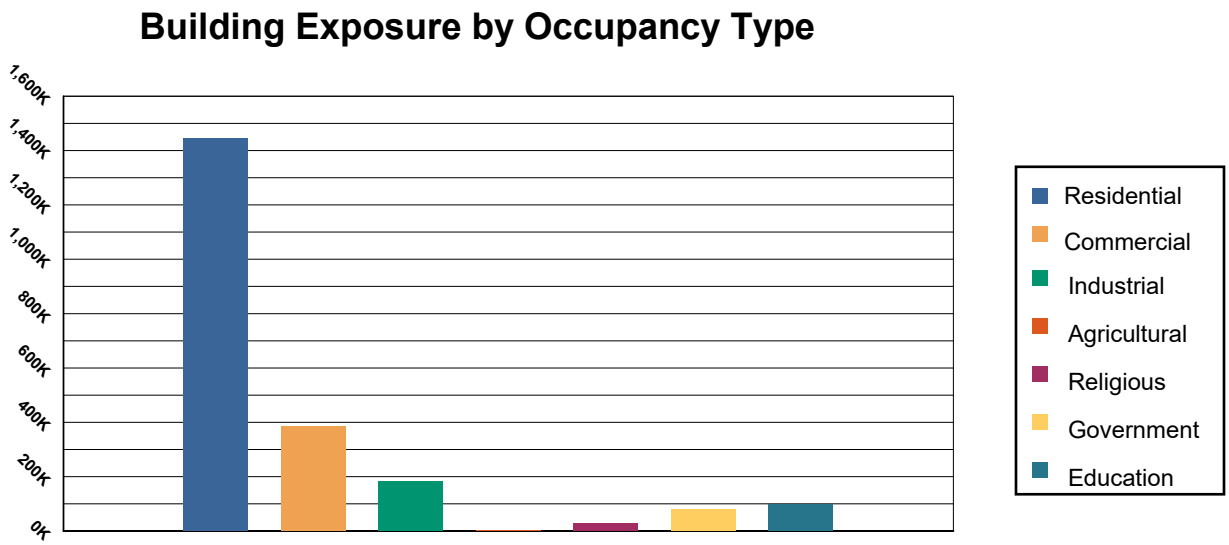


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,444,151	65.12%
Commercial	386,331	17.42%
Industrial	181,631	8.19%
Agricultural	900	0.04%
Religious	26,595	1.20%
Government	80,532	3.63%
Education	97,485	4.40%
Total	**2,217,625**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 63 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

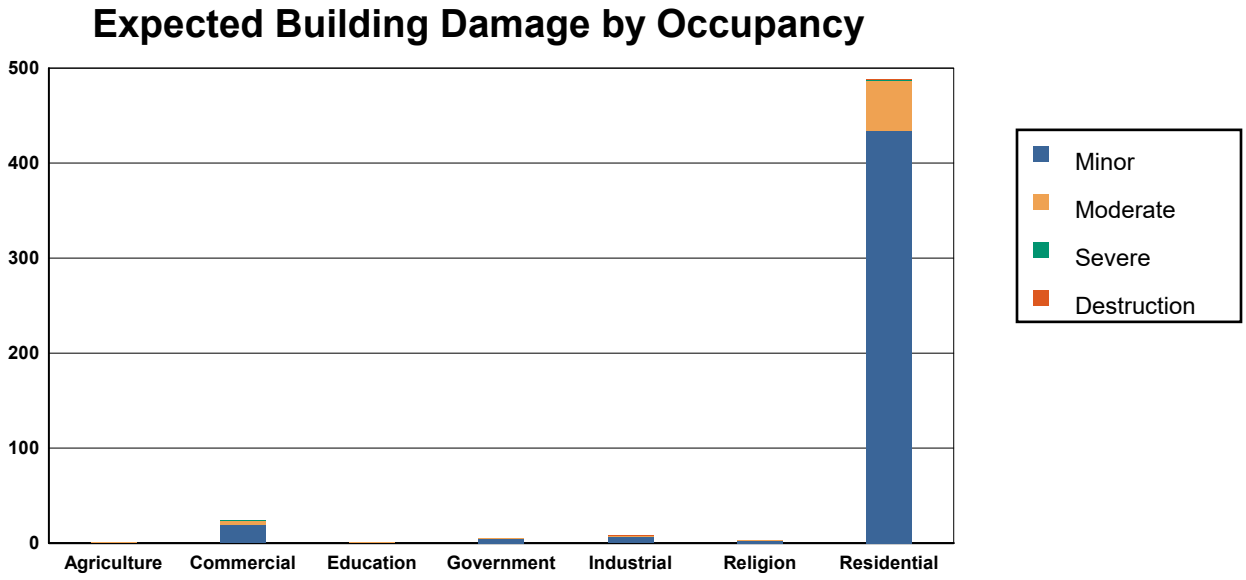


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	5.39	89.87	0.47	7.82	0.09	1.55	0.04	0.70	0.00	0.05
Commercial	270.37	91.65	18.76	6.36	4.82	1.63	1.05	0.35	0.00	0.00
Education	6.46	92.23	0.49	7.01	0.05	0.73	0.00	0.03	0.00	0.00
Government	59.24	92.56	4.32	6.75	0.43	0.67	0.01	0.02	0.00	0.00
Industrial	102.72	92.54	6.88	6.20	1.11	1.00	0.27	0.25	0.01	0.01
Religion	28.42	91.68	2.36	7.62	0.21	0.66	0.01	0.03	0.00	0.00
Residential	3,735.40	88.43	433.70	10.27	52.96	1.25	1.65	0.04	0.29	0.01
Total	**4,208.00**		**466.99**		**59.67**		**3.04**		**0.30**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	62	91.39	5	7.58	1	1.02	0	0.01	0	0.00
Masonry	388	88.86	37	8.38	11	2.59	1	0.16	0	0.01
MH	20	97.57	0	1.72	0	0.55	0	0.01	0	0.15
Steel	239	92.37	14	5.59	4	1.64	1	0.40	0	0.00
Wood	3,514	88.96	402	10.18	32	0.82	1	0.03	0	0.01

Essential Facility Damage

Before the hurricane, the region had 72 hospital beds available for use. On the day of the hurricane, the model estimates that 72 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

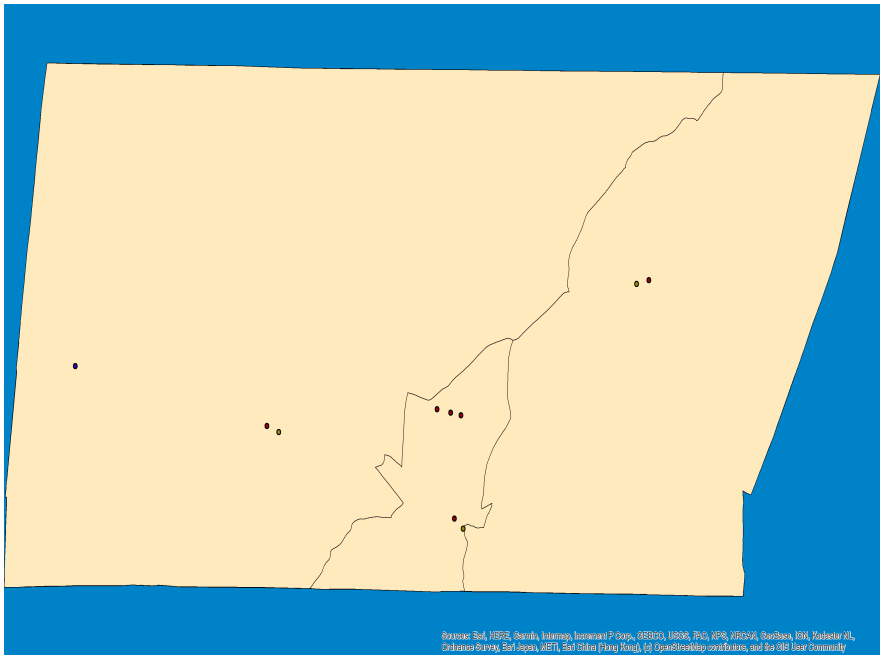
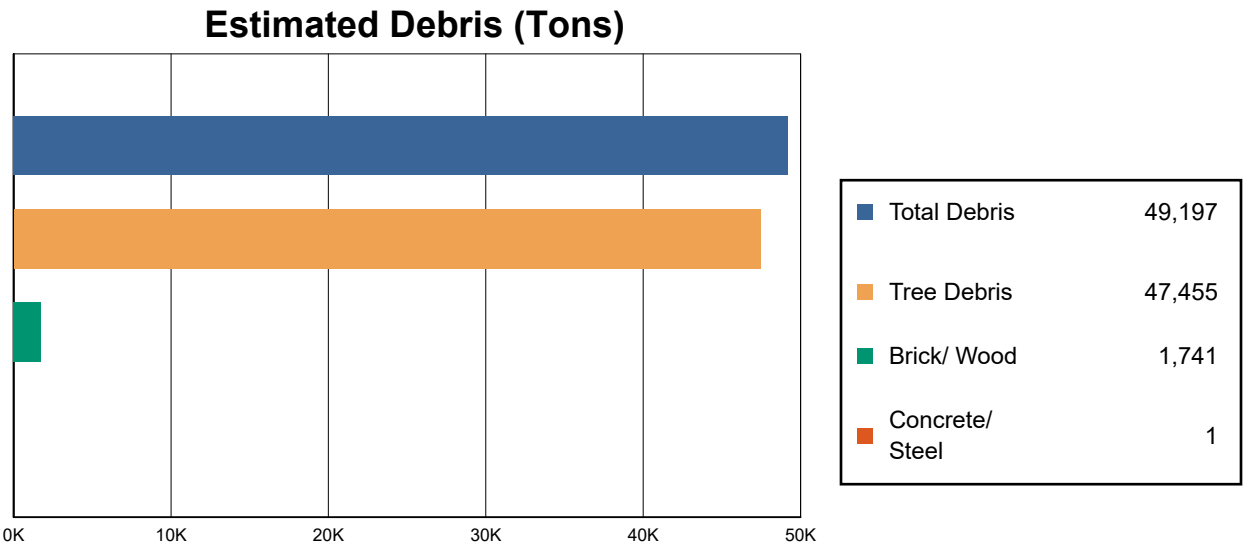


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	5	0	0	5

Induced Hurricane Damage

Debris Generation

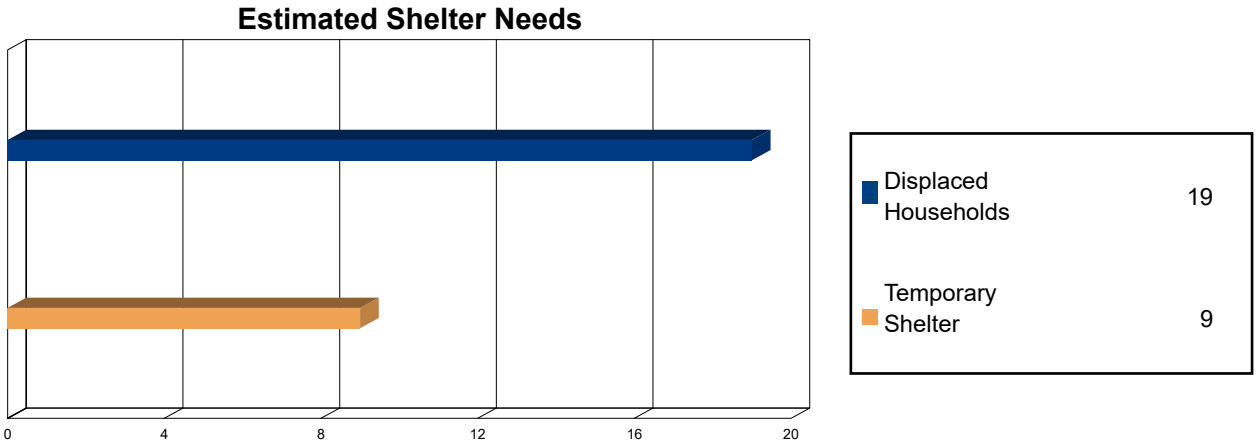


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 49,197 tons of debris will be generated. Of the total amount, 40,415 tons (82%) is Other Tree Debris. Of the remaining 8,782 tons, Brick/Wood comprises 20% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 70 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,040 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 19 households to be displaced due to the hurricane. Of these, 9 people (out of a total population of 11,472) will seek temporary shelter in public shelters.

Economic Loss

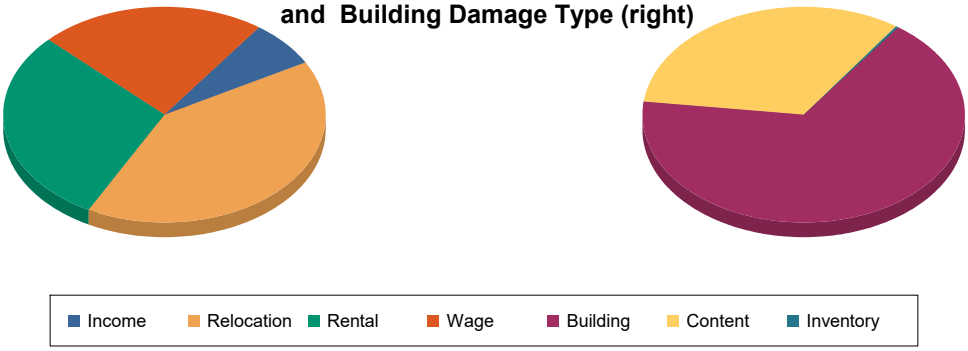
The total economic loss estimated for the hurricane is 38.0 million dollars, which represents 1.71 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 38 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

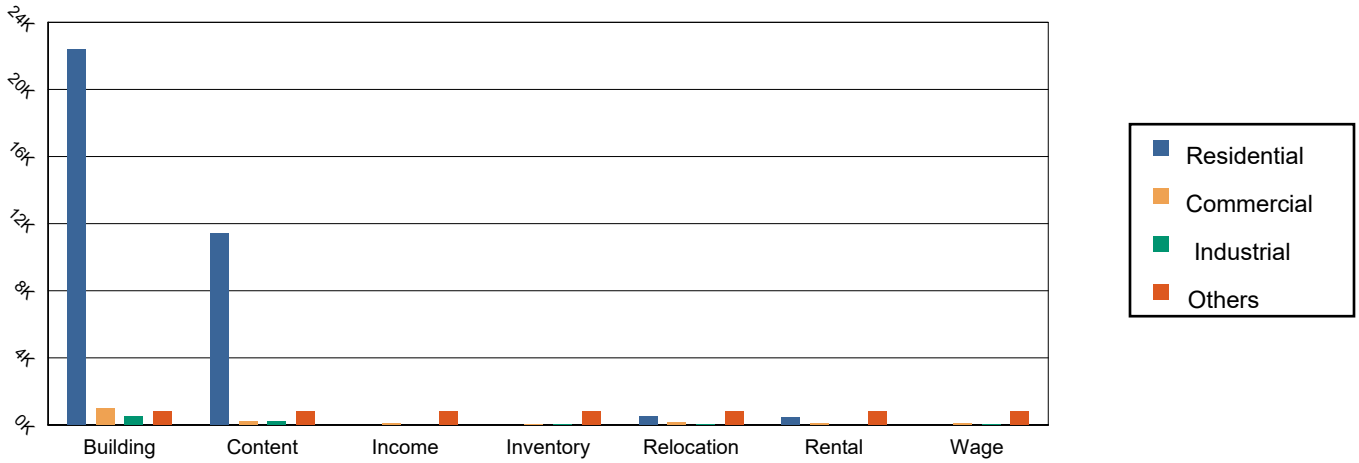


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	22,367.52	991.39	484.67	408.40	24,251.98
	Content	11,415.84	214.01	228.07	47.13	11,905.04
	Inventory	0.00	49.88	26.60	0.99	77.47
	Subtotal	**33,783.36**	**1,255.29**	**739.34**	**456.51**	**36,234.50**
Business Interruption Loss						
	Income	0.00	89.05	5.76	28.47	123.28
	Relocation	502.29	145.54	27.49	44.50	719.81
	Rental	434.95	69.70	4.94	6.60	516.19
	Wage	0.00	97.54	9.56	294.07	401.18
	Subtotal	**937.24**	**401.83**	**47.75**	**373.64**	**1,760.46**

Total

Total	**34,720.60**	**1,657.11**	**787.10**	**830.15**	**37,994.96**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,444,151	773,474	2,217,625
Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**
Study Region Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**

Hazus: Hurricane Global Risk Report

Region Name:	Stafford_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 58.78 square miles and contains 3 census tracts. There are over 4 thousand households in the region and a total population of 11,472 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,218 million dollars. Approximately 89% of the buildings (and 65% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

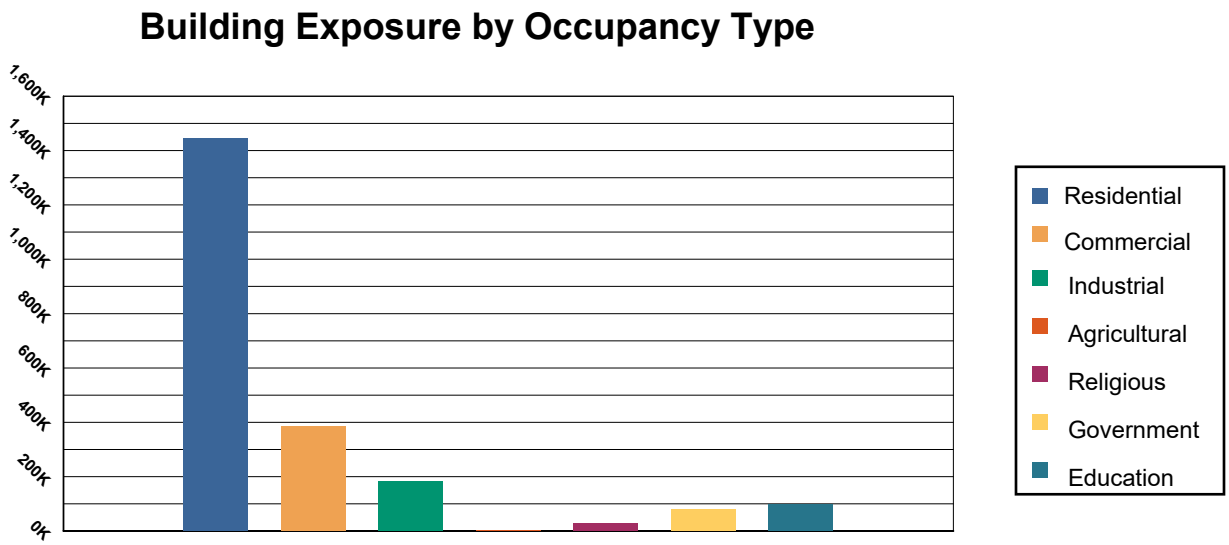


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,444,151	65.12%
Commercial	386,331	17.42%
Industrial	181,631	8.19%
Agricultural	900	0.04%
Religious	26,595	1.20%
Government	80,532	3.63%
Education	97,485	4.40%
Total	**2,217,625**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 172 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 3 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

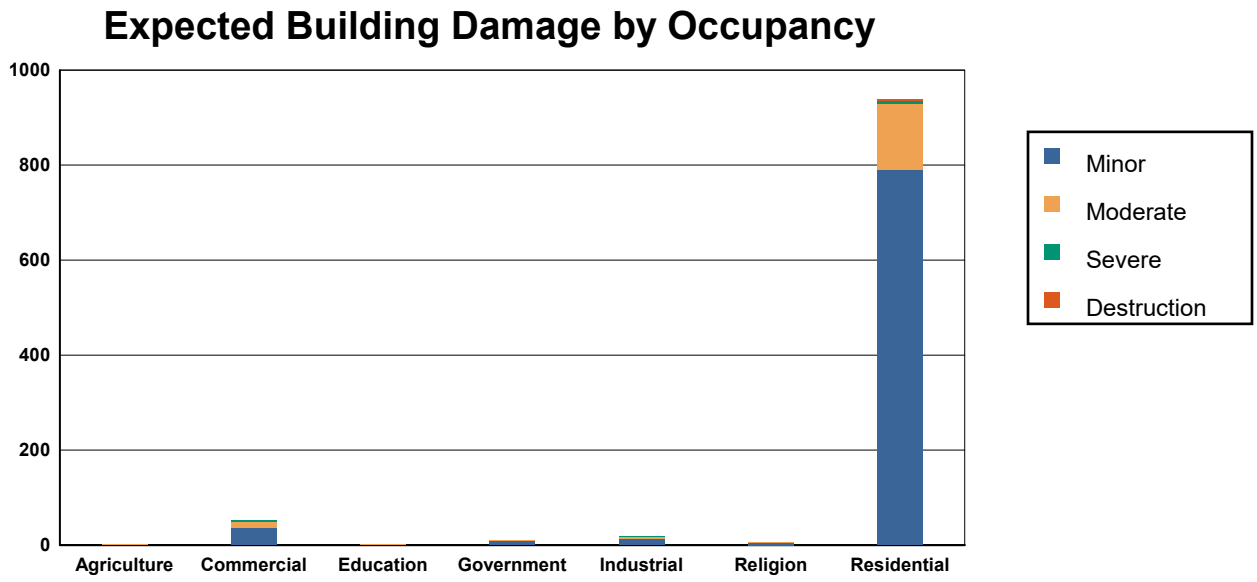


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4.76	79.32	0.89	14.86	0.23	3.77	0.11	1.84	0.01	0.21
Commercial	241.84	81.98	37.05	12.56	12.64	4.28	3.46	1.17	0.02	0.01
Education	5.81	82.98	0.96	13.73	0.22	3.08	0.01	0.21	0.00	0.00
Government	53.74	83.97	8.33	13.02	1.82	2.84	0.11	0.17	0.00	0.00
Industrial	93.00	83.79	13.36	12.04	3.67	3.30	0.90	0.81	0.07	0.06
Religion	25.37	81.83	4.71	15.21	0.86	2.78	0.06	0.18	0.00	0.00
Residential	3,285.64	77.78	790.59	18.72	137.84	3.26	7.14	0.17	2.80	0.07
Total	**3,710.16**		**855.90**		**157.26**		**11.79**		**2.90**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	56	81.73	10	14.19	3	3.92	0	0.16	0	0.00
Masonry	345	78.95	64	14.66	26	5.89	2	0.45	0	0.04
MH	19	92.43	1	4.60	0	2.25	0	0.08	0	0.64
Steel	216	83.38	28	10.88	11	4.34	4	1.39	0	0.02
Wood	3,094	78.34	749	18.95	99	2.50	6	0.15	3	0.07

Essential Facility Damage

Before the hurricane, the region had 72 hospital beds available for use. On the day of the hurricane, the model estimates that 72 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

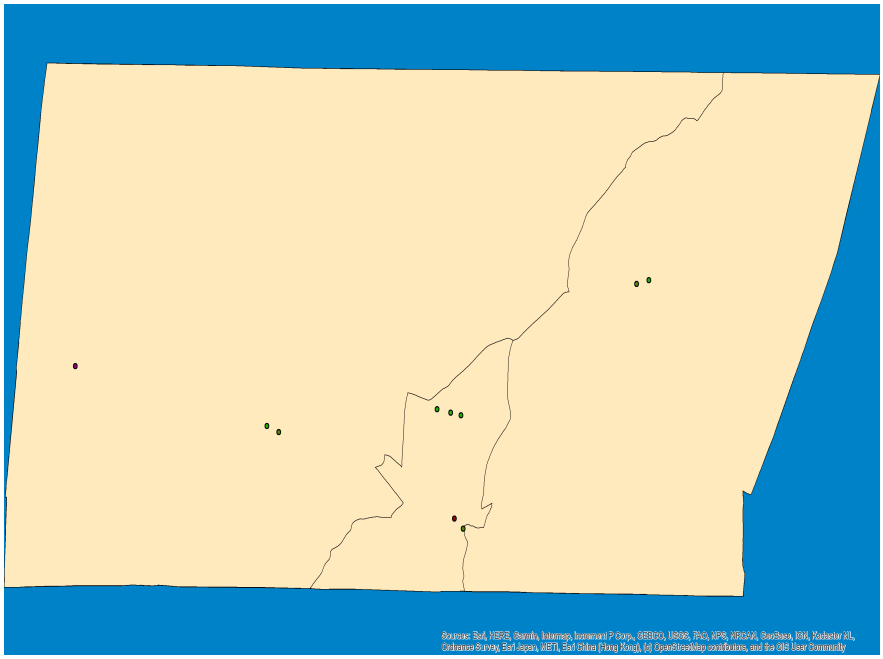
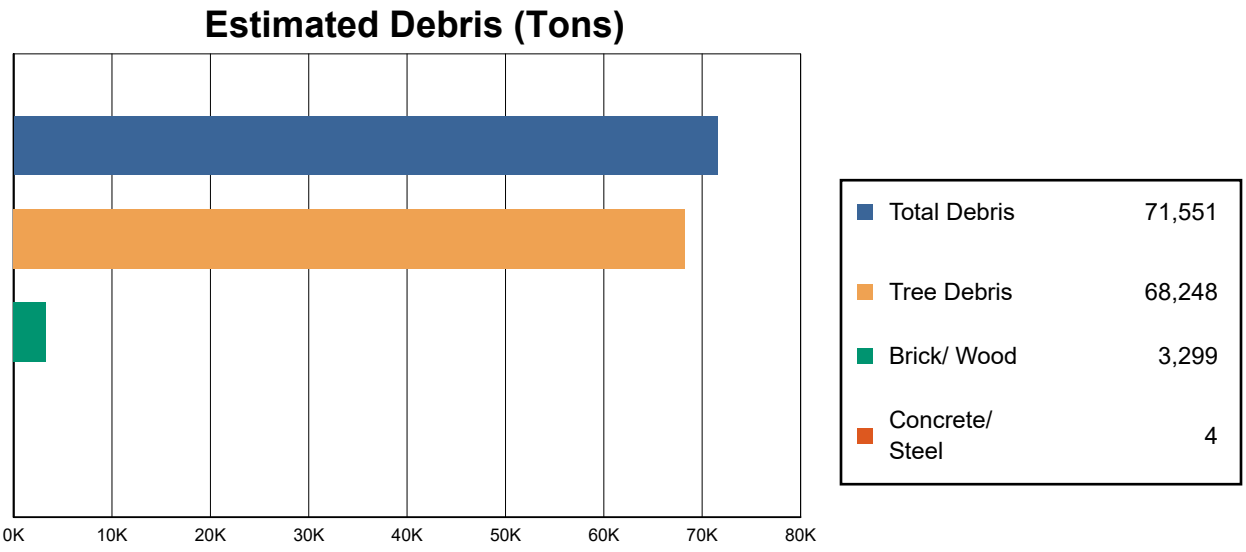


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	5	0	0	2

Induced Hurricane Damage

Debris Generation

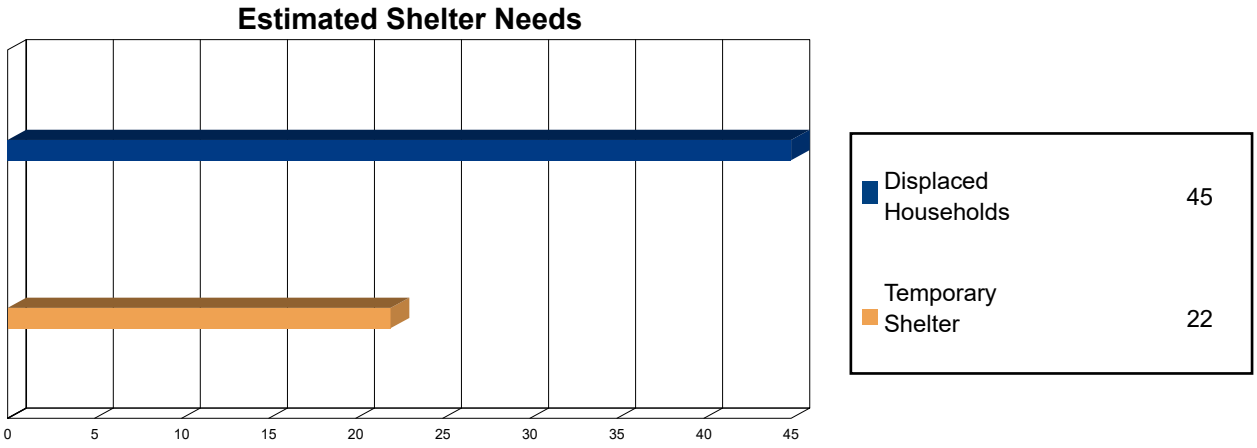


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 71,551 tons of debris will be generated. Of the total amount, 58,076 tons (81%) is Other Tree Debris. Of the remaining 13,475 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 132 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 10,172 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 45 households to be displaced due to the hurricane. Of these, 22 people (out of a total population of 11,472) will seek temporary shelter in public shelters.

Economic Loss

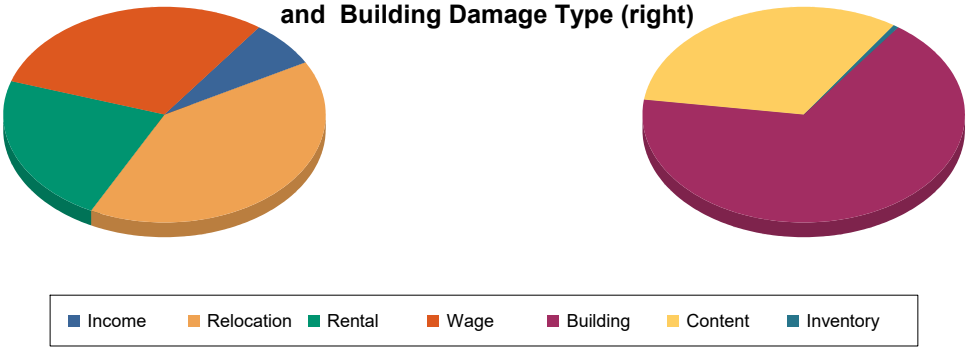
The total economic loss estimated for the hurricane is 68.8 million dollars, which represents 3.10 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 69 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 86% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

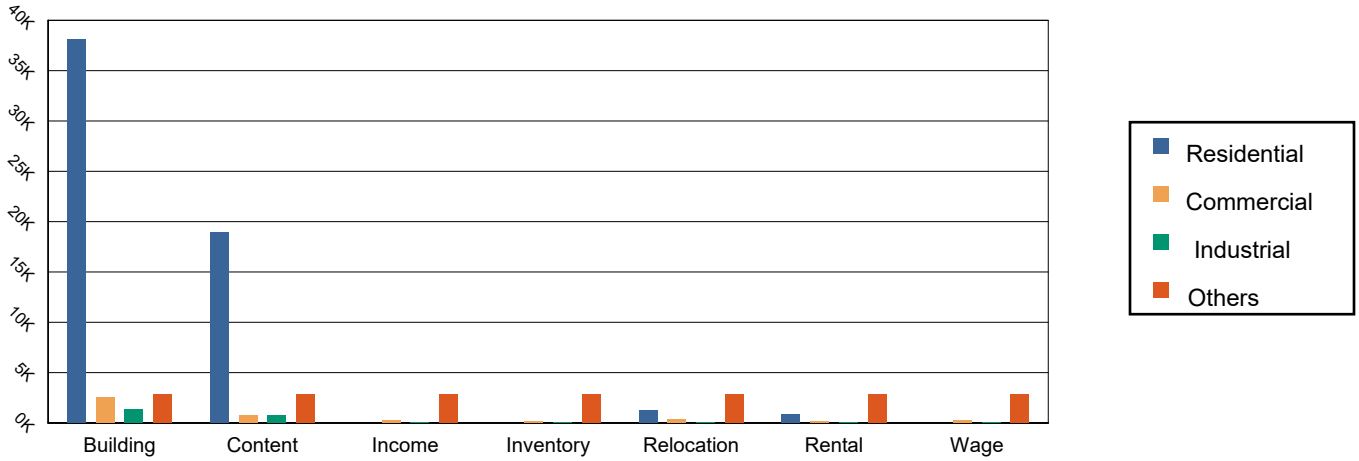


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	38,067.41	2,511.78	1,333.16	1,059.07	42,971.42
	Content	18,965.57	740.62	794.56	237.05	20,737.80
	Inventory	0.00	186.05	91.05	2.98	280.08
	Subtotal	**57,032.98**	**3,438.45**	**2,218.77**	**1,299.10**	**63,989.30**
Business Interruption Loss						
	Income	0.00	213.22	14.78	100.47	328.47
	Relocation	1,273.65	391.23	87.03	196.75	1,948.66
	Rental	851.69	184.87	13.84	26.77	1,077.16
	Wage	0.00	245.20	24.62	1,172.23	1,442.06
	Subtotal	**2,125.34**	**1,034.52**	**140.27**	**1,496.22**	**4,796.35**

Total

Total	**59,158.32**	**4,472.98**	**2,359.04**	**2,795.31**	**68,785.64**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,444,151	773,474	2,217,625
Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**
Study Region Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**

Hazus: Hurricane Global Risk Report

Region Name:	Stafford_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
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There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,218 million dollars. Approximately 89% of the buildings (and 65% of the building value) are associated with residential housing.

Building Inventory

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Hazus estimates that there are 4,738 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

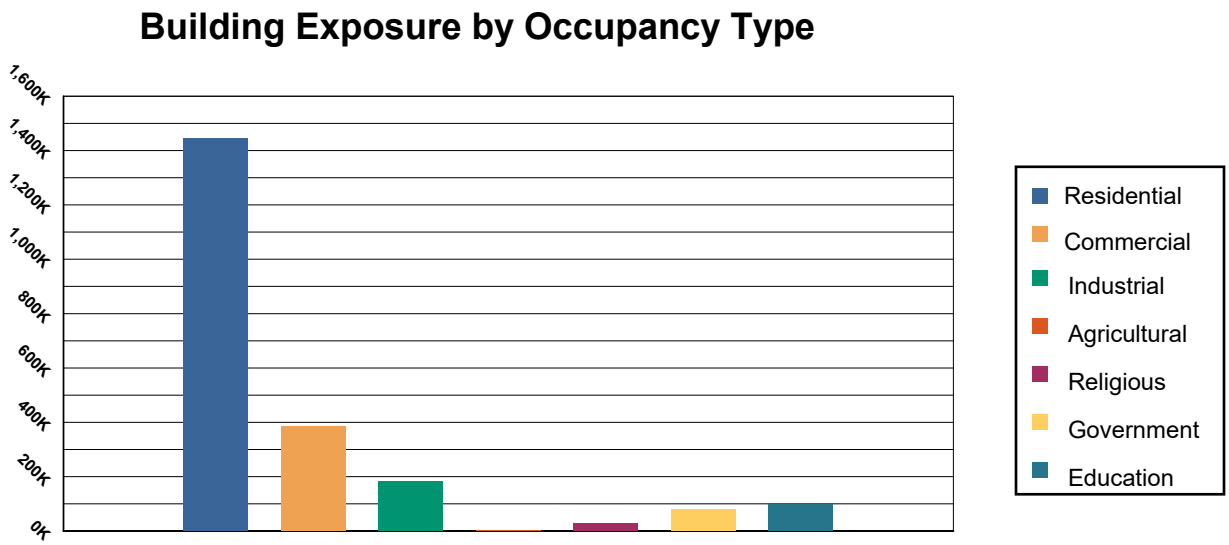


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,444,151	65.12%
Commercial	386,331	17.42%
Industrial	181,631	8.19%
Agricultural	900	0.04%
Religious	26,595	1.20%
Government	80,532	3.63%
Education	97,485	4.40%
Total	**2,217,625**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 281 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 7 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

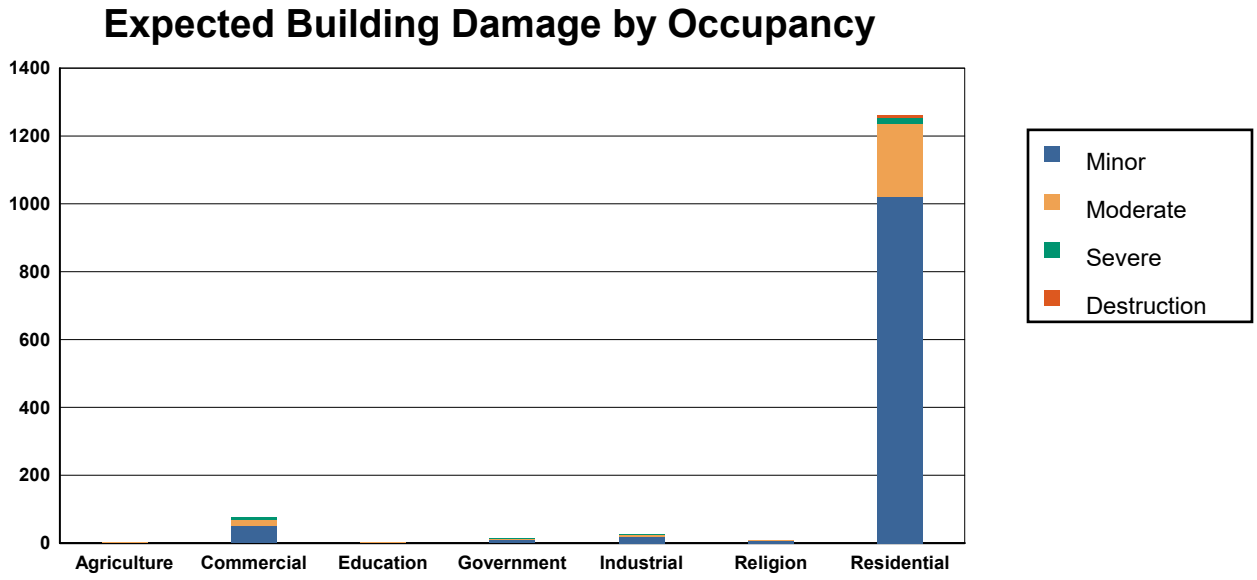


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4.29	71.43	1.17	19.57	0.35	5.83	0.17	2.80	0.02	0.38
Commercial	218.95	74.22	49.55	16.80	20.58	6.98	5.87	1.99	0.05	0.02
Education	5.27	75.30	1.28	18.32	0.41	5.83	0.04	0.55	0.00	0.00
Government	49.07	76.68	11.16	17.43	3.48	5.44	0.29	0.45	0.00	0.00
Industrial	84.86	76.45	17.93	16.15	6.50	5.86	1.58	1.42	0.12	0.11
Religion	22.95	74.03	6.29	20.29	1.62	5.22	0.14	0.47	0.00	0.00
Residential	2,964.00	70.17	1,019.82	24.14	217.70	5.15	15.23	0.36	7.25	0.17
Total	**3,349.39**		**1,107.20**		**250.64**		**23.32**		**7.44**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	50	73.77	13	18.55	5	7.24	0	0.44	0	0.00
Masonry	312	71.39	82	18.77	39	8.96	3	0.80	0	0.08
MH	18	87.63	1	6.83	1	4.10	0	0.20	0	1.24
Steel	197	75.92	38	14.60	18	7.06	6	2.38	0	0.03
Wood	2,793	70.70	973	24.63	165	4.17	13	0.33	7	0.17

Essential Facility Damage

Before the hurricane, the region had 72 hospital beds available for use. On the day of the hurricane, the model estimates that 72 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

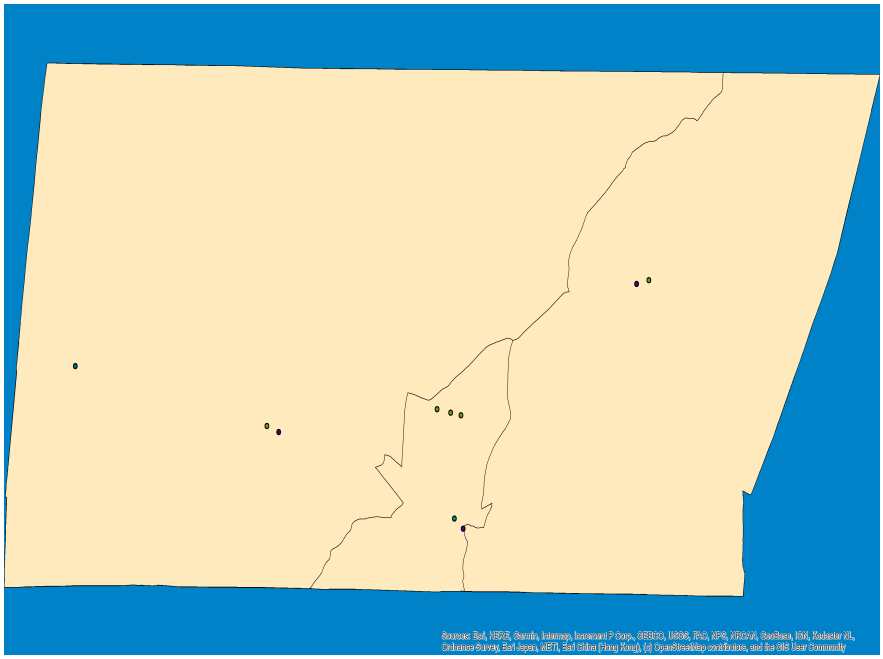
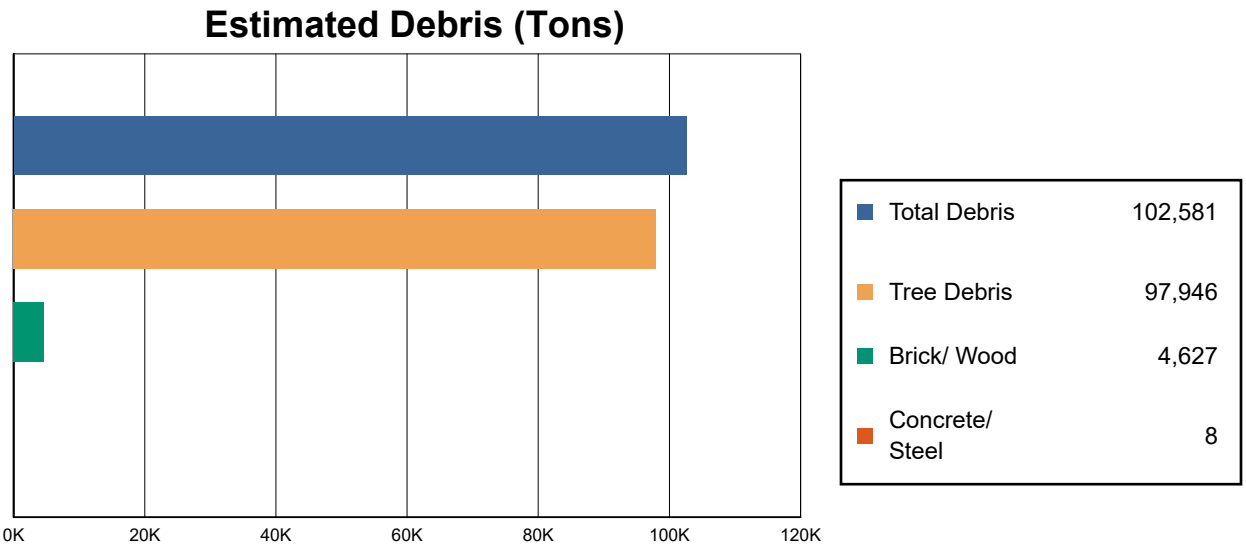


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	5	0	0	2

Induced Hurricane Damage

Debris Generation

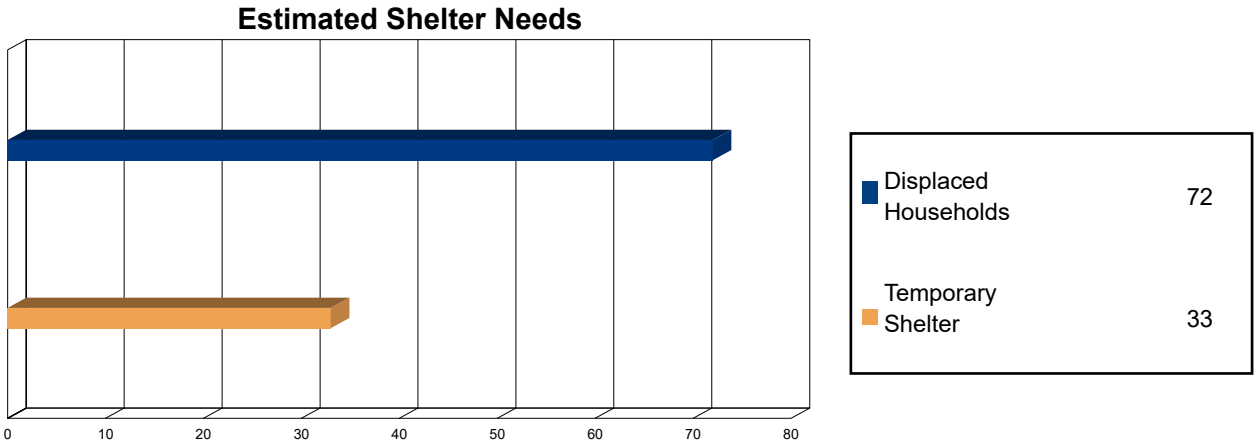


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 102,581 tons of debris will be generated. Of the total amount, 83,483 tons (81%) is Other Tree Debris. Of the remaining 19,098 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 185 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 14,463 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 72 households to be displaced due to the hurricane. Of these, 33 people (out of a total population of 11,472) will seek temporary shelter in public shelters.

Economic Loss

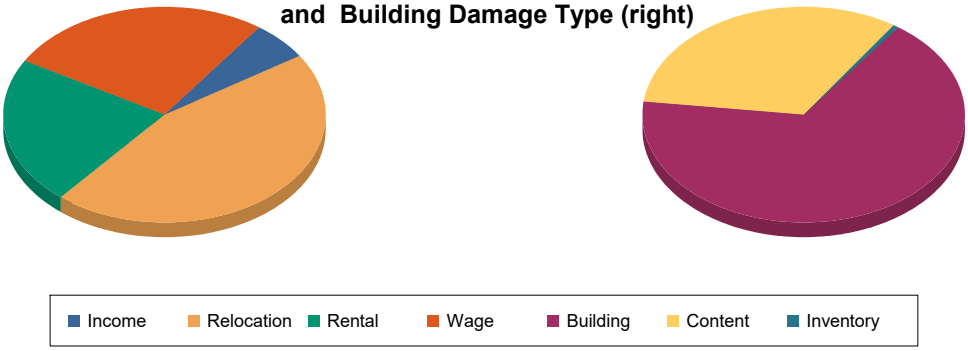
The total economic loss estimated for the hurricane is 96.7 million dollars, which represents 4.36 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 97 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 84% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

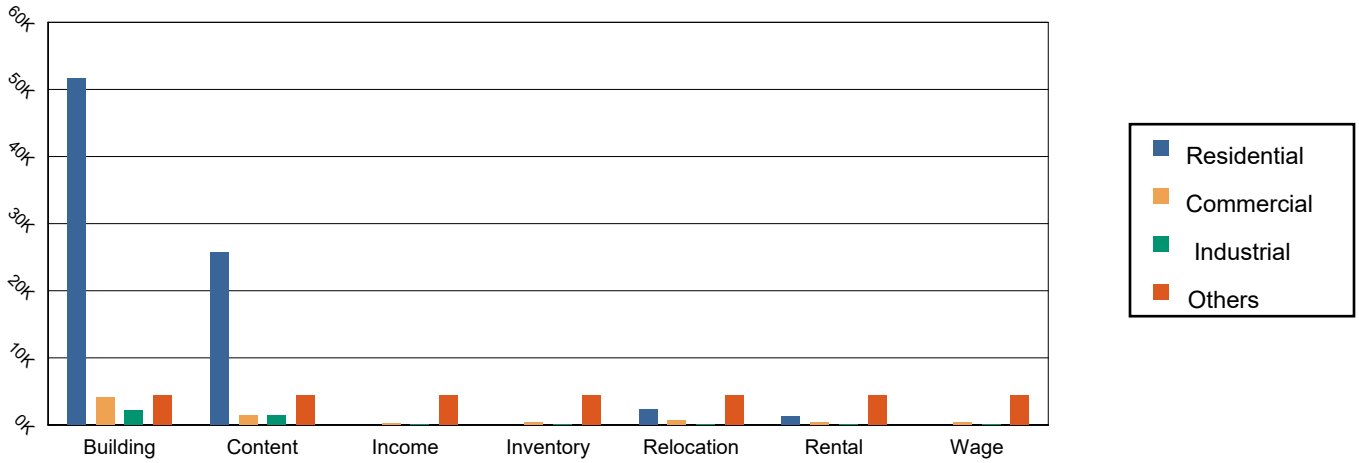


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	51,581.99	4,033.56	2,188.64	1,761.13	59,565.32
	Content	25,679.41	1,373.08	1,390.95	499.02	28,942.46
	Inventory	0.00	346.27	158.35	4.92	509.54
	Subtotal	**77,261.40**	**5,752.92**	**3,737.94**	**2,265.07**	**89,017.32**
Business Interruption Loss						
	Income	0.00	289.46	22.97	127.96	440.39
	Relocation	2,340.26	661.71	157.93	329.98	3,489.88
	Rental	1,304.60	316.78	24.76	44.01	1,690.16
	Wage	0.00	346.99	38.26	1,668.90	2,054.15
	Subtotal	**3,644.86**	**1,614.95**	**243.92**	**2,170.85**	**7,674.58**

Total

Total	**80,906.26**	**7,367.86**	**3,981.86**	**4,435.92**	**96,691.90**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	11,472	1,444,151	773,474	2,217,625
Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**
Study Region Total	**11,472**	**1,444,151**	**773,474**	**2,217,625**

Hazus: Hurricane Global Risk Report

Region Name:	Suffield_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 42.73 square miles and contains 4 census tracts. There are over 5 thousand households in the region and a total population of 15,752 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 3,183 million dollars. Approximately 90% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,971 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

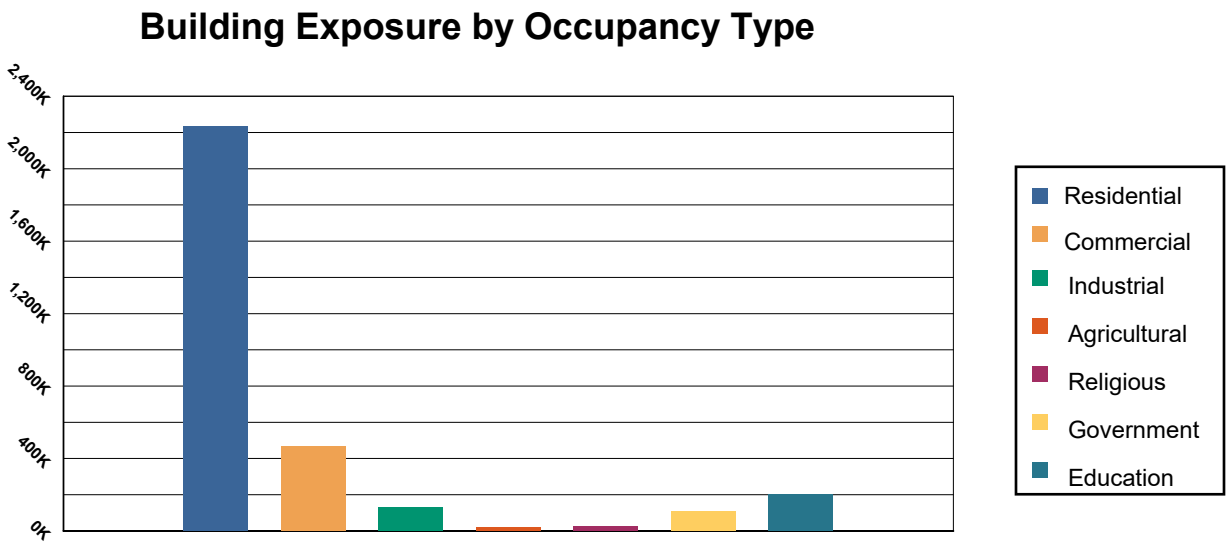


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,232,424	70.14%
Commercial	469,222	14.74%
Industrial	130,547	4.10%
Agricultural	16,820	0.53%
Religious	25,027	0.79%
Government	108,224	3.40%
Education	200,761	6.31%
Total	**3,183,025**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

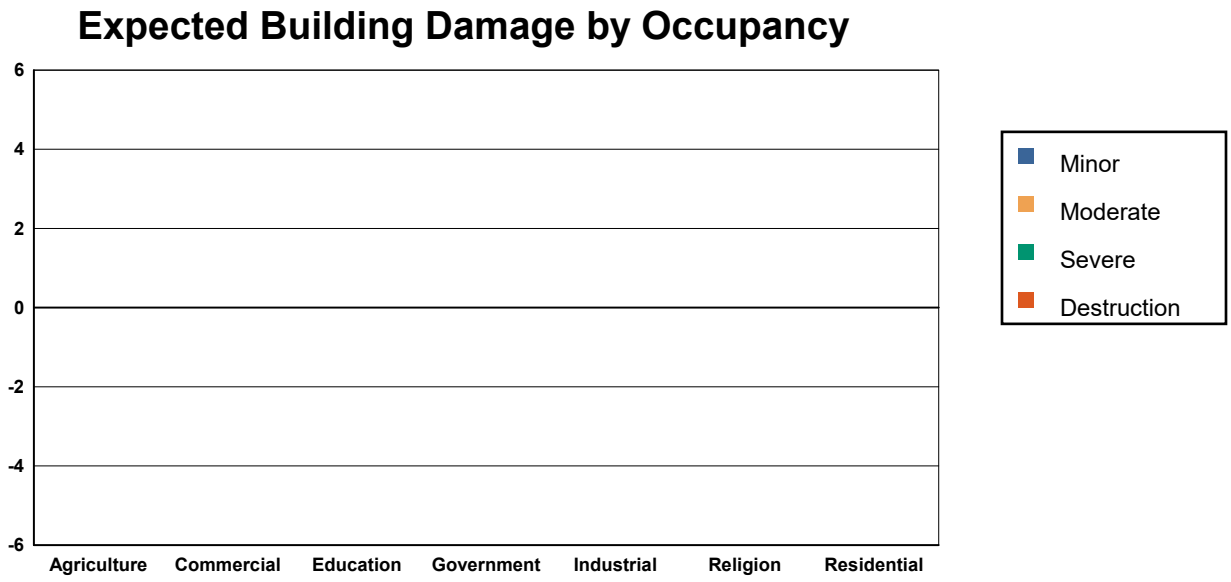


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	25.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	278.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	8.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	86.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	89.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	23.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	4,462.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**4,971.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	62	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	387	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	243	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	4,277	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

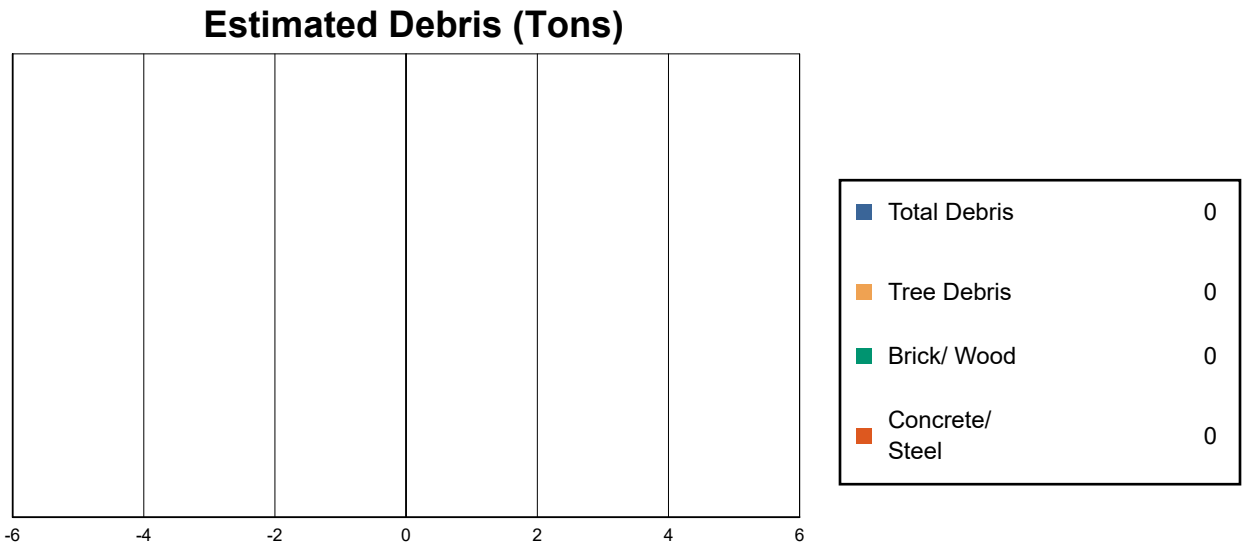
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

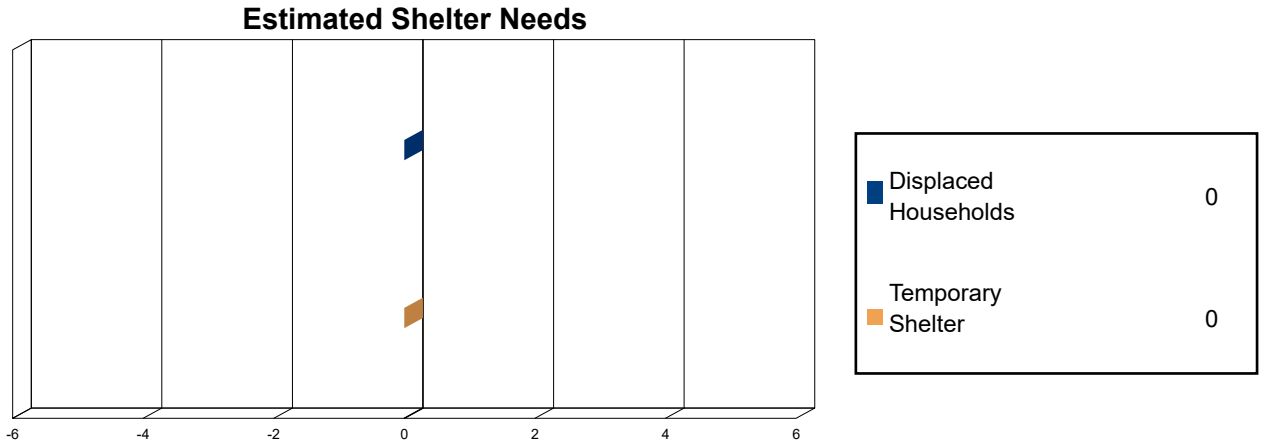


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 15,752) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

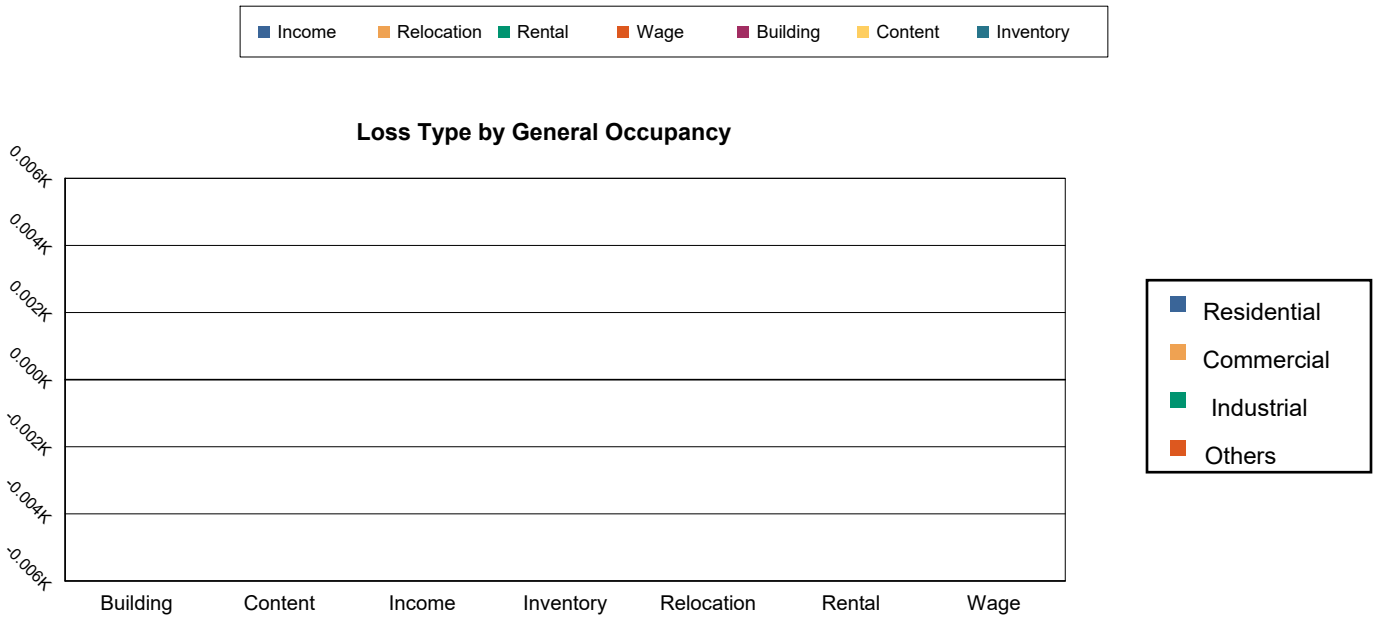


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	15,752	2,232,424	950,601	3,183,025
Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**
Study Region Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**

Hazus: Hurricane Global Risk Report

Region Name:	Suffield_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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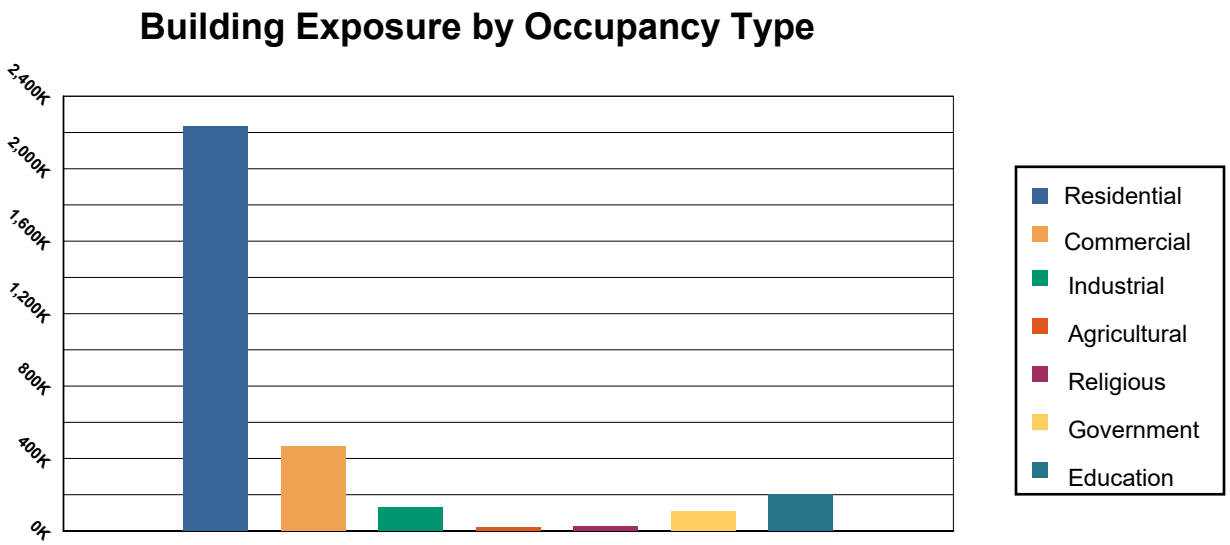

Table 1: Building Exposure by Occupancy Type

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Residential	2,232,424	70.14%
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Industrial	130,547	4.10%
Agricultural	16,820	0.53%
Religious	25,027	0.79%
Government	108,224	3.40%
Education	200,761	6.31%
Total	**3,183,025**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

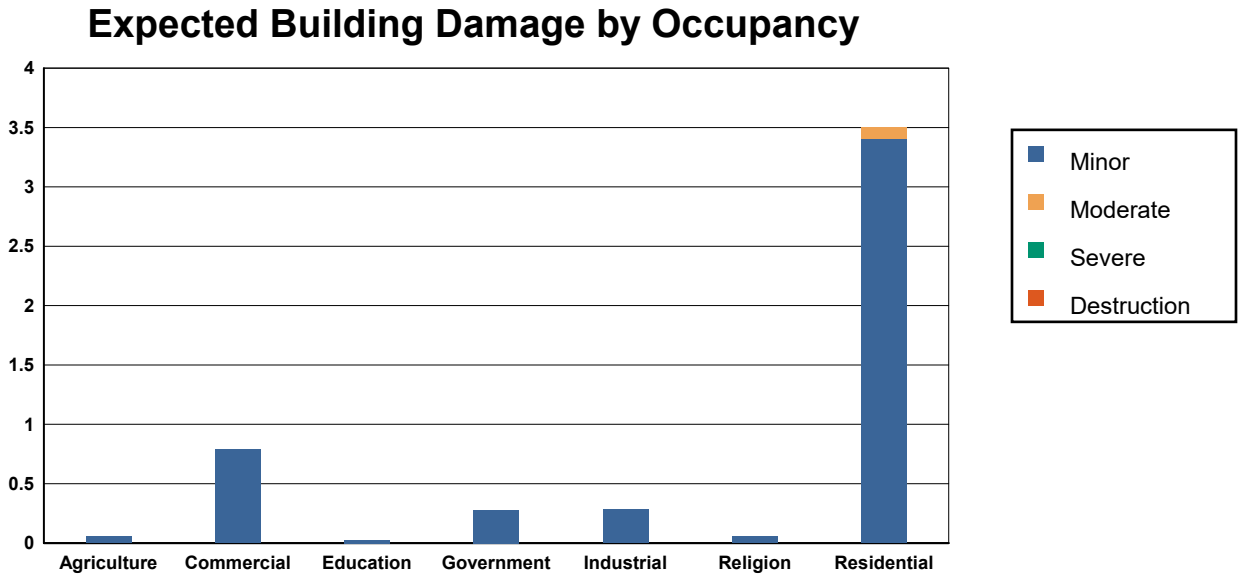


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	24.95	99.78	0.05	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	277.21	99.72	0.79	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Education	7.98	99.69	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Government	85.72	99.67	0.28	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	88.72	99.68	0.28	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Religion	22.94	99.76	0.06	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Residential	4,458.49	99.92	3.41	0.08	0.10	0.00	0.00	0.00	0.00	0.00
Total	**4,966.01**		**4.89**		**0.10**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	62	99.59	0	0.41	0	0.00	0	0.00	0	0.00
Masonry	386	99.62	1	0.37	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	242	99.67	1	0.33	0	0.00	0	0.00	0	0.00
Wood	4,276	99.97	1	0.02	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

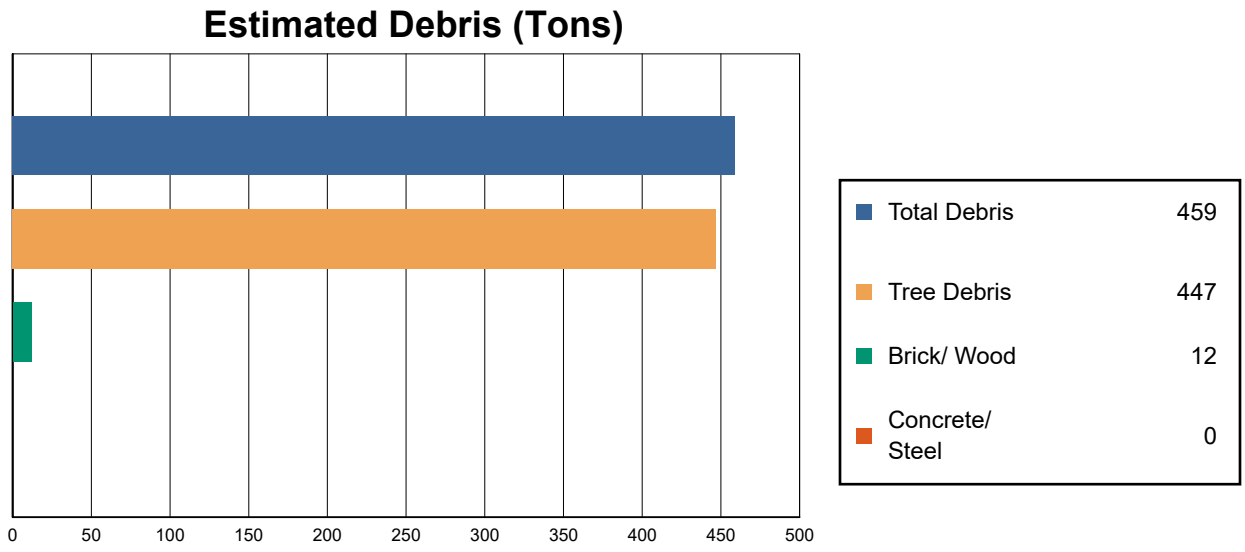
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

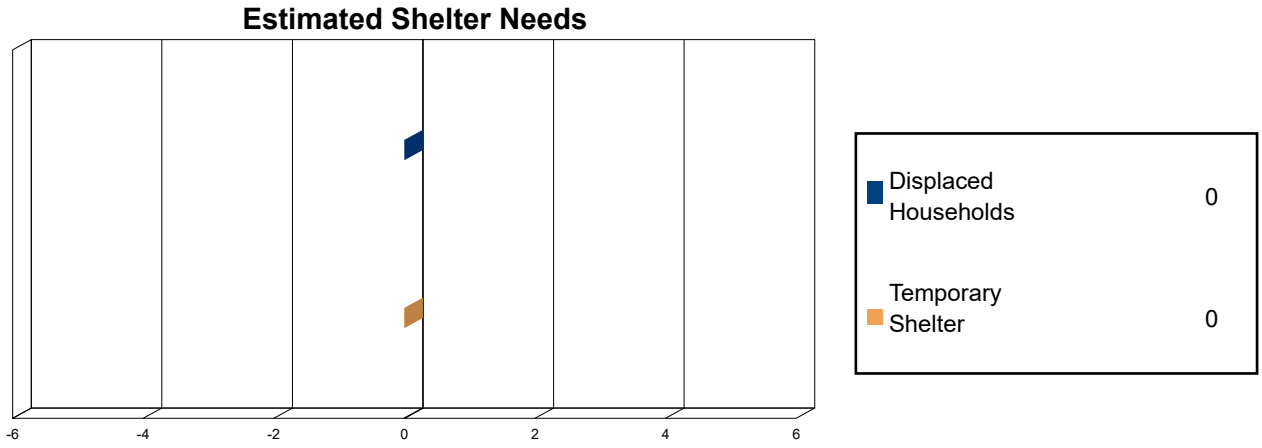


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 459 tons of debris will be generated. Of the total amount, 380 tons (83%) is Other Tree Debris. Of the remaining 79 tons, Brick/Wood comprises 15% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 67 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 15,752) will seek temporary shelter in public shelters.

Economic Loss

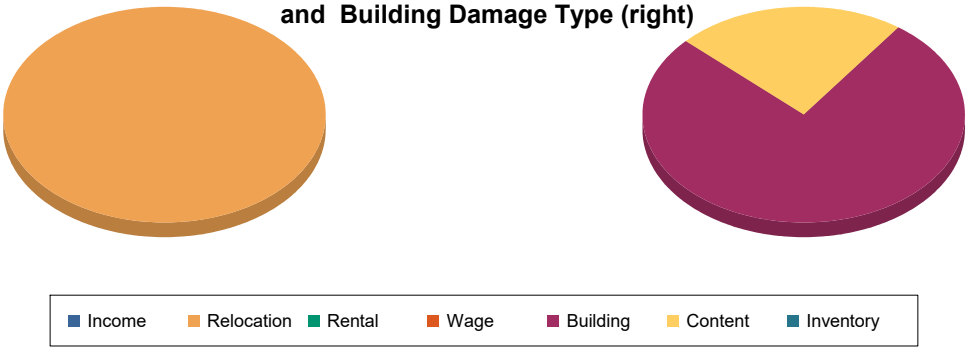
The total economic loss estimated for the hurricane is 0.7 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

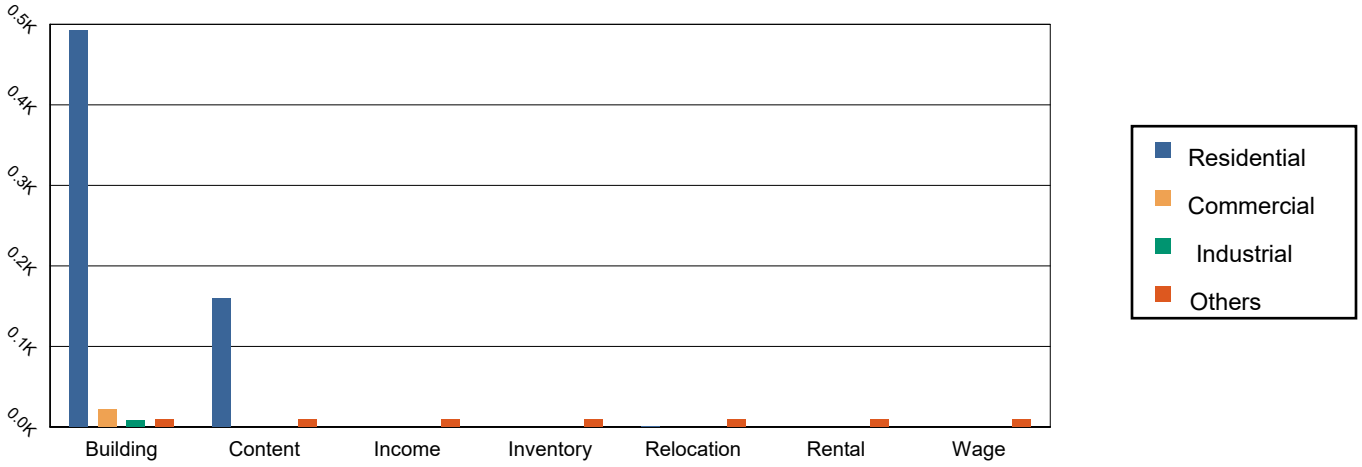


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	492.15	21.45	8.06	10.03	531.69
	Content	159.92	0.00	0.00	0.00	159.92
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**652.07**	**21.45**	**8.06**	**10.03**	**691.61**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.27	0.00	0.00	0.00	0.27
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.27**	**0.00**	**0.00**	**0.00**	**0.27**

Total

Total	**652.34**	**21.45**	**8.06**	**10.03**	**691.88**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	15,752	2,232,424	950,601	3,183,025
Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**
Study Region Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**

Hazus: Hurricane Global Risk Report

Region Name:	Suffield_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 42.73 square miles and contains 4 census tracts. There are over 5 thousand households in the region and a total population of 15,752 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 3,183 million dollars. Approximately 90% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,971 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

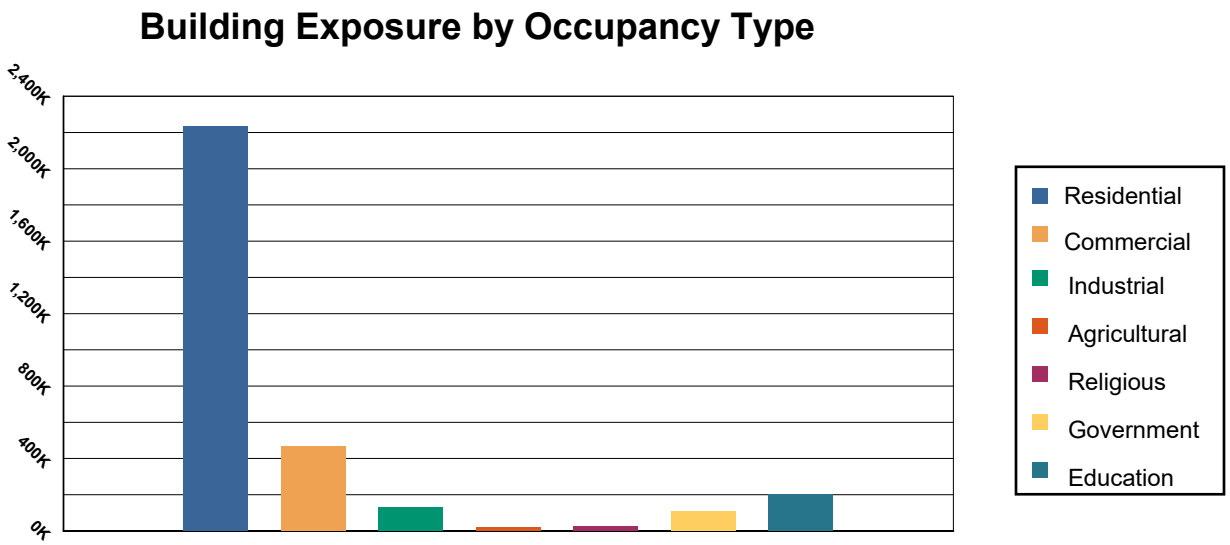


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,232,424	70.14%
Commercial	469,222	14.74%
Industrial	130,547	4.10%
Agricultural	16,820	0.53%
Religious	25,027	0.79%
Government	108,224	3.40%
Education	200,761	6.31%
Total	**3,183,025**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

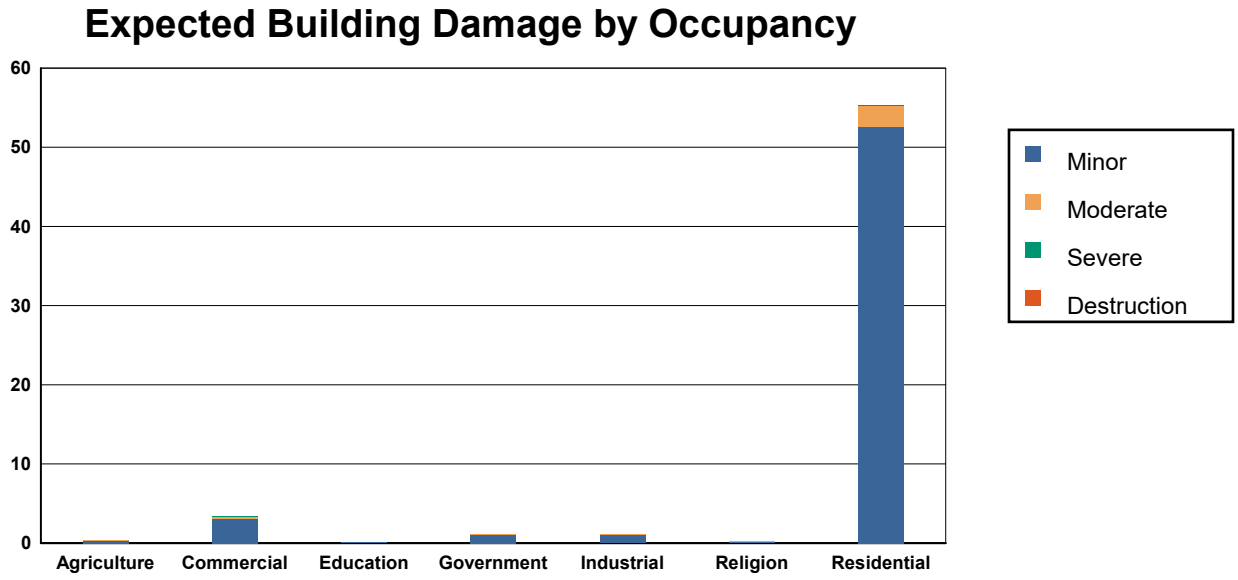


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	24.70	98.80	0.27	1.10	0.02	0.08	0.00	0.02	0.00	0.00
Commercial	274.64	98.79	3.04	1.09	0.31	0.11	0.01	0.00	0.00	0.00
Education	7.91	98.83	0.09	1.16	0.00	0.01	0.00	0.00	0.00	0.00
Government	84.97	98.80	1.02	1.19	0.01	0.01	0.00	0.00	0.00	0.00
Industrial	87.92	98.78	1.05	1.18	0.03	0.03	0.00	0.00	0.00	0.00
Religion	22.77	99.00	0.22	0.97	0.01	0.03	0.00	0.00	0.00	0.00
Residential	4,406.74	98.76	52.55	1.18	2.65	0.06	0.07	0.00	0.00	0.00
Total	**4,909.64**		**58.25**		**3.03**		**0.08**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	61	98.45	1	1.53	0	0.02	0	0.00	0	0.00
Masonry	380	98.08	7	1.73	1	0.19	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	240	98.71	3	1.19	0	0.09	0	0.00	0	0.00
Wood	4,234	98.99	42	0.98	1	0.03	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

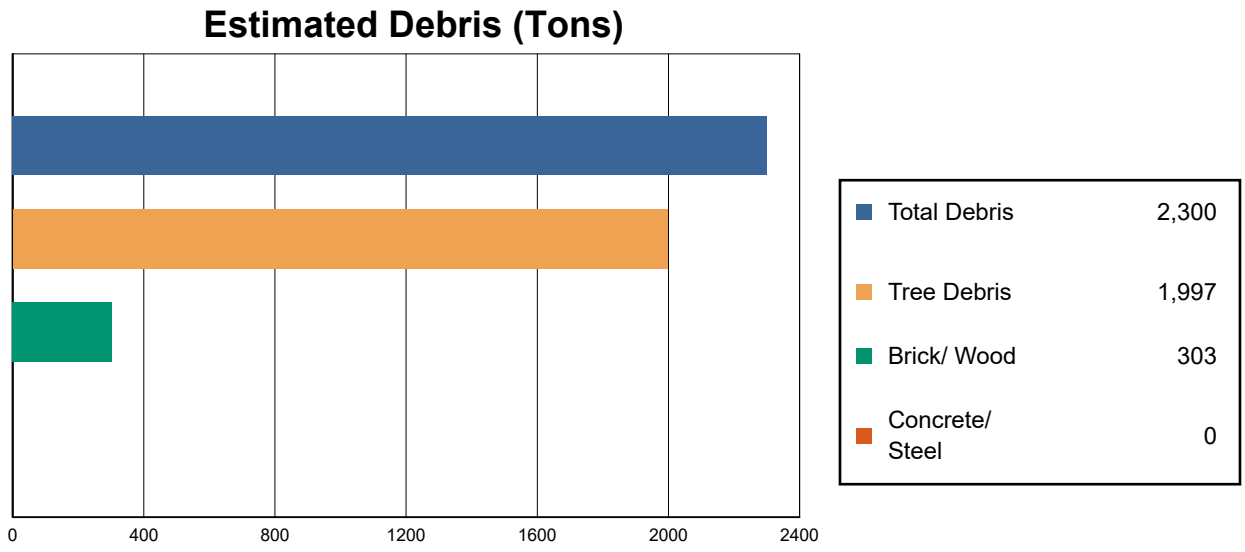
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

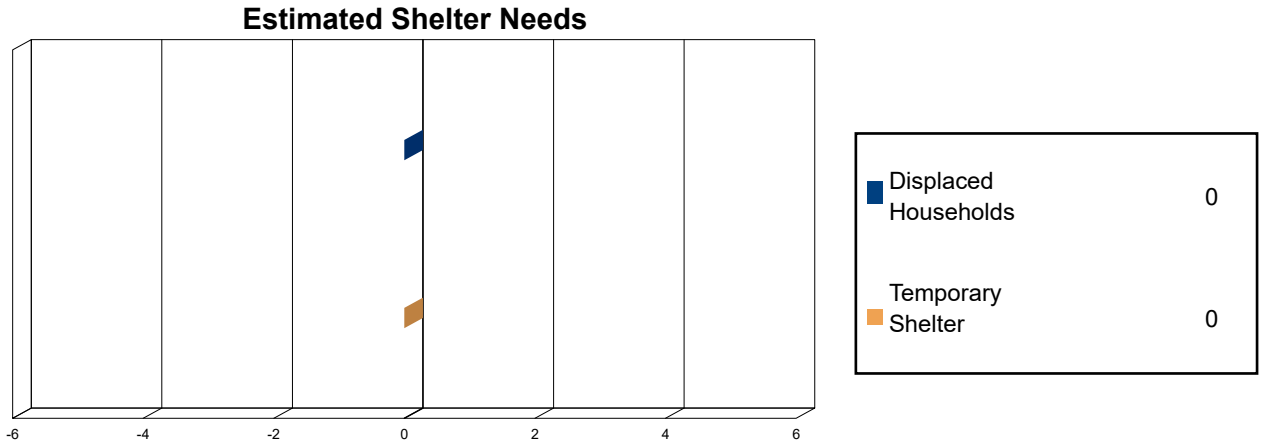


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,300 tons of debris will be generated. Of the total amount, 1,677 tons (73%) is Other Tree Debris. Of the remaining 623 tons, Brick/Wood comprises 49% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 12 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 320 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 15,752) will seek temporary shelter in public shelters.

Economic Loss

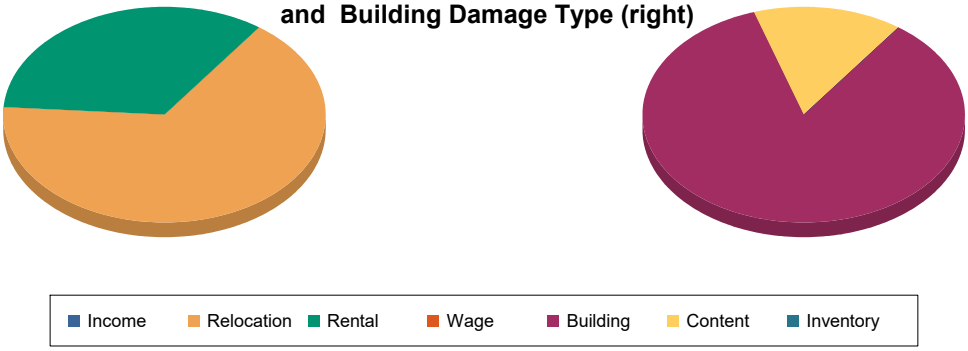
The total economic loss estimated for the hurricane is 6.3 million dollars, which represents 0.20 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 6 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

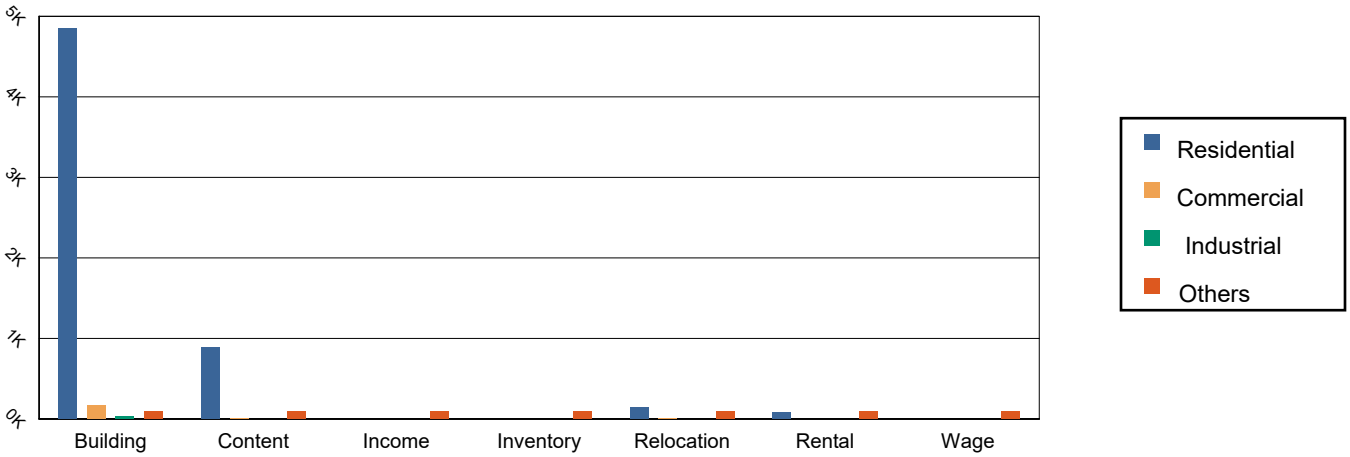


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	4,844.20	169.10	36.52	95.25	5,145.07
	Content	888.80	9.90	0.56	0.85	900.11
	Inventory	0.00	1.00	0.08	0.63	1.70
	Subtotal	**5,733.00**	**180.00**	**37.16**	**96.73**	**6,046.88**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	147.41	4.80	0.09	0.35	152.65
	Rental	78.23	0.00	0.00	0.00	78.23
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**225.64**	**4.80**	**0.09**	**0.35**	**230.88**

Total

Total	**5,958.63**	**184.80**	**37.25**	**97.07**	**6,277.76**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	15,752	2,232,424	950,601	3,183,025
Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**
Study Region Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**

Hazus: Hurricane Global Risk Report

Region Name:	Suffield_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Friday, May 12, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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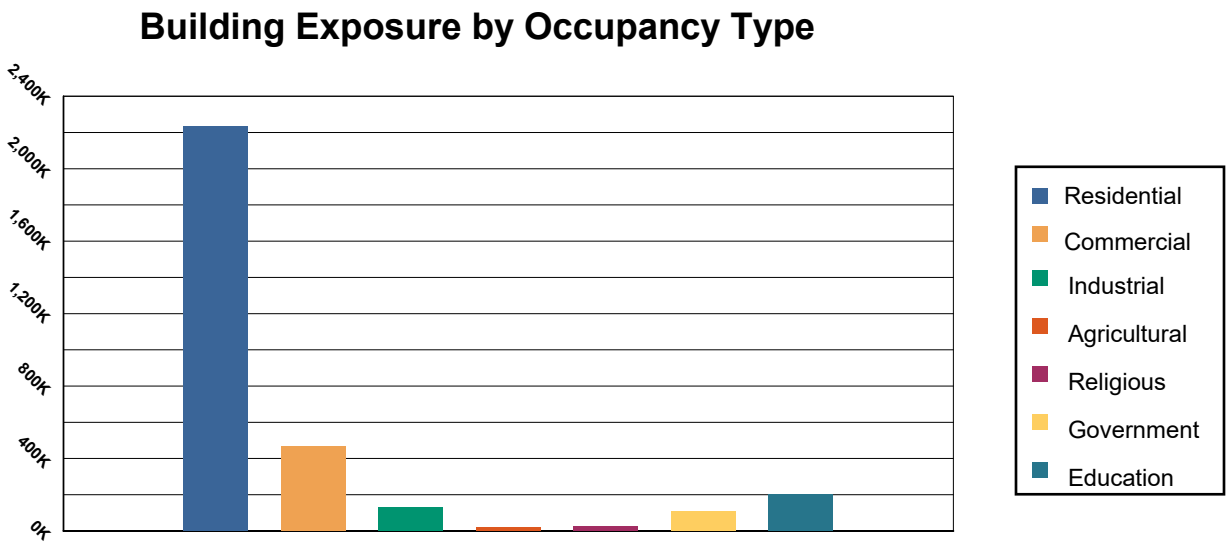

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Total	**3,183,025**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 17 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

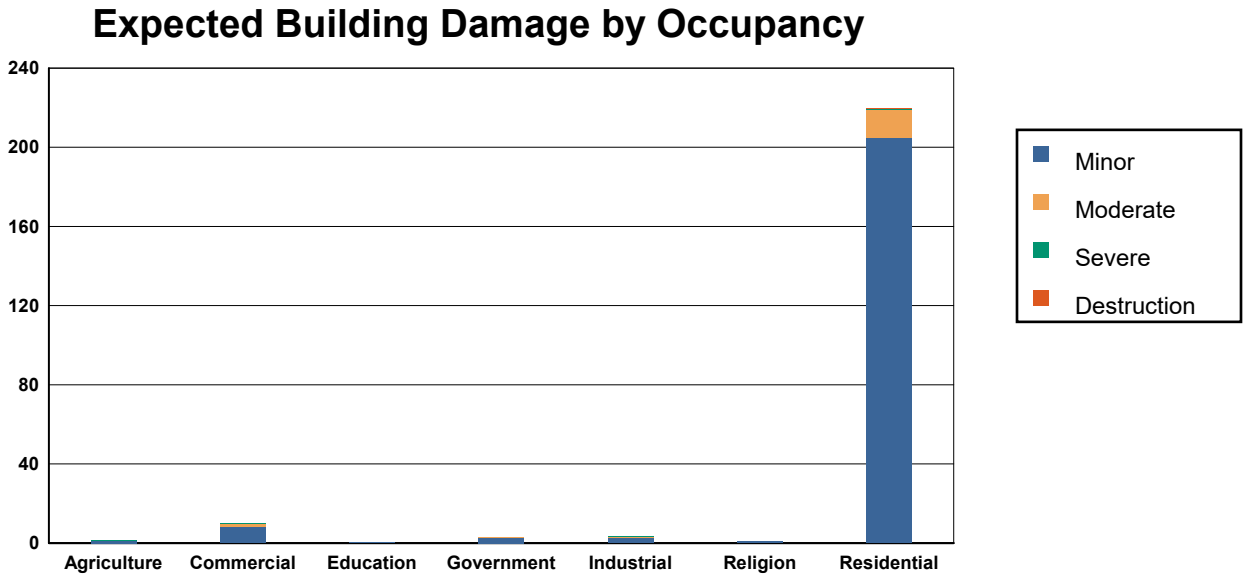


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	23.80	95.22	0.99	3.95	0.15	0.60	0.06	0.23	0.00	0.01
Commercial	268.10	96.44	8.36	3.01	1.39	0.50	0.15	0.05	0.00	0.00
Education	7.75	96.91	0.24	2.96	0.01	0.13	0.00	0.00	0.00	0.00
Government	83.37	96.94	2.53	2.94	0.11	0.12	0.00	0.00	0.00	0.00
Industrial	85.92	96.54	2.82	3.17	0.22	0.24	0.04	0.04	0.00	0.00
Religion	22.26	96.79	0.70	3.06	0.03	0.14	0.00	0.01	0.00	0.00
Residential	4,242.57	95.08	204.77	4.59	14.32	0.32	0.21	0.00	0.13	0.00
Total	**4,733.78**		**220.40**		**16.23**		**0.45**		**0.13**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	60	96.15	2	3.65	0	0.20	0	0.00	0	0.00
Masonry	367	94.75	17	4.43	3	0.78	0	0.05	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	235	96.53	7	2.97	1	0.46	0	0.05	0	0.00
Wood	4,083	95.47	185	4.33	8	0.19	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

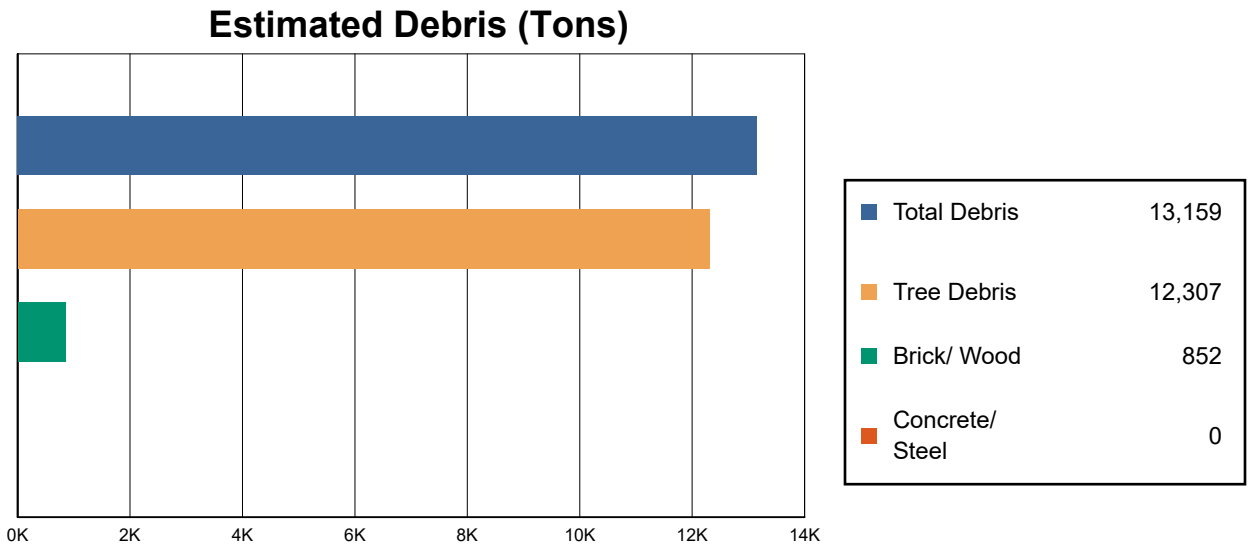
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

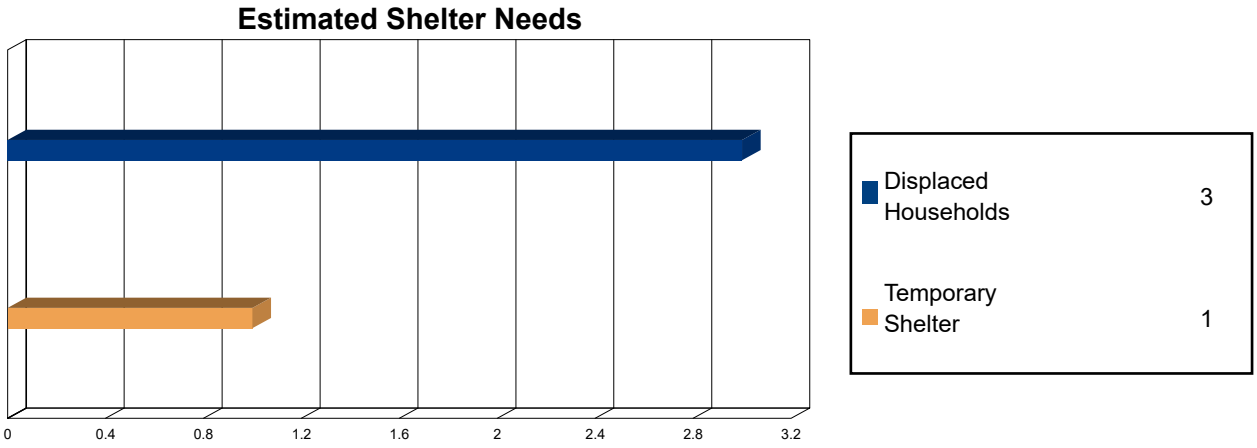


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 13,159 tons of debris will be generated. Of the total amount, 10,033 tons (76%) is Other Tree Debris. Of the remaining 3,126 tons, Brick/Wood comprises 27% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 34 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,274 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 3 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 15,752) will seek temporary shelter in public shelters.

Economic Loss

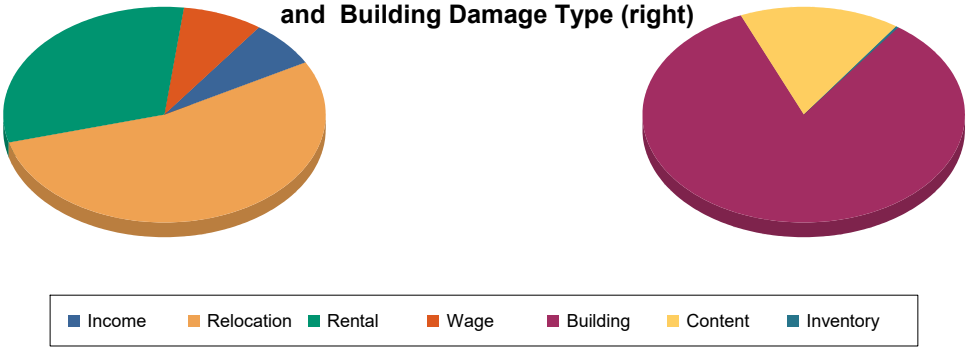
The total economic loss estimated for the hurricane is 15.5 million dollars, which represents 0.49 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 15 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 92% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

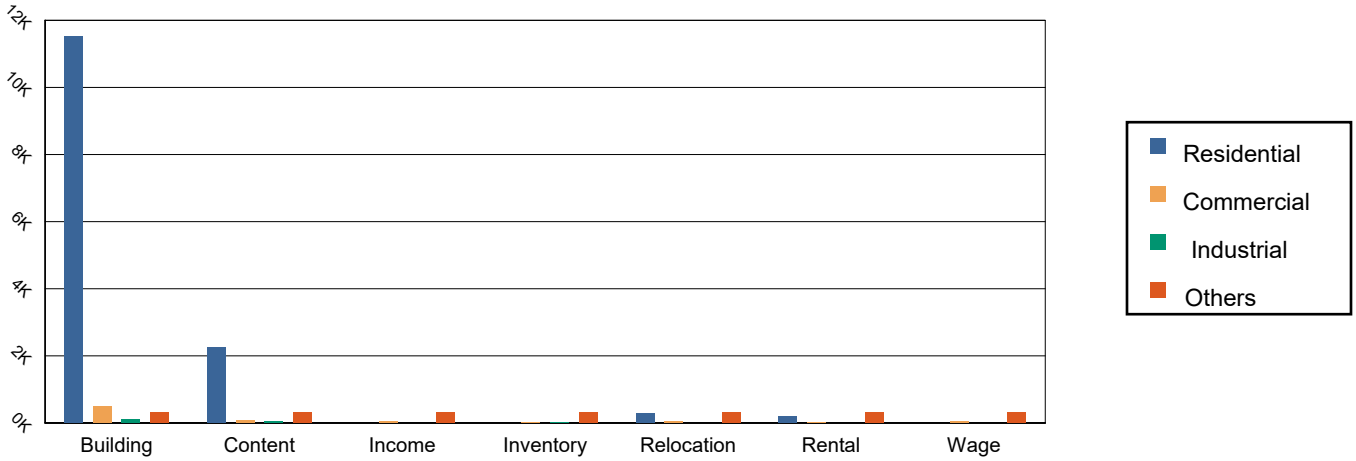


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	11,526.25	486.86	111.17	255.95	12,380.22
	Content	2,251.84	75.73	39.69	27.58	2,394.83
	Inventory	0.00	12.56	5.25	6.36	24.17
	Subtotal	**13,778.09**	**575.14**	**156.11**	**289.88**	**14,799.22**
Business Interruption Loss						
	Income	0.00	41.35	0.06	3.20	44.61
	Relocation	295.13	49.15	1.21	7.00	352.49
	Rental	181.72	20.20	0.04	0.31	202.27
	Wage	0.00	45.16	0.10	7.55	52.80
	Subtotal	**476.85**	**155.85**	**1.42**	**18.06**	**652.17**

Total

Total	**14,254.94**	**731.00**	**157.52**	**307.93**	**15,451.39**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	15,752	2,232,424	950,601	3,183,025
Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**
Study Region Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**

Hazus: Hurricane Global Risk Report

Region Name:	Suffield_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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General Building Stock

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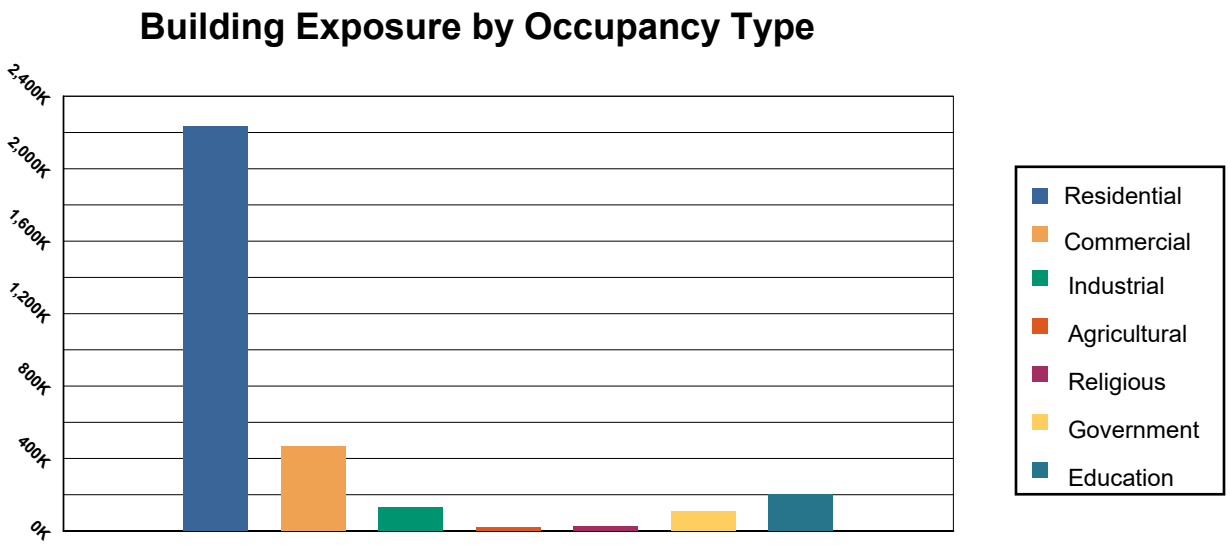


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,232,424	70.14%
Commercial	469,222	14.74%
Industrial	130,547	4.10%
Agricultural	16,820	0.53%
Religious	25,027	0.79%
Government	108,224	3.40%
Education	200,761	6.31%
Total	**3,183,025**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 64 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

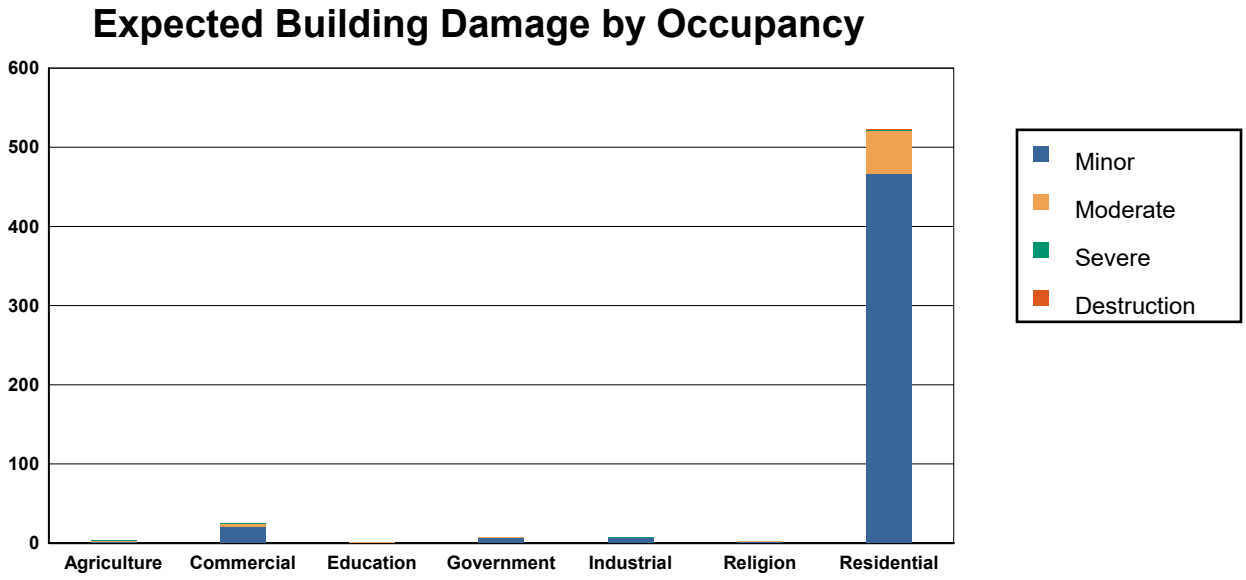


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.24	88.94	2.12	8.47	0.44	1.77	0.19	0.76	0.01	0.05
Commercial	252.59	90.86	19.83	7.13	4.77	1.71	0.82	0.29	0.00	0.00
Education	7.34	91.75	0.59	7.31	0.07	0.91	0.00	0.03	0.00	0.00
Government	78.92	91.77	6.23	7.25	0.82	0.96	0.02	0.03	0.00	0.00
Industrial	81.45	91.52	6.27	7.04	1.06	1.19	0.21	0.23	0.01	0.01
Religion	21.10	91.73	1.72	7.49	0.17	0.75	0.01	0.03	0.00	0.00
Residential	3,939.53	88.29	466.71	10.46	53.81	1.21	1.10	0.02	0.84	0.02
Total	**4,403.17**		**503.47**		**61.15**		**2.35**		**0.87**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	56	90.11	5	8.47	1	1.40	0	0.02	0	0.00
Masonry	341	88.04	36	9.24	10	2.54	1	0.16	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	221	91.11	17	6.84	4	1.76	1	0.30	0	0.00
Wood	3,806	88.98	435	10.18	34	0.79	1	0.03	1	0.02

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

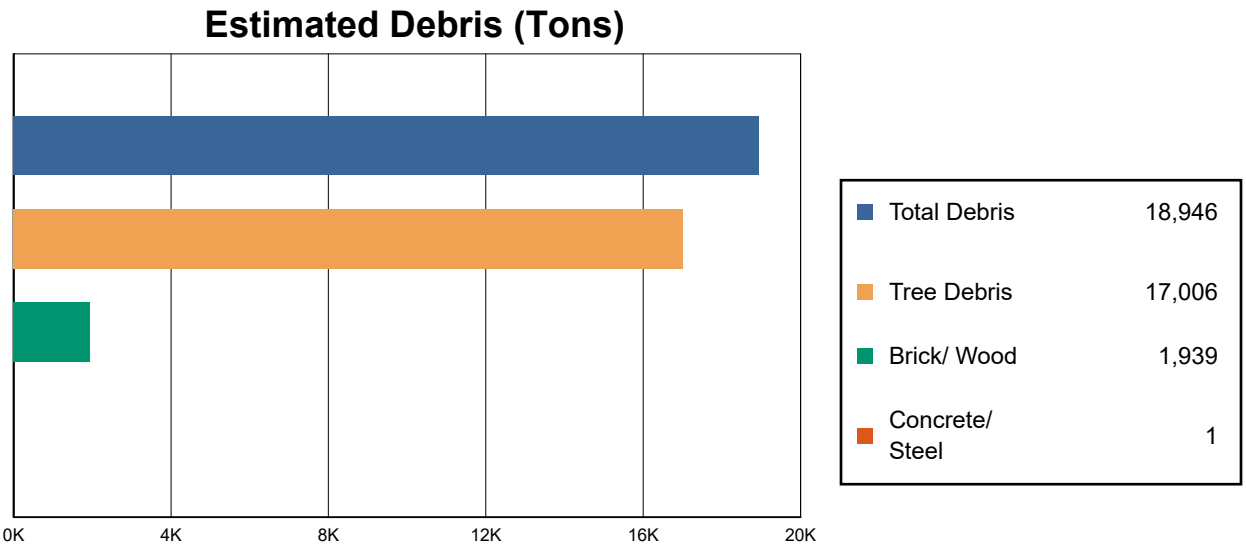
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

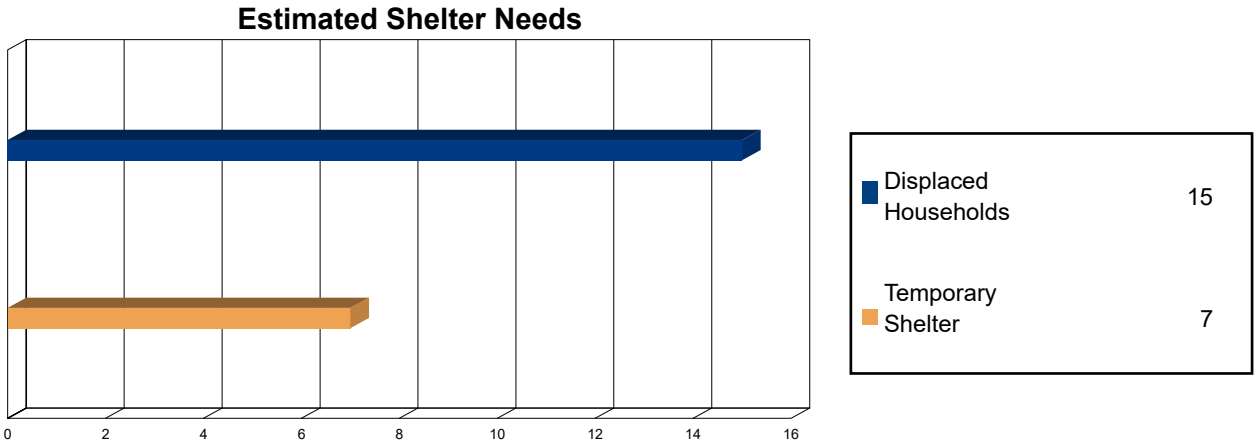


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 18,946 tons of debris will be generated. Of the total amount, 13,809 tons (73%) is Other Tree Debris. Of the remaining 5,137 tons, Brick/Wood comprises 38% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 78 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,197 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 15 households to be displaced due to the hurricane. Of these, 7 people (out of a total population of 15,752) will seek temporary shelter in public shelters.

Economic Loss

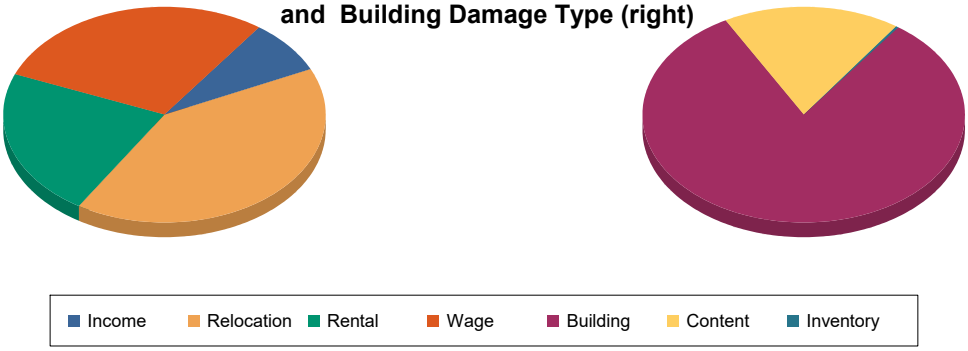
The total economic loss estimated for the hurricane is 30.3 million dollars, which represents 0.95 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 30 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 86% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

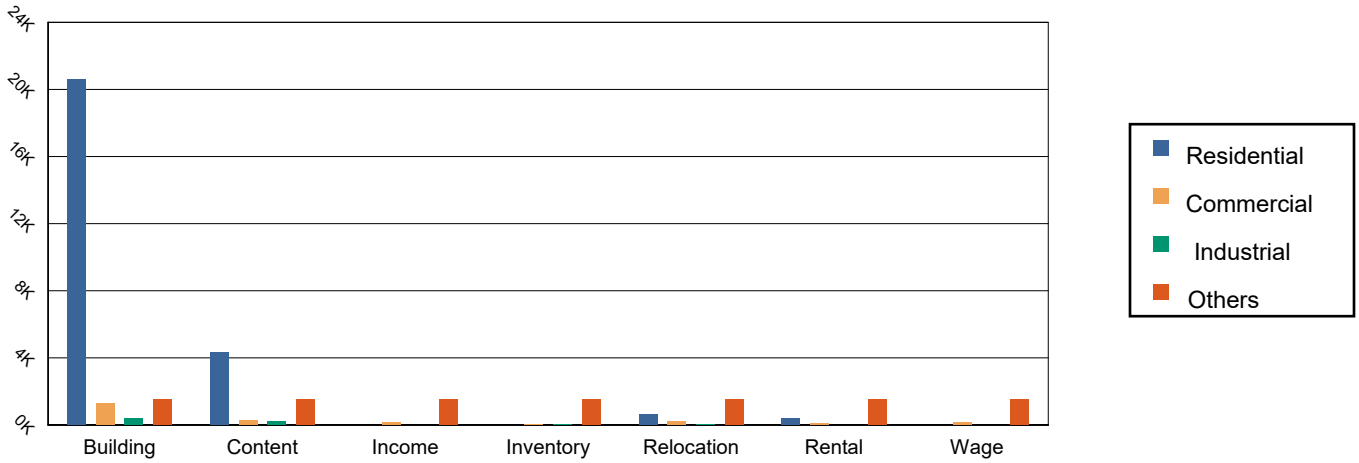


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	20,580.84	1,303.54	381.34	722.13	22,987.85
	Content	4,322.71	300.68	194.98	146.34	4,964.71
	Inventory	0.00	56.10	25.93	21.02	103.06
	Subtotal	**24,903.56**	**1,660.32**	**602.25**	**889.50**	**28,055.63**
Business Interruption Loss						
	Income	0.00	129.56	4.19	49.88	183.62
	Relocation	624.83	187.31	15.17	89.66	916.96
	Rental	403.24	84.30	2.87	8.84	499.25
	Wage	0.00	142.51	7.01	503.86	653.37
	Subtotal	**1,028.07**	**543.68**	**29.23**	**652.23**	**2,253.21**

Total

Total	25,931.63	2,204.00	631.49	1,541.73	30,308.84

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	15,752	2,232,424	950,601	3,183,025
Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**
Study Region Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**

Hazus: Hurricane Global Risk Report

Region Name:	Suffield_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 42.73 square miles and contains 4 census tracts. There are over 5 thousand households in the region and a total population of 15,752 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 3,183 million dollars. Approximately 90% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,971 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

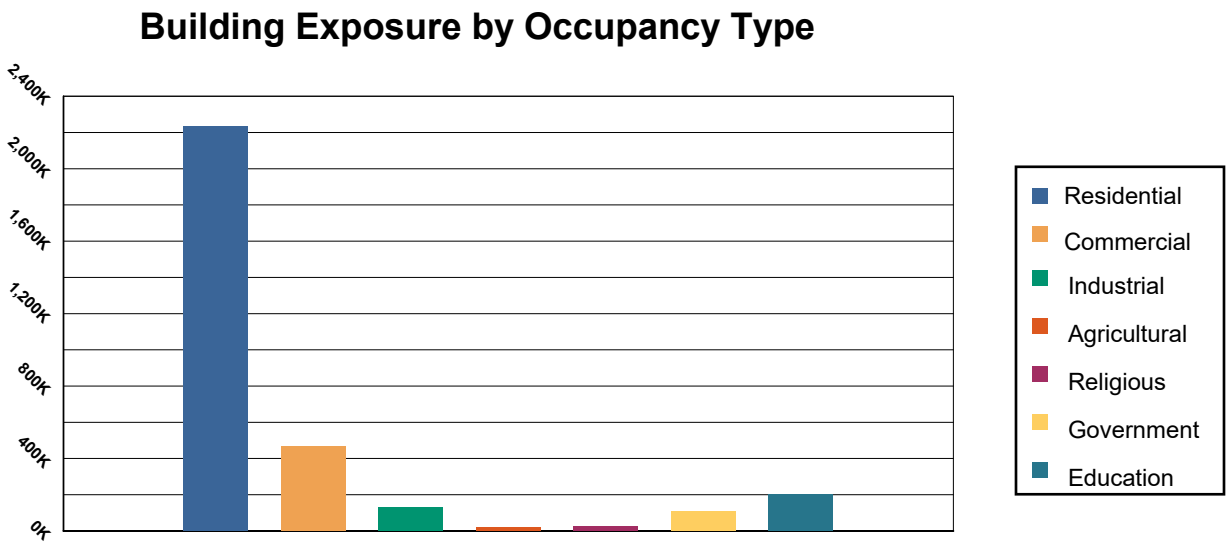


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,232,424	70.14%
Commercial	469,222	14.74%
Industrial	130,547	4.10%
Agricultural	16,820	0.53%
Religious	25,027	0.79%
Government	108,224	3.40%
Education	200,761	6.31%
Total	**3,183,025**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 203 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 6 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

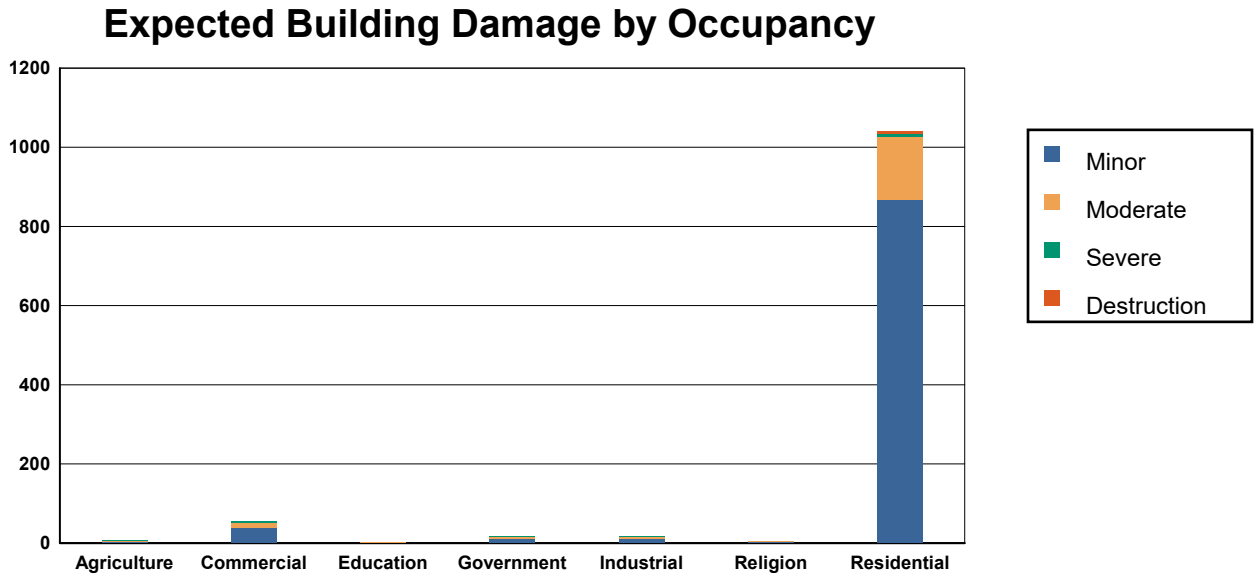


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.14	76.55	4.06	16.22	1.18	4.73	0.56	2.23	0.06	0.26
Commercial	222.50	80.04	38.54	13.86	14.00	5.04	2.94	1.06	0.02	0.01
Education	6.52	81.44	1.15	14.35	0.31	3.92	0.02	0.28	0.00	0.00
Government	70.14	81.56	12.10	14.07	3.52	4.09	0.25	0.29	0.00	0.00
Industrial	72.10	81.01	12.15	13.65	3.93	4.41	0.77	0.86	0.06	0.06
Religion	18.71	81.34	3.50	15.22	0.74	3.21	0.05	0.22	0.00	0.00
Residential	3,420.70	76.66	866.27	19.41	160.89	3.61	7.78	0.17	6.35	0.14
Total	**3,829.80**		**937.77**		**184.57**		**12.37**		**6.49**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	49	78.68	10	15.52	3	5.55	0	0.24	0	0.00
Masonry	295	76.34	63	16.27	26	6.73	2	0.59	0	0.07
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	195	80.37	32	13.02	13	5.47	3	1.13	0	0.01
Wood	3,321	77.65	828	19.36	114	2.66	7	0.17	6	0.15

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

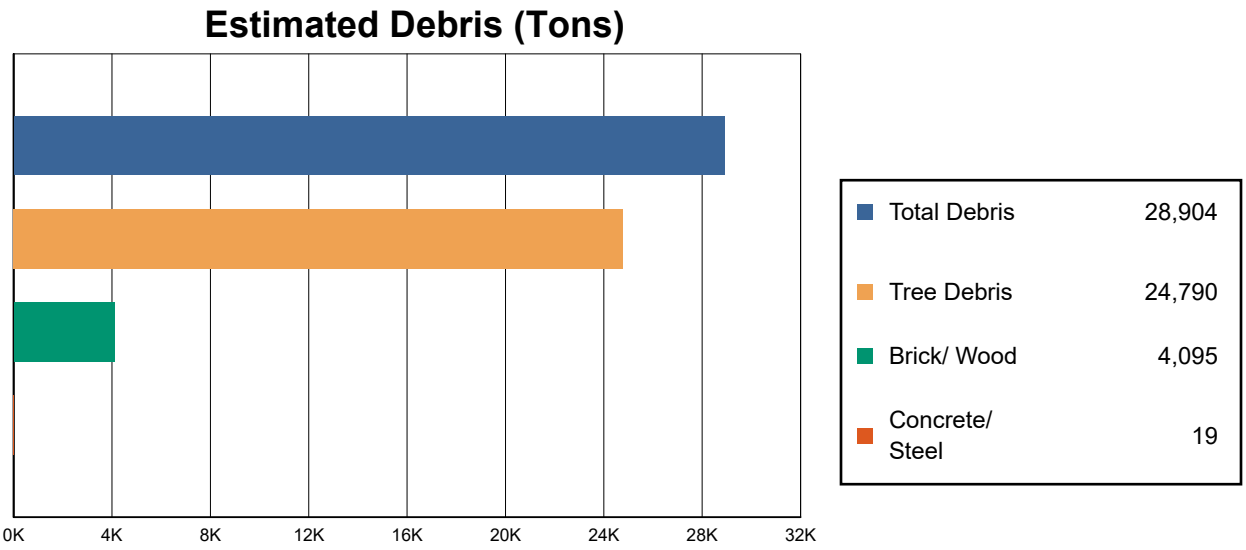
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

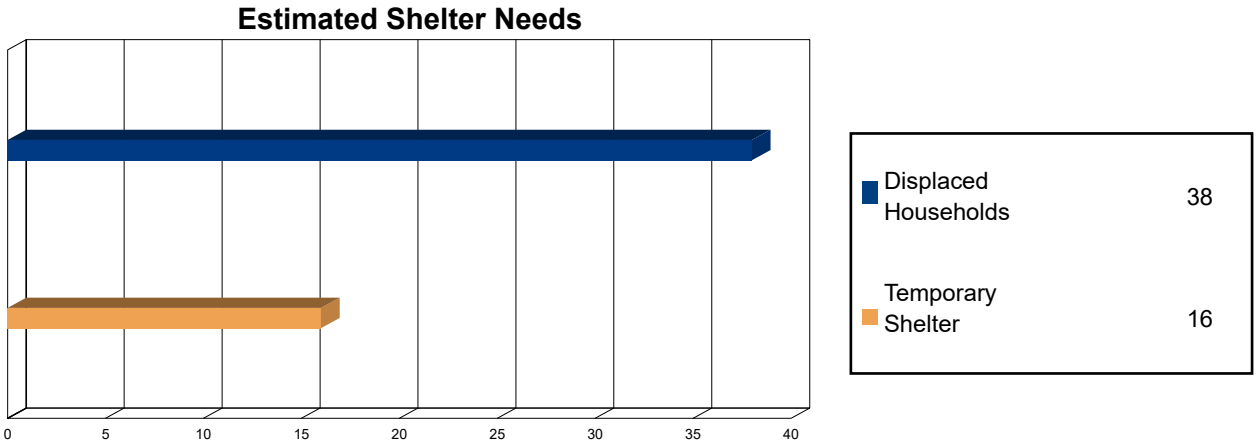


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 28,904 tons of debris will be generated. Of the total amount, 20,122 tons (70%) is Other Tree Debris. Of the remaining 8,782 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 165 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,668 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 38 households to be displaced due to the hurricane. Of these, 16 people (out of a total population of 15,752) will seek temporary shelter in public shelters.

Economic Loss

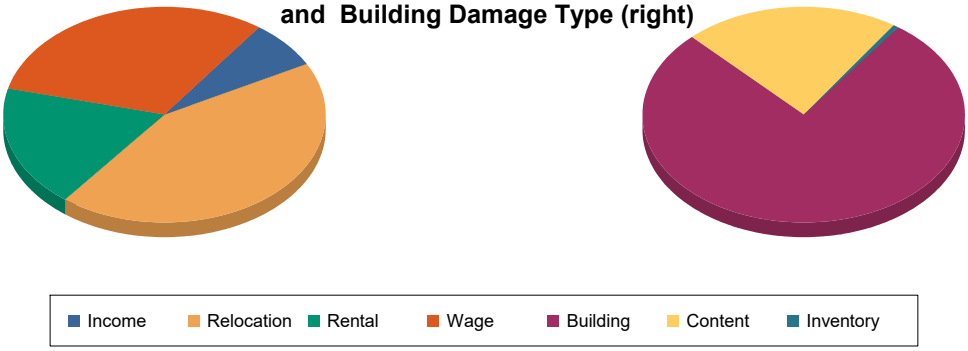
The total economic loss estimated for the hurricane is 66.7 million dollars, which represents 2.10 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 67 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 80% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

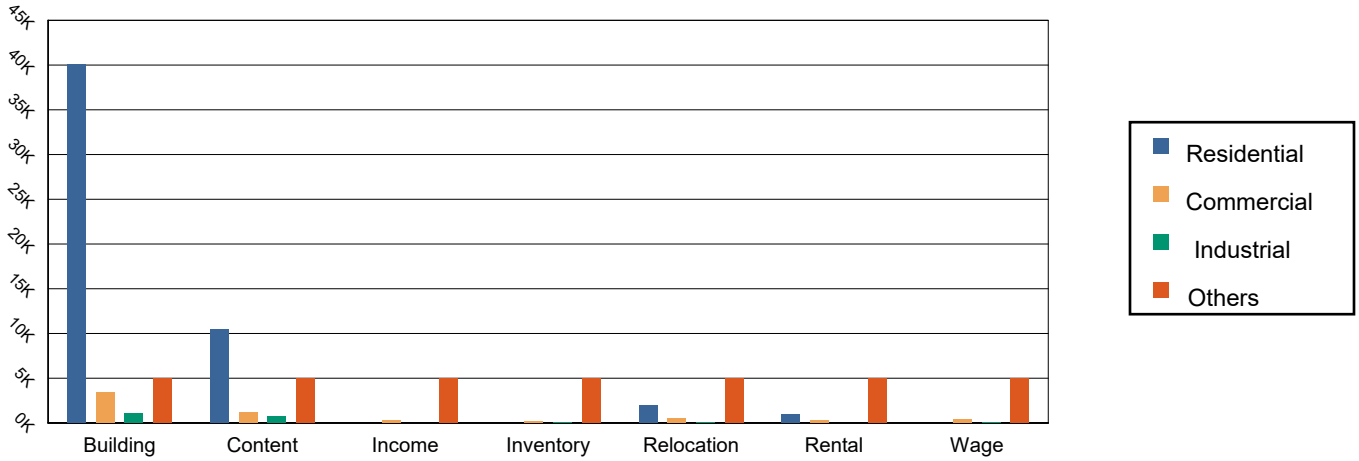


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	40,077.89	3,376.13	1,112.63	2,040.40	46,607.05
	Content	10,497.11	1,168.78	700.89	623.21	12,989.99
	Inventory	0.00	220.62	91.95	72.85	385.41
	Subtotal	**50,574.99**	**4,765.53**	**1,905.47**	**2,736.46**	**59,982.46**
Business Interruption Loss						
	Income	0.00	316.94	13.73	152.38	483.04
	Relocation	1,958.48	534.16	58.17	351.81	2,902.62
	Rental	944.64	243.86	9.93	36.49	1,234.92
	Wage	0.00	342.56	23.06	1,720.44	2,086.07
	Subtotal	**2,903.12**	**1,437.53**	**104.88**	**2,261.12**	**6,706.64**

Total

Total	**53,478.12**	**6,203.05**	**2,010.36**	**4,997.57**	**66,689.10**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	15,752	2,232,424	950,601	3,183,025
Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**
Study Region Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**

Hazus: Hurricane Global Risk Report

Region Name:	Suffield_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 3,183 million dollars. Approximately 90% of the buildings (and 70% of the building value) are associated with residential housing.

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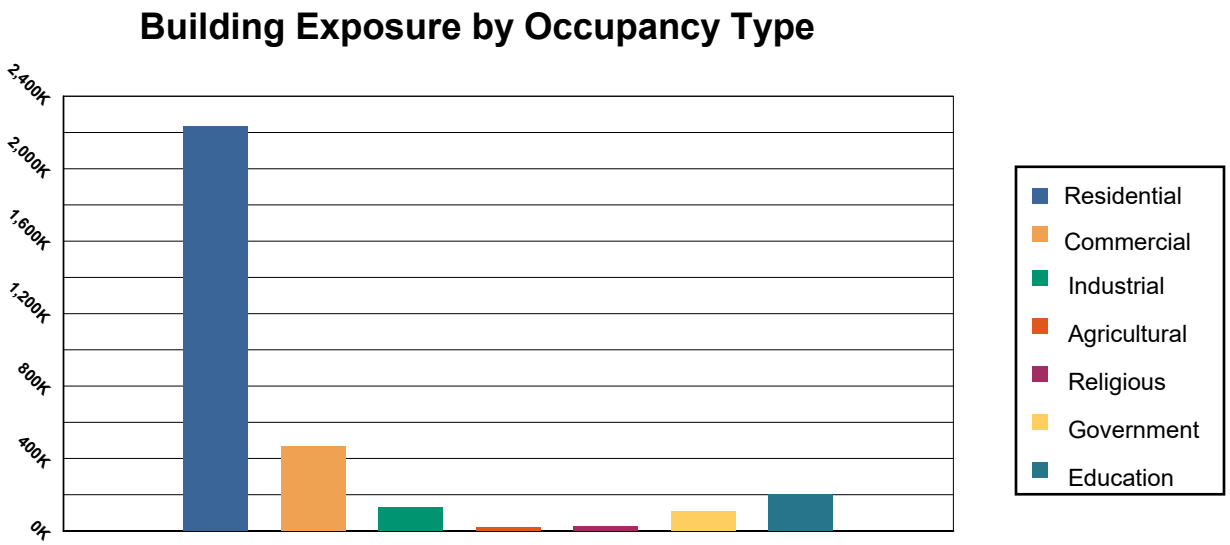

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Government	108,224	3.40%
Education	200,761	6.31%
Total	**3,183,025**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 358 buildings will be at least moderately damaged. This is over 7% of the total number of buildings in the region. There are an estimated 15 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

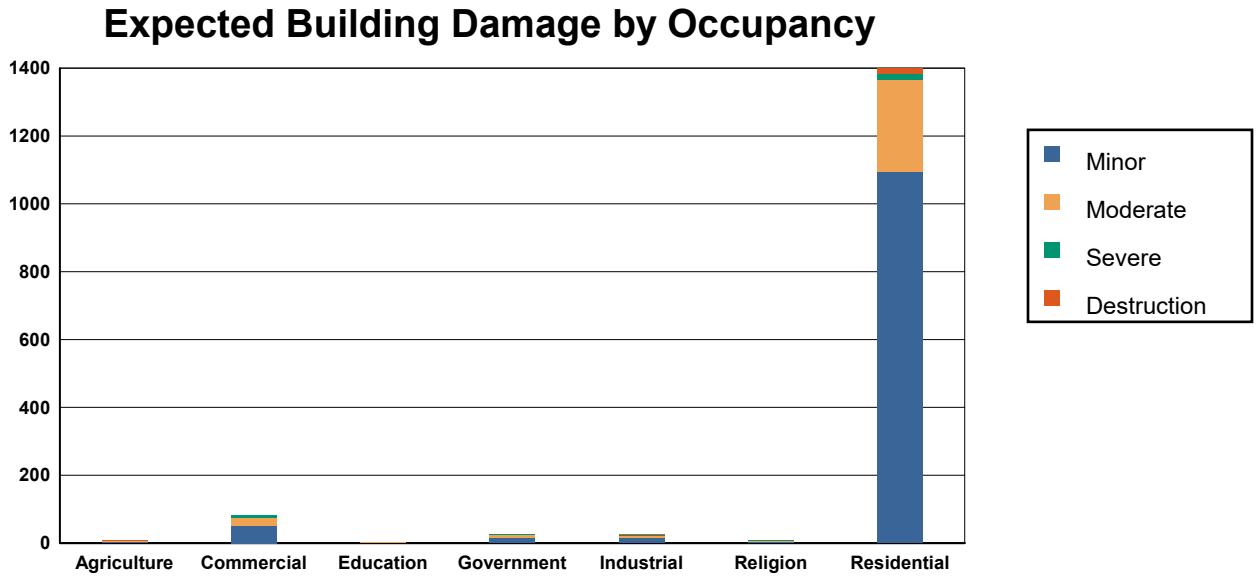


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.33	69.32	5.01	20.05	1.71	6.85	0.83	3.31	0.11	0.46
Commercial	196.48	70.67	50.84	18.29	24.38	8.77	6.25	2.25	0.06	0.02
Education	5.67	70.82	1.59	19.82	0.67	8.33	0.08	1.04	0.00	0.00
Government	61.48	71.48	16.33	18.99	7.28	8.46	0.91	1.06	0.00	0.00
Industrial	64.39	72.35	15.63	17.57	7.12	8.00	1.70	1.92	0.14	0.16
Religion	16.69	72.56	4.70	20.41	1.46	6.33	0.16	0.69	0.00	0.00
Residential	3,062.93	68.64	1,093.51	24.51	270.71	6.07	19.88	0.45	14.97	0.34
Total	**3,424.96**		**1,187.60**		**313.33**		**29.82**		**15.28**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	42	68.40	12	19.80	7	10.96	1	0.85	0	0.00
Masonry	261	67.40	78	20.04	43	11.17	5	1.23	1	0.15
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	172	70.87	41	16.87	24	9.76	6	2.47	0	0.02
Wood	2,986	69.82	1,063	24.87	194	4.54	18	0.43	15	0.35

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

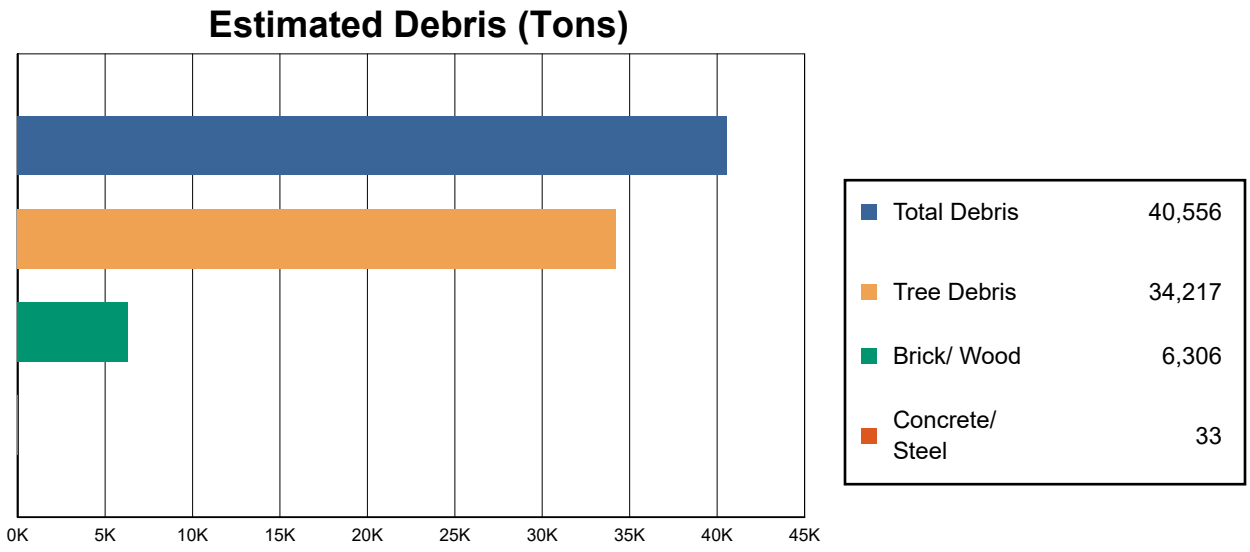
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

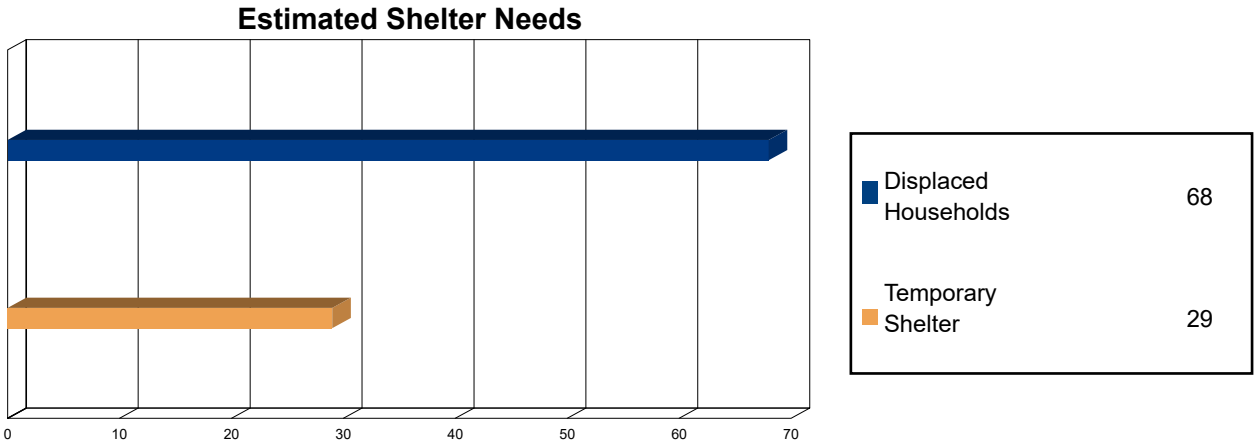


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 40,556 tons of debris will be generated. Of the total amount, 27,397 tons (68%) is Other Tree Debris. Of the remaining 13,159 tons, Brick/Wood comprises 48% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 254 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,820 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 68 households to be displaced due to the hurricane. Of these, 29 people (out of a total population of 15,752) will seek temporary shelter in public shelters.

Economic Loss

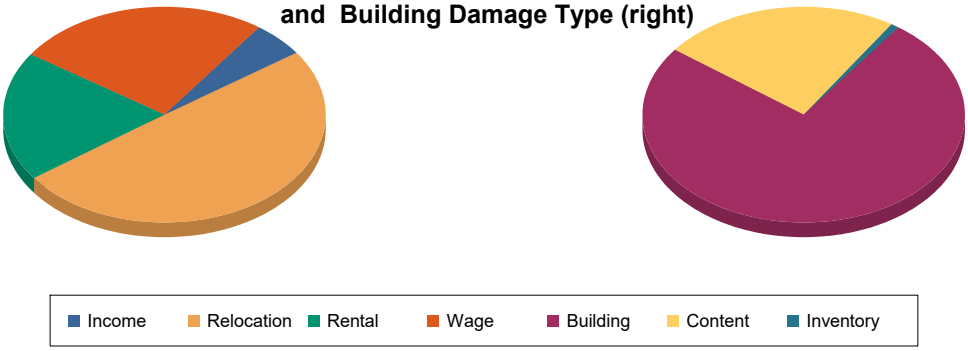
The total economic loss estimated for the hurricane is 108.3 million dollars, which represents 3.40 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 108 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 76% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

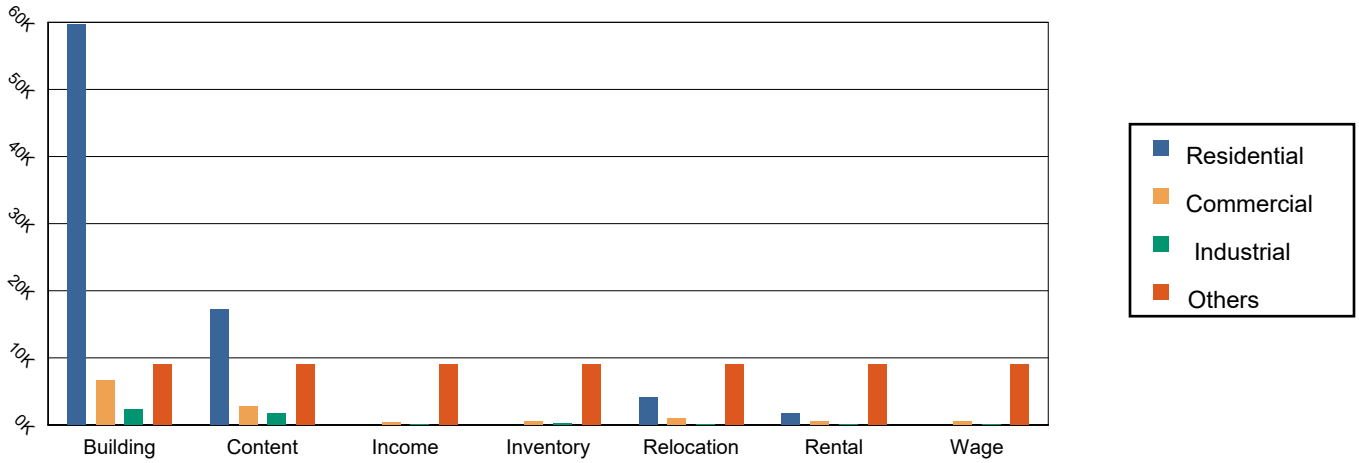


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	59,686.68	6,577.43	2,324.24	3,930.25	72,518.60
	Content	17,275.60	2,715.93	1,637.82	1,444.63	23,073.98
	Inventory	0.00	542.32	214.67	112.92	869.91
	Subtotal	**76,962.28**	**9,835.68**	**4,176.73**	**5,487.80**	**96,462.49**
Business Interruption Loss						
	Income	0.00	397.23	25.53	214.43	637.19
	Relocation	4,020.59	1,024.63	118.21	708.40	5,871.82
	Rental	1,741.54	467.46	20.01	80.32	2,309.32
	Wage	0.00	458.30	42.73	2,509.57	3,010.60
	Subtotal	**5,762.12**	**2,347.61**	**206.47**	**3,512.72**	**11,828.93**

Total

Total	**82,724.40**	**12,183.29**	**4,383.20**	**9,000.53**	**108,291.42**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	15,752	2,232,424	950,601	3,183,025
Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**
Study Region Total	**15,752**	**2,232,424**	**950,601**	**3,183,025**

Hazus: Hurricane Global Risk Report

Region Name:	Tolland_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.27 square miles and contains 3 census tracts. There are over 5 thousand households in the region and a total population of 14,563 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,767 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

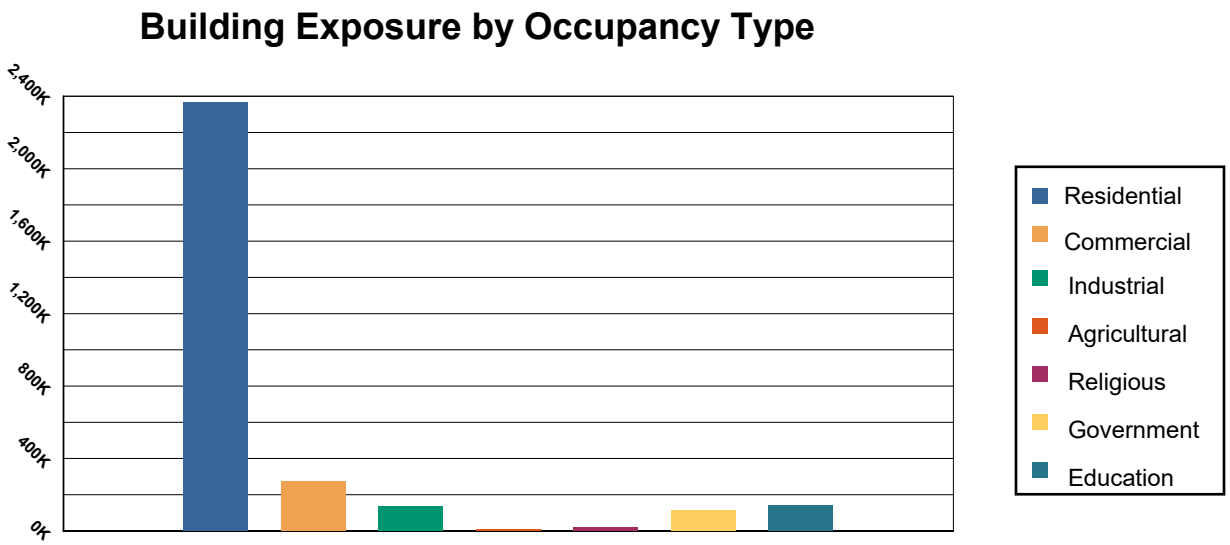


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,366,653	77.44%
Commercial	273,233	8.94%
Industrial	133,155	4.36%
Agricultural	9,020	0.30%
Religious	19,295	0.63%
Government	112,830	3.69%
Education	141,953	4.64%
Total	**3,056,139**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

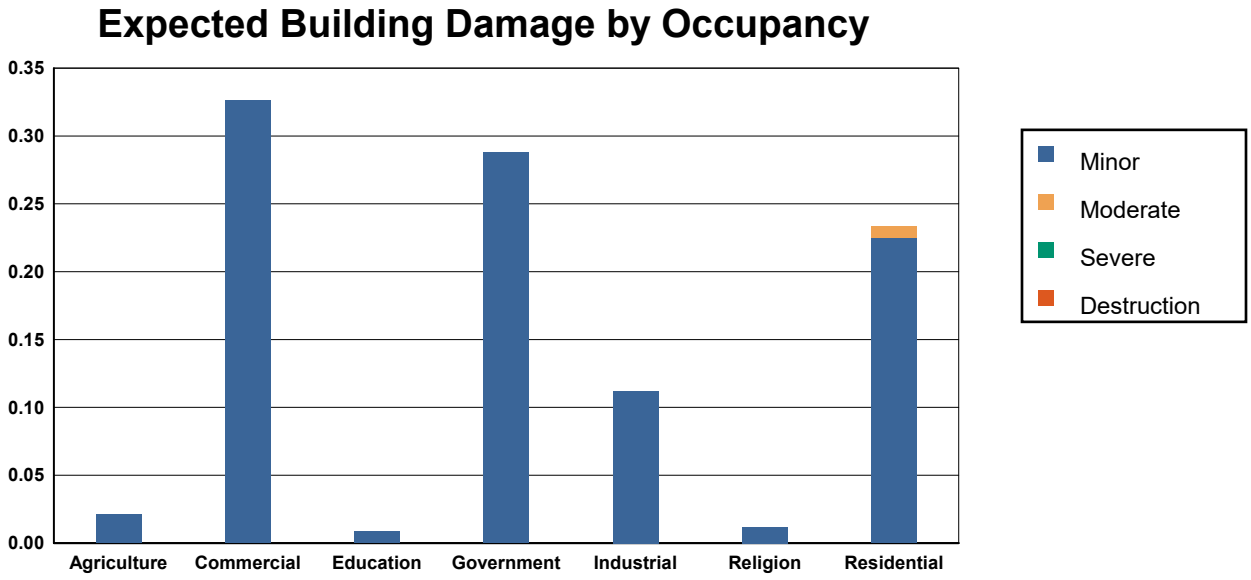


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.98	99.91	0.02	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	284.67	99.89	0.33	0.11	0.00	0.00	0.00	0.00	0.00	0.00
Education	8.99	99.91	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Government	174.71	99.84	0.29	0.16	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	116.89	99.90	0.11	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Religion	13.99	99.92	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Residential	5,143.77	100.00	0.23	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Total	**5,766.00**		**0.99**		**0.01**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	67	99.83	0	0.17	0	0.00	0	0.00	0	0.00
Masonry	380	99.89	0	0.11	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	310	99.87	0	0.13	0	0.00	0	0.00	0	0.00
Wood	5,007	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

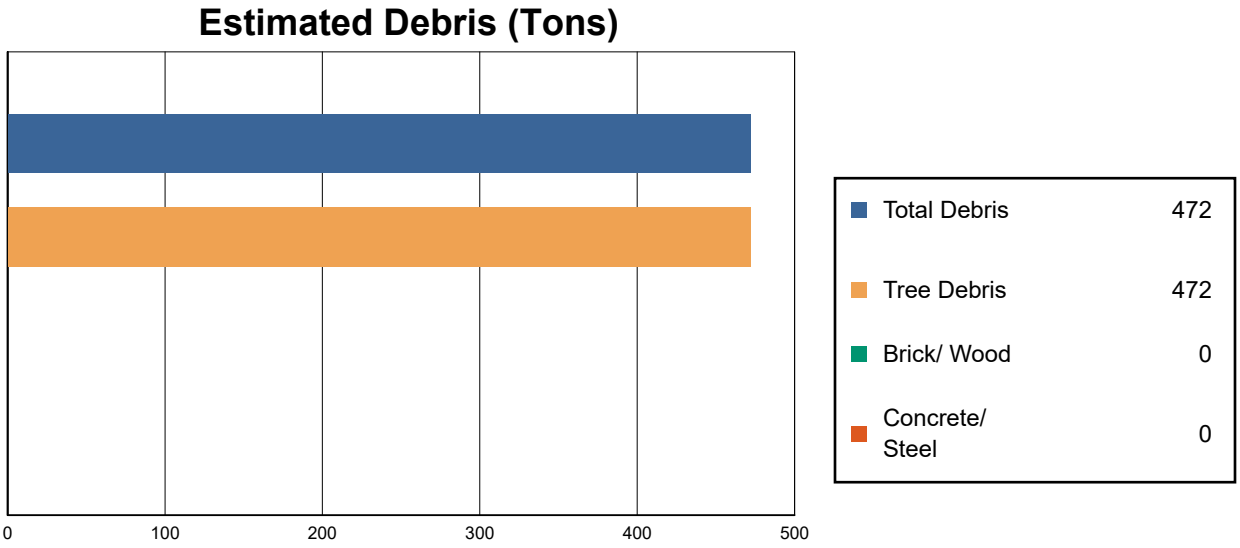
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

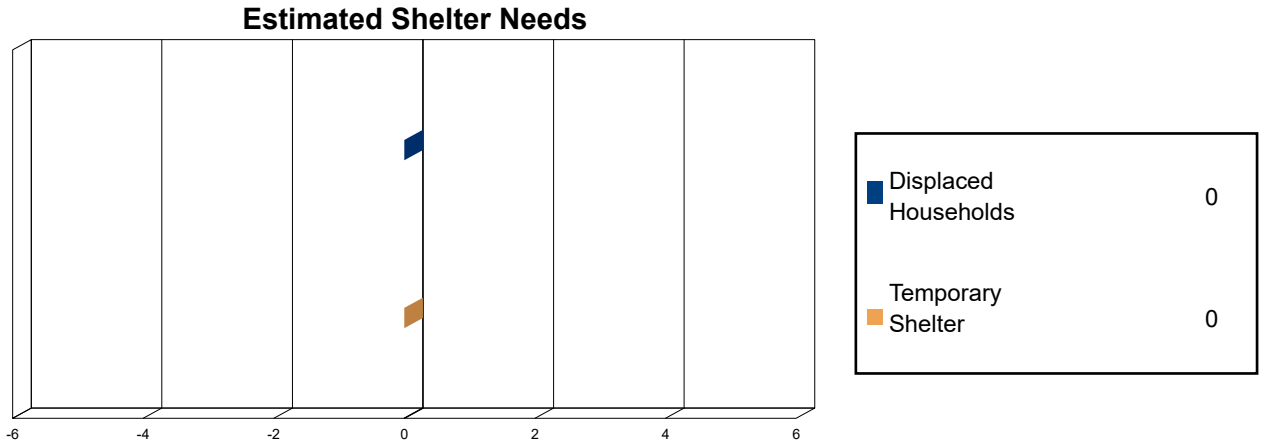


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 472 tons of debris will be generated. Of the total amount, 382 tons (81%) is Other Tree Debris. Of the remaining 90 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 90 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 14,563) will seek temporary shelter in public shelters.

Economic Loss

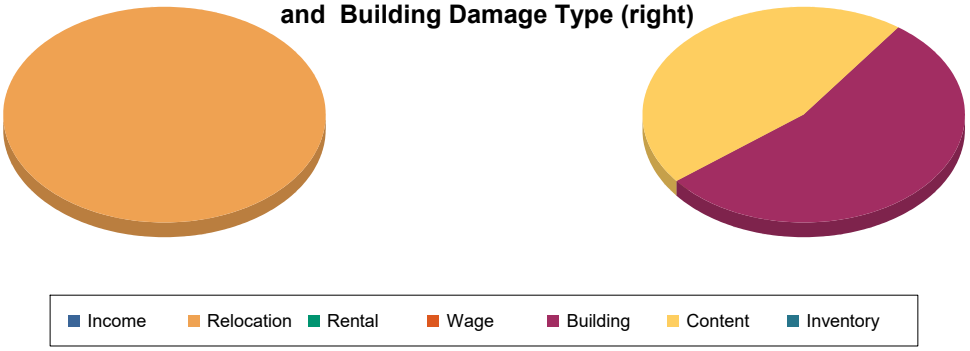
The total economic loss estimated for the hurricane is 0.5 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	253.61	0.00	0.00	0.00	253.61
	Content	211.33	0.00	0.00	0.00	211.33
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**464.94**	**0.00**	**0.00**	**0.00**	**464.94**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.02	0.00	0.00	0.00	0.02
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.02**	**0.00**	**0.00**	**0.00**	**0.02**

Total

Total	**464.96**	**0.00**	**0.00**	**0.00**	**464.96**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	14,563	2,366,653	689,486	3,056,139
Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**
Study Region Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**

Hazus: Hurricane Global Risk Report

Region Name:	Tolland_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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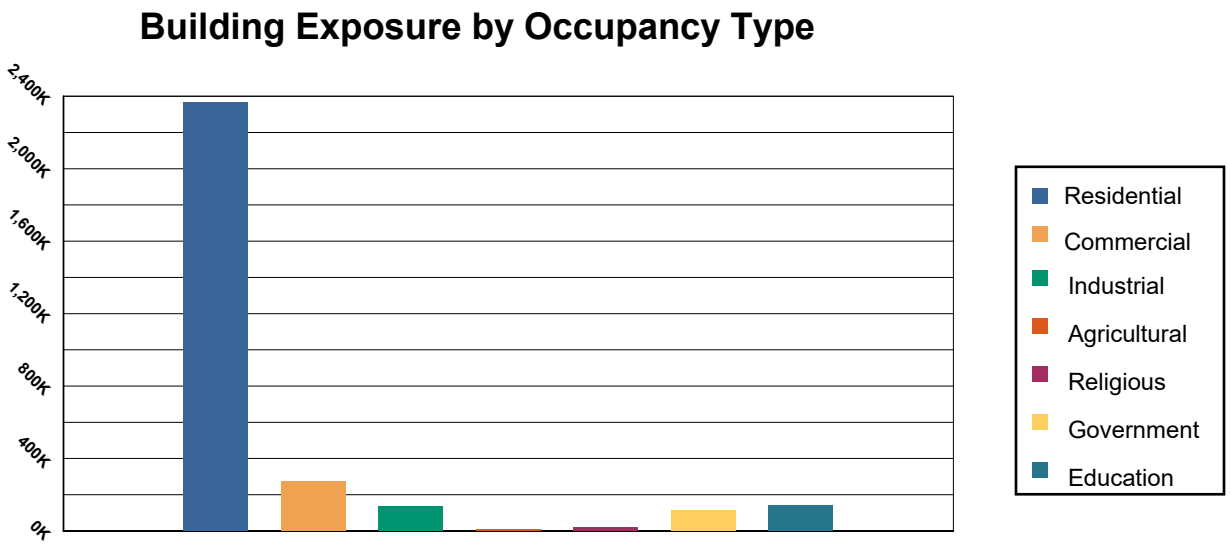

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Residential	2,366,653	77.44%
Commercial	273,233	8.94%
Industrial	133,155	4.36%
Agricultural	9,020	0.30%
Religious	19,295	0.63%
Government	112,830	3.69%
Education	141,953	4.64%
Total	**3,056,139**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

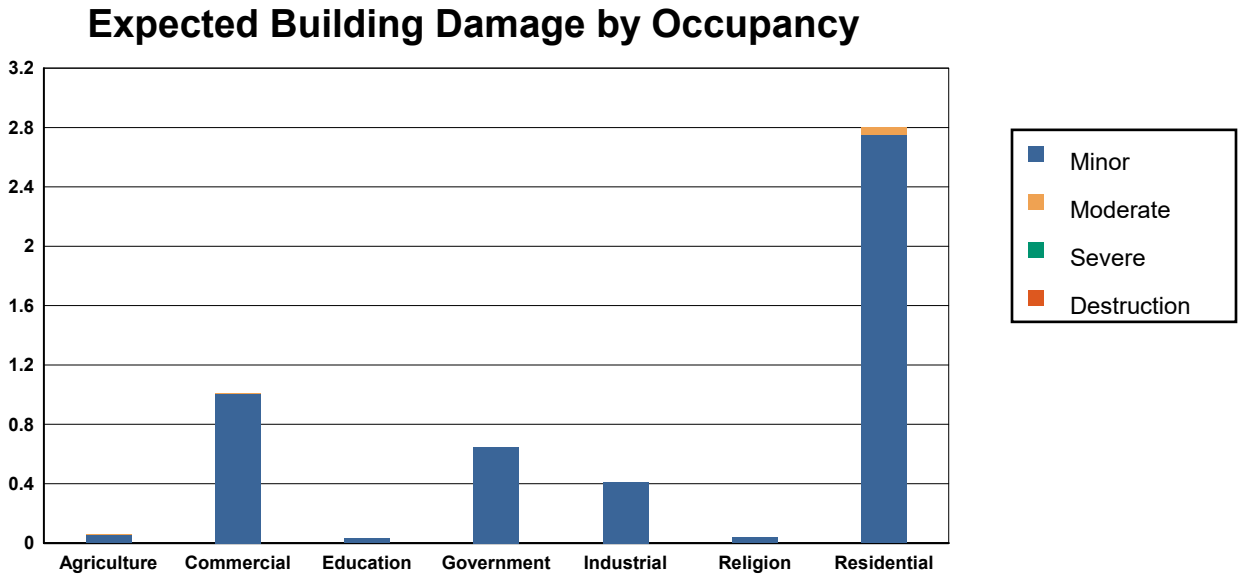


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.94	99.74	0.06	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	283.99	99.65	1.01	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Education	8.97	99.66	0.03	0.34	0.00	0.00	0.00	0.00	0.00	0.00
Government	174.35	99.63	0.65	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	116.59	99.65	0.41	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Religion	13.96	99.73	0.04	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Residential	5,141.20	99.95	2.75	0.05	0.05	0.00	0.00	0.00	0.00	0.00
Total	**5,762.00**		**4.95**		**0.06**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	67	99.53	0	0.47	0	0.00	0	0.00	0	0.00
Masonry	379	99.63	1	0.36	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	309	99.63	1	0.37	0	0.00	0	0.00	0	0.00
Wood	5,005	99.96	2	0.04	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

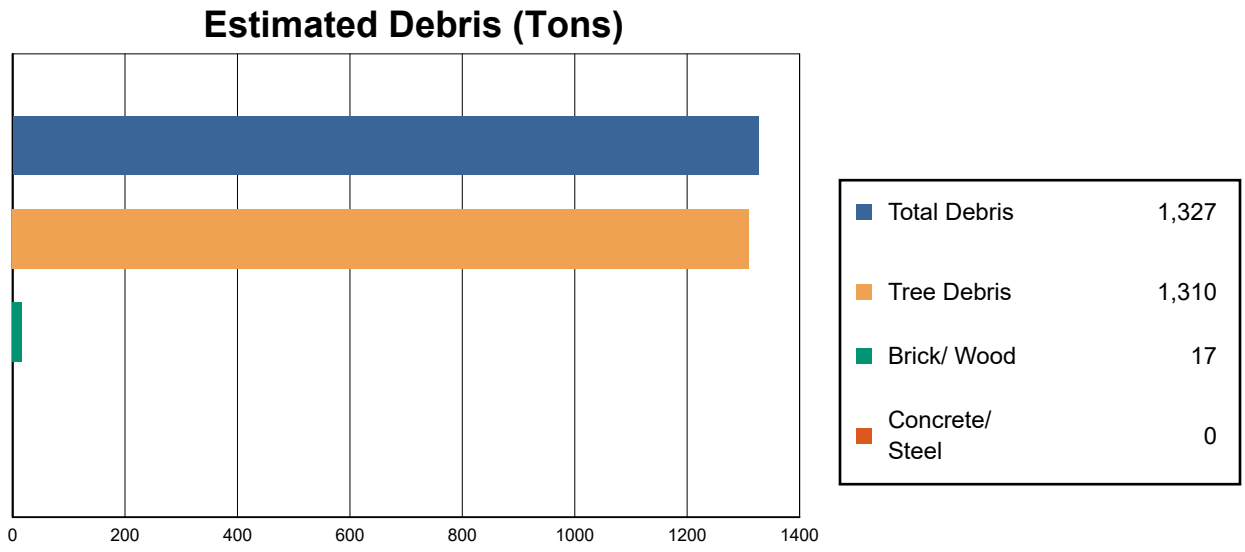
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

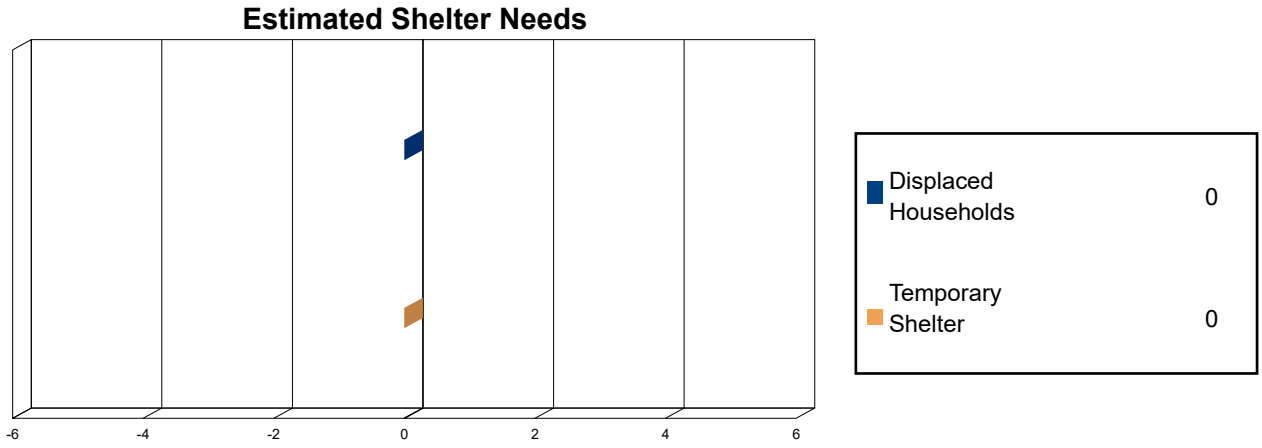


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,327 tons of debris will be generated. Of the total amount, 1,036 tons (78%) is Other Tree Debris. Of the remaining 291 tons, Brick/Wood comprises 6% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 274 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 14,563) will seek temporary shelter in public shelters.

Economic Loss

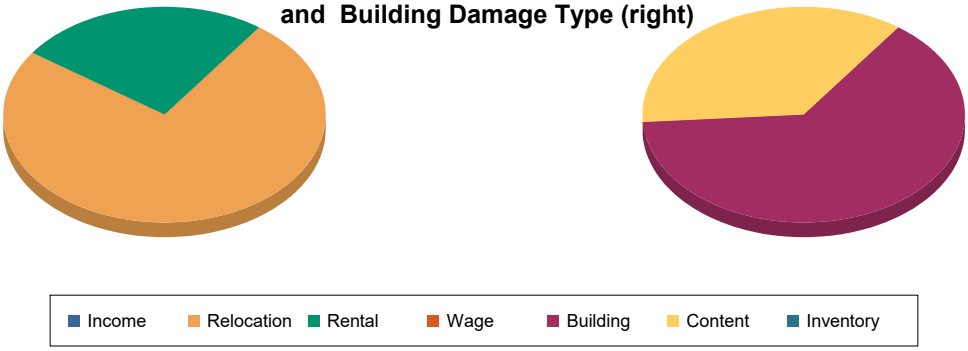
The total economic loss estimated for the hurricane is 2.6 million dollars, which represents 0.08 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 3 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

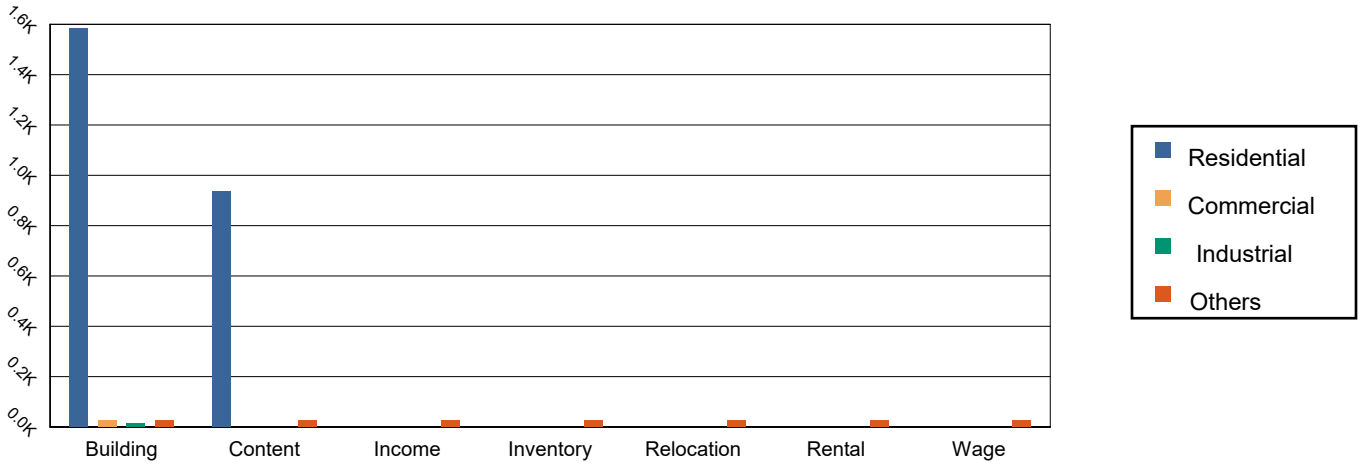


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,583.57	27.32	13.32	27.41	1,651.62
	Content	934.33	0.00	0.00	0.00	934.33
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2,517.91**	**27.32**	**13.32**	**27.41**	**2,585.95**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.14	0.03	0.00	0.00	0.18
	Rental	0.06	0.00	0.00	0.00	0.06
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.20**	**0.03**	**0.00**	**0.00**	**0.23**

Total

Total	**2,518.11**	**27.35**	**13.32**	**27.41**	**2,586.19**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	14,563	2,366,653	689,486	3,056,139
Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**
Study Region Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**

Hazus: Hurricane Global Risk Report

Region Name:	Tolland_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.27 square miles and contains 3 census tracts. There are over 5 thousand households in the region and a total population of 14,563 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,767 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

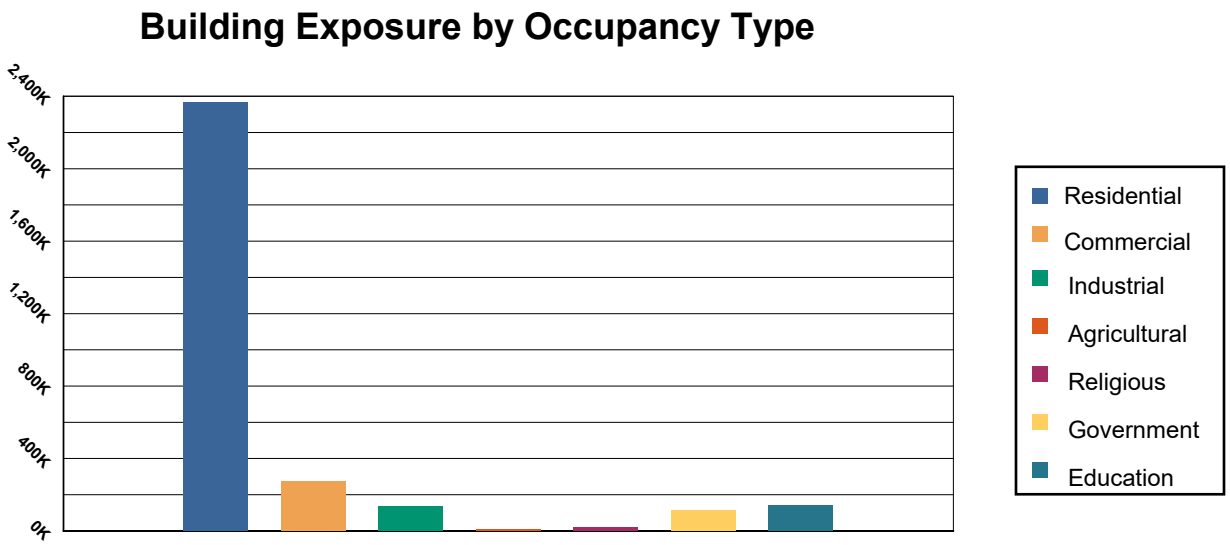


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,366,653	77.44%
Commercial	273,233	8.94%
Industrial	133,155	4.36%
Agricultural	9,020	0.30%
Religious	19,295	0.63%
Government	112,830	3.69%
Education	141,953	4.64%
Total	**3,056,139**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

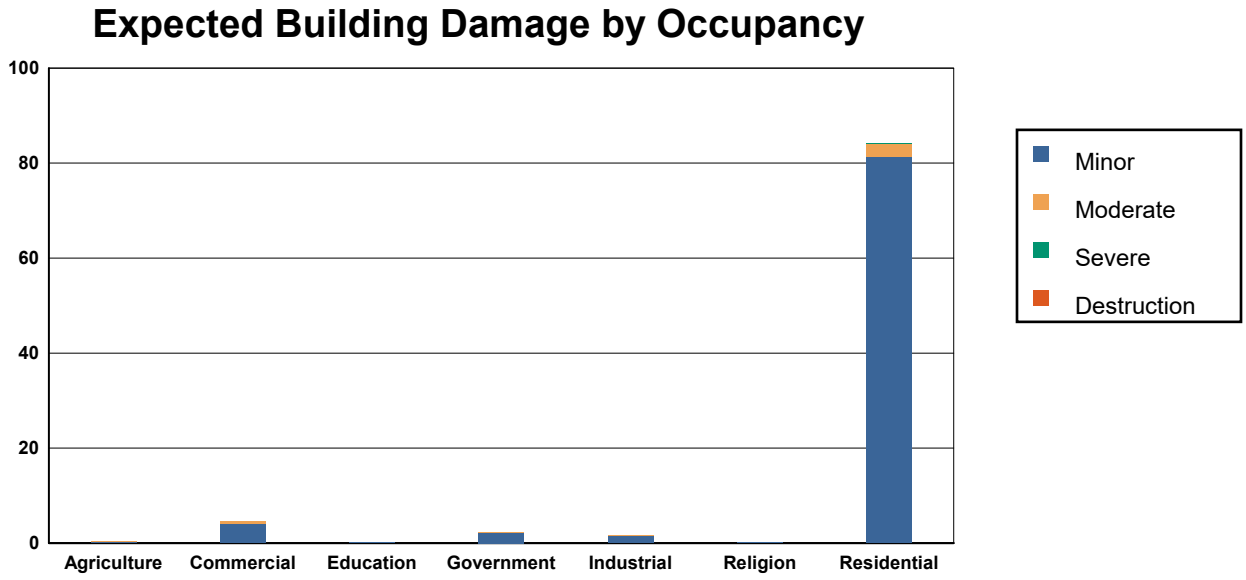


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.63	98.38	0.33	1.43	0.03	0.14	0.01	0.04	0.00	0.00
Commercial	280.50	98.42	4.06	1.43	0.43	0.15	0.01	0.01	0.00	0.00
Education	8.88	98.69	0.12	1.29	0.00	0.02	0.00	0.00	0.00	0.00
Government	172.66	98.66	2.30	1.32	0.04	0.02	0.00	0.00	0.00	0.00
Industrial	115.37	98.61	1.56	1.34	0.06	0.05	0.01	0.01	0.00	0.00
Religion	13.83	98.80	0.16	1.17	0.00	0.03	0.00	0.00	0.00	0.00
Residential	5,059.82	98.36	81.40	1.58	2.76	0.05	0.02	0.00	0.00	0.00
Total	**5,673.69**		**89.94**		**3.31**		**0.05**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	66	98.16	1	1.81	0	0.03	0	0.00	0	0.00
Masonry	372	97.93	7	1.85	1	0.21	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	306	98.57	4	1.33	0	0.10	0	0.00	0	0.00
Wood	4,930	98.46	75	1.50	2	0.04	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

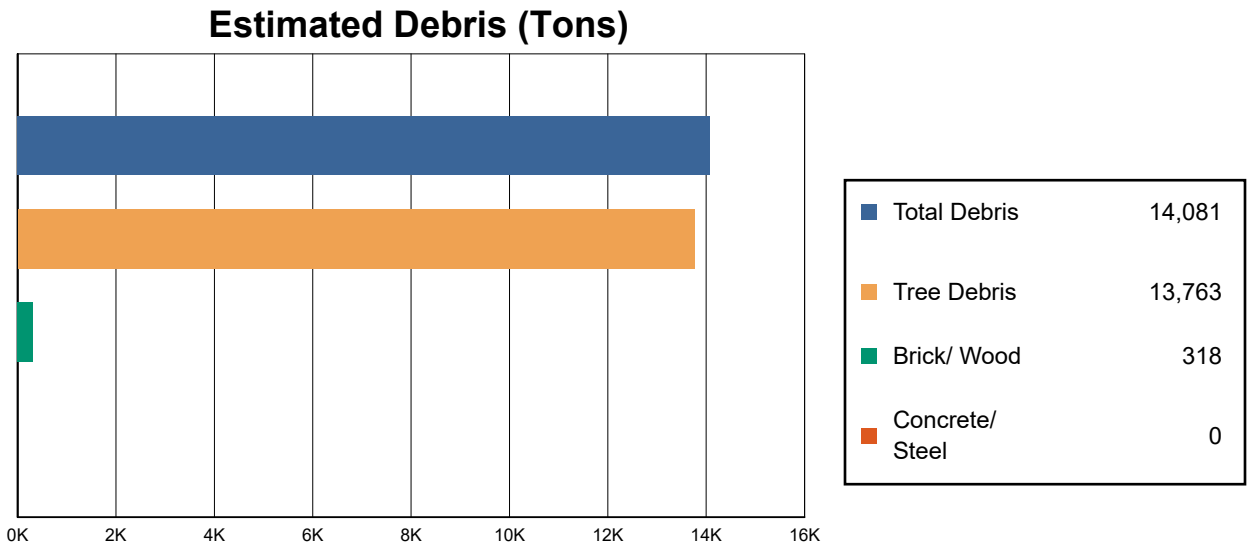
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

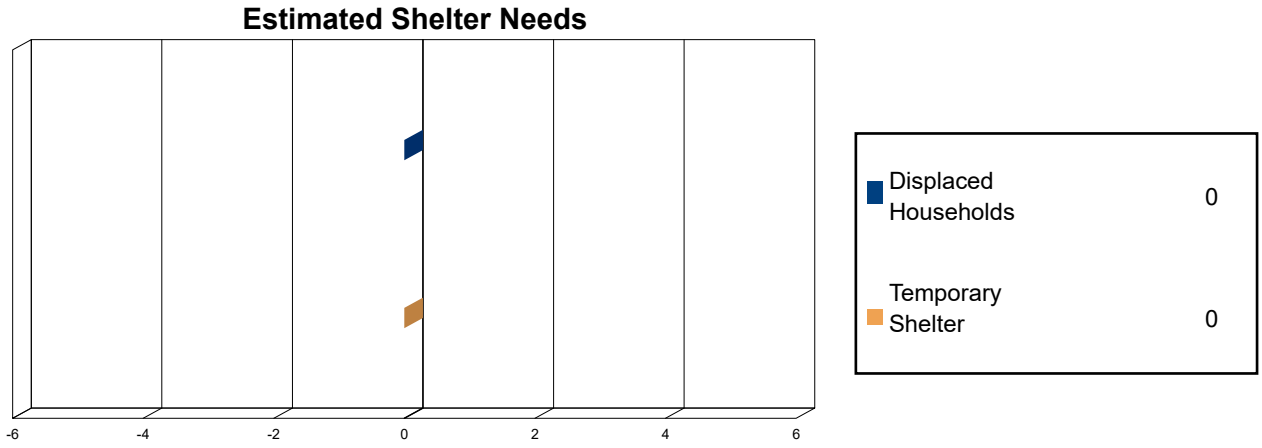


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 14,081 tons of debris will be generated. Of the total amount, 10,723 tons (76%) is Other Tree Debris. Of the remaining 3,358 tons, Brick/Wood comprises 9% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 13 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,040 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 14,563) will seek temporary shelter in public shelters.

Economic Loss

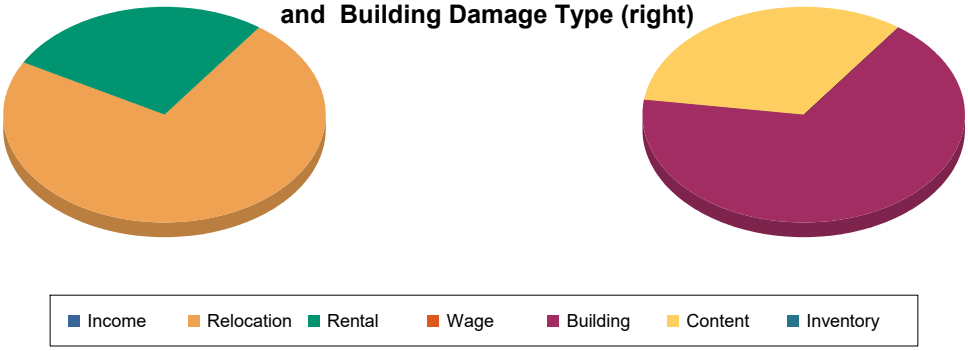
The total economic loss estimated for the hurricane is 16.1 million dollars, which represents 0.53 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 16 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

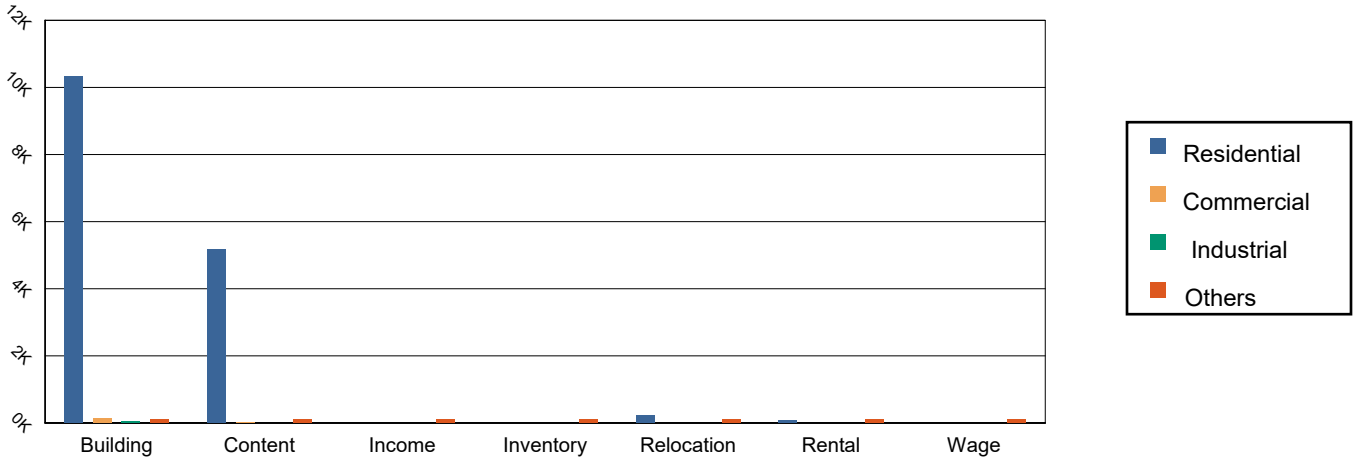


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	10,334.35	124.41	45.42	103.89	10,608.07
	Content	5,185.23	11.79	2.79	0.90	5,200.71
	Inventory	0.00	1.50	0.39	0.66	2.56
	Subtotal	**15,519.58**	**137.70**	**48.61**	**105.45**	**15,811.33**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	230.74	2.70	0.34	0.43	234.21
	Rental	86.87	0.00	0.00	0.00	86.87
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**317.61**	**2.70**	**0.34**	**0.43**	**321.08**

Total

Total	**15,837.19**	**140.39**	**48.94**	**105.88**	**16,132.41**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	14,563	2,366,653	689,486	3,056,139
Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**
Study Region Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**

Hazus: Hurricane Global Risk Report

Region Name:	Tolland_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Building Inventory

General Building Stock

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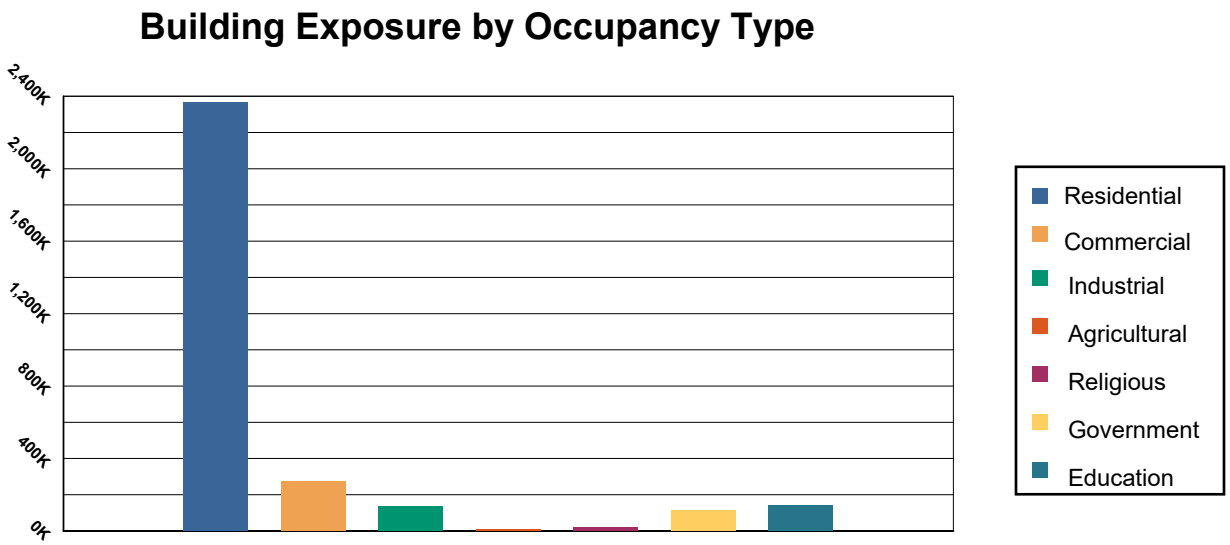

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Government	112,830	3.69%
Education	141,953	4.64%
Total	**3,056,139**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 23 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

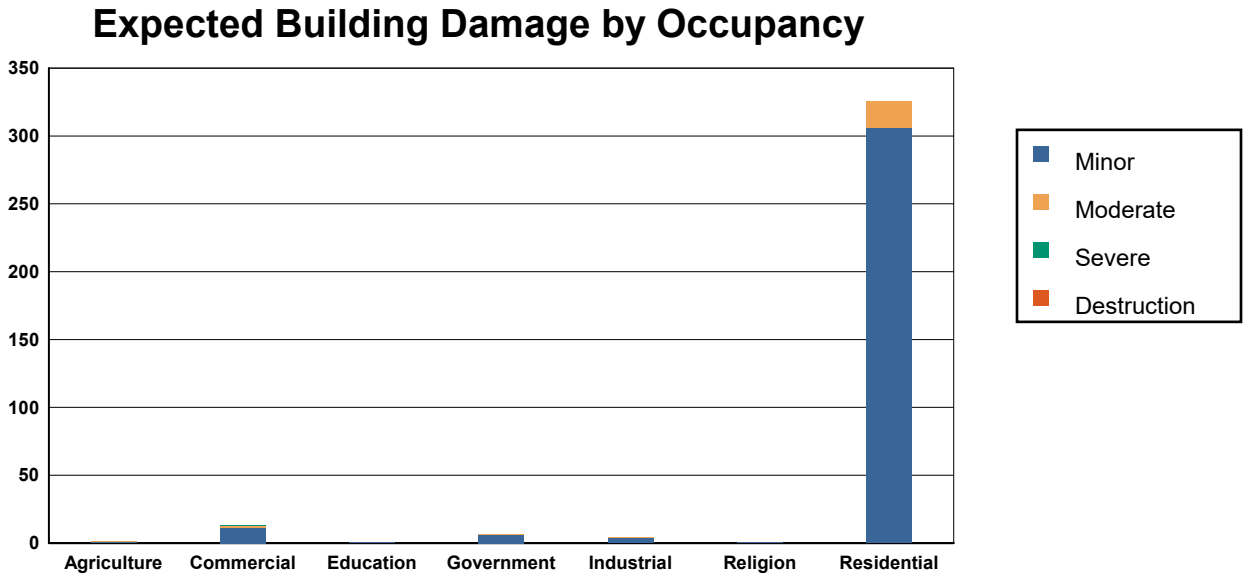


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.70	94.33	1.06	4.59	0.17	0.75	0.07	0.31	0.00	0.01
Commercial	271.80	95.37	11.14	3.91	1.84	0.64	0.23	0.08	0.00	0.00
Education	8.67	96.38	0.31	3.48	0.01	0.14	0.00	0.00	0.00	0.00
Government	168.78	96.45	6.00	3.43	0.22	0.13	0.00	0.00	0.00	0.00
Industrial	112.52	96.17	4.09	3.50	0.32	0.27	0.07	0.06	0.00	0.00
Religion	13.47	96.25	0.51	3.61	0.02	0.13	0.00	0.01	0.00	0.00
Residential	4,818.70	93.68	305.67	5.94	19.55	0.38	0.08	0.00	0.00	0.00
Total	**5,415.64**		**328.76**		**22.14**		**0.45**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	64	95.26	3	4.45	0	0.29	0	0.00	0	0.00
Masonry	358	94.14	19	4.96	3	0.85	0	0.05	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	298	96.18	10	3.32	1	0.44	0	0.06	0	0.00
Wood	4,699	93.85	292	5.84	15	0.30	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

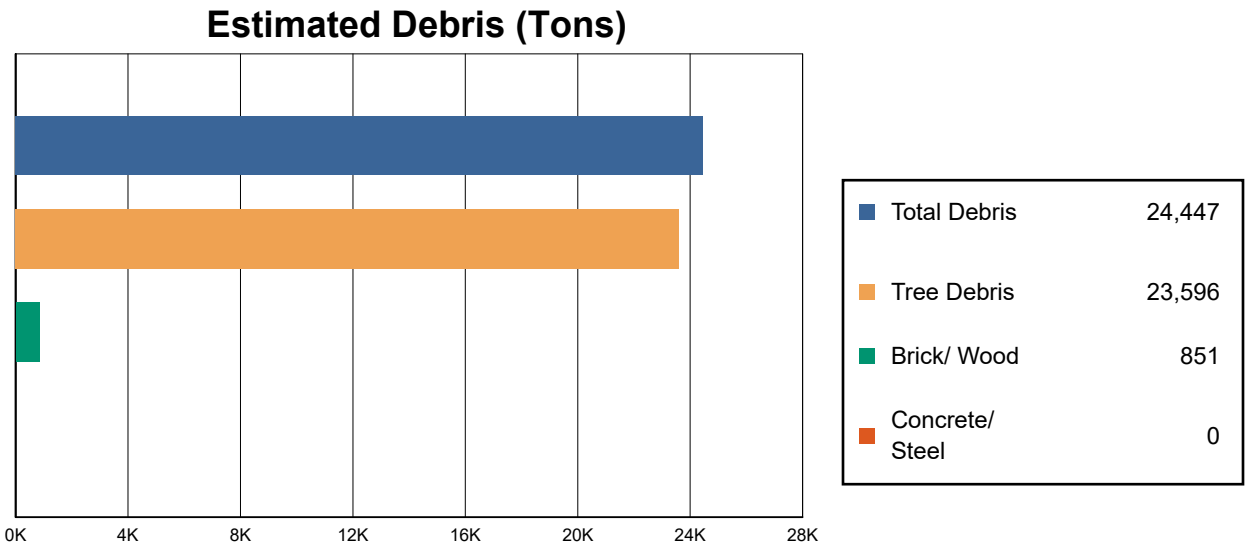
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

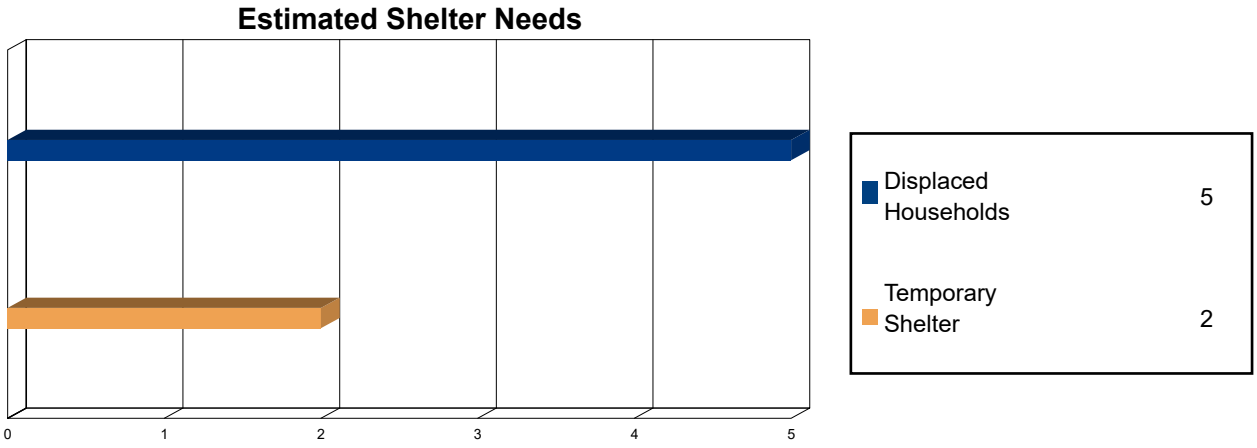


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 24,447 tons of debris will be generated. Of the total amount, 18,339 tons (75%) is Other Tree Debris. Of the remaining 6,108 tons, Brick/Wood comprises 14% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 34 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,257 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the hurricane. Of these, 2 people (out of a total population of 14,563) will seek temporary shelter in public shelters.

Economic Loss

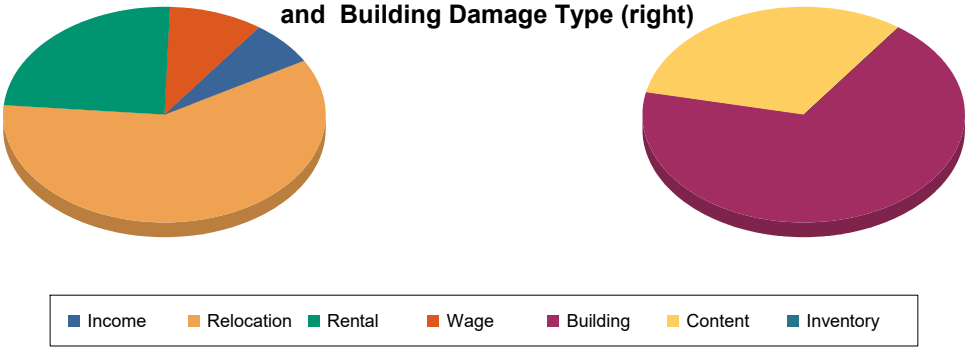
The total economic loss estimated for the hurricane is 31.0 million dollars, which represents 1.01 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 31 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

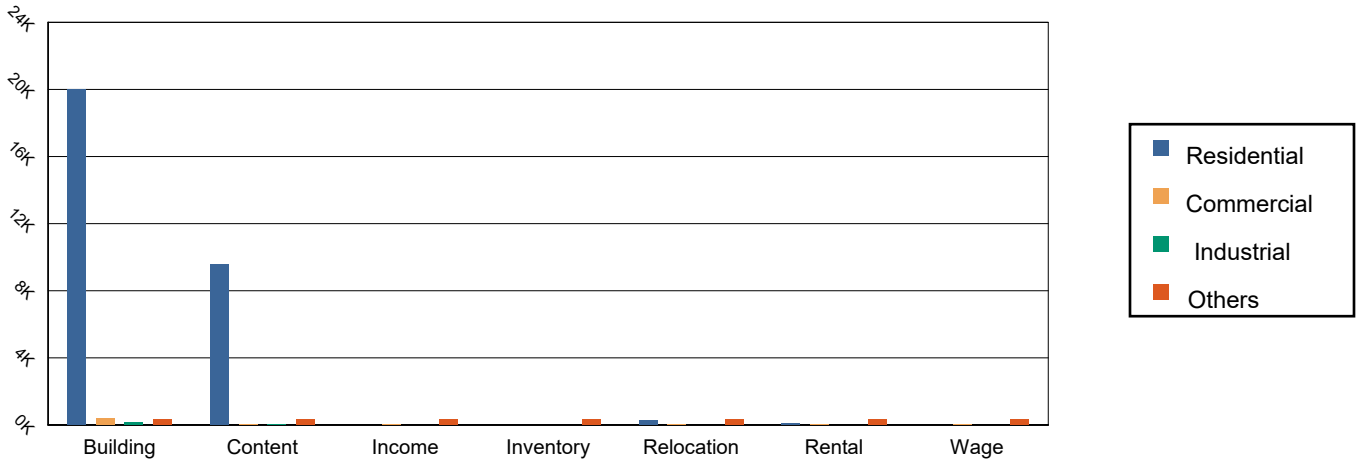


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	20,019.19	374.32	136.11	276.79	20,806.41
	Content	9,540.85	47.74	24.45	14.86	9,627.90
	Inventory	0.00	6.57	2.99	3.56	13.12
	Subtotal	**29,560.04**	**428.63**	**163.54**	**295.21**	**30,447.42**
Business Interruption Loss						
	Income	0.00	28.11	0.37	7.57	36.05
	Relocation	280.67	32.79	2.90	8.77	325.13
	Rental	114.41	16.17	0.25	0.59	131.42
	Wage	0.00	32.16	0.60	17.85	50.61
	Subtotal	**395.07**	**109.23**	**4.12**	**34.79**	**543.21**

Total

Total	29,955.12	537.86	167.66	330.00	30,990.63

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	14,563	2,366,653	689,486	3,056,139
Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**
Study Region Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**

Hazus: Hurricane Global Risk Report

Region Name:	Tolland_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.27 square miles and contains 3 census tracts. There are over 5 thousand households in the region and a total population of 14,563 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,767 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

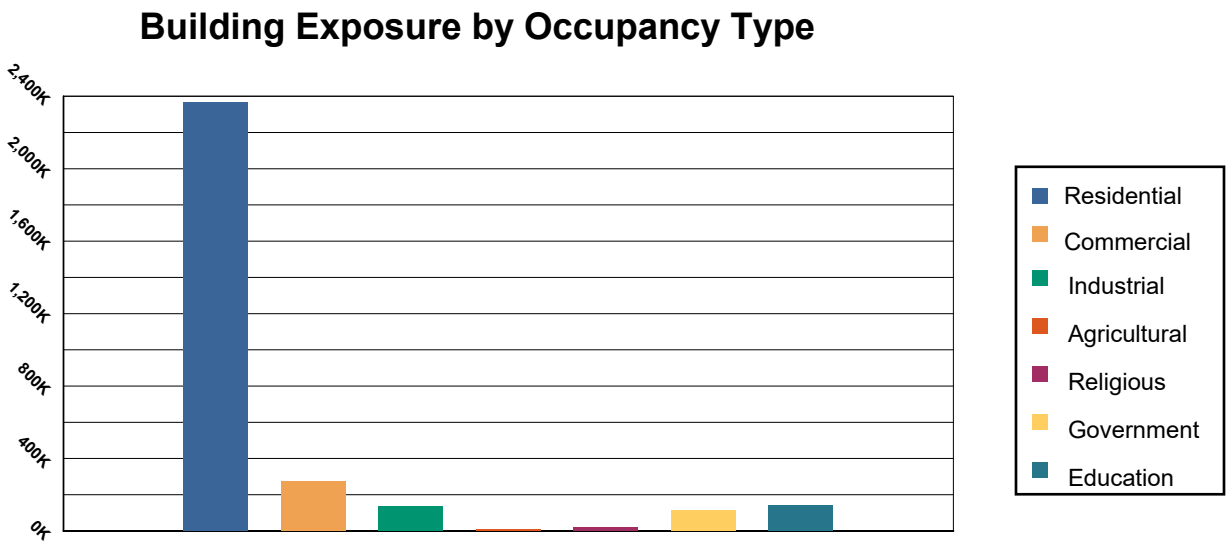


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,366,653	77.44%
Commercial	273,233	8.94%
Industrial	133,155	4.36%
Agricultural	9,020	0.30%
Religious	19,295	0.63%
Government	112,830	3.69%
Education	141,953	4.64%
Total	**3,056,139**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 66 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

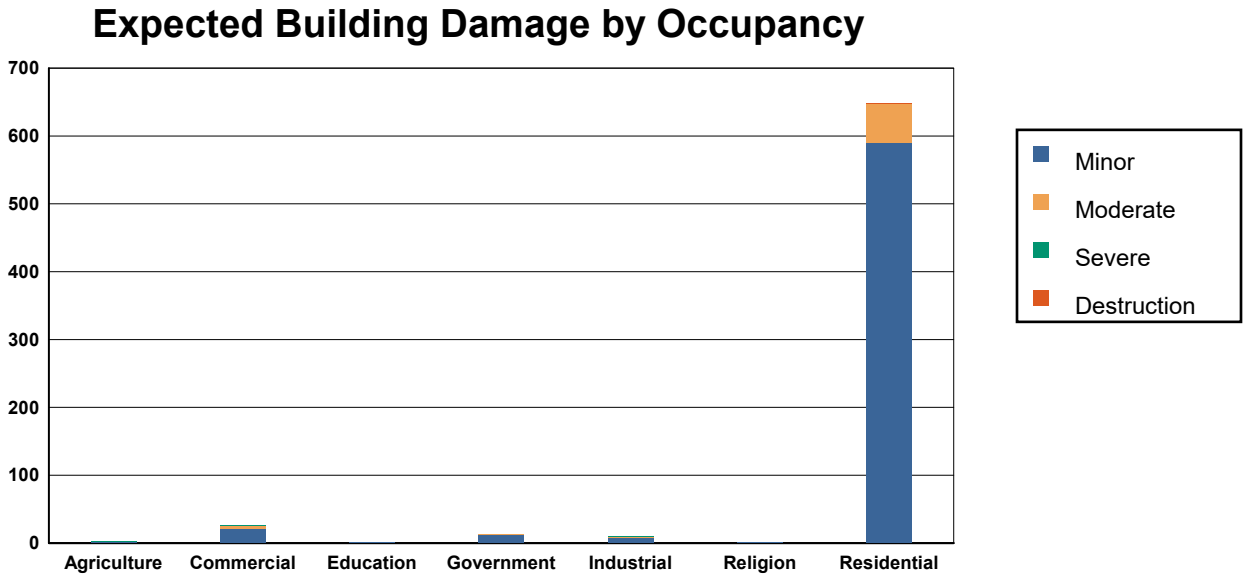


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	20.32	88.33	2.05	8.93	0.42	1.82	0.20	0.86	0.01	0.06
Commercial	258.44	90.68	21.38	7.50	4.41	1.55	0.77	0.27	0.00	0.00
Education	8.34	92.62	0.61	6.82	0.05	0.54	0.00	0.02	0.00	0.00
Government	162.25	92.72	11.76	6.72	0.97	0.55	0.02	0.01	0.00	0.00
Industrial	107.83	92.16	7.88	6.74	1.04	0.89	0.24	0.20	0.01	0.01
Religion	12.87	91.96	1.05	7.50	0.07	0.51	0.00	0.03	0.00	0.00
Residential	4,495.85	87.40	590.30	11.48	56.49	1.10	0.86	0.02	0.49	0.01
Total	**5,065.90**		**635.04**		**63.45**		**2.09**		**0.52**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	61	90.53	6	8.33	1	1.13	0	0.01	0	0.00
Masonry	338	88.89	34	9.00	7	1.96	1	0.15	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	286	92.28	20	6.34	4	1.16	1	0.23	0	0.00
Wood	4,387	87.61	571	11.40	48	0.96	1	0.02	0	0.01

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

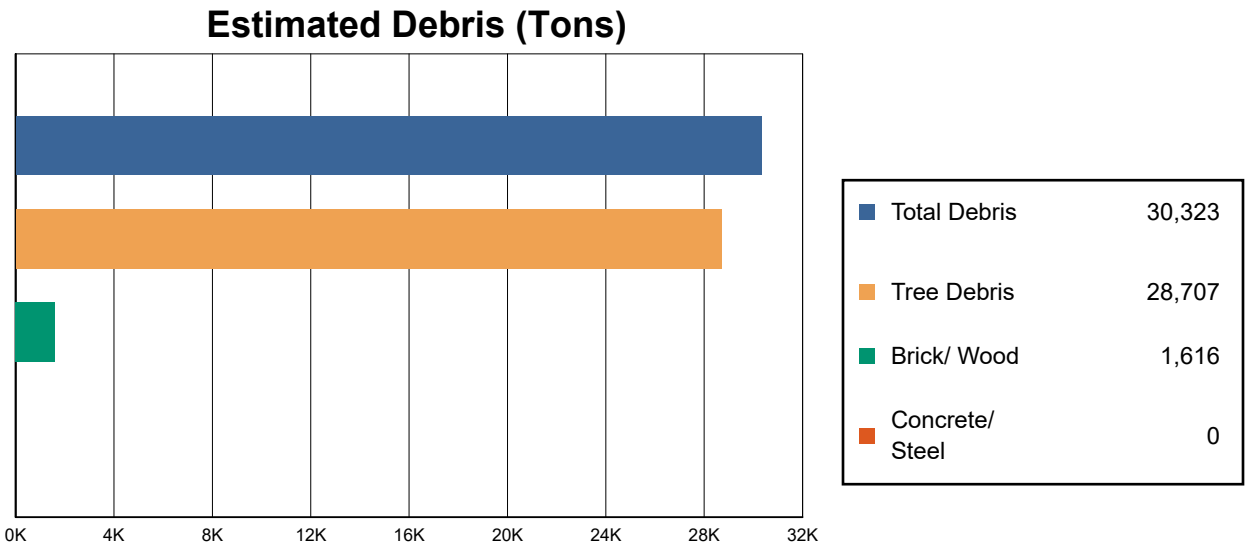
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

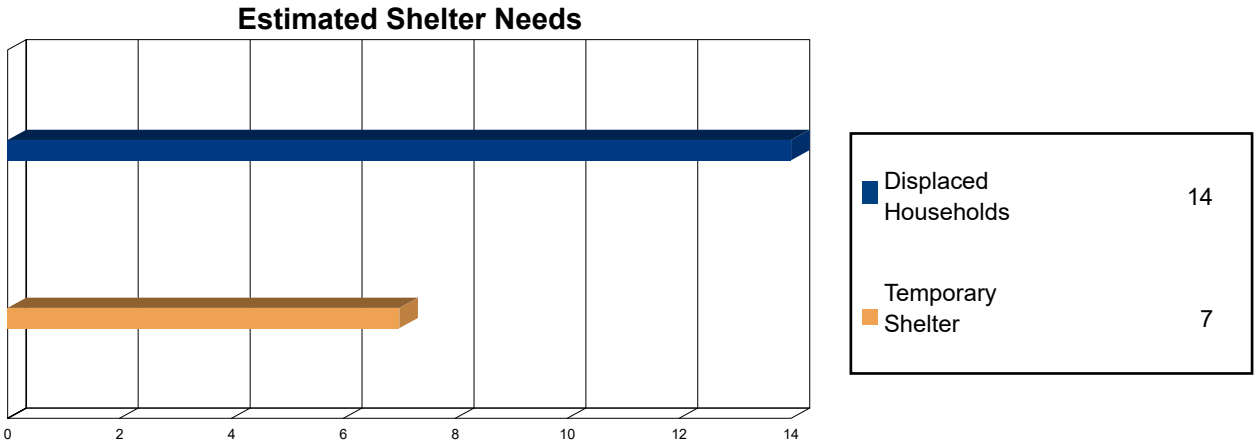


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 30,323 tons of debris will be generated. Of the total amount, 22,333 tons (74%) is Other Tree Debris. Of the remaining 7,990 tons, Brick/Wood comprises 20% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 65 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,374 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 14 households to be displaced due to the hurricane. Of these, 7 people (out of a total population of 14,563) will seek temporary shelter in public shelters.

Economic Loss

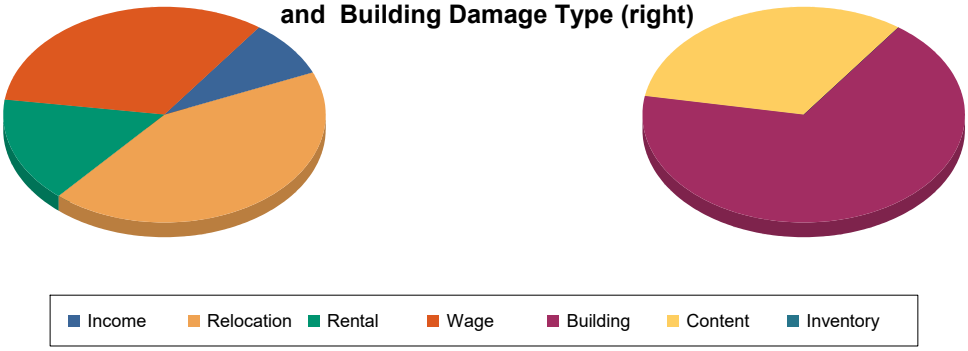
The total economic loss estimated for the hurricane is 50.4 million dollars, which represents 1.65 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 50 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

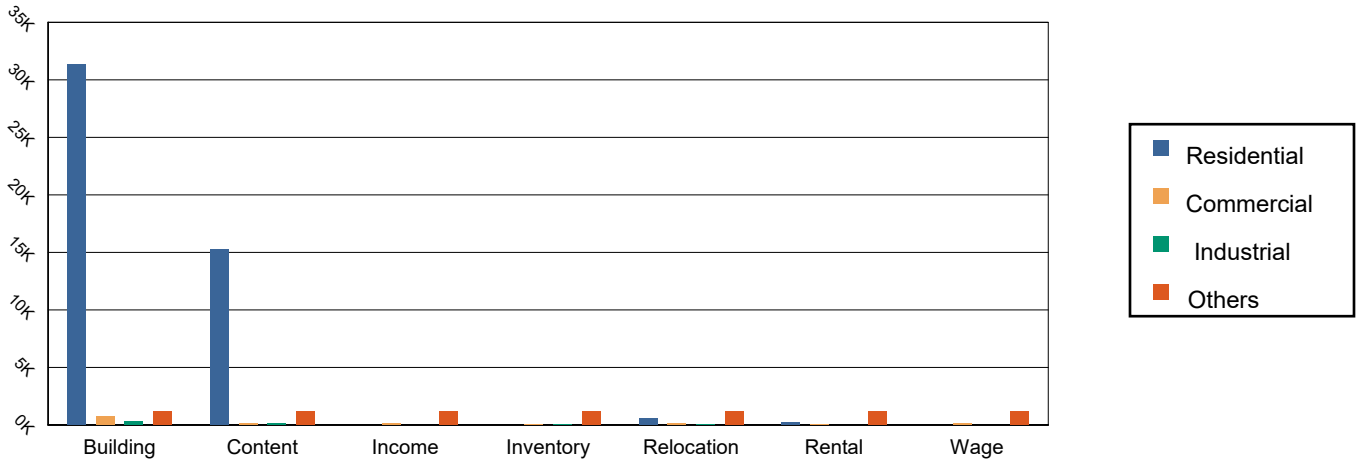


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	31,339.34	741.82	314.21	560.01	32,955.39
	Content	15,254.97	138.63	115.51	64.60	15,573.71
	Inventory	0.00	20.19	13.40	11.98	45.56
	Subtotal	**46,594.31**	**900.64**	**443.12**	**636.59**	**48,574.66**
Business Interruption Loss						
	Income	0.00	116.04	5.00	40.31	161.35
	Relocation	595.92	109.11	19.25	73.18	797.47
	Rental	220.81	61.61	3.80	11.92	298.15
	Wage	0.00	151.44	7.96	451.89	611.28
	Subtotal	**816.74**	**438.20**	**36.01**	**577.30**	**1,868.25**

Total

Total	**47,411.04**	**1,338.84**	**479.13**	**1,213.89**	**50,442.90**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	14,563	2,366,653	689,486	3,056,139
Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**
Study Region Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**

Hazus: Hurricane Global Risk Report

Region Name:	Tolland_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.27 square miles and contains 3 census tracts. There are over 5 thousand households in the region and a total population of 14,563 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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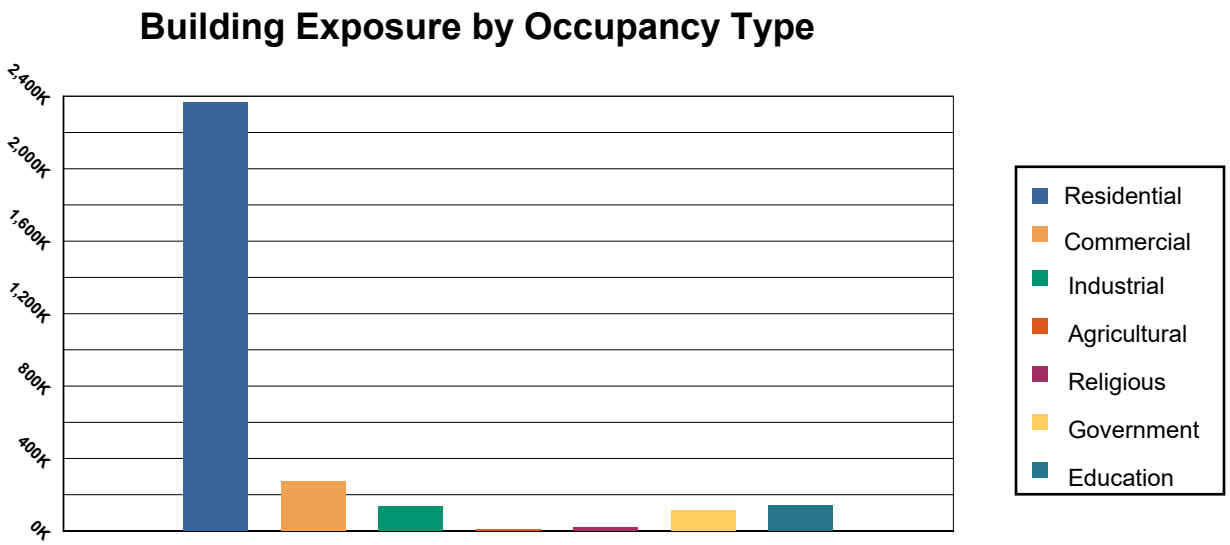


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,366,653	77.44%
Commercial	273,233	8.94%
Industrial	133,155	4.36%
Agricultural	9,020	0.30%
Religious	19,295	0.63%
Government	112,830	3.69%
Education	141,953	4.64%
Total	**3,056,139**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 211 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

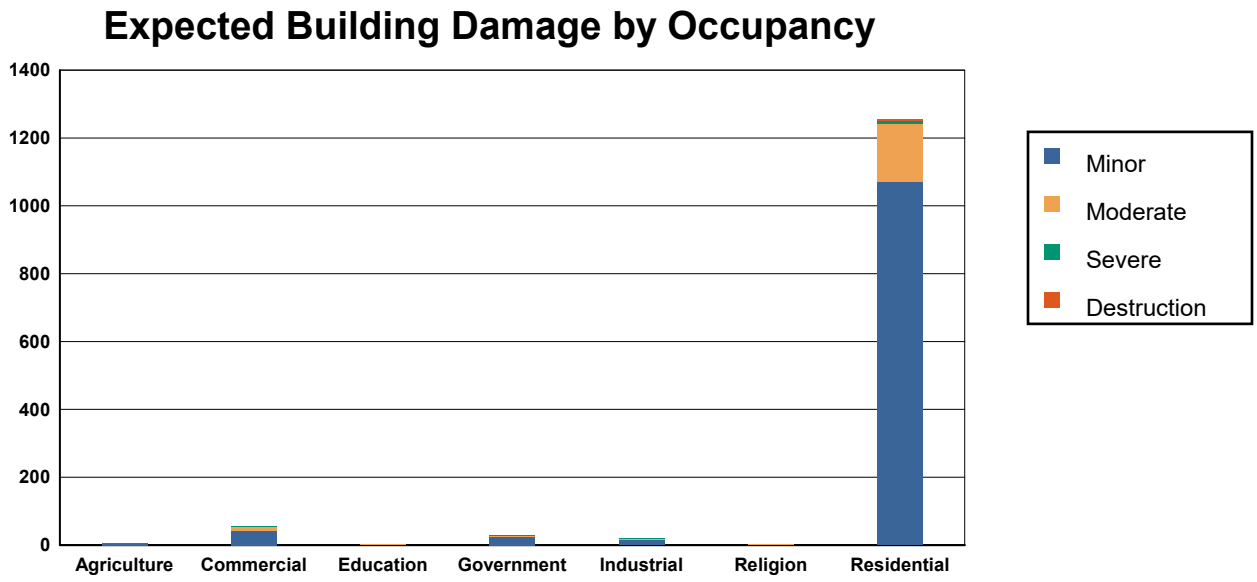


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.59	76.50	3.81	16.57	1.03	4.49	0.50	2.18	0.06	0.26
Commercial	227.61	79.86	41.96	14.72	12.88	4.52	2.53	0.89	0.02	0.01
Education	7.47	83.00	1.27	14.07	0.25	2.80	0.01	0.13	0.00	0.00
Government	146.06	83.46	23.79	13.60	4.94	2.82	0.21	0.12	0.00	0.00
Industrial	96.52	82.50	15.71	13.42	3.98	3.40	0.73	0.63	0.05	0.05
Religion	11.51	82.20	2.13	15.23	0.34	2.45	0.02	0.12	0.00	0.00
Residential	3,888.56	75.59	1,071.85	20.84	169.45	3.29	9.24	0.18	4.90	0.10
Total	**4,395.33**		**1,160.52**		**192.88**		**13.24**		**5.03**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	54	79.89	10	15.56	3	4.44	0	0.10	0	0.00
Masonry	297	78.04	62	16.37	19	5.08	2	0.44	0	0.07
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	256	82.67	39	12.67	12	3.85	2	0.80	0	0.01
Wood	3,797	75.83	1,045	20.87	152	3.04	9	0.18	5	0.09

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

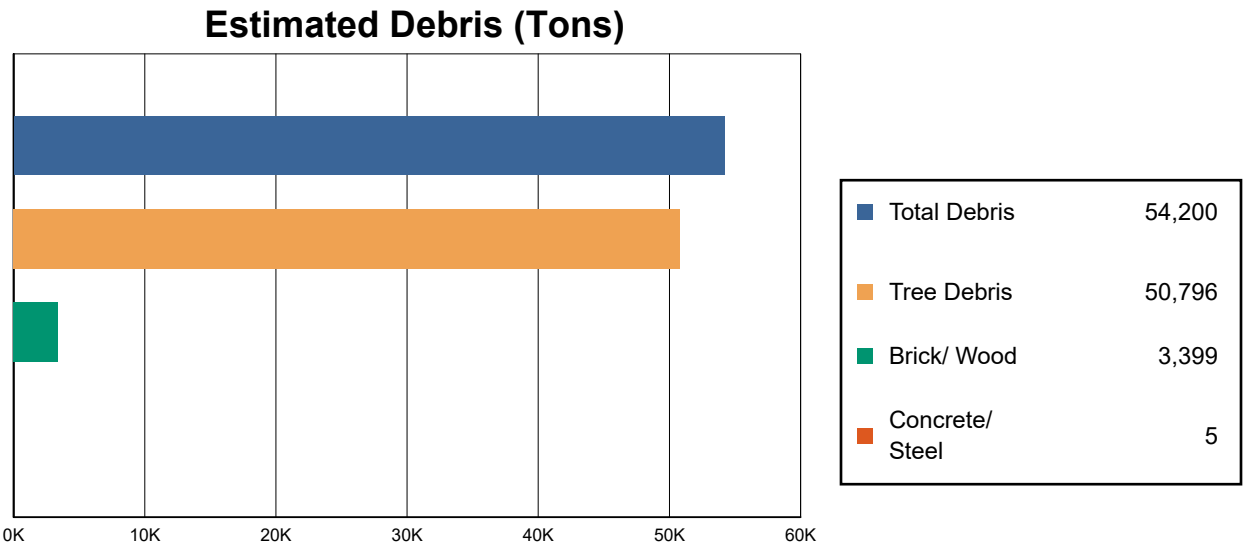
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

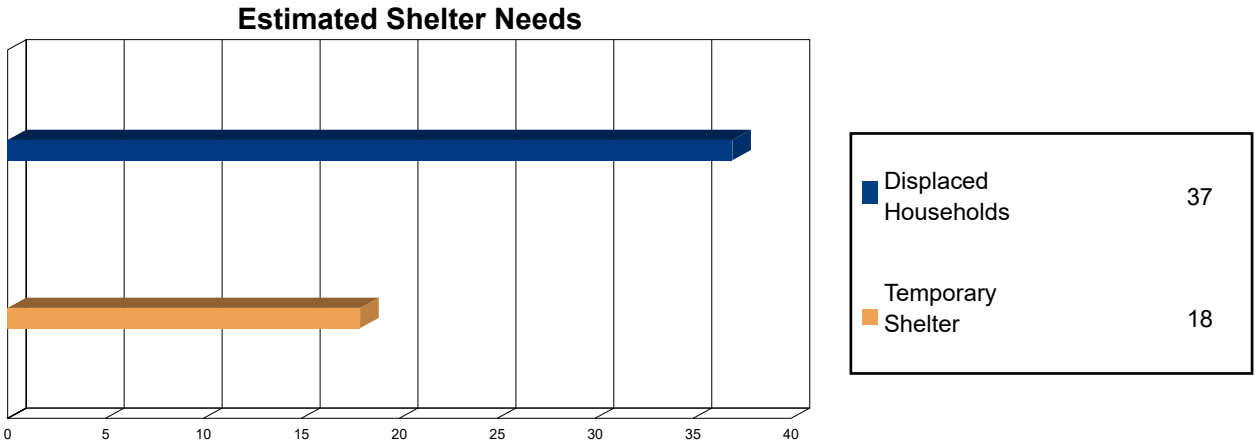


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 54,200 tons of debris will be generated. Of the total amount, 39,452 tons (73%) is Other Tree Debris. Of the remaining 14,748 tons, Brick/Wood comprises 23% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 136 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 11,344 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 37 households to be displaced due to the hurricane. Of these, 18 people (out of a total population of 14,563) will seek temporary shelter in public shelters.

Economic Loss

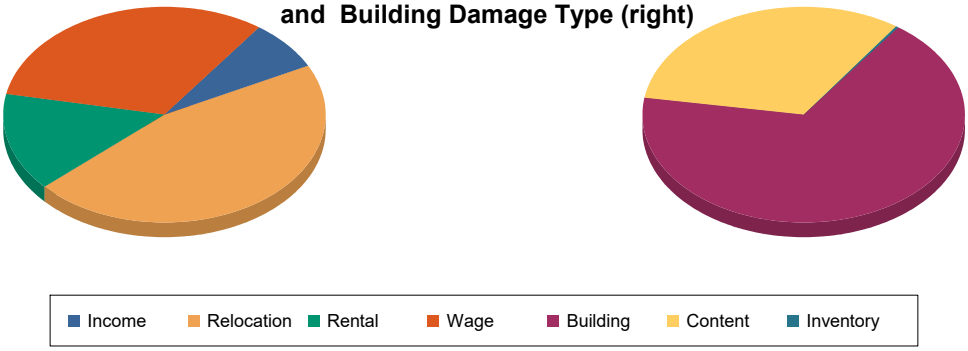
The total economic loss estimated for the hurricane is 94.4 million dollars, which represents 3.09 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 94 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

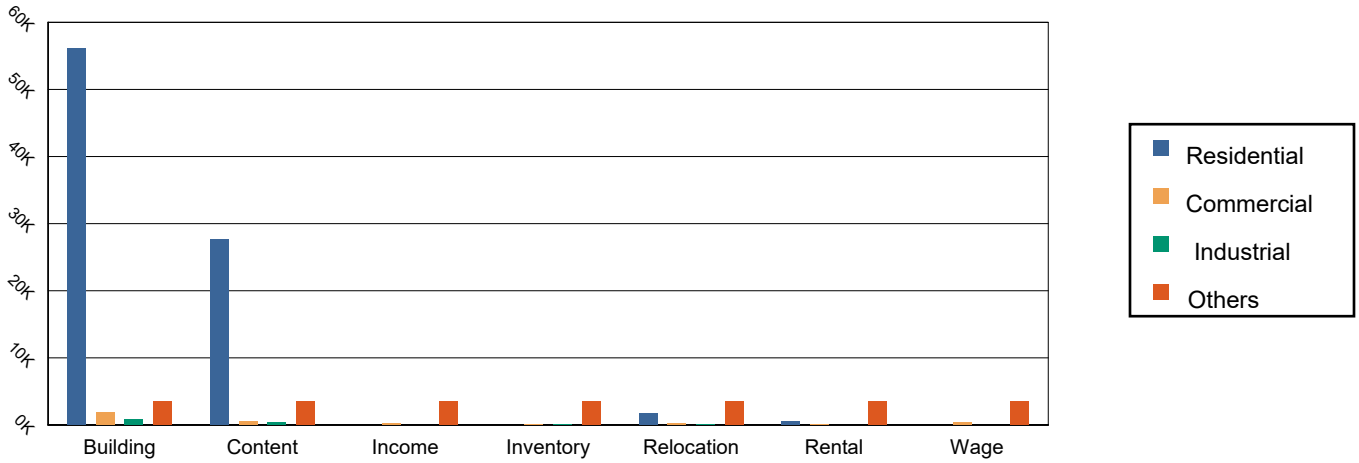


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	56,136.83	1,836.85	856.84	1,481.37	60,311.90
	Content	27,649.74	473.56	421.38	299.77	28,844.45
	Inventory	0.00	72.03	47.79	36.50	156.32
	Subtotal	**83,786.57**	**2,382.44**	**1,326.01**	**1,817.64**	**89,312.66**
Business Interruption Loss						
	Income	0.00	236.70	11.25	130.25	378.19
	Relocation	1,719.83	274.15	60.03	277.67	2,331.69
	Rental	562.39	143.58	8.82	39.32	754.10
	Wage	0.00	312.70	17.34	1,297.30	1,627.34
	Subtotal	**2,282.22**	**967.13**	**97.43**	**1,744.55**	**5,091.33**

Total

Total	86,068.80	3,349.58	1,423.44	3,562.18	94,403.99

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	14,563	2,366,653	689,486	3,056,139
Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**
Study Region Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**

Hazus: Hurricane Global Risk Report

Region Name:	Tolland_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.27 square miles and contains 3 census tracts. There are over 5 thousand households in the region and a total population of 14,563 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,056 million dollars. Approximately 89% of the buildings (and 77% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 5,767 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

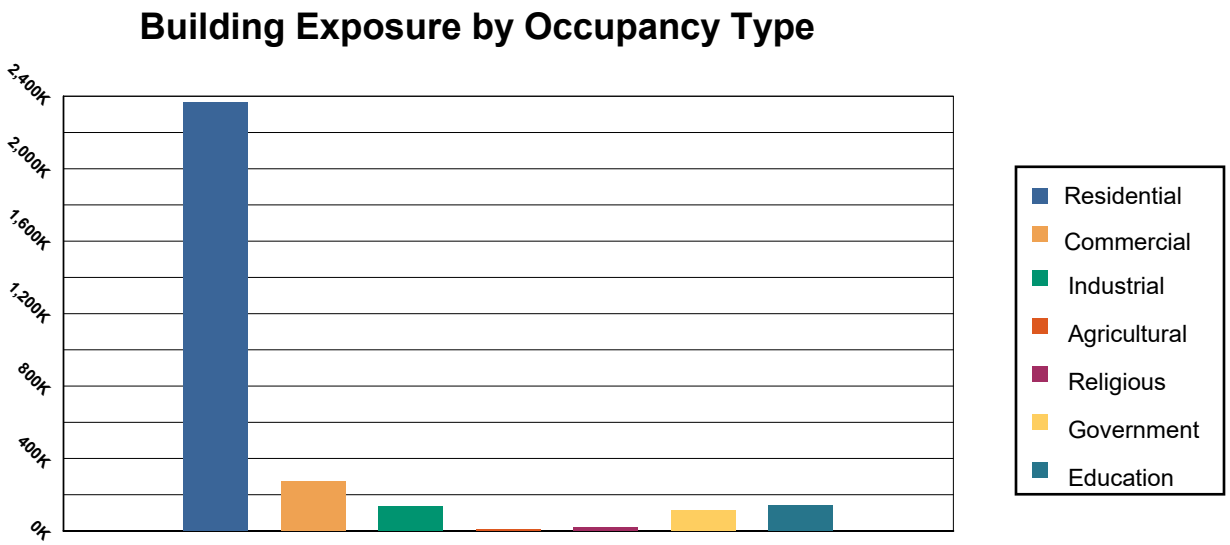


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,366,653	77.44%
Commercial	273,233	8.94%
Industrial	133,155	4.36%
Agricultural	9,020	0.30%
Religious	19,295	0.63%
Government	112,830	3.69%
Education	141,953	4.64%
Total	**3,056,139**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 352 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 13 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

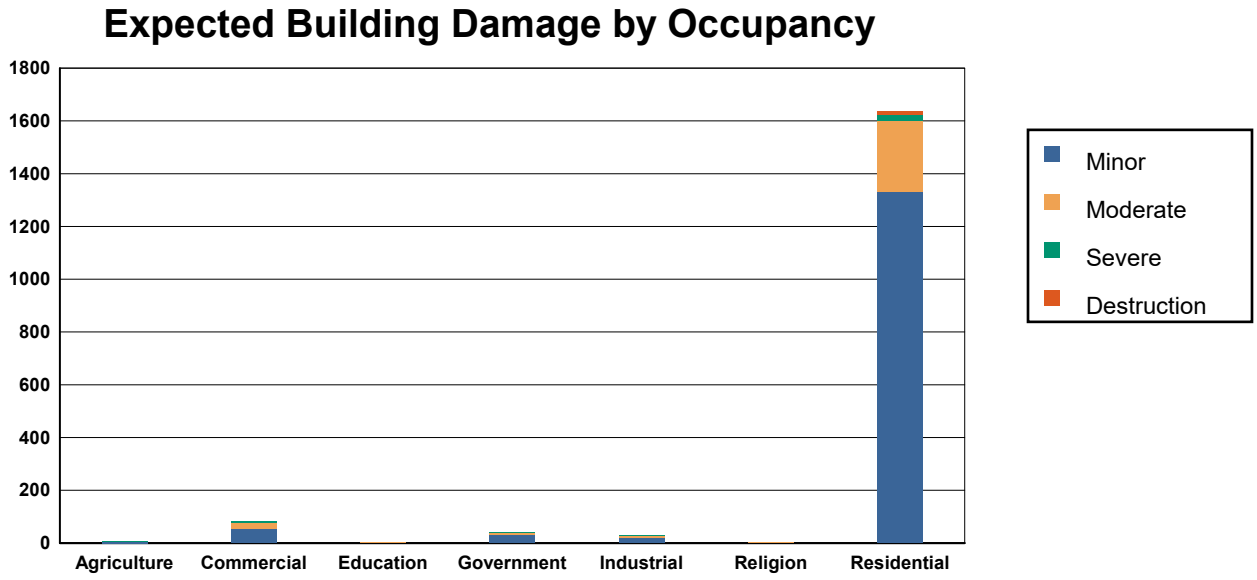


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15.65	68.04	4.90	21.32	1.58	6.88	0.76	3.29	0.11	0.47
Commercial	203.80	71.51	54.51	19.13	22.22	7.80	4.43	1.55	0.04	0.01
Education	6.71	74.57	1.71	19.05	0.53	5.94	0.04	0.44	0.00	0.00
Government	133.40	76.23	31.24	17.85	9.68	5.53	0.69	0.39	0.00	0.00
Industrial	86.41	73.86	21.09	18.02	7.85	6.71	1.54	1.32	0.11	0.09
Religion	10.29	73.51	2.92	20.88	0.73	5.24	0.05	0.37	0.00	0.00
Residential	3,508.89	68.21	1,333.61	25.93	266.34	5.18	22.42	0.44	12.74	0.25
Total	**3,965.15**		**1,449.98**		**308.95**		**29.92**		**12.99**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	48	71.13	13	19.93	6	8.56	0	0.38	0	0.00
Masonry	267	70.19	78	20.63	31	8.17	3	0.87	1	0.14
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	232	74.71	52	16.74	22	7.02	5	1.51	0	0.02
Wood	3,427	68.44	1,305	26.07	242	4.83	21	0.42	12	0.24

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

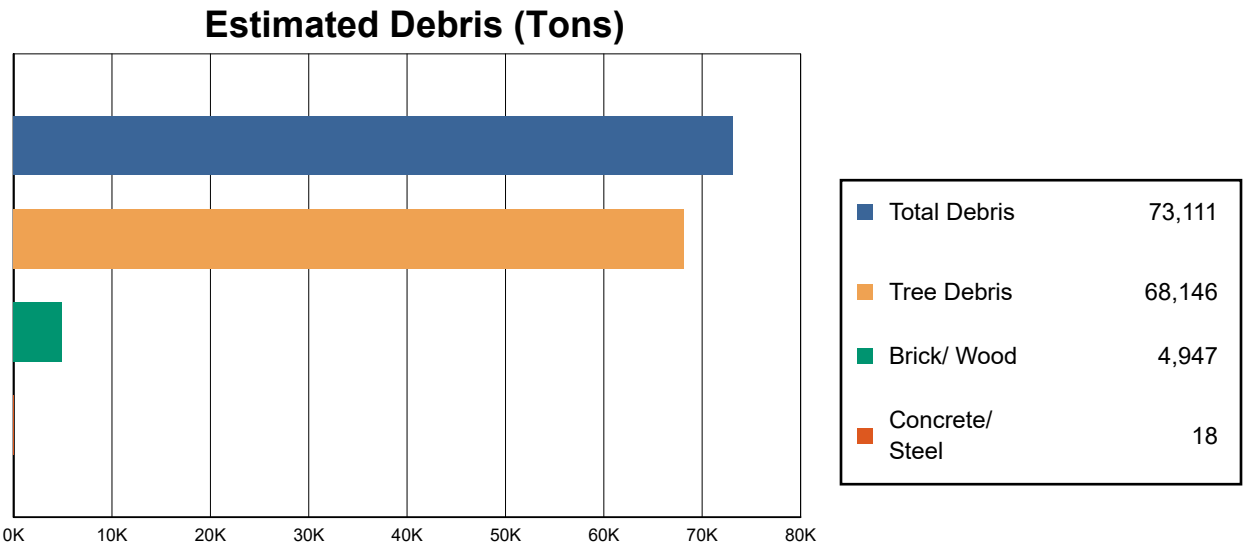
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

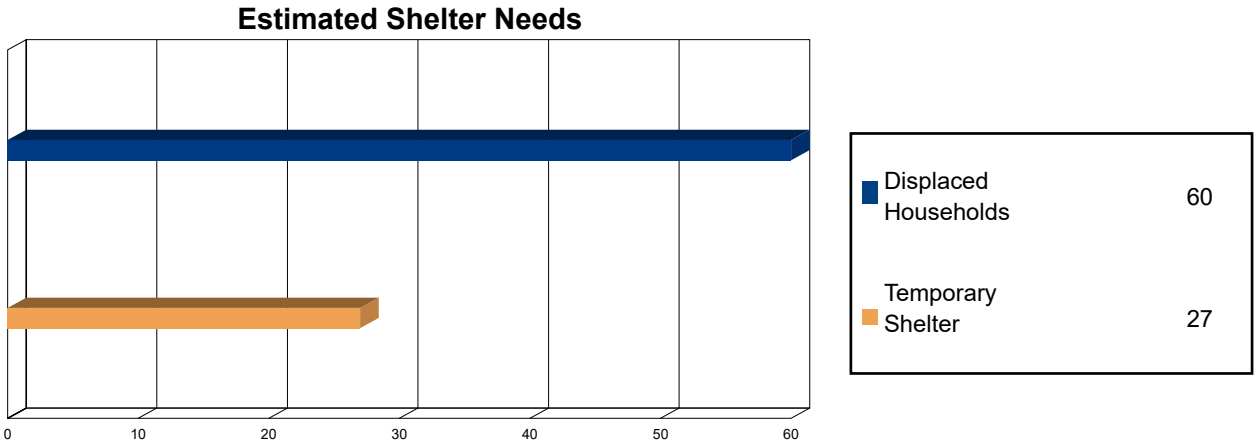


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 73,111 tons of debris will be generated. Of the total amount, 52,909 tons (72%) is Other Tree Debris. Of the remaining 20,202 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 199 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 15,237 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 60 households to be displaced due to the hurricane. Of these, 27 people (out of a total population of 14,563) will seek temporary shelter in public shelters.

Economic Loss

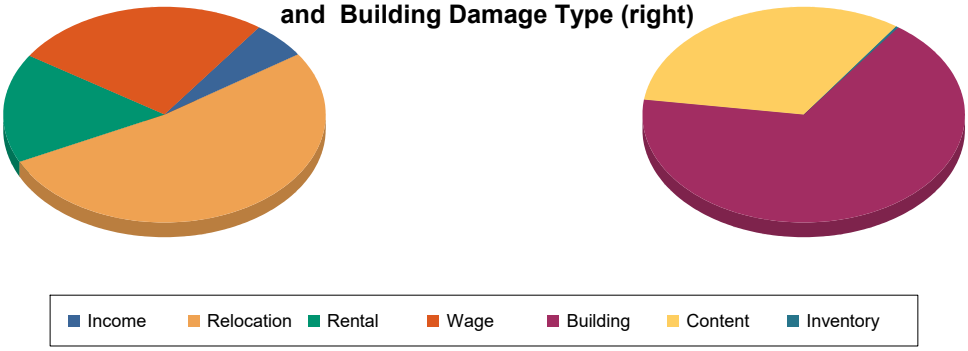
The total economic loss estimated for the hurricane is 135.0 million dollars, which represents 4.42 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 135 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

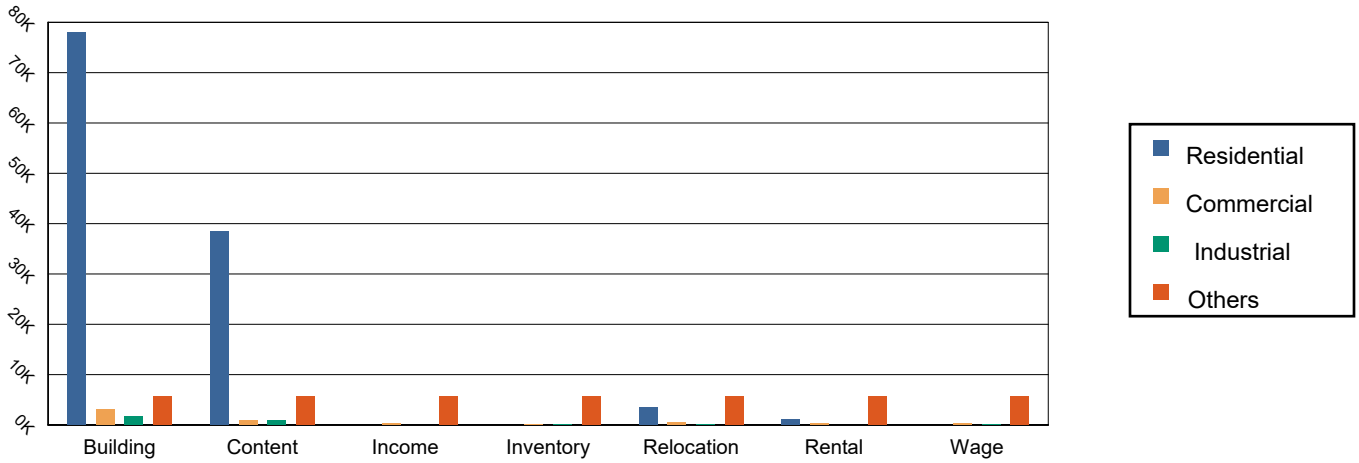


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	78,043.37	3,020.58	1,615.54	2,470.87	85,150.36
	Content	38,458.29	945.94	921.40	648.65	40,974.27
	Inventory	0.00	137.09	102.43	59.59	299.11
	Subtotal	**116,501.66**	**4,103.60**	**2,639.38**	**3,179.11**	**126,423.74**
Business Interruption Loss						
	Income	0.00	294.39	16.92	160.03	471.34
	Relocation	3,448.61	445.69	127.12	450.47	4,471.89
	Rental	1,102.11	227.25	17.49	62.53	1,409.38
	Wage	0.00	392.17	26.13	1,802.35	2,220.66
	Subtotal	**4,550.72**	**1,359.52**	**187.66**	**2,475.39**	**8,573.28**

Total

Total	**121,052.38**	**5,463.12**	**2,827.04**	**5,654.49**	**134,997.03**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	14,563	2,366,653	689,486	3,056,139
Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**
Study Region Total	**14,563**	**2,366,653**	**689,486**	**3,056,139**

Hazus: Hurricane Global Risk Report

Region Name:	Vernon_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.08 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 30,215 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88% of the buildings (and 71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,605 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

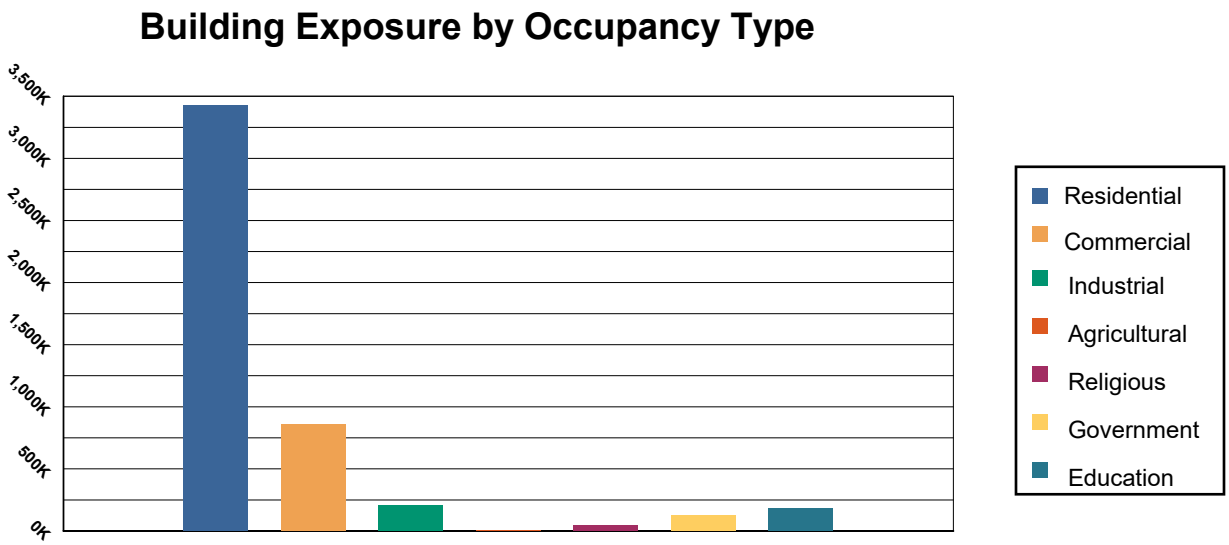


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,427,753	70.84%
Commercial	859,331	17.76%
Industrial	201,650	4.17%
Agricultural	3,212	0.07%
Religious	40,643	0.84%
Government	124,177	2.57%
Education	181,696	3.76%
Total	**4,838,462**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds. There are 7 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

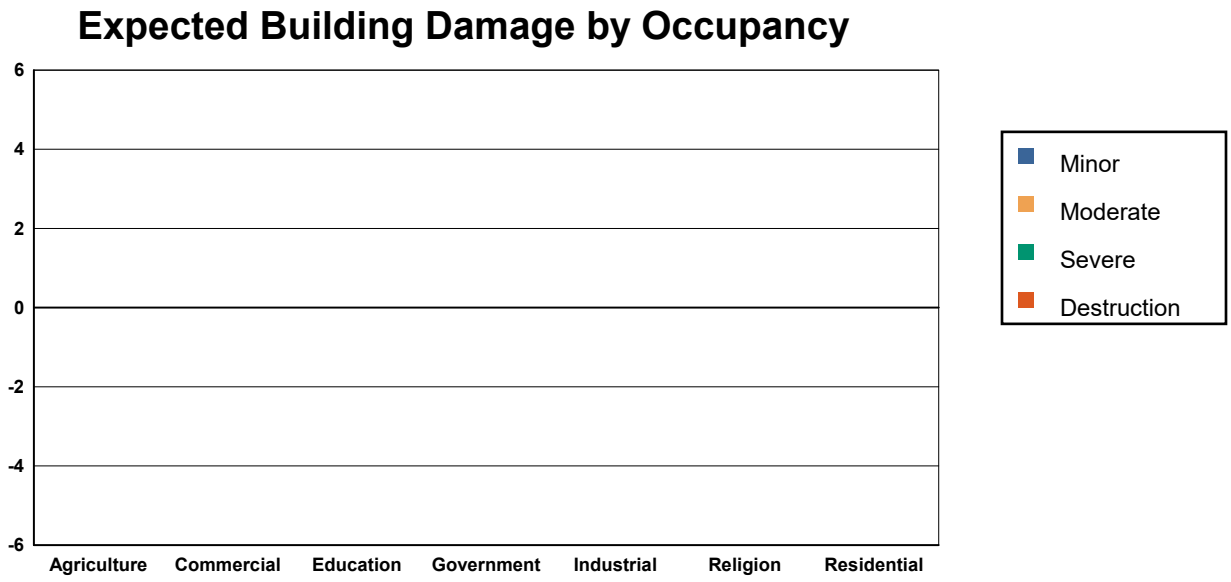


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	679.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	15.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	127.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	127.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	45.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	7,601.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**8,605.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	165	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	954	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	53	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	507	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	6,918	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 102 hospital beds available for use. On the day of the hurricane, the model estimates that 102 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

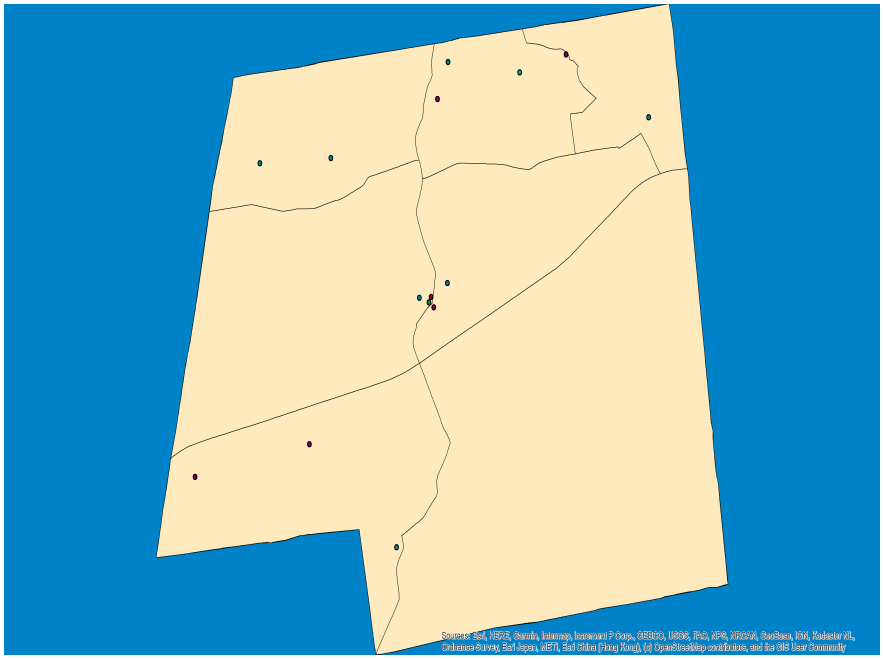
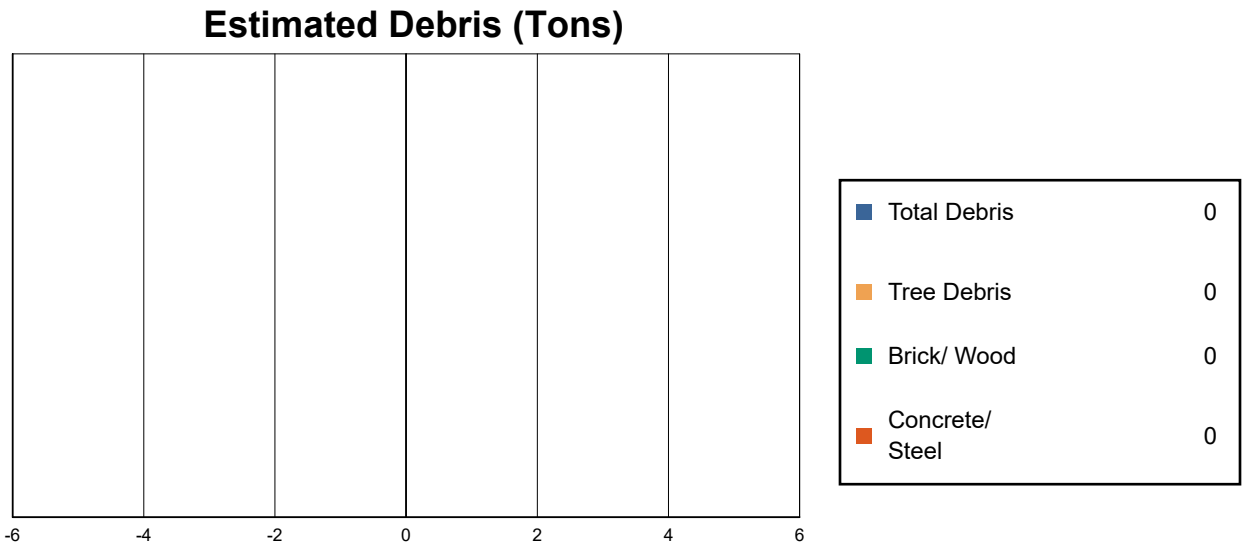


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

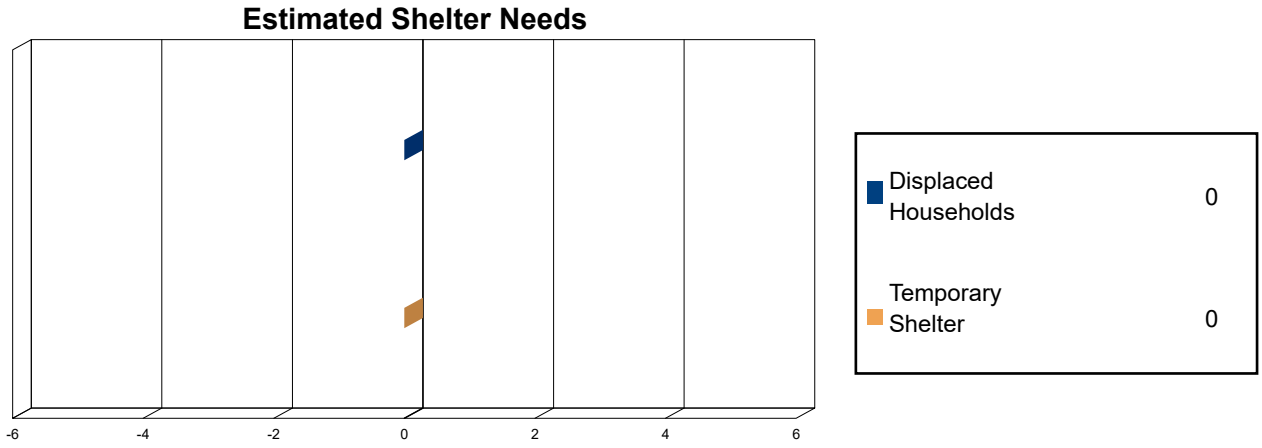


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 30,215) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

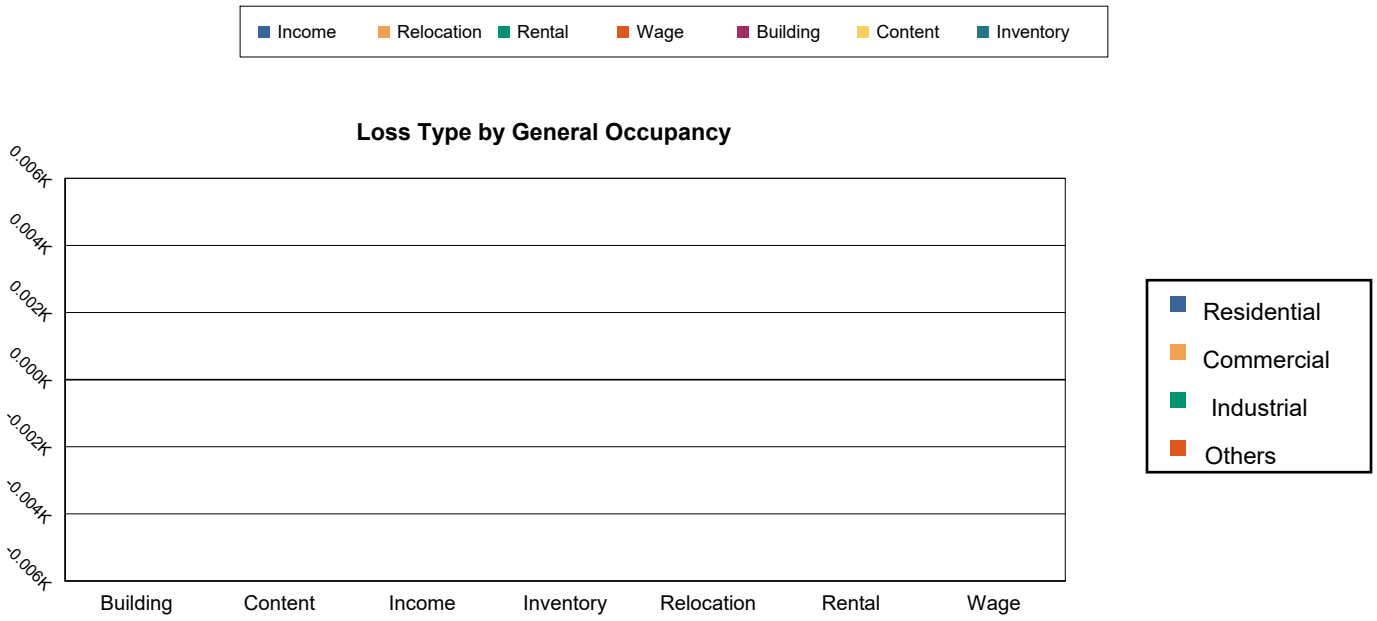


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,753	1,410,709	4,838,462
Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**
Study Region Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**

Hazus: Hurricane Global Risk Report

Region Name: Vernon_HU

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.08 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 30,215 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88% of the buildings (and 71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,605 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

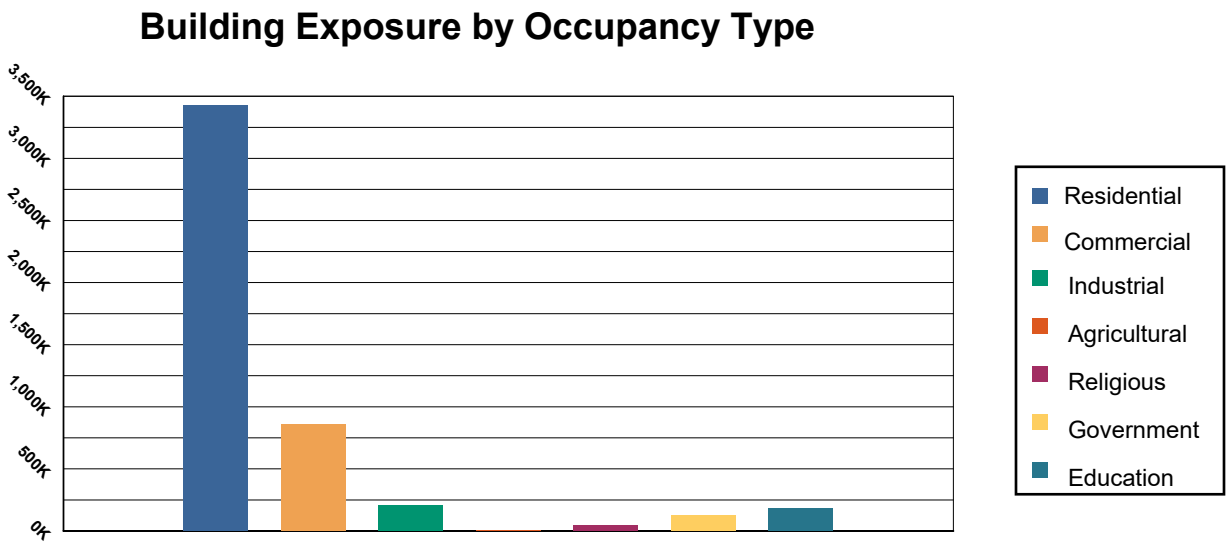


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,427,753	70.84%
Commercial	859,331	17.76%
Industrial	201,650	4.17%
Agricultural	3,212	0.07%
Religious	40,643	0.84%
Government	124,177	2.57%
Education	181,696	3.76%
Total	**4,838,462**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds. There are 7 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

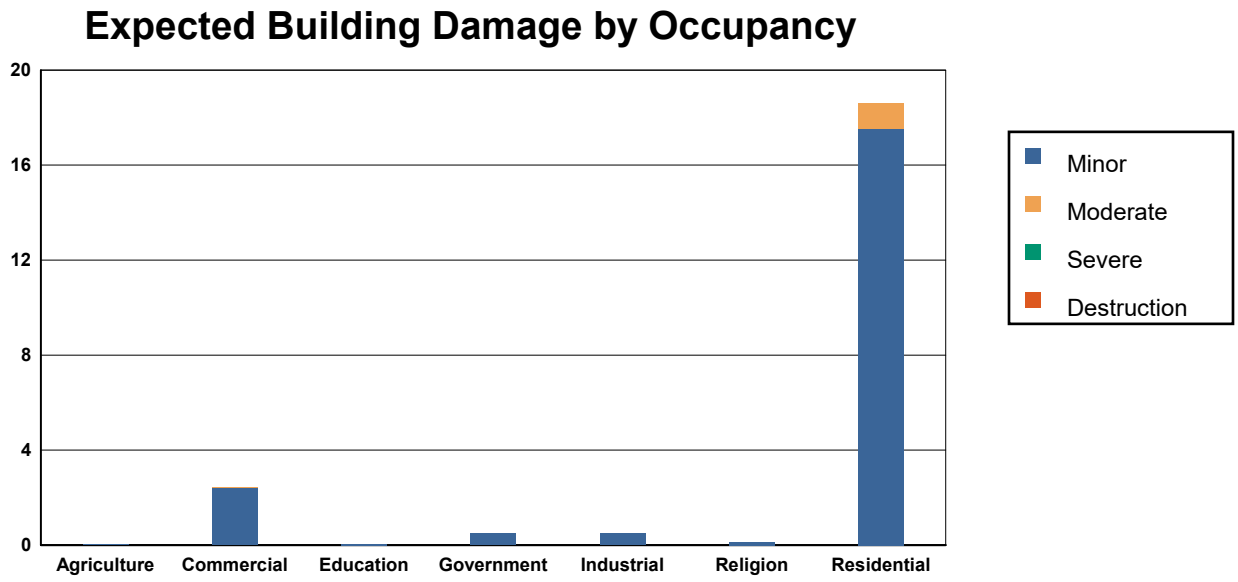


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	10.97	99.73	0.03	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	676.57	99.64	2.43	0.36	0.01	0.00	0.00	0.00	0.00	0.00
Education	14.95	99.64	0.05	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Government	126.51	99.61	0.49	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	126.51	99.61	0.49	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Religion	44.87	99.70	0.13	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Residential	7,582.41	99.76	17.52	0.23	1.07	0.01	0.00	0.00	0.00	0.00
Total	**8,582.77**		**21.15**		**1.08**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	164	99.52	1	0.48	0	0.00	0	0.00	0	0.00
Masonry	946	99.20	7	0.76	0	0.04	0	0.00	0	0.00
MH	53	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	505	99.59	2	0.41	0	0.00	0	0.00	0	0.00
Wood	6,913	99.92	5	0.07	0	0.01	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 102 hospital beds available for use. On the day of the hurricane, the model estimates that 102 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

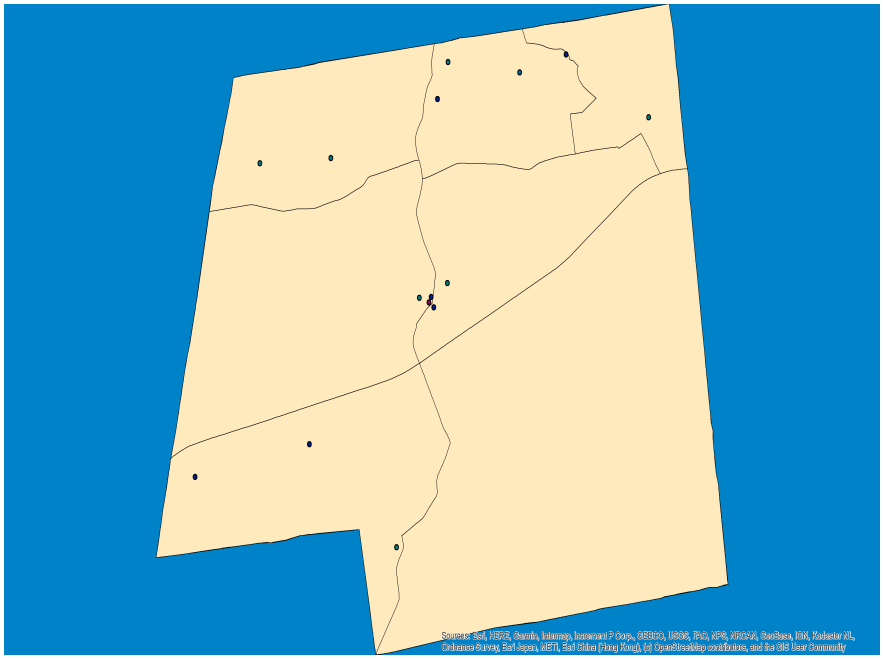
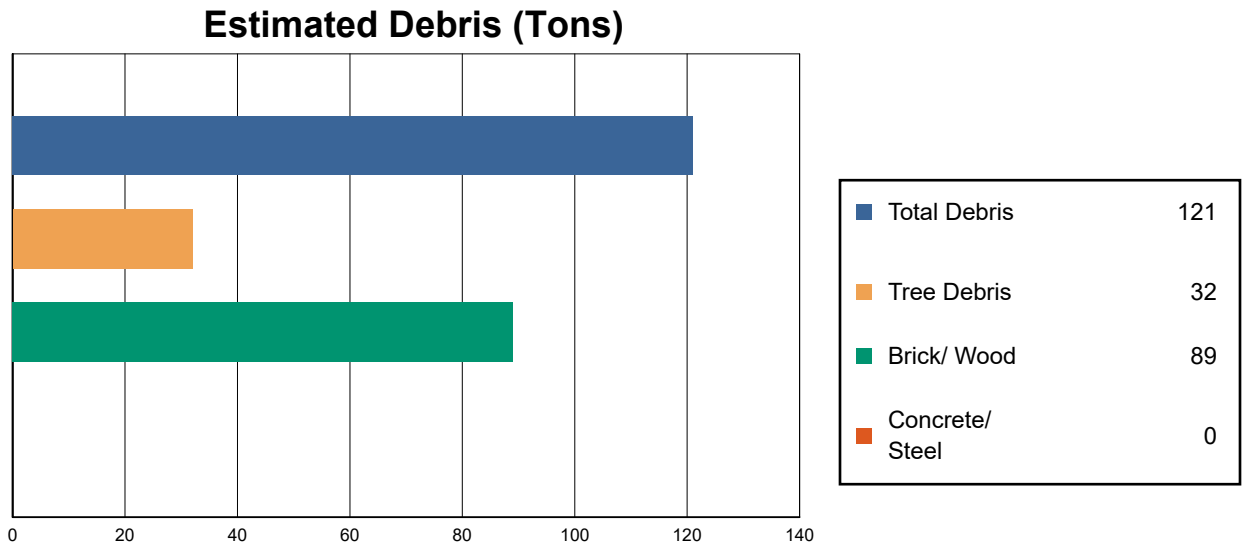


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

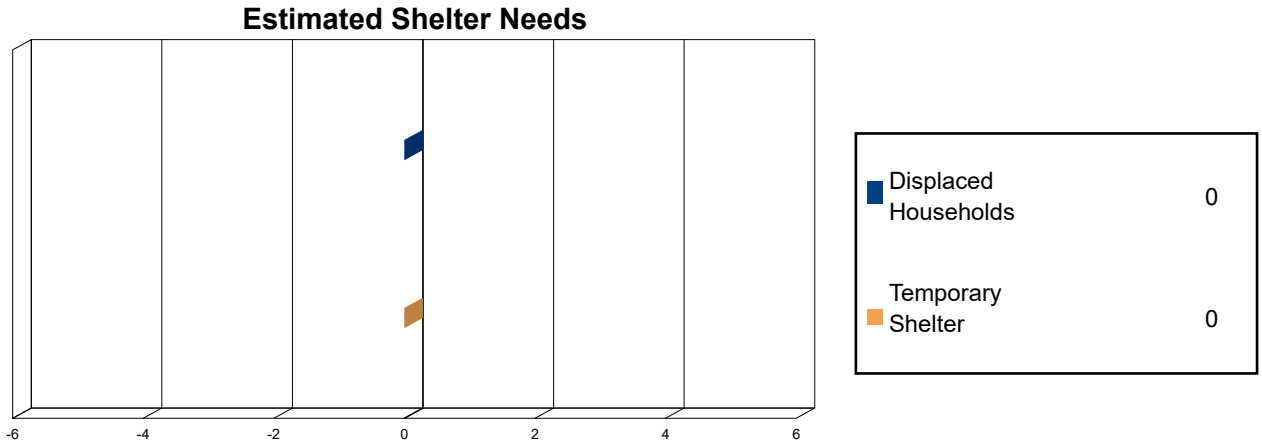


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 121 tons of debris will be generated. Of the total amount, 10 tons (8%) is Other Tree Debris. Of the remaining 111 tons, Brick/Wood comprises 80% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 22 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 30,215) will seek temporary shelter in public shelters.

Economic Loss

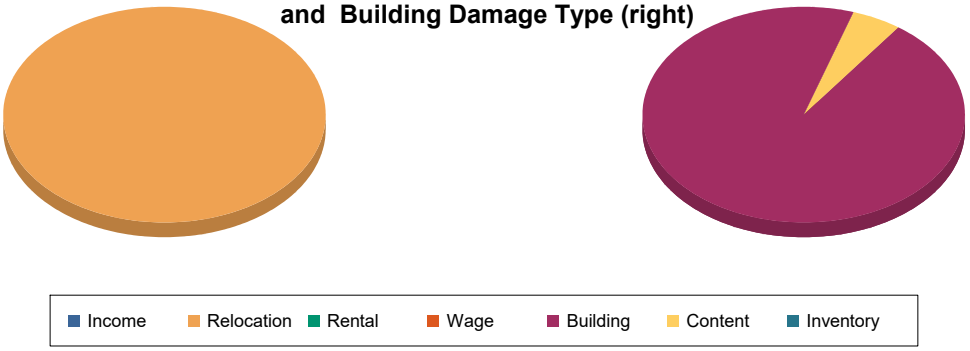
The total economic loss estimated for the hurricane is 1.5 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

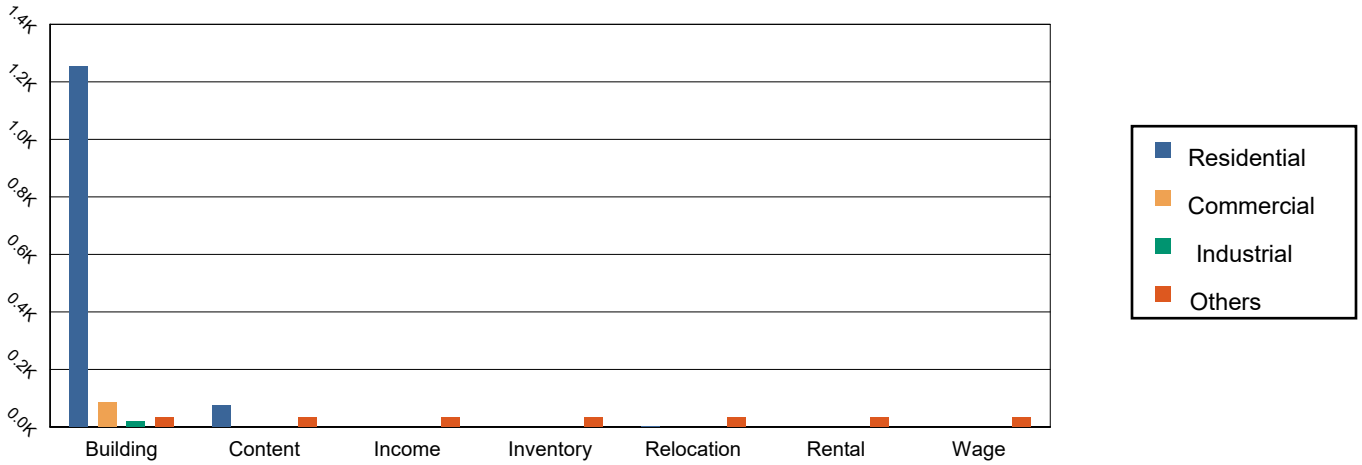


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,254.24	85.93	20.17	34.65	1,394.99
	Content	74.31	0.00	0.00	0.00	74.31
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,328.55**	**85.93**	**20.17**	**34.65**	**1,469.30**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	2.75	0.04	0.00	0.00	2.79
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2.75**	**0.04**	**0.00**	**0.00**	**2.79**

Total

Total	**1,331.30**	**85.98**	**20.17**	**34.65**	**1,472.09**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,753	1,410,709	4,838,462
Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**
Study Region Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**

Hazus: Hurricane Global Risk Report

Region Name:	Vernon_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
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The geographical size of the region is 18.08 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 30,215 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88% of the buildings (and 71% of the building value) are associated with residential housing.

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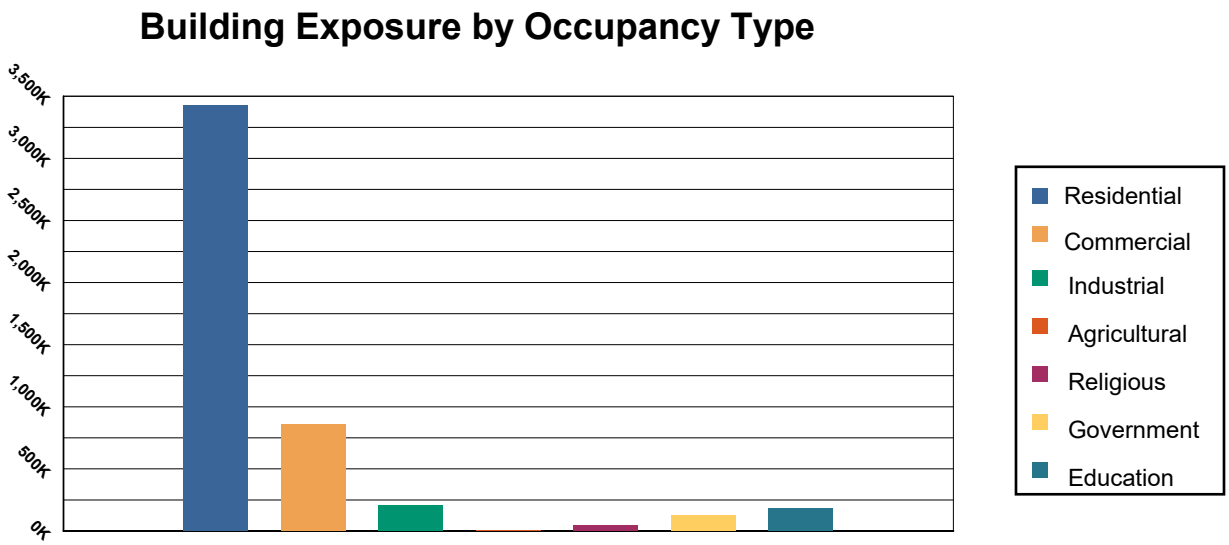

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Agricultural	3,212	0.07%
Religious	40,643	0.84%
Government	124,177	2.57%
Education	181,696	3.76%
Total	**4,838,462**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds. There are 7 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 26 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

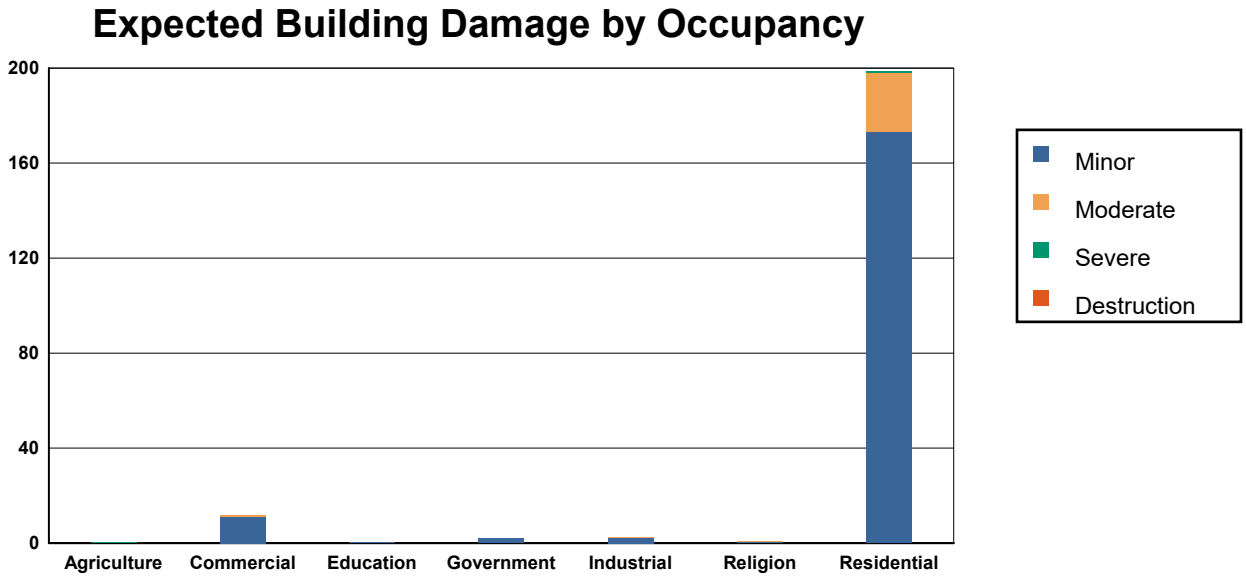


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	10.79	98.05	0.19	1.71	0.02	0.19	0.01	0.05	0.00	0.00
Commercial	667.24	98.27	10.99	1.62	0.75	0.11	0.02	0.00	0.00	0.00
Education	14.76	98.42	0.23	1.55	0.00	0.03	0.00	0.00	0.00	0.00
Government	124.93	98.37	2.03	1.60	0.03	0.03	0.00	0.00	0.00	0.00
Industrial	124.73	98.21	2.16	1.70	0.09	0.07	0.02	0.01	0.00	0.00
Religion	44.31	98.46	0.67	1.49	0.02	0.04	0.00	0.00	0.00	0.00
Residential	7,402.25	97.39	173.32	2.28	24.80	0.33	0.61	0.01	0.00	0.00
Total	**8,389.01**		**189.60**		**25.72**		**0.66**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	162	97.92	3	2.04	0	0.04	0	0.00	0	0.00
Masonry	909	95.26	35	3.65	10	1.07	0	0.02	0	0.00
MH	53	99.82	0	0.13	0	0.04	0	0.00	0	0.01
Steel	498	98.25	8	1.66	0	0.09	0	0.00	0	0.00
Wood	6,793	98.19	120	1.73	5	0.07	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had 102 hospital beds available for use. On the day of the hurricane, the model estimates that 102 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

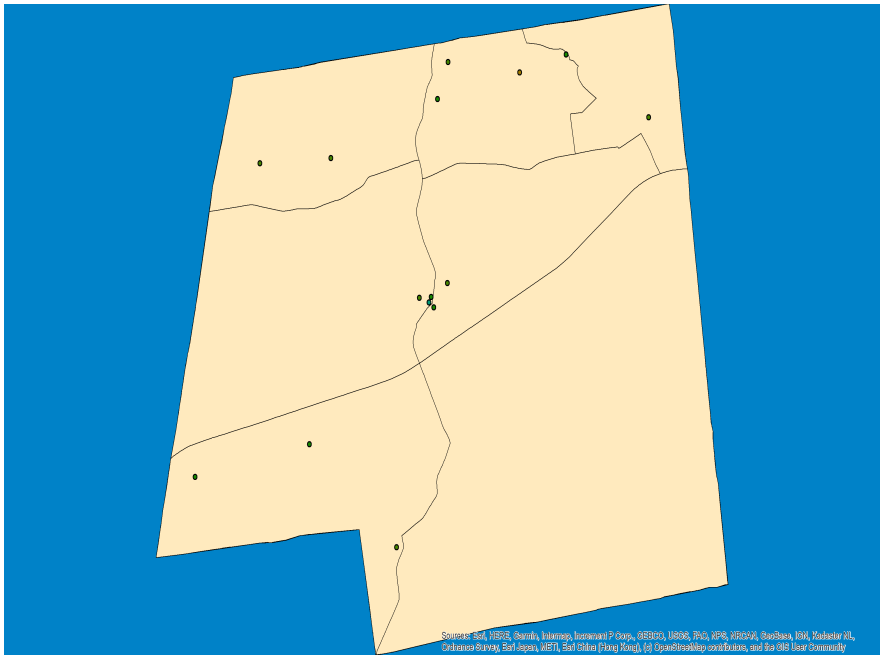
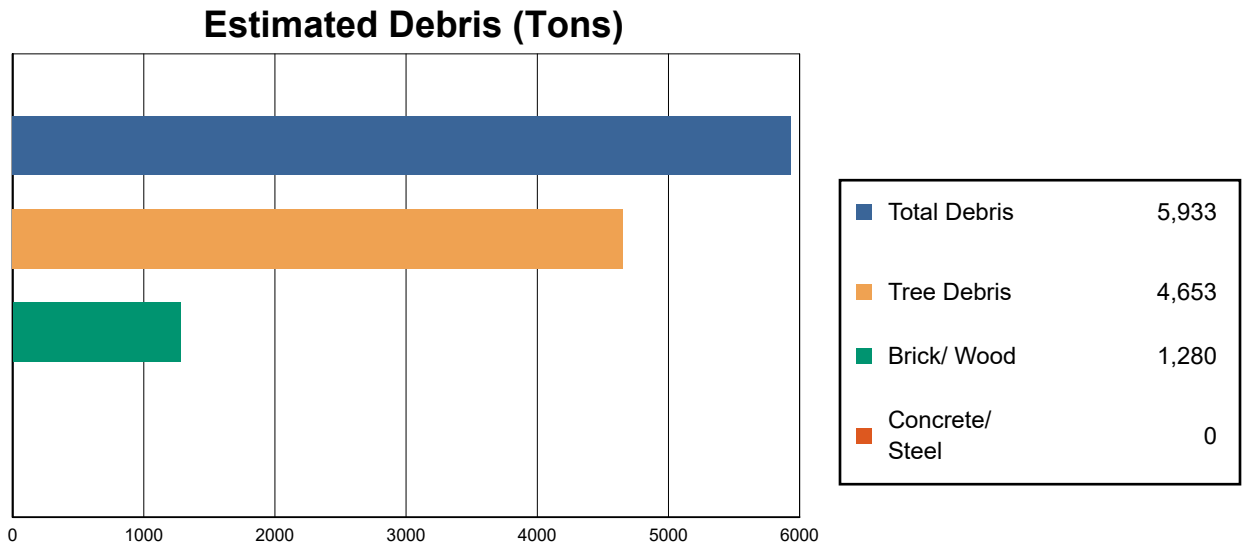


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

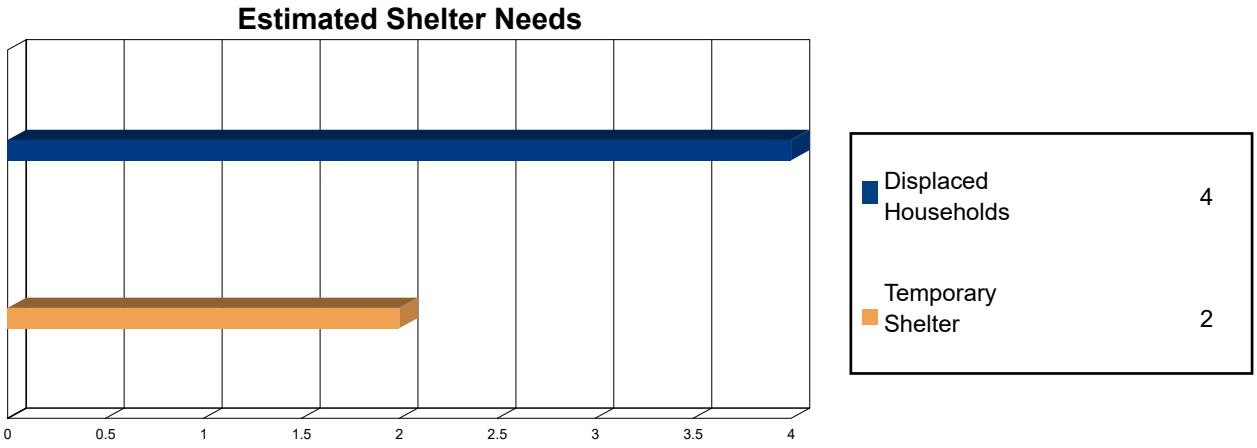


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,933 tons of debris will be generated. Of the total amount, 2,492 tons (42%) is Other Tree Debris. Of the remaining 3,441 tons, Brick/Wood comprises 37% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 51 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,161 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 4 households to be displaced due to the hurricane. Of these, 2 people (out of a total population of 30,215) will seek temporary shelter in public shelters.

Economic Loss

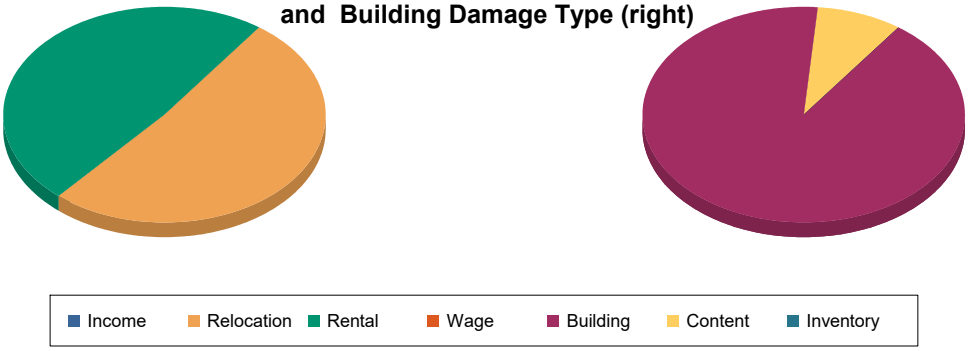
The total economic loss estimated for the hurricane is 14.1 million dollars, which represents 0.29 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 14 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

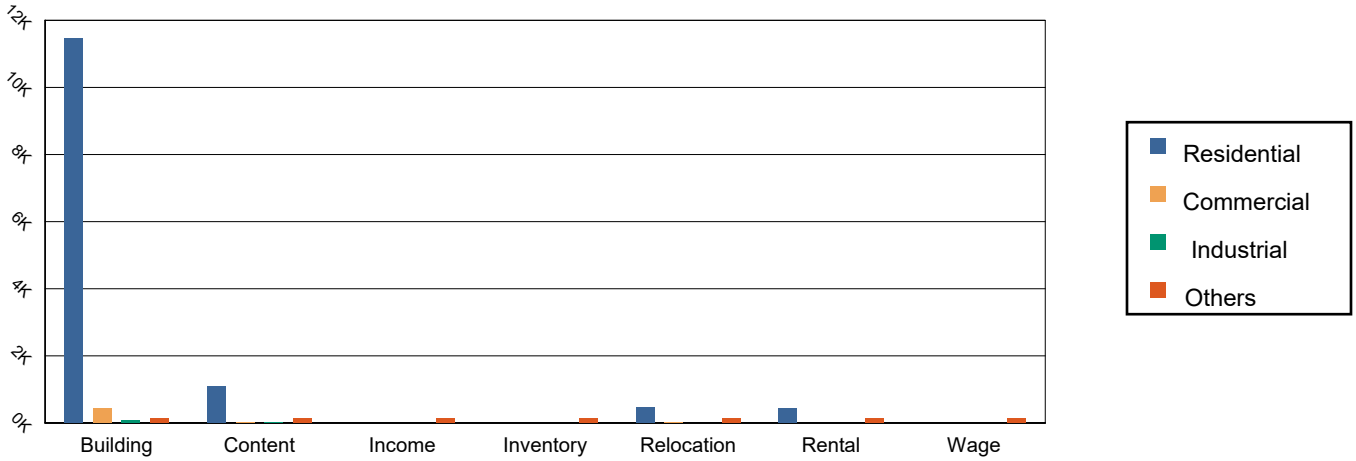


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	11,464.70	442.03	86.58	125.33	12,118.64
	Content	1,087.34	26.88	12.33	0.35	1,126.90
	Inventory	0.00	1.37	1.71	0.26	3.34
	Subtotal	**12,552.03**	**470.28**	**100.62**	**125.95**	**13,248.88**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	447.57	5.90	0.43	0.67	454.56
	Rental	430.57	0.00	0.00	0.00	430.57
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**878.14**	**5.90**	**0.43**	**0.67**	**885.14**

Total

Total	**13,430.17**	**476.18**	**101.05**	**126.61**	**14,134.01**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,753	1,410,709	4,838,462
Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**
Study Region Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**

Hazus: Hurricane Global Risk Report

Region Name:	Vernon_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.08 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 30,215 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88% of the buildings (and 71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,605 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

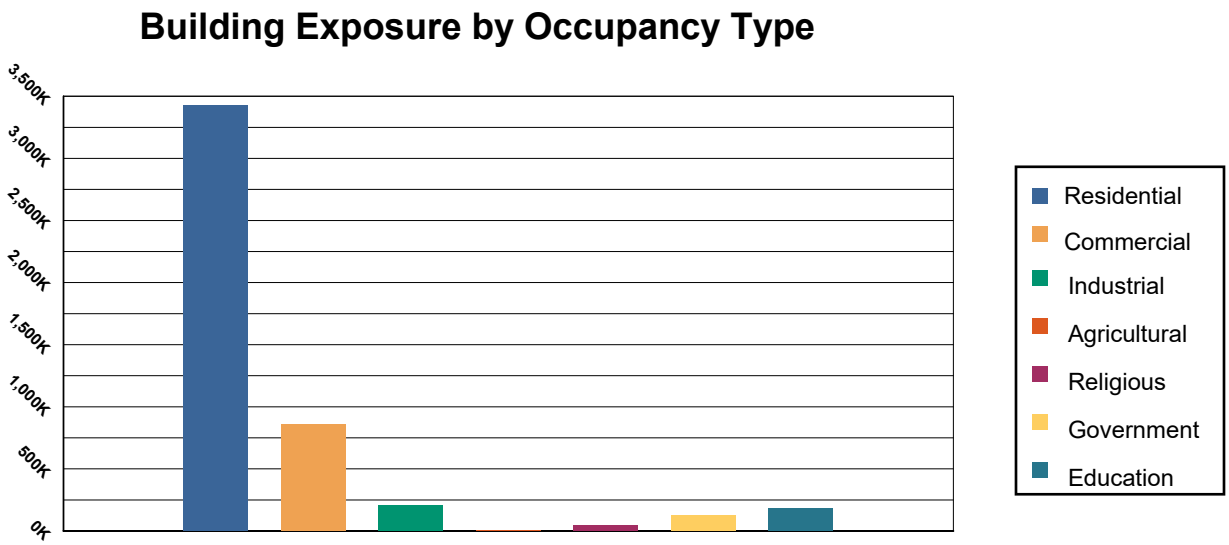


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,427,753	70.84%
Commercial	859,331	17.76%
Industrial	201,650	4.17%
Agricultural	3,212	0.07%
Religious	40,643	0.84%
Government	124,177	2.57%
Education	181,696	3.76%
Total	**4,838,462**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds. There are 7 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 107 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

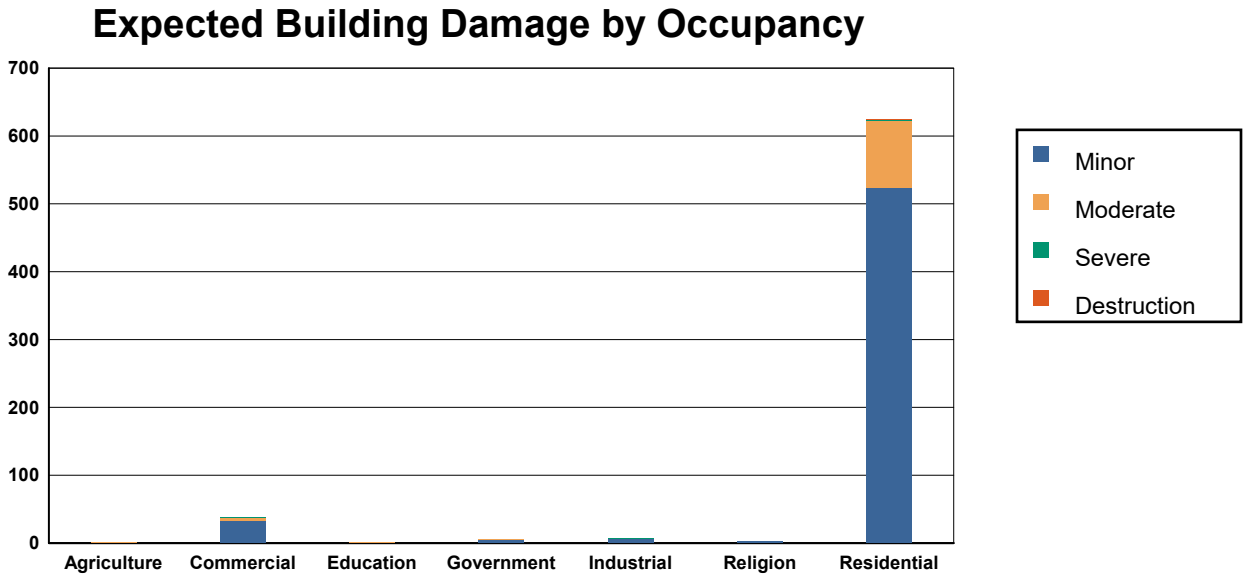


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	10.18	92.56	0.65	5.89	0.12	1.07	0.05	0.45	0.00	0.02
Commercial	640.91	94.39	33.45	4.93	4.27	0.63	0.37	0.05	0.00	0.00
Education	14.24	94.90	0.71	4.73	0.05	0.36	0.00	0.00	0.00	0.00
Government	120.88	95.18	5.69	4.48	0.43	0.34	0.00	0.00	0.00	0.00
Industrial	120.50	94.88	5.73	4.51	0.65	0.51	0.13	0.10	0.01	0.00
Religion	42.66	94.80	2.19	4.87	0.14	0.32	0.01	0.01	0.00	0.00
Residential	6,975.80	91.77	523.94	6.89	98.94	1.30	2.08	0.03	0.25	0.00
Total	**7,925.16**		**572.35**		**104.60**		**2.63**		**0.25**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	155	93.83	9	5.60	1	0.57	0	0.00	0	0.00
Masonry	842	88.27	74	7.78	37	3.87	1	0.08	0	0.00
MH	52	98.78	0	0.90	0	0.24	0	0.00	0	0.08
Steel	481	94.79	23	4.57	3	0.59	0	0.06	0	0.00
Wood	6,451	93.25	437	6.32	27	0.39	2	0.02	0	0.00

Essential Facility Damage

Before the hurricane, the region had 102 hospital beds available for use. On the day of the hurricane, the model estimates that 102 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

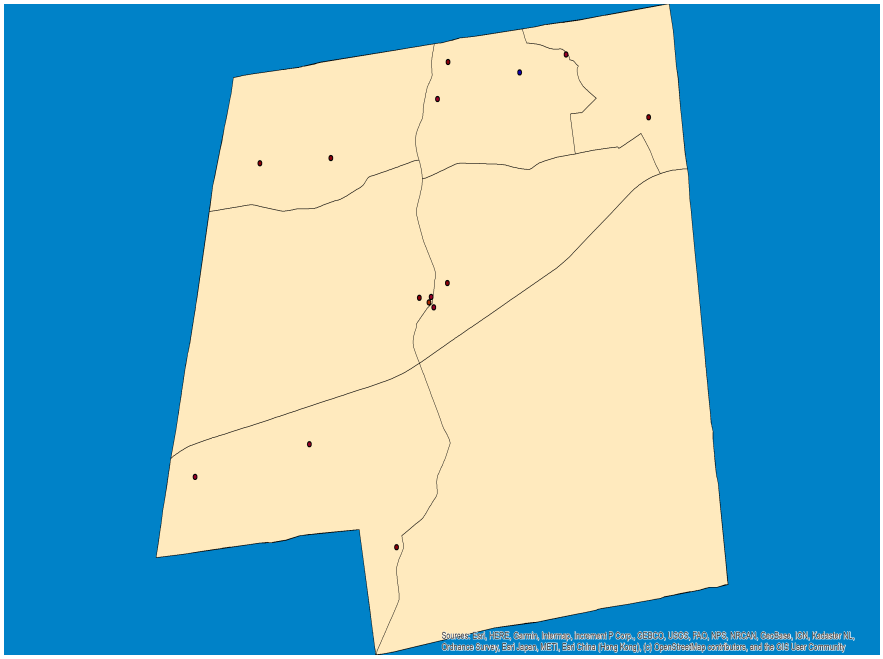
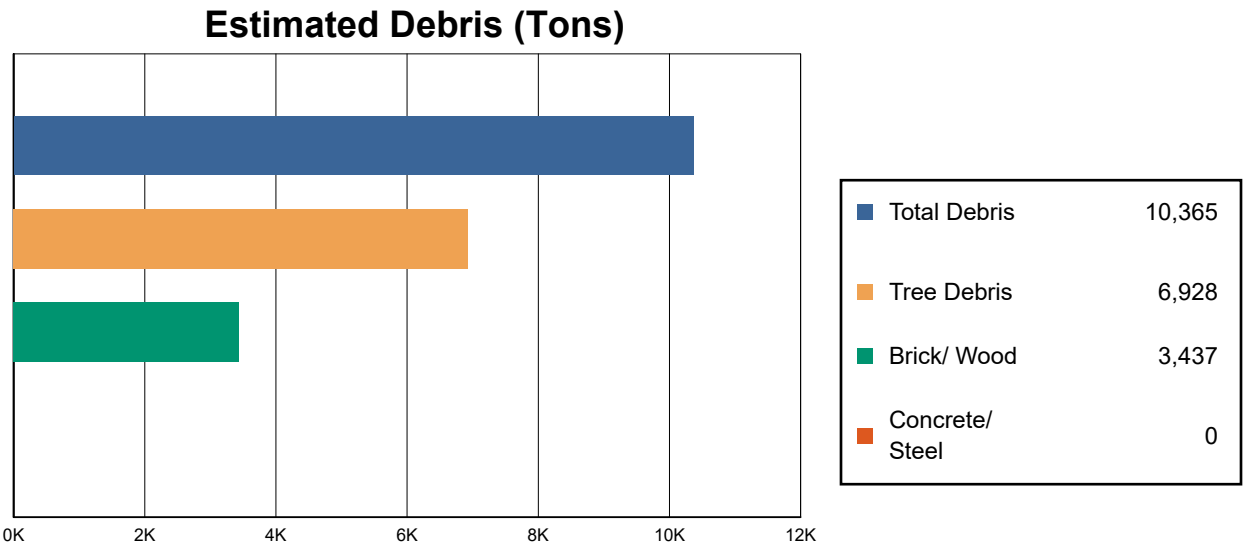


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

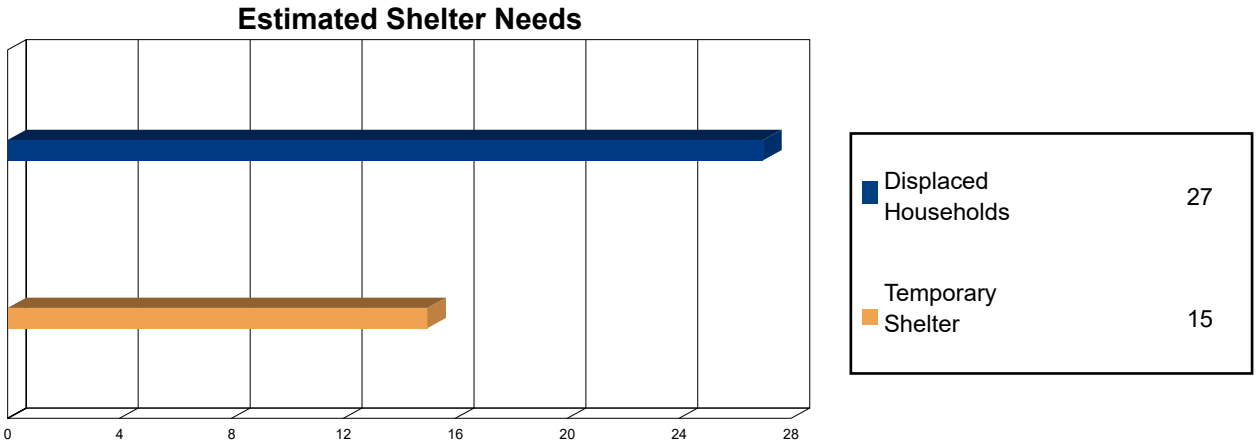


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 10,365 tons of debris will be generated. Of the total amount, 2,986 tons (29%) is Other Tree Debris. Of the remaining 7,379 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 137 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,942 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 27 households to be displaced due to the hurricane. Of these, 15 people (out of a total population of 30,215) will seek temporary shelter in public shelters.

Economic Loss

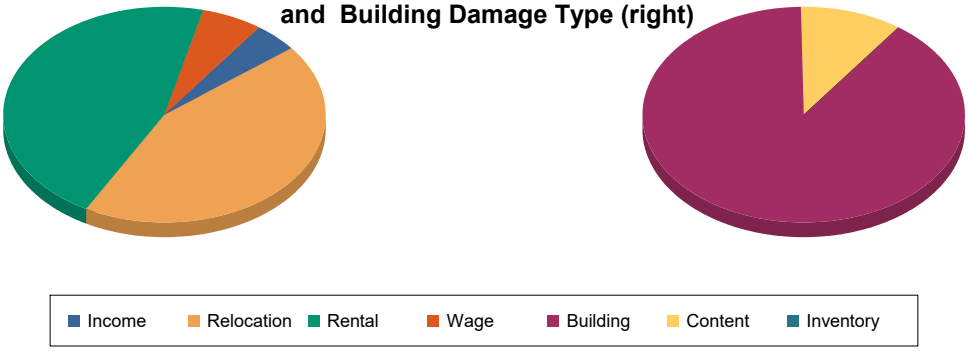
The total economic loss estimated for the hurricane is 35.7 million dollars, which represents 0.74 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 36 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 92% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

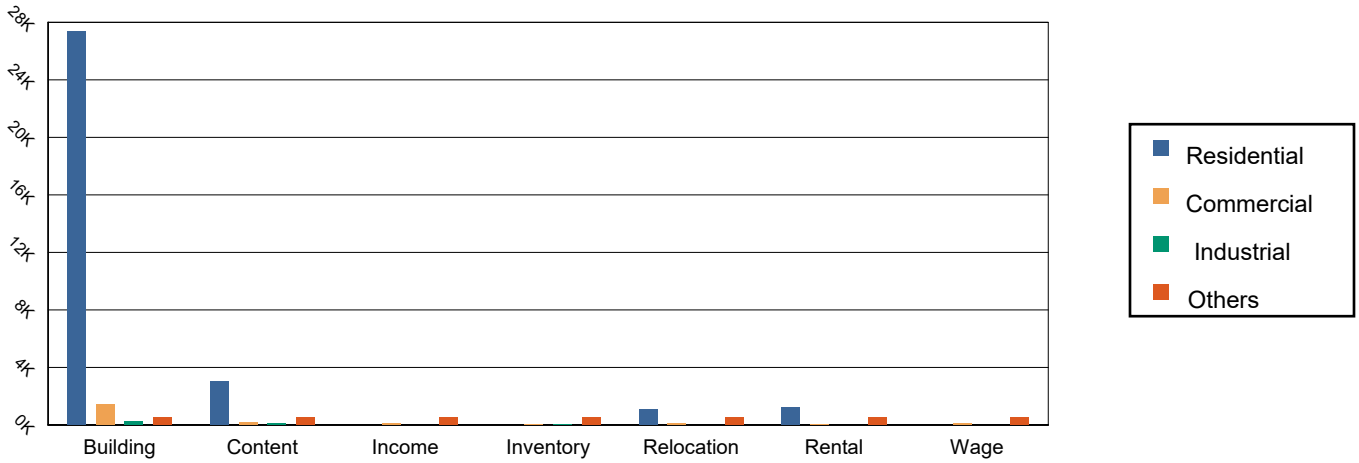


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	27,359.86	1,426.39	280.82	426.94	29,494.01
	Content	3,008.38	207.05	89.77	49.93	3,355.13
	Inventory	0.00	28.15	11.98	2.38	42.51
	Subtotal	**30,368.24**	**1,661.60**	**382.57**	**479.24**	**32,891.64**
Business Interruption Loss						
	Income	0.00	103.71	1.08	15.31	120.10
	Relocation	1,064.21	121.69	6.19	17.81	1,209.91
	Rental	1,194.69	64.54	0.73	1.12	1,261.07
	Wage	0.00	131.84	1.79	36.09	169.72
	Subtotal	**2,258.90**	**421.78**	**9.79**	**70.33**	**2,760.80**

Total

Total	32,627.14	2,083.37	392.36	549.57	35,652.44

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,753	1,410,709	4,838,462
Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**
Study Region Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**

Hazus: Hurricane Global Risk Report

Region Name:	Vernon_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
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Building Inventory

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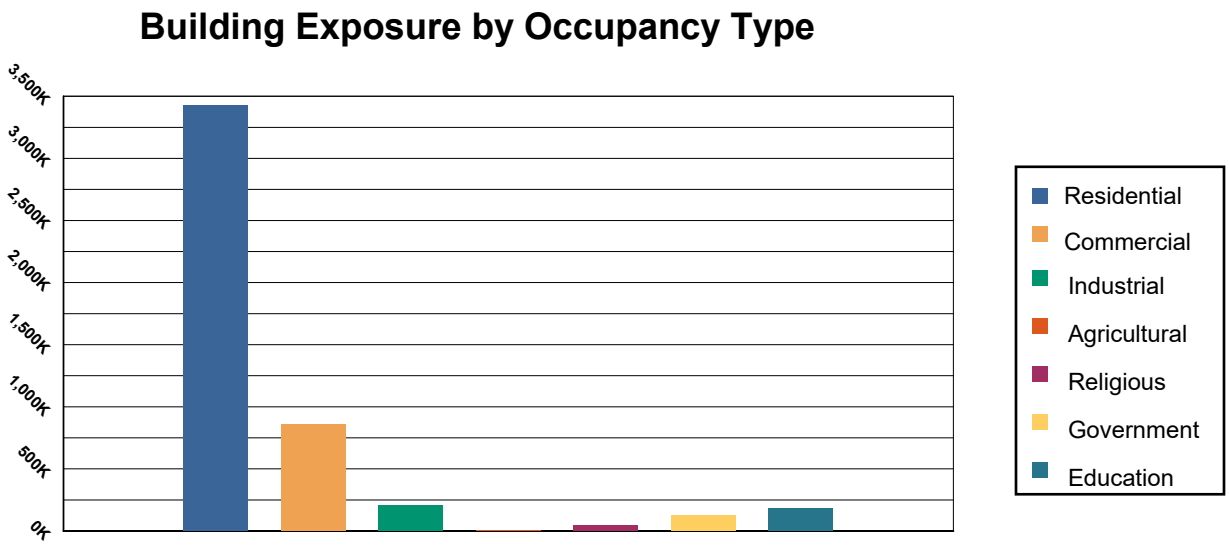

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Agricultural	3,212	0.07%
Religious	40,643	0.84%
Government	124,177	2.57%
Education	181,696	3.76%
Total	**4,838,462**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds. There are 7 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 249 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

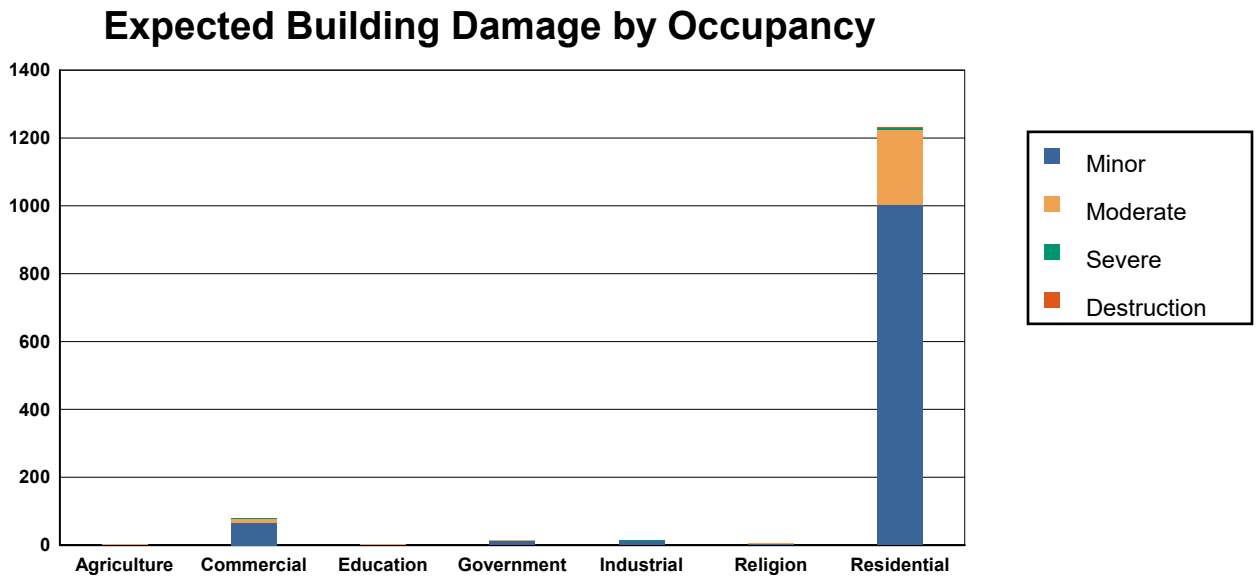


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	9.35	84.99	1.22	11.12	0.29	2.60	0.13	1.19	0.01	0.11
Commercial	599.49	88.29	65.33	9.62	12.86	1.89	1.32	0.19	0.00	0.00
Education	13.39	89.29	1.39	9.24	0.21	1.41	0.01	0.05	0.00	0.00
Government	113.65	89.49	11.48	9.04	1.81	1.43	0.06	0.05	0.00	0.00
Industrial	112.59	88.65	11.60	9.14	2.34	1.84	0.45	0.35	0.03	0.02
Religion	39.83	88.51	4.56	10.14	0.58	1.28	0.03	0.06	0.00	0.00
Residential	6,368.03	83.78	1,003.94	13.21	221.11	2.91	6.13	0.08	1.79	0.02
Total	**7,256.33**		**1,099.52**		**239.20**		**8.12**		**1.83**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	144	87.28	17	10.53	4	2.15	0	0.04	0	0.00
Masonry	760	79.63	119	12.42	74	7.72	2	0.22	0	0.01
MH	51	95.67	1	2.83	1	1.09	0	0.02	0	0.39
Steel	451	88.95	45	8.89	10	1.94	1	0.22	0	0.00
Wood	5,929	85.70	897	12.97	86	1.24	5	0.07	2	0.02

Essential Facility Damage

Before the hurricane, the region had 102 hospital beds available for use. On the day of the hurricane, the model estimates that 102 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

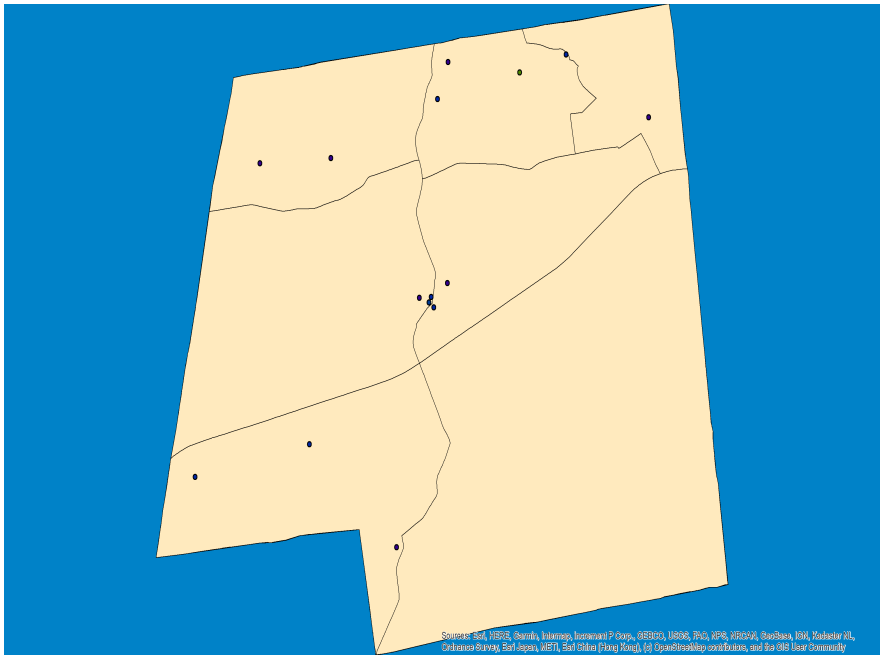
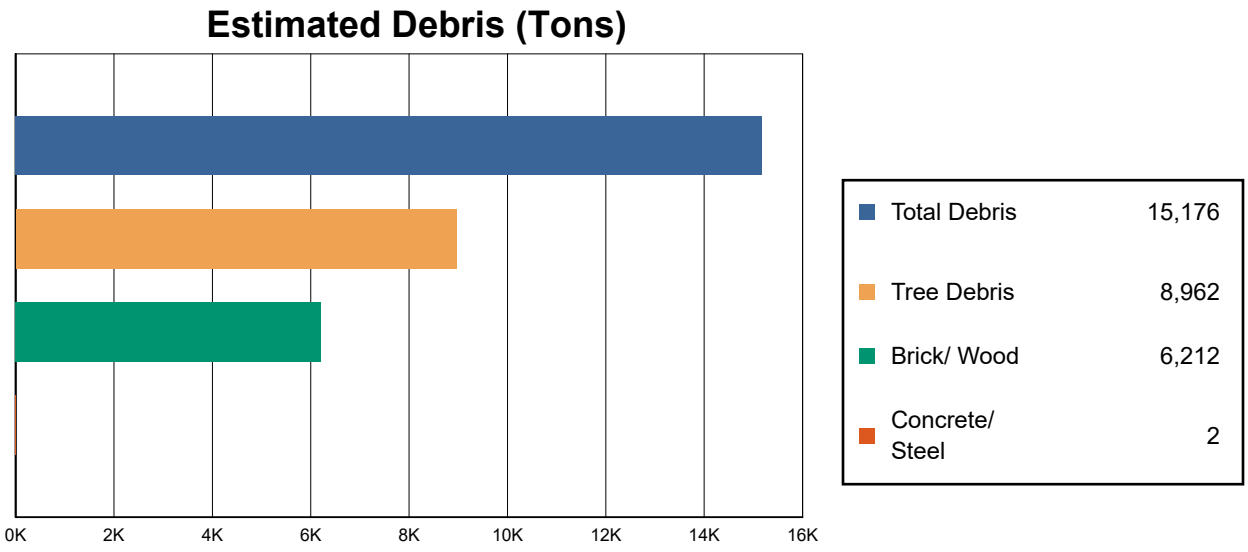


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	7

Induced Hurricane Damage

Debris Generation

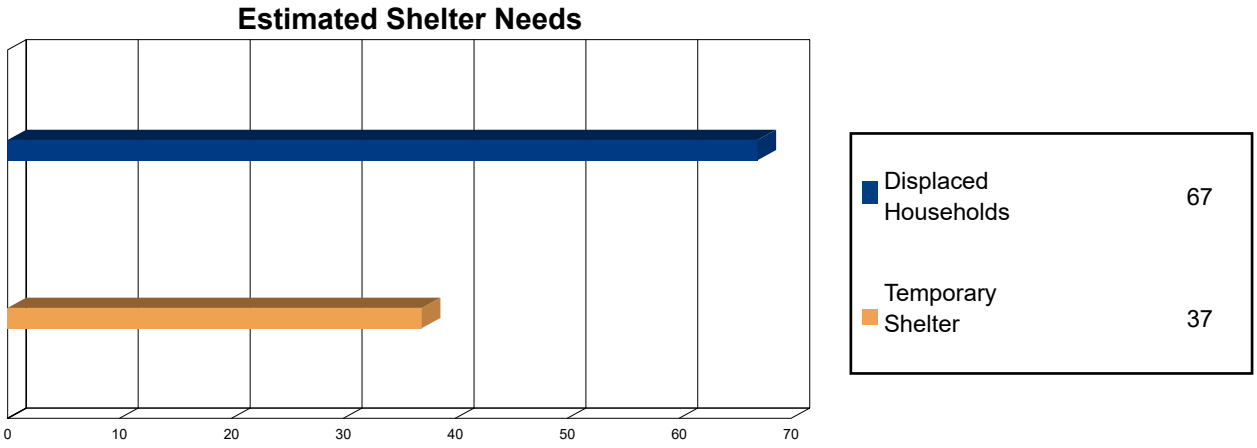


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15,176 tons of debris will be generated. Of the total amount, 3,986 tons (26%) is Other Tree Debris. Of the remaining 11,190 tons, Brick/Wood comprises 56% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 249 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,976 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 67 households to be displaced due to the hurricane. Of these, 37 people (out of a total population of 30,215) will seek temporary shelter in public shelters.

Economic Loss

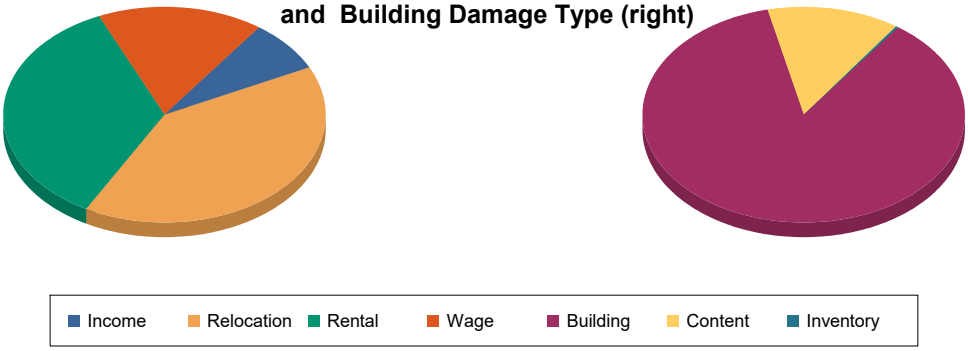
The total economic loss estimated for the hurricane is 68.0 million dollars, which represents 1.41 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 68 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

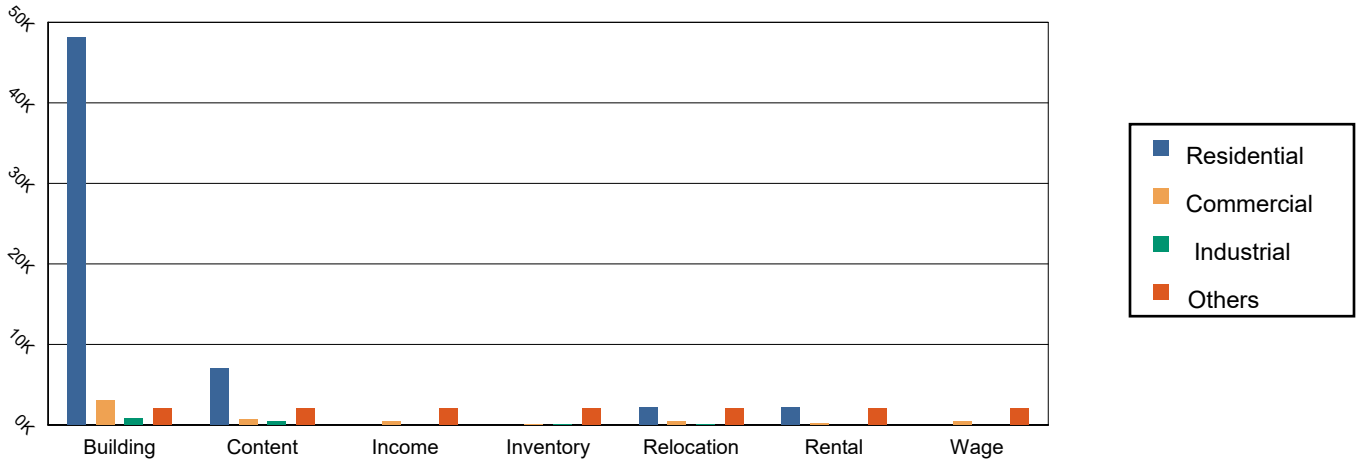


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	48,069.94	3,044.81	775.53	967.63	52,857.91
	Content	6,971.80	667.90	381.24	177.71	8,198.65
	Inventory	0.00	91.95	50.30	6.89	149.14
	Subtotal	**55,041.74**	**3,804.67**	**1,207.06**	**1,152.23**	**61,205.70**
Business Interruption Loss						
	Income	0.00	438.80	8.92	88.16	535.88
	Relocation	2,159.71	409.81	35.52	138.11	2,743.15
	Rental	2,145.87	224.87	6.20	15.65	2,392.59
	Wage	0.00	509.98	14.19	617.62	1,141.79
	Subtotal	**4,305.59**	**1,583.46**	**64.83**	**859.54**	**6,813.41**

Total

Total	**59,347.33**	**5,388.13**	**1,271.89**	**2,011.77**	**68,019.11**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,753	1,410,709	4,838,462
Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**
Study Region Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**

Hazus: Hurricane Global Risk Report

Region Name:	Vernon_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.08 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 30,215 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88% of the buildings (and 71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,605 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

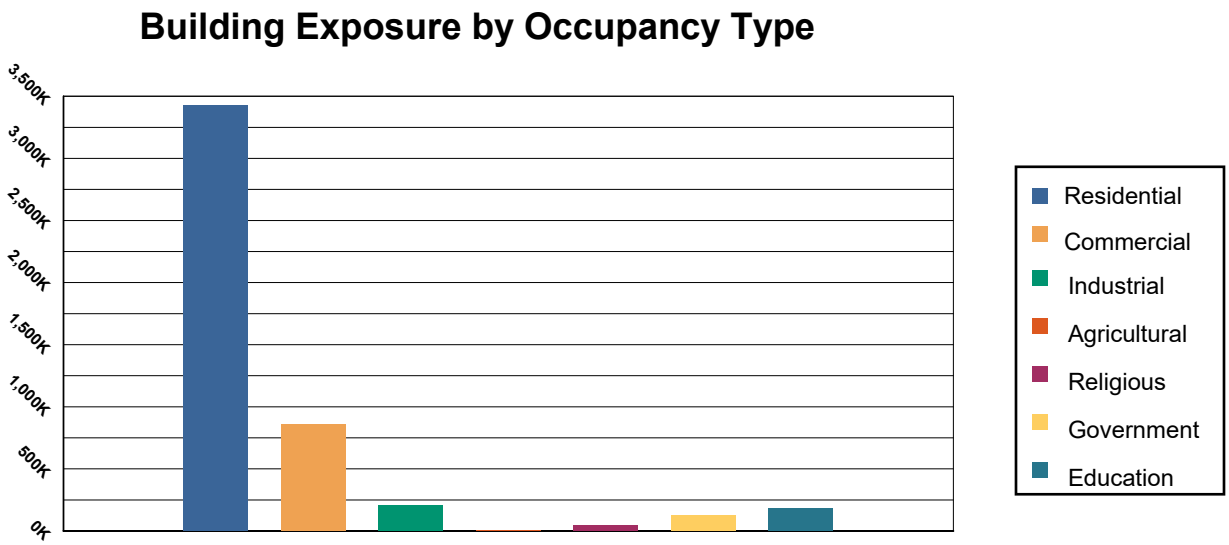


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,427,753	70.84%
Commercial	859,331	17.76%
Industrial	201,650	4.17%
Agricultural	3,212	0.07%
Religious	40,643	0.84%
Government	124,177	2.57%
Education	181,696	3.76%
Total	**4,838,462**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds. There are 7 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 586 buildings will be at least moderately damaged. This is over 7% of the total number of buildings in the region. There are an estimated 10 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

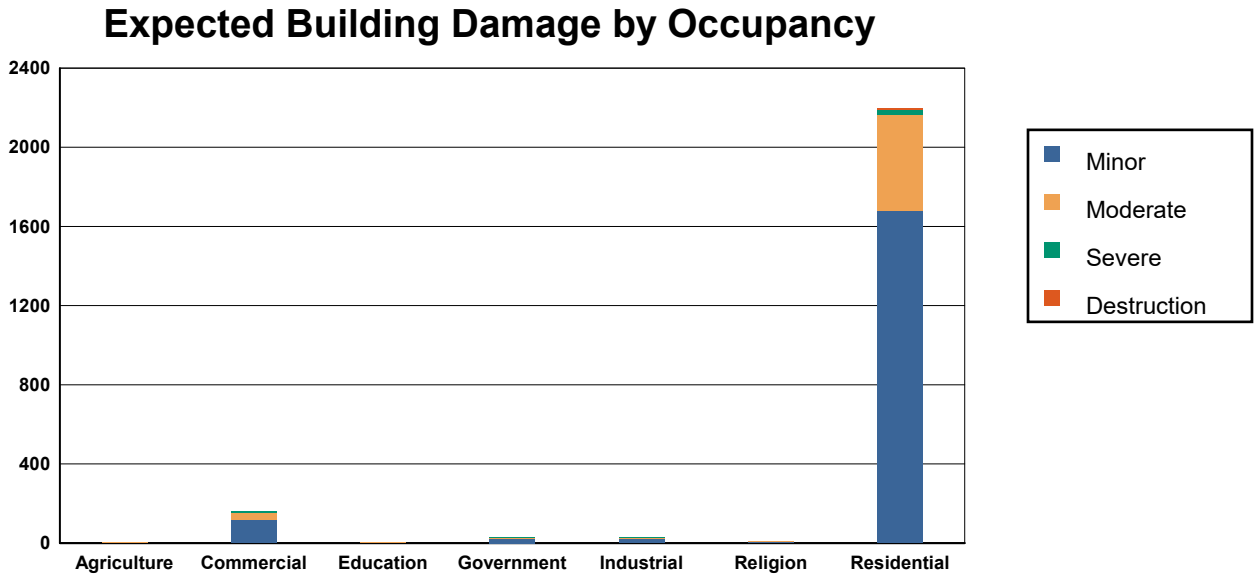


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.89	71.73	2.09	18.99	0.66	6.00	0.32	2.90	0.04	0.38
Commercial	518.80	76.41	115.17	16.96	39.63	5.84	5.36	0.79	0.04	0.01
Education	11.66	77.72	2.49	16.59	0.78	5.21	0.07	0.48	0.00	0.00
Government	99.33	78.21	20.42	16.08	6.65	5.23	0.60	0.47	0.00	0.00
Industrial	97.80	77.01	20.25	15.95	7.34	5.78	1.48	1.17	0.12	0.09
Religion	34.50	76.66	8.25	18.33	2.08	4.62	0.18	0.40	0.00	0.00
Residential	5,400.20	71.05	1,680.28	22.11	485.90	6.39	24.35	0.32	10.28	0.14
Total	**6,170.17**		**1,848.95**		**543.04**		**32.36**		**10.47**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	123	74.60	29	17.64	12	7.31	1	0.45	0	0.00
Masonry	635	66.60	174	18.20	138	14.49	6	0.66	1	0.05
MH	47	88.20	3	6.40	2	3.83	0	0.18	1	1.39
Steel	392	77.30	79	15.51	32	6.24	5	0.94	0	0.01
Wood	5,067	73.25	1,572	22.72	249	3.59	20	0.29	10	0.15

Essential Facility Damage

Before the hurricane, the region had 102 hospital beds available for use. On the day of the hurricane, the model estimates that 102 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

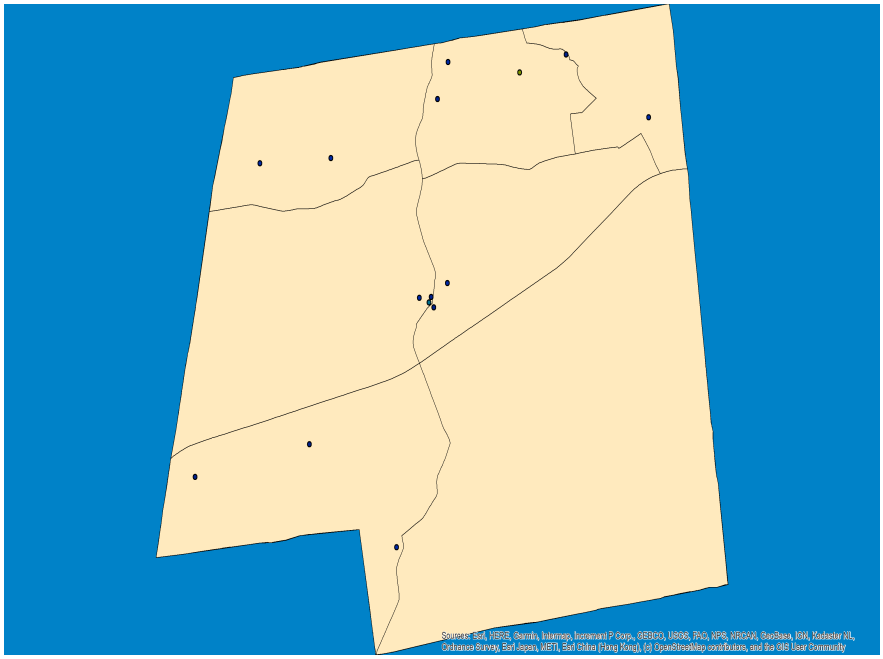
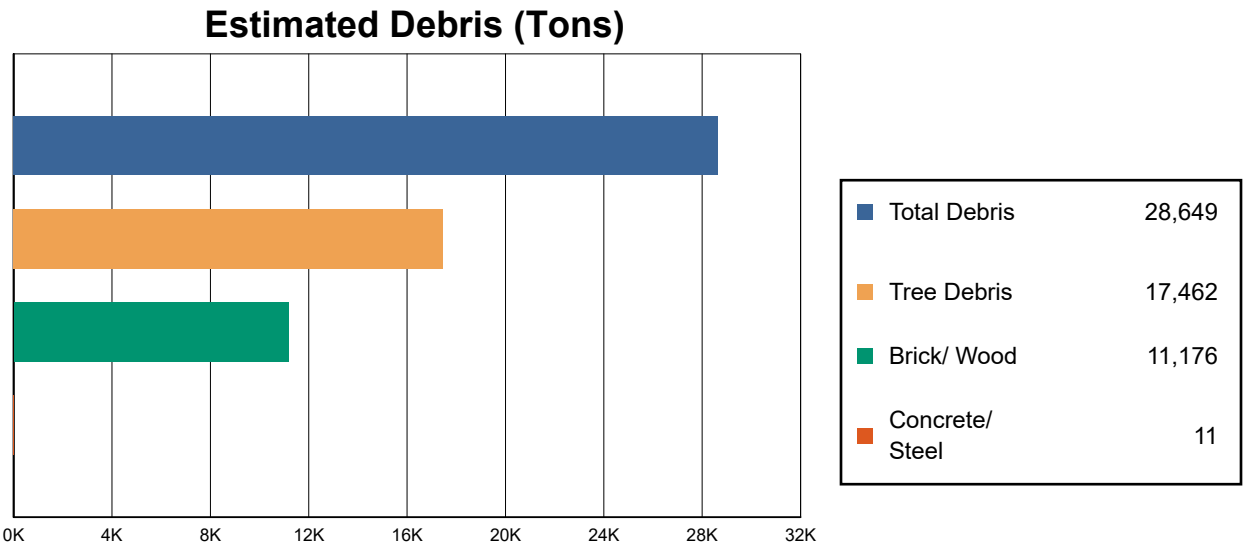


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	0

Induced Hurricane Damage

Debris Generation

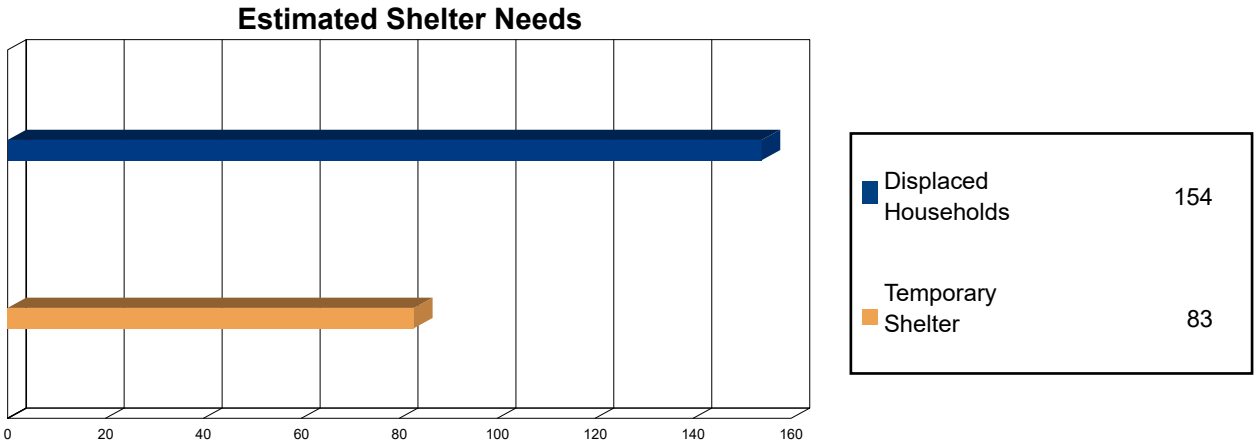


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 28,649 tons of debris will be generated. Of the total amount, 7,881 tons (28%) is Other Tree Debris. Of the remaining 20,768 tons, Brick/Wood comprises 54% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 447 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,581 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 154 households to be displaced due to the hurricane. Of these, 83 people (out of a total population of 30,215) will seek temporary shelter in public shelters.

Economic Loss

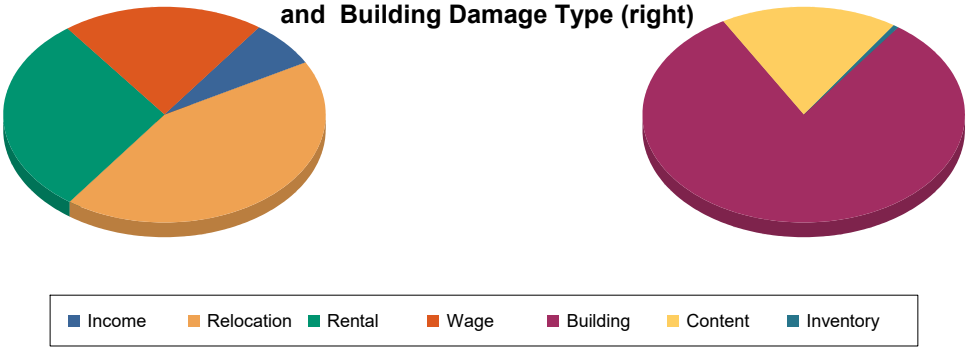
The total economic loss estimated for the hurricane is 140.4 million dollars, which represents 2.90 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 140 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

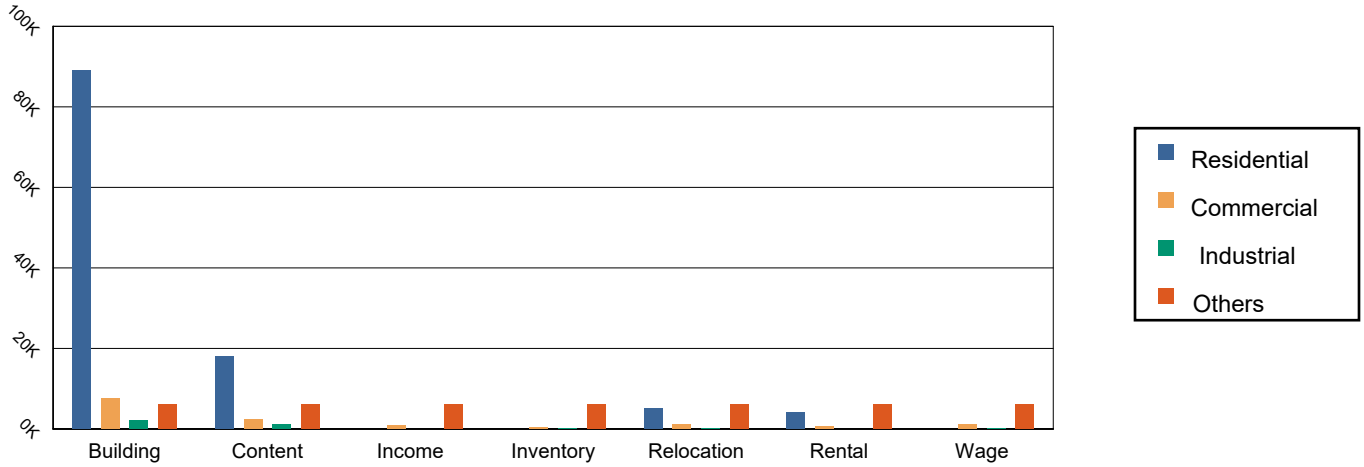


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	89,085.12	7,571.21	2,071.36	2,591.36	101,319.04
	Content	18,053.04	2,377.89	1,229.33	755.52	22,415.78
	Inventory	0.00	344.84	160.92	19.31	525.08
	Subtotal	**107,138.16**	**10,293.94**	**3,461.61**	**3,366.19**	**124,259.91**
Business Interruption Loss						
	Income	0.00	909.47	25.42	198.31	1,133.19
	Relocation	5,144.58	1,179.33	119.73	472.41	6,916.04
	Rental	4,078.09	616.44	20.26	64.02	4,778.80
	Wage	0.00	1,134.16	40.84	2,093.16	3,268.17
	Subtotal	**9,222.67**	**3,839.40**	**206.25**	**2,827.89**	**16,096.21**

Total

Total	**116,360.83**	**14,133.34**	**3,667.86**	**6,194.08**	**140,356.11**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,753	1,410,709	4,838,462
Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**
Study Region Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**

Hazus: Hurricane Global Risk Report

Region Name:	Vernon_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.08 square miles and contains 7 census tracts. There are over 13 thousand households in the region and a total population of 30,215 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,838 million dollars. Approximately 88% of the buildings (and 71% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,605 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

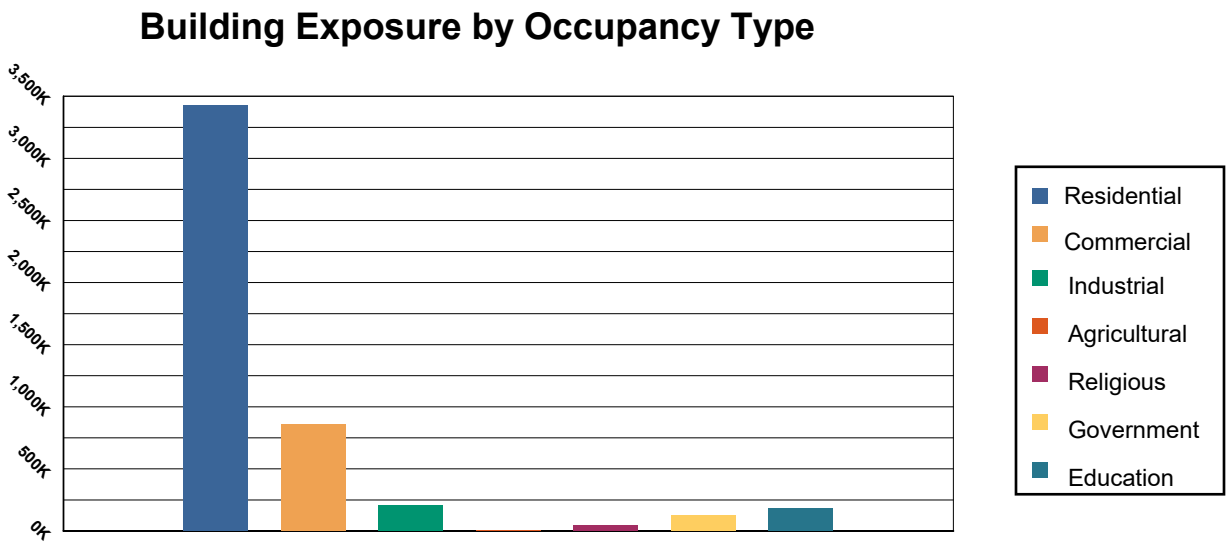


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,427,753	70.84%
Commercial	859,331	17.76%
Industrial	201,650	4.17%
Agricultural	3,212	0.07%
Religious	40,643	0.84%
Government	124,177	2.57%
Education	181,696	3.76%
Total	**4,838,462**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds. There are 7 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 944 buildings will be at least moderately damaged. This is over 11% of the total number of buildings in the region. There are an estimated 27 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

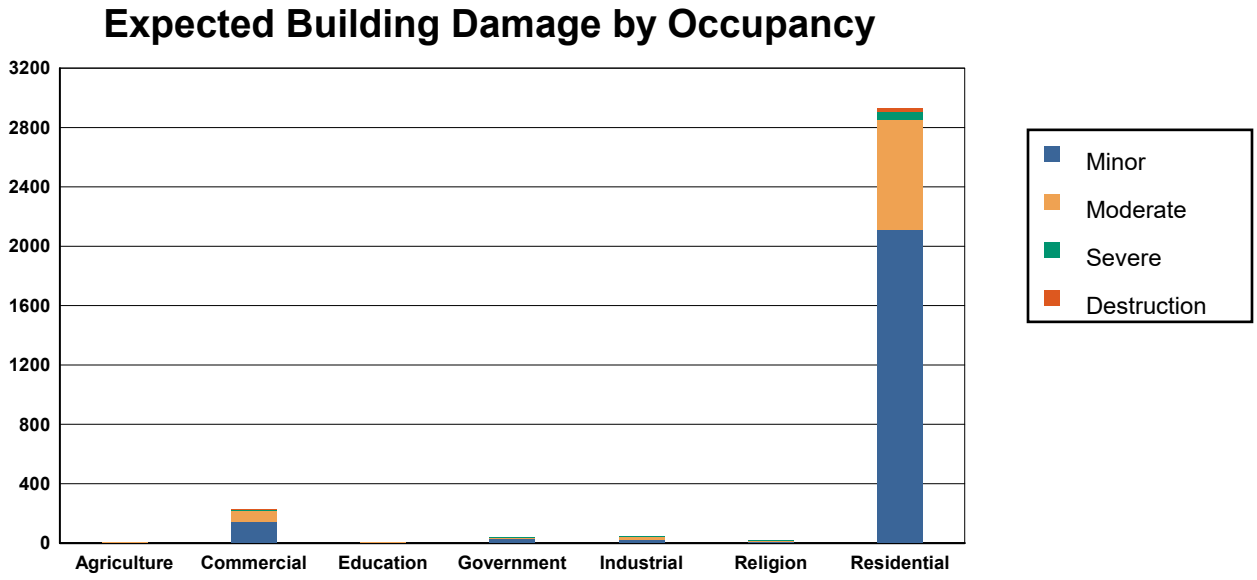


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.78	61.60	2.64	23.99	1.01	9.17	0.50	4.53	0.08	0.71
Commercial	450.61	66.36	146.89	21.63	69.09	10.18	12.33	1.82	0.08	0.01
Education	10.12	67.47	3.21	21.38	1.45	9.68	0.22	1.47	0.00	0.00
Government	85.79	67.55	26.51	20.87	12.72	10.01	1.98	1.56	0.00	0.00
Industrial	84.34	66.41	25.94	20.43	13.27	10.45	3.23	2.54	0.21	0.17
Religion	29.56	65.70	10.87	24.16	4.00	8.88	0.57	1.26	0.00	0.00
Residential	4,666.48	61.39	2,111.53	27.78	742.02	9.76	54.76	0.72	26.21	0.34
Total	**5,333.68**		**2,327.59**		**843.55**		**73.59**		**26.59**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	105	63.64	36	21.74	22	13.13	2	1.49	0	0.00
Masonry	539	56.49	205	21.52	195	20.47	13	1.41	1	0.11
MH	43	81.00	5	9.06	4	6.76	0	0.45	1	2.73
Steel	339	66.94	100	19.67	56	11.12	11	2.26	0	0.01
Wood	4,404	63.66	2,017	29.15	425	6.15	46	0.67	26	0.37

Essential Facility Damage

Before the hurricane, the region had 102 hospital beds available for use. On the day of the hurricane, the model estimates that 102 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

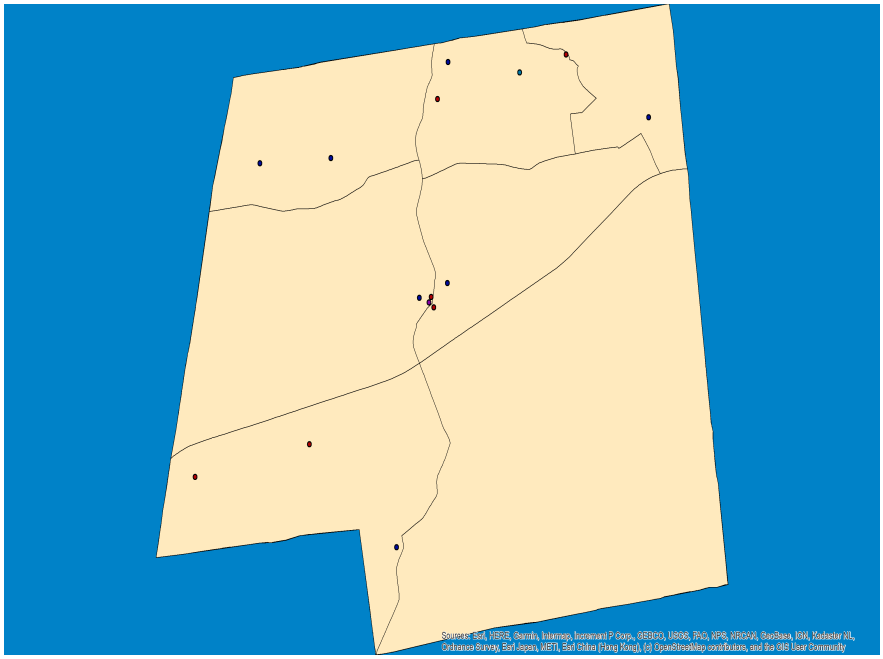
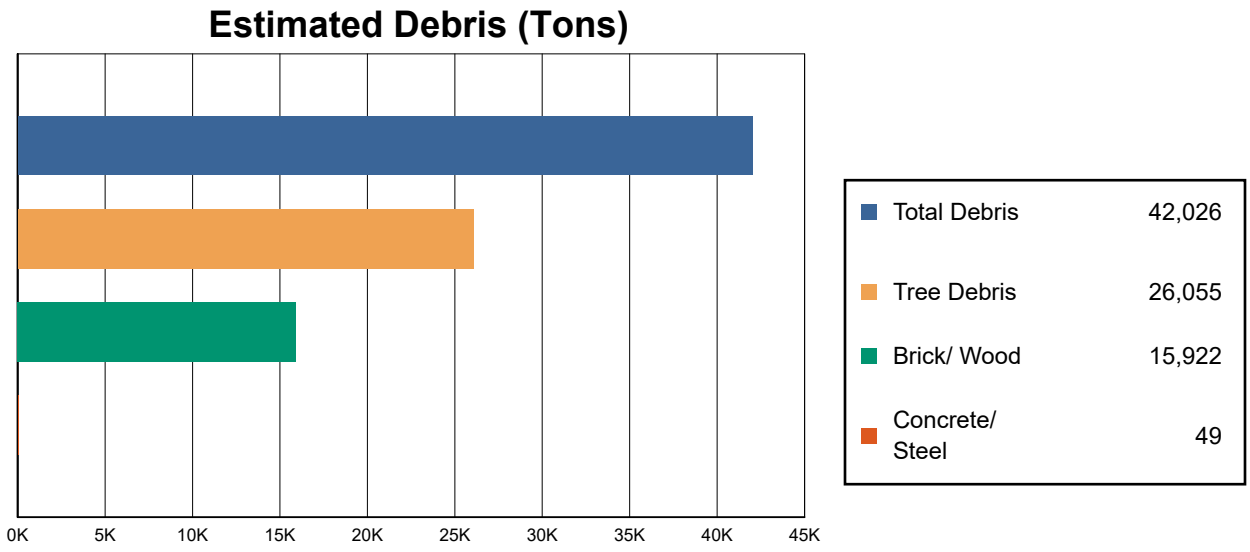


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	6	0	0	6
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	7	0	0	0

Induced Hurricane Damage

Debris Generation

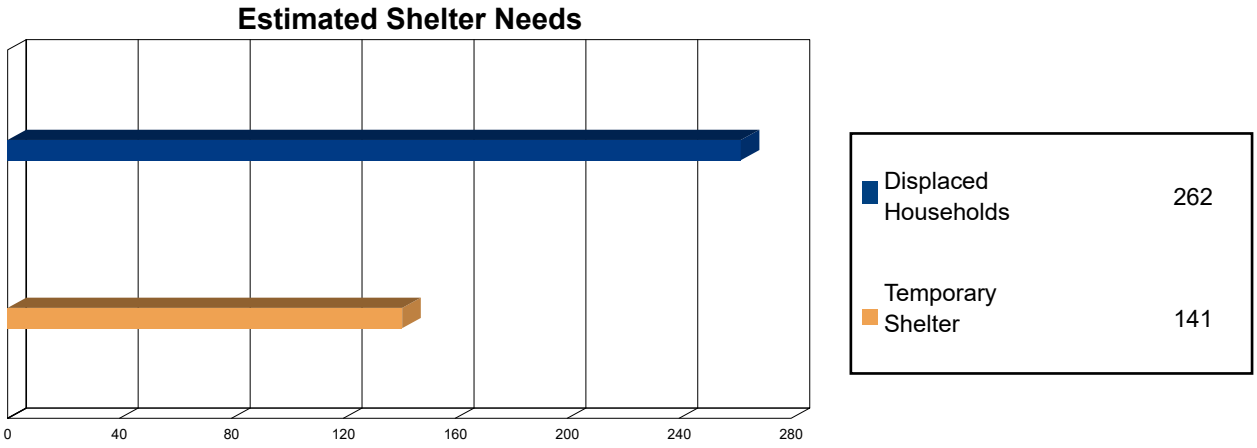


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 42,026 tons of debris will be generated. Of the total amount, 11,787 tons (28%) is Other Tree Debris. Of the remaining 30,239 tons, Brick/Wood comprises 53% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 639 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 14,268 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 262 households to be displaced due to the hurricane. Of these, 141 people (out of a total population of 30,215) will seek temporary shelter in public shelters.

Economic Loss

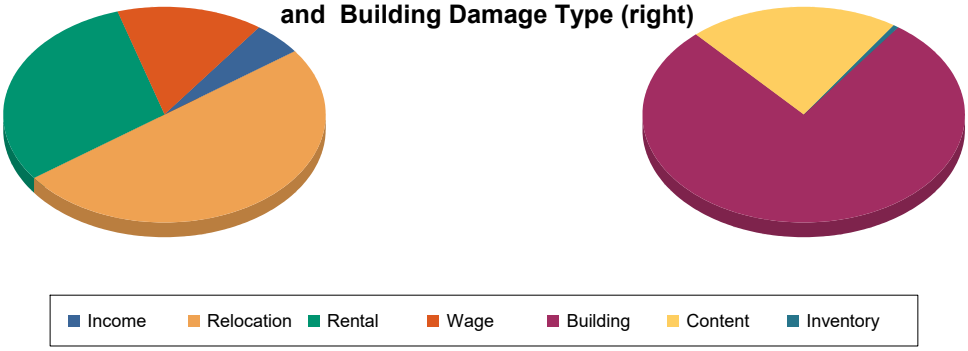
The total economic loss estimated for the hurricane is 219.0 million dollars, which represents 4.53 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 219 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 81% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

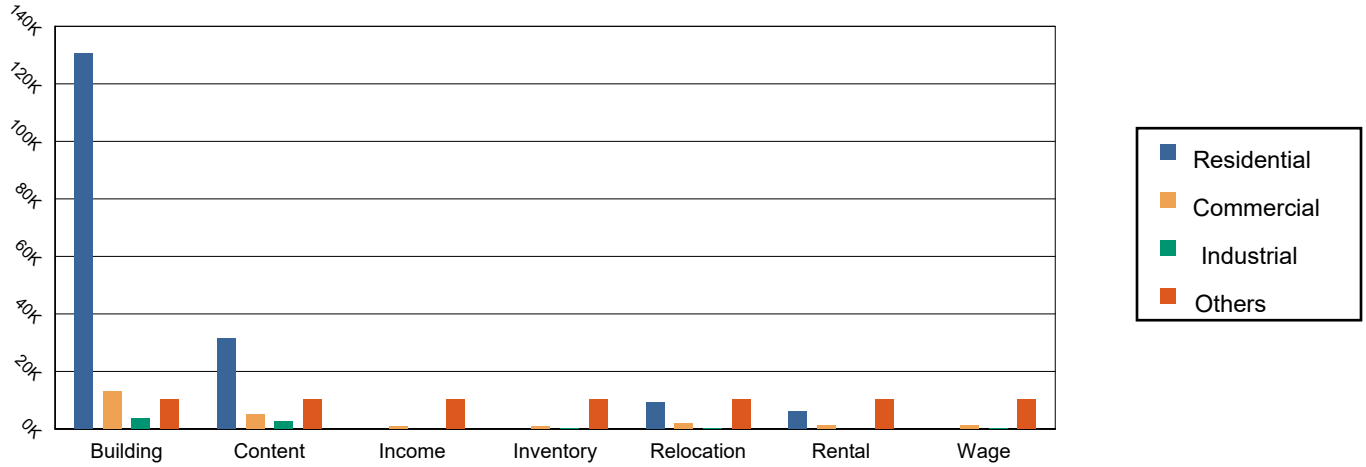


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	130,467.21	13,203.19	3,755.82	4,845.59	152,271.81
	Content	31,541.12	5,115.76	2,458.07	1,789.44	40,904.40
	Inventory	0.00	716.35	321.61	33.55	1,071.52
	Subtotal	**162,008.33**	**19,035.30**	**6,535.51**	**6,668.59**	**194,247.73**
Business Interruption Loss						
	Income	0.42	978.87	37.39	218.06	1,234.75
	Relocation	9,224.17	2,099.97	226.91	873.69	12,424.74
	Rental	6,226.85	1,083.49	36.83	115.84	7,463.01
	Wage	0.99	1,215.26	60.37	2,394.02	3,670.64
	Subtotal	**15,452.44**	**5,377.59**	**361.51**	**3,601.60**	**24,793.14**

Total

Total	**177,460.77**	**24,412.89**	**6,897.02**	**10,270.19**	**219,040.87**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	30,215	3,427,753	1,410,709	4,838,462
Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**
Study Region Total	**30,215**	**3,427,753**	**1,410,709**	**4,838,462**

Hazus: Hurricane Global Risk Report

Region Name:	West_Hartford_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.26 square miles and contains 17 census tracts. There are over 25 thousand households in the region and a total population of 64,083 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 21 thousand buildings in the region with a total building replacement value (excluding contents) of 13,219 million dollars. Approximately 89% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 21,341 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

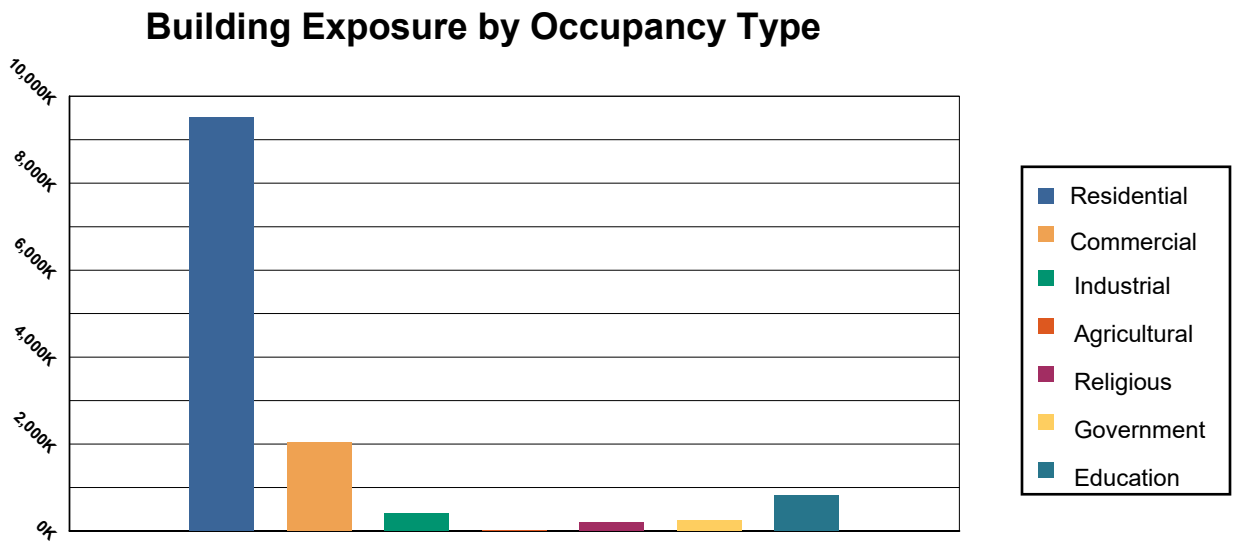


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,508,034	71.93%
Commercial	2,044,240	15.46%
Industrial	408,954	3.09%
Agricultural	13,670	0.10%
Religious	189,174	1.43%
Government	242,153	1.83%
Education	812,794	6.15%
Total	**13,219,019**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds. There are 34 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

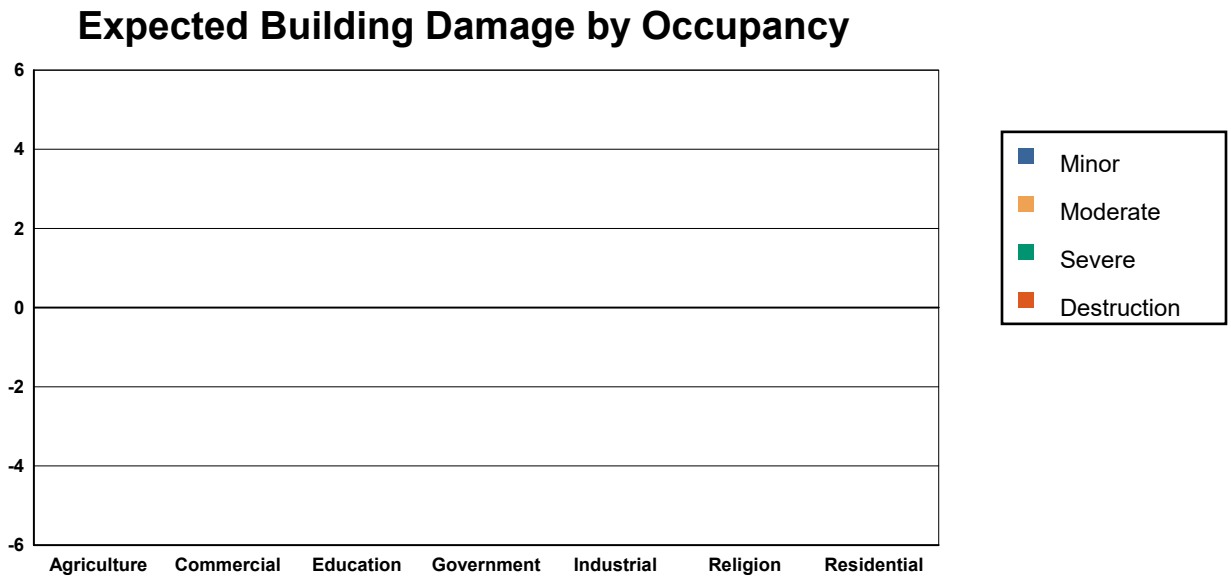


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	34.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1,617.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	66.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	116.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	314.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	128.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	19,066.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**21,341.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	284	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	1,936	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,053	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	18,060	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 332 hospital beds available for use. On the day of the hurricane, the model estimates that 332 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

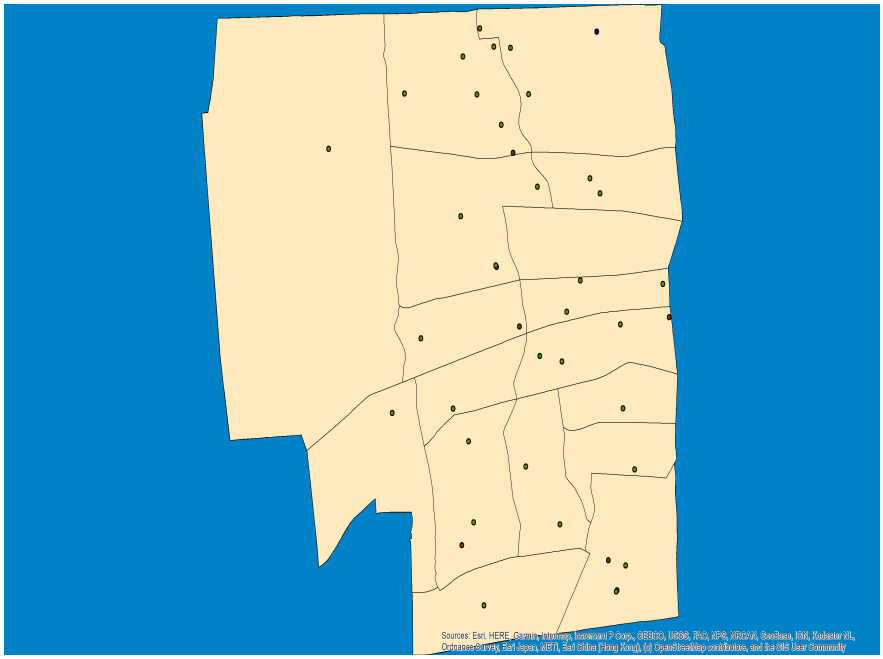
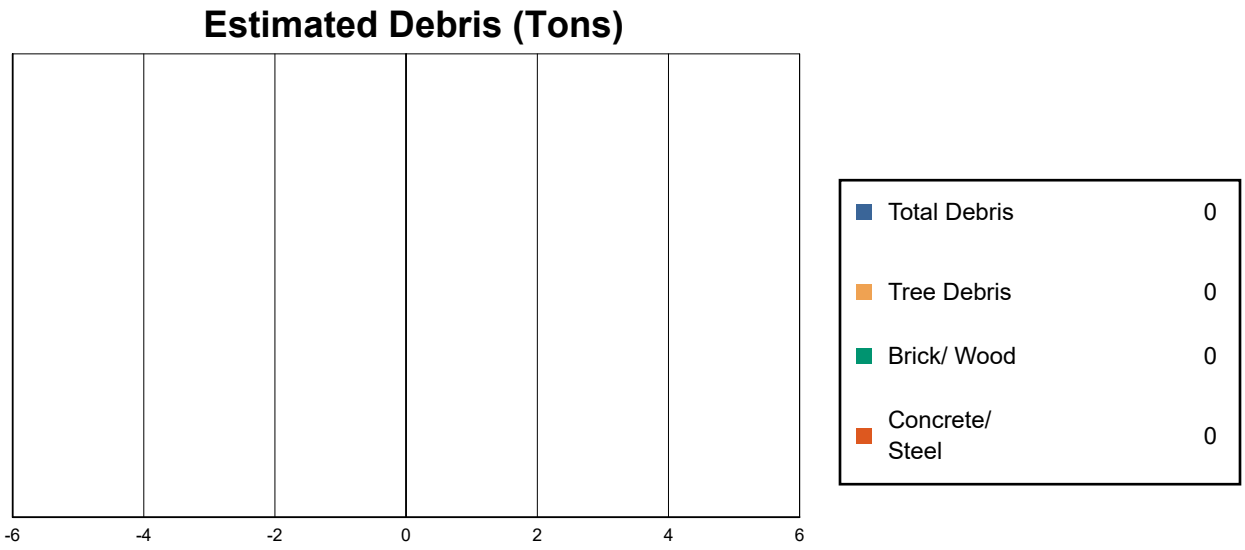


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	34	0	0	34

Induced Hurricane Damage

Debris Generation

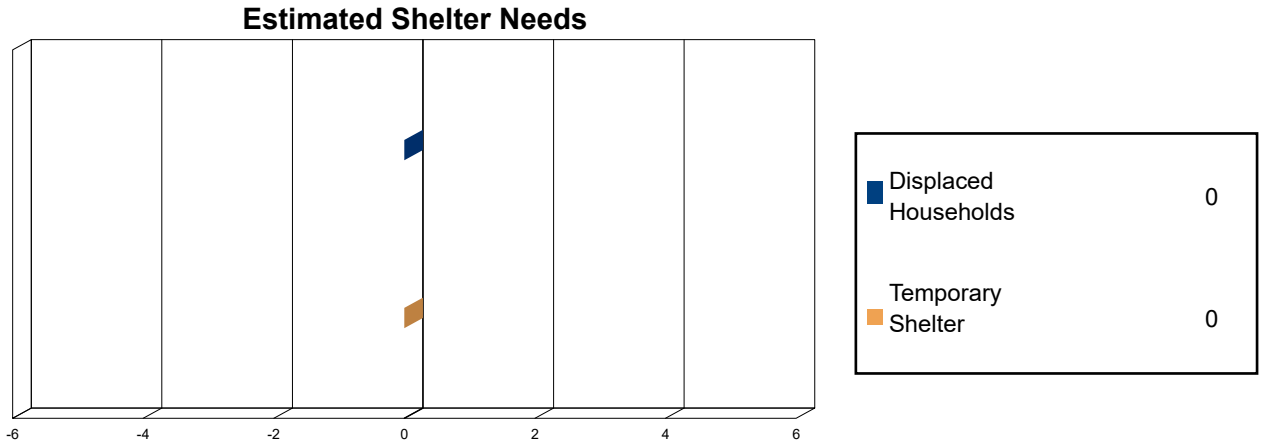


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 64,083) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

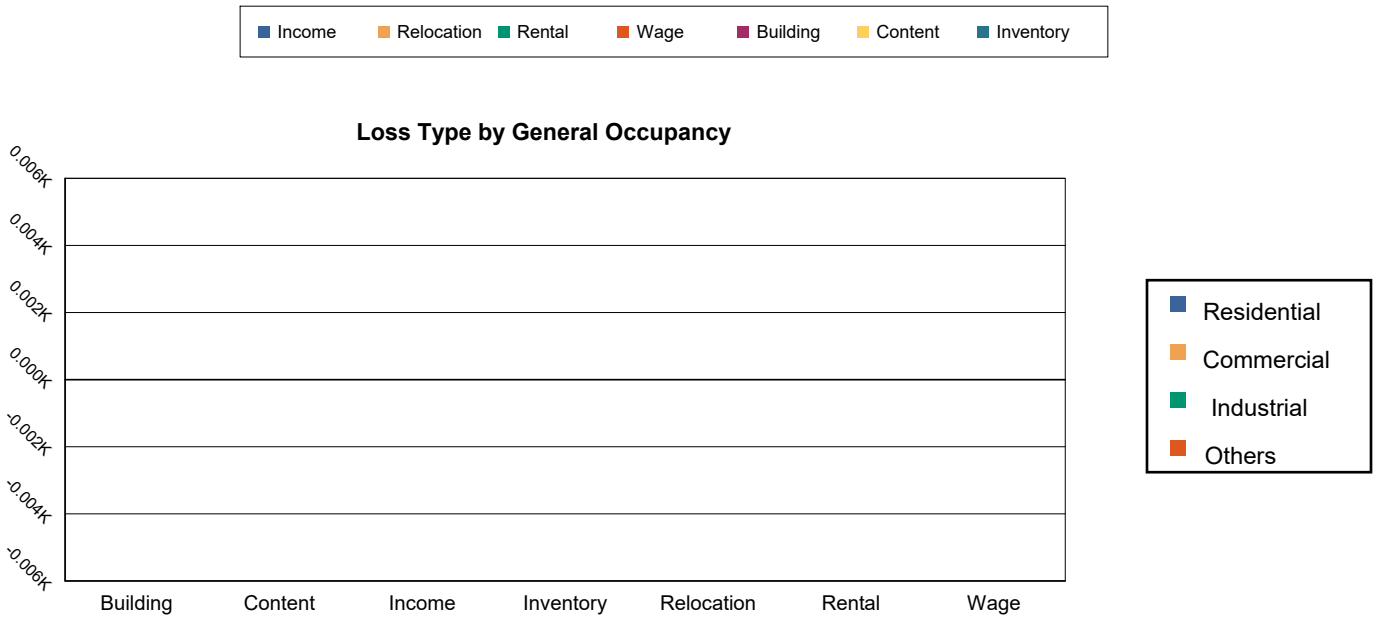


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,508,034	3,710,985	13,219,019
Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**
Study Region Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**

Hazus: Hurricane Global Risk Report

Region Name:	West_Hartford_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
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Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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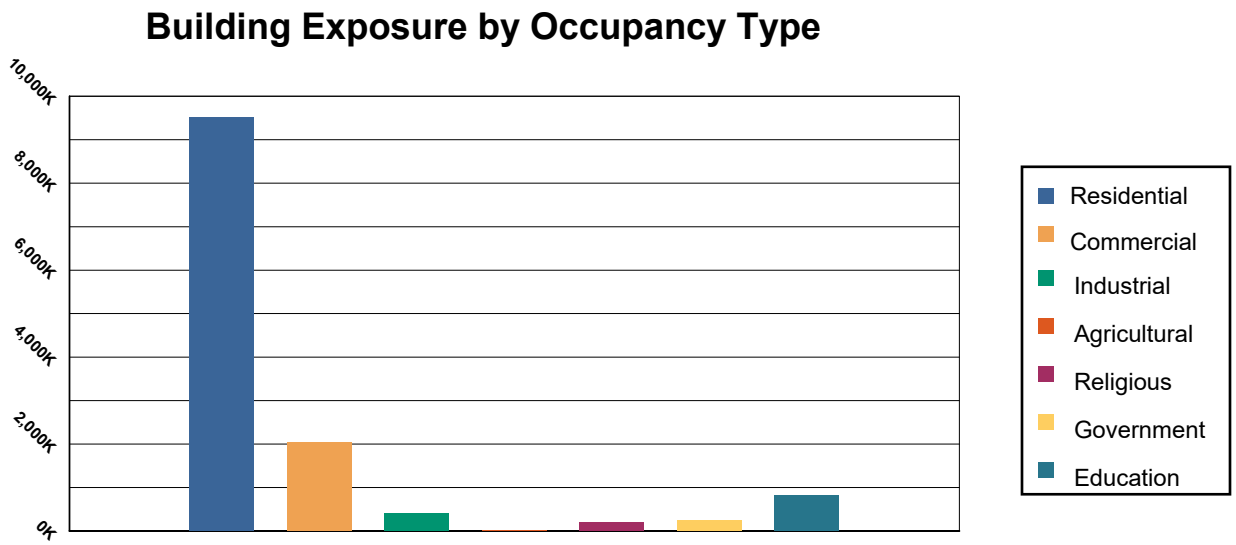

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Scenario Name:	Probabilistic
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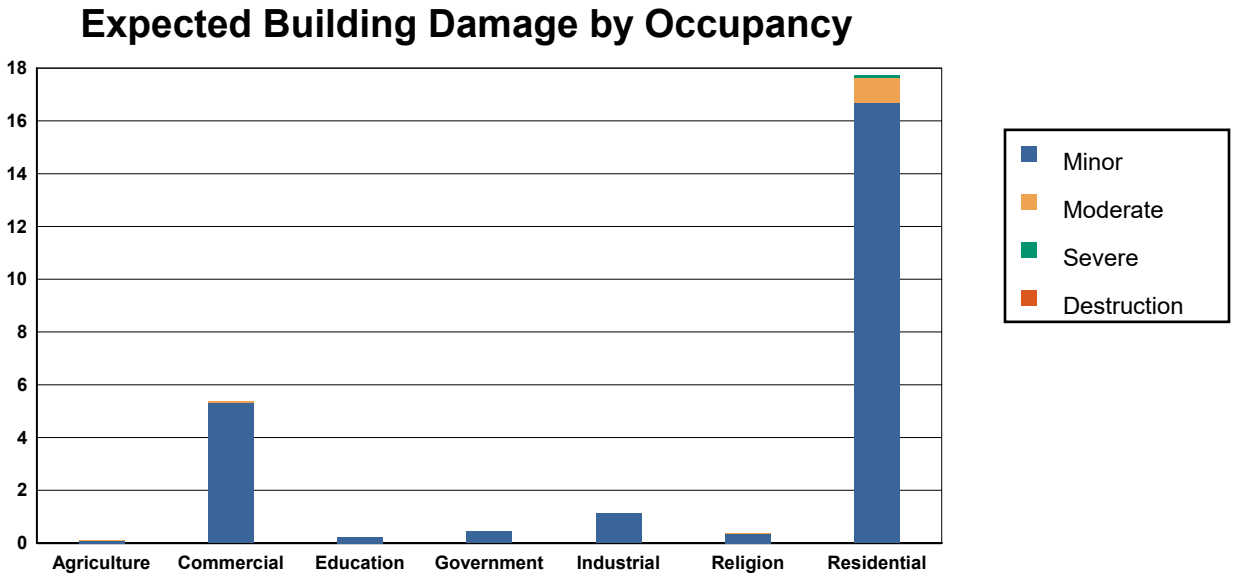


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	33.91	99.75	0.08	0.25	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	1,611.63	99.67	5.32	0.33	0.05	0.00	0.00	0.00	0.00	0.00
Education	65.77	99.65	0.23	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Government	115.57	99.63	0.43	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	312.87	99.64	1.13	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Religion	127.65	99.72	0.35	0.27	0.01	0.01	0.00	0.00	0.00	0.00
Residential	19,048.28	99.91	16.69	0.09	0.92	0.00	0.11	0.00	0.00	0.00
Total	**21,315.69**		**24.23**		**0.98**		**0.11**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	283	99.59	1	0.41	0	0.00	0	0.00	0	0.00
Masonry	1,926	99.50	9	0.48	0	0.02	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,049	99.63	4	0.37	0	0.00	0	0.00	0	0.00
Wood	18,053	99.96	7	0.04	1	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 332 hospital beds available for use. On the day of the hurricane, the model estimates that 332 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

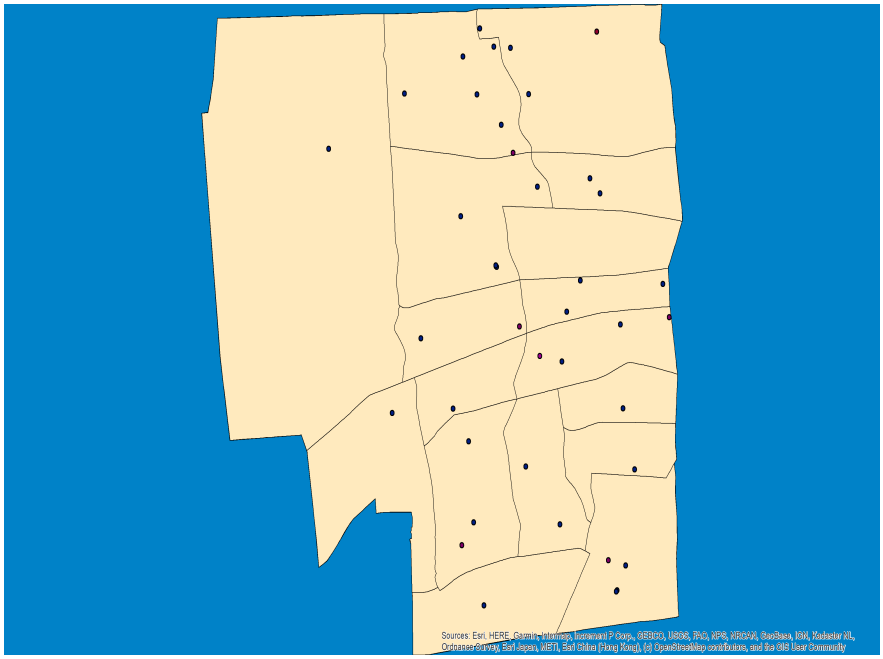
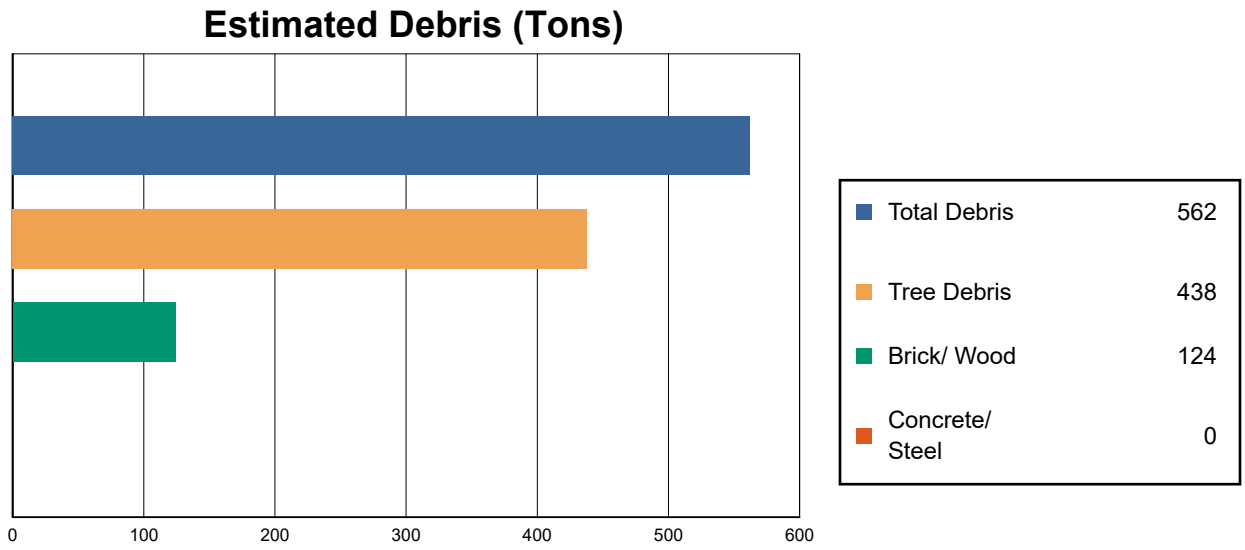


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	34	0	0	34

Induced Hurricane Damage

Debris Generation

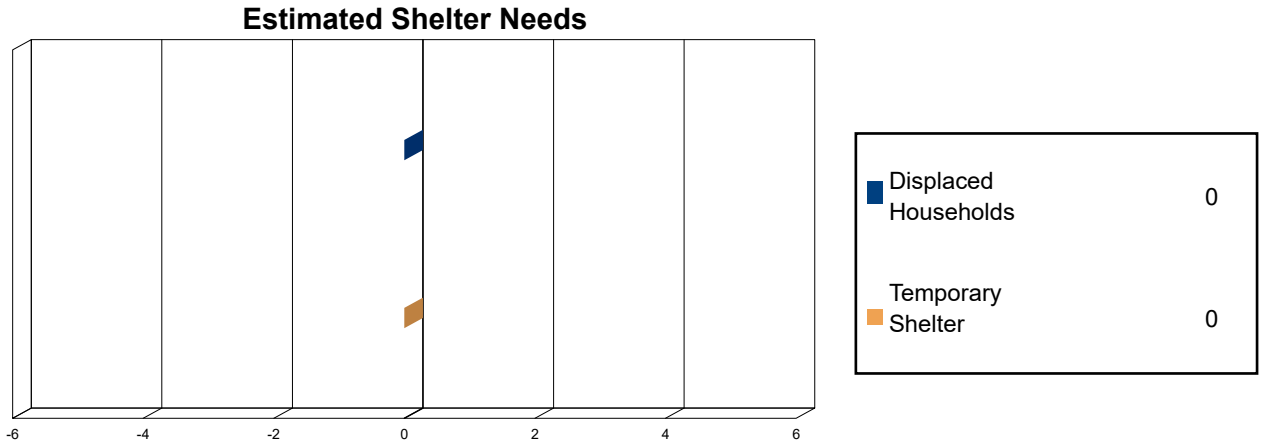


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 562 tons of debris will be generated. Of the total amount, 52 tons (9%) is Other Tree Debris. Of the remaining 510 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 5 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 386 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 64,083) will seek temporary shelter in public shelters.

Economic Loss

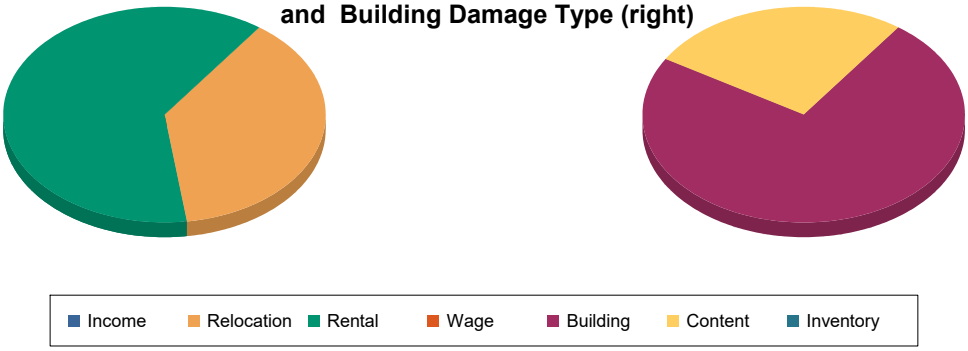
The total economic loss estimated for the hurricane is 6.4 million dollars, which represents 0.05 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 6 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

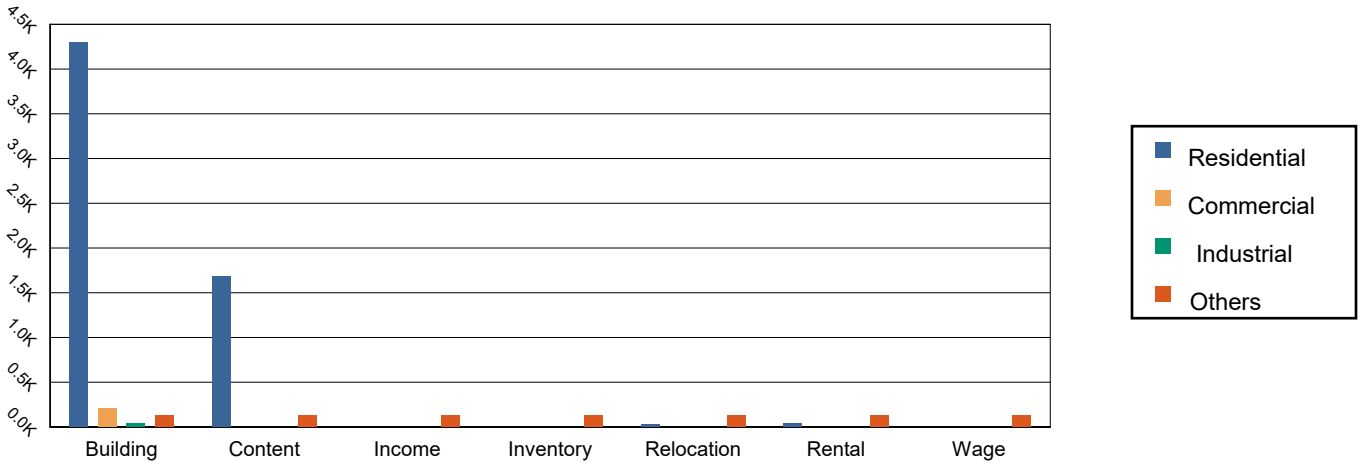


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	4,293.88	204.42	40.90	124.41	4,663.61
	Content	1,679.61	0.00	0.00	0.00	1,679.61
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**5,973.49**	**204.42**	**40.90**	**124.41**	**6,343.22**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	26.70	0.43	0.00	0.07	27.19
	Rental	44.74	0.00	0.00	0.00	44.74
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**71.44**	**0.43**	**0.00**	**0.07**	**71.93**

Total

Total	**6,044.93**	**204.85**	**40.90**	**124.48**	**6,415.16**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,508,034	3,710,985	13,219,019
Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**
Study Region Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**

Hazus: Hurricane Global Risk Report

Region Name:	West_Hartford_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Friday, May 12, 2023

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Section	Page #
General Description of the Region	3
Building Inventory	4
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Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
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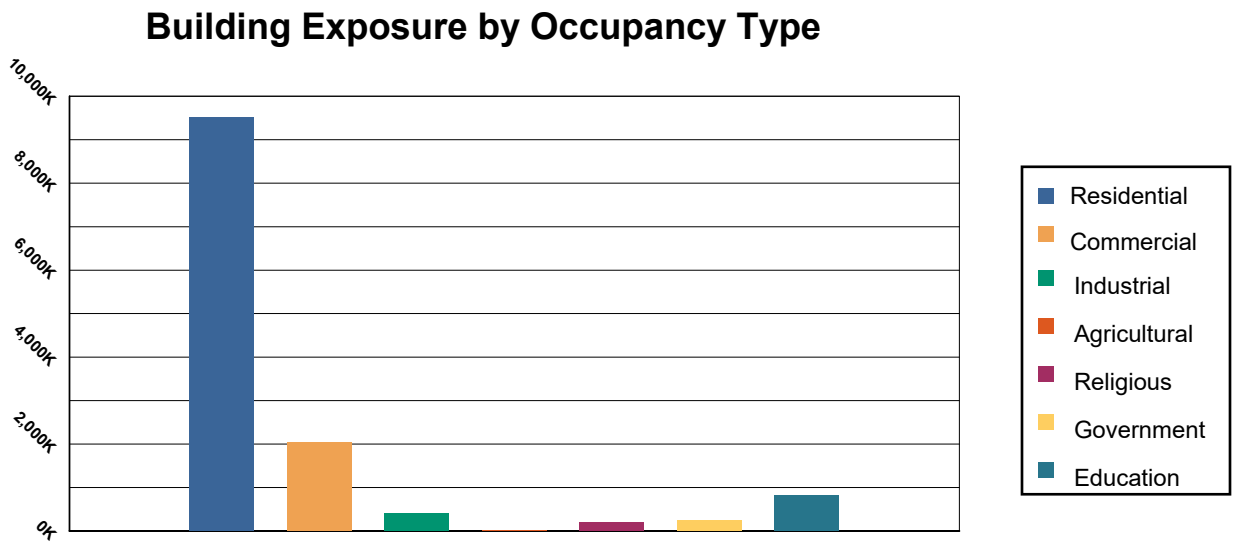

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For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds. There are 34 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 32 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

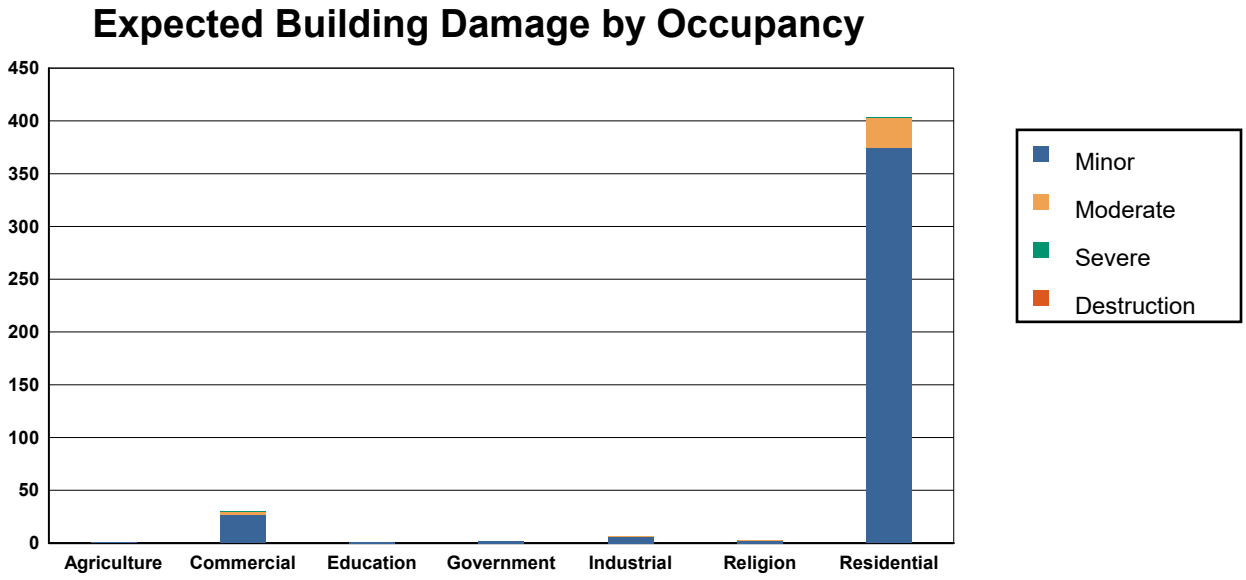


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	33.26	97.82	0.65	1.91	0.07	0.21	0.02	0.06	0.00	0.00
Commercial	1,587.23	98.16	27.29	1.69	2.35	0.15	0.12	0.01	0.00	0.00
Education	64.92	98.37	1.06	1.60	0.02	0.03	0.00	0.00	0.00	0.00
Government	114.03	98.30	1.94	1.67	0.03	0.03	0.00	0.00	0.00	0.00
Industrial	307.78	98.02	5.88	1.87	0.29	0.09	0.06	0.02	0.00	0.00
Religion	125.97	98.42	1.96	1.53	0.06	0.05	0.00	0.00	0.00	0.00
Residential	18,662.64	97.88	374.74	1.97	27.95	0.15	0.67	0.00	0.00	0.00
Total	**20,895.83**		**413.52**		**30.78**		**0.87**		**0.01**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	278	98.05	5	1.91	0	0.04	0	0.00	0	0.00
Masonry	1,872	96.68	53	2.75	11	0.56	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,034	98.17	18	1.68	1	0.14	0	0.01	0	0.00
Wood	17,732	98.19	317	1.75	10	0.06	1	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 332 hospital beds available for use. On the day of the hurricane, the model estimates that 332 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

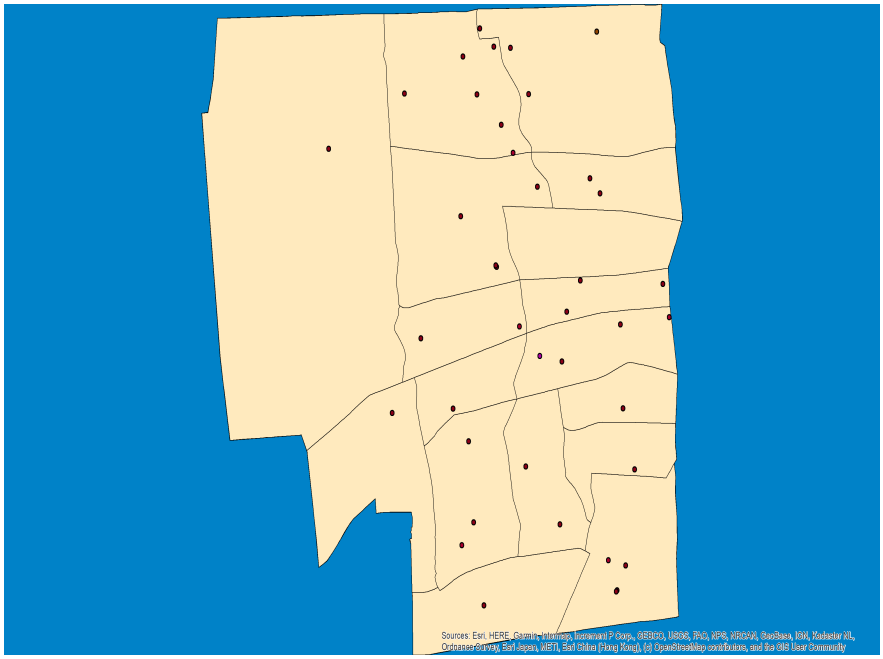
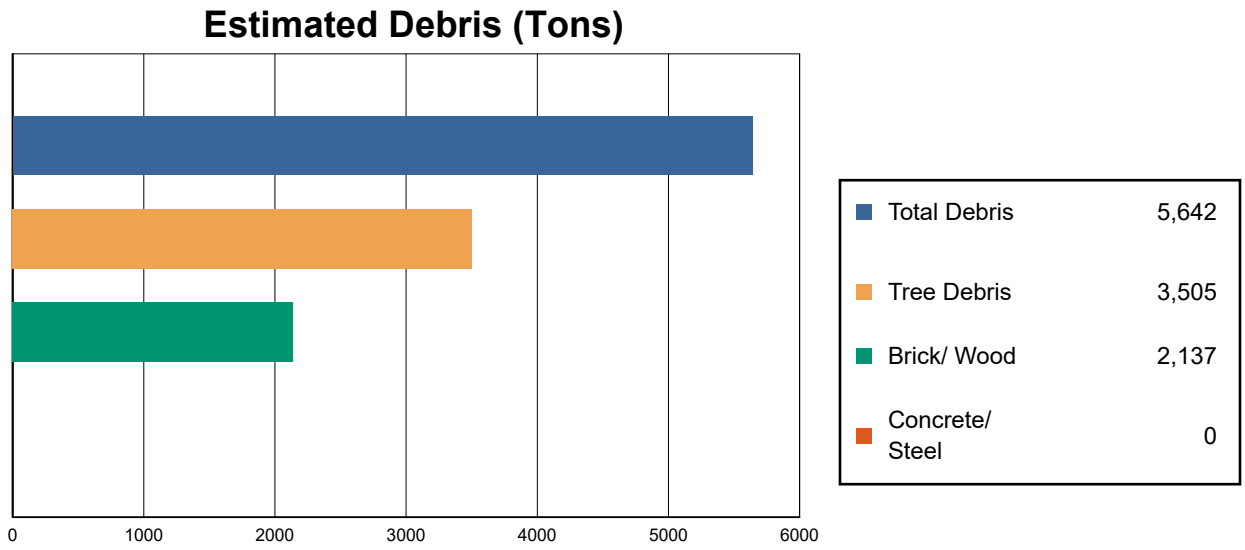


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	34	0	0	34

Induced Hurricane Damage

Debris Generation

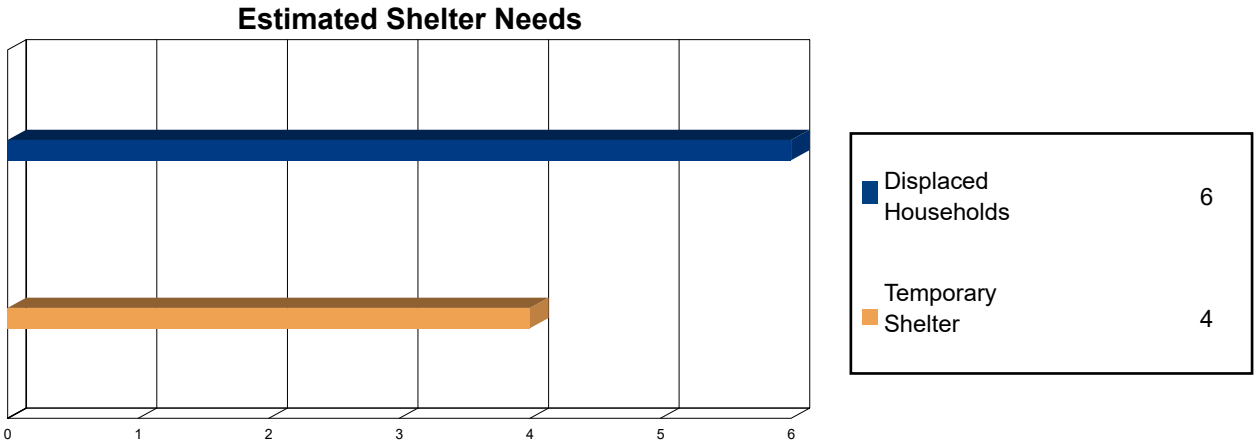


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,642 tons of debris will be generated. Of the total amount, 789 tons (14%) is Other Tree Debris. Of the remaining 4,853 tons, Brick/Wood comprises 44% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 85 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,716 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 6 households to be displaced due to the hurricane. Of these, 4 people (out of a total population of 64,083) will seek temporary shelter in public shelters.

Economic Loss

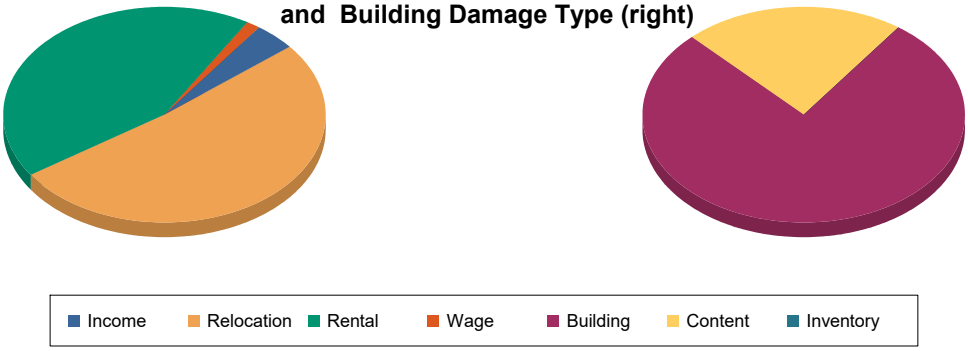
The total economic loss estimated for the hurricane is 47.0 million dollars, which represents 0.36 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 47 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

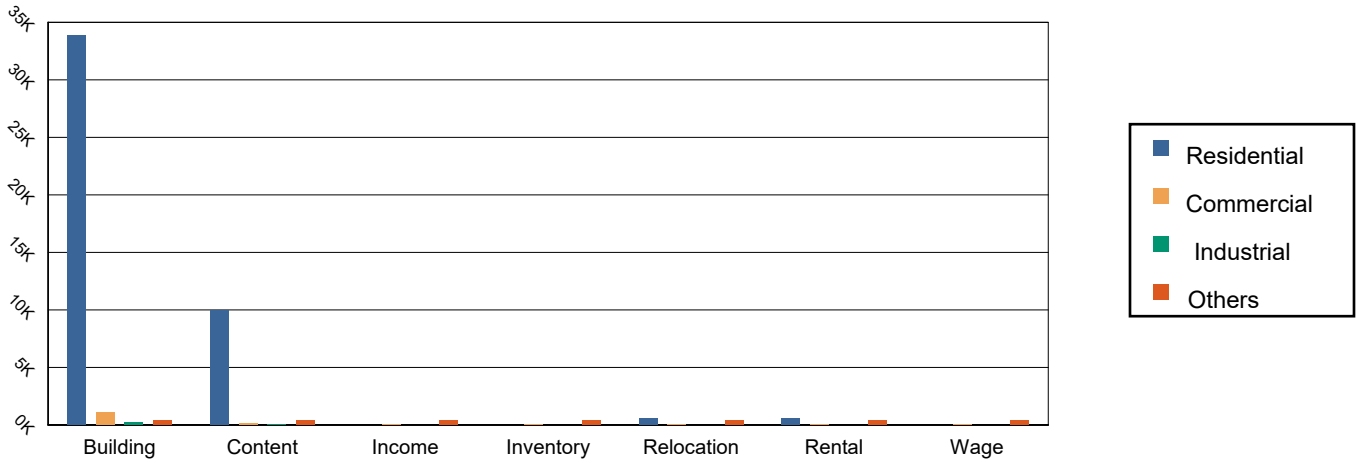


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	33,816.31	1,101.48	210.71	420.80	35,549.29
	Content	9,927.81	111.73	67.75	5.44	10,112.73
	Inventory	0.00	24.27	8.37	1.51	34.15
	Subtotal	**43,744.12**	**1,237.48**	**286.83**	**427.74**	**45,696.17**
Business Interruption Loss						
	Income	0.00	52.76	0.00	0.00	52.76
	Relocation	606.23	48.09	1.59	2.55	658.46
	Rental	528.85	21.53	0.00	0.00	550.38
	Wage	0.00	18.75	0.00	0.00	18.75
	Subtotal	**1,135.08**	**141.12**	**1.59**	**2.55**	**1,280.35**

Total

Total	**44,879.20**	**1,378.60**	**288.42**	**430.30**	**46,976.52**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,508,034	3,710,985	13,219,019
Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**
Study Region Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**

Hazus: Hurricane Global Risk Report

Region Name:	West_Hartford_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.26 square miles and contains 17 census tracts. There are over 25 thousand households in the region and a total population of 64,083 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 21 thousand buildings in the region with a total building replacement value (excluding contents) of 13,219 million dollars. Approximately 89% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 21,341 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

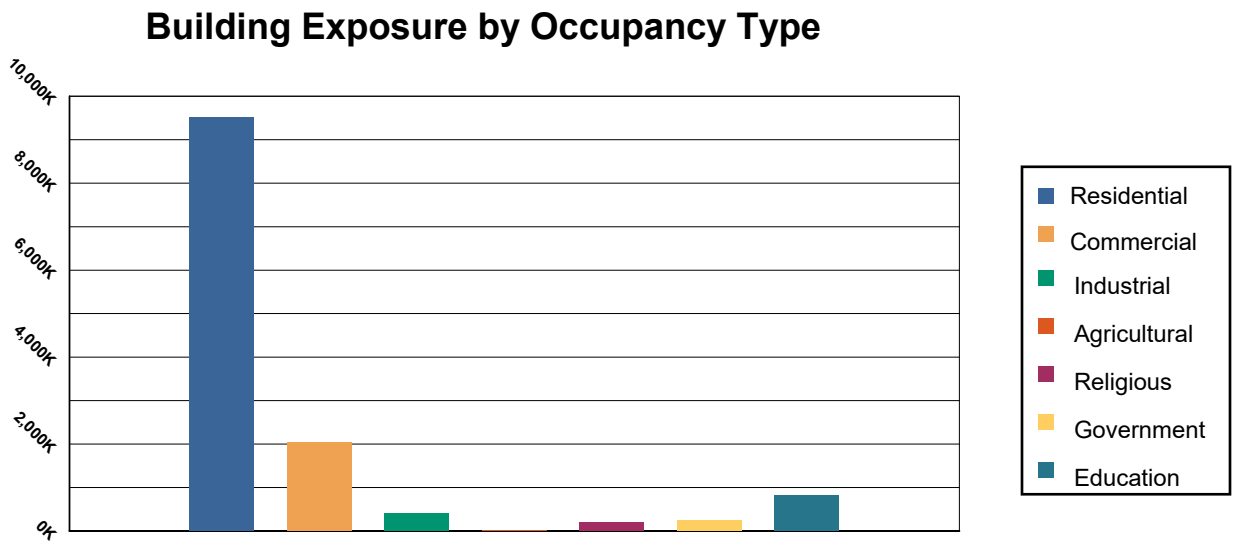


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,508,034	71.93%
Commercial	2,044,240	15.46%
Industrial	408,954	3.09%
Agricultural	13,670	0.10%
Religious	189,174	1.43%
Government	242,153	1.83%
Education	812,794	6.15%
Total	**13,219,019**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds. There are 34 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 164 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

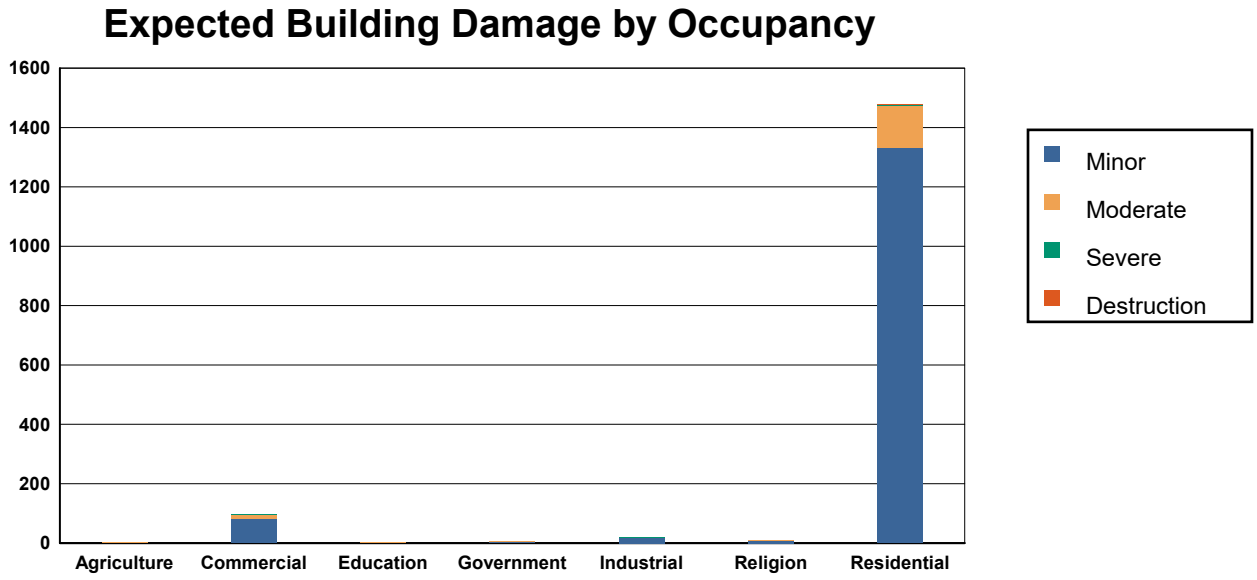


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	31.32	92.12	2.12	6.22	0.39	1.15	0.16	0.48	0.01	0.03
Commercial	1,519.77	93.99	83.16	5.14	12.67	0.78	1.40	0.09	0.00	0.00
Education	62.58	94.81	3.16	4.79	0.26	0.39	0.00	0.00	0.00	0.00
Government	109.78	94.64	5.72	4.94	0.49	0.42	0.01	0.01	0.00	0.00
Industrial	294.14	93.68	17.00	5.41	2.37	0.75	0.47	0.15	0.02	0.01
Religion	120.77	94.35	6.72	5.25	0.50	0.39	0.02	0.02	0.00	0.00
Residential	17,588.49	92.25	1,332.37	6.99	140.80	0.74	2.88	0.02	1.46	0.01
Total	**19,726.85**		**1,450.24**		**157.47**		**4.94**		**1.49**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	267	94.04	15	5.42	2	0.54	0	0.01	0	0.00
Masonry	1,757	90.76	134	6.93	43	2.24	1	0.07	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	993	94.28	50	4.78	9	0.83	1	0.12	0	0.00
Wood	16,760	92.80	1,222	6.77	74	0.41	2	0.01	1	0.01

Essential Facility Damage

Before the hurricane, the region had 332 hospital beds available for use. On the day of the hurricane, the model estimates that 332 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

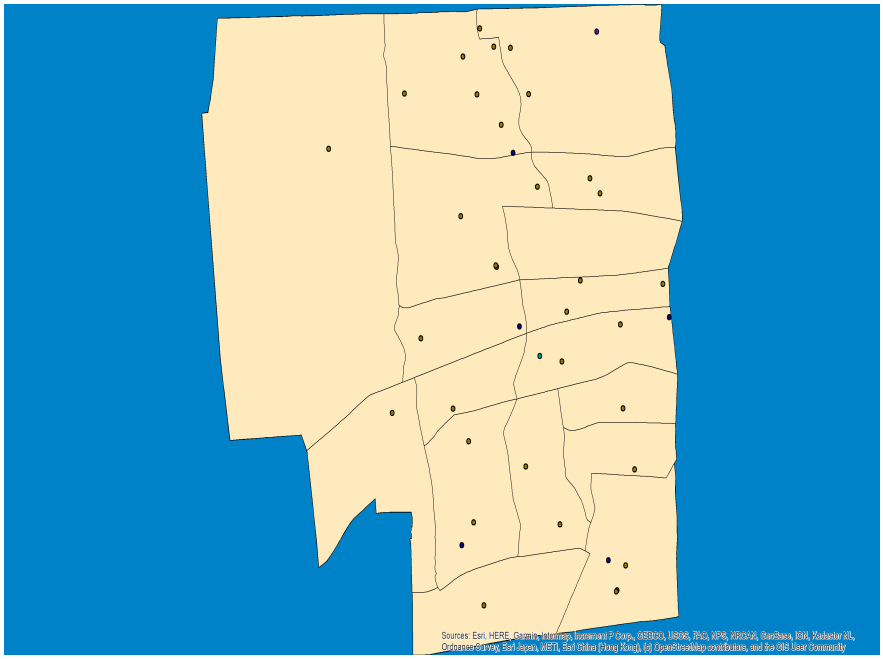
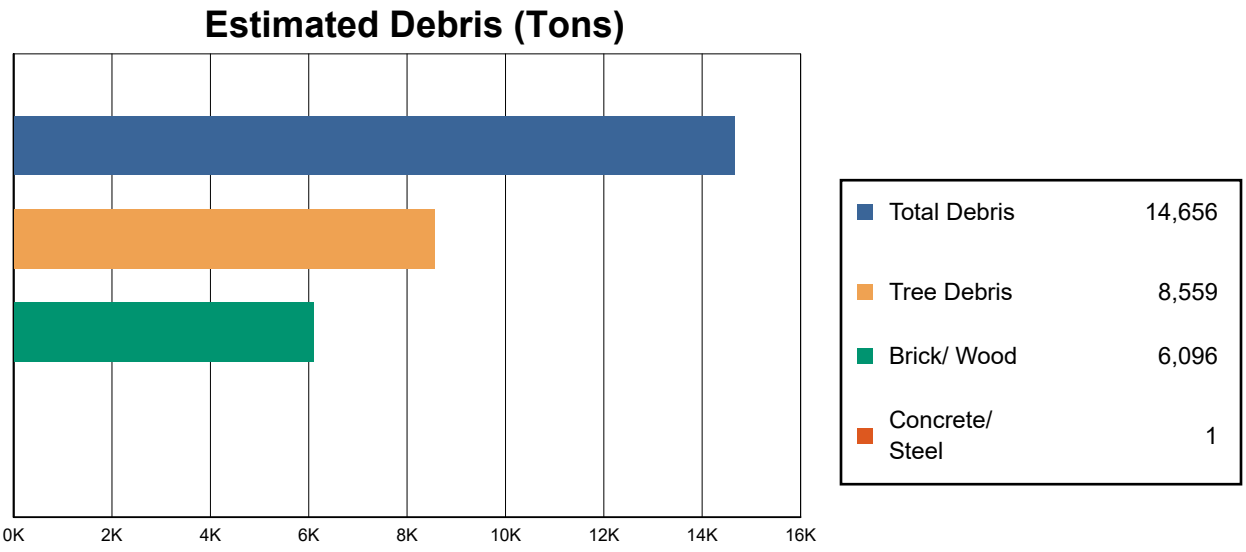


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	34	0	0	34

Induced Hurricane Damage

Debris Generation

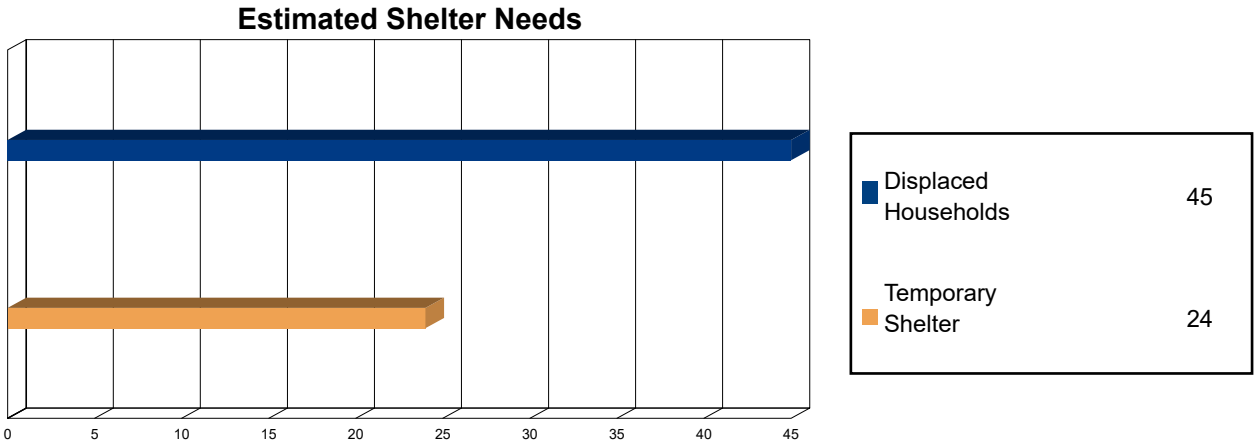


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 14,656 tons of debris will be generated. Of the total amount, 2,149 tons (15%) is Other Tree Debris. Of the remaining 12,507 tons, Brick/Wood comprises 49% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 244 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,410 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 45 households to be displaced due to the hurricane. Of these, 24 people (out of a total population of 64,083) will seek temporary shelter in public shelters.

Economic Loss

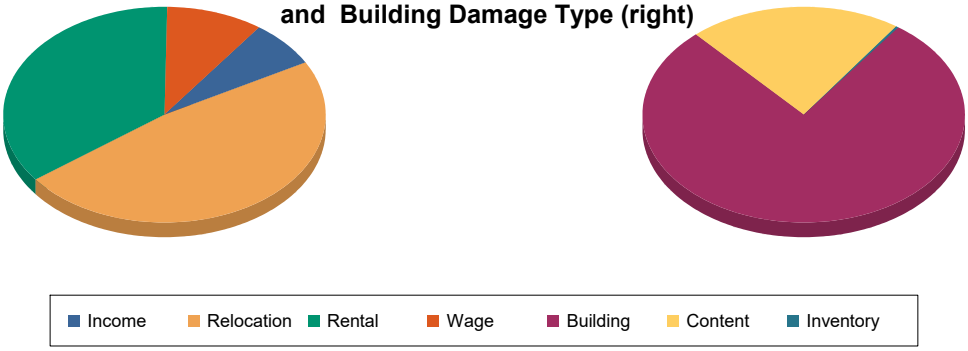
The total economic loss estimated for the hurricane is 110.0 million dollars, which represents 0.83 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 110 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 92% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

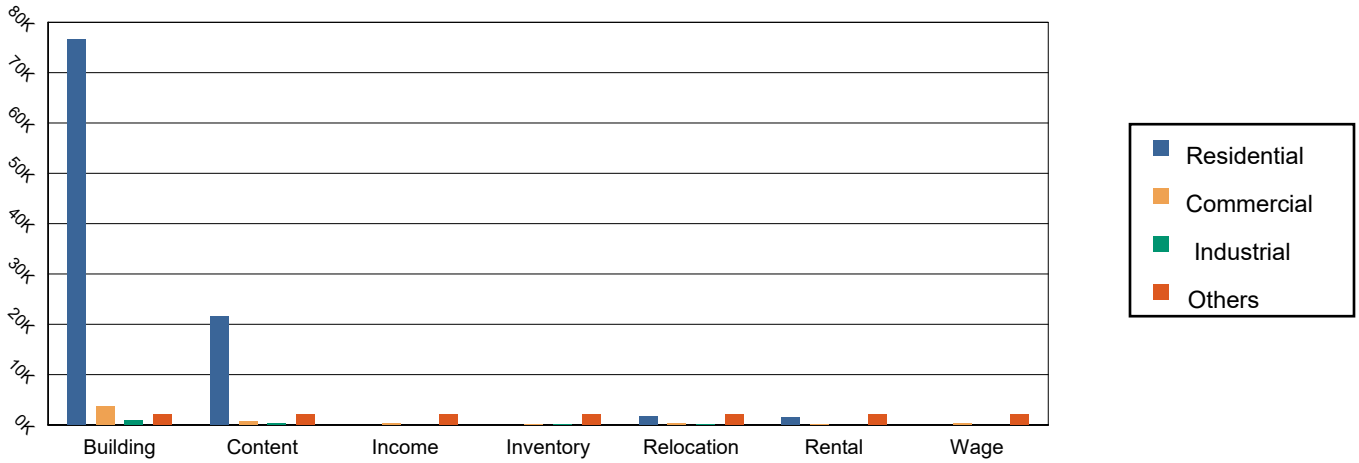


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	76,496.33	3,628.71	833.13	1,562.96	82,521.13
	Content	21,482.68	637.83	363.39	180.77	22,664.67
	Inventory	0.00	104.68	45.71	11.79	162.19
	Subtotal	**97,979.01**	**4,371.23**	**1,242.23**	**1,755.52**	**105,347.99**
Business Interruption Loss						
	Income	0.00	256.98	7.45	52.45	316.89
	Relocation	1,788.32	340.73	35.50	67.72	2,232.27
	Rental	1,474.10	169.51	5.92	3.93	1,653.47
	Wage	0.00	312.06	12.33	123.67	448.07
	Subtotal	**3,262.42**	**1,079.30**	**61.20**	**247.77**	**4,650.69**

Total

Total	**101,241.43**	**5,450.52**	**1,303.43**	**2,003.30**	**109,998.68**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,508,034	3,710,985	13,219,019
Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**
Study Region Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**

Hazus: Hurricane Global Risk Report

Region Name:	West_Hartford_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.26 square miles and contains 17 census tracts. There are over 25 thousand households in the region and a total population of 64,083 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 21 thousand buildings in the region with a total building replacement value (excluding contents) of 13,219 million dollars. Approximately 89% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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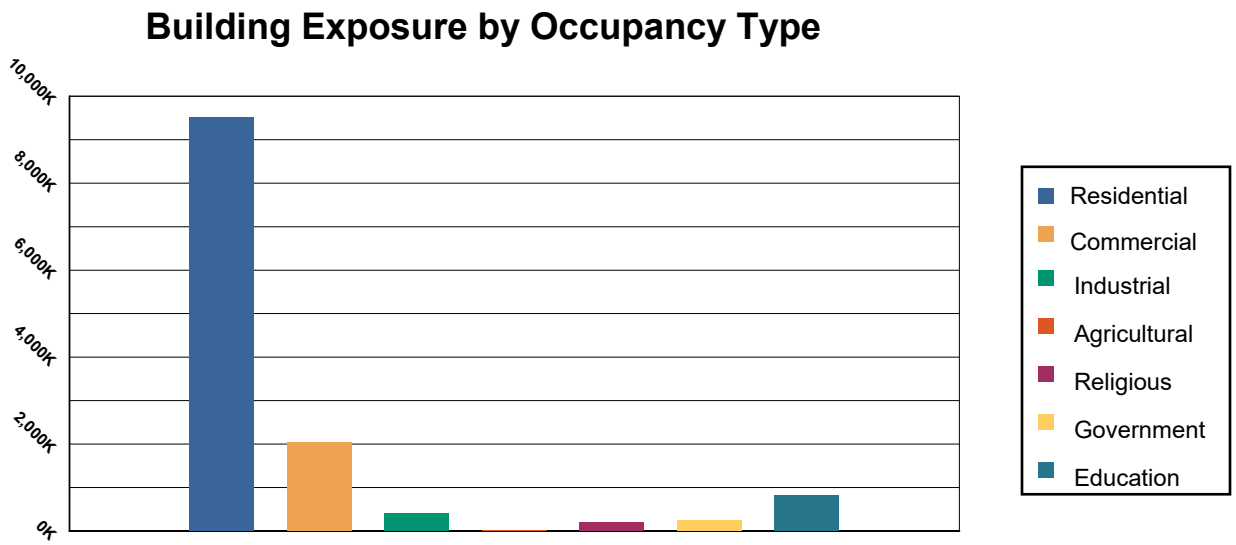

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Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,508,034	71.93%
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Agricultural	13,670	0.10%
Religious	189,174	1.43%
Government	242,153	1.83%
Education	812,794	6.15%
Total	**13,219,019**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds. There are 34 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 477 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 9 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

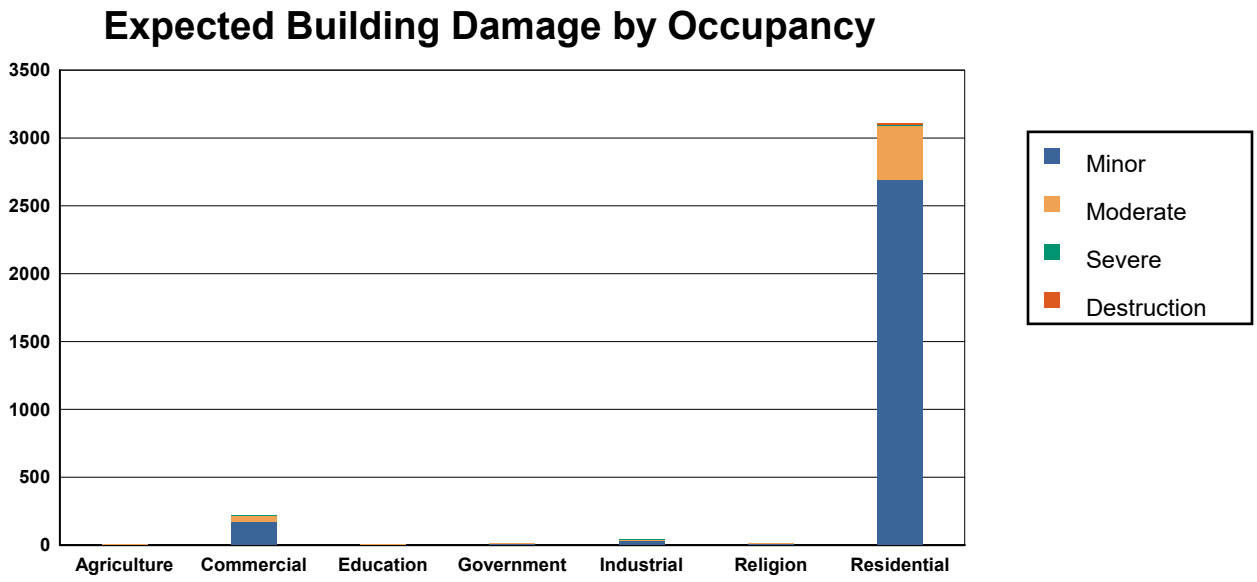


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	28.28	83.19	4.18	12.28	1.03	3.04	0.46	1.37	0.04	0.13
Commercial	1,400.00	86.58	171.30	10.59	40.52	2.51	5.17	0.32	0.02	0.00
Education	58.08	87.99	6.68	10.12	1.20	1.82	0.05	0.07	0.00	0.00
Government	101.67	87.65	11.95	10.30	2.30	1.98	0.09	0.07	0.00	0.00
Industrial	270.86	86.26	33.26	10.59	8.24	2.62	1.53	0.49	0.11	0.03
Religion	111.50	87.11	14.29	11.17	2.11	1.65	0.09	0.07	0.00	0.00
Residential	15,955.54	83.69	2,696.30	14.14	392.56	2.06	12.50	0.07	9.10	0.05
Total	**17,925.92**		**2,937.96**		**447.96**		**19.89**		**9.28**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	246	86.76	31	10.79	7	2.38	0	0.07	0	0.00
Masonry	1,591	82.19	240	12.41	100	5.18	4	0.20	0	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	918	87.18	102	9.68	29	2.71	5	0.43	0	0.00
Wood	15,241	84.39	2,544	14.08	255	1.41	11	0.06	8	0.05

Essential Facility Damage

Before the hurricane, the region had 332 hospital beds available for use. On the day of the hurricane, the model estimates that 332 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

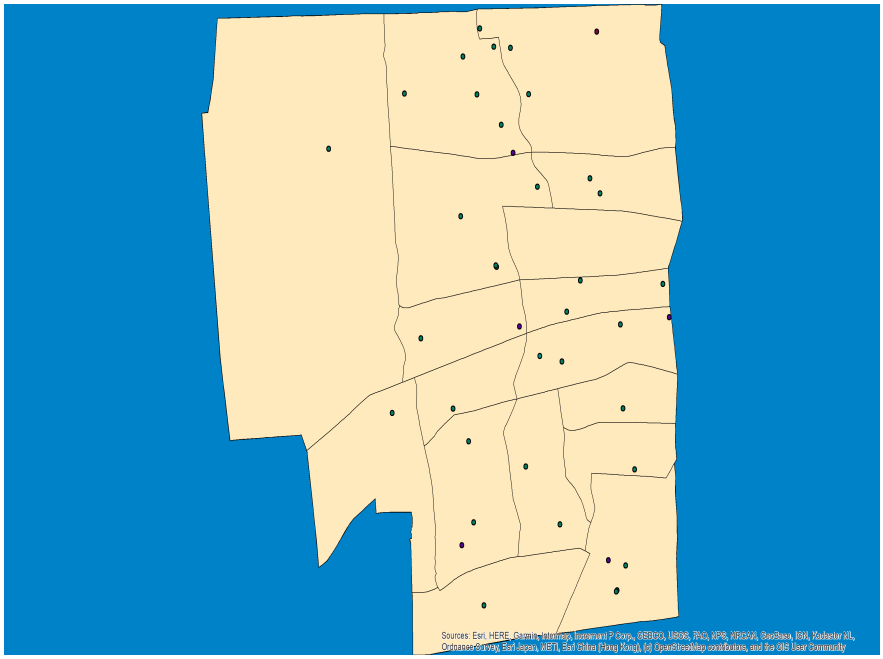
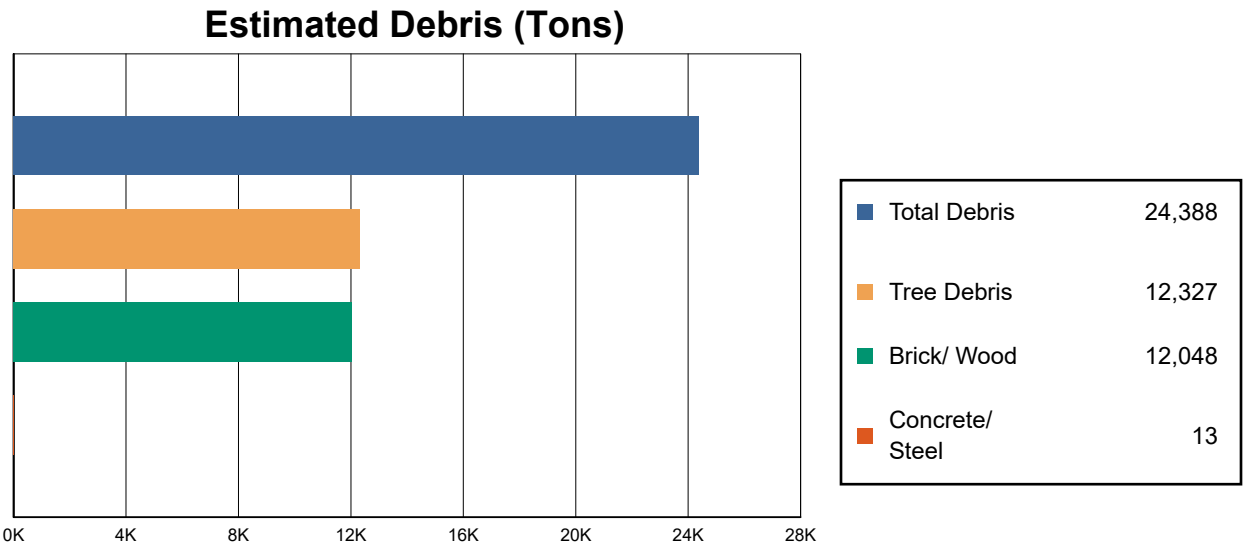


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	34	0	0	33

Induced Hurricane Damage

Debris Generation

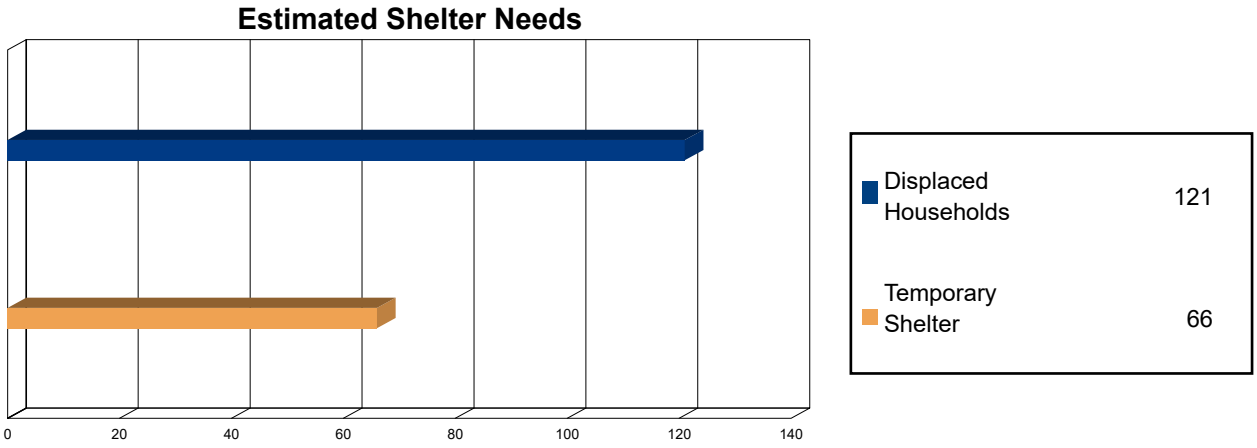


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 24,388 tons of debris will be generated. Of the total amount, 2,873 tons (12%) is Other Tree Debris. Of the remaining 21,515 tons, Brick/Wood comprises 56% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 482 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,454 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 121 households to be displaced due to the hurricane. Of these, 66 people (out of a total population of 64,083) will seek temporary shelter in public shelters.

Economic Loss

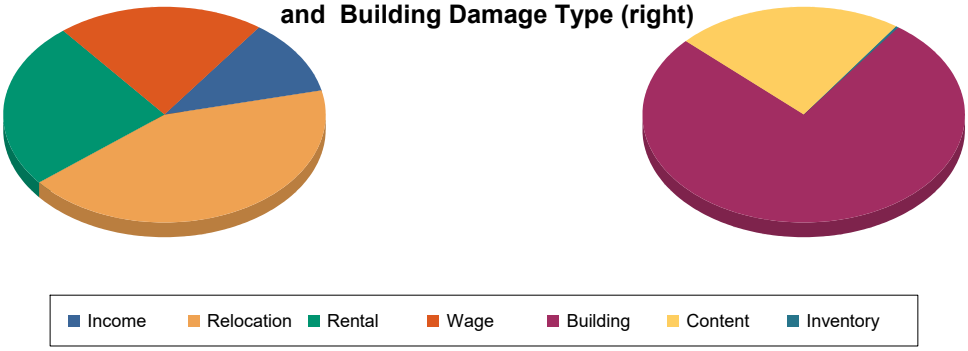
The total economic loss estimated for the hurricane is 206.5 million dollars, which represents 1.56 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 207 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

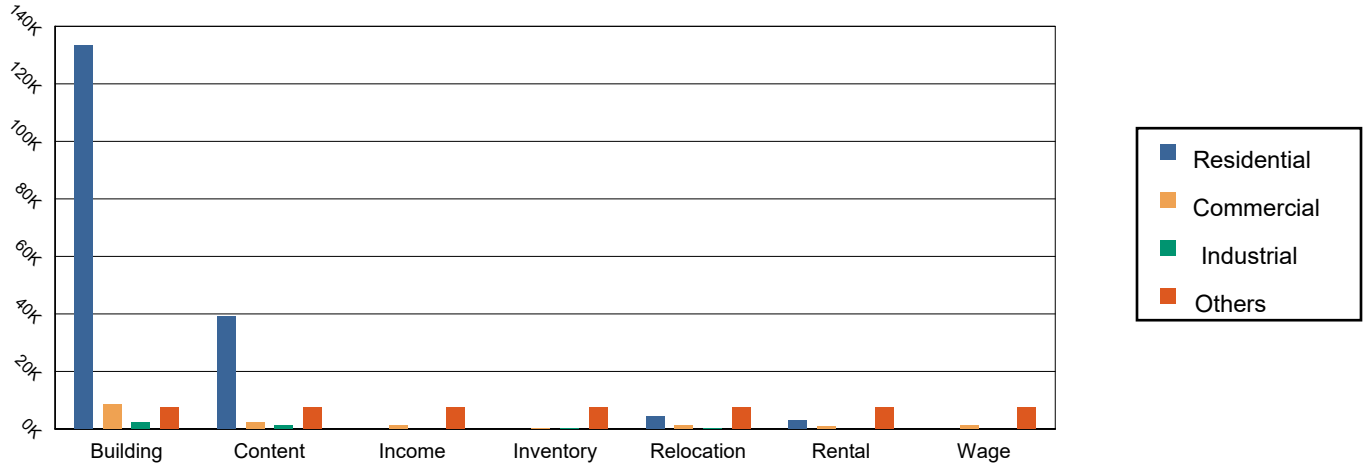


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	133,210.41	8,381.68	2,104.38	3,797.29	147,493.76
	Content	39,215.75	2,106.98	1,234.56	824.21	43,381.49
	Inventory	0.00	344.86	151.58	36.41	532.85
	Subtotal	**172,426.16**	**10,833.52**	**3,490.52**	**4,657.91**	**191,408.10**
Business Interruption Loss						
	Income	0.00	1,225.05	26.77	452.11	1,703.93
	Relocation	4,431.44	1,331.77	127.26	602.71	6,493.17
	Rental	2,966.67	715.18	20.37	70.07	3,772.29
	Wage	0.00	1,367.55	42.78	1,760.48	3,170.81
	Subtotal	**7,398.11**	**4,639.55**	**217.17**	**2,885.37**	**15,140.21**

Total

Total	**179,824.27**	**15,473.08**	**3,707.69**	**7,543.27**	**206,548.31**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,508,034	3,710,985	13,219,019
Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**
Study Region Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**

Hazus: Hurricane Global Risk Report

Region Name:	West_Hartford_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.26 square miles and contains 17 census tracts. There are over 25 thousand households in the region and a total population of 64,083 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 21 thousand buildings in the region with a total building replacement value (excluding contents) of 13,219 million dollars. Approximately 89% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 21,341 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

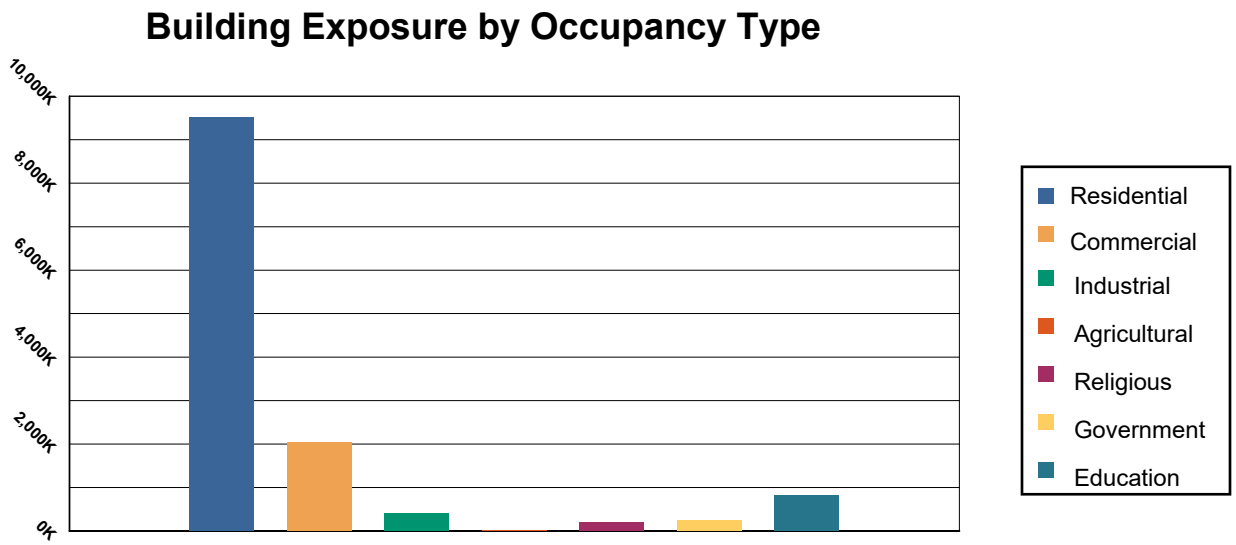


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,508,034	71.93%
Commercial	2,044,240	15.46%
Industrial	408,954	3.09%
Agricultural	13,670	0.10%
Religious	189,174	1.43%
Government	242,153	1.83%
Education	812,794	6.15%
Total	**13,219,019**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds. There are 34 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,345 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 55 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

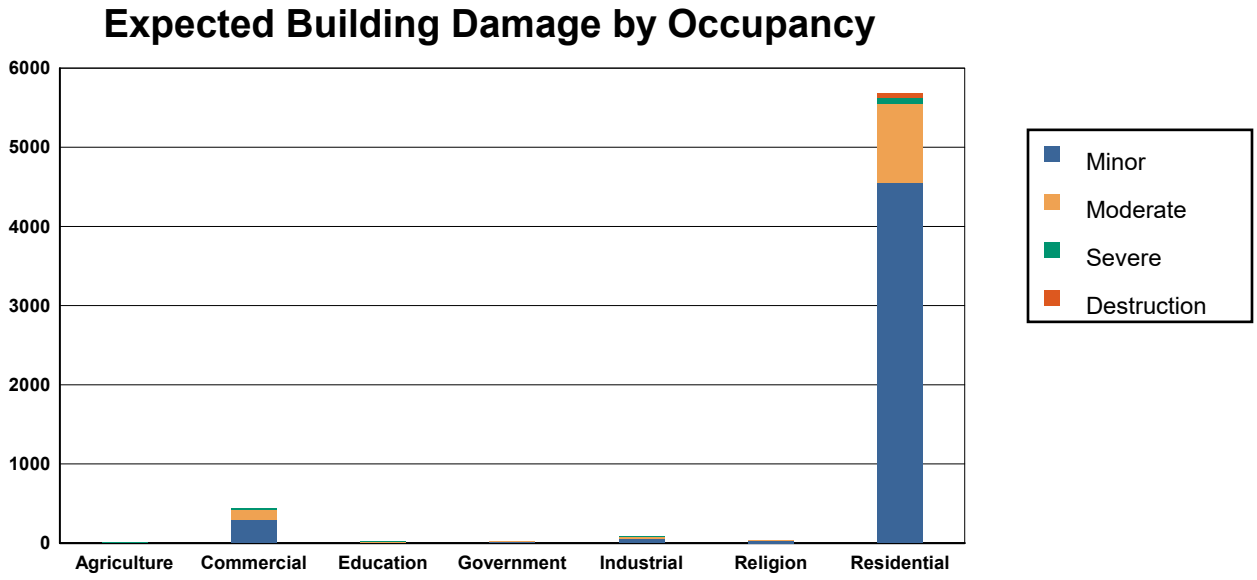


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	23.01	67.69	7.12	20.94	2.49	7.33	1.21	3.55	0.17	0.49
Commercial	1,173.64	72.58	297.19	18.38	124.33	7.69	21.66	1.34	0.17	0.01
Education	49.50	75.00	11.65	17.66	4.38	6.64	0.47	0.71	0.00	0.00
Government	86.13	74.25	20.61	17.77	8.35	7.20	0.91	0.79	0.00	0.00
Industrial	223.94	71.32	56.64	18.04	26.87	8.56	6.11	1.95	0.44	0.14
Religion	94.04	73.47	25.56	19.97	7.64	5.97	0.76	0.60	0.00	0.00
Residential	13,381.88	70.19	4,544.78	23.84	1,009.59	5.30	75.93	0.40	53.81	0.28
Total	**15,032.14**		**4,963.56**		**1,183.66**		**107.05**		**54.59**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	206	72.48	52	18.18	24	8.51	2	0.83	0	0.00
Masonry	1,319	68.11	376	19.40	223	11.54	17	0.85	2	0.09
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	771	73.18	174	16.55	89	8.43	19	1.82	0	0.02
Wood	12,816	70.96	4,369	24.19	758	4.20	66	0.37	51	0.28

Essential Facility Damage

Before the hurricane, the region had 332 hospital beds available for use. On the day of the hurricane, the model estimates that 332 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

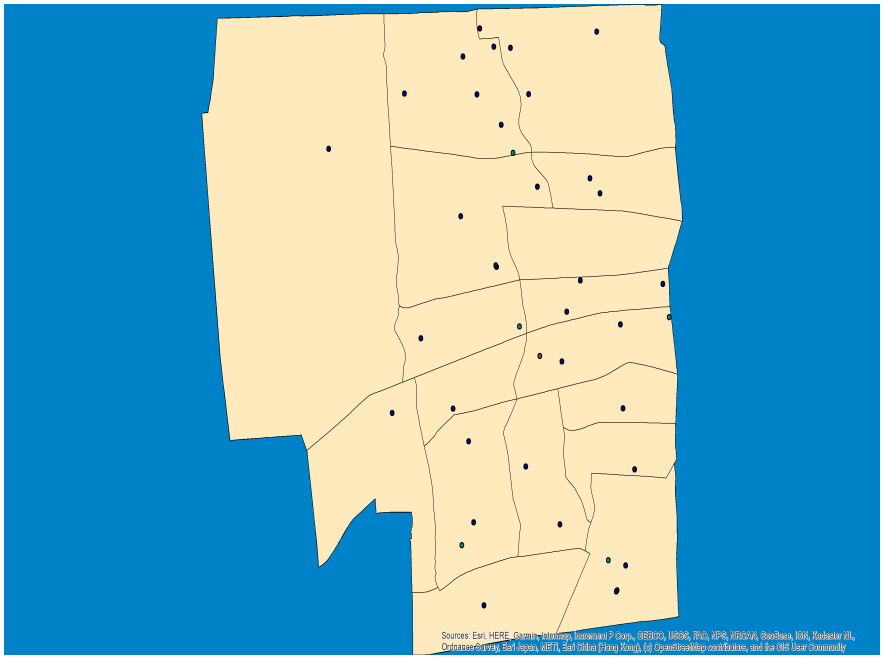
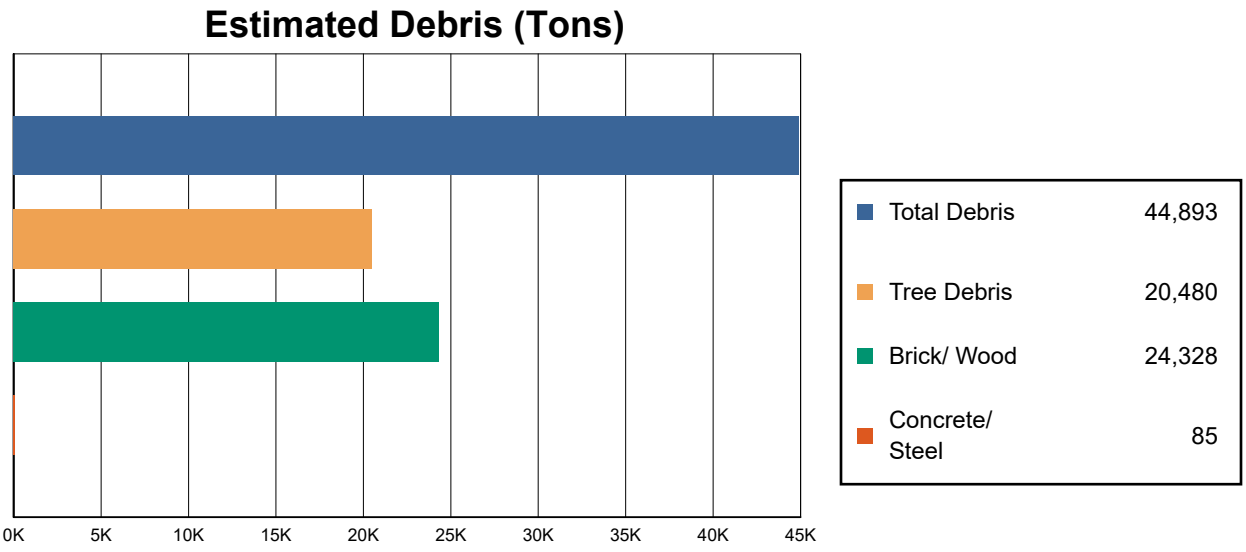


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	34	1	0	3

Induced Hurricane Damage

Debris Generation

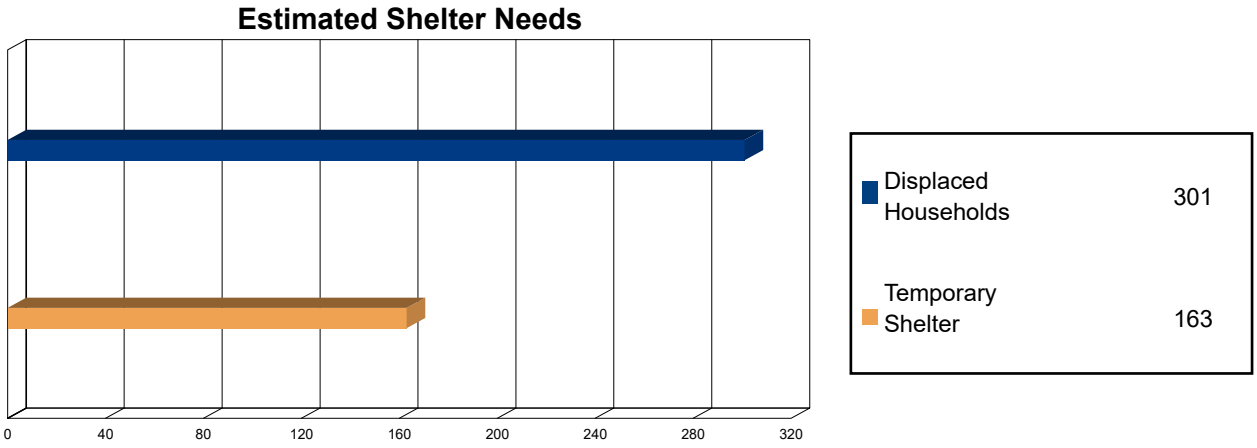


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 44,893 tons of debris will be generated. Of the total amount, 5,157 tons (11%) is Other Tree Debris. Of the remaining 39,736 tons, Brick/Wood comprises 61% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 977 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 15,323 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 301 households to be displaced due to the hurricane. Of these, 163 people (out of a total population of 64,083) will seek temporary shelter in public shelters.

Economic Loss

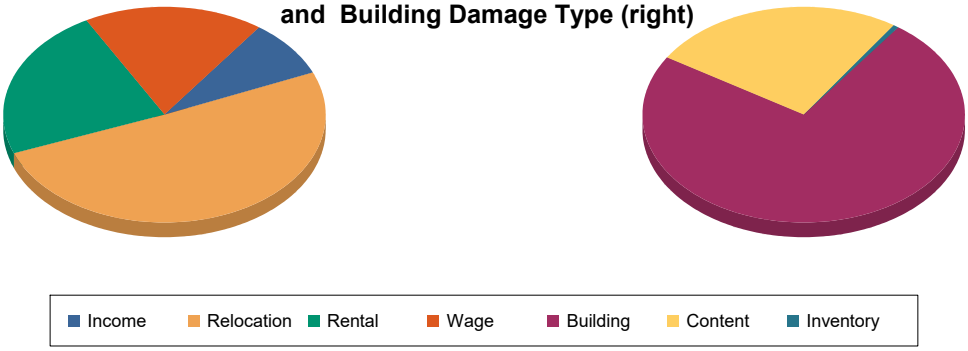
The total economic loss estimated for the hurricane is 445.8 million dollars, which represents 3.37 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 446 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 82% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

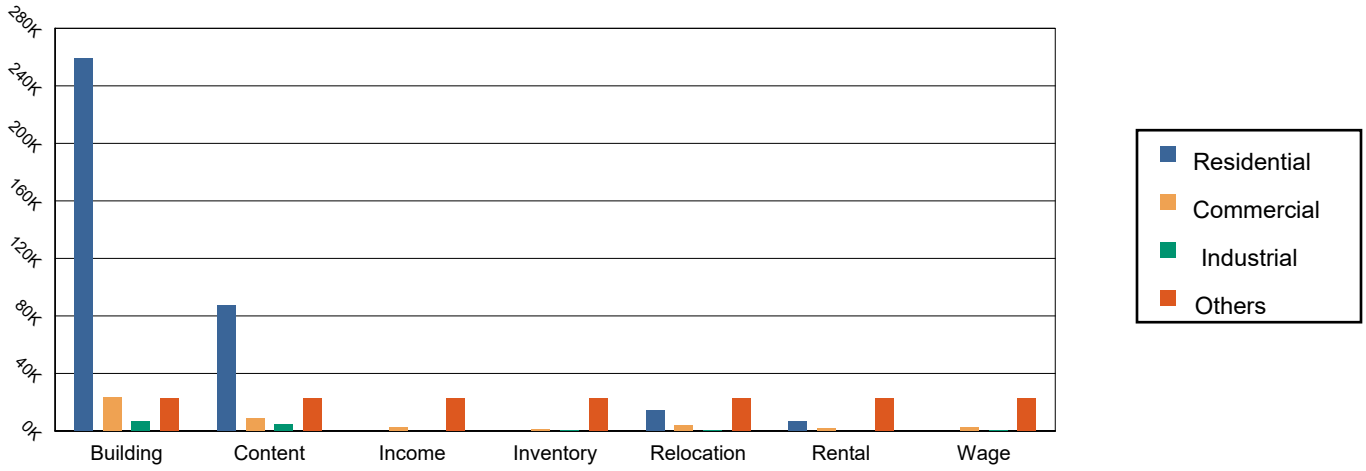


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	259,106.56	23,065.00	6,562.63	10,876.68	299,610.86
	Content	87,056.22	8,457.78	4,661.26	3,849.59	104,024.85
	Inventory	0.00	1,403.08	561.03	108.23	2,072.34
	Subtotal	**346,162.78**	**32,925.86**	**11,784.92**	**14,834.50**	**405,708.06**
Business Interruption Loss						
	Income	0.00	2,203.32	68.38	1,132.76	3,404.45
	Relocation	14,061.89	3,757.99	449.57	2,087.28	20,356.73
	Rental	6,915.65	1,899.70	66.49	245.76	9,127.61
	Wage	0.00	2,585.10	110.07	4,530.80	7,225.97
	Subtotal	**20,977.54**	**10,446.11**	**694.51**	**7,996.60**	**40,114.76**

Total

Total	**367,140.32**	**43,371.96**	**12,479.43**	**22,831.11**	**445,822.82**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,508,034	3,710,985	13,219,019
Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**
Study Region Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**

Hazus: Hurricane Global Risk Report

Region Name:	West_Hartford_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.26 square miles and contains 17 census tracts. There are over 25 thousand households in the region and a total population of 64,083 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 21 thousand buildings in the region with a total building replacement value (excluding contents) of 13,219 million dollars. Approximately 89% of the buildings (and 72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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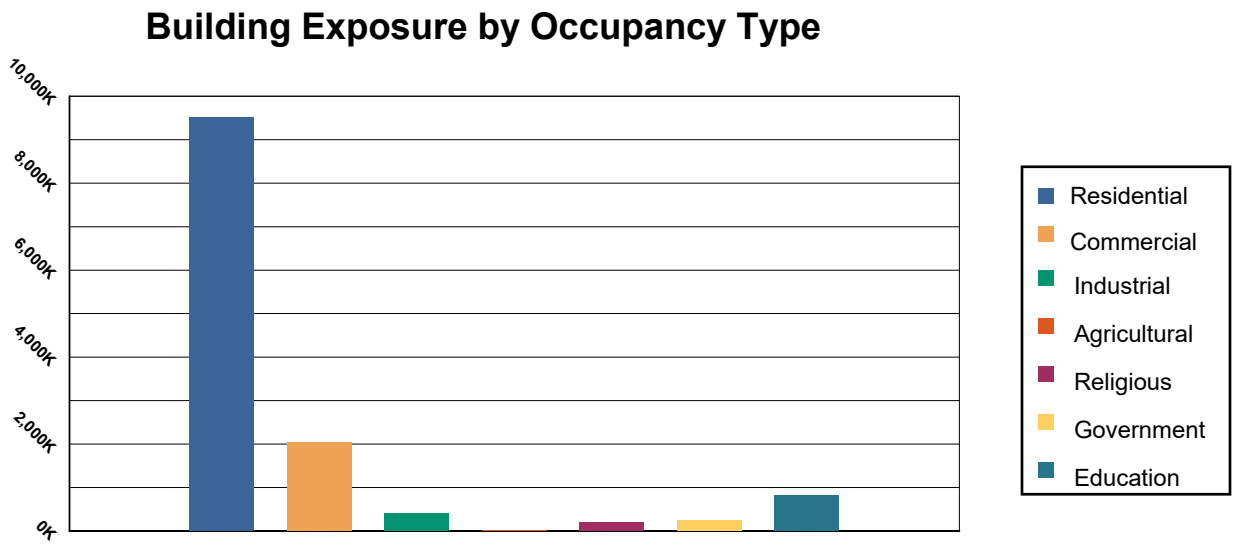

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,508,034	71.93%
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Industrial	408,954	3.09%
Agricultural	13,670	0.10%
Religious	189,174	1.43%
Government	242,153	1.83%
Education	812,794	6.15%
Total	**13,219,019**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds. There are 34 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2,271 buildings will be at least moderately damaged. This is over 11% of the total number of buildings in the region. There are an estimated 128 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

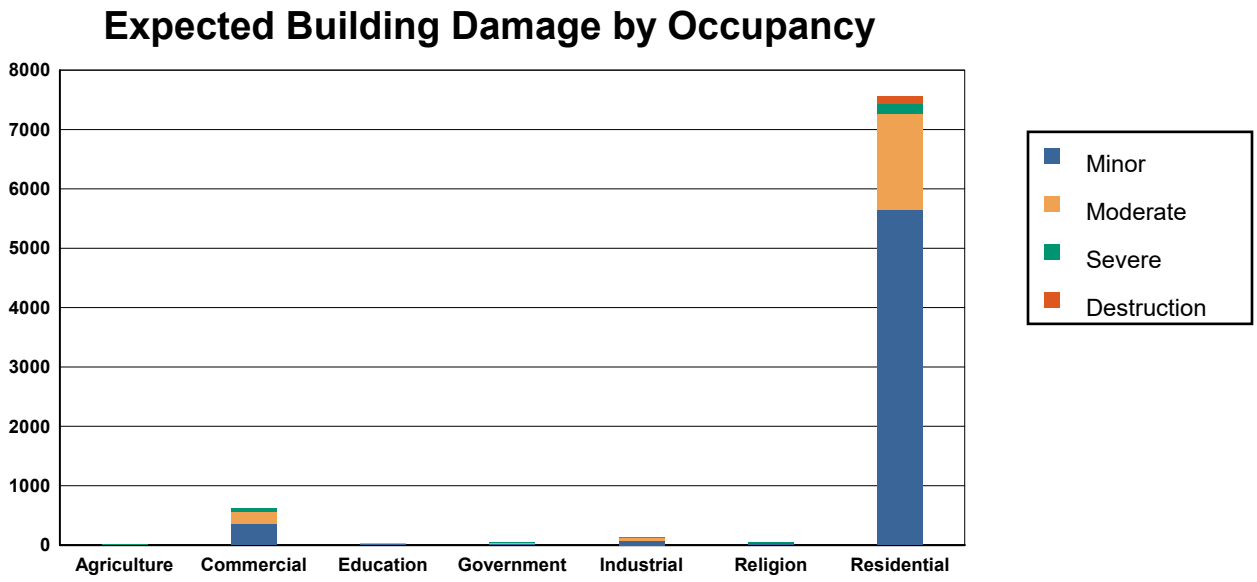


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.11	56.19	8.84	26.00	3.80	11.17	1.93	5.69	0.32	0.95
Commercial	994.48	61.50	366.02	22.64	206.89	12.79	49.18	3.04	0.43	0.03
Education	42.76	64.79	14.36	21.76	7.53	11.41	1.34	2.03	0.00	0.00
Government	73.90	63.71	25.17	21.70	14.27	12.31	2.66	2.29	0.00	0.00
Industrial	186.12	59.27	68.24	21.73	45.13	14.37	13.62	4.34	0.89	0.28
Religion	80.35	62.77	32.13	25.10	13.34	10.42	2.18	1.70	0.00	0.00
Residential	11,502.73	60.33	5,655.68	29.66	1,602.21	8.40	178.78	0.94	126.60	0.66
Total	**12,899.45**		**6,170.45**		**1,893.17**		**249.69**		**128.24**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	173	61.09	62	21.73	42	14.63	7	2.55	0	0.00
Masonry	1,117	57.68	445	22.99	331	17.10	39	2.01	4	0.21
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	652	61.93	210	19.99	147	13.96	43	4.08	0	0.04
Wood	11,029	61.07	5,488	30.39	1,267	7.01	157	0.87	119	0.66

Essential Facility Damage

Before the hurricane, the region had 332 hospital beds available for use. On the day of the hurricane, the model estimates that 332 hospital beds (100%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Thematic Map of Essential Facilities

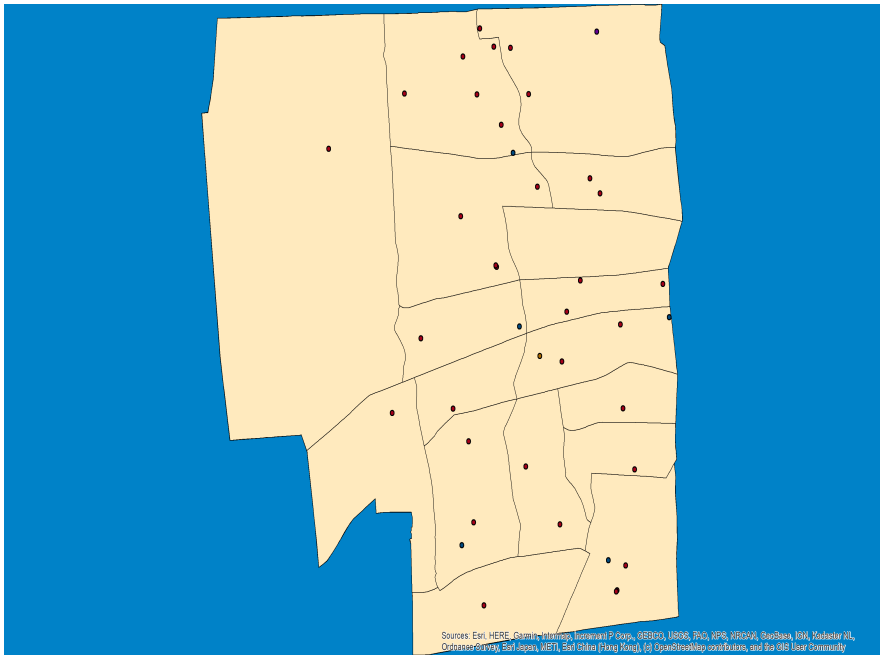
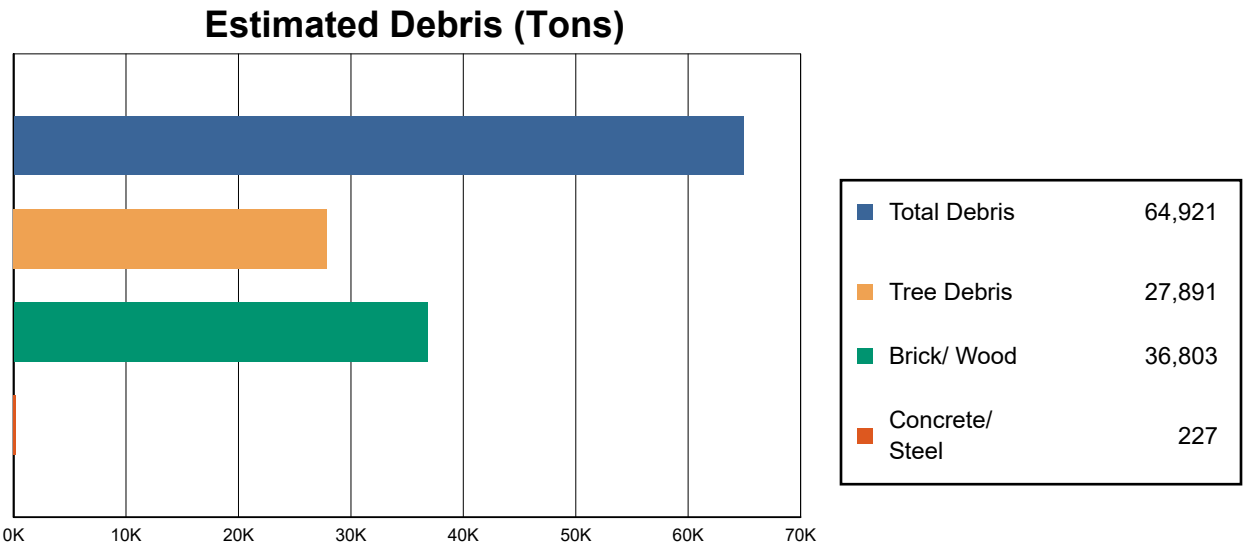


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	5	0	0	5
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	34	2	0	1

Induced Hurricane Damage

Debris Generation

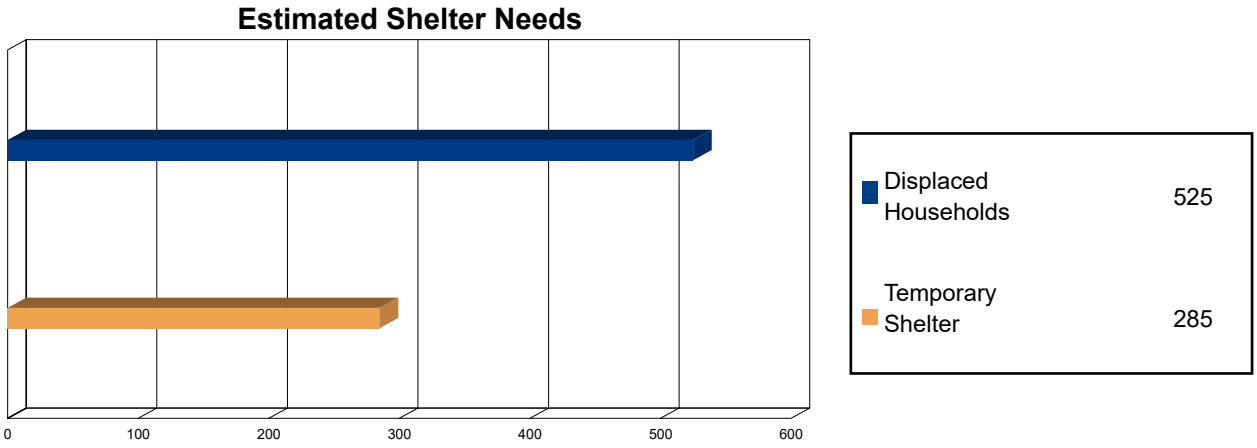


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 64,921 tons of debris will be generated. Of the total amount, 7,347 tons (11%) is Other Tree Debris. Of the remaining 57,574 tons, Brick/Wood comprises 64% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1481 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 20,544 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 525 households to be displaced due to the hurricane. Of these, 285 people (out of a total population of 64,083) will seek temporary shelter in public shelters.

Economic Loss

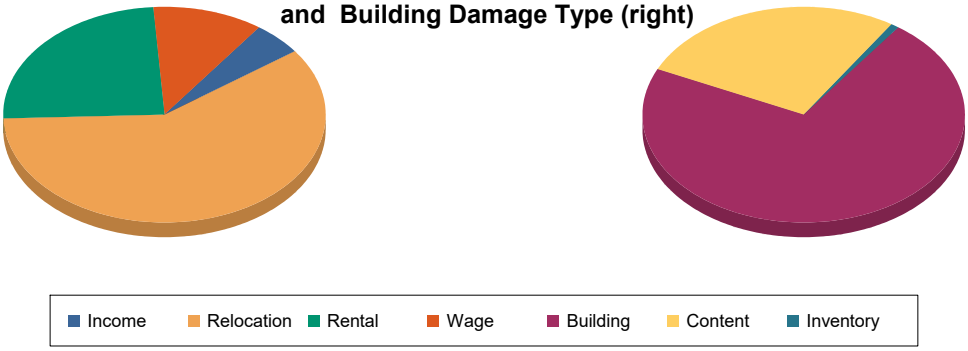
The total economic loss estimated for the hurricane is 712.2 million dollars, which represents 5.39 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 712 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 80% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

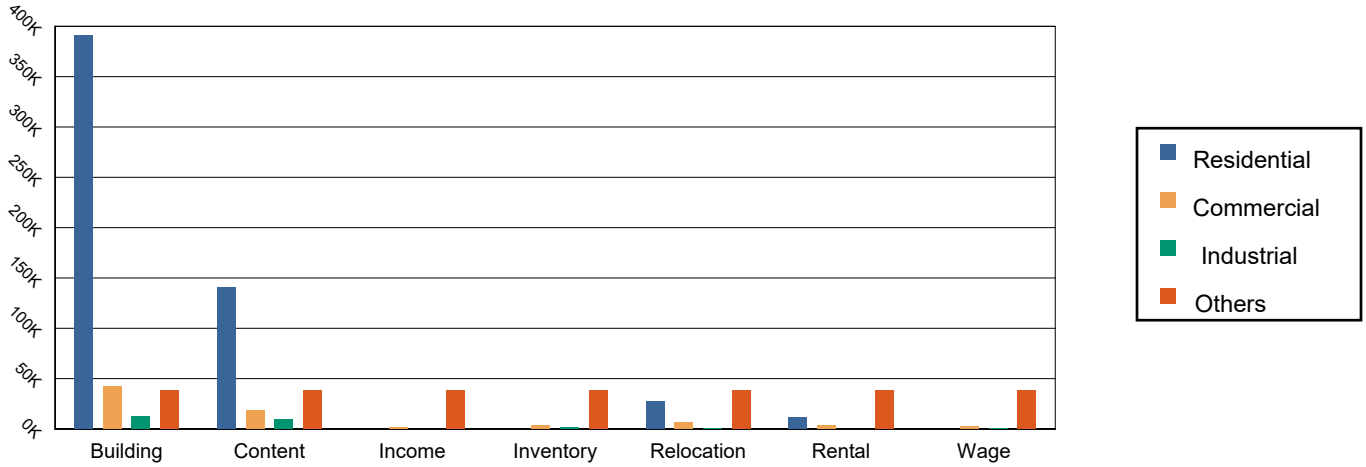


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	391,184.13	42,277.32	12,563.81	19,382.34	465,407.60
	Content	140,550.67	18,653.93	9,659.78	8,222.02	177,086.41
	Inventory	0.00	3,145.56	1,149.40	192.29	4,487.25
	Subtotal	**531,734.80**	**64,076.82**	**23,373.00**	**27,796.64**	**646,981.26**
Business Interruption Loss						
	Income	0.46	1,887.59	110.94	1,219.65	3,218.64
	Relocation	27,406.03	6,794.83	837.39	3,797.68	38,835.92
	Rental	11,943.11	3,462.13	124.49	466.99	15,996.71
	Wage	1.08	2,318.88	179.36	4,711.25	7,210.57
	Subtotal	**39,350.68**	**14,463.43**	**1,252.17**	**10,195.56**	**65,261.84**

Total

Total	**571,085.48**	**78,540.25**	**24,625.17**	**37,992.20**	**712,243.10**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	64,083	9,508,034	3,710,985	13,219,019
Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**
Study Region Total	**64,083**	**9,508,034**	**3,710,985**	**13,219,019**

Hazus: Hurricane Global Risk Report

Region Name:	Wethersfield_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.10 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 27,298 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,172 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

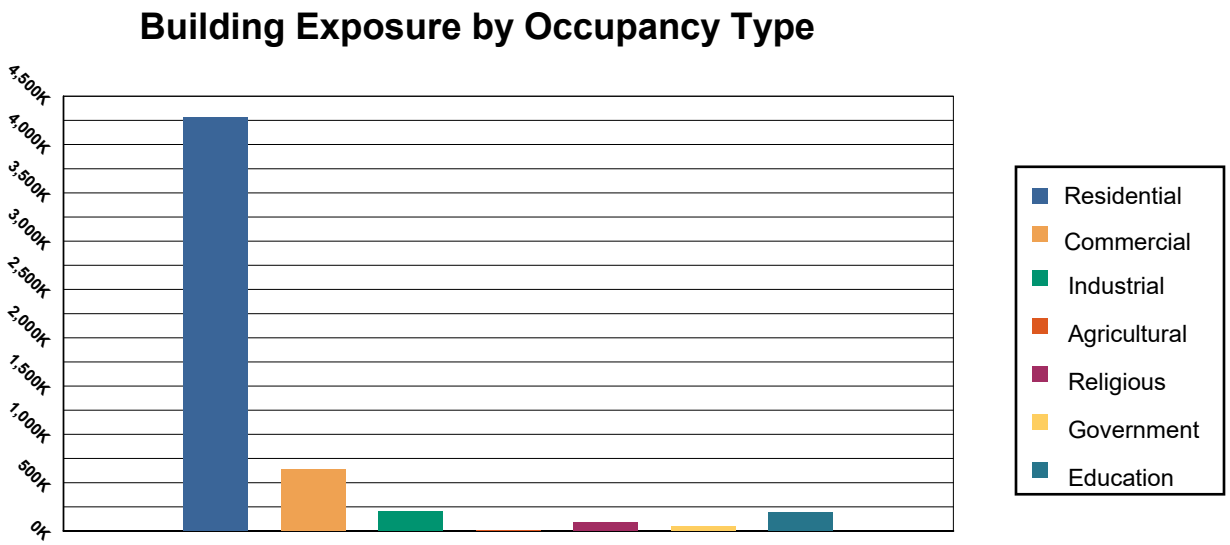


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,277,504	78.50%
Commercial	638,390	11.72%
Industrial	200,978	3.69%
Agricultural	10,158	0.19%
Religious	84,475	1.55%
Government	46,583	0.85%
Education	191,133	3.51%
Total	**5,449,221**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds. There are 11 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

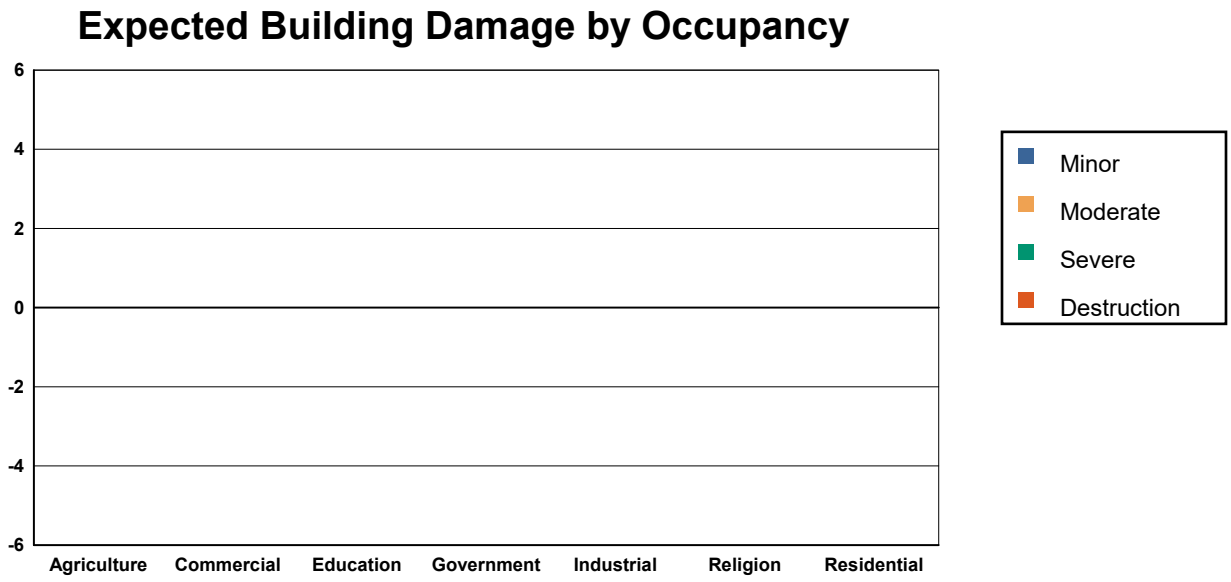


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	23.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	472.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	31.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	18.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	141.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	41.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	8,446.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**9,172.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	112	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	815	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	11	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	353	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	7,877	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

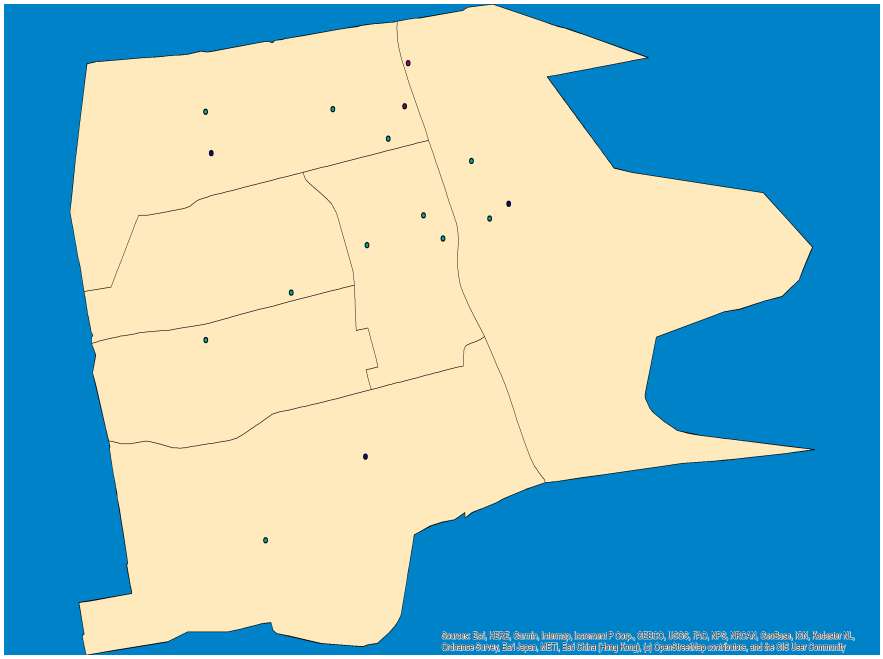
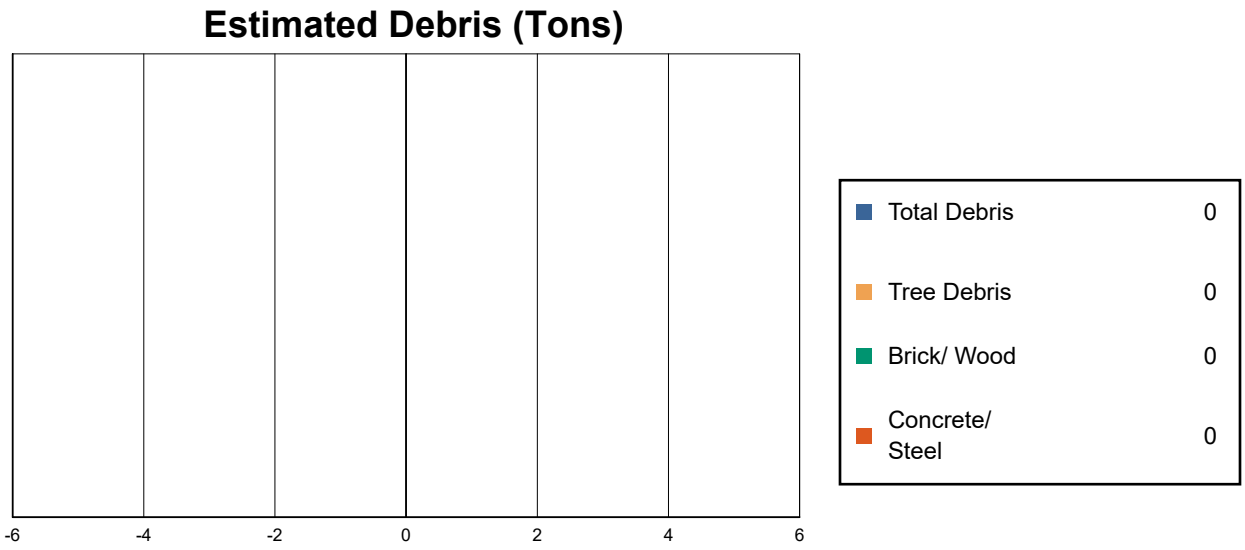


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

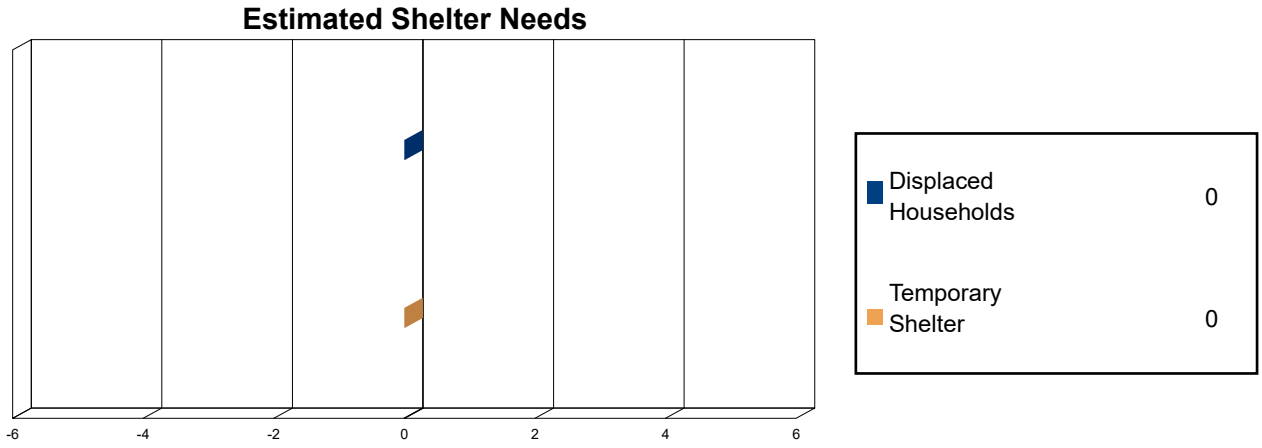


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 27,298) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

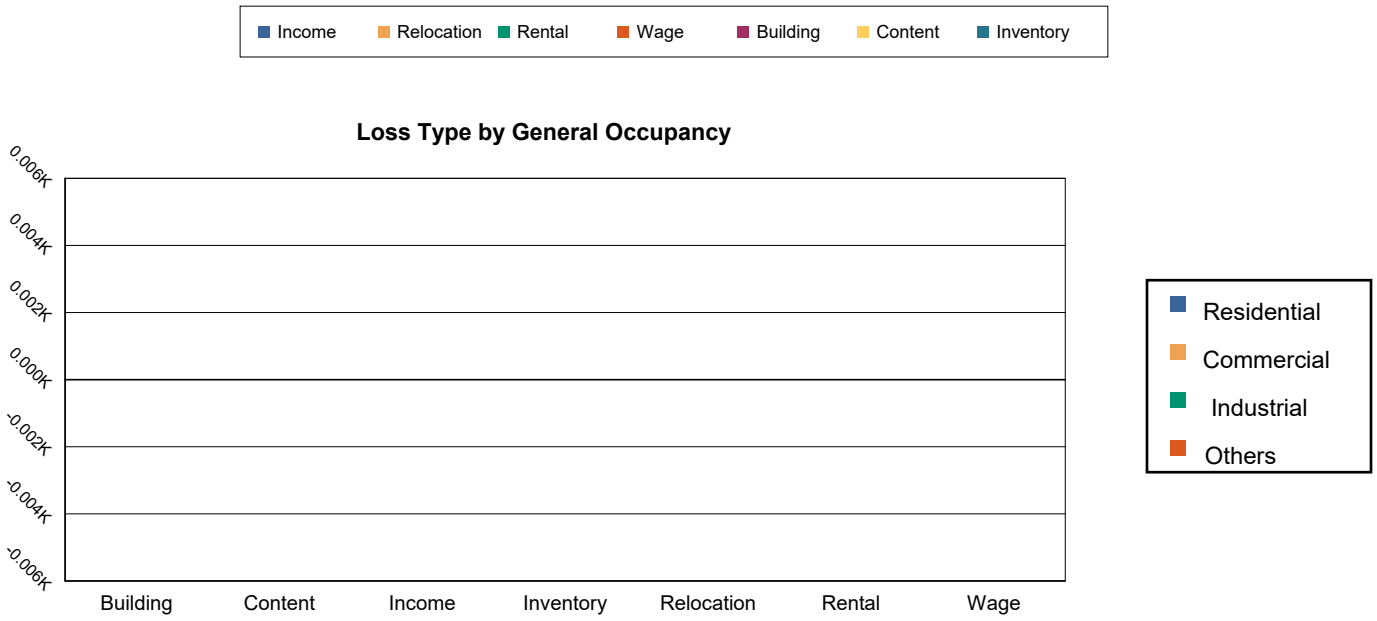


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,504	1,171,717	5,449,221
Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**
Study Region Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**

Hazus: Hurricane Global Risk Report

Region Name:	Wethersfield_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
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Shelter Requirements	
Economic Loss	9
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There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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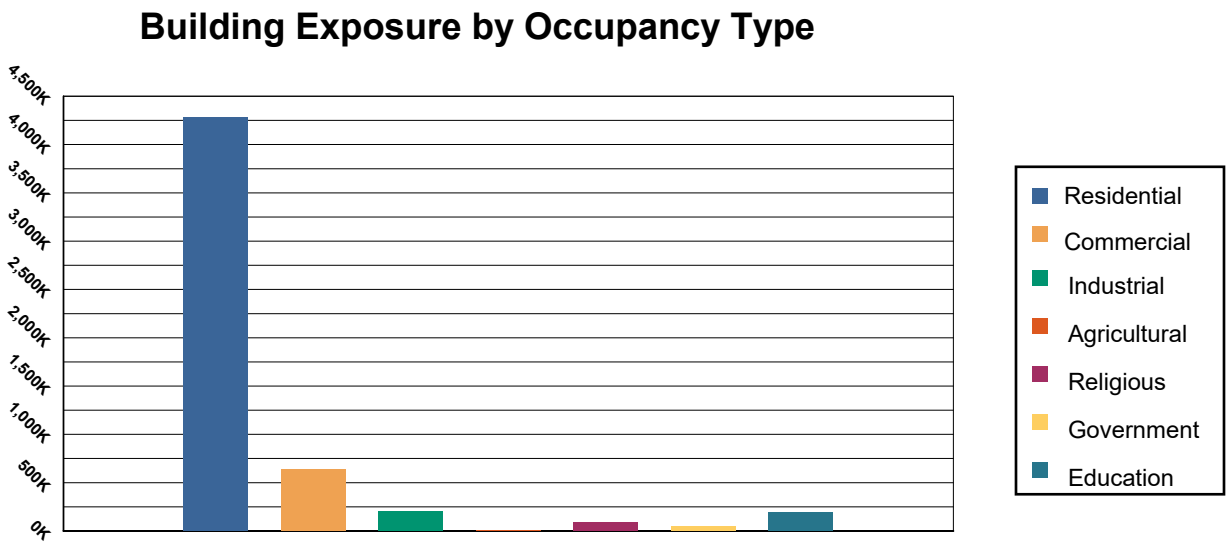

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Agricultural	10,158	0.19%
Religious	84,475	1.55%
Government	46,583	0.85%
Education	191,133	3.51%
Total	**5,449,221**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds. There are 11 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

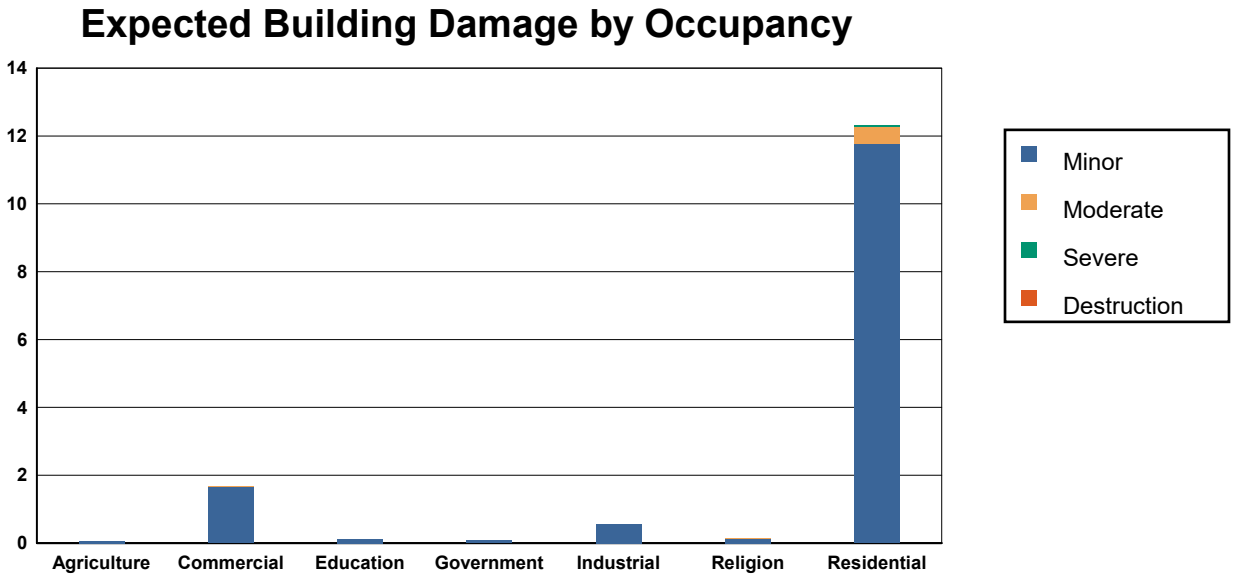


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.93	99.71	0.06	0.28	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	470.31	99.64	1.67	0.35	0.02	0.00	0.00	0.00	0.00	0.00
Education	30.88	99.62	0.12	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Government	17.93	99.59	0.07	0.41	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	140.44	99.60	0.56	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Religion	40.88	99.70	0.12	0.29	0.00	0.01	0.00	0.00	0.00	0.00
Residential	8,433.68	99.85	11.79	0.14	0.48	0.01	0.06	0.00	0.00	0.00
Total	**9,157.05**		**14.39**		**0.50**		**0.06**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	111	99.43	1	0.57	0	0.00	0	0.00	0	0.00
Masonry	810	99.43	4	0.54	0	0.02	0	0.00	0	0.00
MH	11	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	351	99.57	1	0.42	0	0.00	0	0.00	0	0.00
Wood	7,872	99.94	5	0.06	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

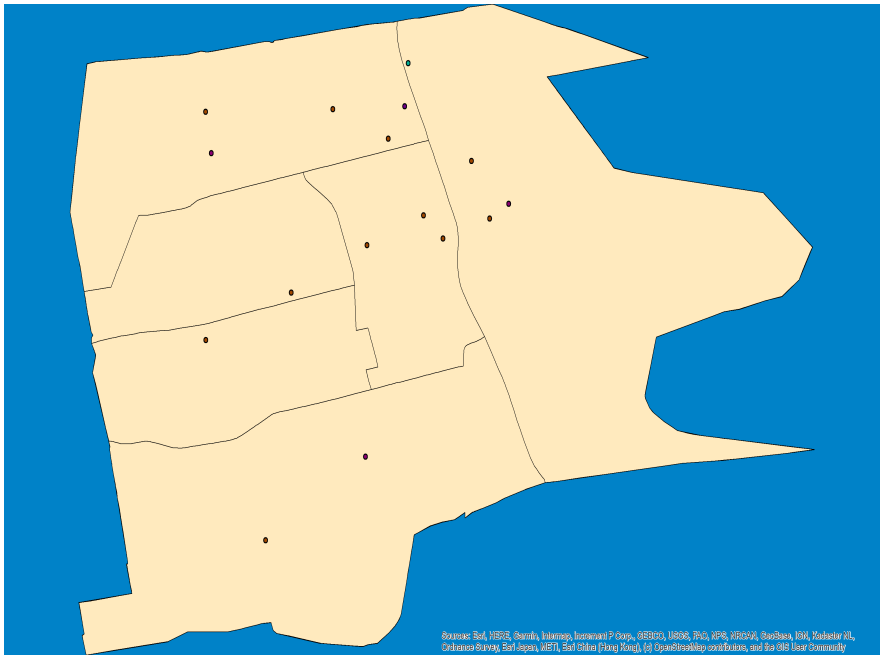
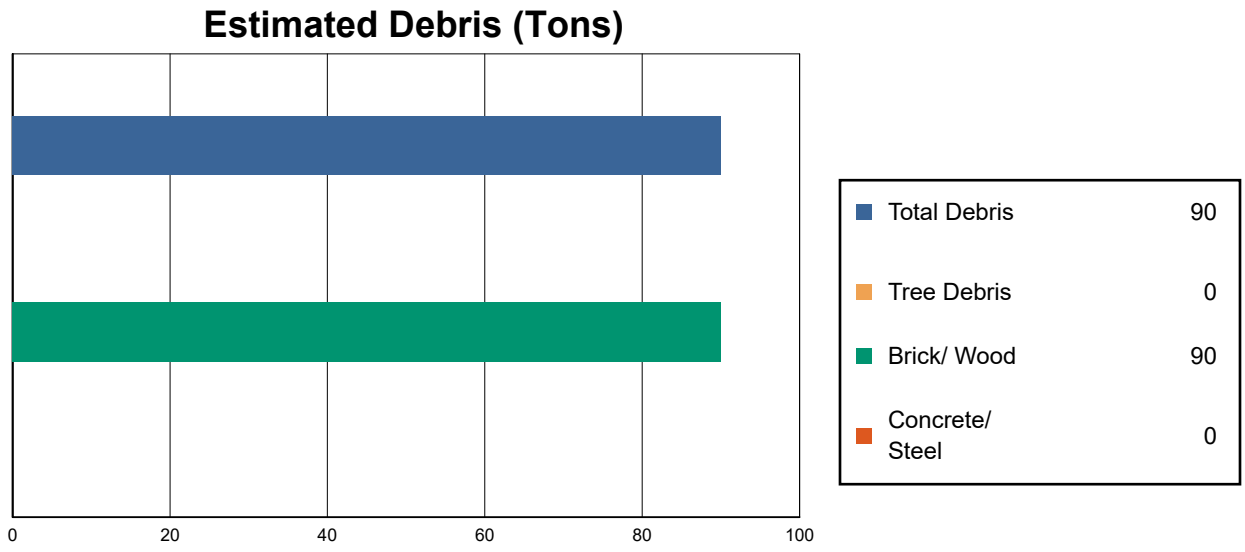


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

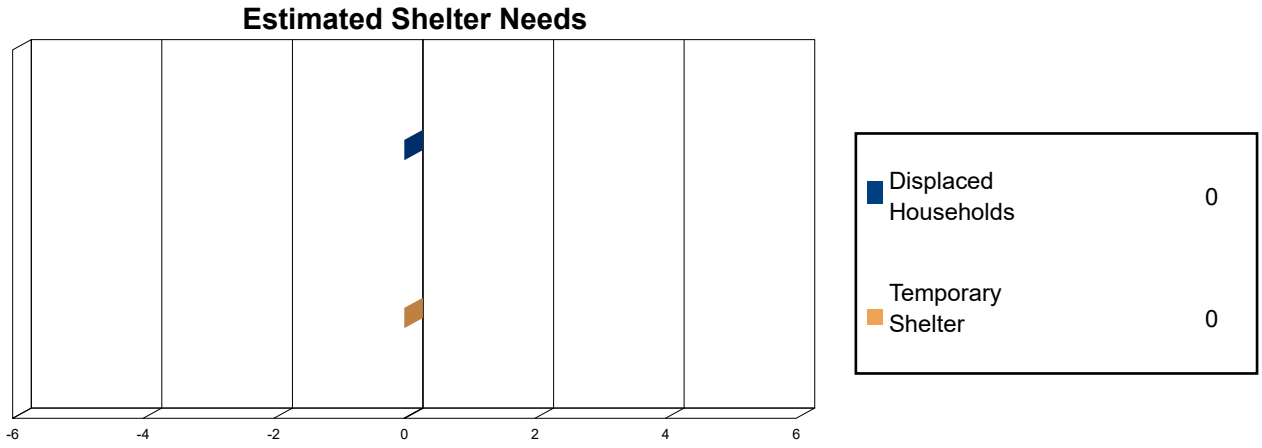


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 90 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 90 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 4 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 27,298) will seek temporary shelter in public shelters.

Economic Loss

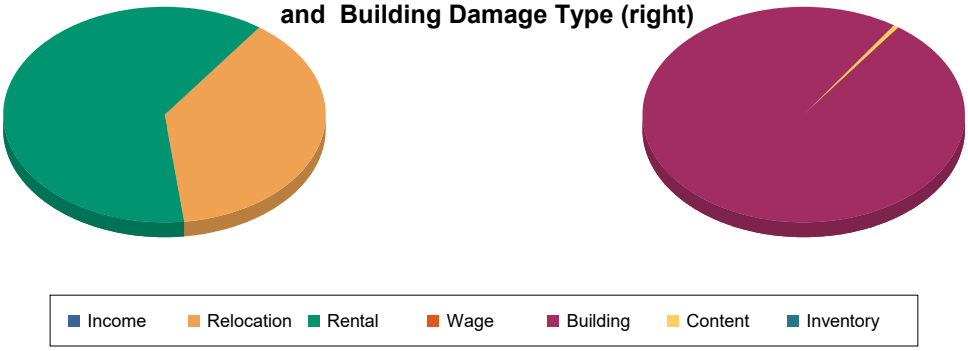
The total economic loss estimated for the hurricane is 1.8 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

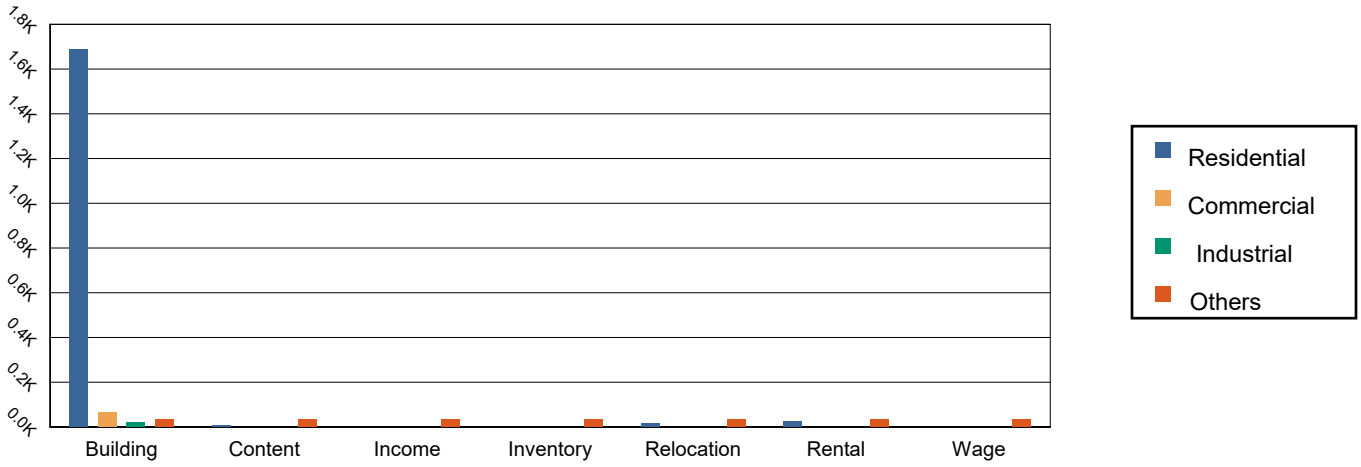


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,685.49	63.84	20.10	32.22	1,801.64
	Content	8.78	0.00	0.00	0.00	8.78
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,694.27**	**63.84**	**20.10**	**32.22**	**1,810.42**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	14.19	0.21	0.00	0.05	14.45
	Rental	23.61	0.00	0.00	0.00	23.61
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**37.80**	**0.21**	**0.00**	**0.05**	**38.06**

Total

Total	**1,732.06**	**64.05**	**20.10**	**32.27**	**1,848.48**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,504	1,171,717	5,449,221
Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**
Study Region Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**

Hazus: Hurricane Global Risk Report

Region Name:	Wethersfield_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.10 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 27,298 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,172 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

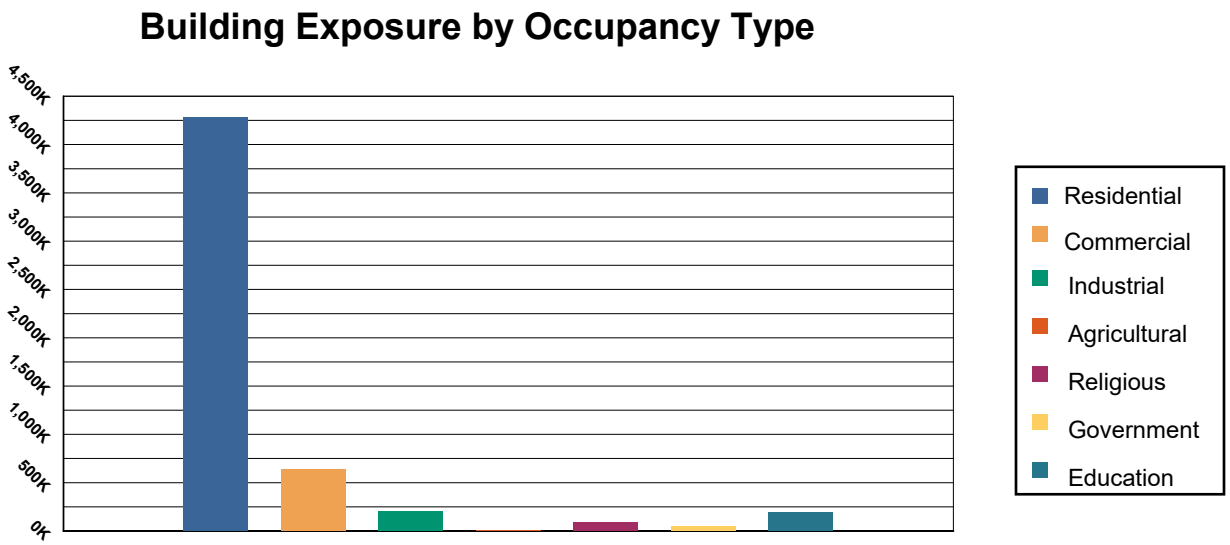


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,277,504	78.50%
Commercial	638,390	11.72%
Industrial	200,978	3.69%
Agricultural	10,158	0.19%
Religious	84,475	1.55%
Government	46,583	0.85%
Education	191,133	3.51%
Total	**5,449,221**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds. There are 11 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 16 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

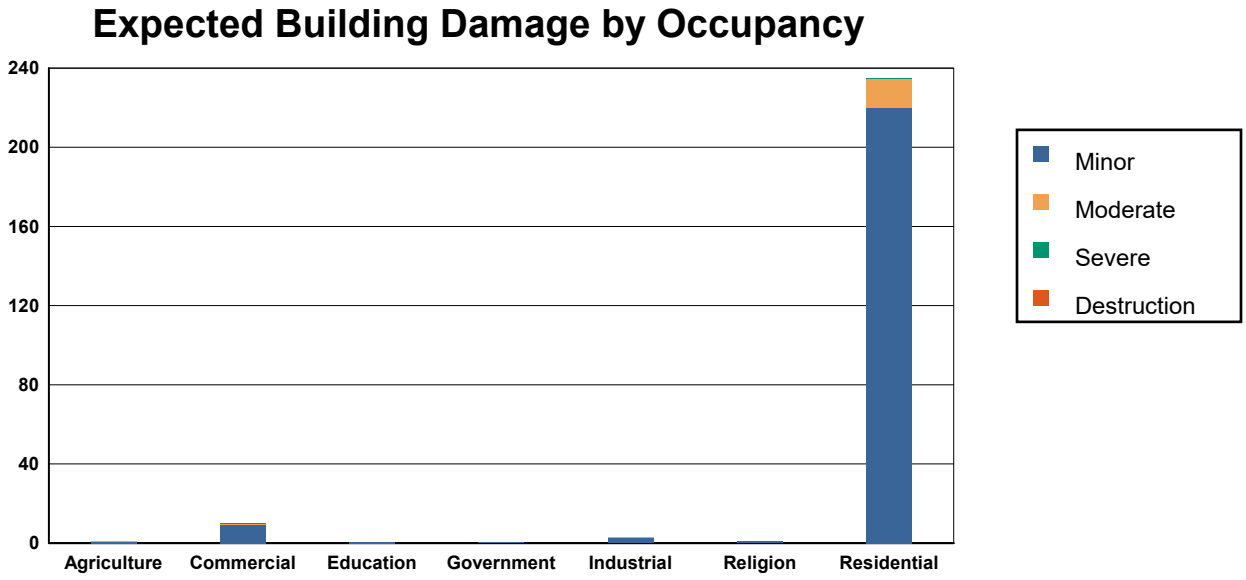


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	22.39	97.37	0.52	2.27	0.06	0.27	0.02	0.08	0.00	0.01
Commercial	461.84	97.85	9.09	1.93	0.99	0.21	0.08	0.02	0.00	0.00
Education	30.37	97.98	0.61	1.96	0.02	0.05	0.00	0.00	0.00	0.00
Government	17.64	98.00	0.35	1.95	0.01	0.04	0.00	0.00	0.00	0.00
Industrial	137.94	97.83	2.89	2.05	0.14	0.10	0.03	0.02	0.00	0.00
Religion	40.19	98.01	0.79	1.92	0.02	0.06	0.00	0.01	0.00	0.00
Residential	8,211.28	97.22	219.90	2.60	14.41	0.17	0.41	0.00	0.00	0.00
Total	**8,921.65**		**234.15**		**15.65**		**0.54**		**0.01**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	109	97.06	3	2.84	0	0.10	0	0.00	0	0.00
Masonry	784	96.22	26	3.17	5	0.59	0	0.02	0	0.00
MH	11	99.69	0	0.24	0	0.06	0	0.00	0	0.02
Steel	345	97.75	7	2.04	1	0.20	0	0.01	0	0.00
Wood	7,684	97.55	186	2.36	7	0.09	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

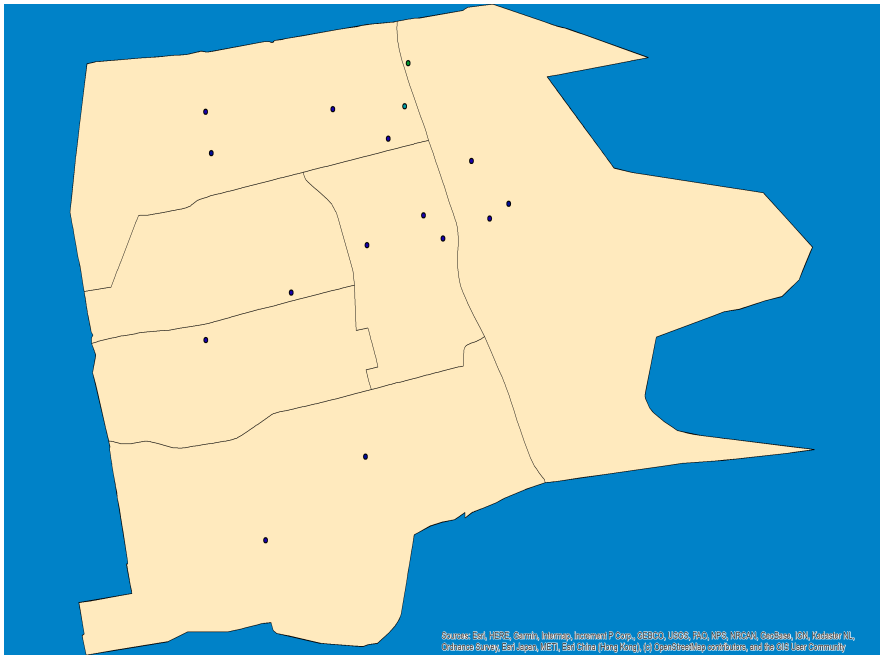
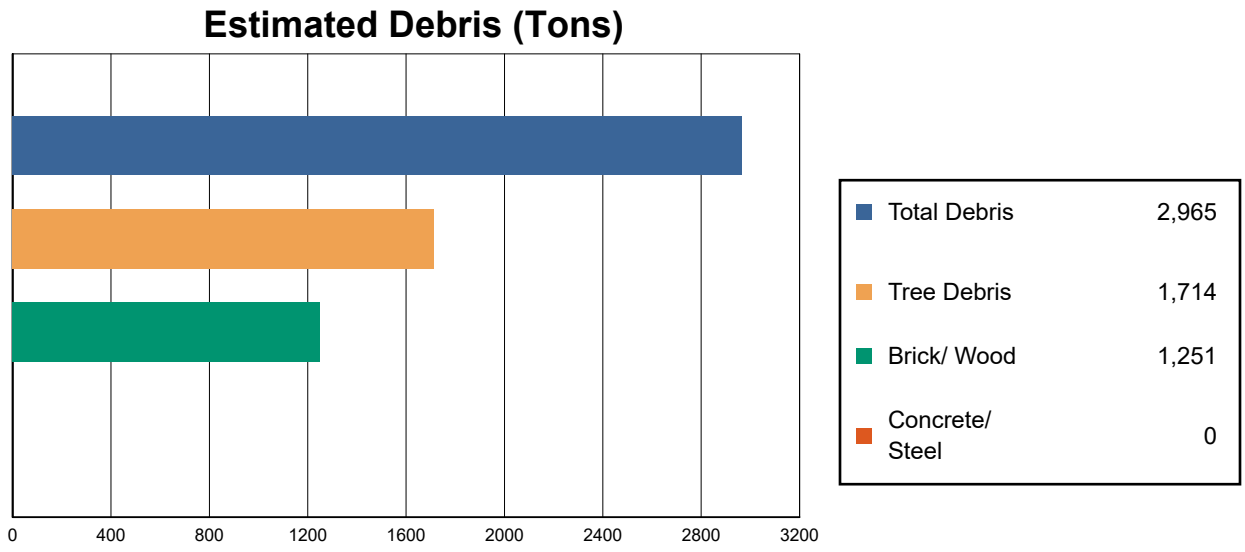


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

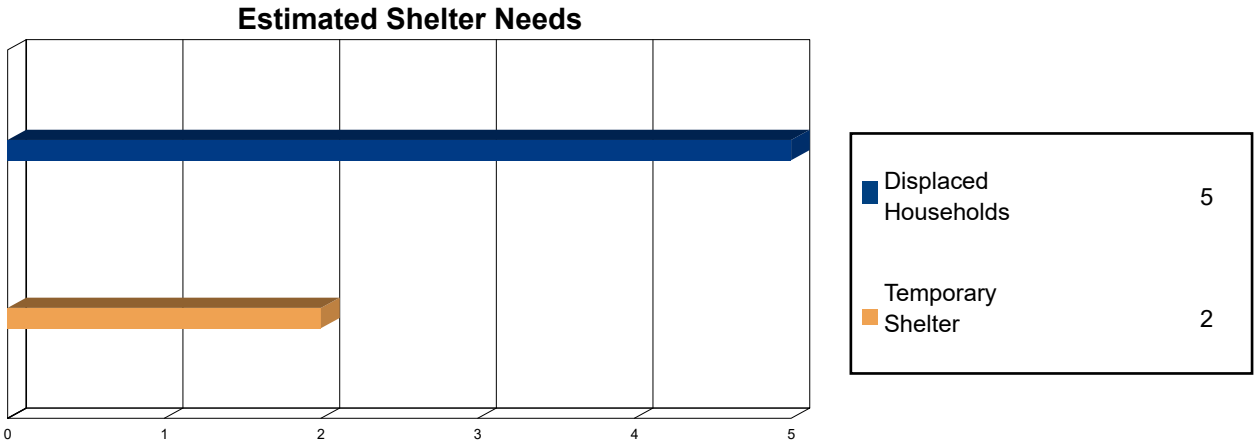


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,965 tons of debris will be generated. Of the total amount, 549 tons (19%) is Other Tree Debris. Of the remaining 2,416 tons, Brick/Wood comprises 52% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 50 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,165 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the hurricane. Of these, 2 people (out of a total population of 27,298) will seek temporary shelter in public shelters.

Economic Loss

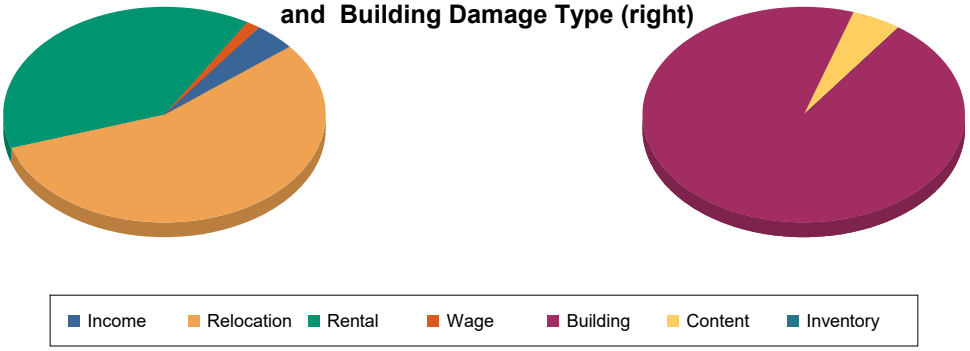
The total economic loss estimated for the hurricane is 16.5 million dollars, which represents 0.30 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 17 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

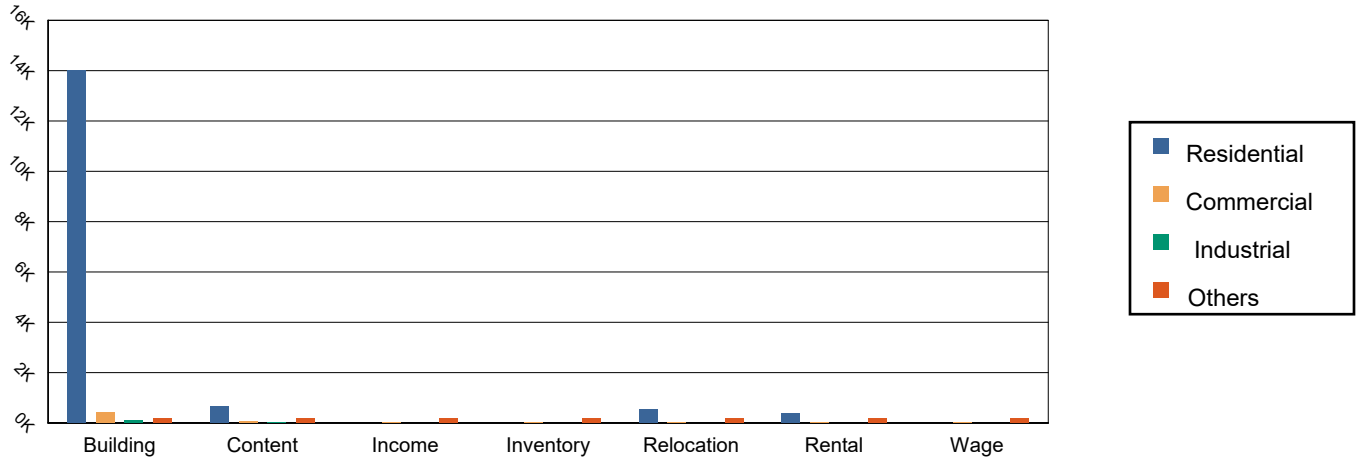


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	14,001.55	407.45	104.95	179.48	14,693.43
	Content	648.99	72.40	25.14	10.32	756.85
	Inventory	0.00	10.55	3.23	1.47	15.26
	Subtotal	**14,650.54**	**490.40**	**133.32**	**191.28**	**15,465.54**
Business Interruption Loss						
	Income	0.00	43.20	0.00	0.00	43.20
	Relocation	556.70	31.48	0.76	1.19	590.12
	Rental	388.33	17.67	0.00	0.00	406.00
	Wage	0.00	15.35	0.00	0.00	15.35
	Subtotal	**945.03**	**107.70**	**0.76**	**1.19**	**1,054.68**

Total

Total	**15,595.57**	**598.10**	**134.09**	**192.47**	**16,520.22**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,504	1,171,717	5,449,221
Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**
Study Region Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**

Hazus: Hurricane Global Risk Report

Region Name:	Wethersfield_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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Note:
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There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

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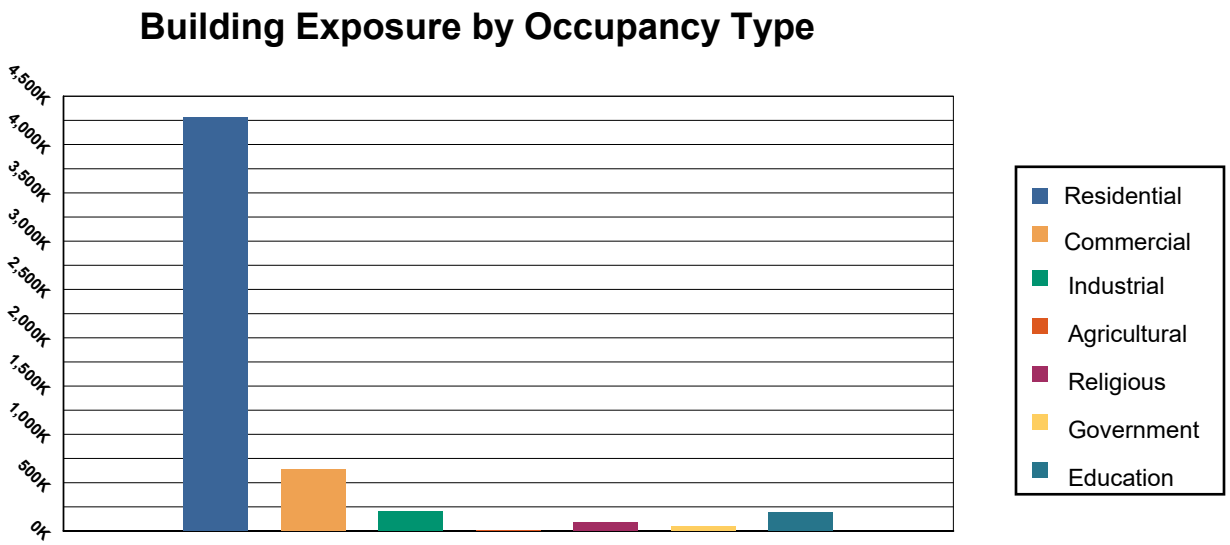

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Agricultural	10,158	0.19%
Religious	84,475	1.55%
Government	46,583	0.85%
Education	191,133	3.51%
Total	**5,449,221**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds. There are 11 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 89 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

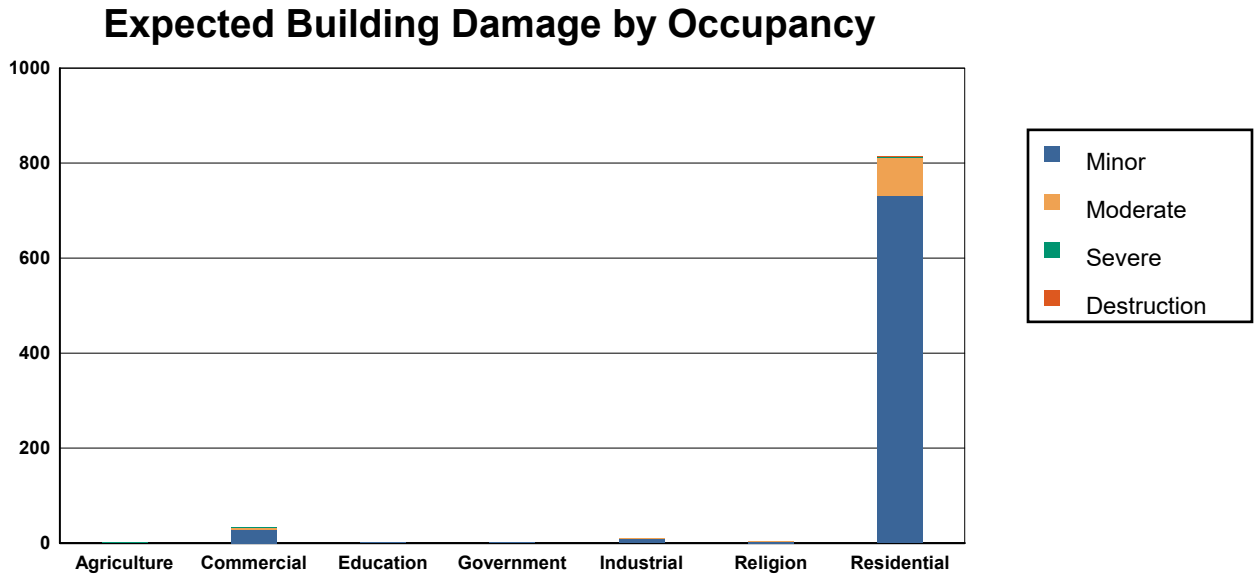


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	20.92	90.96	1.62	7.06	0.31	1.37	0.13	0.58	0.01	0.04
Commercial	438.58	92.92	27.62	5.85	5.09	1.08	0.71	0.15	0.00	0.00
Education	28.98	93.48	1.84	5.92	0.18	0.59	0.00	0.01	0.00	0.00
Government	16.82	93.42	1.07	5.95	0.11	0.62	0.00	0.01	0.00	0.00
Industrial	131.31	93.13	8.35	5.92	1.14	0.81	0.19	0.13	0.01	0.01
Religion	38.22	93.21	2.56	6.24	0.22	0.53	0.01	0.02	0.00	0.00
Residential	7,632.37	90.37	732.25	8.67	78.63	0.93	1.87	0.02	0.87	0.01
Total	**8,307.19**		**775.31**		**85.69**		**2.92**		**0.89**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	102	90.96	9	7.92	1	1.12	0	0.01	0	0.00
Masonry	728	89.36	66	8.11	20	2.41	1	0.11	0	0.01
MH	11	97.95	0	1.44	0	0.43	0	0.00	0	0.18
Steel	328	92.91	20	5.78	4	1.15	1	0.16	0	0.00
Wood	7,166	90.97	663	8.42	45	0.58	2	0.02	1	0.01

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

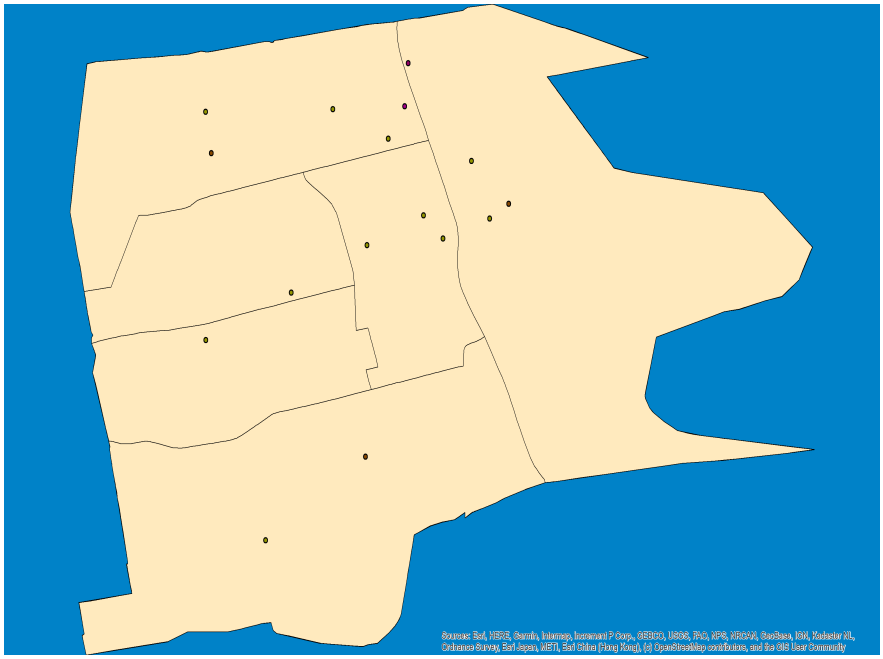
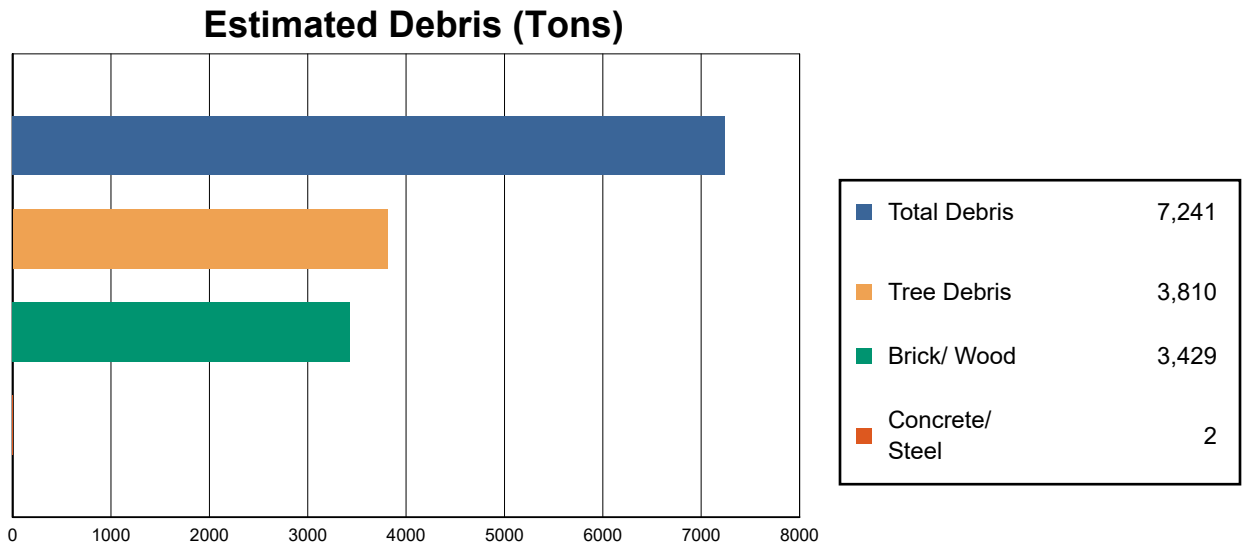


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

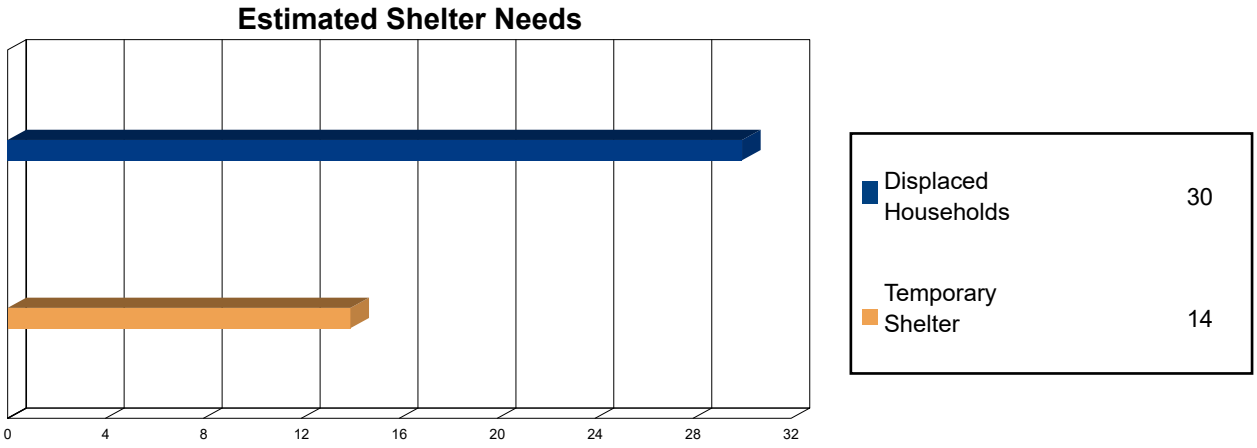


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7,241 tons of debris will be generated. Of the total amount, 1,225 tons (17%) is Other Tree Debris. Of the remaining 6,016 tons, Brick/Wood comprises 57% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 137 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,585 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 30 households to be displaced due to the hurricane. Of these, 14 people (out of a total population of 27,298) will seek temporary shelter in public shelters.

Economic Loss

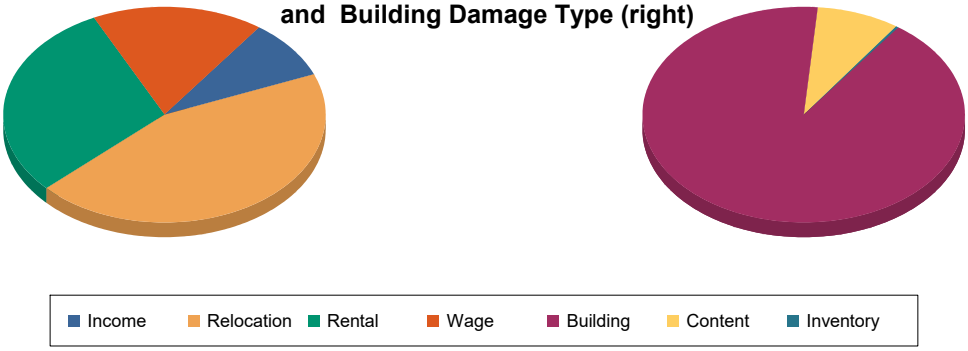
The total economic loss estimated for the hurricane is 40.8 million dollars, which represents 0.75 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 41 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 89% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

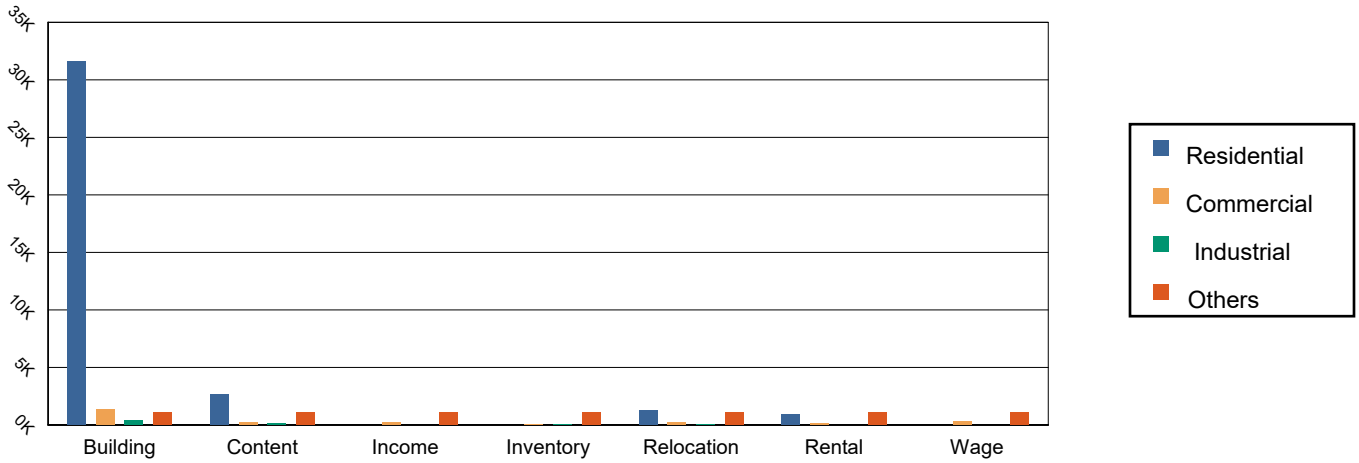


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	31,637.47	1,344.78	384.40	580.08	33,946.74
	Content	2,669.14	247.61	153.95	84.59	3,155.29
	Inventory	0.00	36.88	20.23	10.09	67.21
	Subtotal	**34,306.60**	**1,629.27**	**558.58**	**674.77**	**37,169.23**
Business Interruption Loss						
	Income	0.00	245.53	5.14	78.21	328.88
	Relocation	1,284.92	230.43	18.62	85.62	1,619.58
	Rental	939.12	131.90	2.81	9.77	1,083.60
	Wage	0.00	353.75	8.41	271.20	633.36
	Subtotal	**2,224.04**	**961.61**	**34.98**	**444.80**	**3,665.42**

Total

Total	**36,530.64**	**2,590.88**	**593.56**	**1,119.57**	**40,834.65**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,504	1,171,717	5,449,221
Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**
Study Region Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**

Hazus: Hurricane Global Risk Report

Region Name:	Wethersfield_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.10 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 27,298 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,172 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

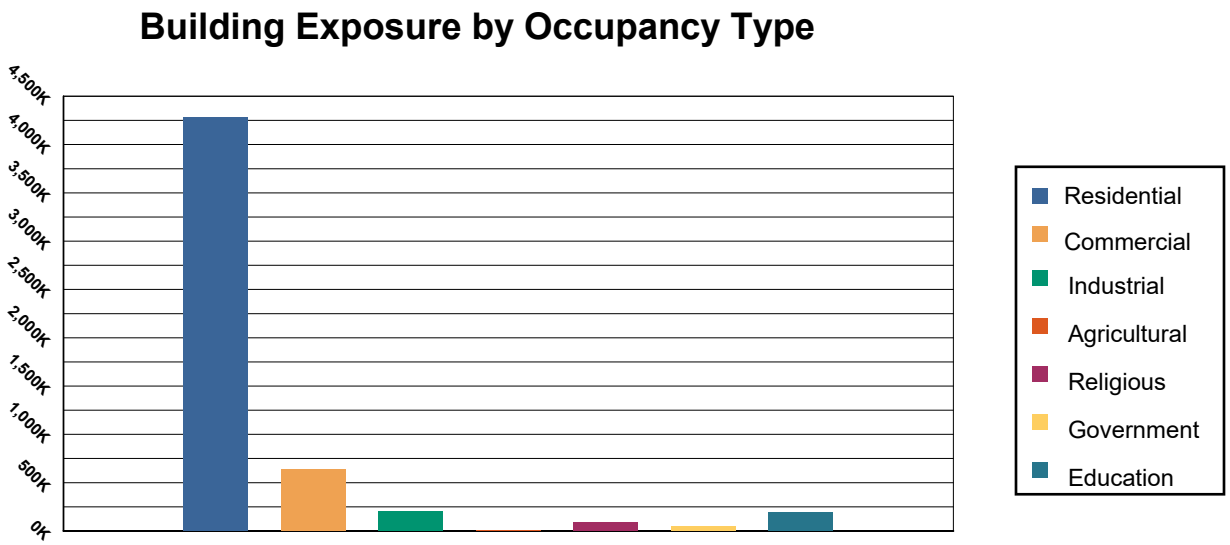


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,277,504	78.50%
Commercial	638,390	11.72%
Industrial	200,978	3.69%
Agricultural	10,158	0.19%
Religious	84,475	1.55%
Government	46,583	0.85%
Education	191,133	3.51%
Total	**5,449,221**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds. There are 11 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 272 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 7 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

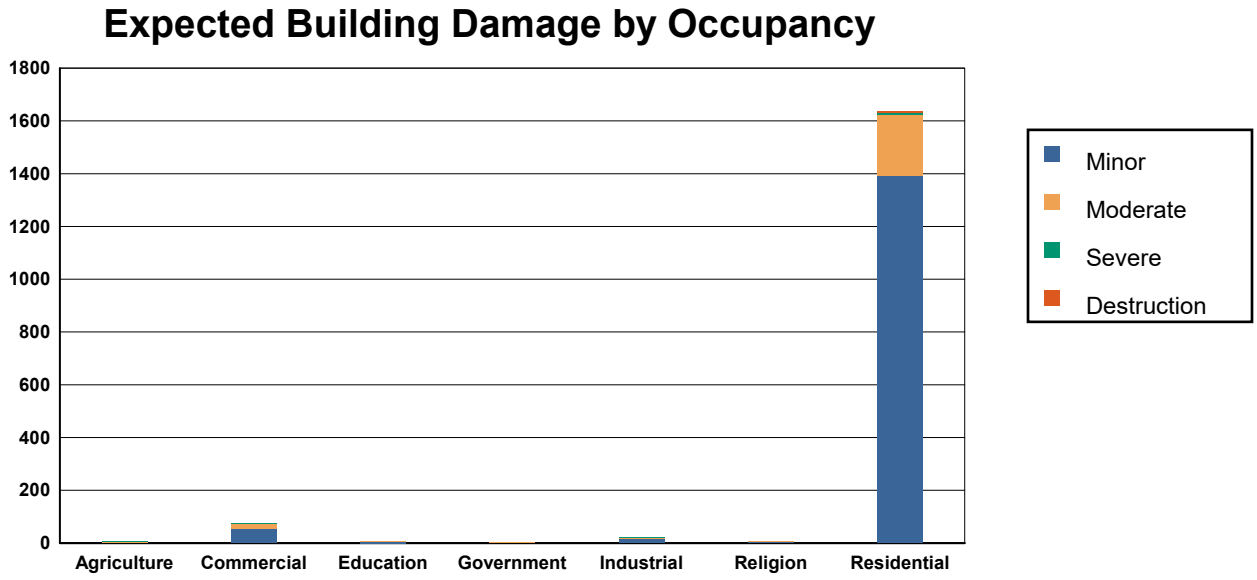


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	18.51	80.46	3.20	13.92	0.86	3.72	0.39	1.71	0.04	0.18
Commercial	397.41	84.20	55.96	11.85	15.95	3.38	2.68	0.57	0.01	0.00
Education	26.39	85.12	3.73	12.03	0.84	2.71	0.05	0.15	0.00	0.00
Government	15.38	85.43	2.11	11.71	0.49	2.72	0.03	0.14	0.00	0.00
Industrial	119.09	84.46	16.64	11.80	4.47	3.17	0.74	0.53	0.05	0.04
Religion	34.65	84.50	5.33	13.01	0.96	2.35	0.06	0.13	0.00	0.00
Residential	6,807.10	80.60	1,394.04	16.51	228.37	2.70	9.42	0.11	7.07	0.08
Total	**7,418.52**		**1,481.00**		**251.95**		**13.36**		**7.17**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	90	80.72	16	14.67	5	4.51	0	0.11	0	0.00
Masonry	647	79.40	117	14.31	48	5.88	3	0.37	0	0.04
MH	10	93.29	0	3.99	0	1.87	0	0.05	0	0.80
Steel	297	84.15	40	11.39	14	3.83	2	0.62	0	0.00
Wood	6,415	81.44	1,294	16.42	153	1.94	9	0.11	7	0.08

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

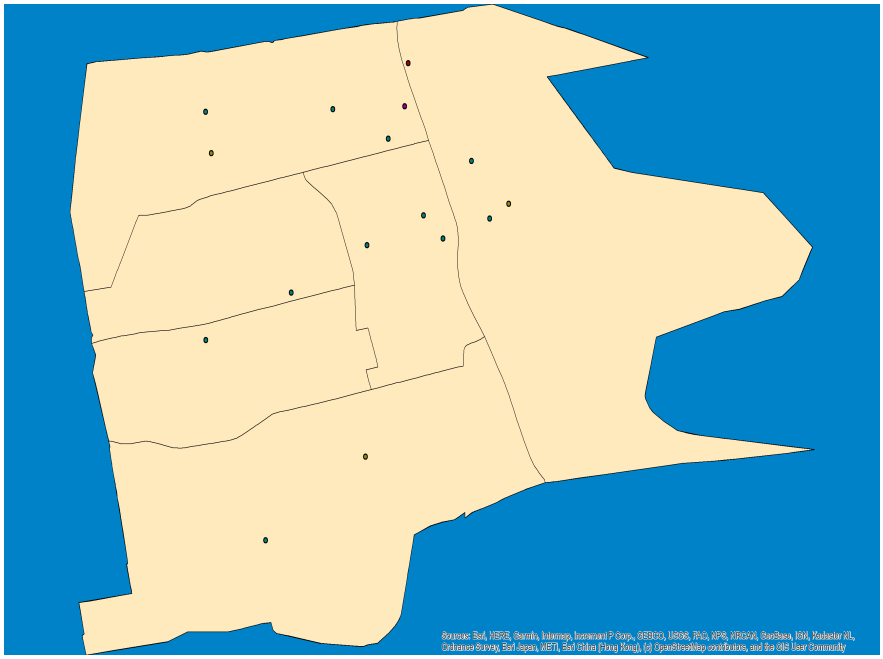
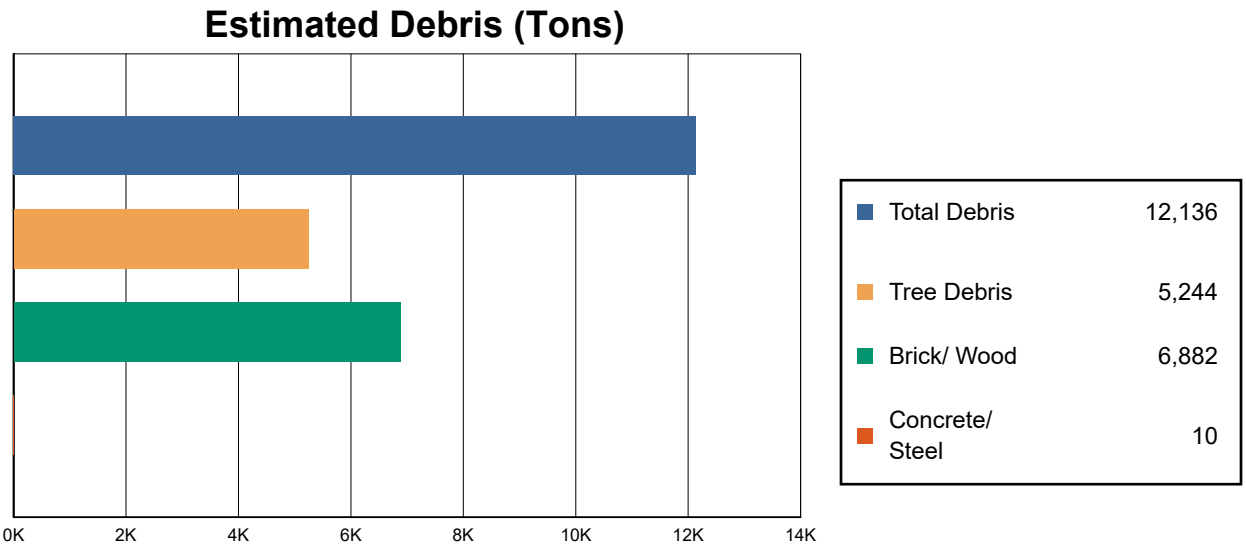


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

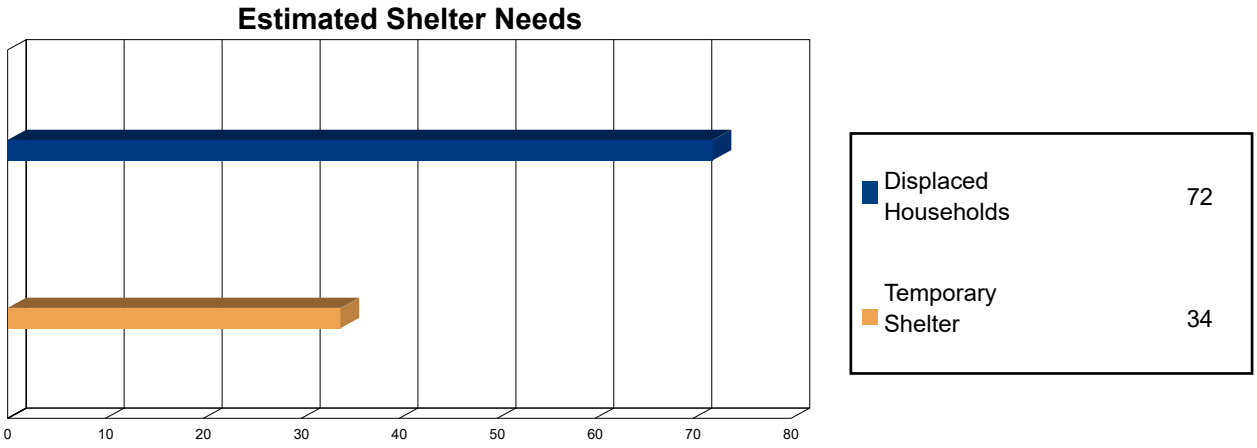


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 12,136 tons of debris will be generated. Of the total amount, 1,655 tons (14%) is Other Tree Debris. Of the remaining 10,481 tons, Brick/Wood comprises 66% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 276 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,589 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 72 households to be displaced due to the hurricane. Of these, 34 people (out of a total population of 27,298) will seek temporary shelter in public shelters.

Economic Loss

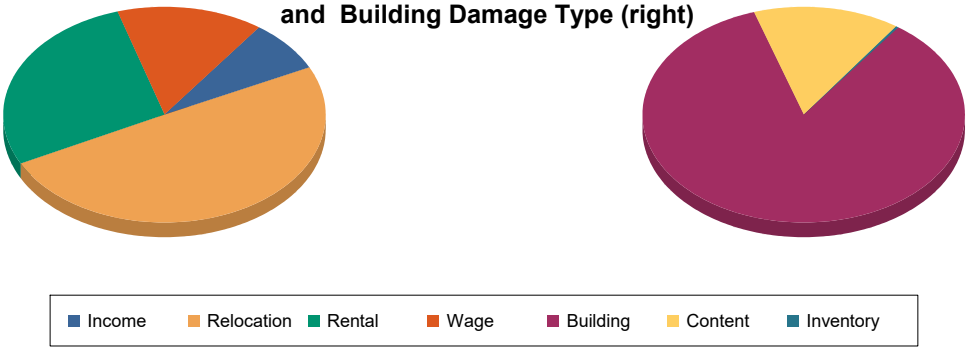
The total economic loss estimated for the hurricane is 84.5 million dollars, which represents 1.55 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 84 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 87% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

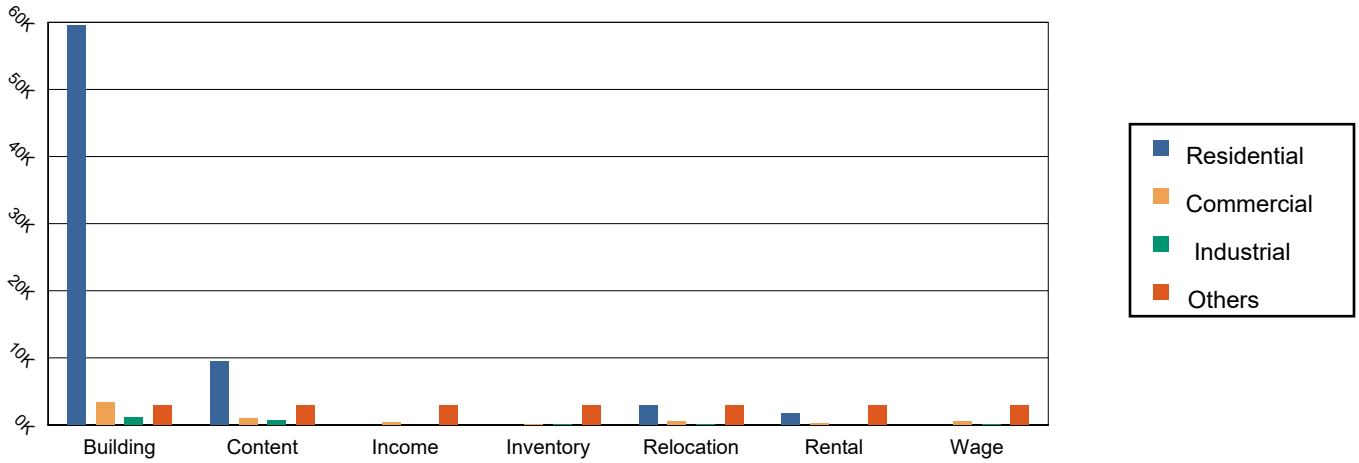


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	59,565.22	3,316.90	1,130.08	1,482.76	65,494.96
	Content	9,407.98	963.69	622.30	361.88	11,355.86
	Inventory	0.00	135.37	81.11	33.67	250.15
	Subtotal	**68,973.20**	**4,415.96**	**1,833.49**	**1,878.31**	**77,100.96**
Business Interruption Loss						
	Income	0.00	408.98	13.16	160.69	582.84
	Relocation	2,870.58	487.72	66.81	233.70	3,658.81
	Rental	1,782.72	240.01	8.03	21.22	2,051.99
	Wage	0.00	529.08	21.27	537.95	1,088.30
	Subtotal	**4,653.30**	**1,665.80**	**109.28**	**953.56**	**7,381.94**

Total

Total	**73,626.50**	**6,081.76**	**1,942.77**	**2,831.88**	**84,482.91**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,504	1,171,717	5,449,221
Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**
Study Region Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**

Hazus: Hurricane Global Risk Report

Region Name:	Wethersfield_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.10 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 27,298 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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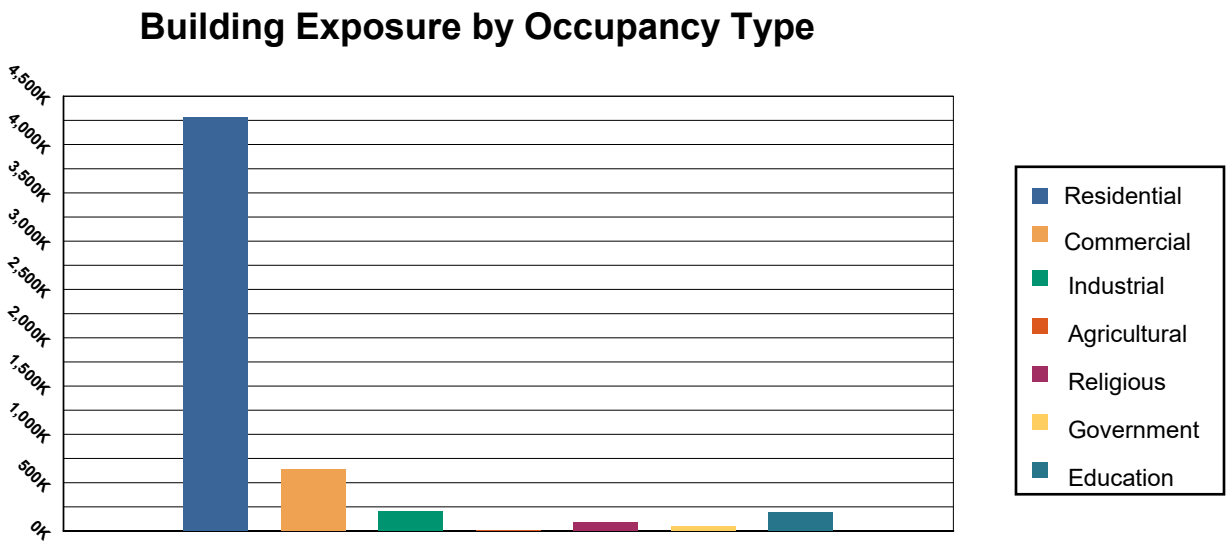

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Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,277,504	78.50%
Commercial	638,390	11.72%
Industrial	200,978	3.69%
Agricultural	10,158	0.19%
Religious	84,475	1.55%
Government	46,583	0.85%
Education	191,133	3.51%
Total	**5,449,221**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds. There are 11 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 702 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. There are an estimated 32 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

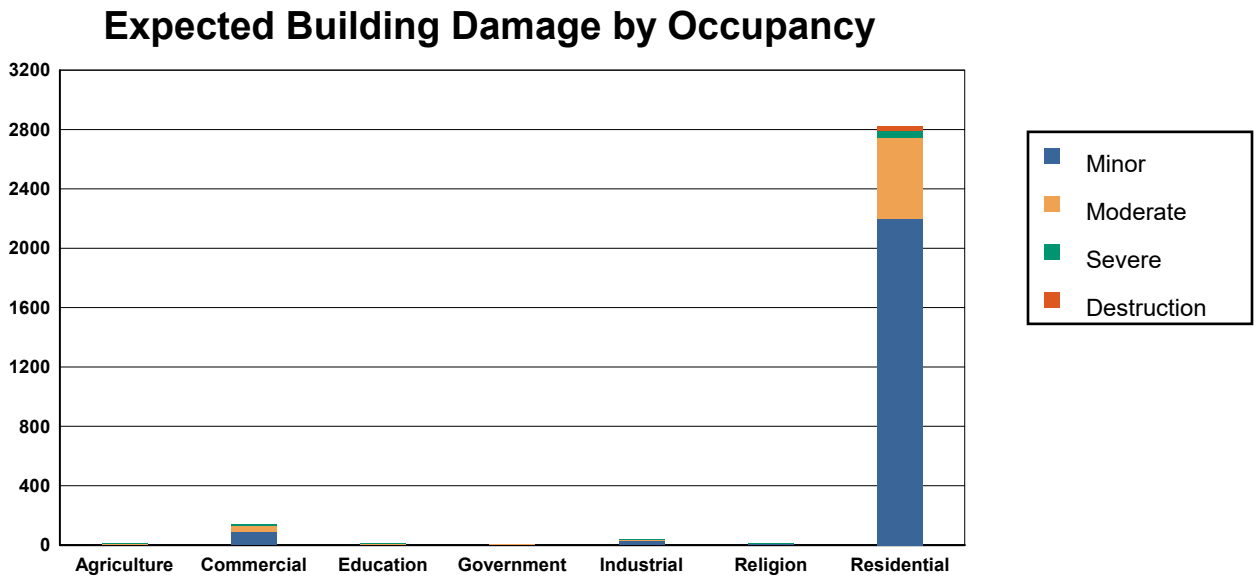


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	14.96	65.04	5.12	22.28	1.87	8.14	0.91	3.96	0.13	0.58
Commercial	331.03	70.13	90.78	19.23	41.32	8.75	8.80	1.86	0.07	0.01
Education	22.09	71.25	6.05	19.53	2.55	8.23	0.31	0.99	0.00	0.00
Government	12.91	71.70	3.41	18.93	1.51	8.37	0.18	1.00	0.00	0.00
Industrial	99.18	70.34	26.50	18.80	12.52	8.88	2.62	1.86	0.17	0.12
Religion	28.79	70.22	8.92	21.76	2.96	7.22	0.33	0.80	0.00	0.00
Residential	5,624.50	66.59	2,196.12	26.00	549.70	6.51	43.68	0.52	32.00	0.38
Total	**6,133.46**		**2,336.91**		**612.44**		**56.82**		**32.37**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	73	64.87	24	21.63	14	12.70	1	0.79	0	0.00
Masonry	529	64.96	172	21.13	102	12.56	10	1.19	1	0.16
MH	9	84.02	1	7.86	1	5.41	0	0.30	0	2.41
Steel	247	69.85	63	17.87	36	10.12	8	2.14	0	0.02
Wood	5,330	67.66	2,080	26.40	397	5.04	39	0.50	31	0.40

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

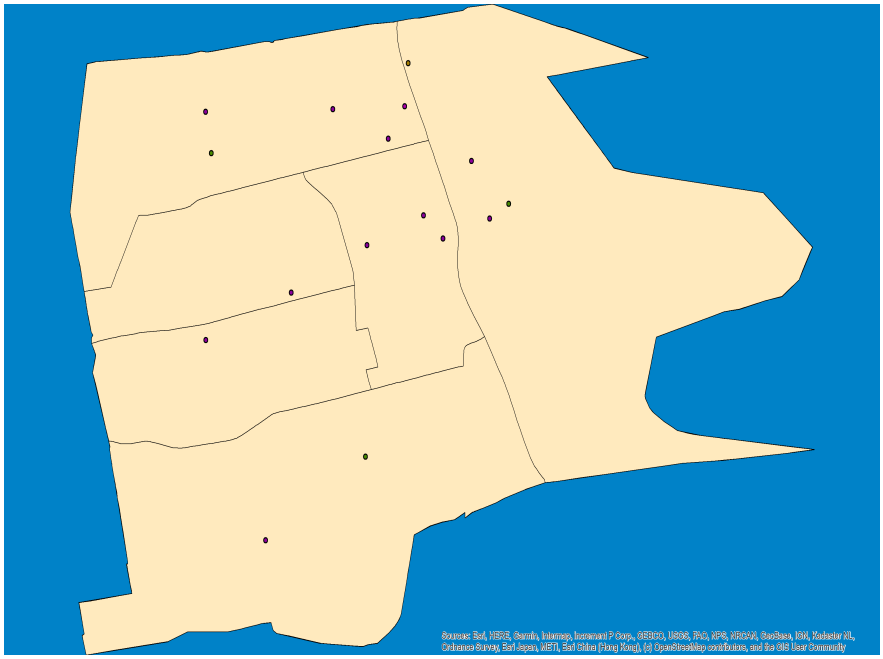
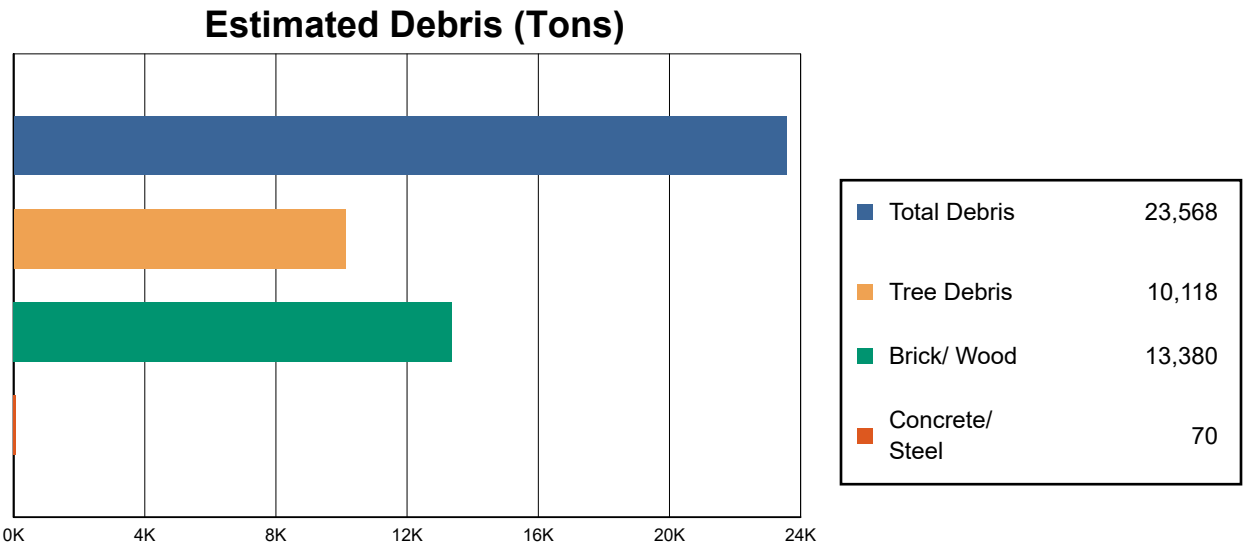


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	1
Police Stations	1	0	0	1
Schools	11	0	0	0

Induced Hurricane Damage

Debris Generation

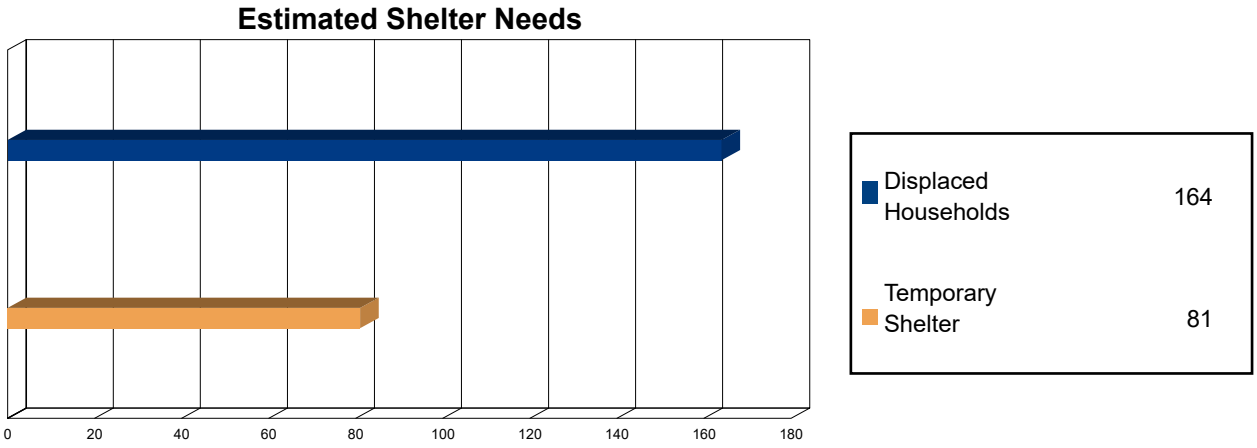


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 23,568 tons of debris will be generated. Of the total amount, 3,294 tons (14%) is Other Tree Debris. Of the remaining 20,274 tons, Brick/Wood comprises 66% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 538 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 6,824 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 164 households to be displaced due to the hurricane. Of these, 81 people (out of a total population of 27,298) will seek temporary shelter in public shelters.

Economic Loss

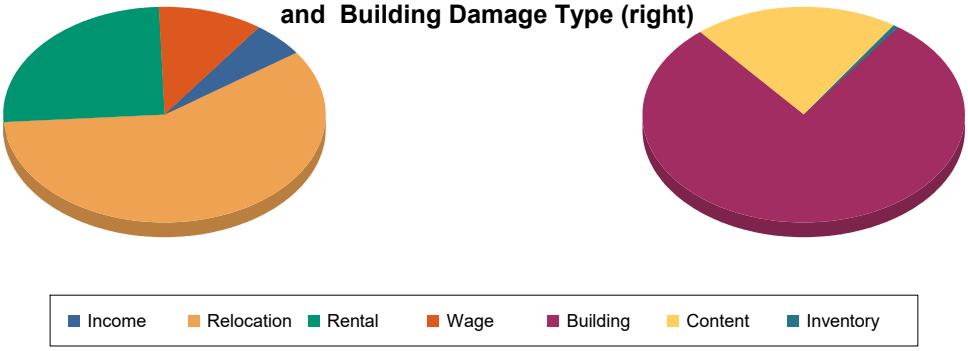
The total economic loss estimated for the hurricane is 190.0 million dollars, which represents 3.49 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 190 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 85% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

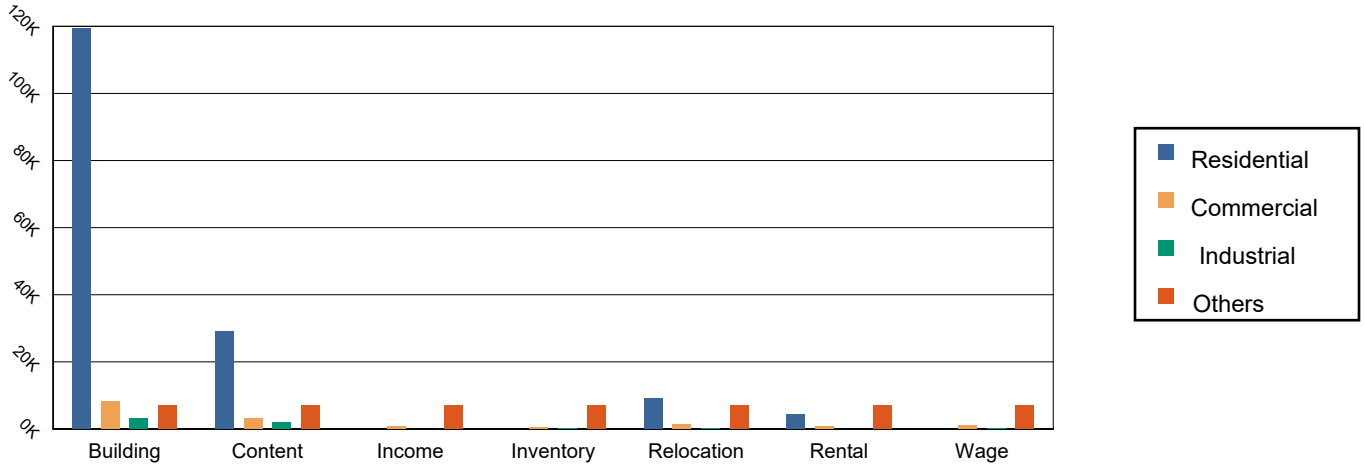


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	119,462.73	8,184.81	3,043.30	3,790.61	134,481.45
	Content	28,963.08	3,195.54	1,945.52	1,264.59	35,368.73
	Inventory	0.00	446.64	253.15	87.13	786.92
	Subtotal	**148,425.81**	**11,826.99**	**5,241.97**	**5,142.33**	**170,637.10**
Business Interruption Loss						
	Income	0.00	685.79	32.27	279.58	997.64
	Relocation	9,185.23	1,291.34	204.72	652.27	11,333.55
	Rental	4,280.29	626.33	23.07	60.19	4,989.88
	Wage	0.00	945.01	52.89	1,018.03	2,015.93
	Subtotal	**13,465.52**	**3,548.47**	**312.95**	**2,010.07**	**19,337.00**

Total

Total	**161,891.33**	**15,375.46**	**5,554.92**	**7,152.39**	**189,974.10**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,504	1,171,717	5,449,221
Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**
Study Region Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**

Hazus: Hurricane Global Risk Report

Region Name:	Wethersfield_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.10 square miles and contains 6 census tracts. There are over 11 thousand households in the region and a total population of 27,298 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,449 million dollars. Approximately 92% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,172 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

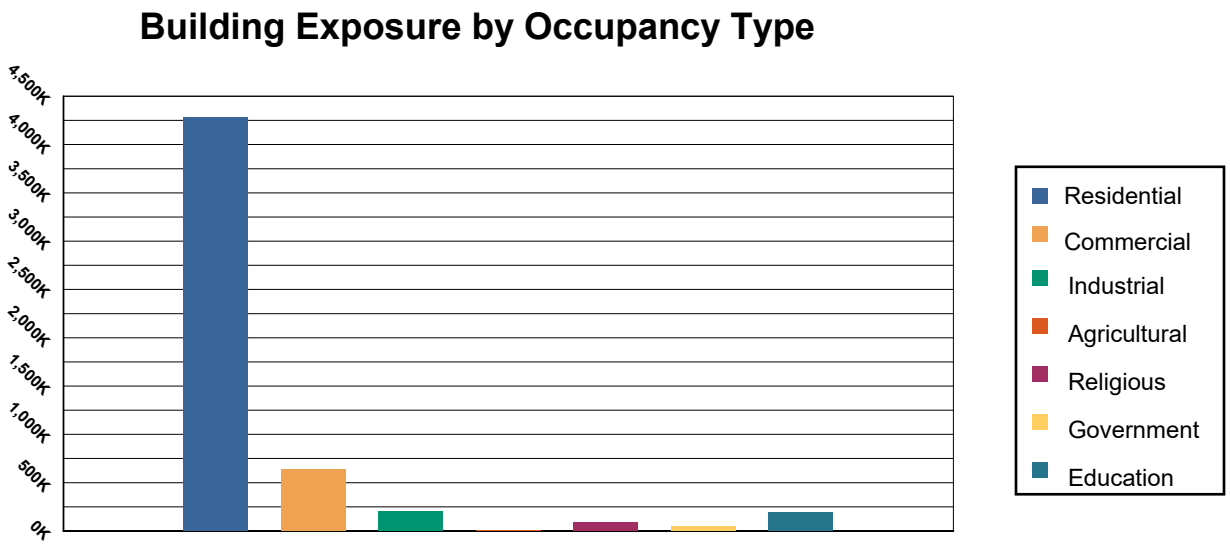


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	4,277,504	78.50%
Commercial	638,390	11.72%
Industrial	200,978	3.69%
Agricultural	10,158	0.19%
Religious	84,475	1.55%
Government	46,583	0.85%
Education	191,133	3.51%
Total	**5,449,221**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of no beds. There are 11 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1,161 buildings will be at least moderately damaged. This is over 13% of the total number of buildings in the region. There are an estimated 73 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

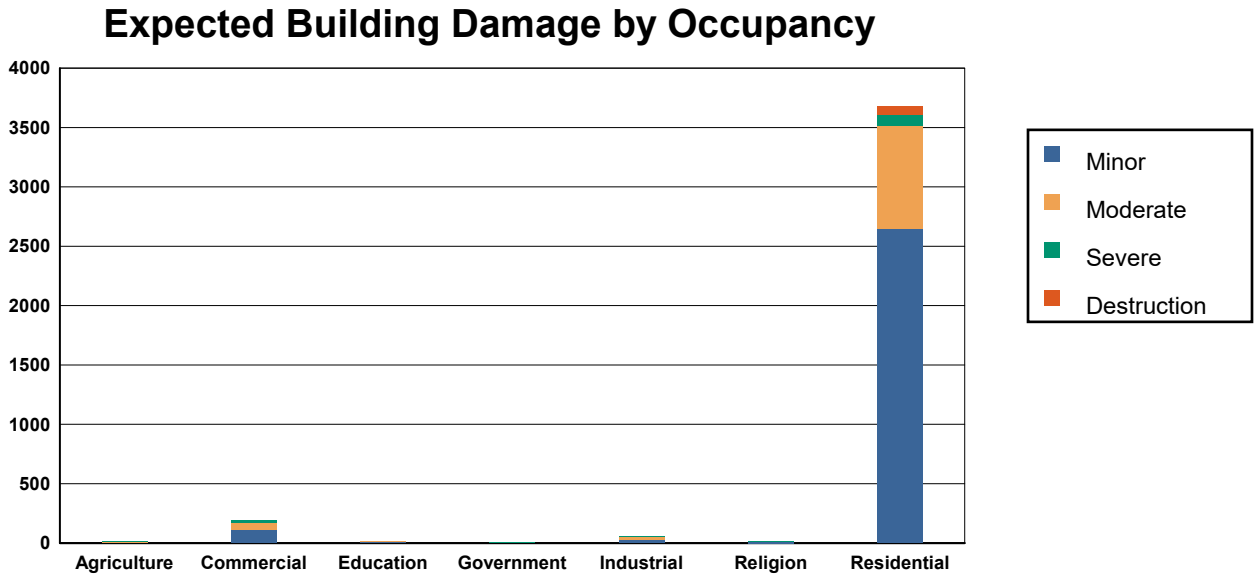


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	12.51	54.39	6.16	26.78	2.71	11.78	1.39	6.03	0.24	1.03
Commercial	280.17	59.36	108.82	23.05	64.74	13.72	18.10	3.83	0.18	0.04
Education	18.72	60.39	7.24	23.35	4.19	13.52	0.85	2.74	0.00	0.00
Government	10.89	60.49	4.08	22.66	2.51	13.96	0.52	2.89	0.00	0.00
Industrial	83.92	59.52	31.33	22.22	19.89	14.10	5.55	3.94	0.31	0.22
Religion	24.39	59.48	10.85	26.45	4.89	11.92	0.88	2.15	0.00	0.00
Residential	4,762.18	56.38	2,650.07	31.38	860.63	10.19	101.06	1.20	72.06	0.85
Total	**5,192.77**		**2,818.54**		**959.55**		**128.35**		**72.79**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	60	53.25	27	24.00	23	20.46	3	2.29	0	0.00
Masonry	444	54.51	198	24.31	150	18.37	20	2.49	3	0.32
MH	8	75.80	1	10.35	1	8.76	0	0.70	0	4.39
Steel	208	58.90	73	20.74	56	15.84	16	4.47	0	0.04
Wood	4,529	57.50	2,543	32.29	644	8.17	90	1.14	70	0.89

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities

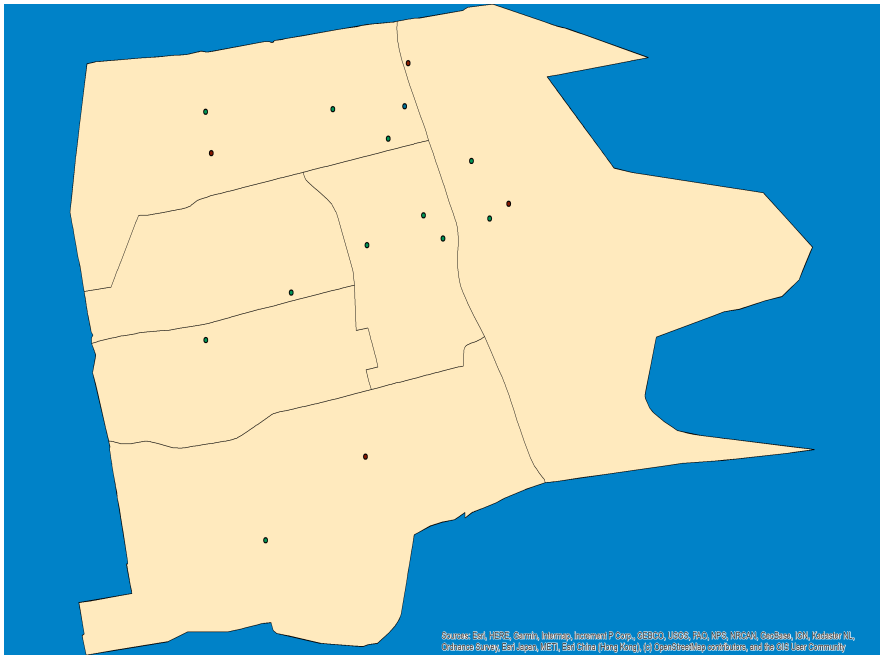
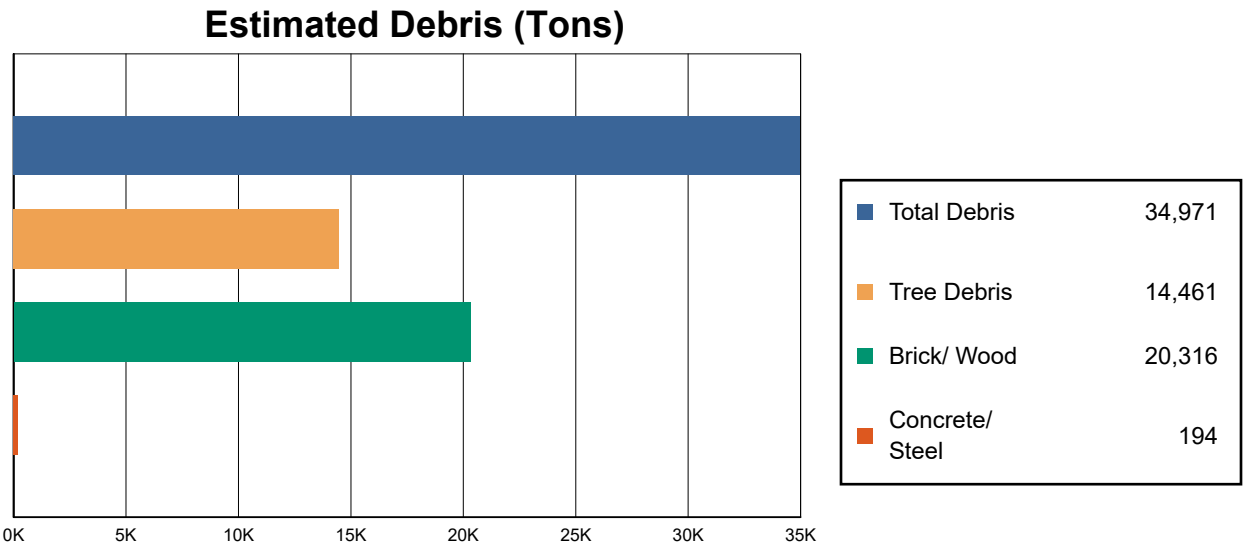


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Hospitals	1	0	0	0
Police Stations	1	0	0	1
Schools	11	1	0	0

Induced Hurricane Damage

Debris Generation

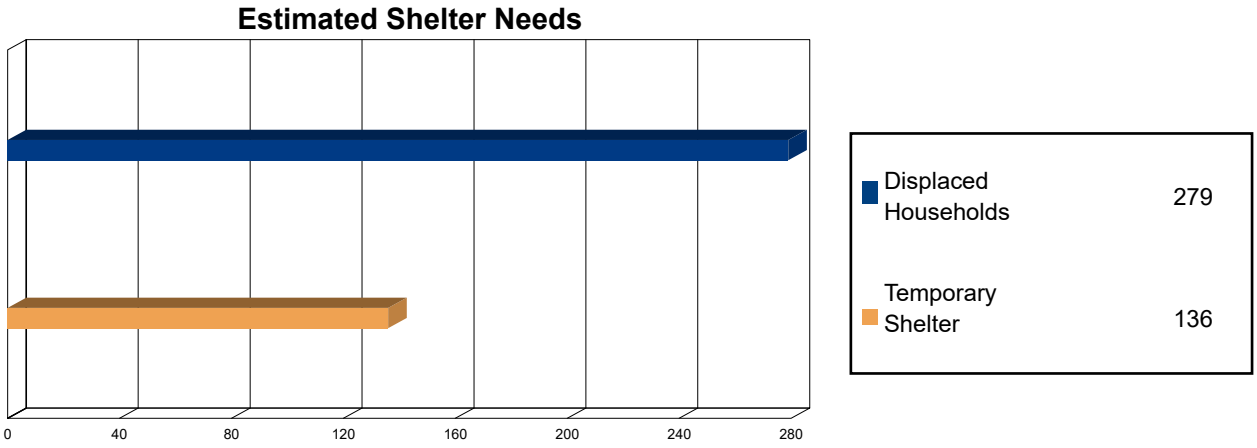


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 34,971 tons of debris will be generated. Of the total amount, 4,641 tons (13%) is Other Tree Debris. Of the remaining 30,330 tons, Brick/Wood comprises 67% of the total, Reinforced Concrete/Steel comprises of 1% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 820 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,820 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 279 households to be displaced due to the hurricane. Of these, 136 people (out of a total population of 27,298) will seek temporary shelter in public shelters.

Economic Loss

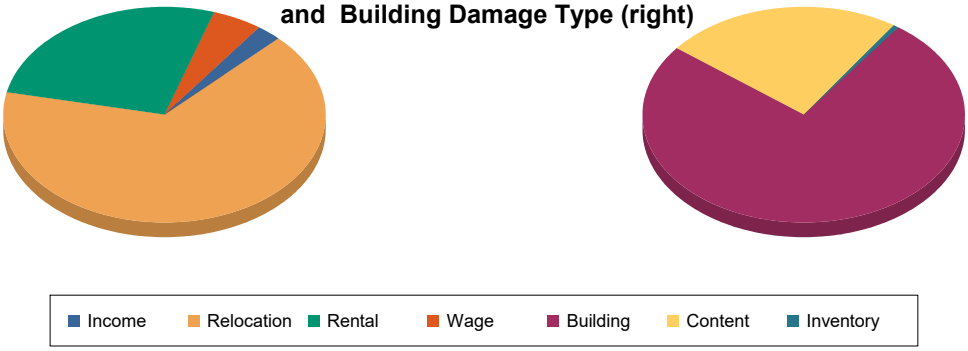
The total economic loss estimated for the hurricane is 317.7 million dollars, which represents 5.83 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 318 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 85% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

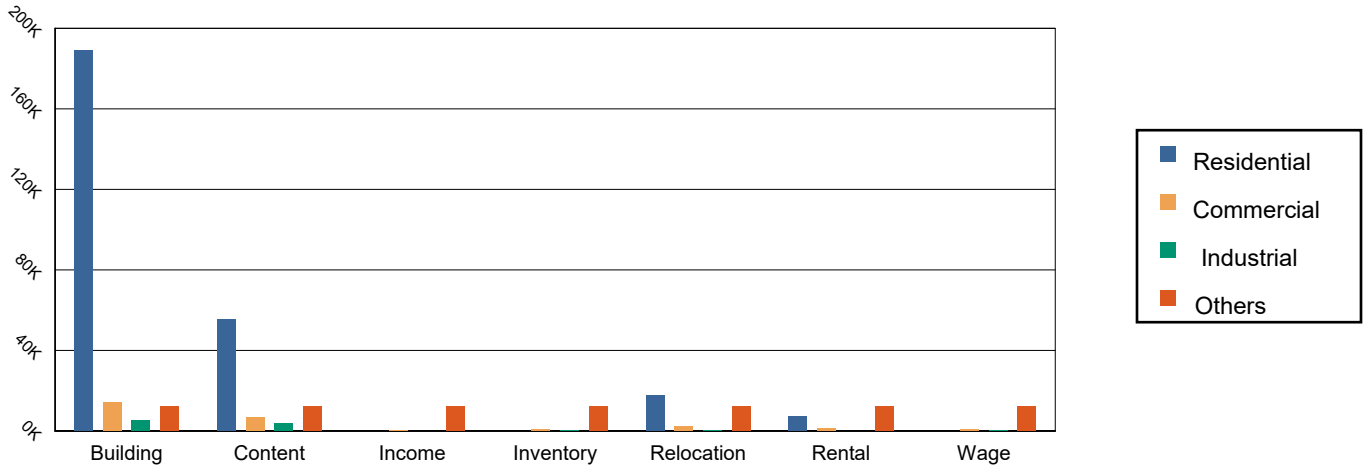


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	188,841.66	14,355.61	5,310.55	6,763.32	215,271.15
	Content	55,169.75	6,670.86	3,645.92	2,752.84	68,239.37
	Inventory	0.00	907.72	472.04	144.49	1,524.24
	Subtotal	**244,011.42**	**21,934.19**	**9,428.52**	**9,660.65**	**285,034.77**
Business Interruption Loss						
	Income	2.30	538.26	47.06	203.96	791.57
	Relocation	17,709.33	2,270.96	361.78	1,206.80	21,548.87
	Rental	7,430.52	1,136.77	40.86	119.79	8,727.93
	Wage	5.41	756.12	76.58	789.58	1,627.68
	Subtotal	**25,147.54**	**4,702.11**	**526.28**	**2,320.12**	**32,696.05**

Total

Total	**269,158.96**	**26,636.29**	**9,954.80**	**11,980.77**	**317,730.82**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	27,298	4,277,504	1,171,717	5,449,221
Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**
Study Region Total	**27,298**	**4,277,504**	**1,171,717**	**5,449,221**

Hazus: Hurricane Global Risk Report

Region Name:	Willington_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 33.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 5,566 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 969 million dollars. Approximately 92% of the buildings (and 75% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,102 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

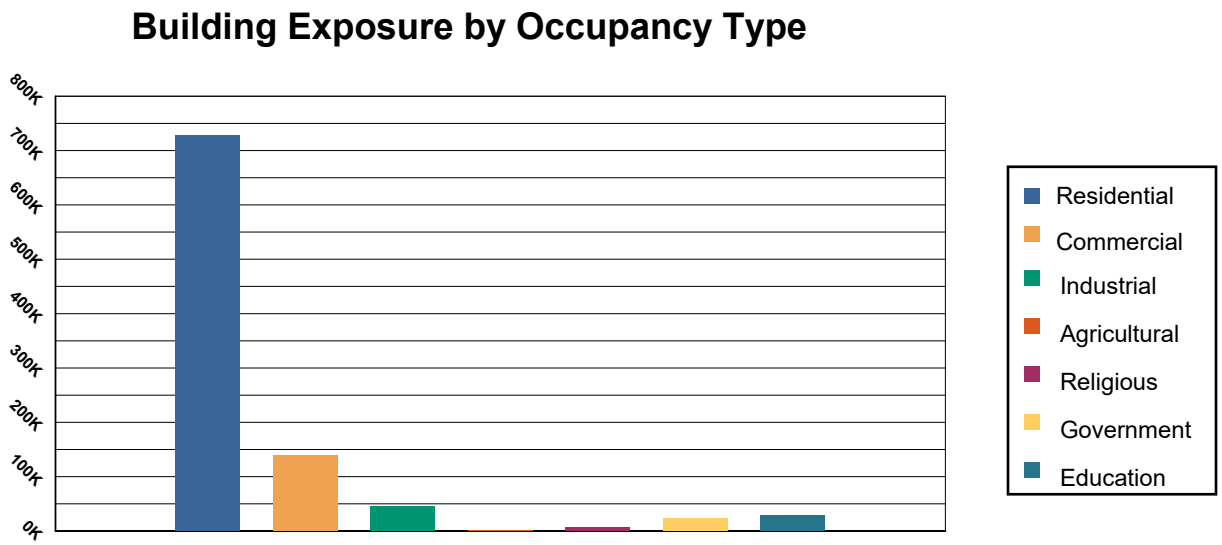


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	727,262	75.06%
Commercial	138,369	14.28%
Industrial	44,364	4.58%
Agricultural	676	0.07%
Religious	6,317	0.65%
Government	22,527	2.33%
Education	29,342	3.03%
Total	**968,857**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 3 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

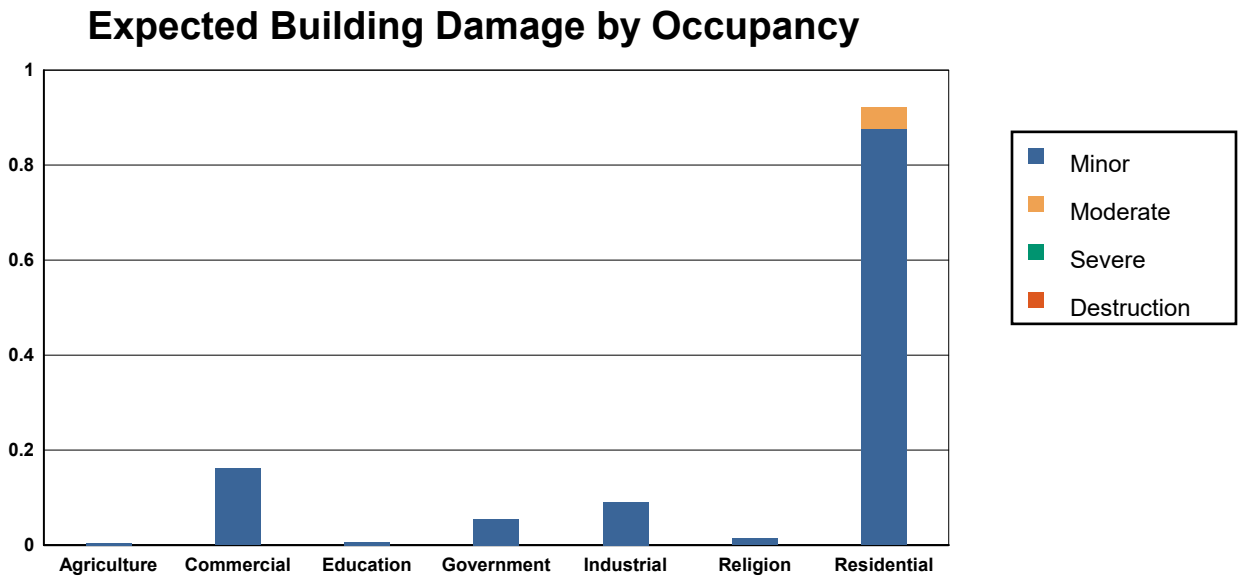


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	3.00	99.85	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	89.84	99.82	0.16	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Education	2.99	99.79	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00
Government	23.95	99.77	0.05	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	40.91	99.78	0.09	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Religion	7.99	99.83	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Residential	1,932.08	99.95	0.88	0.05	0.05	0.00	0.00	0.00	0.00	0.00
Total	**2,100.75**		**1.21**		**0.05**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	24	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Masonry	163	99.71	0	0.28	0	0.01	0	0.00	0	0.00
MH	33	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	89	99.79	0	0.21	0	0.00	0	0.00	0	0.00
Wood	1,793	99.99	0	0.01	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

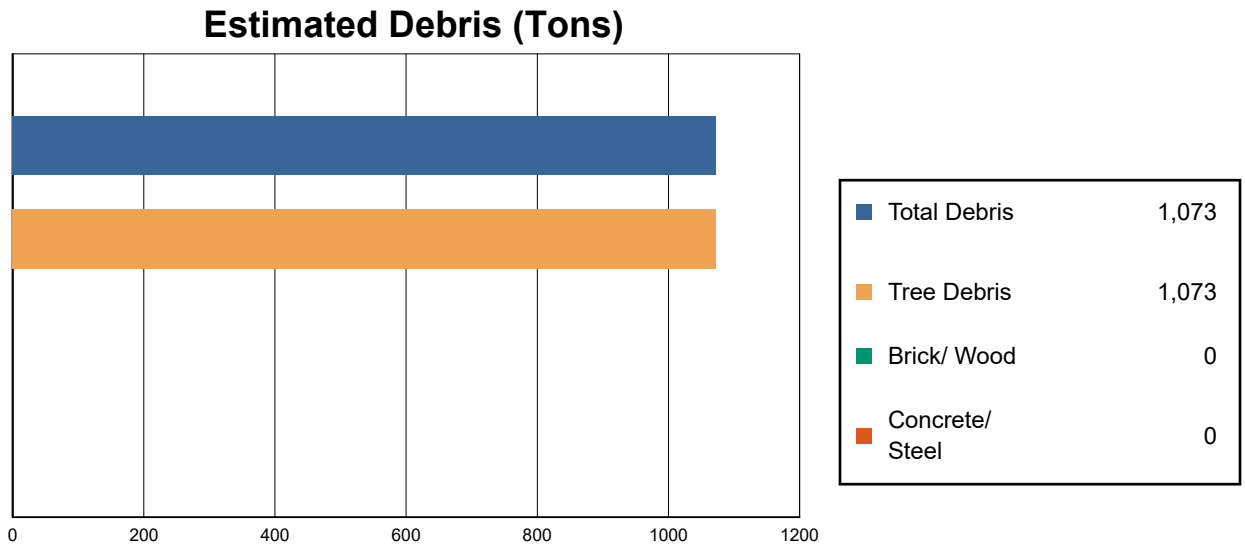
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

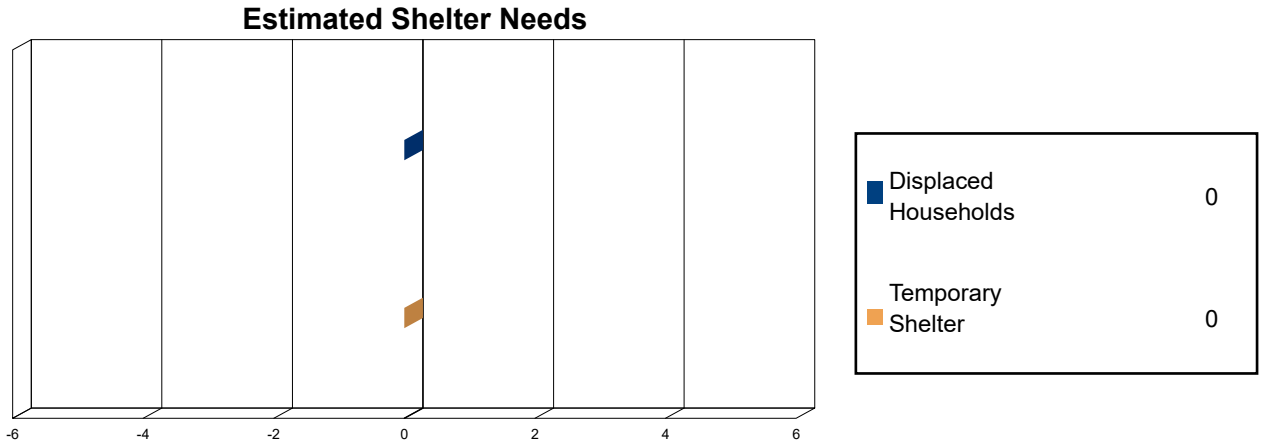


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,073 tons of debris will be generated. Of the total amount, 944 tons (88%) is Other Tree Debris. Of the remaining 129 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 129 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,566) will seek temporary shelter in public shelters.

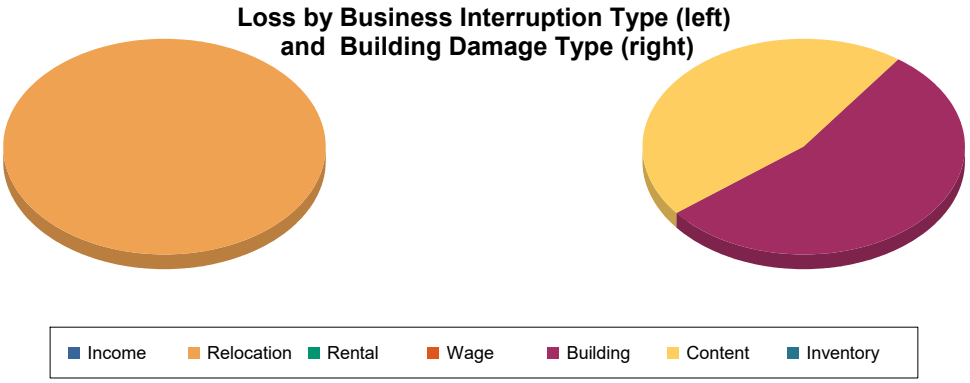
Economic Loss

The total economic loss estimated for the hurricane is 0.3 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.



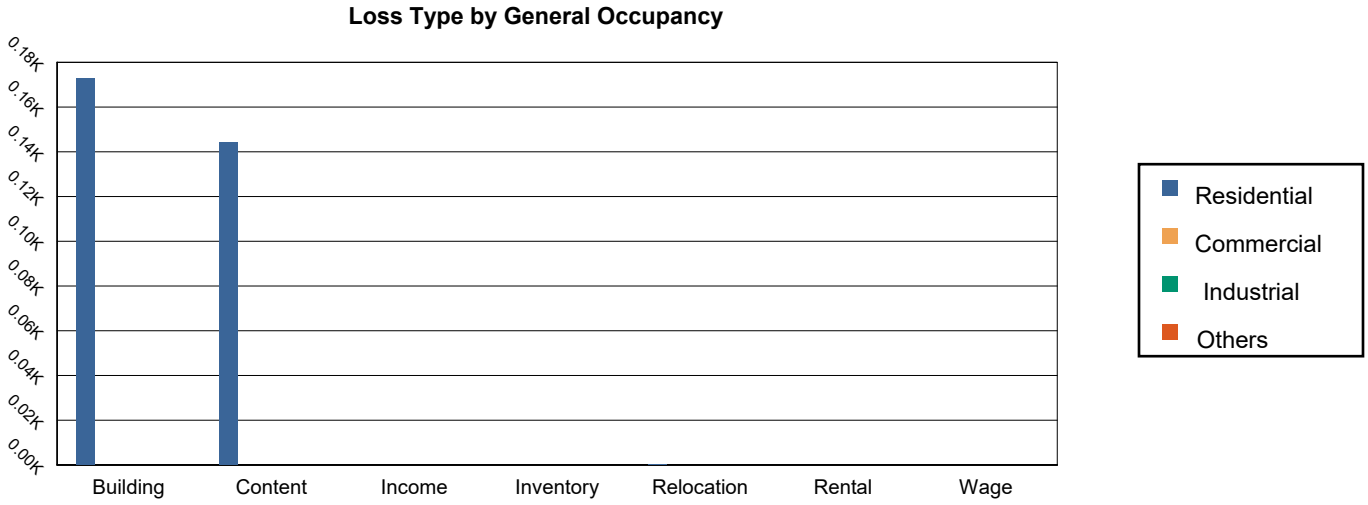


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	173.00	0.00	0.00	0.00	173.00
	Content	143.98	0.00	0.00	0.00	143.98
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**316.98**	**0.00**	**0.00**	**0.00**	**316.98**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.10	0.00	0.00	0.00	0.10
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.10**	**0.00**	**0.00**	**0.00**	**0.10**

Total

Total	**317.08**	**0.00**	**0.00**	**0.00**	**317.08**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,262	241,595	968,857
Total	**5,566**	**727,262**	**241,595**	**968,857**
Study Region Total	**5,566**	**727,262**	**241,595**	**968,857**

Hazus: Hurricane Global Risk Report

Region Name: Willington_HU

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 33.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 5,566 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 969 million dollars. Approximately 92% of the buildings (and 75% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,102 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

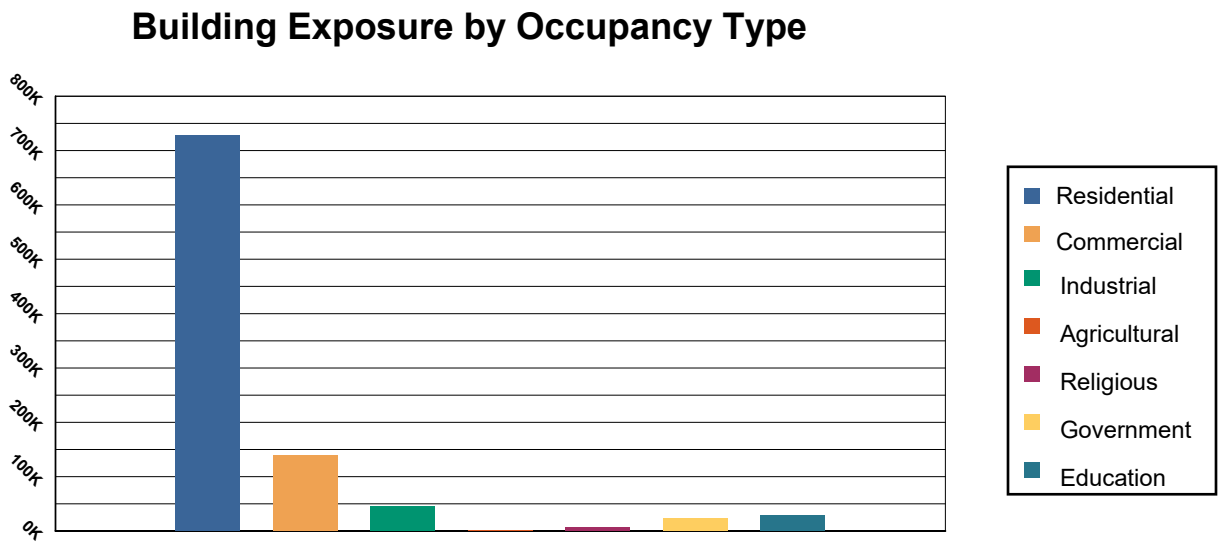


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	727,262	75.06%
Commercial	138,369	14.28%
Industrial	44,364	4.58%
Agricultural	676	0.07%
Religious	6,317	0.65%
Government	22,527	2.33%
Education	29,342	3.03%
Total	**968,857**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 3 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

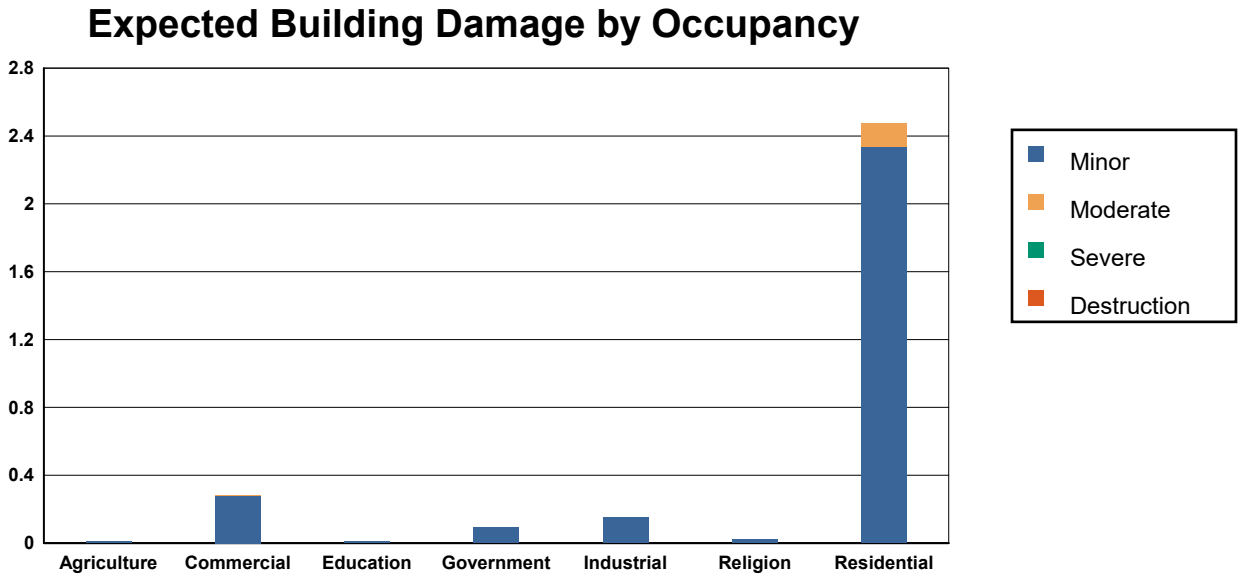


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	2.99	99.73	0.01	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	89.72	99.69	0.28	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Education	2.99	99.64	0.01	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Government	23.91	99.62	0.09	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	40.85	99.63	0.15	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Religion	7.98	99.72	0.02	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Residential	1,930.52	99.87	2.34	0.12	0.14	0.01	0.00	0.00	0.00	0.00
Total	**2,098.96**		**2.90**		**0.14**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	24	99.55	0	0.45	0	0.00	0	0.00	0	0.00
Masonry	162	99.38	1	0.60	0	0.03	0	0.00	0	0.00
MH	33	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	89	99.65	0	0.35	0	0.00	0	0.00	0	0.00
Wood	1,792	99.95	1	0.05	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

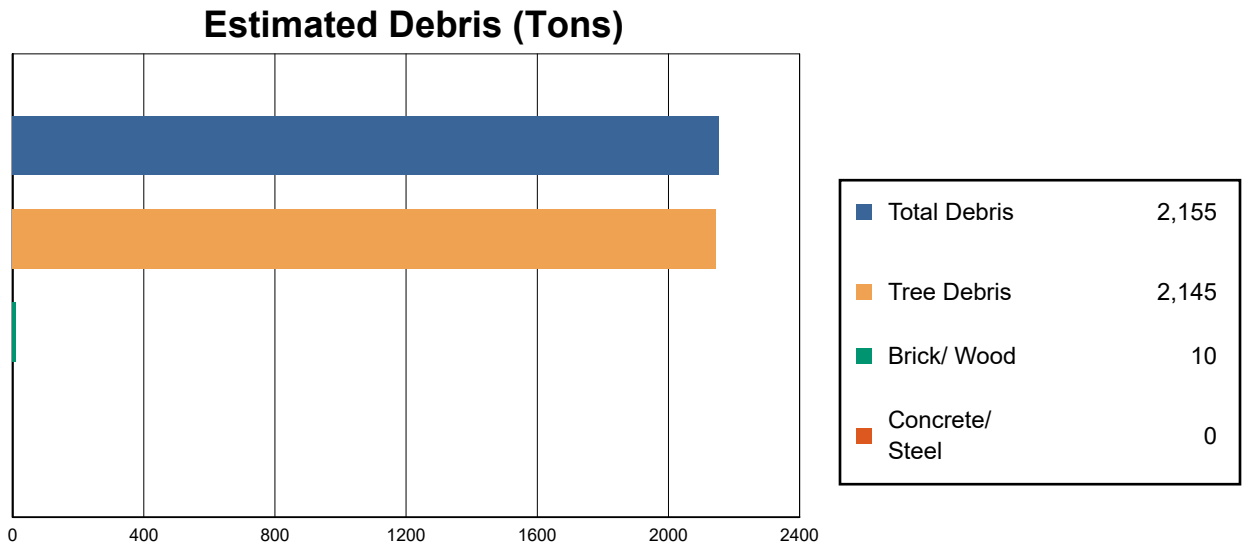
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

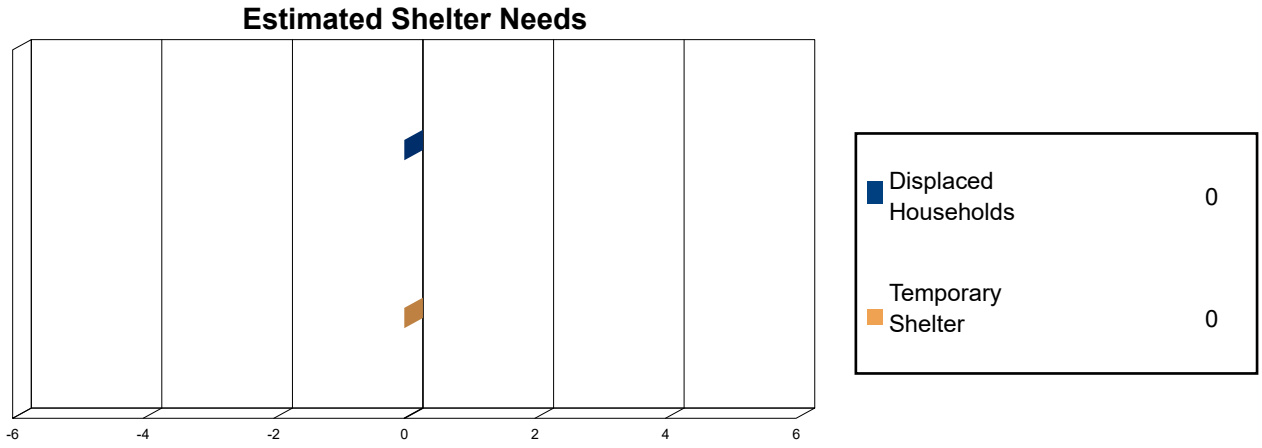


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,155 tons of debris will be generated. Of the total amount, 1,888 tons (88%) is Other Tree Debris. Of the remaining 267 tons, Brick/Wood comprises 4% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 257 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,566) will seek temporary shelter in public shelters.

Economic Loss

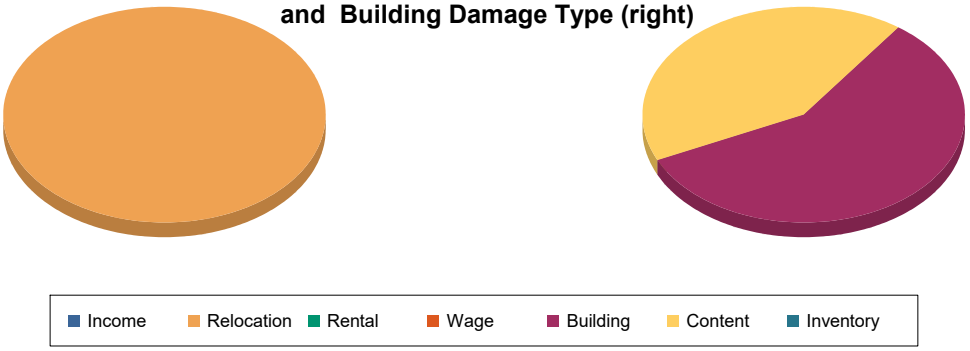
The total economic loss estimated for the hurricane is 1.0 million dollars, which represents 0.11 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

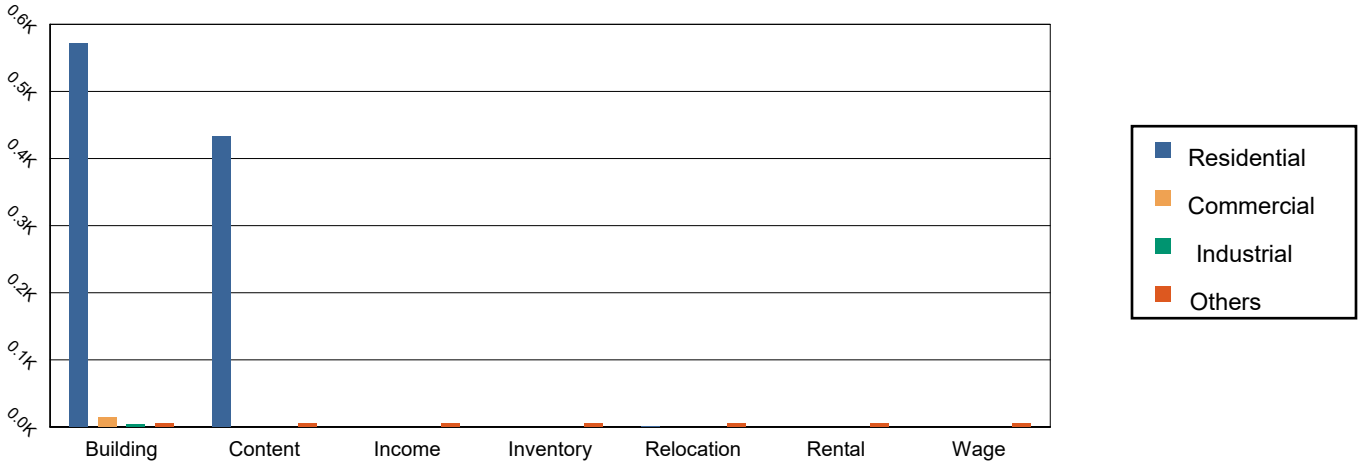


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	571.79	13.84	4.44	5.82	595.88
	Content	432.91	0.00	0.00	0.00	432.91
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,004.70**	**13.84**	**4.44**	**5.82**	**1,028.79**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.30	0.05	0.00	0.00	0.34
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.30**	**0.05**	**0.00**	**0.00**	**0.34**

Total

Total	1,005.00	13.88	4.44	5.82	1,029.13

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,262	241,595	968,857
Total	**5,566**	**727,262**	**241,595**	**968,857**
Study Region Total	**5,566**	**727,262**	**241,595**	**968,857**

Hazus: Hurricane Global Risk Report

Region Name:	Willington_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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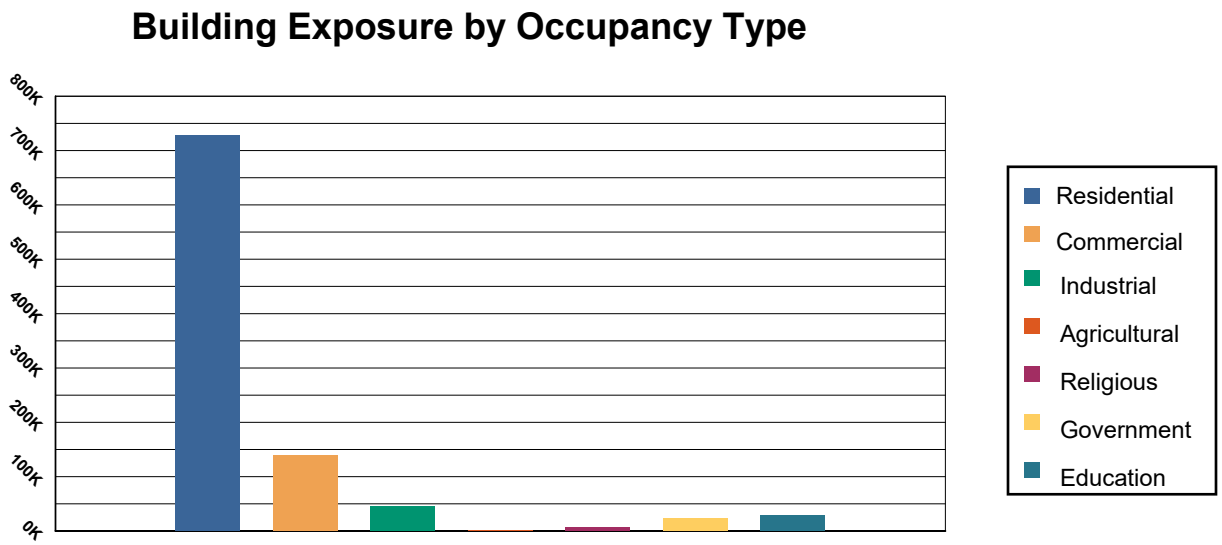

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Industrial	44,364	4.58%
Agricultural	676	0.07%
Religious	6,317	0.65%
Government	22,527	2.33%
Education	29,342	3.03%
Total	**968,857**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 3 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

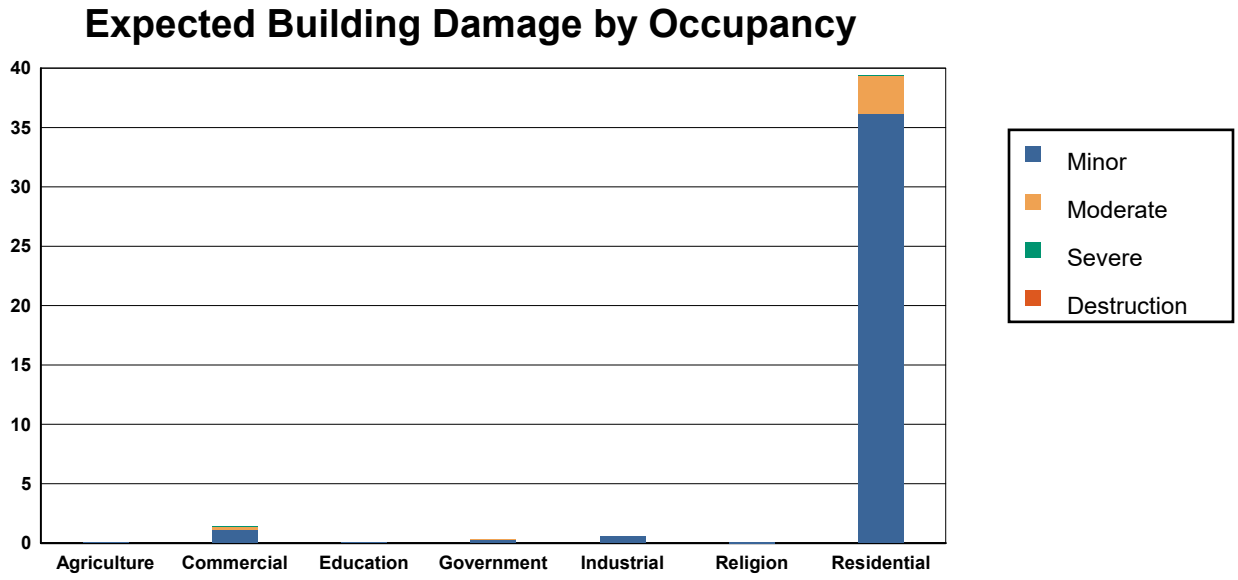


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	2.95	98.24	0.05	1.55	0.01	0.17	0.00	0.04	0.00	0.00
Commercial	88.64	98.48	1.13	1.26	0.22	0.24	0.01	0.01	0.00	0.00
Education	2.96	98.60	0.04	1.37	0.00	0.03	0.00	0.00	0.00	0.00
Government	23.66	98.58	0.34	1.40	0.00	0.02	0.00	0.00	0.00	0.00
Industrial	40.42	98.59	0.57	1.38	0.01	0.02	0.00	0.00	0.00	0.00
Religion	7.90	98.71	0.10	1.25	0.00	0.04	0.00	0.00	0.00	0.00
Residential	1,893.56	97.96	36.13	1.87	3.24	0.17	0.07	0.00	0.00	0.00
Total	**2,060.08**		**38.35**		**3.48**		**0.08**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	24	98.24	0	1.73	0	0.02	0	0.00	0	0.00
Masonry	157	96.49	5	2.79	1	0.71	0	0.01	0	0.00
MH	33	99.91	0	0.07	0	0.02	0	0.00	0	0.00
Steel	88	98.44	1	1.30	0	0.25	0	0.01	0	0.00
Wood	1,763	98.33	29	1.62	1	0.05	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

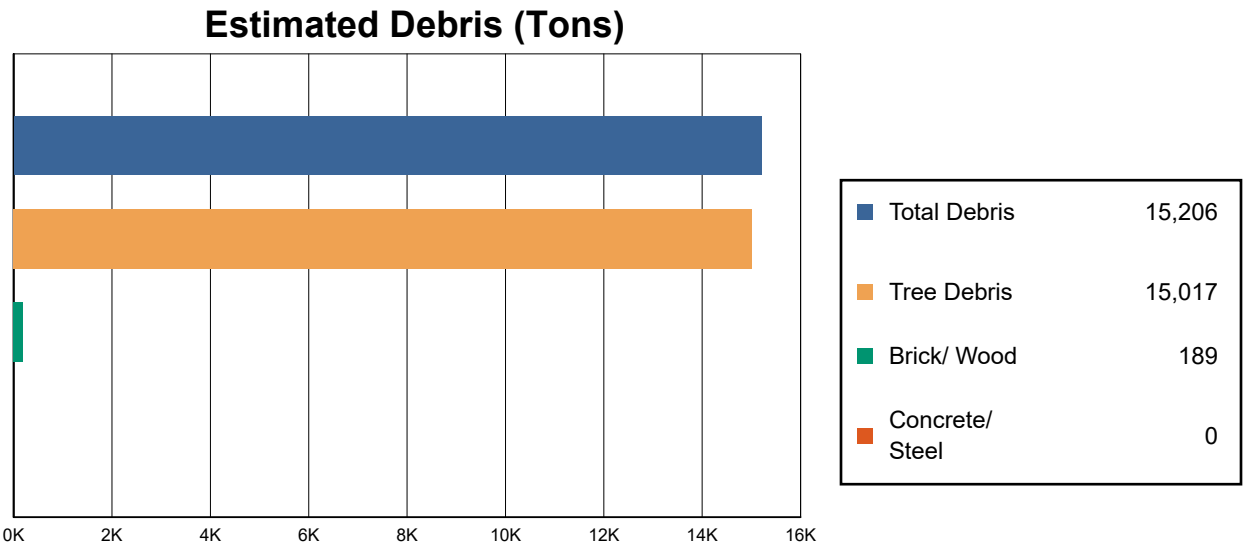
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

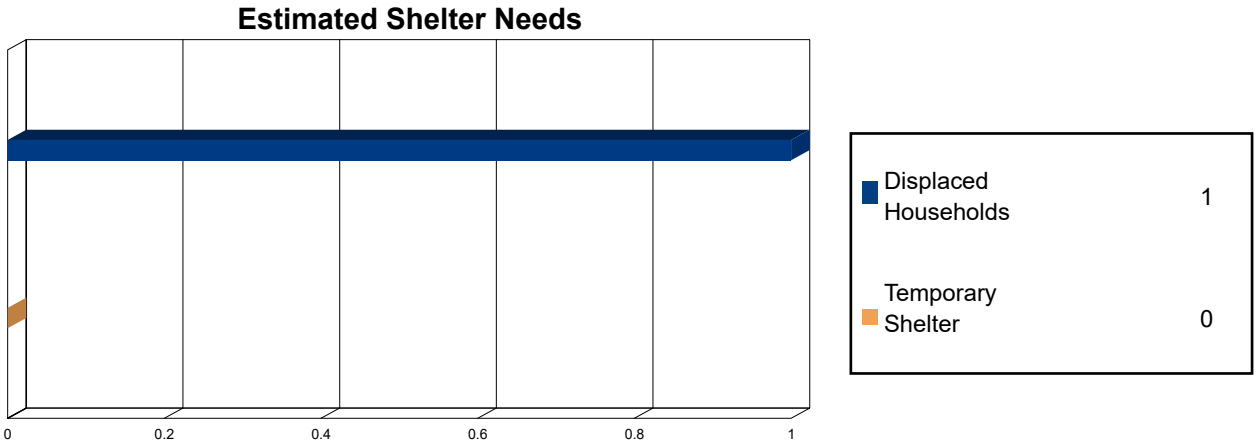


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15,206 tons of debris will be generated. Of the total amount, 13,215 tons (87%) is Other Tree Debris. Of the remaining 1,991 tons, Brick/Wood comprises 9% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 8 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,802 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,566) will seek temporary shelter in public shelters.

Economic Loss

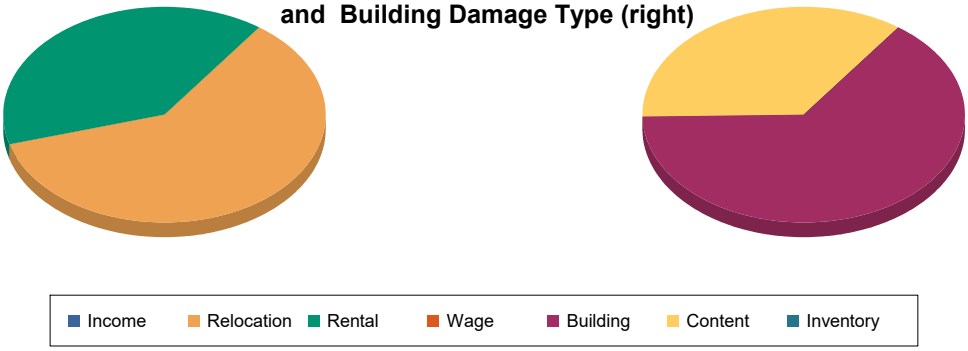
The total economic loss estimated for the hurricane is 6.5 million dollars, which represents 0.67 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 7 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

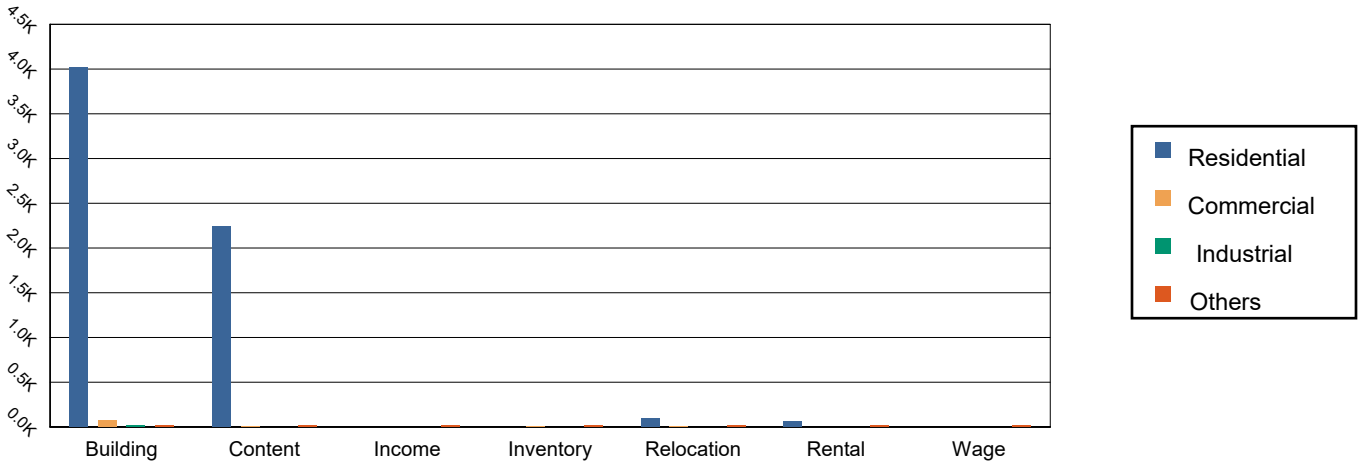


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	4,014.75	70.91	15.49	22.56	4,123.71
	Content	2,237.71	7.61	0.00	0.07	2,245.39
	Inventory	0.00	1.45	0.00	0.05	1.50
	Subtotal	**6,252.46**	**79.98**	**15.49**	**22.67**	**6,370.61**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	98.91	2.52	0.07	0.10	101.60
	Rental	66.30	0.00	0.00	0.00	66.30
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**165.21**	**2.52**	**0.07**	**0.10**	**167.90**

Total

Total	**6,417.67**	**82.50**	**15.57**	**22.77**	**6,538.50**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,262	241,595	968,857
Total	**5,566**	**727,262**	**241,595**	**968,857**
Study Region Total	**5,566**	**727,262**	**241,595**	**968,857**

Hazus: Hurricane Global Risk Report

Region Name:	Willington_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 33.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 5,566 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 969 million dollars. Approximately 92% of the buildings (and 75% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,102 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

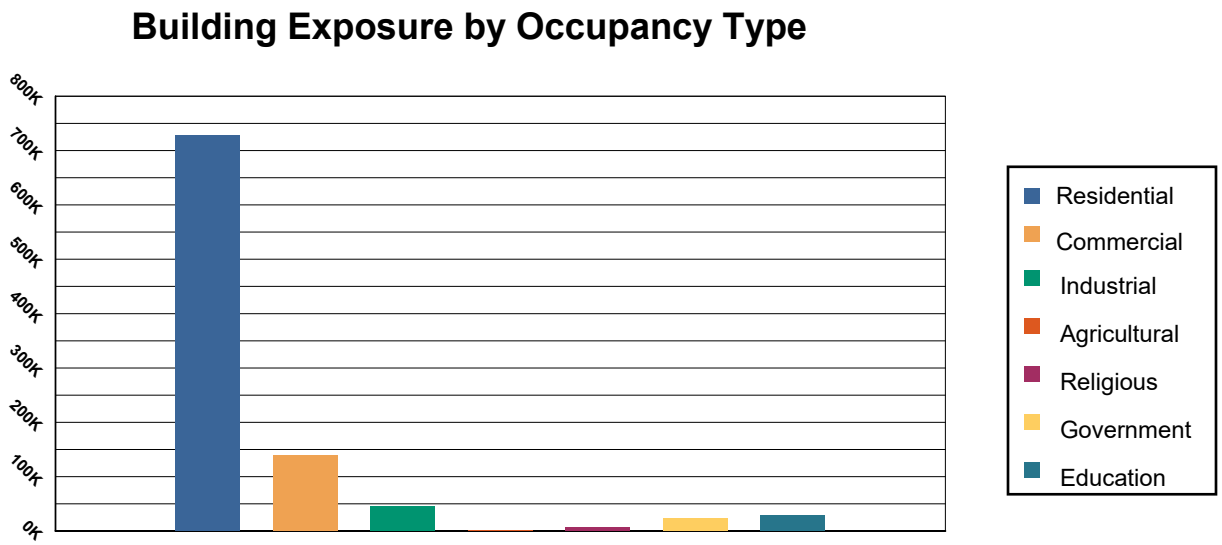


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	727,262	75.06%
Commercial	138,369	14.28%
Industrial	44,364	4.58%
Agricultural	676	0.07%
Religious	6,317	0.65%
Government	22,527	2.33%
Education	29,342	3.03%
Total	**968,857**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 3 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 14 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

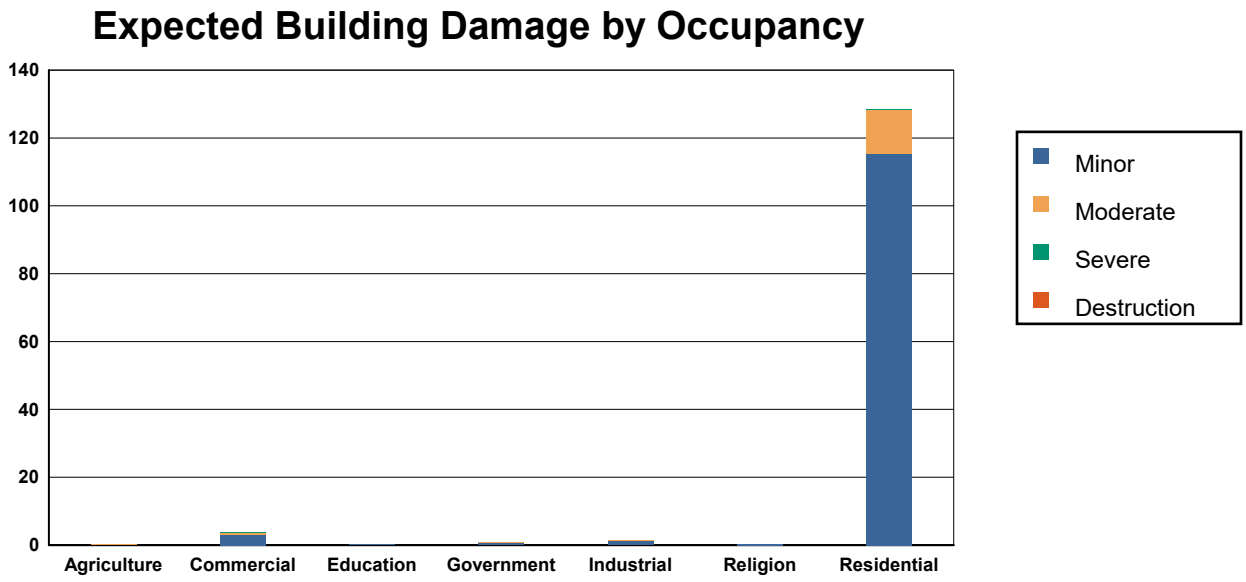


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	2.83	94.17	0.14	4.72	0.02	0.77	0.01	0.33	0.00	0.01
Commercial	86.13	95.70	2.97	3.30	0.77	0.86	0.13	0.14	0.00	0.00
Education	2.89	96.34	0.11	3.52	0.00	0.14	0.00	0.00	0.00	0.00
Government	23.14	96.42	0.83	3.45	0.03	0.13	0.00	0.00	0.00	0.00
Industrial	39.52	96.39	1.42	3.46	0.06	0.15	0.00	0.00	0.00	0.00
Religion	7.69	96.09	0.30	3.76	0.01	0.14	0.00	0.01	0.00	0.00
Residential	1,804.36	93.34	115.26	5.96	13.18	0.68	0.20	0.01	0.01	0.00
Total	**1,966.55**		**121.02**		**14.08**		**0.34**		**0.01**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	23	95.67	1	4.09	0	0.23	0	0.00	0	0.00
Masonry	150	91.80	10	5.88	4	2.28	0	0.03	0	0.00
MH	33	99.19	0	0.63	0	0.15	0	0.00	0	0.02
Steel	85	95.86	3	3.09	1	0.90	0	0.15	0	0.00
Wood	1,684	93.94	103	5.73	6	0.31	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

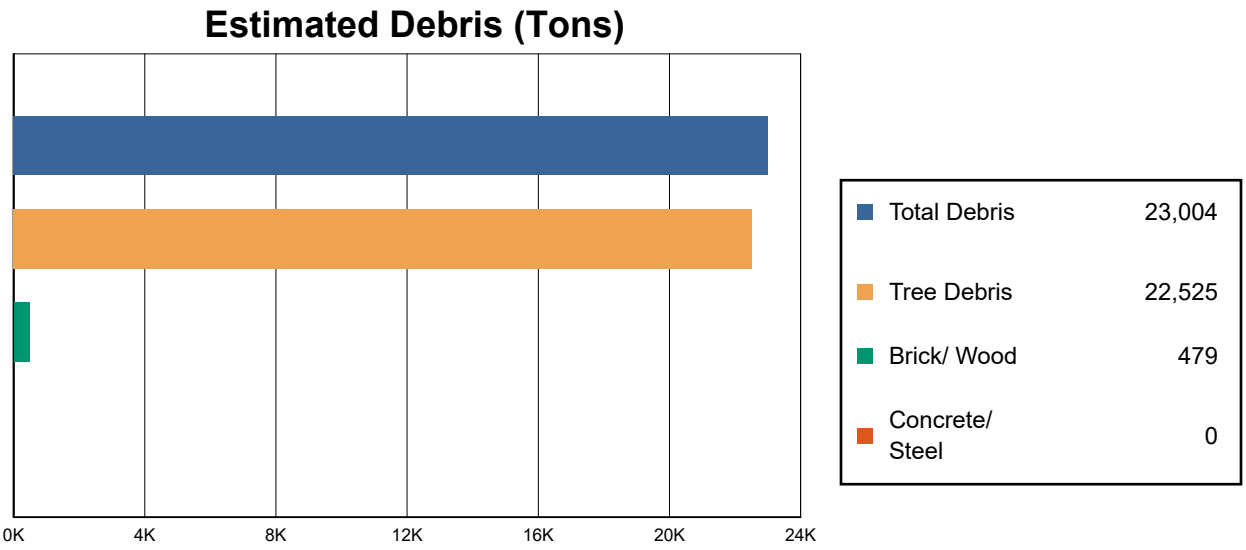
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

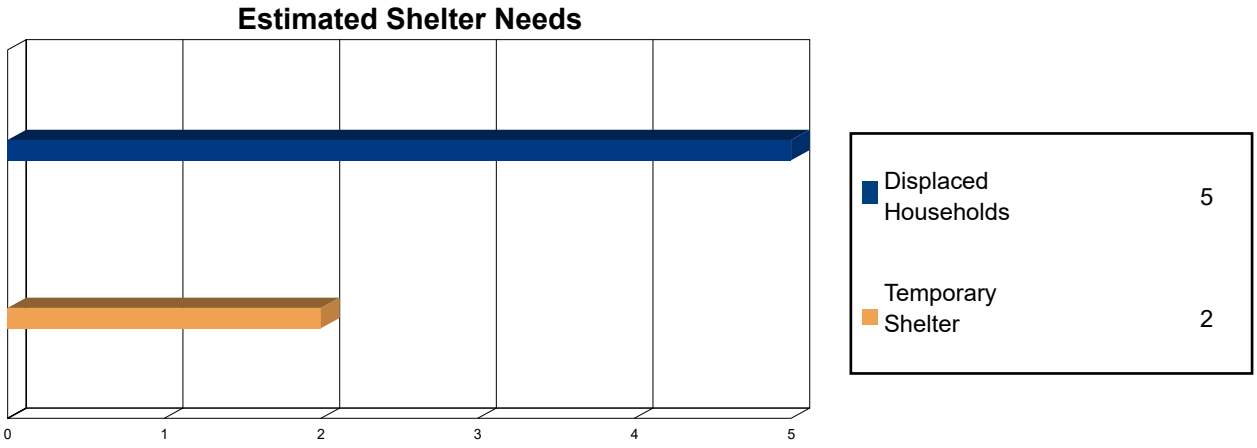


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 23,004 tons of debris will be generated. Of the total amount, 19,822 tons (86%) is Other Tree Debris. Of the remaining 3,182 tons, Brick/Wood comprises 15% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 19 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,703 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the hurricane. Of these, 2 people (out of a total population of 5,566) will seek temporary shelter in public shelters.

Economic Loss

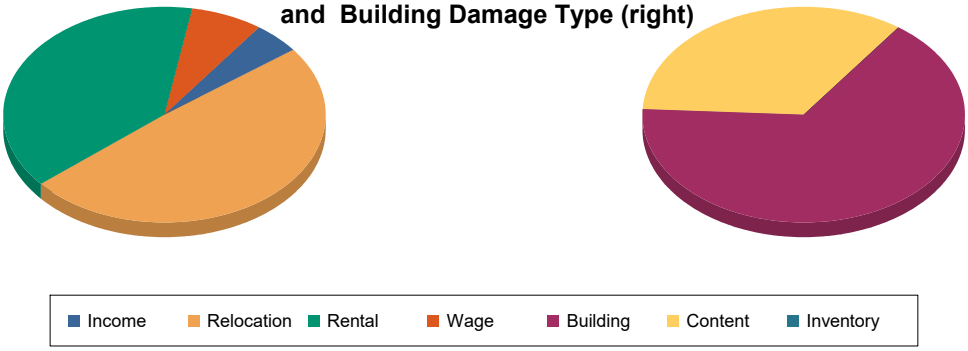
The total economic loss estimated for the hurricane is 12.7 million dollars, which represents 1.31 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 13 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

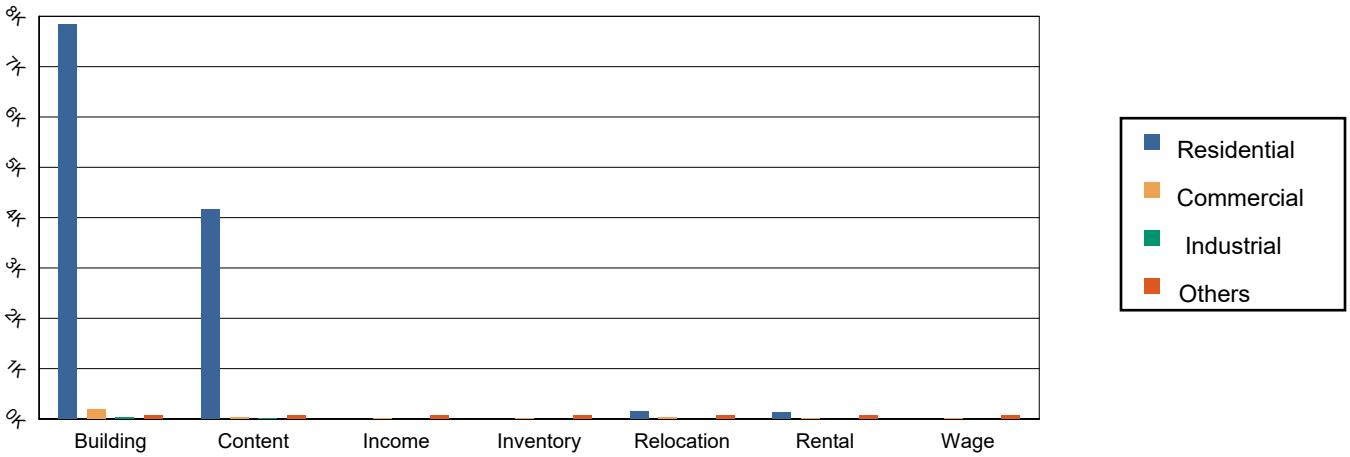


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	7,832.75	182.06	33.77	56.43	8,105.01
	Content	4,162.27	26.03	2.57	4.54	4,195.40
	Inventory	0.00	5.19	0.22	0.25	5.66
	Subtotal	**11,995.02**	**213.28**	**36.55**	**61.22**	**12,306.07**
Business Interruption Loss						
	Income	0.00	13.84	0.00	3.57	17.41
	Relocation	156.02	24.71	0.50	2.88	184.11
	Rental	132.73	11.82	0.00	0.26	144.81
	Wage	0.00	18.43	0.00	8.42	26.84
	Subtotal	**288.75**	**68.81**	**0.50**	**15.12**	**373.18**

Total

Total	**12,283.77**	**282.09**	**37.05**	**76.34**	**12,679.25**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,262	241,595	968,857
Total	**5,566**	**727,262**	**241,595**	**968,857**
Study Region Total	**5,566**	**727,262**	**241,595**	**968,857**

Hazus: Hurricane Global Risk Report

Region Name:	Willington_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 33.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 5,566 people. The distribution of population by State and County is provided in Appendix B.

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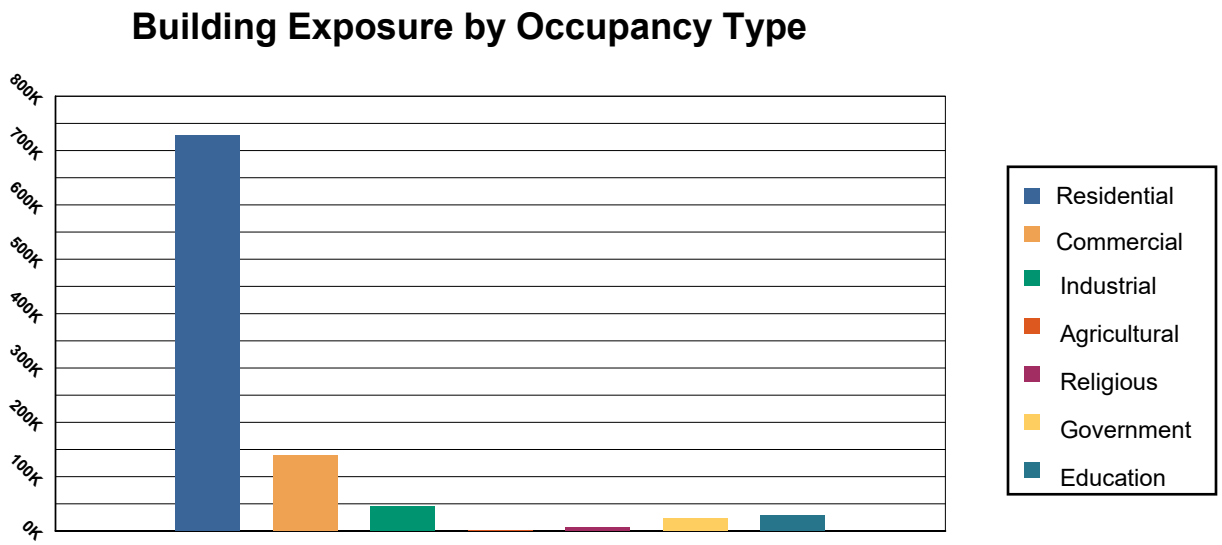


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	727,262	75.06%
Commercial	138,369	14.28%
Industrial	44,364	4.58%
Agricultural	676	0.07%
Religious	6,317	0.65%
Government	22,527	2.33%
Education	29,342	3.03%
Total	**968,857**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 3 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 36 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

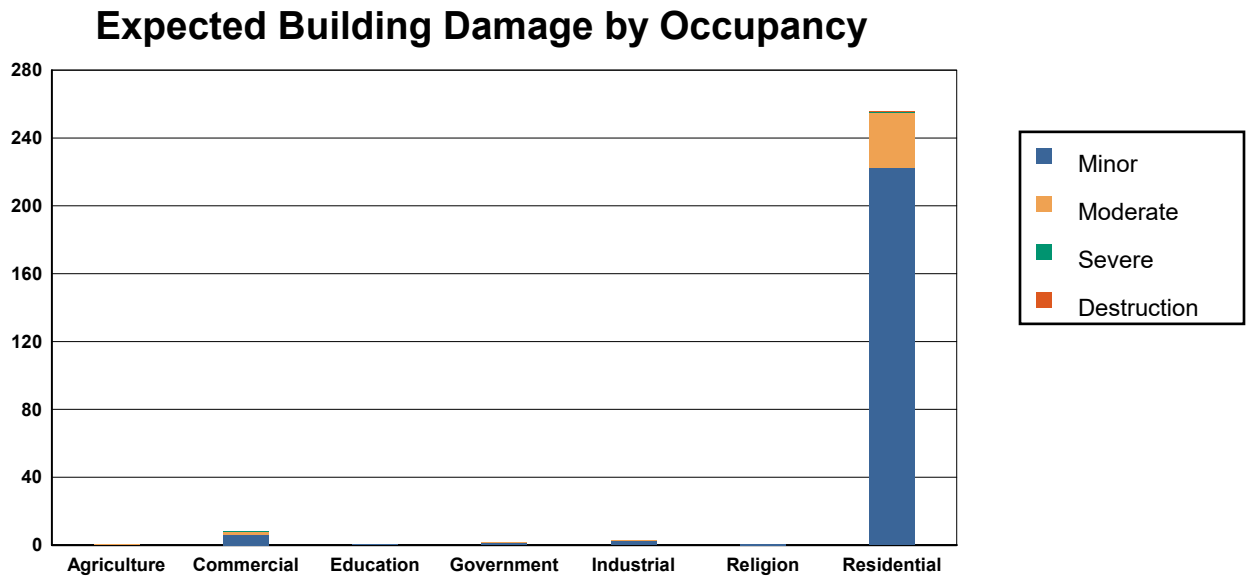


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	2.64	87.90	0.28	9.20	0.06	1.93	0.03	0.90	0.00	0.07
Commercial	81.93	91.03	5.94	6.60	1.68	1.86	0.45	0.50	0.00	0.00
Education	2.77	92.31	0.21	7.07	0.02	0.60	0.00	0.02	0.00	0.00
Government	22.20	92.52	1.65	6.88	0.14	0.58	0.00	0.02	0.00	0.00
Industrial	37.89	92.42	2.84	6.92	0.26	0.63	0.01	0.04	0.00	0.00
Religion	7.33	91.57	0.63	7.82	0.05	0.58	0.00	0.03	0.00	0.00
Residential	1,677.36	86.78	222.67	11.52	32.17	1.66	0.61	0.03	0.18	0.01
Total	**1,832.12**		**234.22**		**34.36**		**1.11**		**0.19**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	22	91.24	2	7.79	0	0.96	0	0.02	0	0.00
Masonry	140	85.67	16	9.79	7	4.47	0	0.07	0	0.00
MH	32	97.22	1	1.98	0	0.64	0	0.01	0	0.15
Steel	81	91.48	5	6.01	2	1.94	1	0.56	0	0.00
Wood	1,569	87.50	206	11.47	18	0.99	1	0.04	0	0.01

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

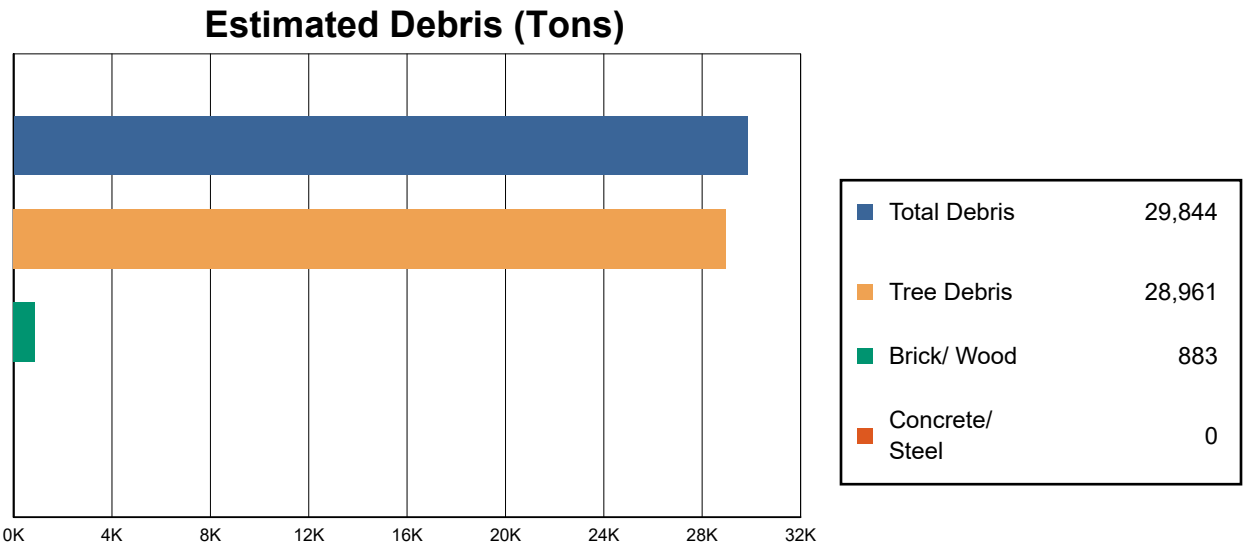
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

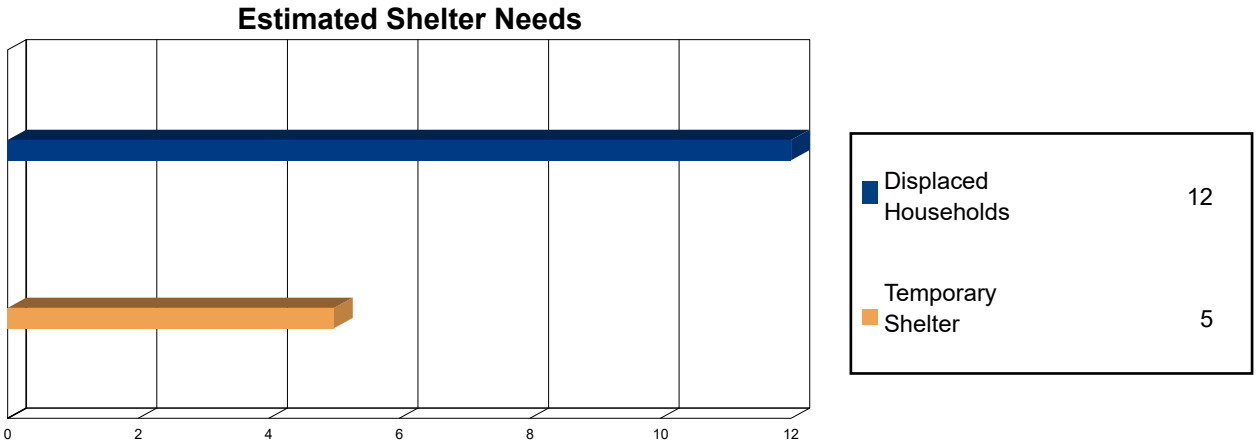


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 29,844 tons of debris will be generated. Of the total amount, 25,486 tons (85%) is Other Tree Debris. Of the remaining 4,358 tons, Brick/Wood comprises 20% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 35 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,475 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 12 households to be displaced due to the hurricane. Of these, 5 people (out of a total population of 5,566) will seek temporary shelter in public shelters.

Economic Loss

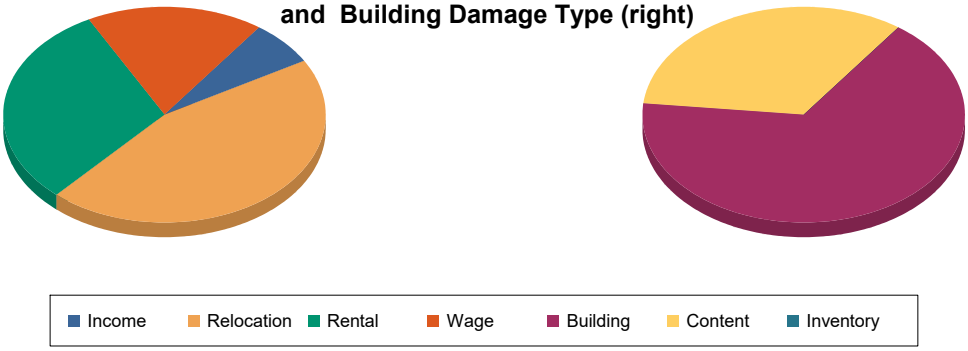
The total economic loss estimated for the hurricane is 20.2 million dollars, which represents 2.08 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 20 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

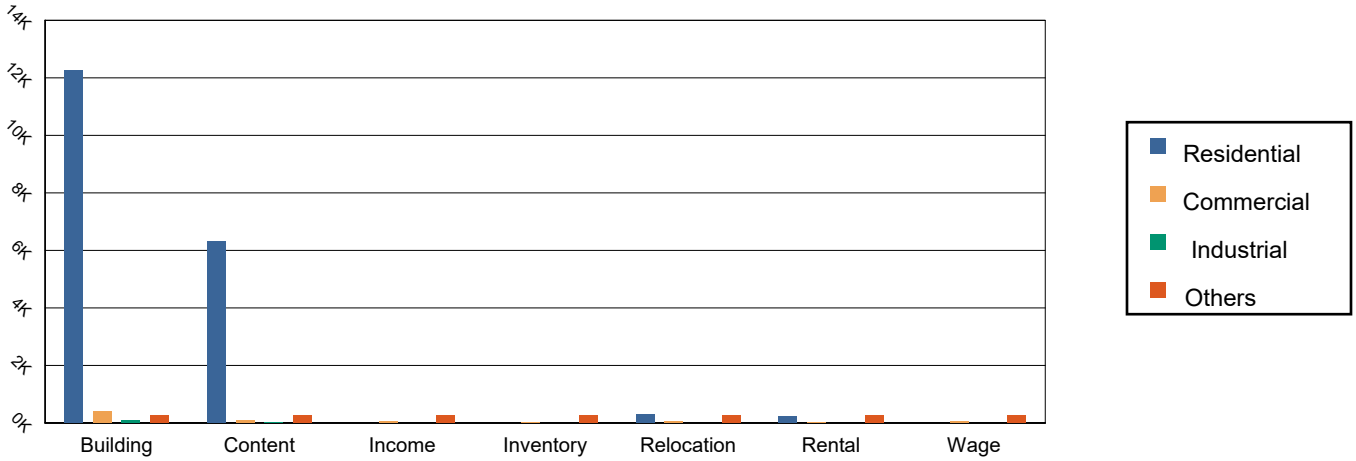


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	12,257.70	386.73	77.00	118.32	12,839.76
	Content	6,325.36	84.20	10.00	12.17	6,431.73
	Inventory	0.00	18.48	1.02	0.95	20.45
	Subtotal	**18,583.06**	**489.42**	**88.02**	**131.44**	**19,291.94**
Business Interruption Loss						
	Income	0.00	47.71	1.25	9.42	58.38
	Relocation	305.95	60.62	3.96	14.99	385.52
	Rental	229.19	30.12	0.60	2.36	262.27
	Wage	0.00	49.56	1.70	100.98	152.24
	Subtotal	**535.14**	**188.01**	**7.51**	**127.75**	**858.41**

Total

Total	**19,118.20**	**677.43**	**95.53**	**259.19**	**20,150.35**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,262	241,595	968,857
Total	**5,566**	**727,262**	**241,595**	**968,857**
Study Region Total	**5,566**	**727,262**	**241,595**	**968,857**

Hazus: Hurricane Global Risk Report

Region Name:	Willington_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 33.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region and a total population of 5,566 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 969 million dollars. Approximately 92% of the buildings (and 75% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,102 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

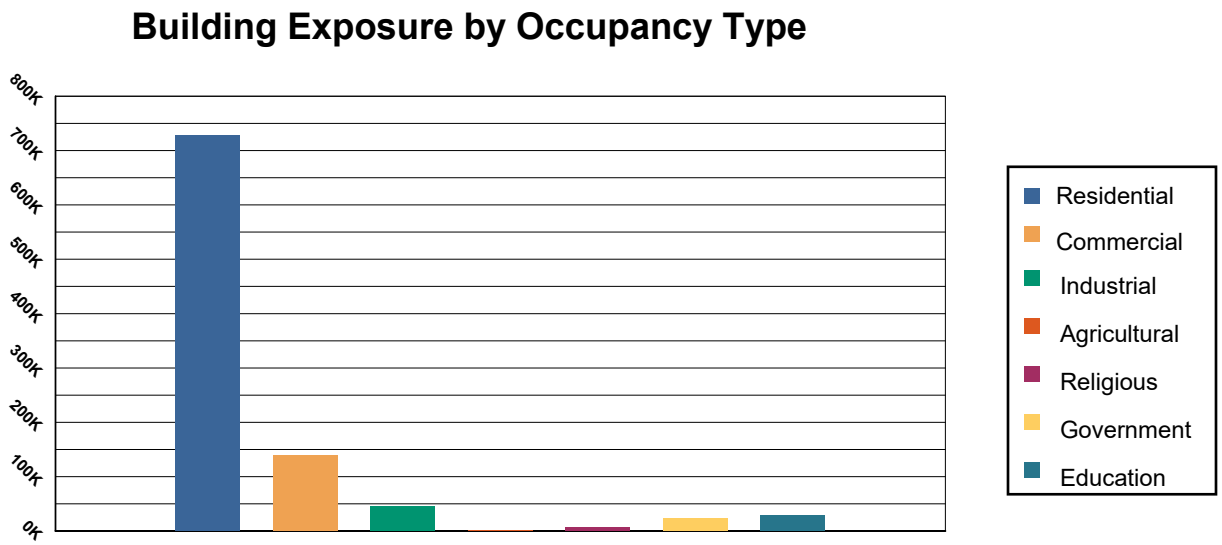


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	727,262	75.06%
Commercial	138,369	14.28%
Industrial	44,364	4.58%
Agricultural	676	0.07%
Religious	6,317	0.65%
Government	22,527	2.33%
Education	29,342	3.03%
Total	**968,857**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 3 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 93 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

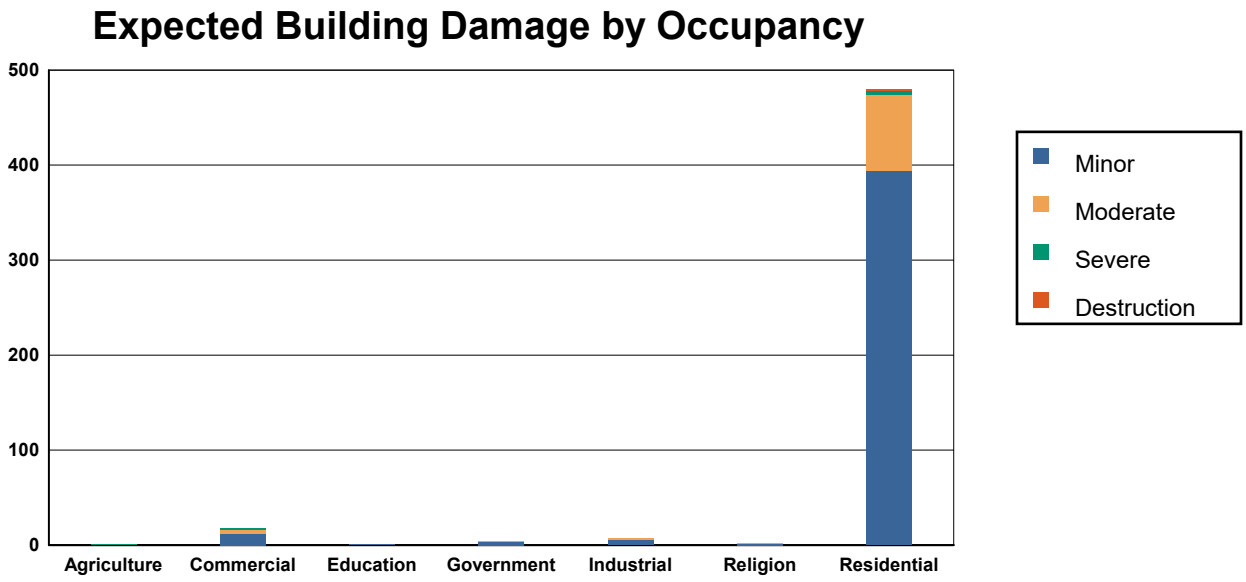


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	2.28	76.00	0.51	16.86	0.14	4.63	0.07	2.23	0.01	0.28
Commercial	72.95	81.06	11.64	12.94	4.04	4.49	1.35	1.50	0.01	0.01
Education	2.49	83.00	0.42	14.07	0.08	2.80	0.00	0.13	0.00	0.00
Government	20.00	83.34	3.29	13.69	0.68	2.85	0.03	0.12	0.00	0.00
Industrial	34.10	83.17	5.63	13.74	1.19	2.91	0.07	0.18	0.00	0.00
Religion	6.53	81.57	1.26	15.69	0.21	2.61	0.01	0.13	0.00	0.00
Residential	1,453.42	75.19	394.55	20.41	79.57	4.12	3.80	0.20	1.66	0.09
Total	**1,591.77**		**417.30**		**85.92**		**5.34**		**1.67**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	20	81.25	4	14.67	1	3.97	0	0.11	0	0.00
Masonry	122	74.73	26	16.21	14	8.82	0	0.22	0	0.02
MH	30	91.54	2	5.13	1	2.60	0	0.09	0	0.64
Steel	73	81.81	10	11.72	4	4.78	1	1.68	0	0.01
Wood	1,362	75.96	372	20.77	54	2.99	3	0.19	1	0.08

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

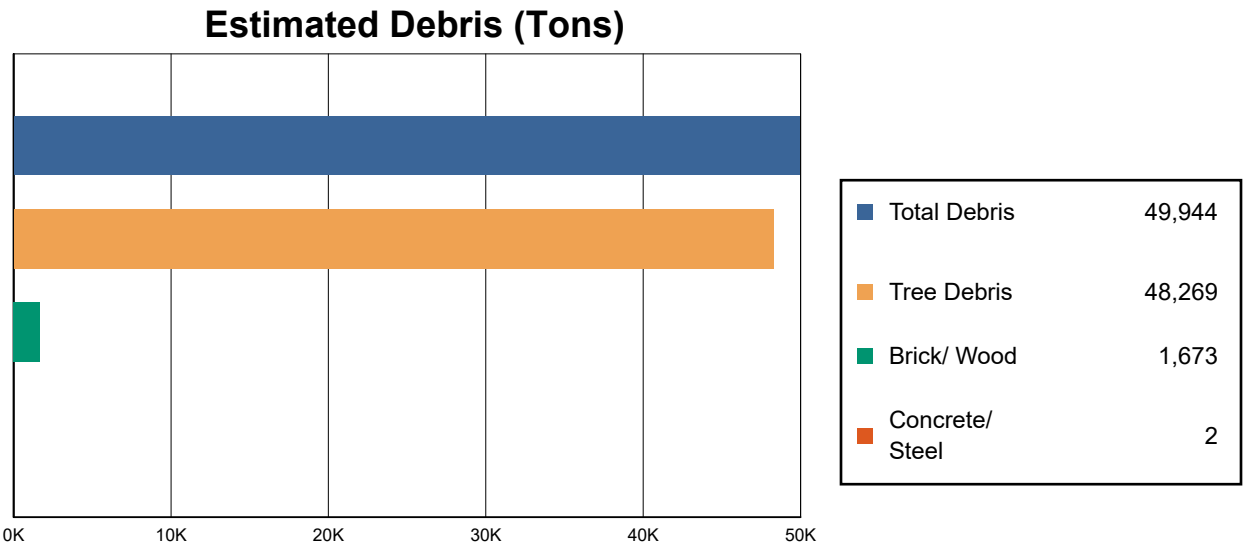
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Schools	2	0	0	2

Induced Hurricane Damage

Debris Generation

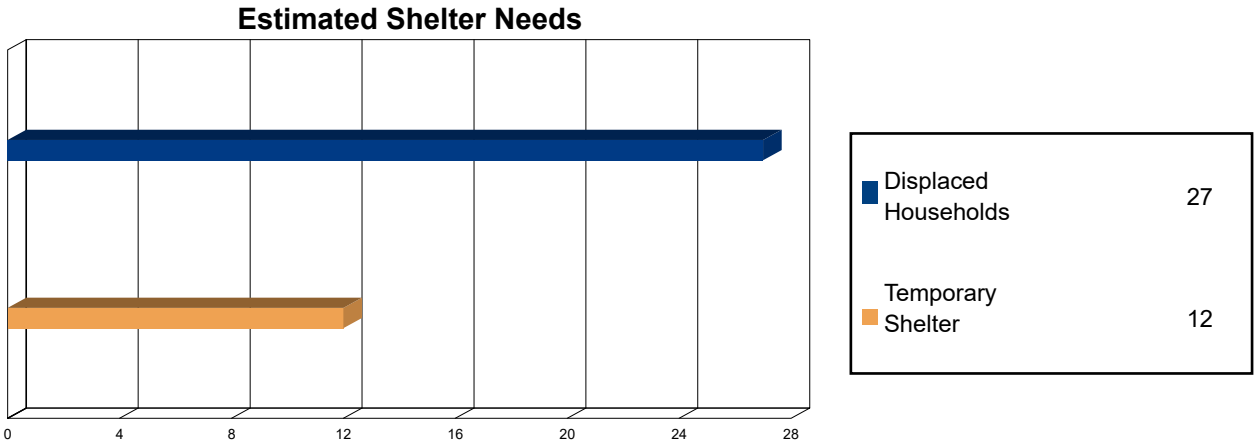


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 49,944 tons of debris will be generated. Of the total amount, 42,477 tons (85%) is Other Tree Debris. Of the remaining 7,467 tons, Brick/Wood comprises 22% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 67 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,792 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 27 households to be displaced due to the hurricane. Of these, 12 people (out of a total population of 5,566) will seek temporary shelter in public shelters.

Economic Loss

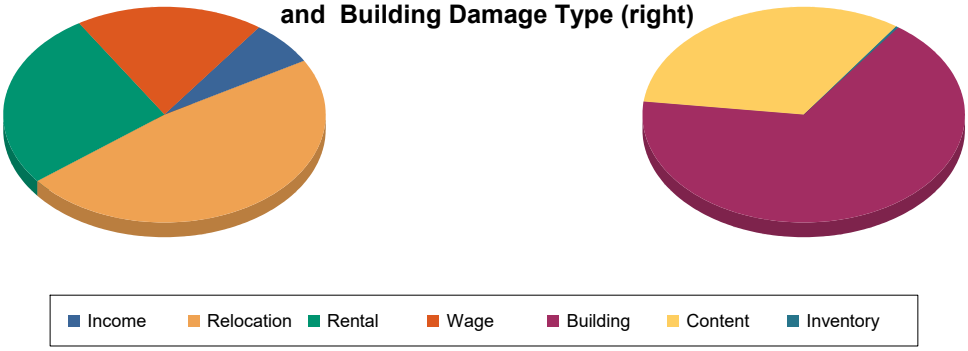
The total economic loss estimated for the hurricane is 35.9 million dollars, which represents 3.71 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 36 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 92% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

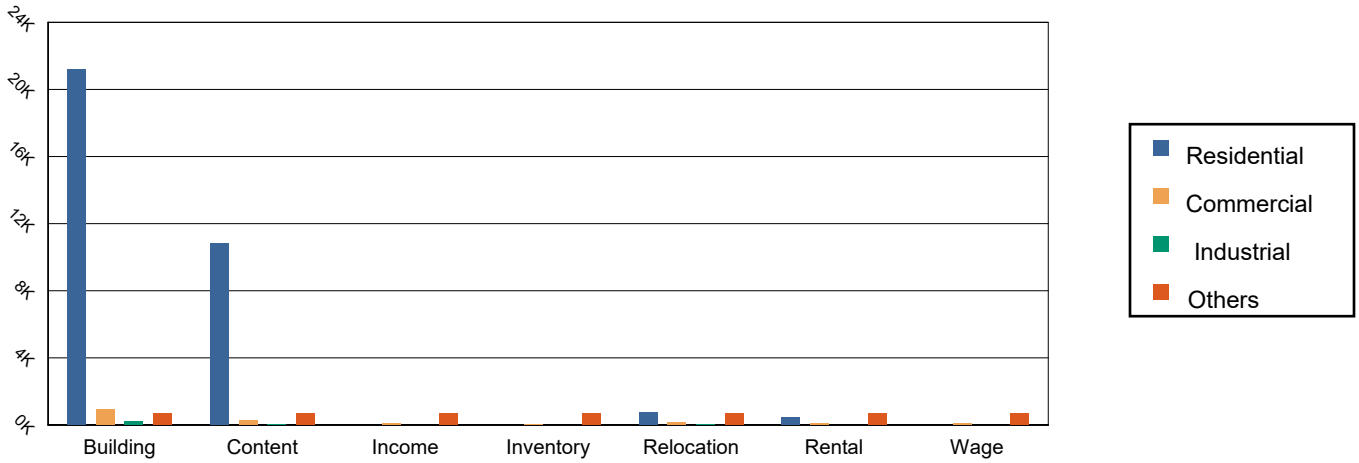


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	21,214.32	946.80	203.47	298.61	22,663.21
	Content	10,788.13	278.10	52.64	55.23	11,174.10
	Inventory	0.00	61.46	5.72	2.79	69.97
	Subtotal	**32,002.45**	**1,286.37**	**261.83**	**356.64**	**33,907.28**
Business Interruption Loss						
	Income	0.00	103.06	3.61	26.86	133.54
	Relocation	766.44	141.29	15.44	52.39	975.56
	Rental	463.18	67.80	1.76	7.22	539.95
	Wage	0.00	106.77	4.55	272.35	383.66
	Subtotal	**1,229.62**	**418.91**	**25.36**	**358.82**	**2,032.71**

Total

Total	**33,232.07**	**1,705.28**	**287.19**	**715.45**	**35,939.99**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,262	241,595	968,857
Total	**5,566**	**727,262**	**241,595**	**968,857**
Study Region Total	**5,566**	**727,262**	**241,595**	**968,857**

Hazus: Hurricane Global Risk Report

Region Name:	Willington_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
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Building Inventory

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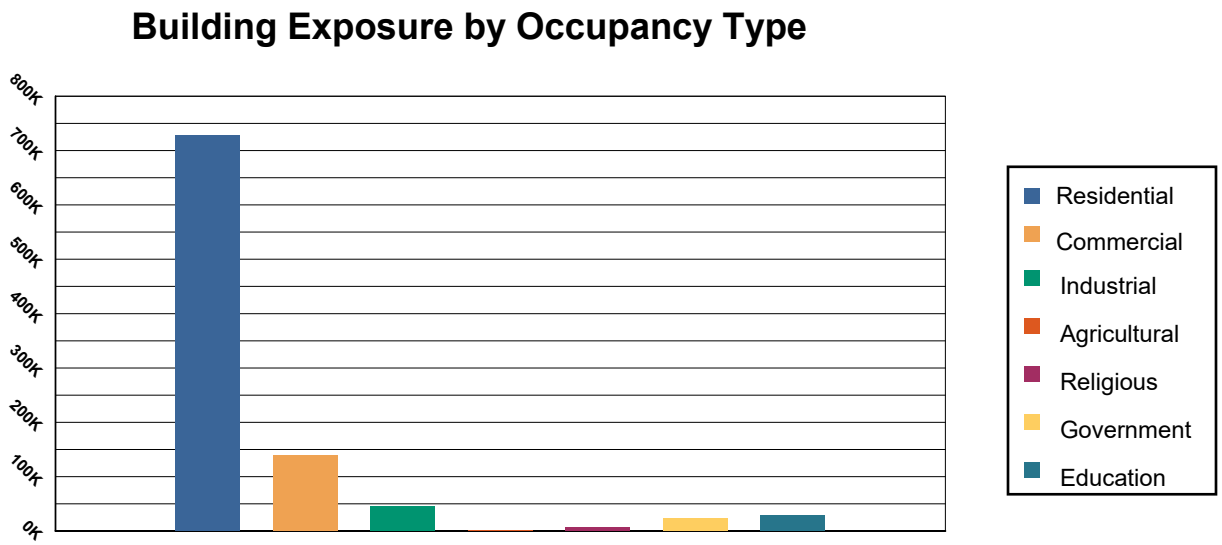


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	727,262	75.06%
Commercial	138,369	14.28%
Industrial	44,364	4.58%
Agricultural	676	0.07%
Religious	6,317	0.65%
Government	22,527	2.33%
Education	29,342	3.03%
Total	**968,857**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 2 schools, 3 fire stations, no police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 150 buildings will be at least moderately damaged. This is over 7% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

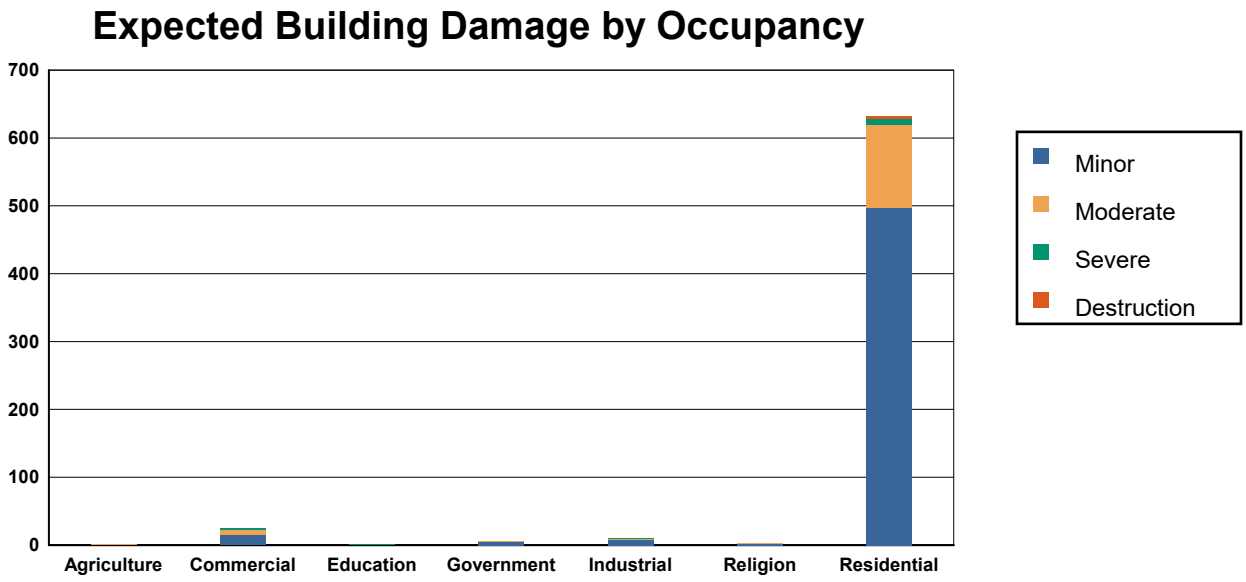


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	2.02	67.49	0.65	21.62	0.21	7.03	0.10	3.38	0.01	0.48
Commercial	65.81	73.13	15.38	17.09	6.54	7.27	2.24	2.49	0.02	0.02
Education	2.25	75.13	0.56	18.74	0.17	5.71	0.01	0.42	0.00	0.00
Government	18.12	75.50	4.37	18.22	1.40	5.85	0.10	0.43	0.00	0.00
Industrial	30.88	75.32	7.49	18.27	2.41	5.88	0.21	0.52	0.00	0.01
Religion	5.89	73.59	1.67	20.85	0.42	5.20	0.03	0.36	0.00	0.00
Residential	1,300.54	67.28	496.75	25.70	122.35	6.33	8.97	0.46	4.38	0.23
Total	**1,425.52**		**526.88**		**133.51**		**11.67**		**4.42**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	18	73.00	5	18.95	2	7.64	0	0.41	0	0.00
Masonry	109	66.82	33	20.04	21	12.59	1	0.50	0	0.05
MH	28	86.23	2	7.49	2	4.73	0	0.24	0	1.31
Steel	66	73.88	14	15.46	7	7.81	2	2.81	0	0.03
Wood	1,220	68.03	473	26.38	88	4.92	8	0.44	4	0.23

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

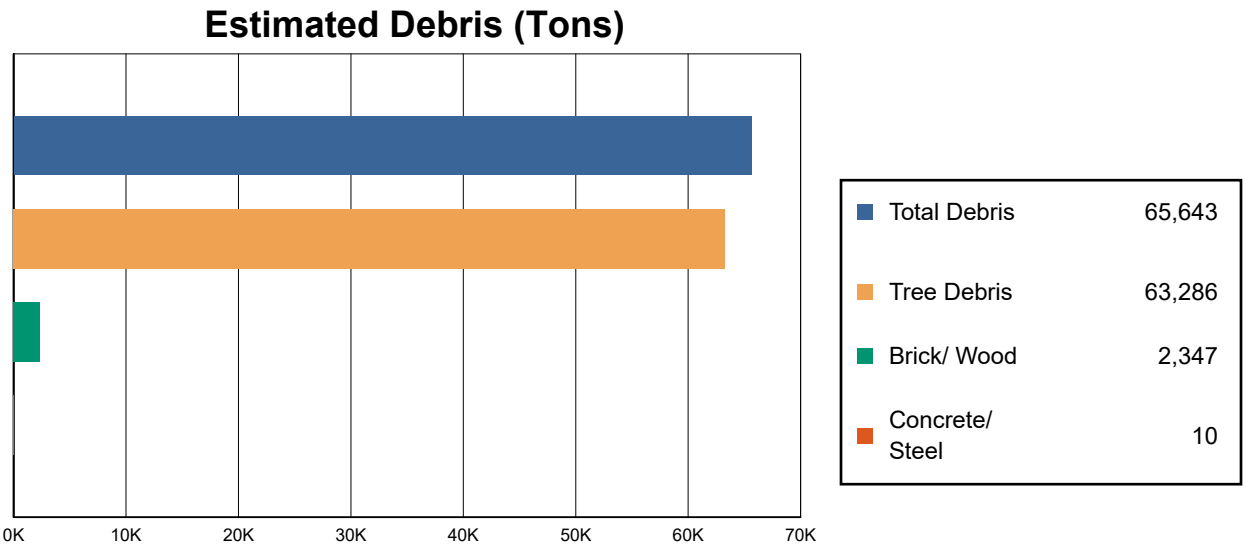
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	3	0	0	3
Schools	2	0	0	0

Induced Hurricane Damage

Debris Generation

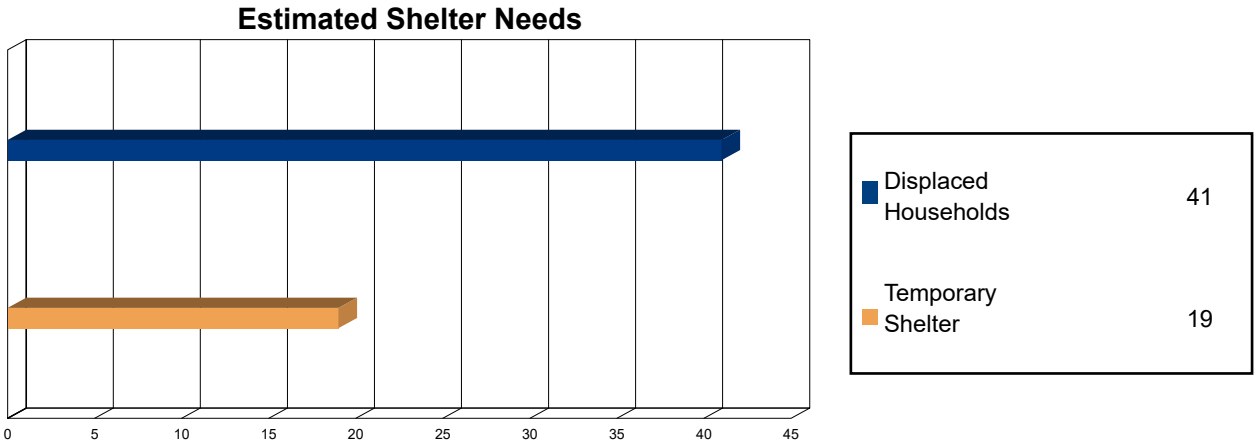


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 65,643 tons of debris will be generated. Of the total amount, 55,692 tons (85%) is Other Tree Debris. Of the remaining 9,951 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 94 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,594 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 41 households to be displaced due to the hurricane. Of these, 19 people (out of a total population of 5,566) will seek temporary shelter in public shelters.

Economic Loss

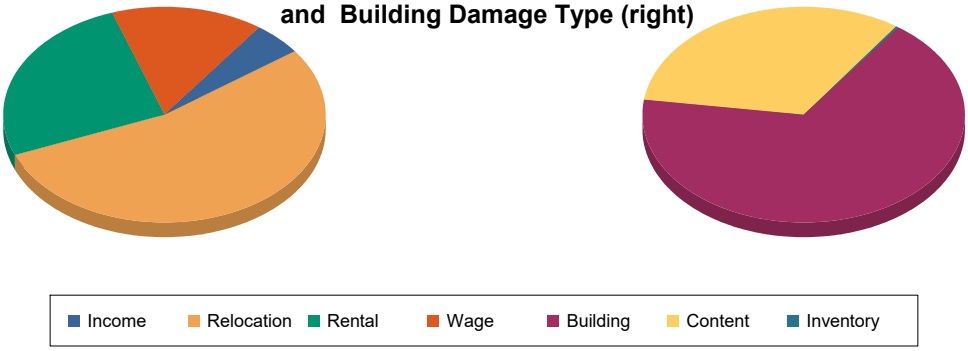
The total economic loss estimated for the hurricane is 49.5 million dollars, which represents 5.11 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 49 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

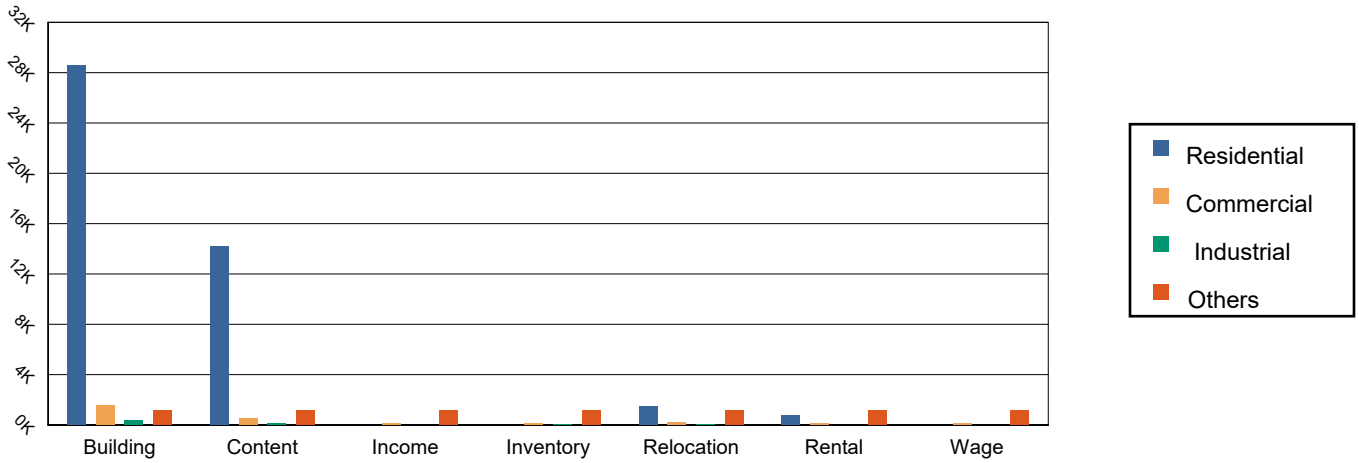


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	28,577.19	1,539.93	355.07	502.62	30,974.81
	Content	14,196.84	526.78	119.01	123.69	14,966.32
	Inventory	0.00	113.59	13.07	4.58	131.24
	Subtotal	**42,774.03**	**2,180.29**	**487.15**	**630.90**	**46,072.37**
Business Interruption Loss						
	Income	0.00	133.42	4.99	33.90	172.31
	Relocation	1,475.43	232.55	29.93	87.43	1,825.35
	Rental	745.91	113.44	2.95	11.80	874.10
	Wage	0.00	139.38	6.42	375.45	521.25
	Subtotal	**2,221.34**	**618.78**	**44.29**	**508.59**	**3,393.00**

Total

Total	**44,995.37**	**2,799.08**	**531.44**	**1,139.49**	**49,465.38**

Appendix A: County Listing for the Region

Connecticut

- Tolland

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Tolland	5,566	727,262	241,595	968,857
Total	**5,566**	**727,262**	**241,595**	**968,857**
Study Region Total	**5,566**	**727,262**	**241,595**	**968,857**

Hazus: Hurricane Global Risk Report

Region Name:	South_Windsor_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.67 square miles and contains 6 census tracts. There are over 10 thousand households in the region and a total population of 26,918 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,662 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

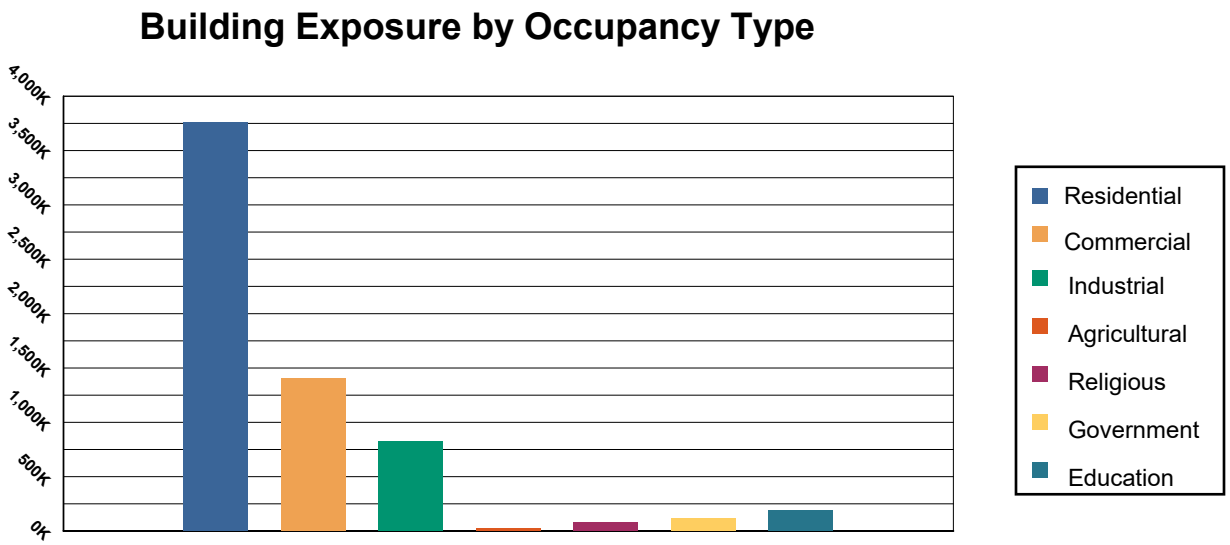


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,758,537	58.86%
Commercial	1,407,105	22.04%
Industrial	821,227	12.86%
Agricultural	19,537	0.31%
Religious	75,883	1.19%
Government	116,678	1.83%
Education	186,119	2.91%
Total	**6,385,086**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

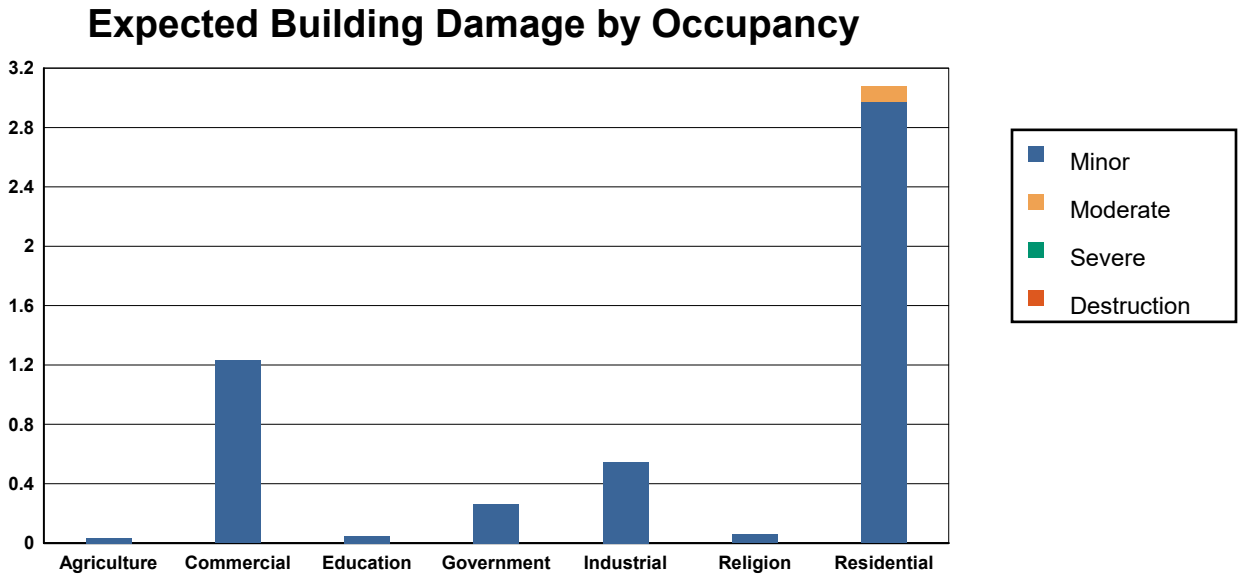


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	33.97	99.90	0.03	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	793.77	99.85	1.23	0.15	0.00	0.00	0.00	0.00	0.00	0.00
Education	22.95	99.79	0.05	0.21	0.00	0.00	0.00	0.00	0.00	0.00
Government	124.74	99.79	0.26	0.21	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	303.45	99.82	0.55	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Religion	41.94	99.86	0.06	0.14	0.00	0.00	0.00	0.00	0.00	0.00
Residential	7,335.92	99.96	2.97	0.04	0.11	0.00	0.00	0.00	0.00	0.00
Total	**8,656.74**		**5.15**		**0.11**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	146	99.78	0	0.22	0	0.00	0	0.00	0	0.00
Masonry	777	99.75	2	0.25	0	0.00	0	0.00	0	0.00
MH	29	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	633	99.82	1	0.18	0	0.00	0	0.00	0	0.00
Wood	7,067	99.99	1	0.01	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

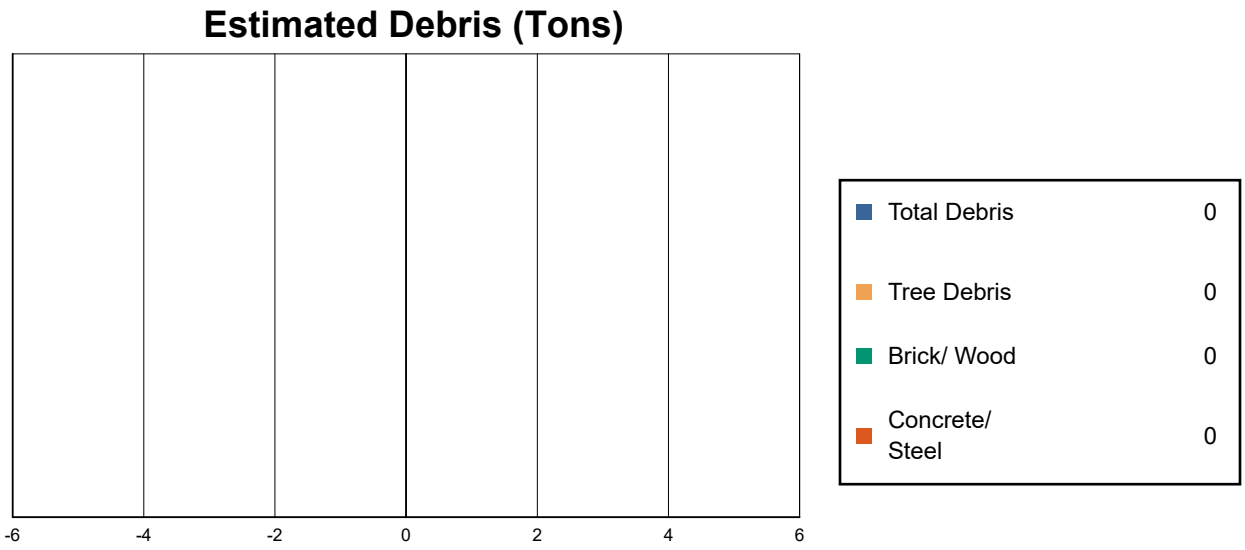
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

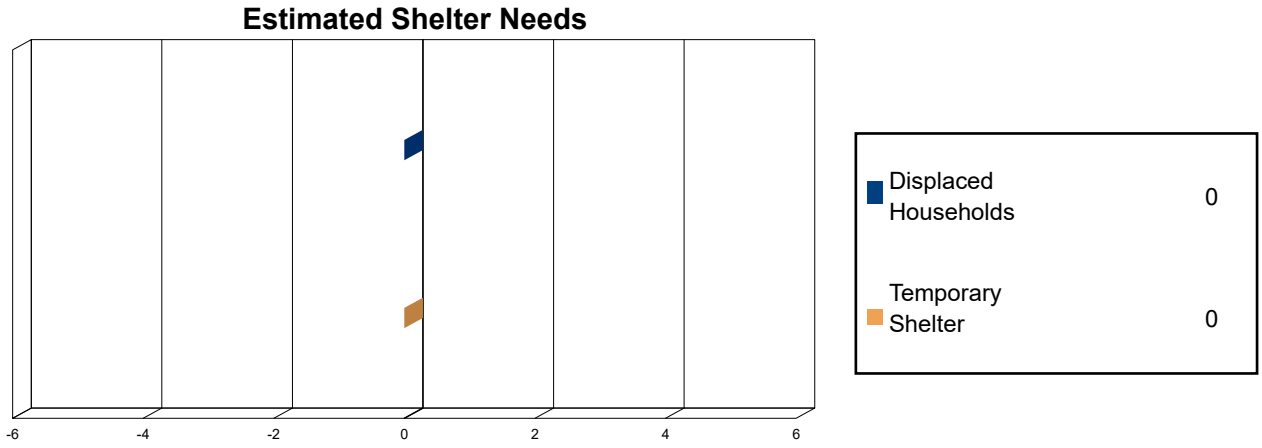


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,918) will seek temporary shelter in public shelters.

Economic Loss

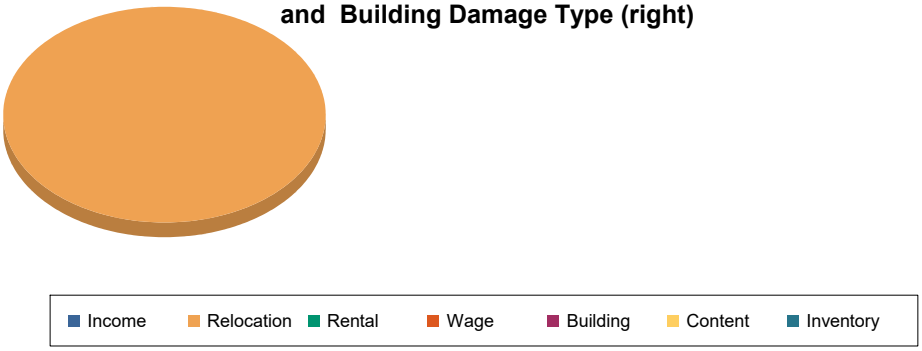
The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 100% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



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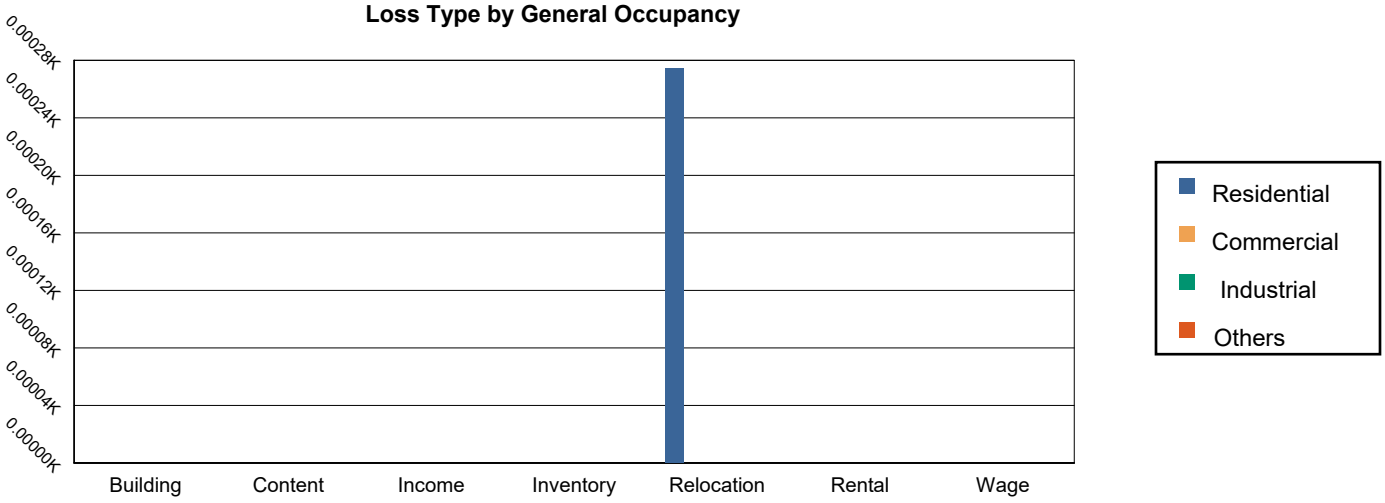

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.27	0.00	0.00	0.00	0.27
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.27**	**0.00**	**0.00**	**0.00**	**0.27**

Total

Total	**0.27**	**0.00**	**0.00**	**0.00**	**0.27**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,918	3,758,537	2,626,549	6,385,086
Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**
Study Region Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**

Hazus: Hurricane Global Risk Report

Region Name:	South_Windsor_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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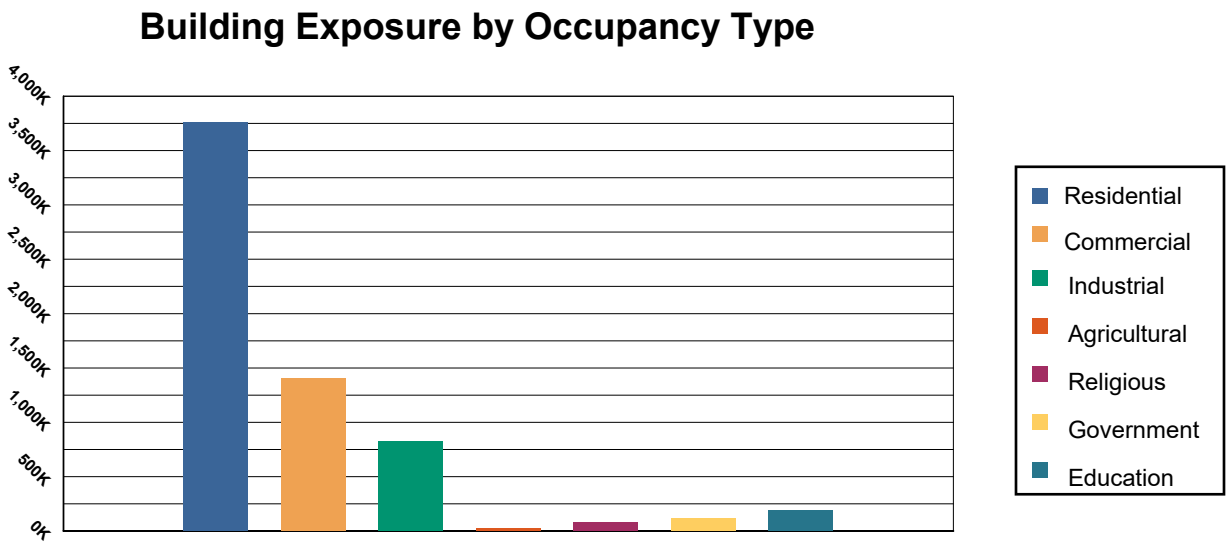

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Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

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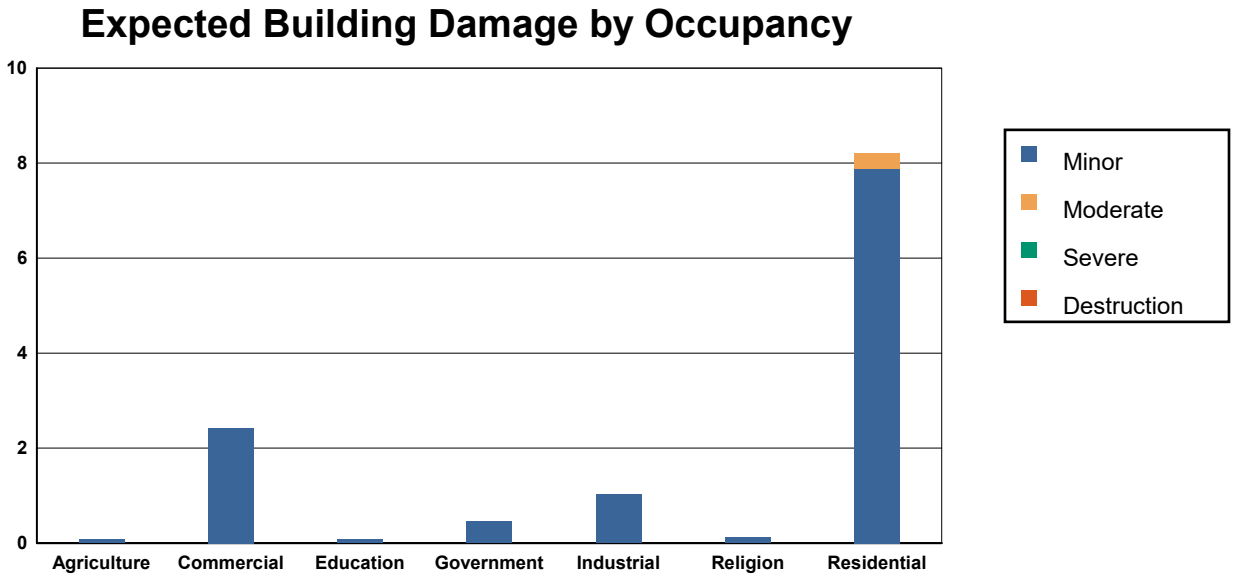


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	33.92	99.76	0.08	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	792.57	99.69	2.43	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Education	22.92	99.66	0.08	0.34	0.00	0.00	0.00	0.00	0.00	0.00
Government	124.55	99.64	0.45	0.36	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	302.97	99.66	1.03	0.34	0.00	0.00	0.00	0.00	0.00	0.00
Religion	41.89	99.73	0.11	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Residential	7,330.79	99.89	7.87	0.11	0.34	0.00	0.00	0.00	0.00	0.00
Total	**8,649.61**		**12.05**		**0.34**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	145	99.59	1	0.41	0	0.00	0	0.00	0	0.00
Masonry	775	99.48	4	0.50	0	0.01	0	0.00	0	0.00
MH	29	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	632	99.67	2	0.33	0	0.00	0	0.00	0	0.00
Wood	7,065	99.95	3	0.05	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

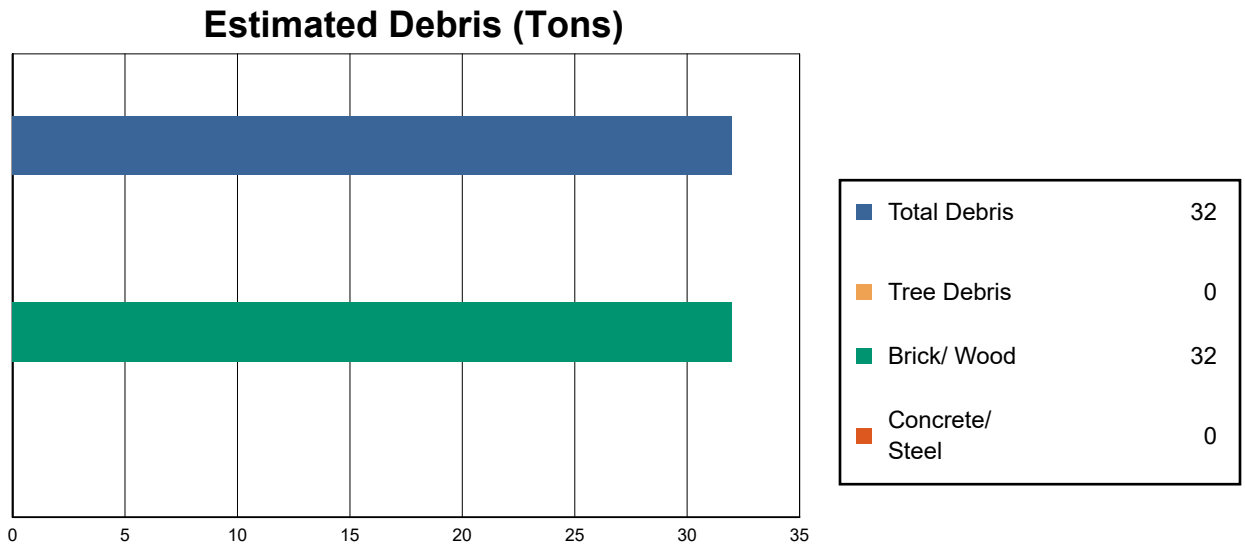
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

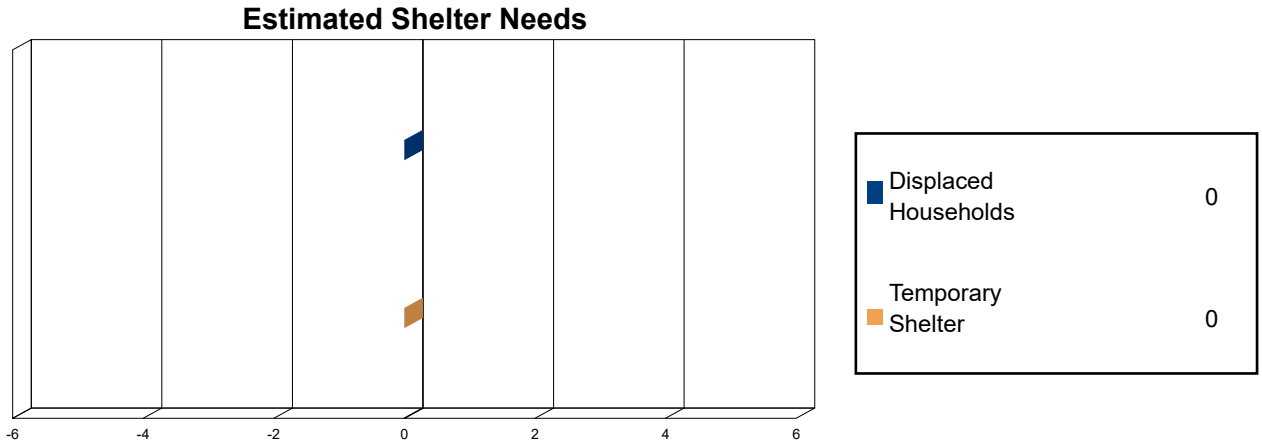


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 32 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 32 tons, Brick/Wood comprises 100% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,918) will seek temporary shelter in public shelters.

Economic Loss

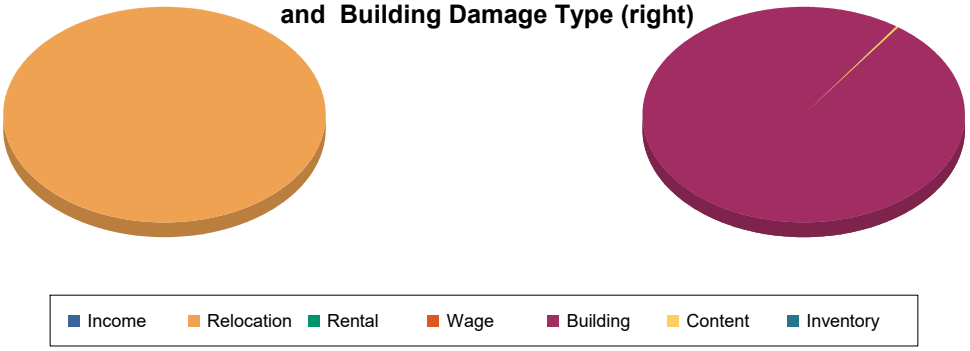
The total economic loss estimated for the hurricane is 1.5 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

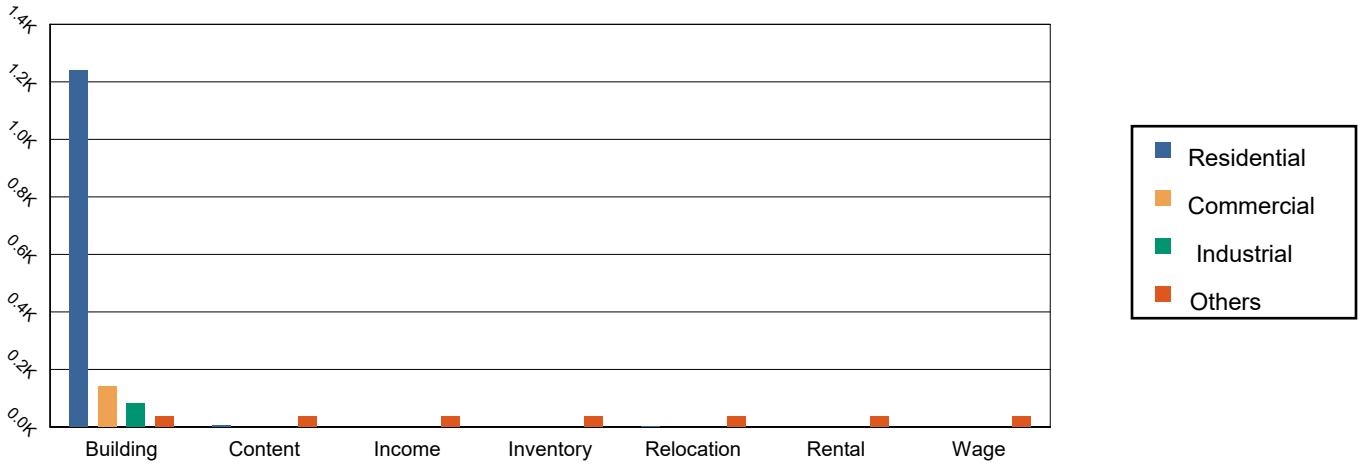


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,240.17	140.71	82.12	37.87	1,500.87
	Content	4.74	0.00	0.00	0.00	4.74
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,244.91**	**140.71**	**82.12**	**37.87**	**1,505.61**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.85	0.00	0.00	0.00	0.85
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.85**	**0.00**	**0.00**	**0.00**	**0.85**

Total

Total	**1,245.76**	**140.71**	**82.12**	**37.87**	**1,506.47**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
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Hartford	26,918	3,758,537	2,626,549	6,385,086
Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**
Study Region Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**

Hazus: Hurricane Global Risk Report

Region Name:	South_Windsor_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Friday, May 12, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
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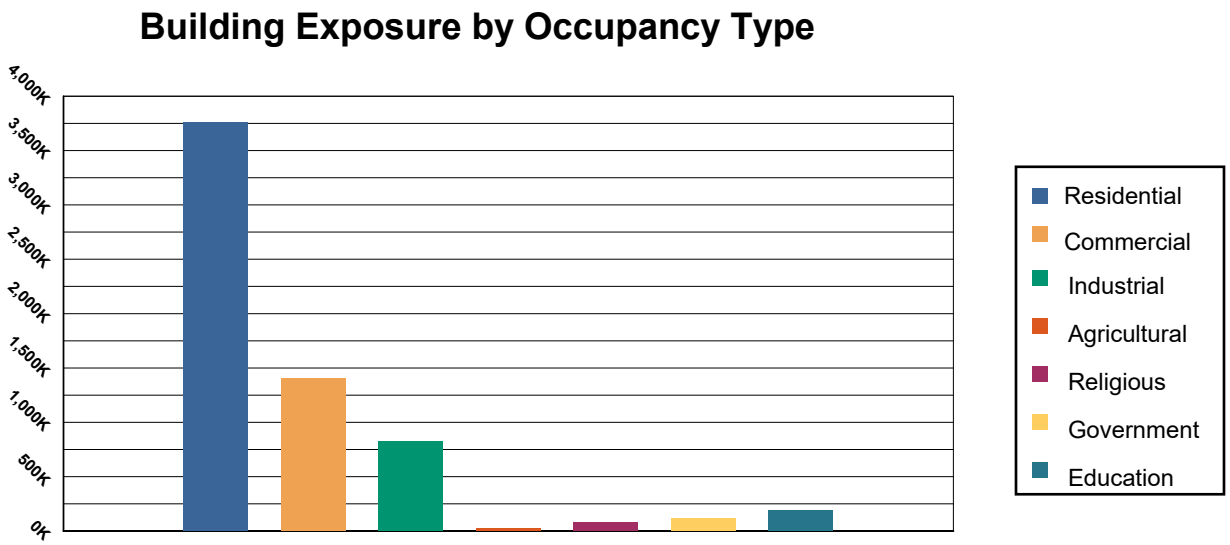

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General Building Stock Damage

Hazus estimates that about 13 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

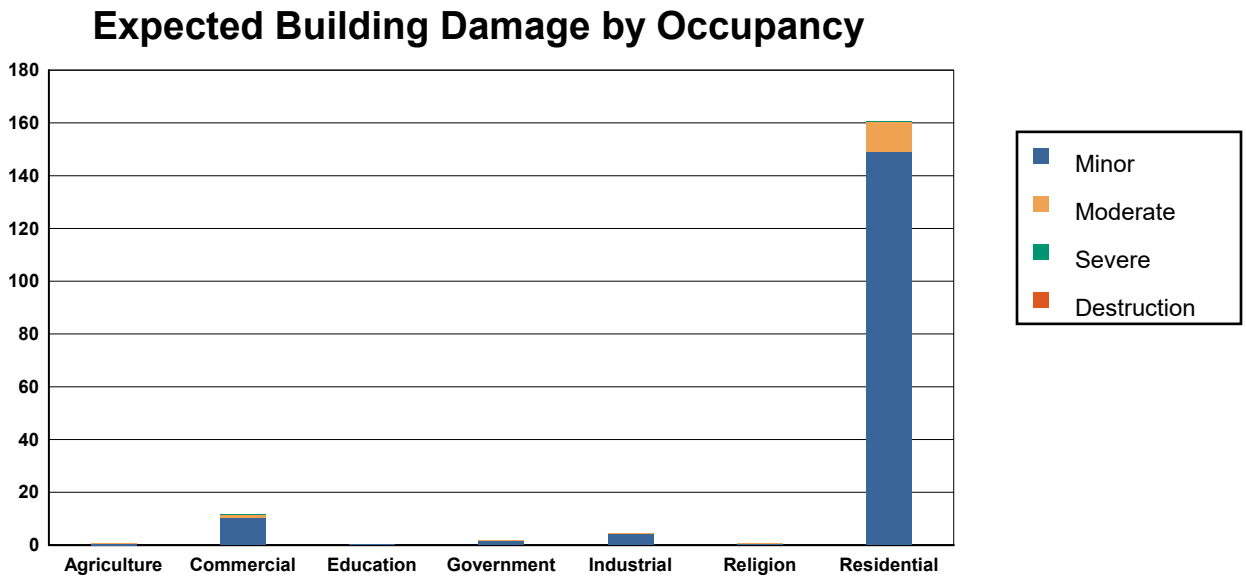


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	33.45	98.39	0.49	1.43	0.05	0.14	0.01	0.04	0.00	0.00
Commercial	783.21	98.52	10.36	1.30	1.38	0.17	0.06	0.01	0.00	0.00
Education	22.65	98.49	0.34	1.48	0.01	0.03	0.00	0.00	0.00	0.00
Government	123.11	98.49	1.86	1.49	0.03	0.02	0.00	0.00	0.00	0.00
Industrial	299.55	98.54	4.26	1.40	0.17	0.06	0.02	0.01	0.00	0.00
Religion	41.44	98.67	0.54	1.29	0.02	0.04	0.00	0.00	0.00	0.00
Residential	7,178.33	97.81	149.04	2.03	11.46	0.16	0.17	0.00	0.00	0.00
Total	**8,481.74**		**166.89**		**13.11**		**0.26**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	144	98.30	2	1.67	0	0.02	0	0.00	0	0.00
Masonry	756	97.00	20	2.53	4	0.46	0	0.01	0	0.00
MH	29	99.92	0	0.06	0	0.02	0	0.00	0	0.00
Steel	625	98.55	8	1.29	1	0.15	0	0.01	0	0.00
Wood	6,941	98.21	123	1.73	4	0.06	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

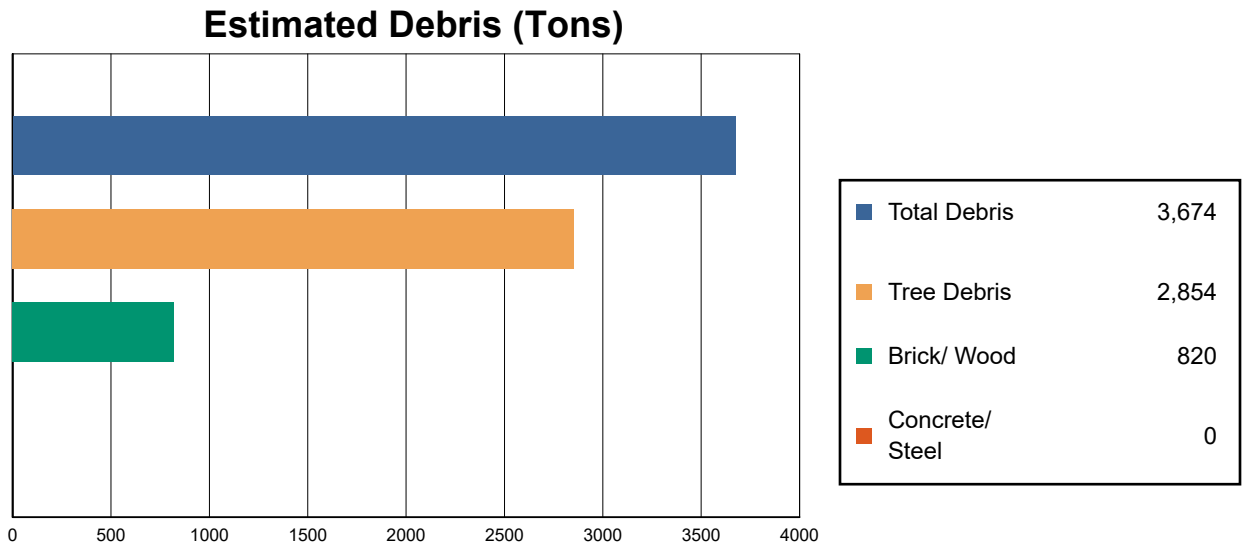
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

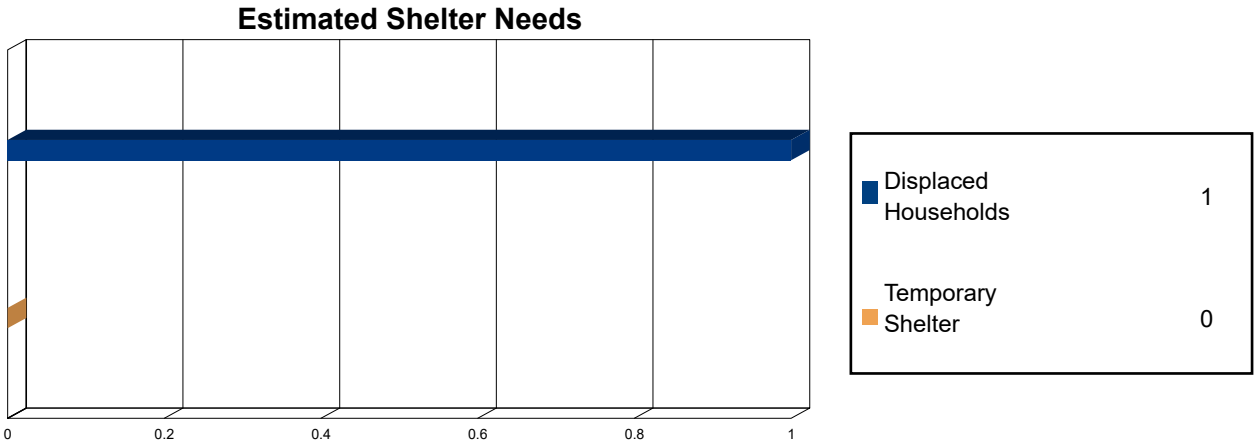


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,674 tons of debris will be generated. Of the total amount, 1,178 tons (32%) is Other Tree Debris. Of the remaining 2,496 tons, Brick/Wood comprises 33% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 33 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,676 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,918) will seek temporary shelter in public shelters.

Economic Loss

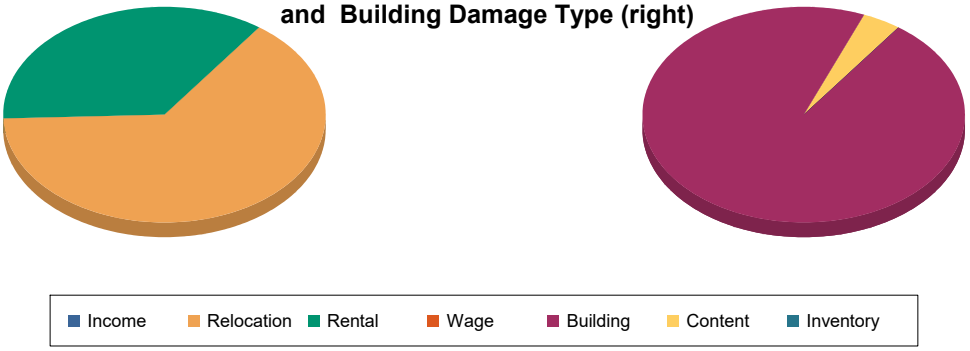
The total economic loss estimated for the hurricane is 12.7 million dollars, which represents 0.20 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 13 million dollars. 4% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

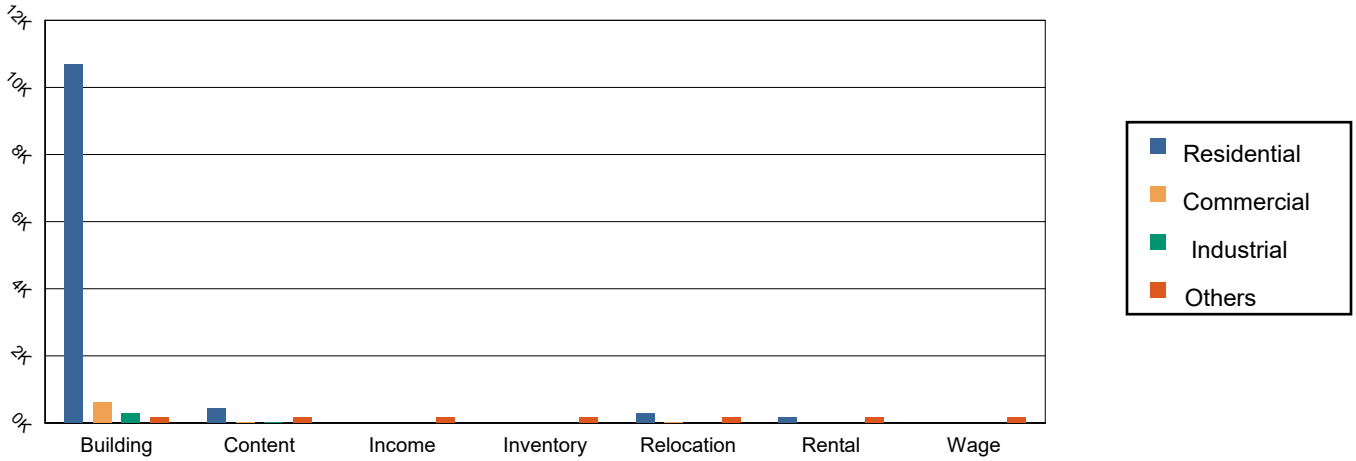


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	10,693.50	604.96	278.01	159.61	11,736.08
	Content	444.43	12.98	24.33	0.84	482.58
	Inventory	0.00	1.61	3.37	0.62	5.59
	Subtotal	**11,137.93**	**619.54**	**305.71**	**161.07**	**12,224.26**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	292.44	17.24	1.96	0.88	312.52
	Rental	172.85	0.00	0.00	0.00	172.85
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**465.29**	**17.24**	**1.96**	**0.88**	**485.37**

Total

Total	**11,603.22**	**636.78**	**307.67**	**161.96**	**12,709.63**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,918	3,758,537	2,626,549	6,385,086
Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**
Study Region Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**

Hazus: Hurricane Global Risk Report

Region Name:	South_Windsor_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.67 square miles and contains 6 census tracts. There are over 10 thousand households in the region and a total population of 26,918 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,662 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

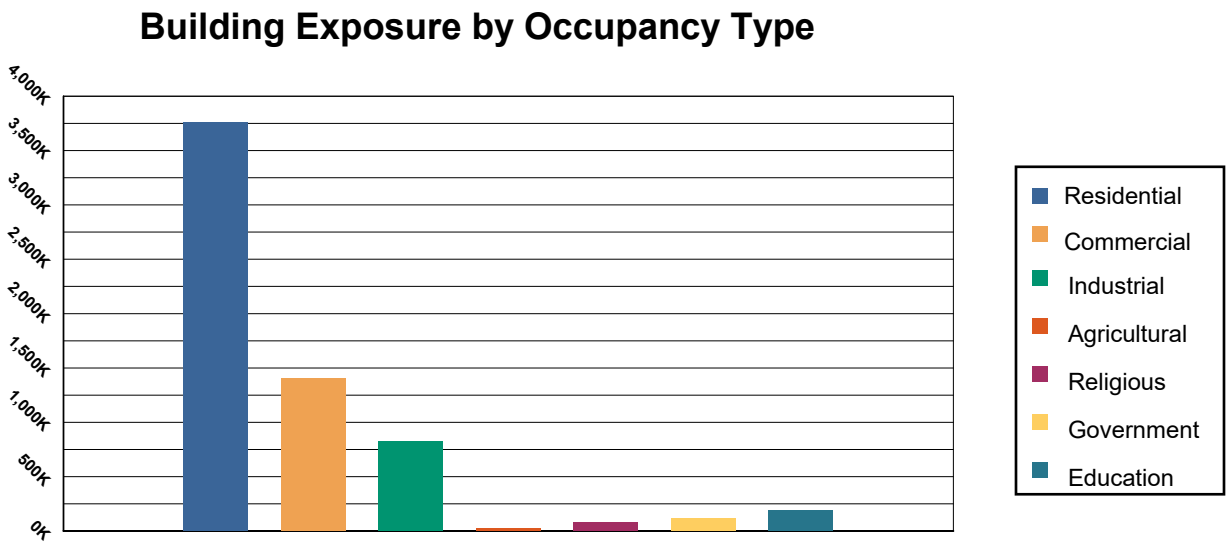


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,758,537	58.86%
Commercial	1,407,105	22.04%
Industrial	821,227	12.86%
Agricultural	19,537	0.31%
Religious	75,883	1.19%
Government	116,678	1.83%
Education	186,119	2.91%
Total	**6,385,086**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 70 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

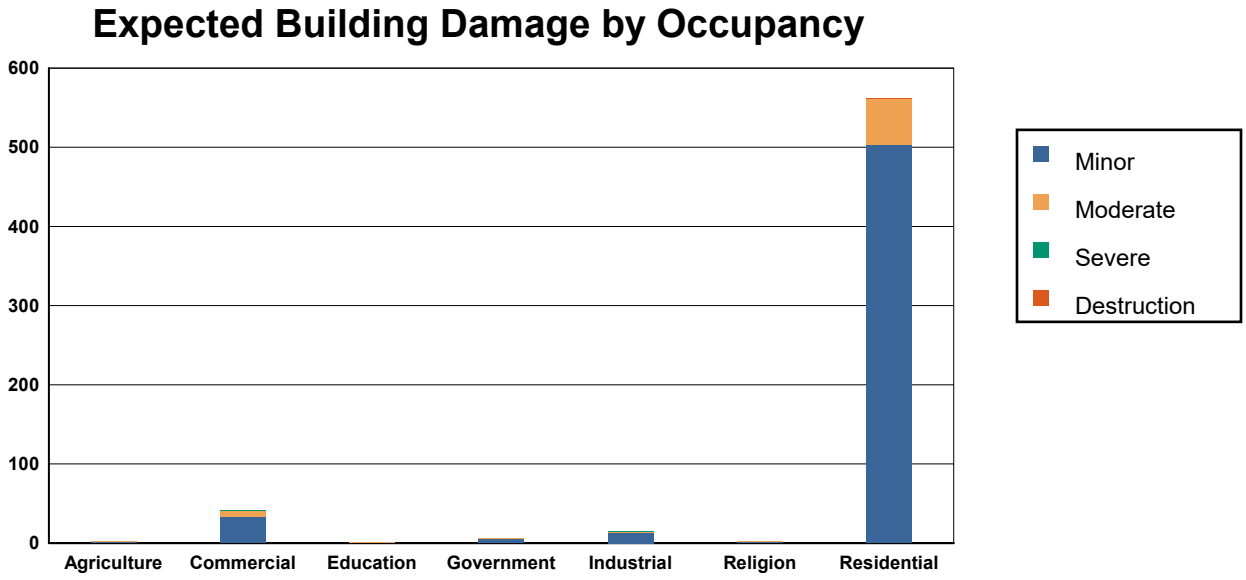


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	31.78	93.48	1.78	5.23	0.31	0.90	0.13	0.37	0.01	0.02
Commercial	753.41	94.77	33.39	4.20	7.14	0.90	1.06	0.13	0.00	0.00
Education	21.92	95.30	1.01	4.39	0.07	0.31	0.00	0.00	0.00	0.00
Government	119.24	95.39	5.38	4.30	0.38	0.30	0.00	0.00	0.00	0.00
Industrial	289.17	95.12	12.93	4.25	1.56	0.51	0.33	0.11	0.01	0.00
Religion	39.94	95.10	1.93	4.60	0.12	0.29	0.01	0.01	0.00	0.00
Residential	6,776.49	92.34	503.26	6.86	57.95	0.79	0.82	0.01	0.48	0.01
Total	**8,031.96**		**559.68**		**67.52**		**2.34**		**0.50**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	138	94.83	7	4.77	1	0.40	0	0.00	0	0.00
Masonry	713	91.59	49	6.31	16	2.02	1	0.08	0	0.00
MH	29	98.74	0	0.93	0	0.23	0	0.00	0	0.10
Steel	603	95.19	24	3.78	6	0.88	1	0.15	0	0.00
Wood	6,584	93.15	456	6.46	27	0.38	1	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

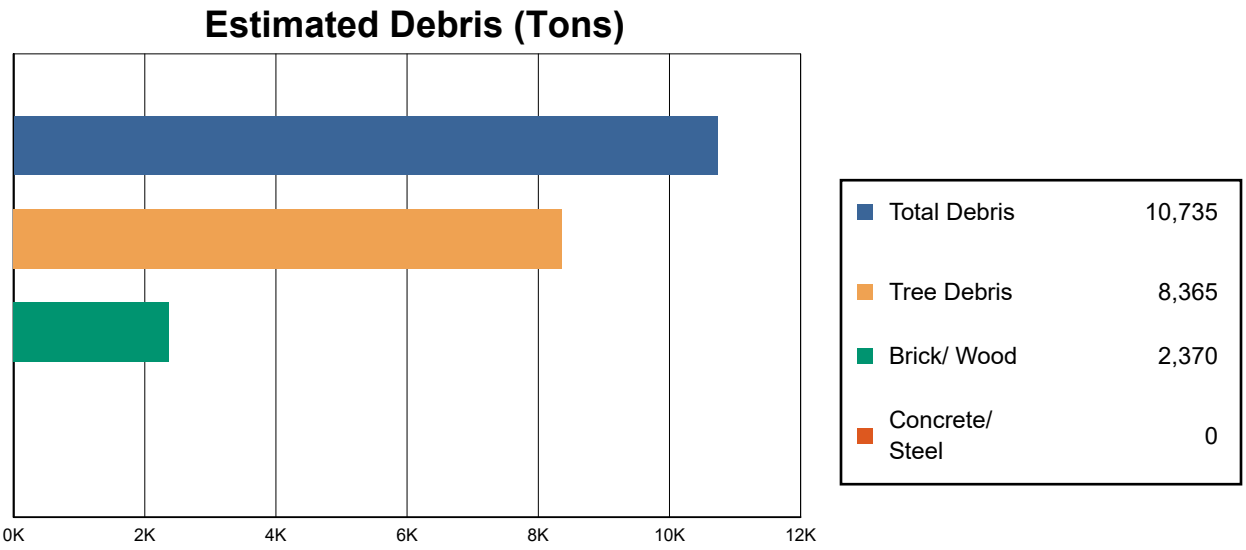
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

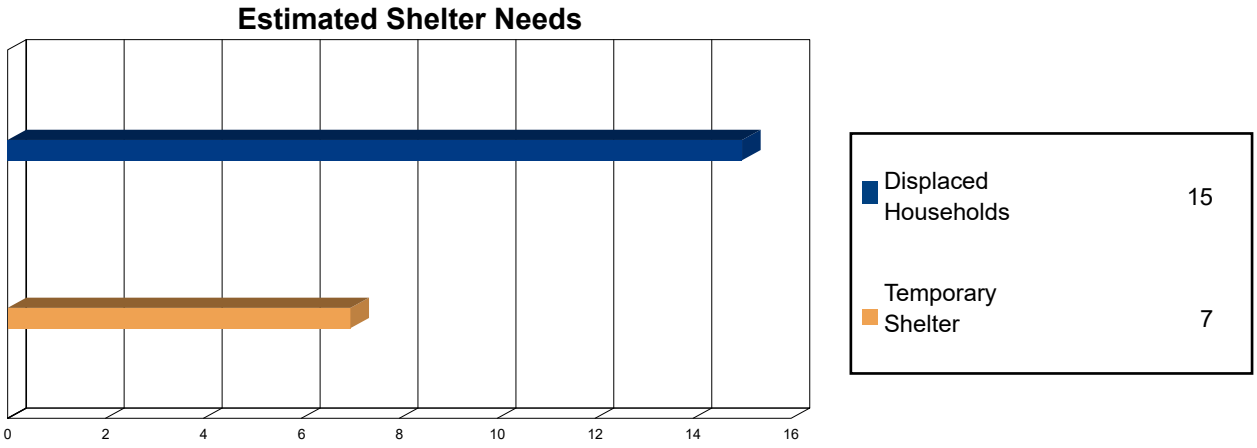


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 10,735 tons of debris will be generated. Of the total amount, 4,359 tons (41%) is Other Tree Debris. Of the remaining 6,376 tons, Brick/Wood comprises 37% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 95 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,006 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 15 households to be displaced due to the hurricane. Of these, 7 people (out of a total population of 26,918) will seek temporary shelter in public shelters.

Economic Loss

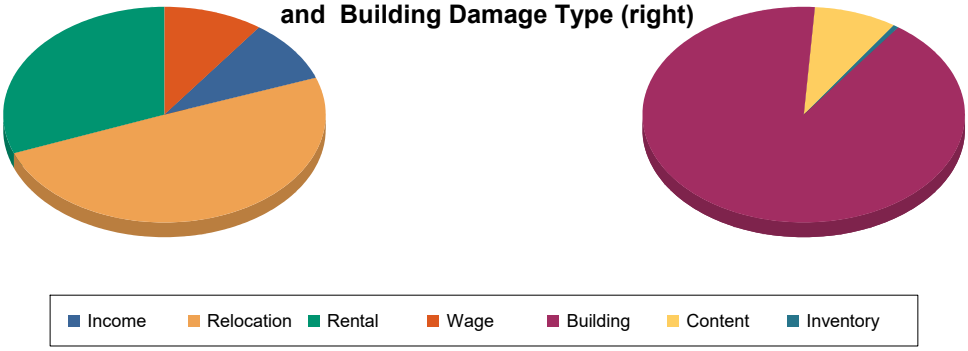
The total economic loss estimated for the hurricane is 31.8 million dollars, which represents 0.50 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 32 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

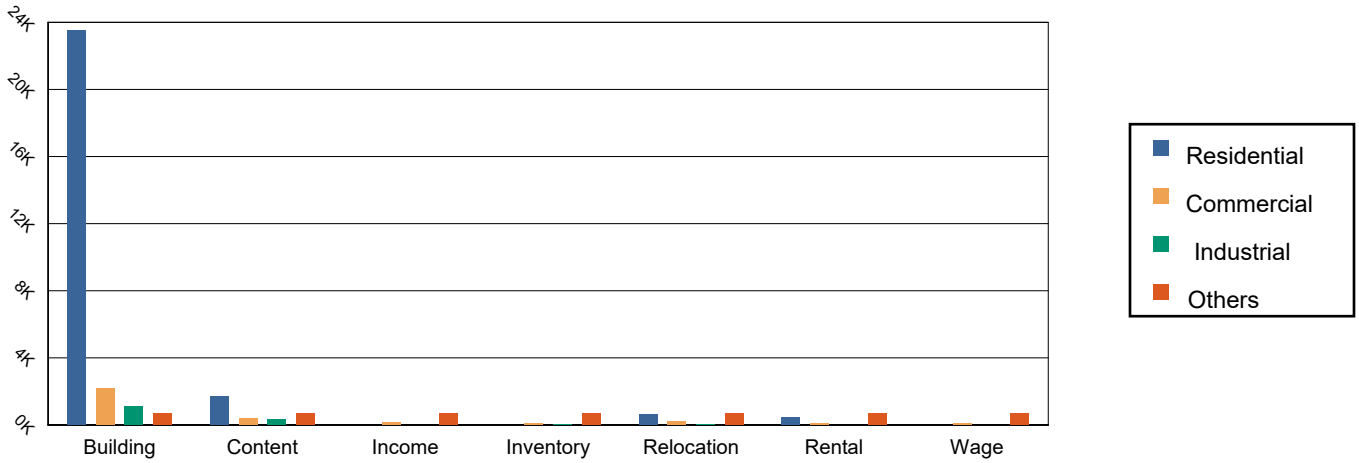


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	23,532.55	2,201.01	1,094.11	499.67	27,327.35
	Content	1,698.88	399.08	352.65	71.45	2,522.06
	Inventory	0.00	78.02	42.89	11.00	131.90
	Subtotal	**25,231.44**	**2,678.11**	**1,489.64**	**582.12**	**29,981.31**
Business Interruption Loss						
	Income	0.00	136.35	3.21	30.23	169.79
	Relocation	649.70	192.44	28.76	29.96	900.86
	Rental	482.63	70.00	2.15	2.27	557.05
	Wage	0.00	103.56	5.30	71.28	180.15
	Subtotal	**1,132.33**	**502.35**	**39.42**	**133.74**	**1,807.84**

Total

Total	**26,363.76**	**3,180.47**	**1,529.06**	**715.86**	**31,789.16**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,918	3,758,537	2,626,549	6,385,086
Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**
Study Region Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**

Hazus: Hurricane Global Risk Report

Region Name:	South_Windsor_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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The geographical size of the region is 28.67 square miles and contains 6 census tracts. There are over 10 thousand households in the region and a total population of 26,918 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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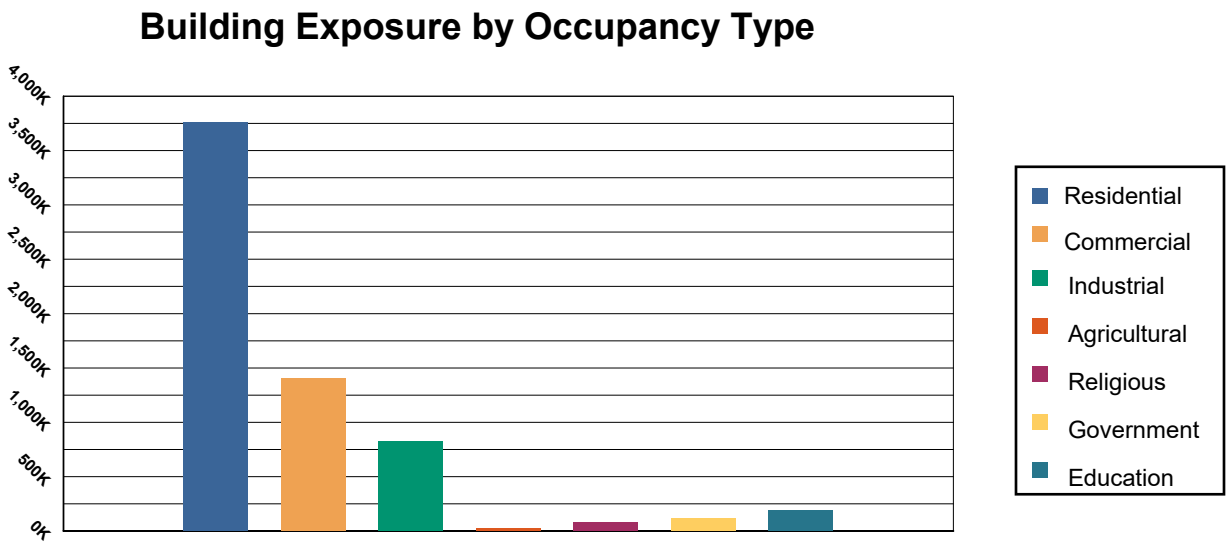

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Agricultural	19,537	0.31%
Religious	75,883	1.19%
Government	116,678	1.83%
Education	186,119	2.91%
Total	**6,385,086**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 194 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 3 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

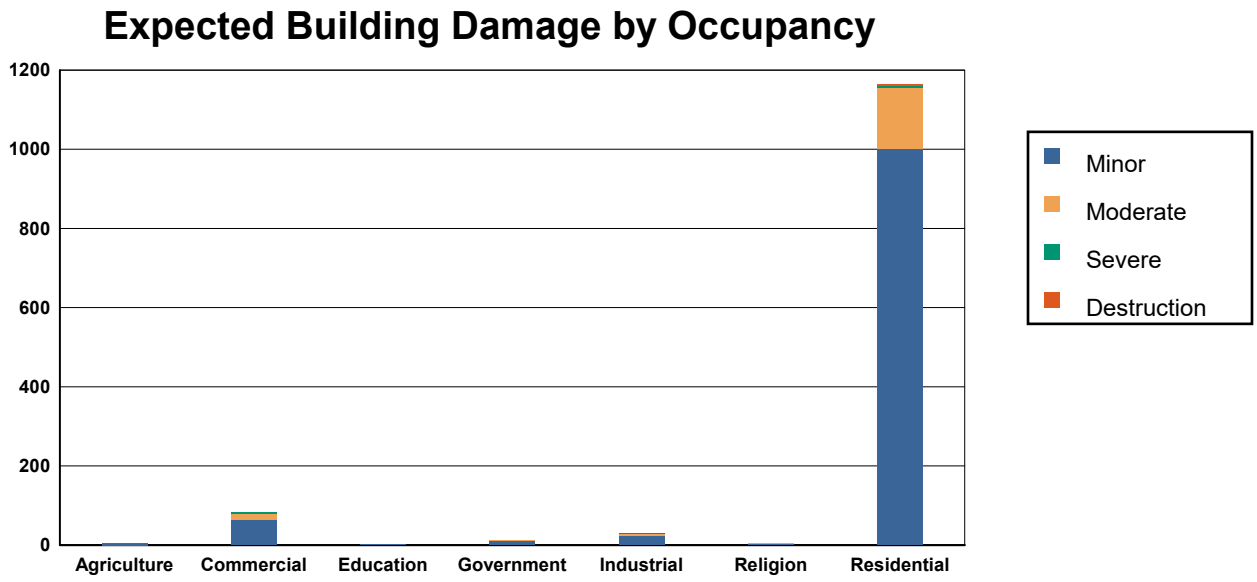


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	29.71	87.38	3.23	9.50	0.71	2.10	0.32	0.94	0.03	0.08
Commercial	711.90	89.55	62.96	7.92	16.85	2.12	3.29	0.41	0.00	0.00
Education	20.61	89.59	2.06	8.97	0.32	1.39	0.01	0.06	0.00	0.00
Government	112.49	89.99	10.74	8.59	1.70	1.36	0.07	0.05	0.00	0.00
Industrial	274.28	90.22	23.84	7.84	4.83	1.59	1.01	0.33	0.05	0.02
Religion	37.63	89.59	3.88	9.24	0.47	1.12	0.02	0.05	0.00	0.00
Residential	6,175.20	84.14	999.57	13.62	156.65	2.13	4.38	0.06	3.20	0.04
Total	**7,361.81**		**1,106.29**		**181.53**		**9.10**		**3.28**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	131	89.52	13	8.83	2	1.62	0	0.04	0	0.00
Masonry	658	84.47	84	10.84	35	4.45	2	0.23	0	0.02
MH	28	97.27	1	1.86	0	0.62	0	0.01	0	0.25
Steel	572	90.23	45	7.09	14	2.20	3	0.48	0	0.00
Wood	6,024	85.23	942	13.32	95	1.35	4	0.06	3	0.04

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

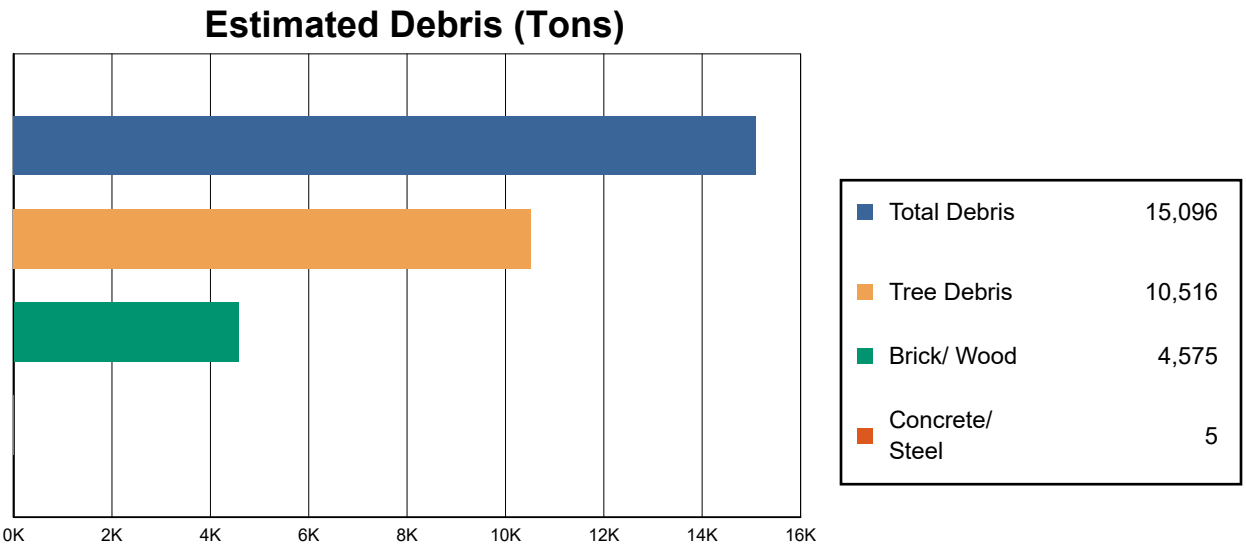
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	8

Induced Hurricane Damage

Debris Generation

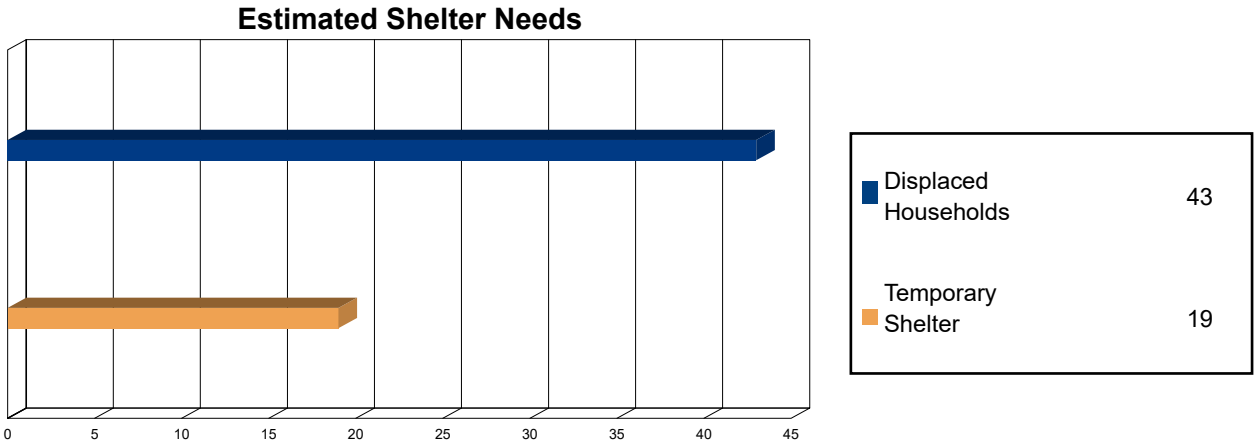


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15,096 tons of debris will be generated. Of the total amount, 5,311 tons (35%) is Other Tree Debris. Of the remaining 9,785 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 183 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,205 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 43 households to be displaced due to the hurricane. Of these, 19 people (out of a total population of 26,918) will seek temporary shelter in public shelters.

Economic Loss

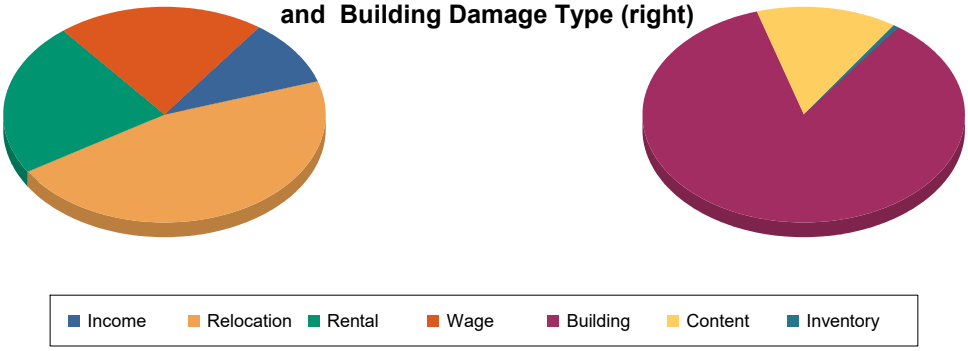
The total economic loss estimated for the hurricane is 65.2 million dollars, which represents 1.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 65 million dollars. 8% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 79% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

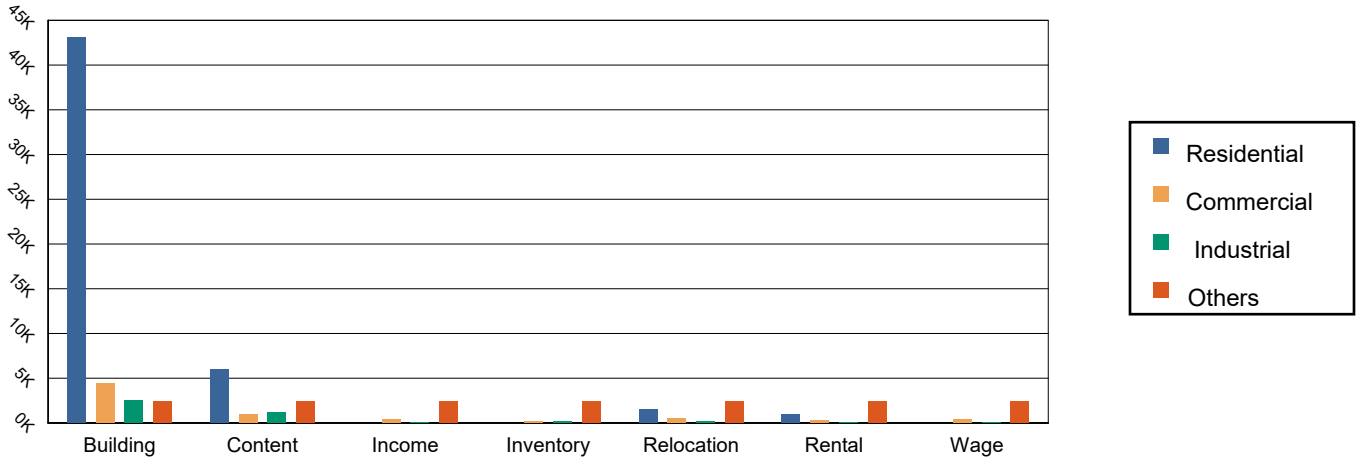


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	43,093.35	4,403.10	2,464.49	1,201.66	51,162.61
	Content	5,952.81	1,011.06	1,178.85	232.19	8,374.91
	Inventory	0.00	203.59	139.45	31.12	374.16
	Subtotal	**49,046.17**	**5,617.75**	**3,782.79**	**1,464.97**	**59,911.68**
Business Interruption Loss						
	Income	0.00	384.64	24.99	108.93	518.55
	Relocation	1,553.72	567.66	134.19	170.71	2,426.28
	Rental	927.41	257.23	19.46	18.78	1,222.89
	Wage	0.00	385.08	39.23	663.79	1,088.10
	Subtotal	**2,481.14**	**1,594.61**	**217.87**	**962.20**	**5,255.82**

Total

Total	**51,527.30**	**7,212.36**	**4,000.66**	**2,427.18**	**65,167.50**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,918	3,758,537	2,626,549	6,385,086
Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**
Study Region Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**

Hazus: Hurricane Global Risk Report

Region Name:	South_Windsor_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.67 square miles and contains 6 census tracts. There are over 10 thousand households in the region and a total population of 26,918 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 8,662 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

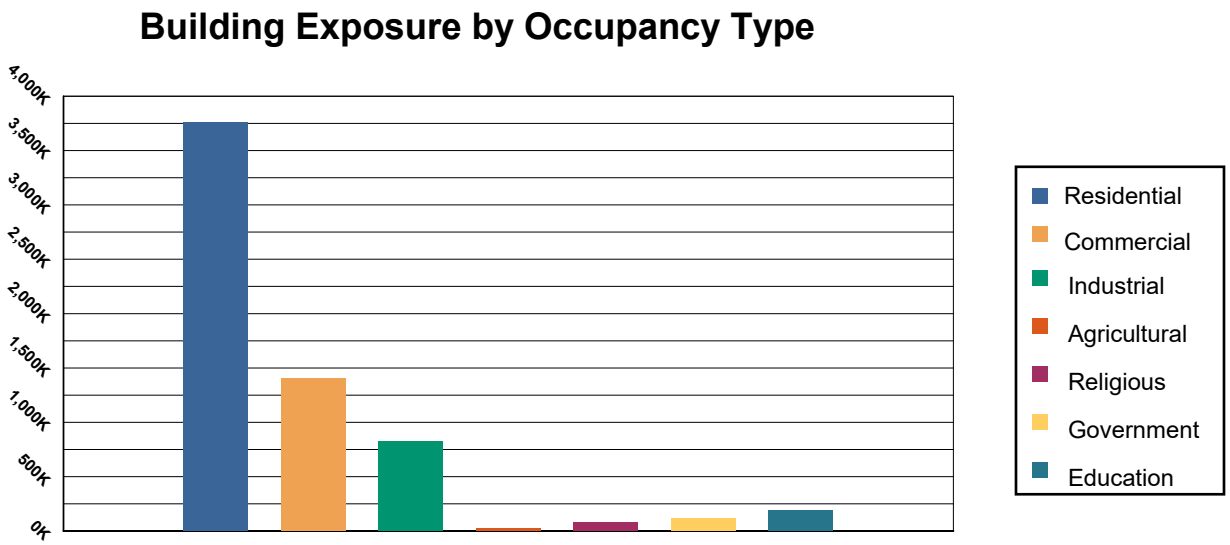


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,758,537	58.86%
Commercial	1,407,105	22.04%
Industrial	821,227	12.86%
Agricultural	19,537	0.31%
Religious	75,883	1.19%
Government	116,678	1.83%
Education	186,119	2.91%
Total	**6,385,086**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 491 buildings will be at least moderately damaged. This is over 6% of the total number of buildings in the region. There are an estimated 14 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

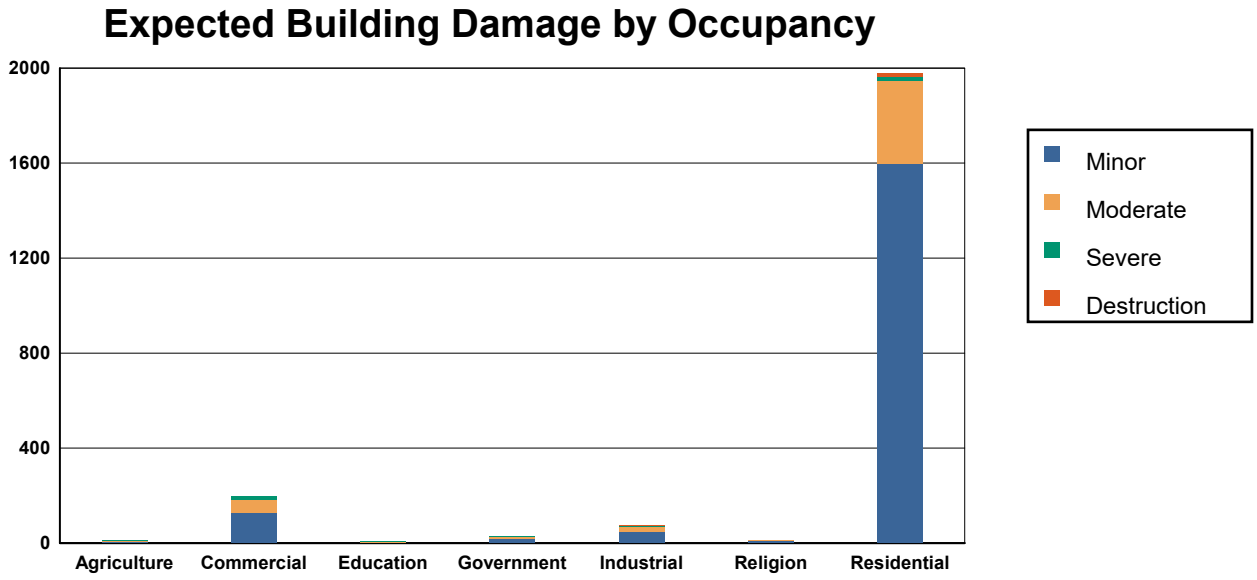


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	23.84	70.11	6.73	19.79	2.22	6.52	1.07	3.16	0.15	0.43
Commercial	596.94	75.09	128.59	16.17	54.84	6.90	14.51	1.83	0.13	0.02
Education	18.12	78.76	3.67	15.96	1.11	4.84	0.10	0.44	0.00	0.00
Government	98.27	78.62	19.70	15.76	6.43	5.14	0.60	0.48	0.00	0.00
Industrial	230.87	75.95	48.40	15.92	19.73	6.49	4.67	1.54	0.34	0.11
Religion	32.05	76.31	7.75	18.46	2.01	4.79	0.19	0.44	0.00	0.00
Residential	5,359.22	73.02	1,597.34	21.77	348.51	4.75	20.09	0.27	13.84	0.19
Total	**6,359.30**		**1,812.18**		**434.84**		**41.23**		**14.45**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	110	75.65	25	16.99	10	6.81	1	0.56	0	0.00
Masonry	554	71.06	137	17.62	80	10.24	8	0.97	1	0.11
MH	25	84.49	2	7.73	2	5.23	0	0.29	1	2.25
Steel	485	76.48	89	14.11	45	7.15	14	2.23	0	0.03
Wood	5,249	74.26	1,551	21.94	239	3.38	18	0.25	12	0.17

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

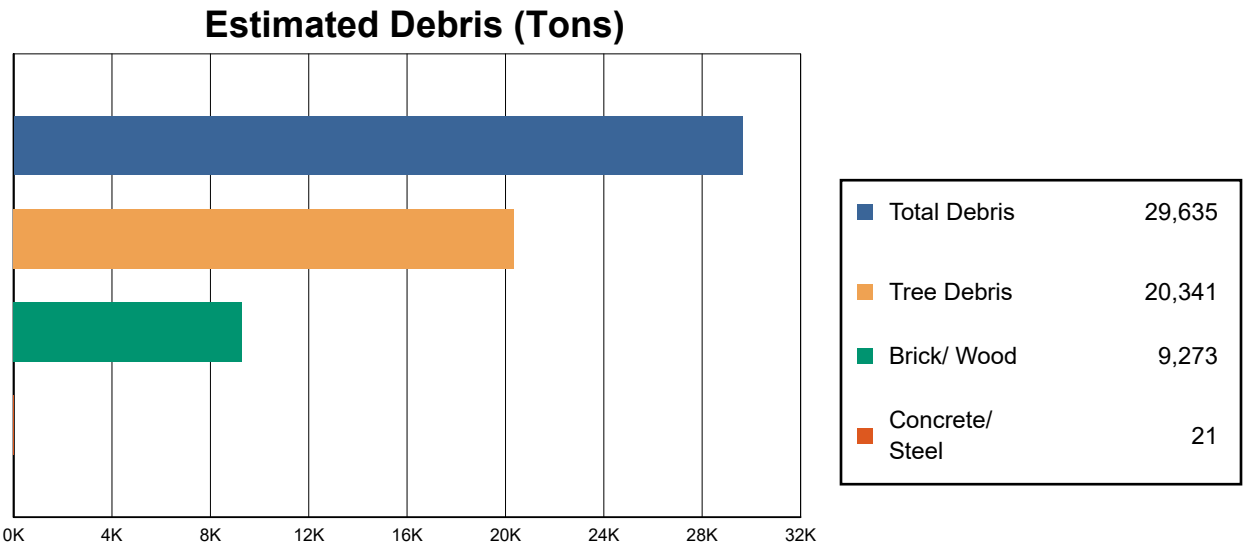
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	2

Induced Hurricane Damage

Debris Generation

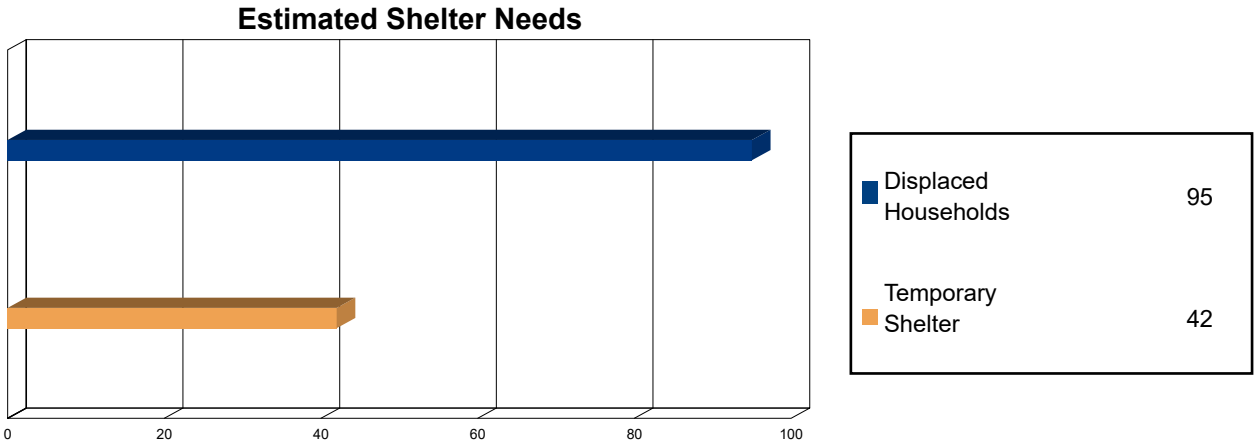


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 29,635 tons of debris will be generated. Of the total amount, 11,198 tons (38%) is Other Tree Debris. Of the remaining 18,437 tons, Brick/Wood comprises 50% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 372 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,143 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 95 households to be displaced due to the hurricane. Of these, 42 people (out of a total population of 26,918) will seek temporary shelter in public shelters.

Economic Loss

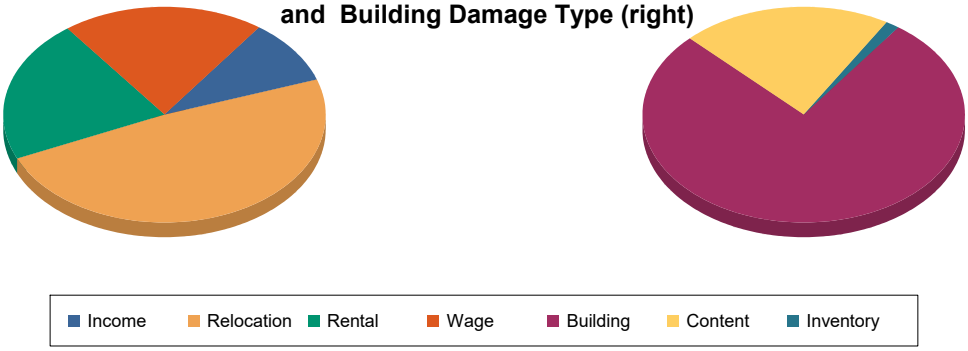
The total economic loss estimated for the hurricane is 152.1 million dollars, which represents 2.38 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 152 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 66% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

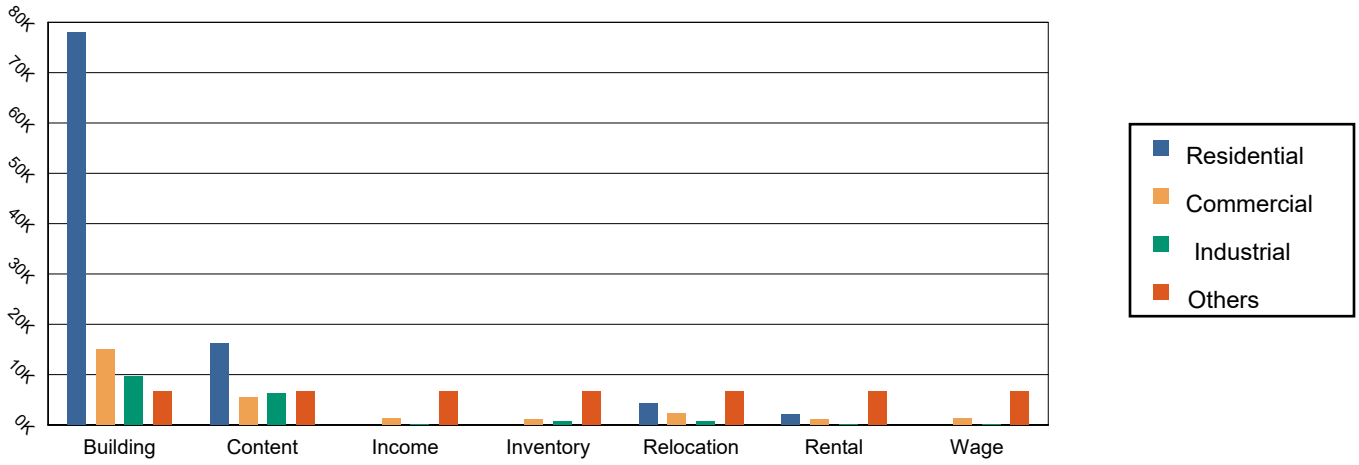


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	78,024.32	14,936.08	9,598.58	2,998.44	105,557.42
	Content	16,108.11	5,394.87	6,213.47	881.56	28,598.00
	Inventory	0.00	1,131.77	728.00	129.88	1,989.65
	Subtotal	**94,132.43**	**21,462.72**	**16,540.05**	**4,009.88**	**136,145.07**
Business Interruption Loss						
	Income	0.00	1,226.80	106.35	232.73	1,565.87
	Relocation	4,242.37	2,342.73	679.26	518.26	7,782.62
	Rental	2,085.67	1,138.17	103.43	61.26	3,388.53
	Wage	0.00	1,271.81	165.48	1,821.23	3,258.52
	Subtotal	**6,328.04**	**5,979.51**	**1,054.51**	**2,633.47**	**15,995.54**

Total

Total	**100,460.47**	**27,442.23**	**17,594.56**	**6,643.36**	**152,140.61**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,918	3,758,537	2,626,549	6,385,086
Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**
Study Region Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**

Hazus: Hurricane Global Risk Report

Region Name:	South_Windsor_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Friday, May 12, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

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There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 6,385 million dollars. Approximately 85% of the buildings (and 59% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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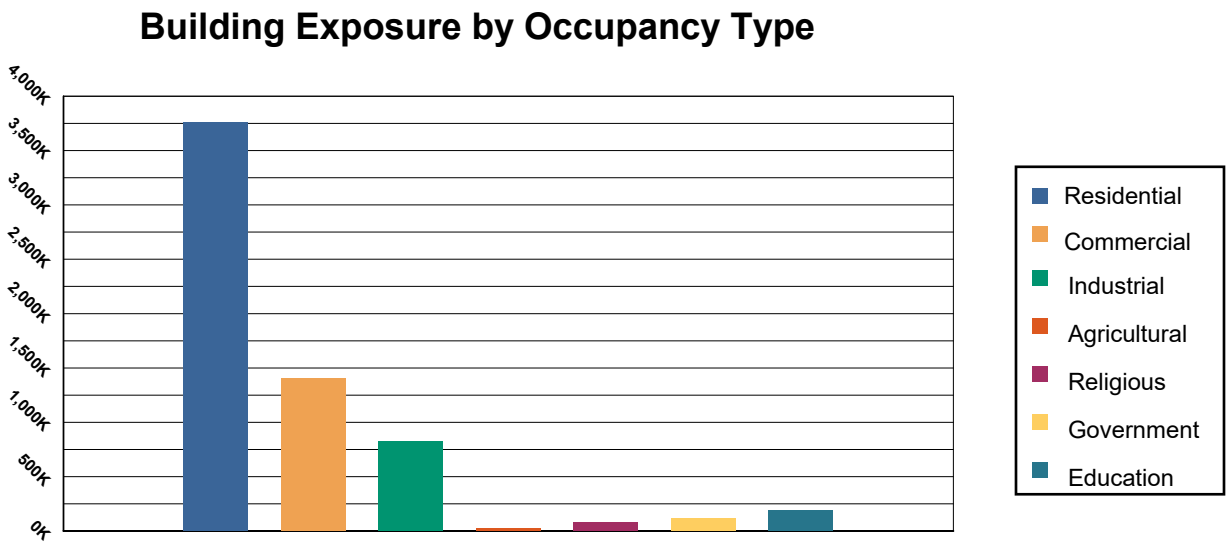


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,758,537	58.86%
Commercial	1,407,105	22.04%
Industrial	821,227	12.86%
Agricultural	19,537	0.31%
Religious	75,883	1.19%
Government	116,678	1.83%
Education	186,119	2.91%
Total	**6,385,086**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 8 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 836 buildings will be at least moderately damaged. This is over 10% of the total number of buildings in the region. There are an estimated 38 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

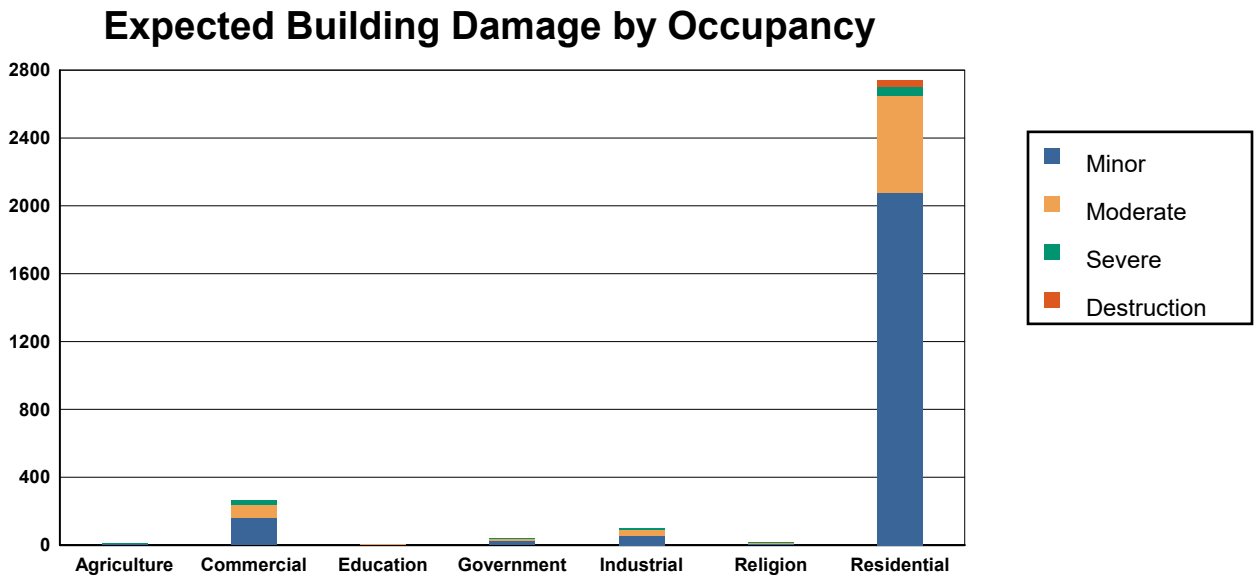


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	21.14	62.18	8.06	23.71	3.05	8.99	1.51	4.43	0.24	0.69
Commercial	531.29	66.83	157.70	19.84	81.70	10.28	24.06	3.03	0.25	0.03
Education	15.77	68.57	4.82	20.96	2.10	9.14	0.31	1.33	0.00	0.00
Government	86.00	68.80	25.47	20.37	11.79	9.43	1.74	1.39	0.00	0.00
Industrial	206.08	67.79	58.76	19.33	30.46	10.02	8.15	2.68	0.55	0.18
Religion	28.24	67.23	9.84	23.43	3.46	8.24	0.46	1.10	0.00	0.00
Residential	4,597.43	62.64	2,075.22	28.28	576.09	7.85	53.26	0.73	37.00	0.50
Total	**5,485.95**		**2,339.86**		**708.66**		**89.50**		**38.04**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	97	66.74	30	20.57	17	11.30	2	1.39	0	0.00
Masonry	480	61.64	166	21.31	117	15.03	14	1.82	2	0.21
MH	23	80.99	3	8.89	2	6.66	0	0.45	1	3.02
Steel	432	68.08	110	17.31	69	10.83	24	3.72	0	0.06
Wood	4,516	63.90	2,040	28.86	430	6.09	48	0.68	33	0.47

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

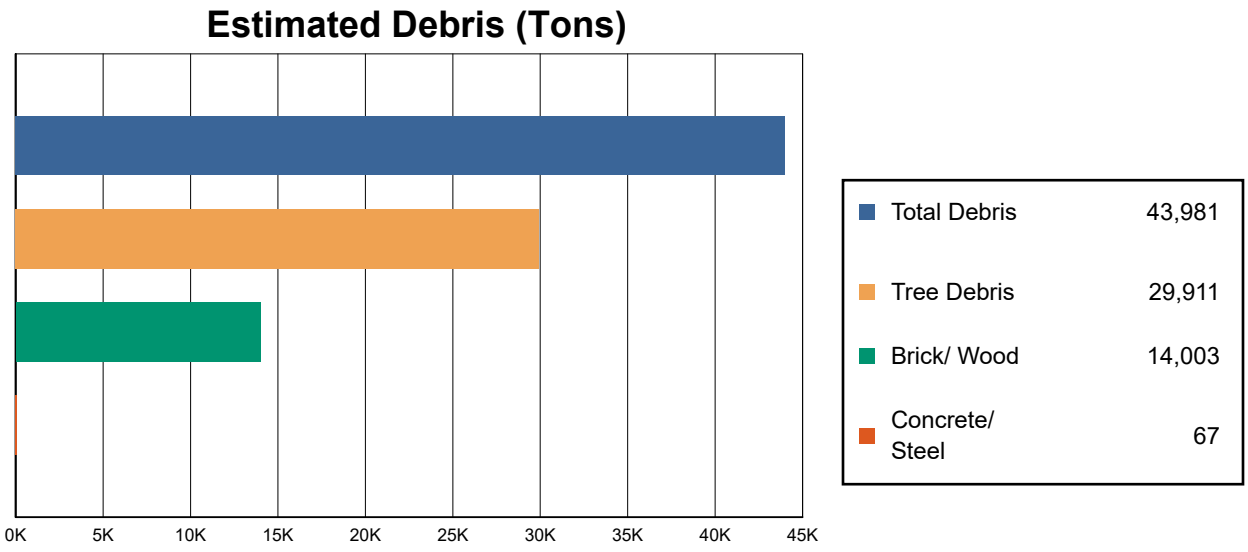
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	8	0	0	0

Induced Hurricane Damage

Debris Generation

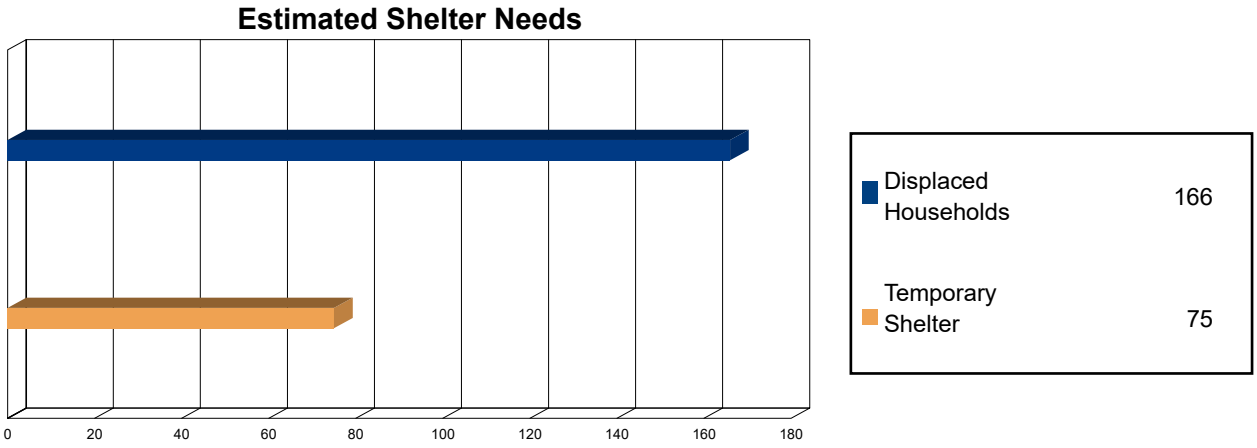


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 43,981 tons of debris will be generated. Of the total amount, 15,488 tons (35%) is Other Tree Debris. Of the remaining 28,493 tons, Brick/Wood comprises 49% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 563 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 14,423 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 166 households to be displaced due to the hurricane. Of these, 75 people (out of a total population of 26,918) will seek temporary shelter in public shelters.

Economic Loss

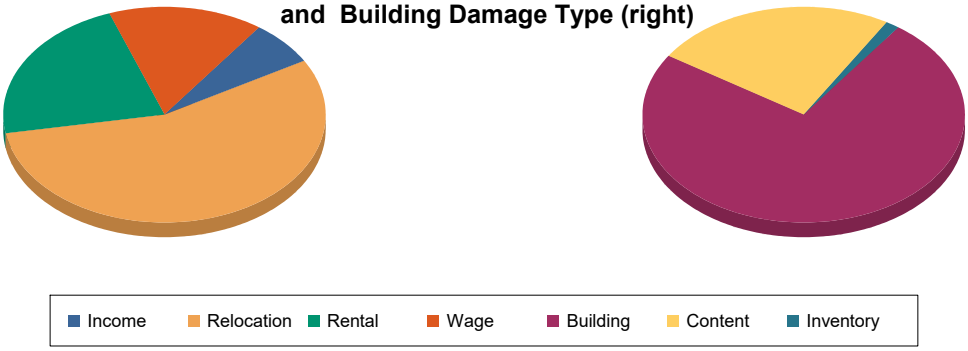
The total economic loss estimated for the hurricane is 254.2 million dollars, which represents 3.98 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 254 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 68% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

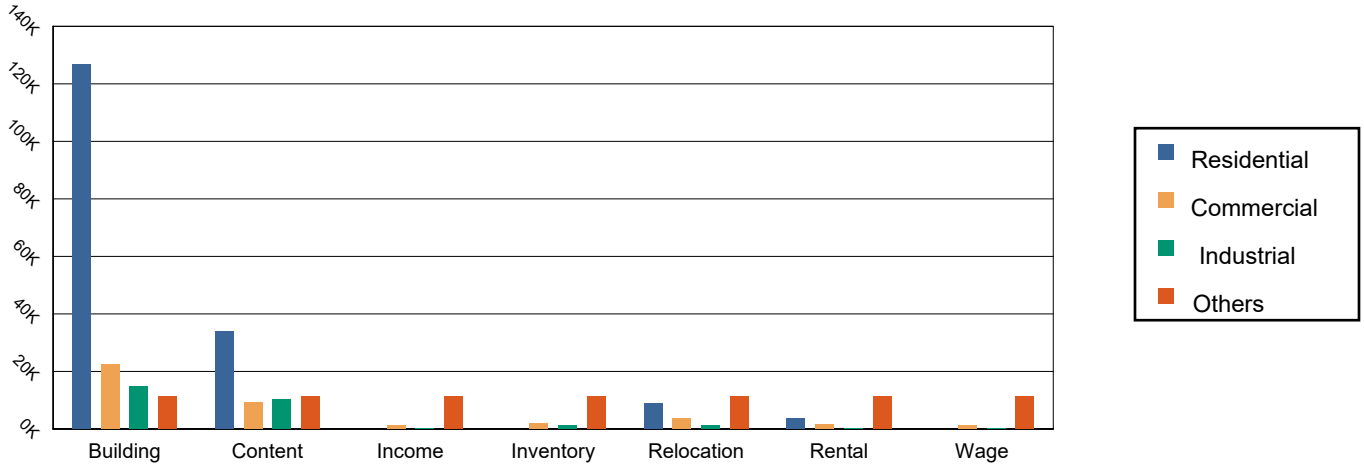


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	126,800.90	22,447.90	14,745.18	5,488.66	169,482.66
	Content	34,024.03	9,115.53	10,266.95	1,981.86	55,388.38
	Inventory	0.00	1,881.51	1,189.46	192.92	3,263.89
	Subtotal	**160,824.94**	**33,444.94**	**26,201.60**	**7,663.44**	**228,134.92**
Business Interruption Loss						
	Income	0.07	1,317.96	131.92	281.06	1,731.02
	Relocation	8,922.01	3,543.21	1,073.20	972.80	14,511.22
	Rental	3,738.69	1,758.38	158.94	118.12	5,774.14
	Wage	0.17	1,430.60	205.22	2,425.23	4,061.23
	Subtotal	**12,660.95**	**8,050.16**	**1,569.29**	**3,797.21**	**26,077.60**

Total

Total	173,485.89	41,495.10	27,770.89	11,460.65	254,212.53

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	26,918	3,758,537	2,626,549	6,385,086
Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**
Study Region Total	**26,918**	**3,758,537**	**2,626,549**	**6,385,086**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 30.97 square miles and contains 8 census tracts. There are over 11 thousand households in the region and a total population of 29,492 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

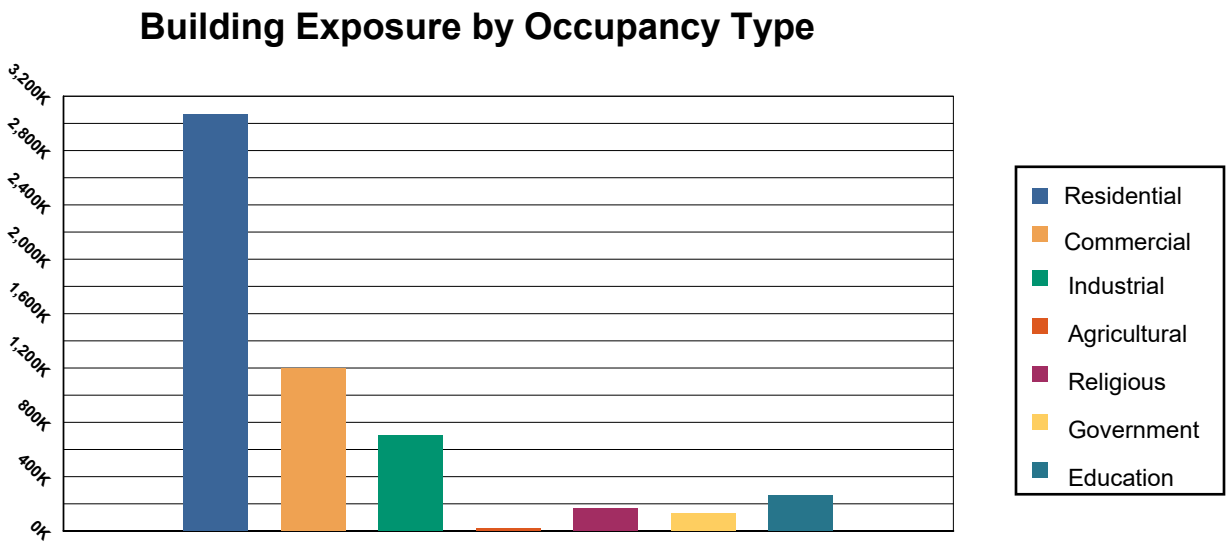


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,063,689	55.41%
Commercial	1,194,091	21.60%
Industrial	701,720	12.69%
Agricultural	19,620	0.35%
Religious	164,824	2.98%
Government	125,225	2.26%
Education	260,275	4.71%
Total	**5,529,444**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

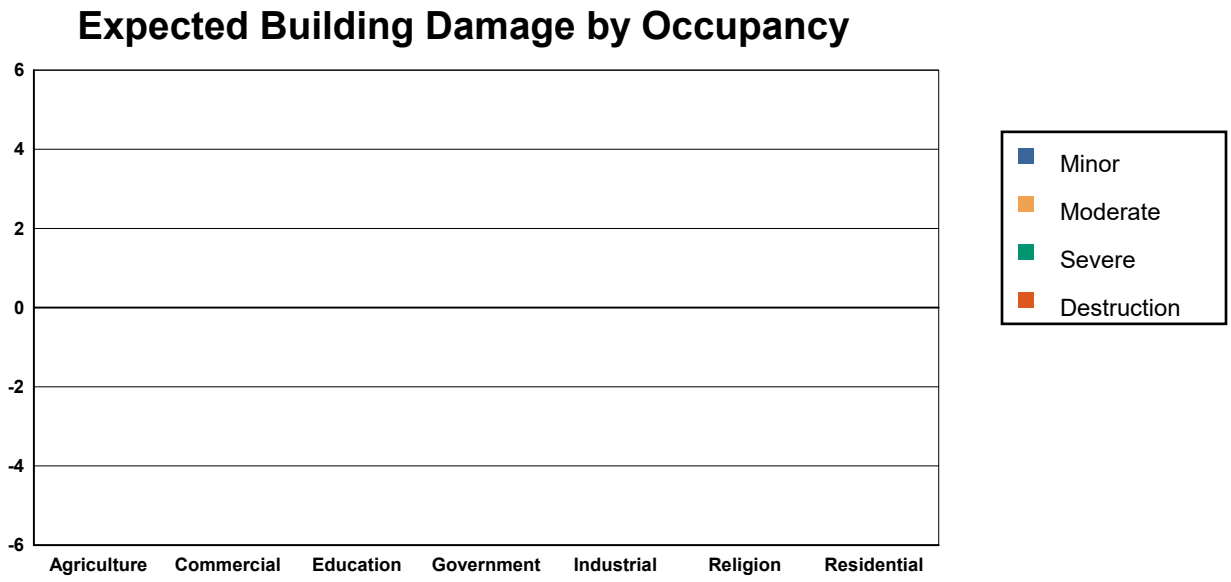


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	19.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	643.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	26.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	70.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	143.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	42.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	8,801.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**9,744.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	110	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	763	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	442	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	8,422	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

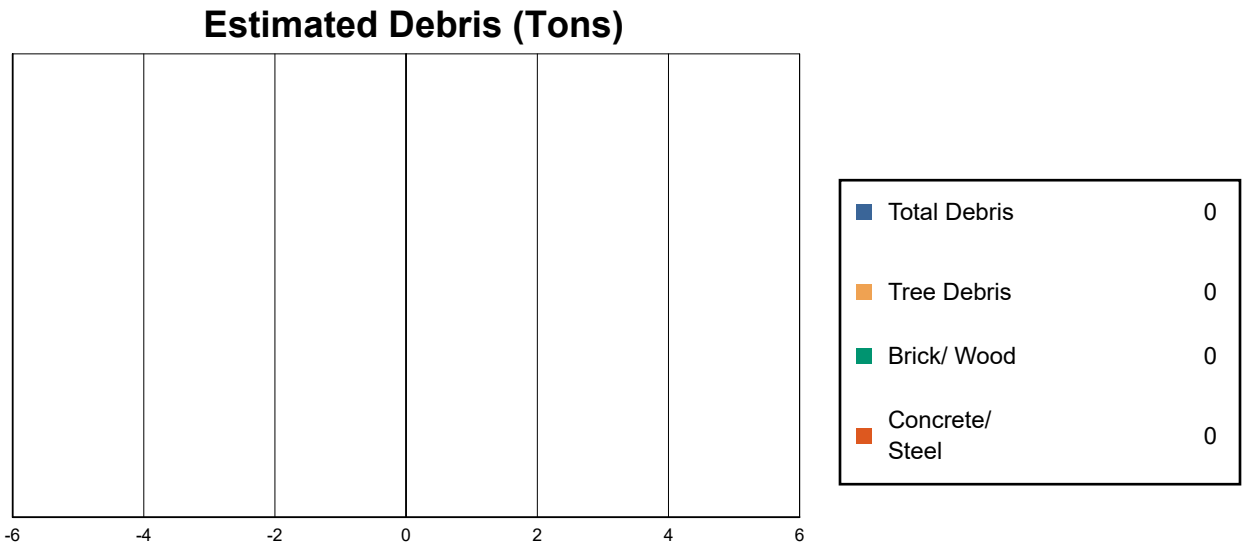
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

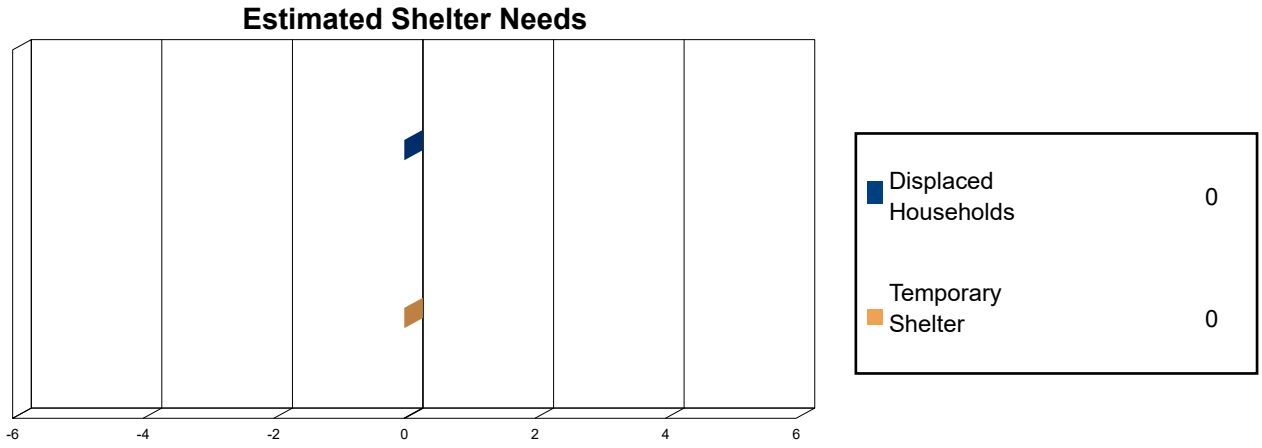


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 29,492) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**

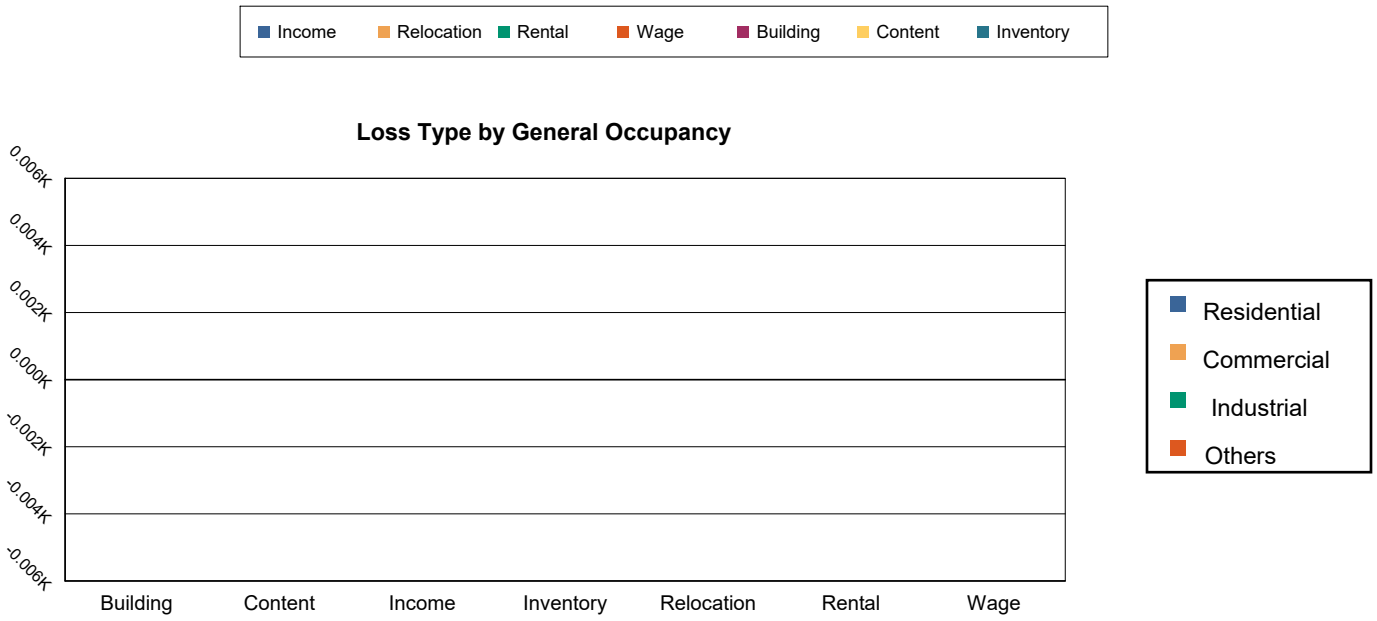


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total

Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	29,492	3,063,689	2,465,755	5,529,444
Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**
Study Region Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Saturday, May 13, 2023

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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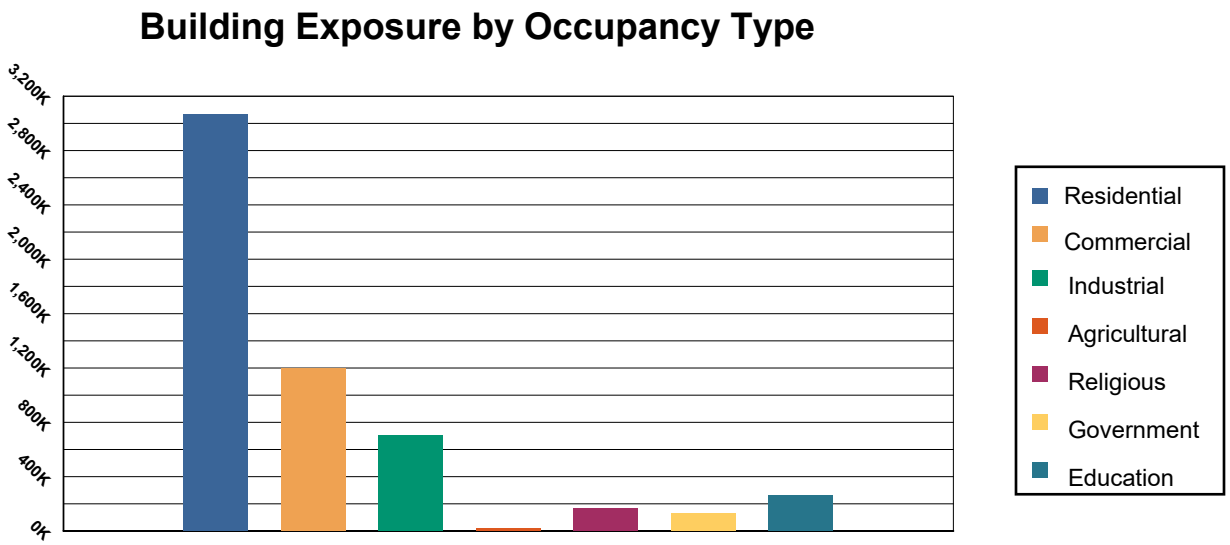

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Occupancy	Exposure ($1000)	Percent of Tot
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Industrial	701,720	12.69%
Agricultural	19,620	0.35%
Religious	164,824	2.98%
Government	125,225	2.26%
Education	260,275	4.71%
Total	**5,529,444**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

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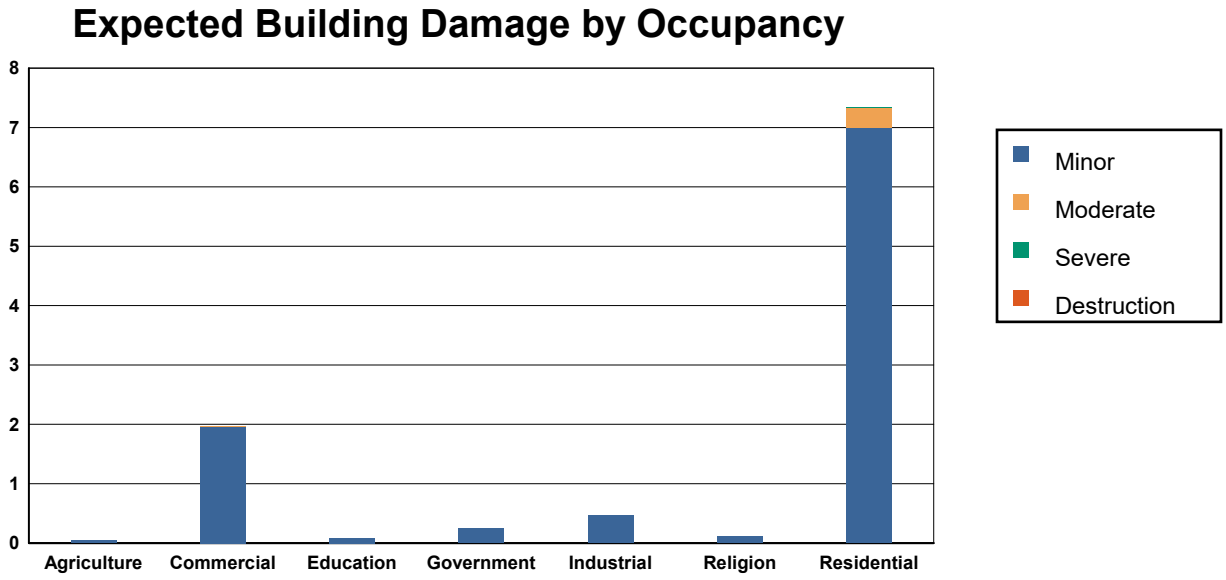


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	18.96	99.77	0.04	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	641.04	99.70	1.96	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Education	25.91	99.66	0.09	0.34	0.00	0.00	0.00	0.00	0.00	0.00
Government	69.75	99.65	0.25	0.35	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	142.54	99.68	0.46	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Religion	41.89	99.73	0.11	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Residential	8,793.65	99.92	6.98	0.08	0.35	0.00	0.01	0.00	0.00	0.00
Total	**9,733.74**		**9.90**		**0.35**		**0.01**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	110	99.59	0	0.41	0	0.00	0	0.00	0	0.00
Masonry	759	99.52	4	0.47	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	441	99.68	1	0.32	0	0.00	0	0.00	0	0.00
Wood	8,419	99.96	3	0.04	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

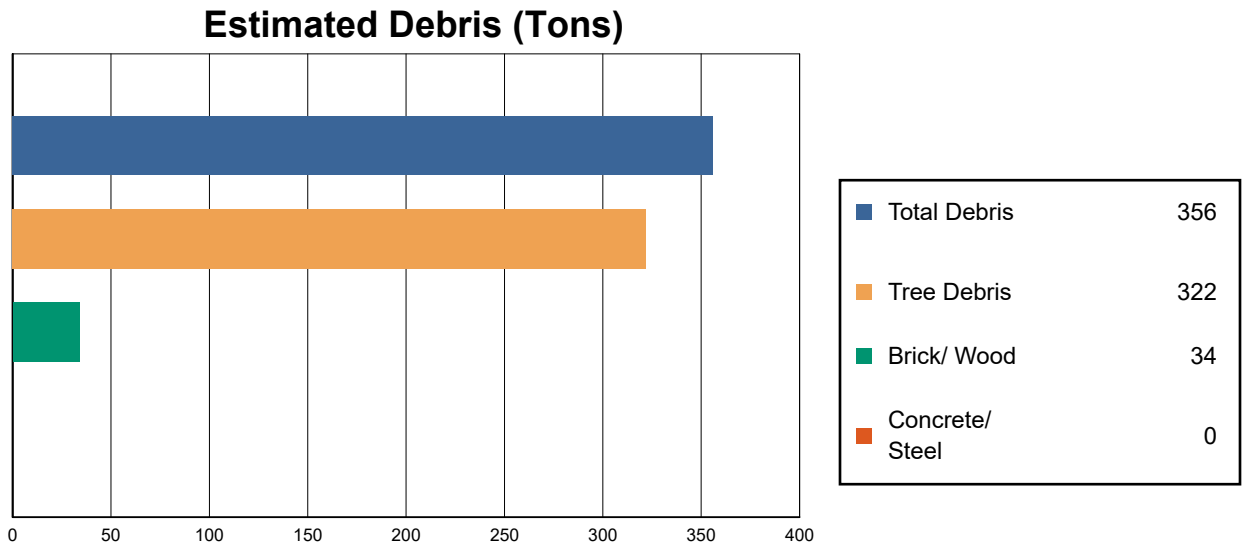
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

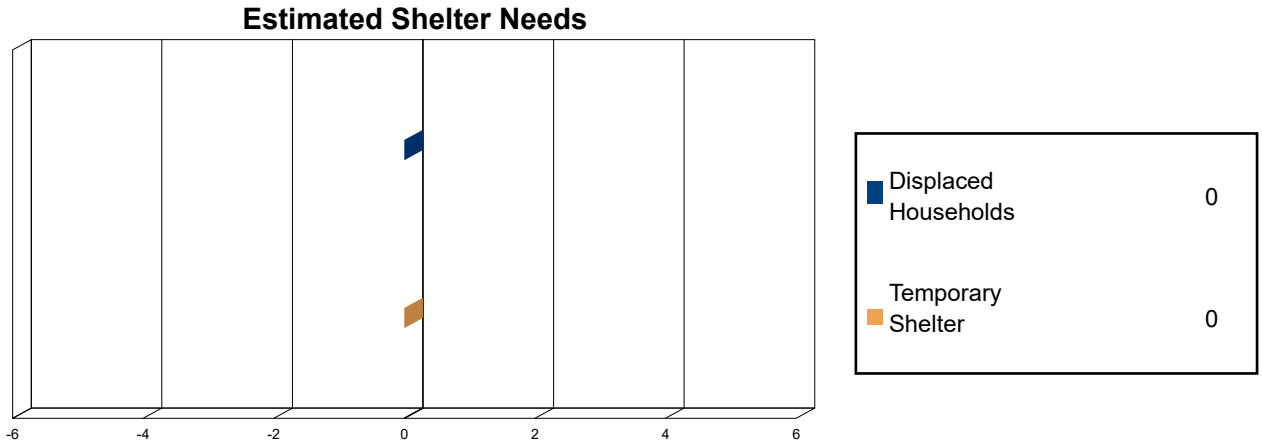


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 356 tons of debris will be generated. Of the total amount, 225 tons (63%) is Other Tree Debris. Of the remaining 131 tons, Brick/Wood comprises 26% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 97 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 29,492) will seek temporary shelter in public shelters.

Economic Loss

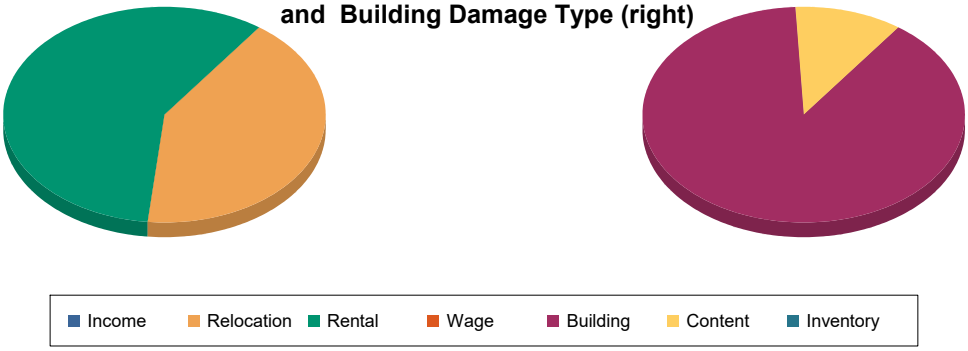
The total economic loss estimated for the hurricane is 1.4 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

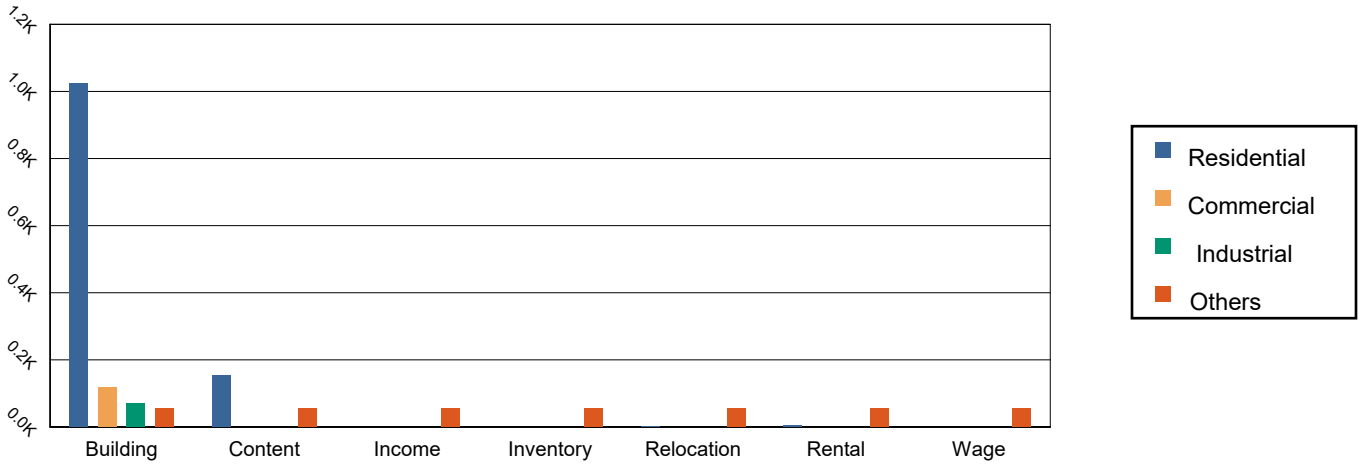


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,025.07	119.41	70.17	55.03	1,269.69
	Content	153.69	0.00	0.00	0.00	153.69
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,178.76**	**119.41**	**70.17**	**55.03**	**1,423.38**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	3.01	0.03	0.00	0.00	3.04
	Rental	4.24	0.00	0.00	0.00	4.24
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**7.25**	**0.03**	**0.00**	**0.00**	**7.28**

Total

Total	**1,186.01**	**119.44**	**70.17**	**55.03**	**1,430.66**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	29,492	3,063,689	2,465,755	5,529,444
Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**
Study Region Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 30.97 square miles and contains 8 census tracts. There are over 11 thousand households in the region and a total population of 29,492 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

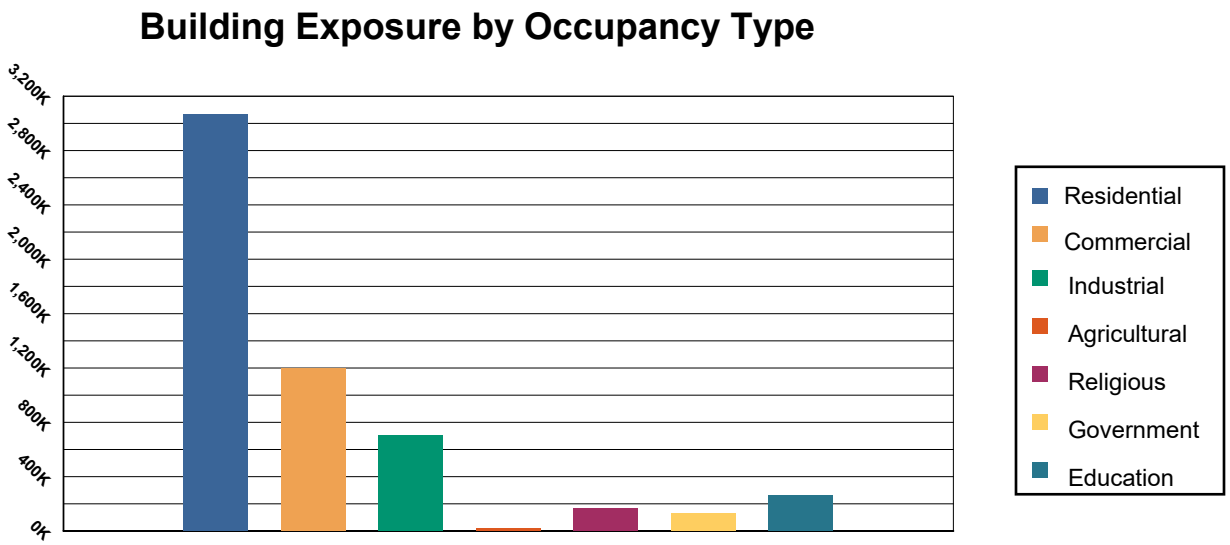


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,063,689	55.41%
Commercial	1,194,091	21.60%
Industrial	701,720	12.69%
Agricultural	19,620	0.35%
Religious	164,824	2.98%
Government	125,225	2.26%
Education	260,275	4.71%
Total	**5,529,444**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

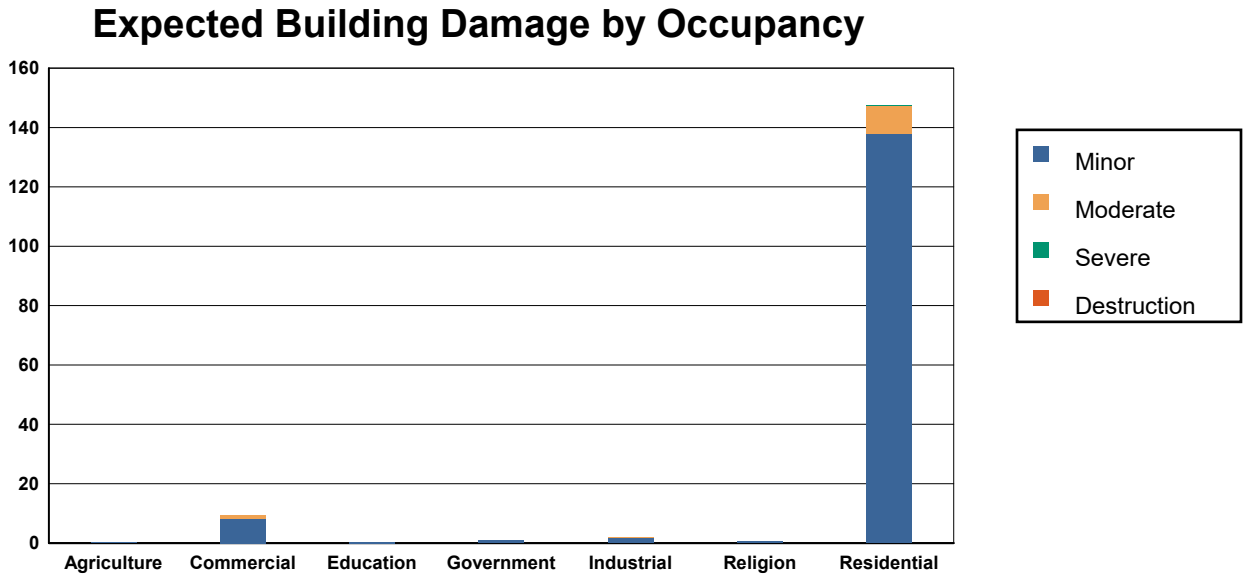


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	18.73	98.59	0.24	1.27	0.02	0.11	0.01	0.03	0.00	0.00
Commercial	633.79	98.57	8.14	1.27	1.02	0.16	0.04	0.01	0.00	0.00
Education	25.65	98.67	0.34	1.31	0.01	0.02	0.00	0.00	0.00	0.00
Government	69.05	98.64	0.94	1.34	0.01	0.02	0.00	0.00	0.00	0.00
Industrial	141.03	98.62	1.89	1.32	0.08	0.05	0.01	0.01	0.00	0.00
Religion	41.47	98.74	0.52	1.23	0.01	0.04	0.00	0.00	0.00	0.00
Residential	8,653.44	98.32	138.07	1.57	9.29	0.11	0.20	0.00	0.00	0.00
Total	**9,583.17**		**150.13**		**10.45**		**0.25**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	108	98.37	2	1.61	0	0.02	0	0.00	0	0.00
Masonry	744	97.46	17	2.18	3	0.35	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	436	98.63	5	1.22	1	0.15	0	0.01	0	0.00
Wood	8,304	98.60	115	1.36	3	0.04	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

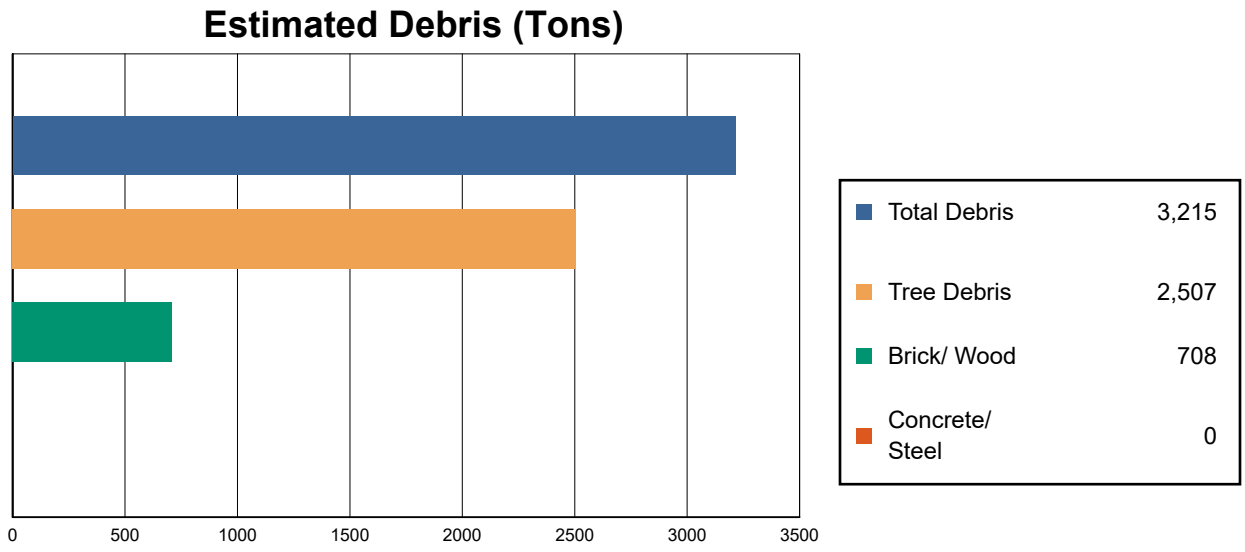
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

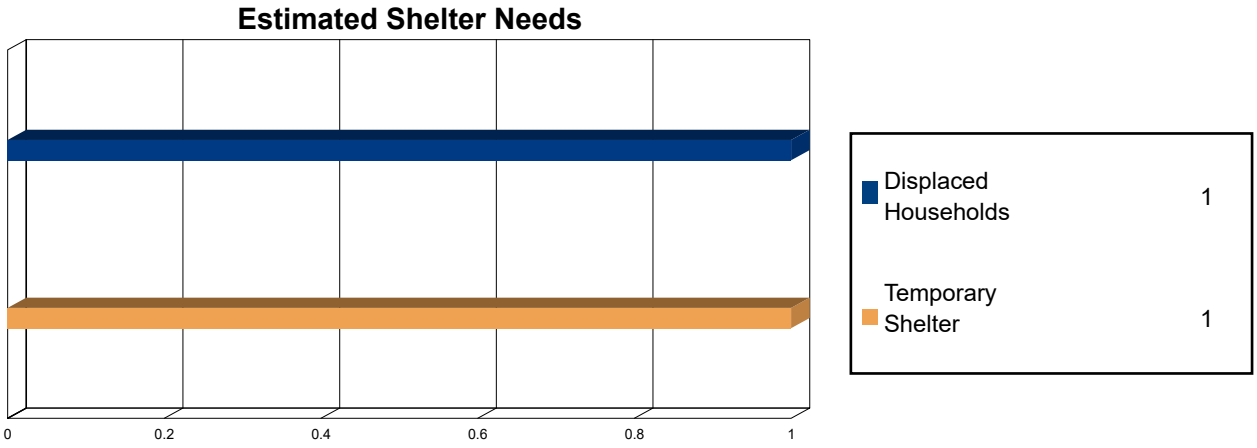


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,215 tons of debris will be generated. Of the total amount, 1,404 tons (44%) is Other Tree Debris. Of the remaining 1,811 tons, Brick/Wood comprises 39% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 28 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,103 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the hurricane. Of these, 1 people (out of a total population of 29,492) will seek temporary shelter in public shelters.

Economic Loss

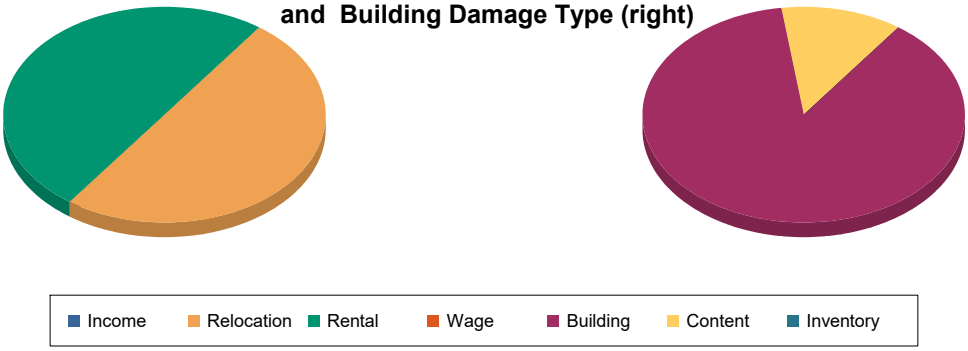
The total economic loss estimated for the hurricane is 10.6 million dollars, which represents 0.19 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 11 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 91% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

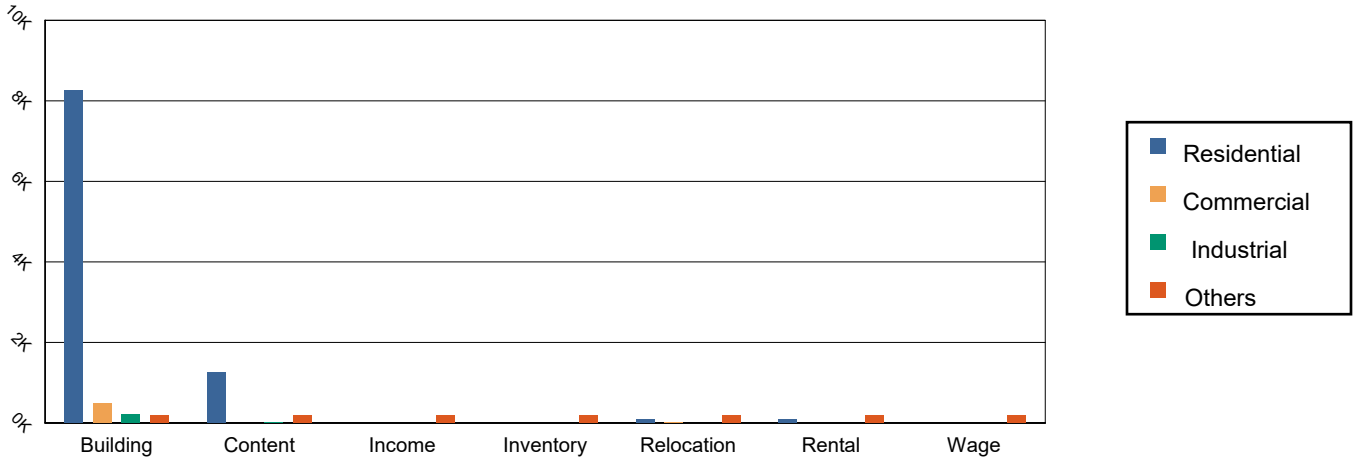


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	8,262.89	492.80	202.82	196.07	9,154.58
	Content	1,267.96	3.11	15.93	0.02	1,287.01
	Inventory	0.00	0.73	2.20	0.01	2.94
	Subtotal	**9,530.86**	**496.63**	**220.95**	**196.10**	**10,444.53**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	79.91	13.61	1.90	0.97	96.40
	Rental	96.44	0.00	0.00	0.00	96.44
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**176.35**	**13.61**	**1.90**	**0.97**	**192.83**

Total

Total	**9,707.21**	**510.24**	**222.85**	**197.07**	**10,637.36**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	29,492	3,063,689	2,465,755	5,529,444
Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**
Study Region Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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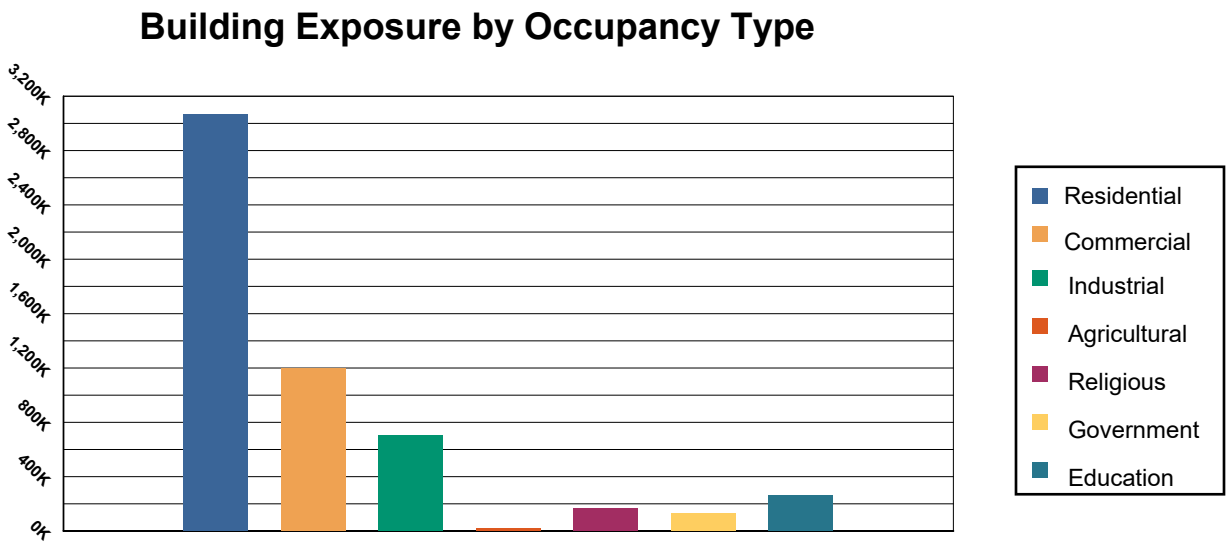

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Occupancy	Exposure ($1000)	Percent of Tot
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Agricultural	19,620	0.35%
Religious	164,824	2.98%
Government	125,225	2.26%
Education	260,275	4.71%
Total	**5,529,444**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 59 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

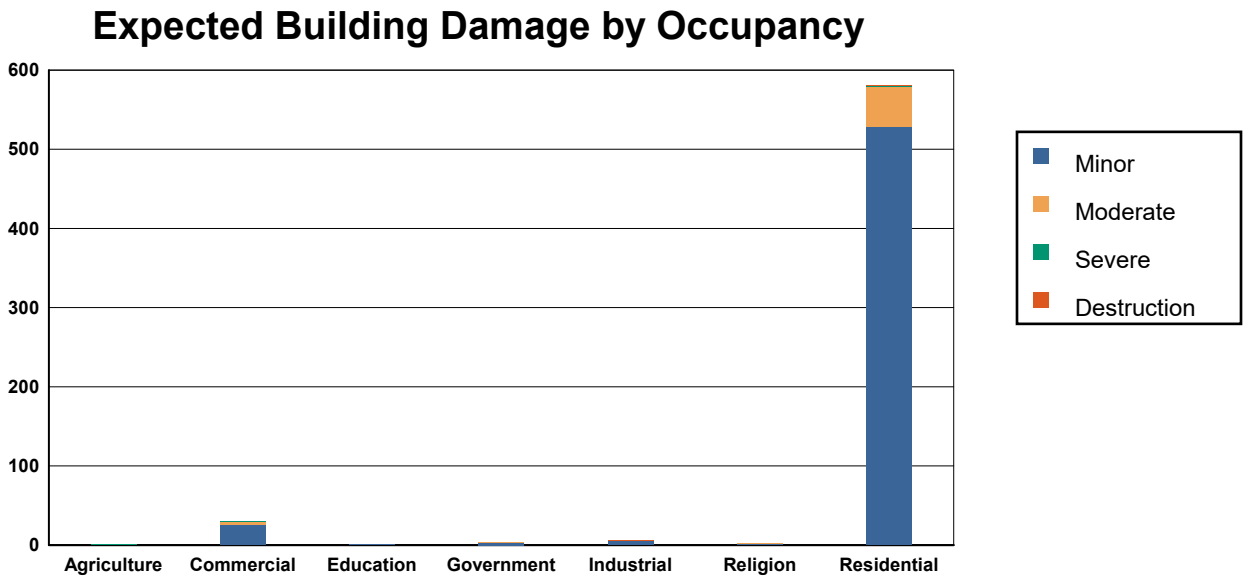


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	17.95	94.48	0.85	4.49	0.14	0.73	0.05	0.29	0.00	0.01
Commercial	612.57	95.27	24.68	3.84	5.06	0.79	0.69	0.11	0.00	0.00
Education	24.88	95.69	1.05	4.04	0.07	0.26	0.00	0.00	0.00	0.00
Government	67.08	95.83	2.75	3.93	0.17	0.24	0.00	0.00	0.00	0.00
Industrial	136.91	95.74	5.39	3.77	0.58	0.41	0.11	0.08	0.00	0.00
Religion	40.14	95.57	1.75	4.17	0.10	0.25	0.00	0.01	0.00	0.00
Residential	8,220.63	93.41	528.56	6.01	50.48	0.57	0.93	0.01	0.41	0.00
Total	**9,120.16**		**565.03**		**56.60**		**1.79**		**0.41**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	105	95.23	5	4.44	0	0.33	0	0.00	0	0.00
Masonry	708	92.84	42	5.57	12	1.54	0	0.05	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	423	95.67	15	3.43	3	0.78	1	0.12	0	0.00
Wood	7,915	93.98	480	5.69	26	0.31	1	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

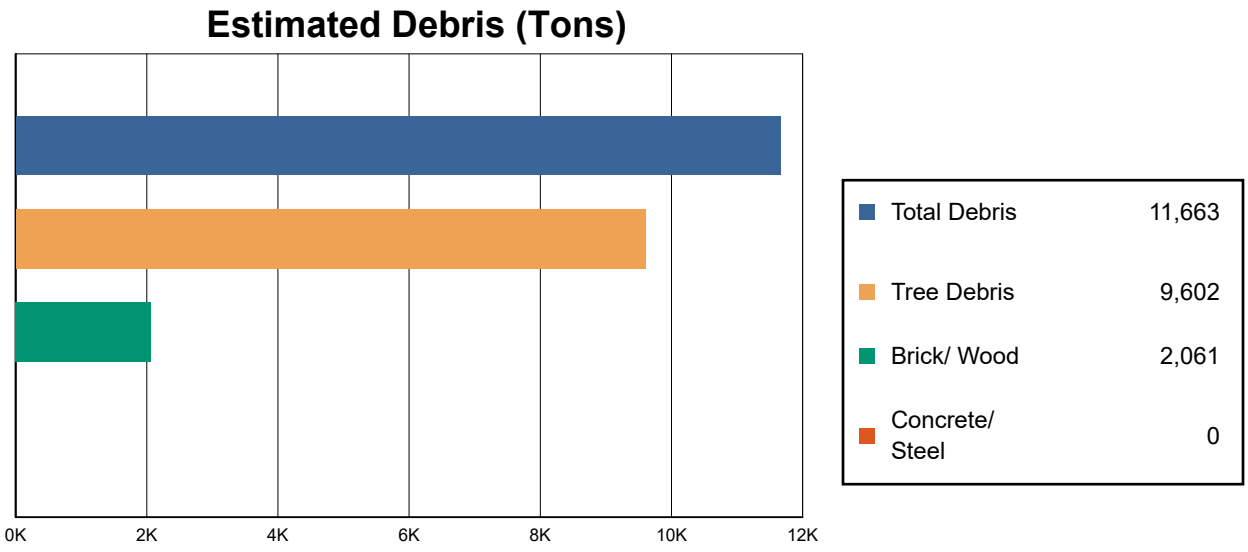
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

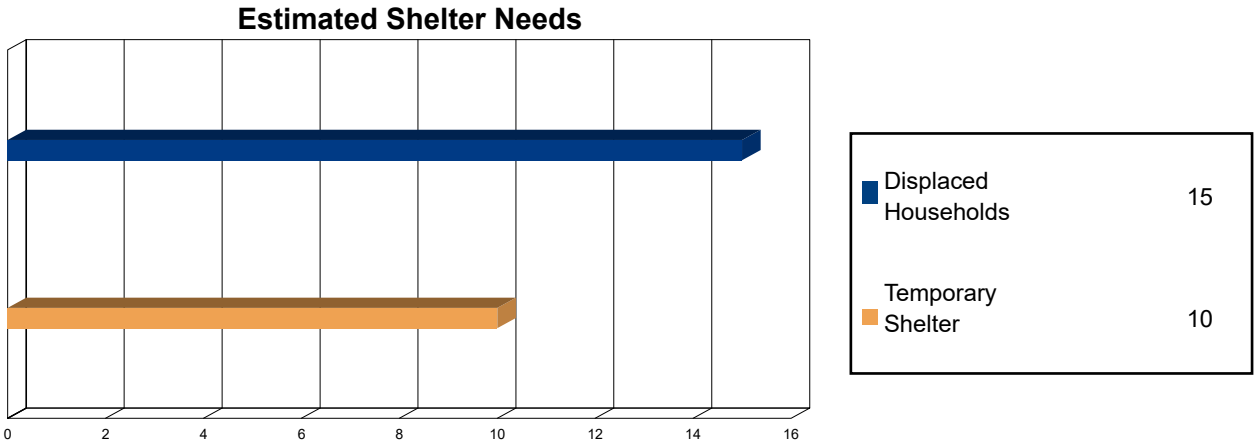


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 11,663 tons of debris will be generated. Of the total amount, 5,342 tons (46%) is Other Tree Debris. Of the remaining 6,321 tons, Brick/Wood comprises 33% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 82 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,260 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 15 households to be displaced due to the hurricane. Of these, 10 people (out of a total population of 29,492) will seek temporary shelter in public shelters.

Economic Loss

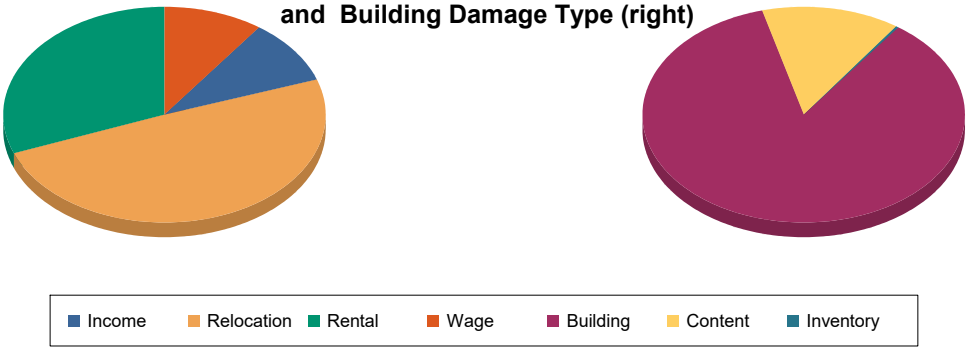
The total economic loss estimated for the hurricane is 27.7 million dollars, which represents 0.50 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 28 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 84% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

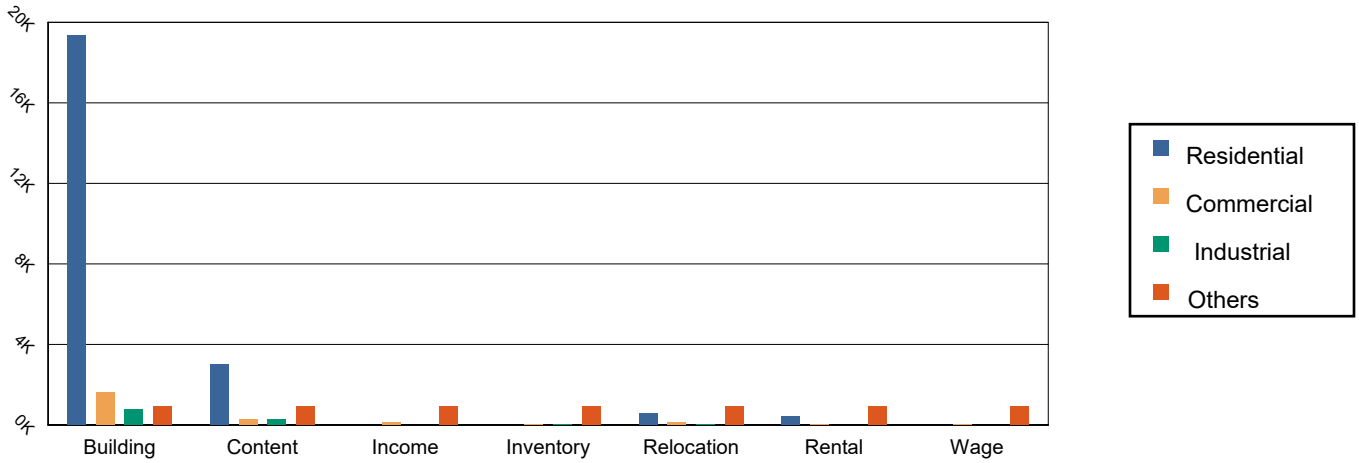


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	19,326.61	1,636.26	797.54	673.00	22,433.41
	Content	3,009.10	255.69	281.23	59.79	3,605.81
	Inventory	0.00	43.51	30.94	8.68	83.13
	Subtotal	**22,335.72**	**1,935.45**	**1,109.72**	**741.47**	**26,122.35**
Business Interruption Loss						
	Income	0.00	104.34	2.45	46.71	153.50
	Relocation	586.83	128.37	24.02	38.71	777.93
	Rental	435.06	46.52	1.65	3.24	486.48
	Wage	0.00	42.04	4.06	110.14	156.23
	Subtotal	**1,021.88**	**321.27**	**32.19**	**198.79**	**1,574.14**

Total

Total	**23,357.60**	**2,256.72**	**1,141.91**	**940.26**	**27,696.49**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	29,492	3,063,689	2,465,755	5,529,444
Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**
Study Region Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 30.97 square miles and contains 8 census tracts. There are over 11 thousand households in the region and a total population of 29,492 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

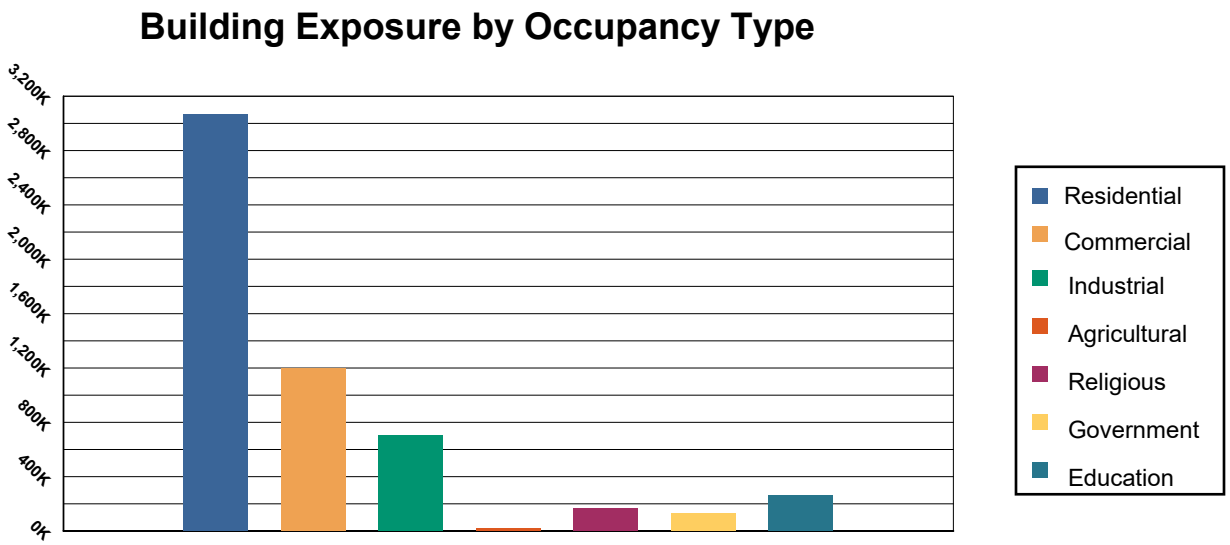


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,063,689	55.41%
Commercial	1,194,091	21.60%
Industrial	701,720	12.69%
Agricultural	19,620	0.35%
Religious	164,824	2.98%
Government	125,225	2.26%
Education	260,275	4.71%
Total	**5,529,444**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 184 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 3 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

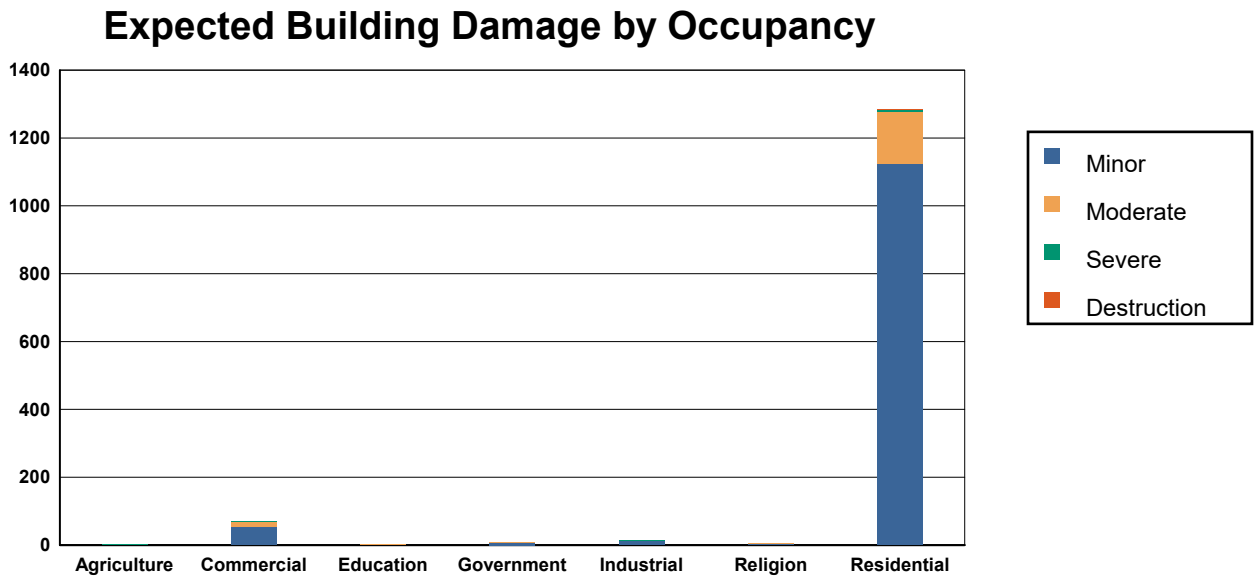


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16.53	87.00	1.86	9.77	0.41	2.18	0.19	0.98	0.02	0.08
Commercial	571.35	88.86	53.78	8.36	14.86	2.31	3.01	0.47	0.00	0.00
Education	23.28	89.52	2.34	9.01	0.37	1.41	0.01	0.05	0.00	0.00
Government	62.97	89.96	6.03	8.61	0.97	1.38	0.03	0.05	0.00	0.00
Industrial	128.66	89.97	11.42	7.98	2.41	1.69	0.49	0.34	0.02	0.02
Religion	37.46	89.19	4.02	9.56	0.50	1.19	0.02	0.06	0.00	0.00
Residential	7,515.78	85.40	1,124.60	12.78	153.29	1.74	4.32	0.05	3.01	0.03
Total	**8,356.02**		**1,204.04**		**172.82**		**8.07**		**3.05**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	98	88.86	10	9.32	2	1.77	0	0.04	0	0.00
Masonry	651	85.28	81	10.55	30	3.97	1	0.18	0	0.01
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	396	89.69	32	7.34	11	2.40	3	0.57	0	0.00
Wood	7,259	86.20	1,058	12.56	98	1.17	4	0.05	3	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

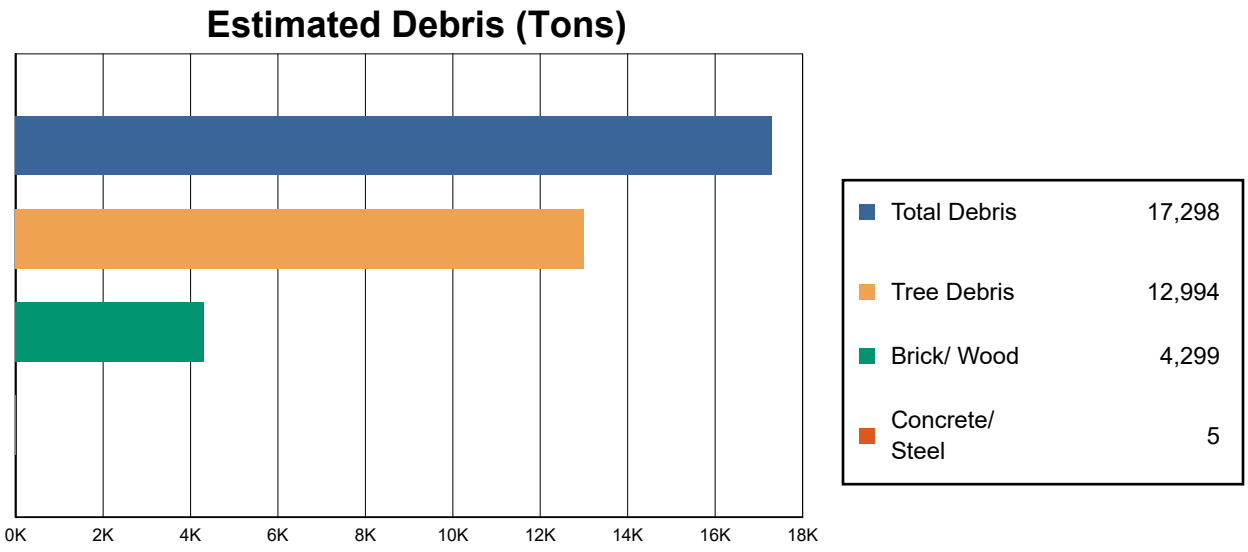
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	11	0	0	11

Induced Hurricane Damage

Debris Generation

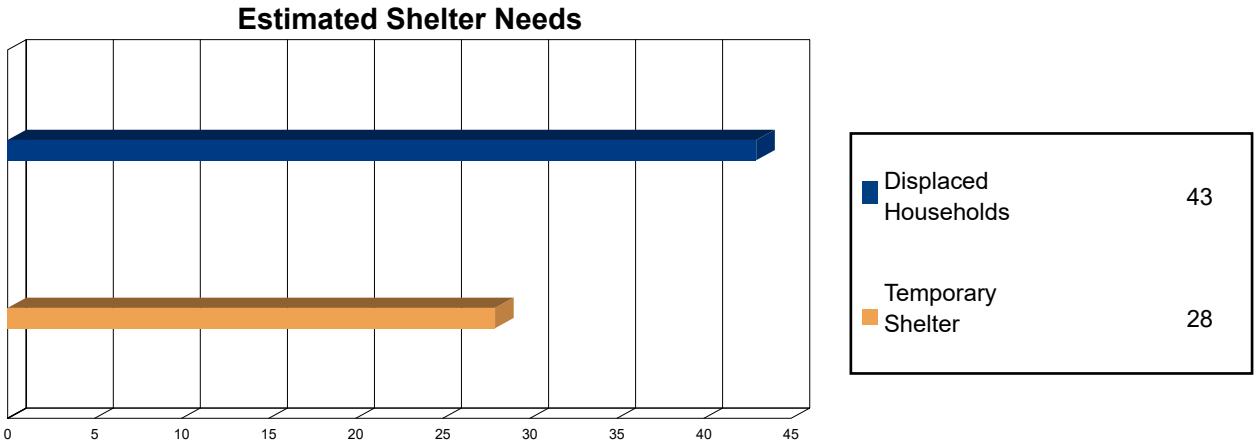


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 17,298 tons of debris will be generated. Of the total amount, 7,279 tons (42%) is Other Tree Debris. Of the remaining 10,019 tons, Brick/Wood comprises 43% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 172 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,715 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 43 households to be displaced due to the hurricane. Of these, 28 people (out of a total population of 29,492) will seek temporary shelter in public shelters.

Economic Loss

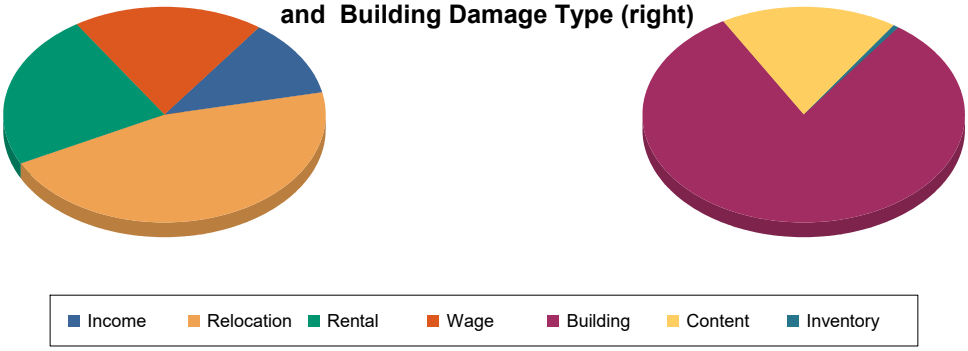
The total economic loss estimated for the hurricane is 57.9 million dollars, which represents 1.05 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 58 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 77% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

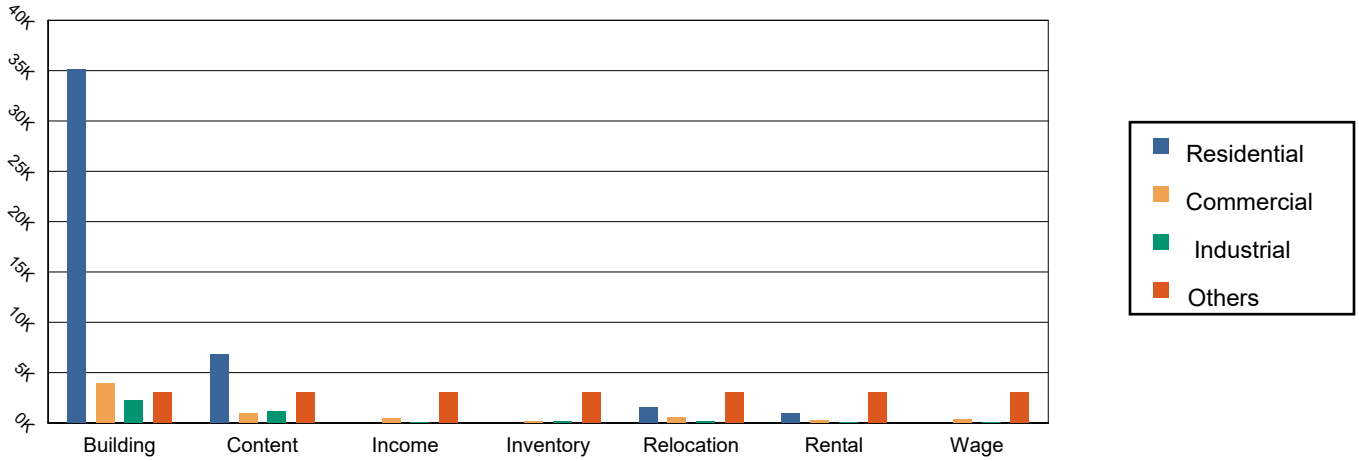


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	35,119.35	3,980.91	2,275.09	1,669.89	43,045.24
	Content	6,793.37	967.61	1,181.29	323.47	9,265.74
	Inventory	0.00	173.19	129.87	30.29	333.34
	Subtotal	**41,912.72**	**5,121.71**	**3,586.24**	**2,023.65**	**52,644.32**
Business Interruption Loss						
	Income	0.00	416.87	22.04	180.79	619.70
	Relocation	1,489.71	533.79	146.39	235.61	2,405.50
	Rental	927.93	248.62	19.26	21.78	1,217.59
	Wage	0.00	380.11	36.31	594.77	1,011.19
	Subtotal	**2,417.65**	**1,579.38**	**223.99**	**1,032.95**	**5,253.97**

Total

Total	44,330.37	6,701.09	3,810.24	3,056.60	57,898.30

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	29,492	3,063,689	2,465,755	5,529,444
Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**
Study Region Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
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There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

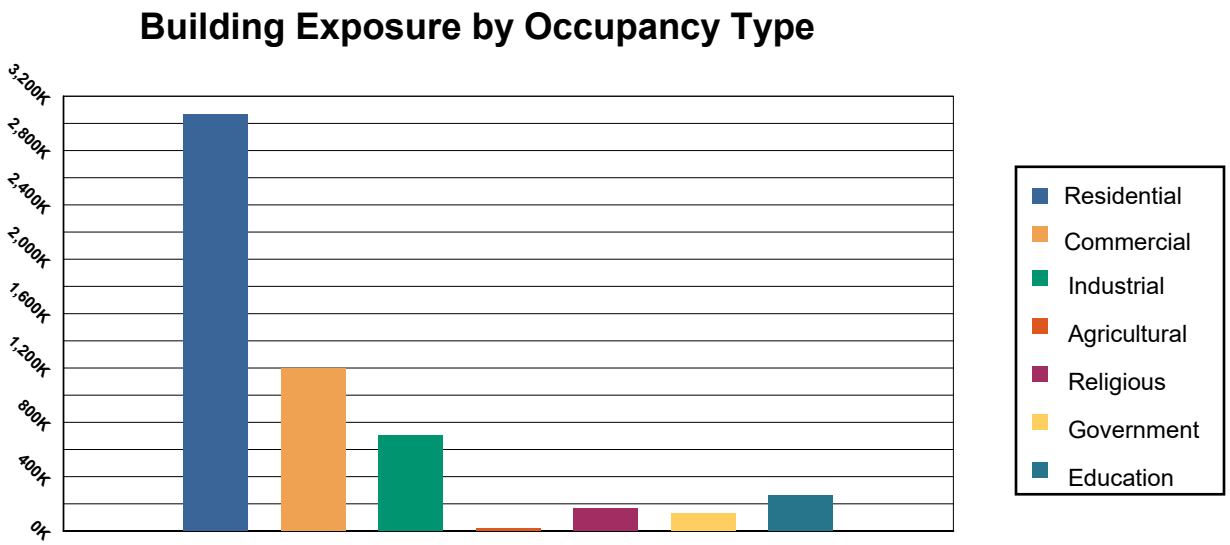


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,063,689	55.41%
Commercial	1,194,091	21.60%
Industrial	701,720	12.69%
Agricultural	19,620	0.35%
Religious	164,824	2.98%
Government	125,225	2.26%
Education	260,275	4.71%
Total	**5,529,444**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 485 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 17 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

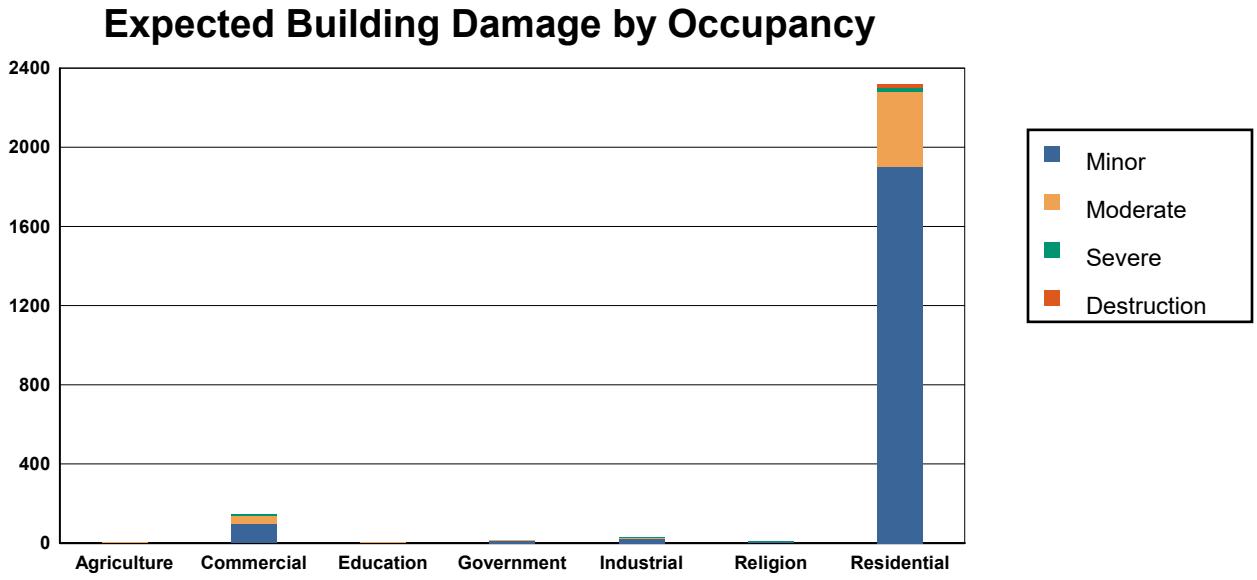


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	14.08	74.11	3.36	17.67	1.01	5.33	0.49	2.57	0.06	0.31
Commercial	496.96	77.29	97.26	15.13	39.14	6.09	9.57	1.49	0.07	0.01
Education	20.57	79.10	4.09	15.74	1.23	4.74	0.11	0.42	0.00	0.00
Government	55.50	79.29	10.76	15.37	3.44	4.91	0.30	0.43	0.00	0.00
Industrial	111.92	78.27	21.04	14.72	8.04	5.63	1.87	1.31	0.12	0.09
Religion	32.88	78.28	7.25	17.27	1.73	4.12	0.14	0.34	0.00	0.00
Residential	6,482.62	73.66	1,900.29	21.59	377.67	4.29	23.62	0.27	16.80	0.19
Total	**7,214.54**		**2,044.06**		**432.26**		**36.10**		**17.05**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	85	77.17	18	16.22	7	6.19	0	0.42	0	0.00
Masonry	561	73.50	129	16.95	67	8.78	5	0.70	1	0.07
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	347	78.55	58	13.15	28	6.39	8	1.89	0	0.02
Wood	6,279	74.56	1,827	21.70	279	3.31	21	0.25	15	0.18

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

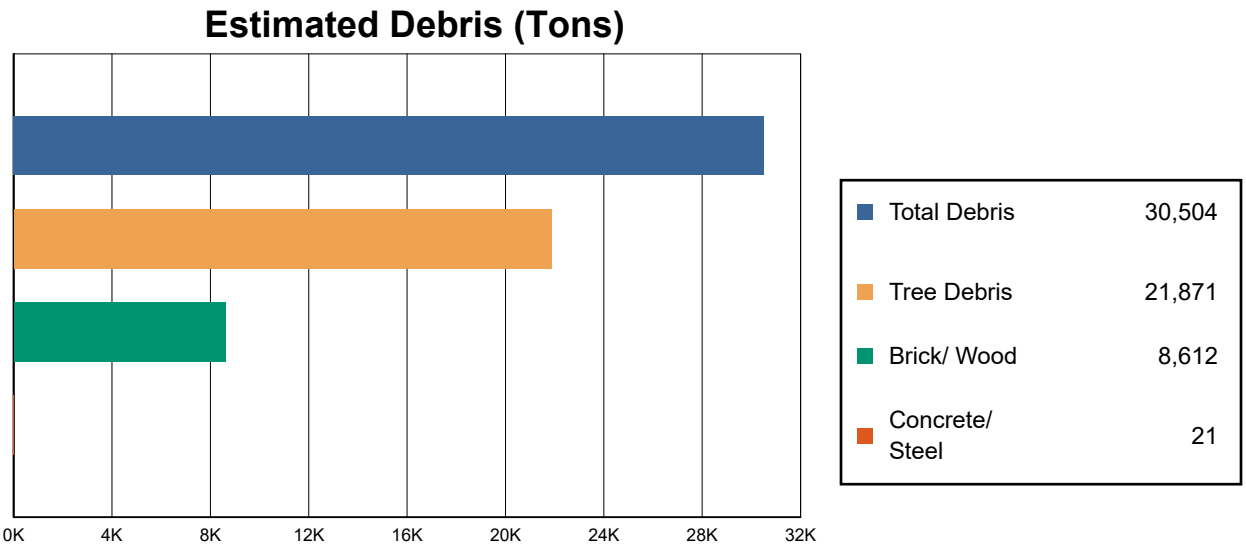
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	11	0	0	1

Induced Hurricane Damage

Debris Generation

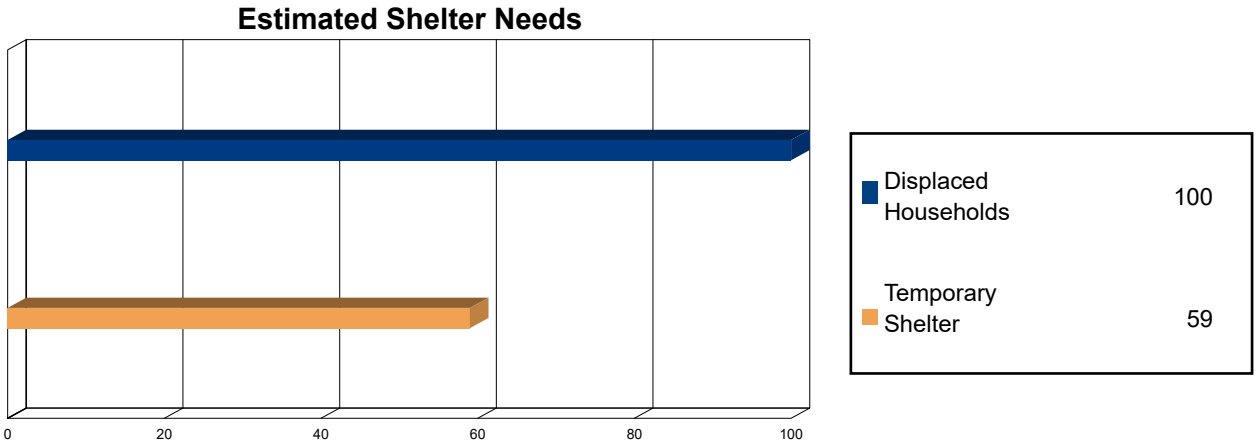


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 30,504 tons of debris will be generated. Of the total amount, 12,200 tons (40%) is Other Tree Debris. Of the remaining 18,304 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 345 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 9,671 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 100 households to be displaced due to the hurricane. Of these, 59 people (out of a total population of 29,492) will seek temporary shelter in public shelters.

Economic Loss

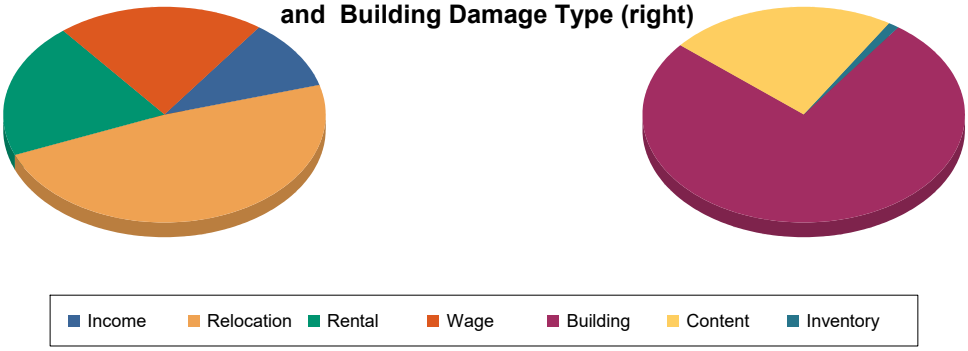
The total economic loss estimated for the hurricane is 130.5 million dollars, which represents 2.36 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 130 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 69% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

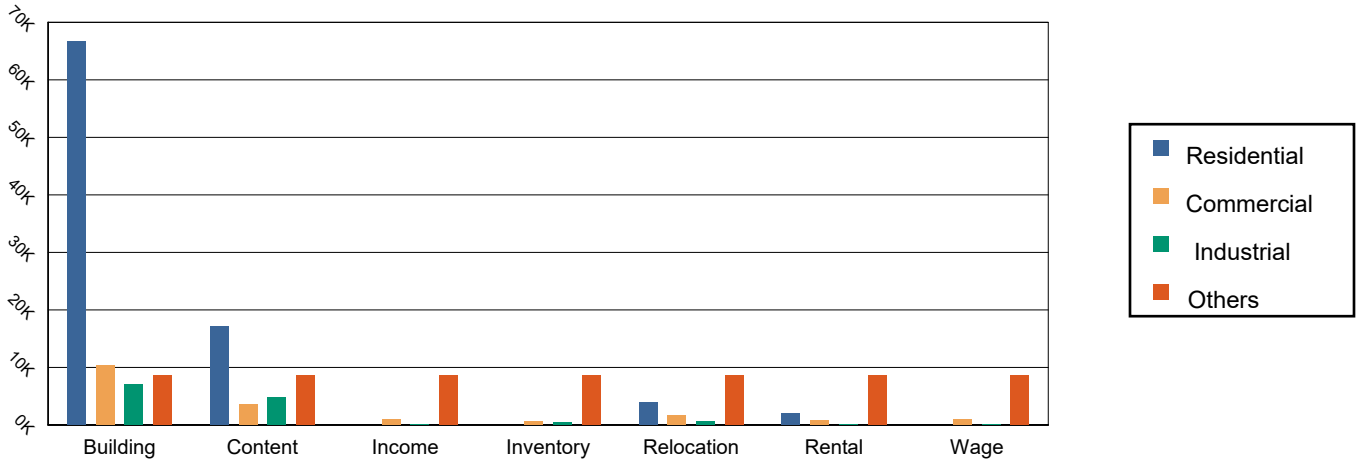


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	66,642.74	10,371.34	7,124.12	4,260.71	88,398.92
	Content	17,104.47	3,564.81	4,744.29	1,182.68	26,596.26
	Inventory	0.00	645.27	515.51	101.03	1,261.81
	Subtotal	**83,747.21**	**14,581.43**	**12,383.93**	**5,544.42**	**116,256.99**
Business Interruption Loss						
	Income	0.00	1,031.60	72.16	413.50	1,517.26
	Relocation	3,962.53	1,598.54	559.56	760.44	6,881.08
	Rental	1,937.15	771.78	78.43	89.20	2,876.56
	Wage	0.00	1,045.42	118.86	1,803.02	2,967.30
	Subtotal	**5,899.68**	**4,447.34**	**829.01**	**3,066.16**	**14,242.19**

Total

Total	**89,646.89**	**19,028.77**	**13,212.94**	**8,610.58**	**130,499.18**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	29,492	3,063,689	2,465,755	5,529,444
Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**
Study Region Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 30.97 square miles and contains 8 census tracts. There are over 11 thousand households in the region and a total population of 29,492 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,529 million dollars. Approximately 90% of the buildings (and 55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,744 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

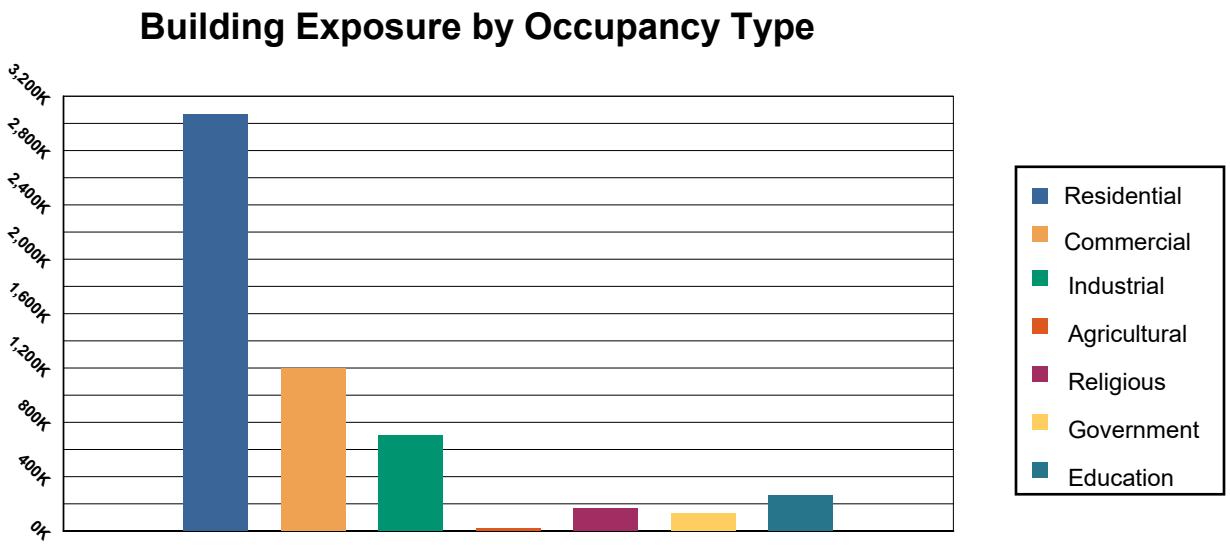


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,063,689	55.41%
Commercial	1,194,091	21.60%
Industrial	701,720	12.69%
Agricultural	19,620	0.35%
Religious	164,824	2.98%
Government	125,225	2.26%
Education	260,275	4.71%
Total	**5,529,444**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 782 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. There are an estimated 38 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

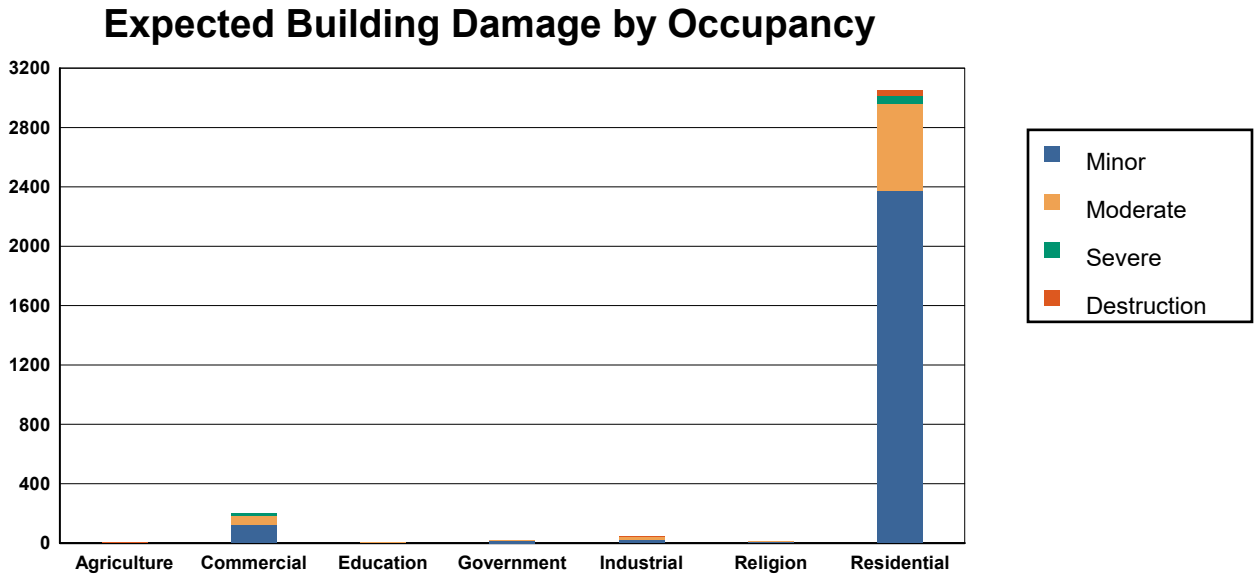


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	12.35	65.02	4.25	22.38	1.53	8.06	0.75	3.95	0.11	0.59
Commercial	440.65	68.53	123.11	19.15	62.11	9.66	16.96	2.64	0.17	0.03
Education	18.58	71.48	5.12	19.70	2.05	7.88	0.25	0.94	0.00	0.00
Government	49.73	71.05	13.58	19.40	5.93	8.47	0.76	1.09	0.00	0.00
Industrial	98.47	68.86	26.75	18.71	13.80	9.65	3.72	2.60	0.26	0.18
Religion	29.38	69.94	9.29	22.11	2.99	7.13	0.34	0.82	0.00	0.00
Residential	5,753.33	65.37	2,377.55	27.01	581.32	6.61	51.65	0.59	37.15	0.42
Total	**6,402.51**		**2,559.65**		**669.72**		**74.43**		**37.69**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	75	68.20	22	20.03	12	10.66	1	1.11	0	0.00
Masonry	496	64.97	157	20.55	99	12.91	11	1.41	1	0.15
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	309	69.90	73	16.55	45	10.11	15	3.38	0	0.05
Wood	5,580	66.26	2,310	27.42	453	5.38	46	0.55	33	0.39

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

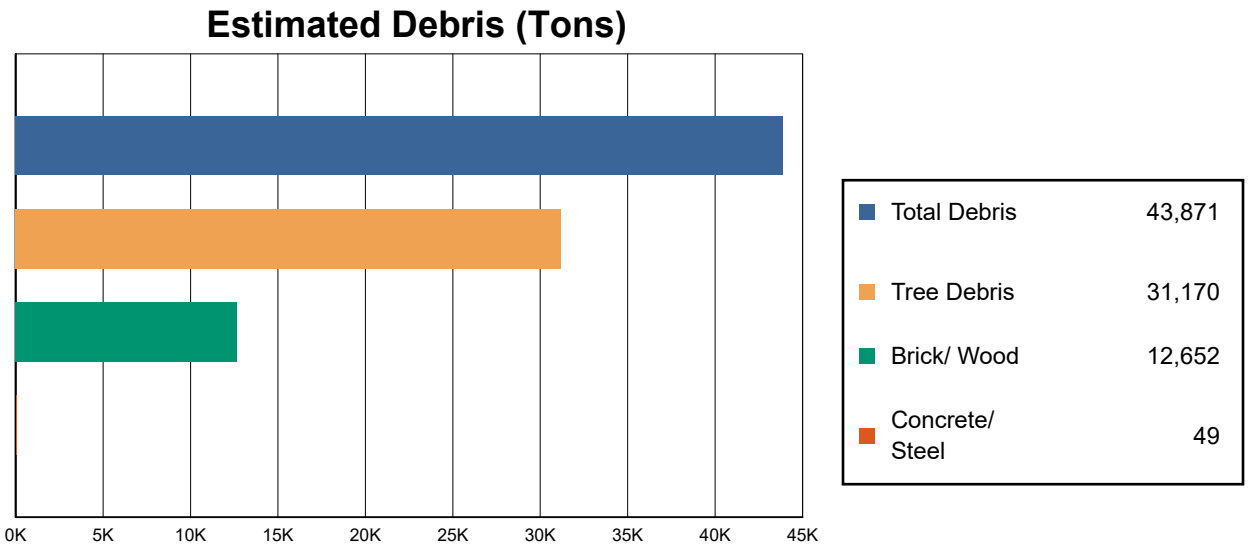
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	1	0	0	1
Schools	11	0	0	0

Induced Hurricane Damage

Debris Generation

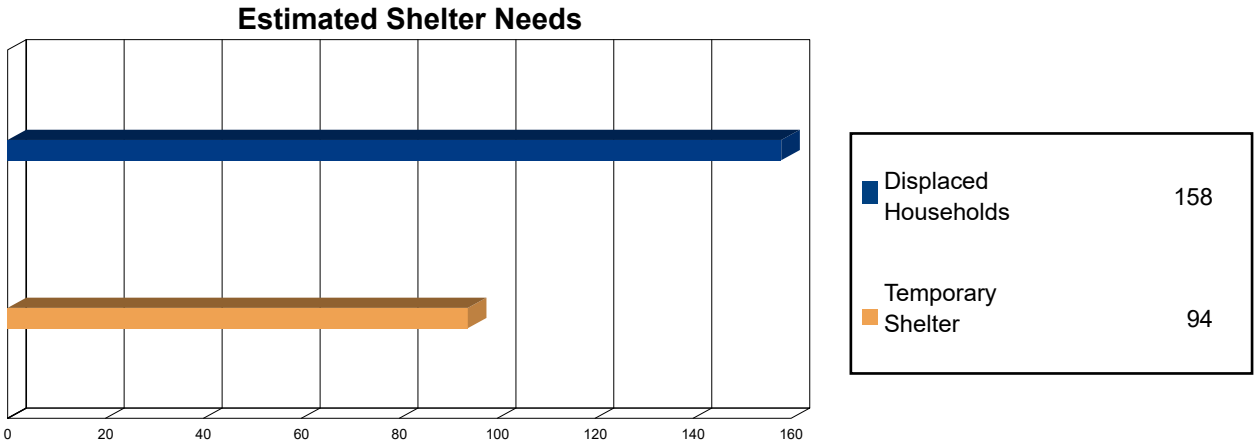


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 43,871 tons of debris will be generated. Of the total amount, 17,360 tons (40%) is Other Tree Debris. Of the remaining 26,511 tons, Brick/Wood comprises 48% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 508 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 13,810 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 158 households to be displaced due to the hurricane. Of these, 94 people (out of a total population of 29,492) will seek temporary shelter in public shelters.

Economic Loss

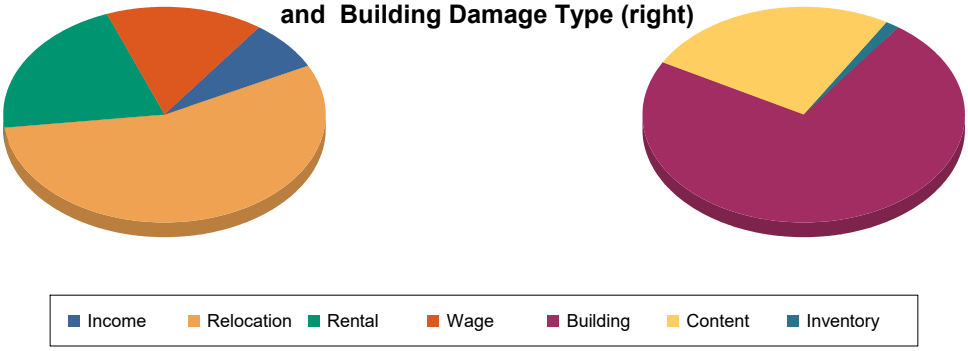
The total economic loss estimated for the hurricane is 208.3 million dollars, which represents 3.77 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 208 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 66% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

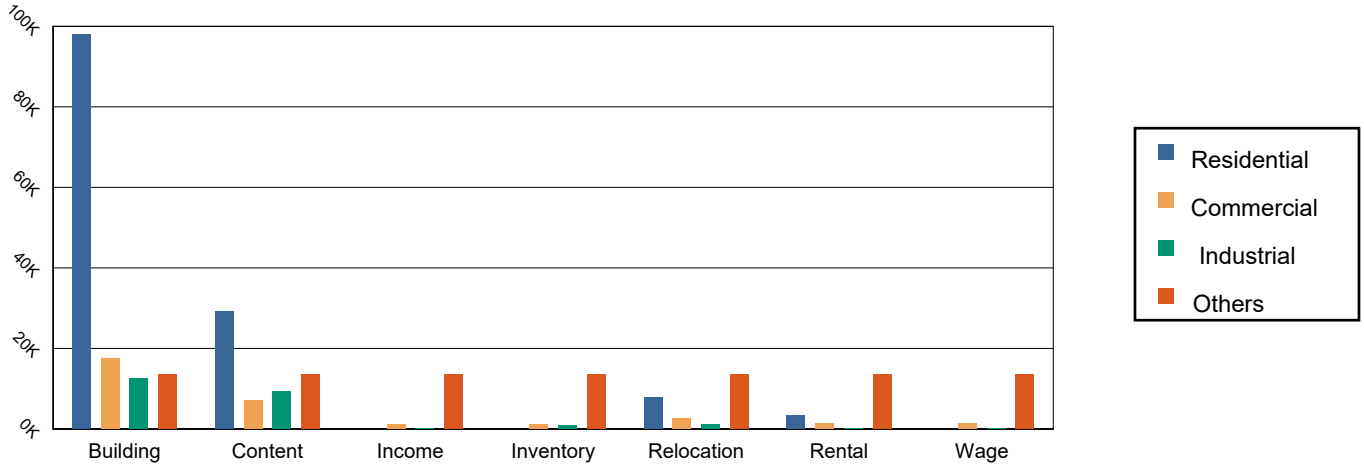


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	97,888.83	17,515.59	12,672.52	6,969.50	135,046.44
	Content	29,142.31	6,981.66	9,242.64	2,289.29	47,655.90
	Inventory	0.00	1,227.13	1,003.75	174.75	2,405.64
	Subtotal	**127,031.15**	**25,724.39**	**22,918.91**	**9,433.54**	**185,107.98**
Business Interruption Loss						
	Income	0.16	1,186.92	102.54	474.50	1,764.13
	Relocation	7,845.50	2,725.14	1,025.47	1,253.13	12,849.25
	Rental	3,323.71	1,336.29	147.62	150.84	4,958.46
	Wage	0.39	1,270.00	168.88	2,213.73	3,653.00
	Subtotal	**11,169.76**	**6,518.36**	**1,444.52**	**4,092.20**	**23,224.84**

Total

Total	**138,200.91**	**32,242.74**	**24,363.43**	**13,525.74**	**208,332.82**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	29,492	3,063,689	2,465,755	5,529,444
Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**
Study Region Total	**29,492**	**3,063,689**	**2,465,755**	**5,529,444**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_Locks_HU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.37 square miles and contains 4 census tracts. There are over 5 thousand households in the region and a total population of 12,613 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86% of the buildings (and 50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,784 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

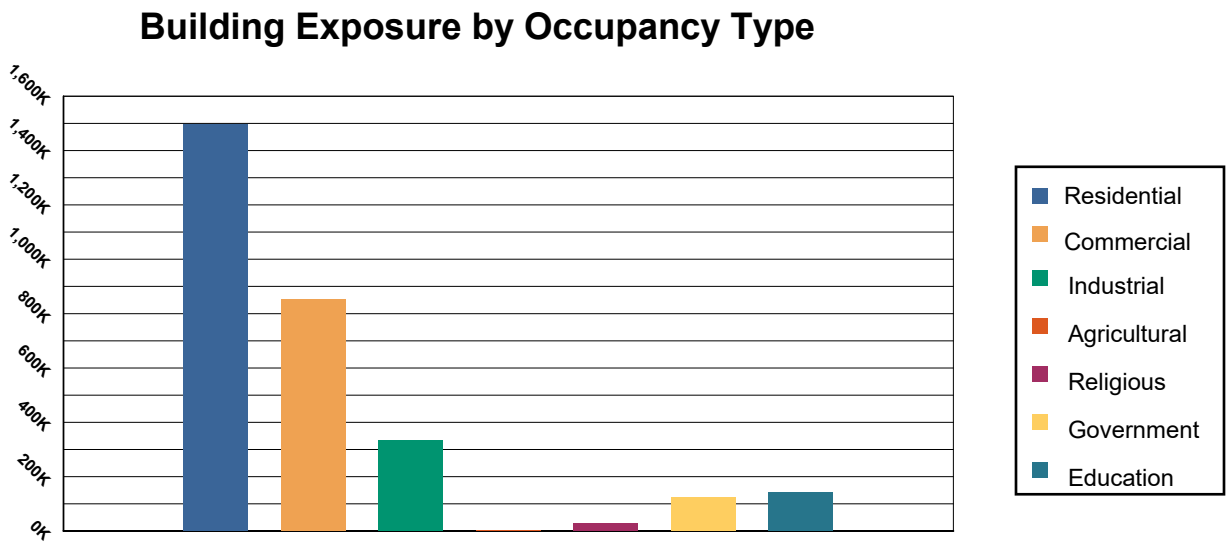


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,494,860	50.27%
Commercial	850,386	28.60%
Industrial	334,077	11.24%
Agricultural	3,770	0.13%
Religious	26,176	0.88%
Government	123,728	4.16%
Education	140,423	4.72%
Total	**2,973,420**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

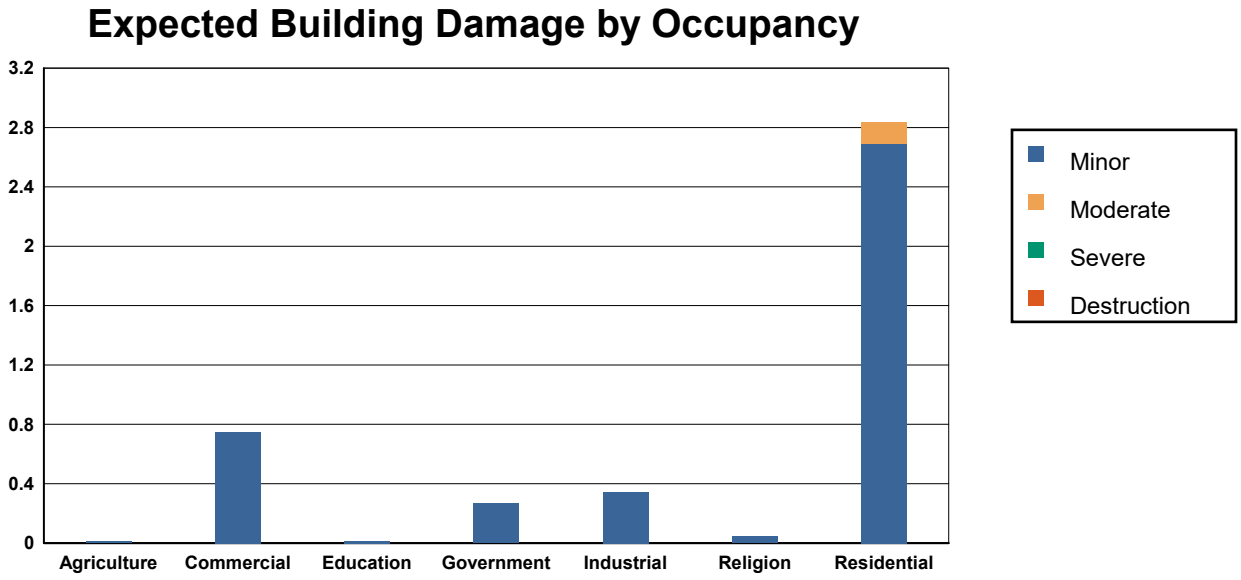


Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.99	99.84	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	358.25	99.79	0.75	0.21	0.00	0.00	0.00	0.00	0.00	0.00
Education	5.99	99.76	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Government	105.74	99.75	0.26	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	144.65	99.76	0.35	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Religion	22.96	99.81	0.04	0.19	0.00	0.00	0.00	0.00	0.00	0.00
Residential	4,134.16	99.93	2.69	0.07	0.14	0.00	0.00	0.00	0.00	0.00
Total	**4,779.73**		**4.12**		**0.14**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	84	99.71	0	0.29	0	0.00	0	0.00	0	0.00
Masonry	459	99.69	1	0.30	0	0.00	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	322	99.78	1	0.22	0	0.00	0	0.00	0	0.00
Wood	3,913	99.98	1	0.02	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

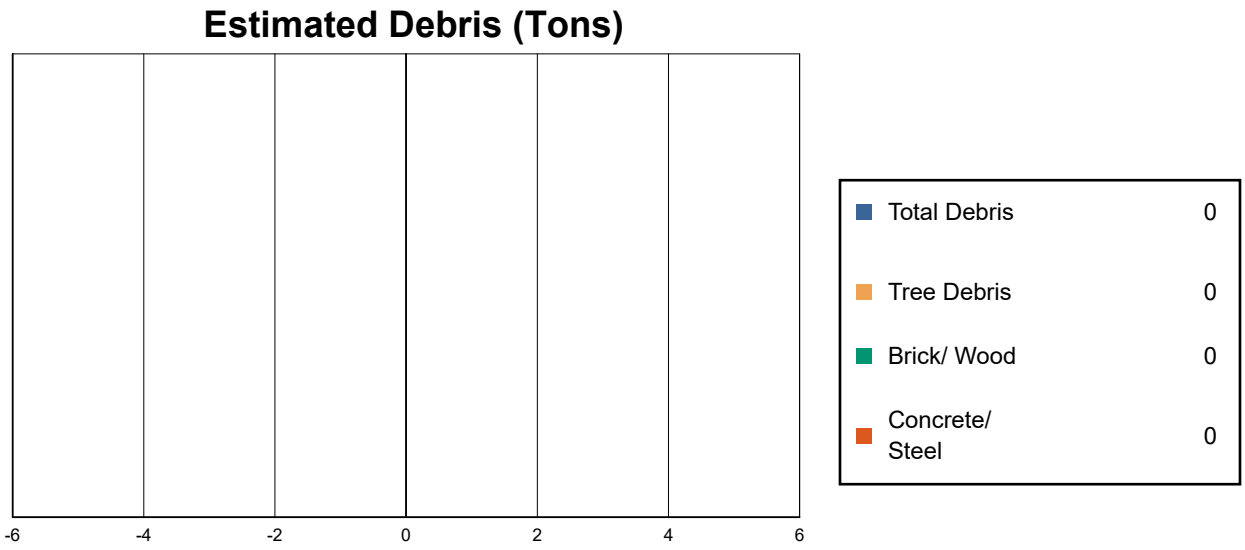
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	2	0	0	2
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

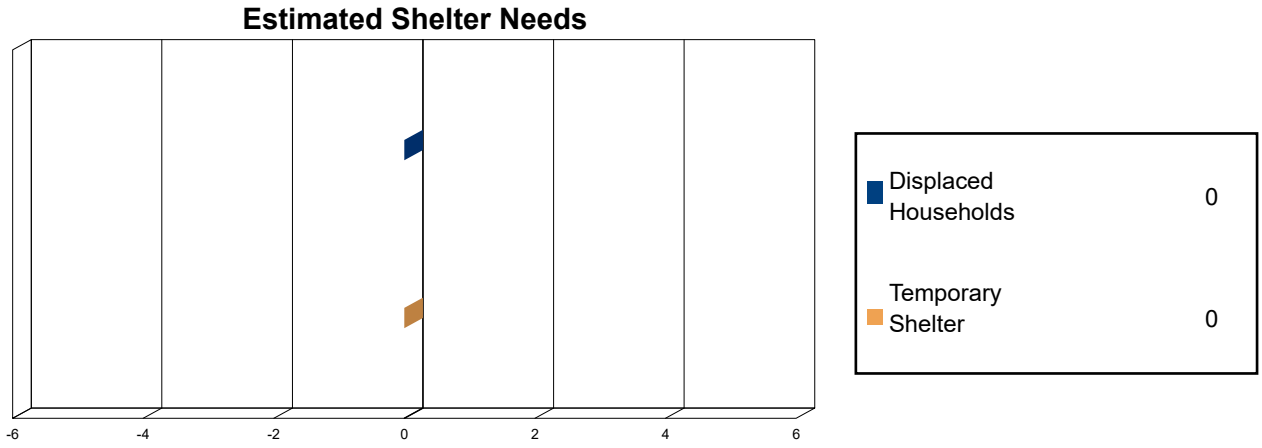


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 12,613) will seek temporary shelter in public shelters.

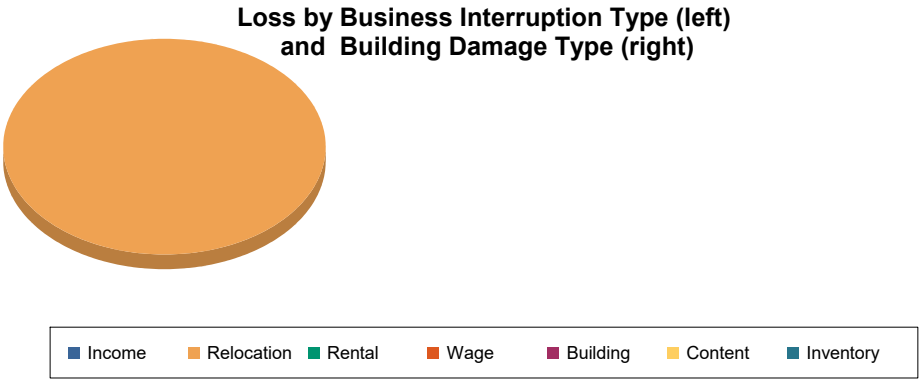
Economic Loss

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 100% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.



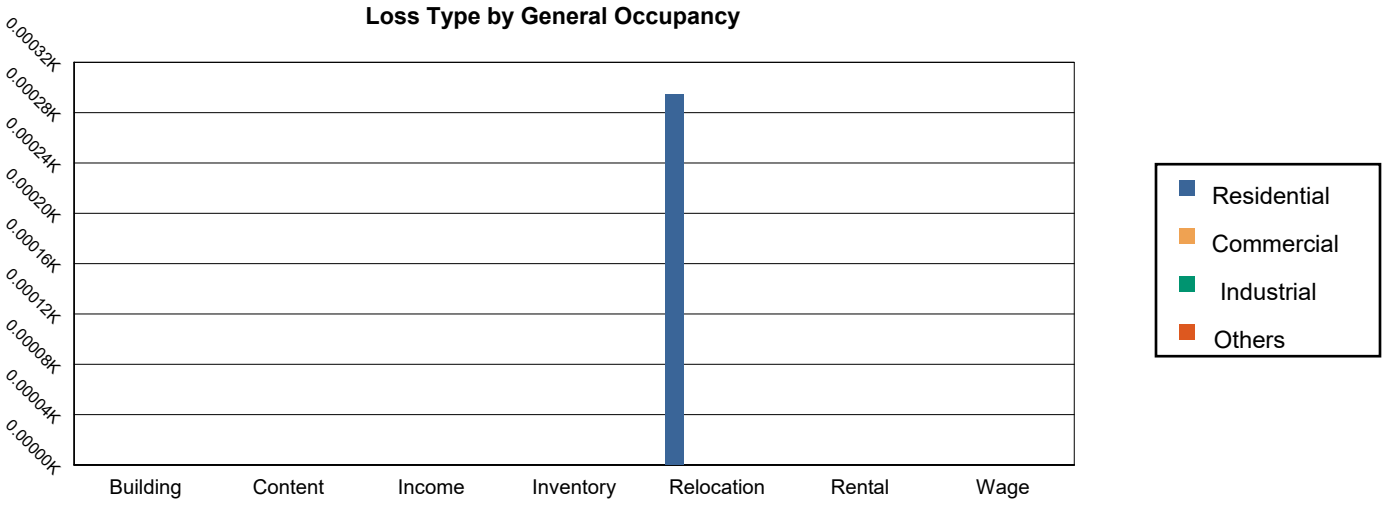


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.29	0.00	0.00	0.00	0.29
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.29**	**0.00**	**0.00**	**0.00**	**0.29**

Total

Total	**0.29**	**0.00**	**0.00**	**0.00**	**0.29**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	12,613	1,494,860	1,478,560	2,973,420
Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**
Study Region Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_Locks_HU
Hurricane Scenario:	Probabilistic 20-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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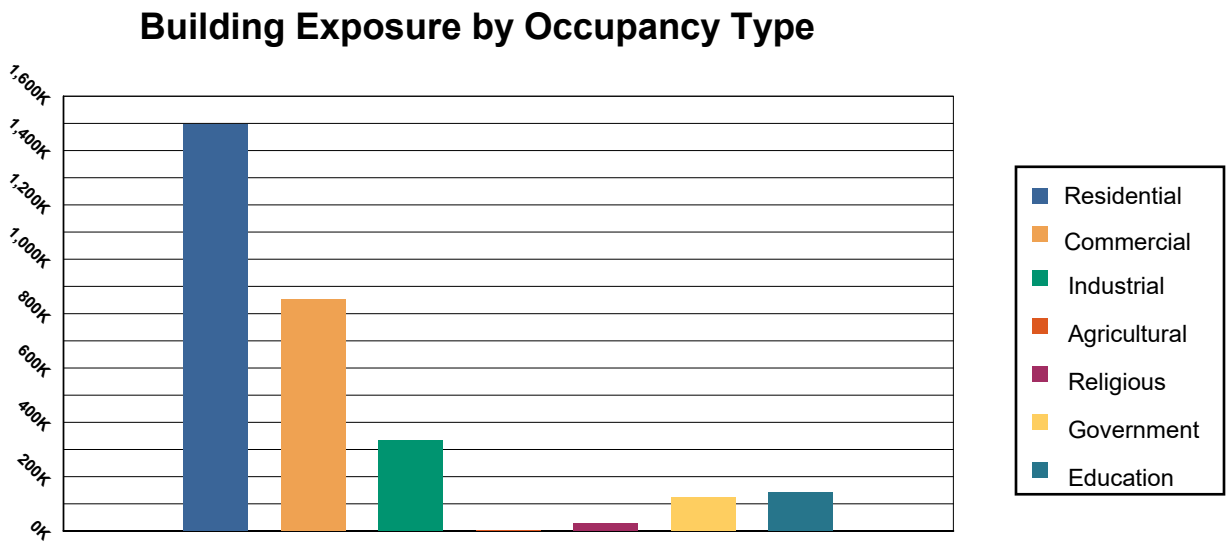

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Occupancy	Exposure ($1000)	Percent of Tot
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Total	**2,973,420**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

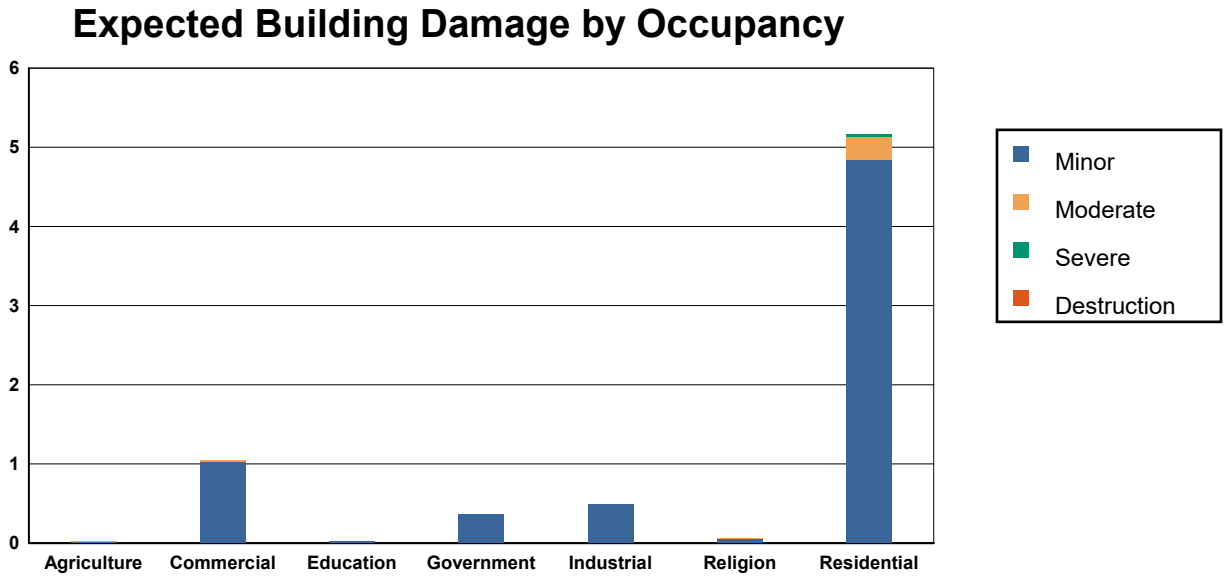


Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.98	99.77	0.02	0.22	0.00	0.01	0.00	0.00	0.00	0.00
Commercial	357.95	99.71	1.03	0.29	0.02	0.01	0.00	0.00	0.00	0.00
Education	5.98	99.68	0.02	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Government	105.64	99.66	0.36	0.34	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	144.52	99.67	0.48	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Religion	22.94	99.74	0.06	0.25	0.00	0.01	0.00	0.00	0.00	0.00
Residential	4,131.84	99.88	4.84	0.12	0.29	0.01	0.03	0.00	0.00	0.00
Total	**4,776.84**		**6.81**		**0.31**		**0.03**		**0.00**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	84	99.59	0	0.41	0	0.00	0	0.00	0	0.00
Masonry	458	99.52	2	0.47	0	0.01	0	0.00	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	322	99.69	1	0.31	0	0.00	0	0.00	0	0.00
Wood	3,912	99.96	2	0.04	0	0.01	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

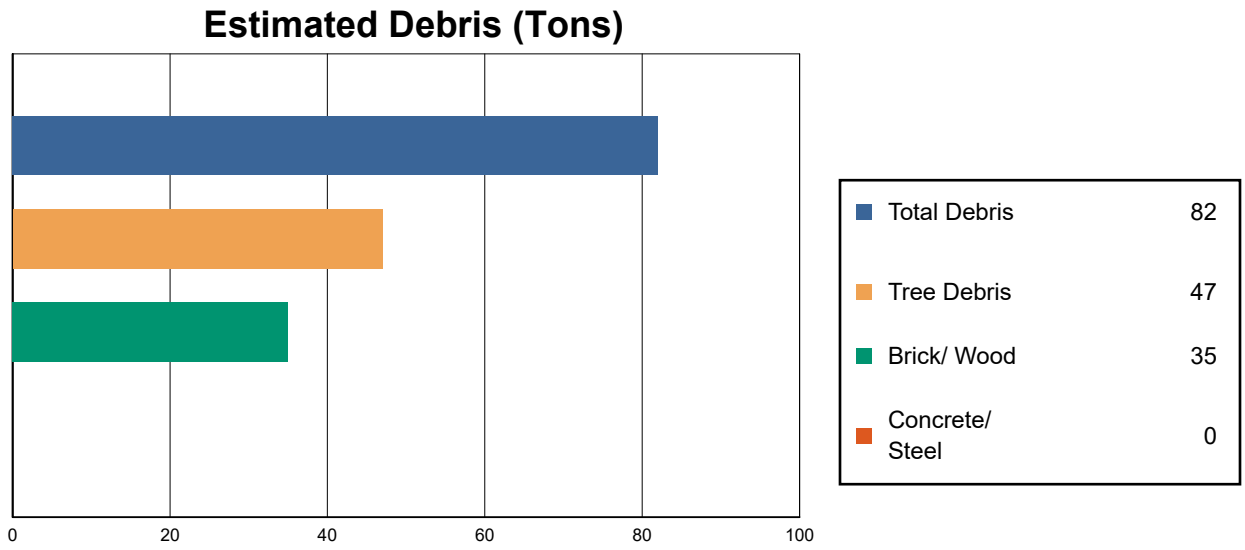
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	2	0	0	2
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

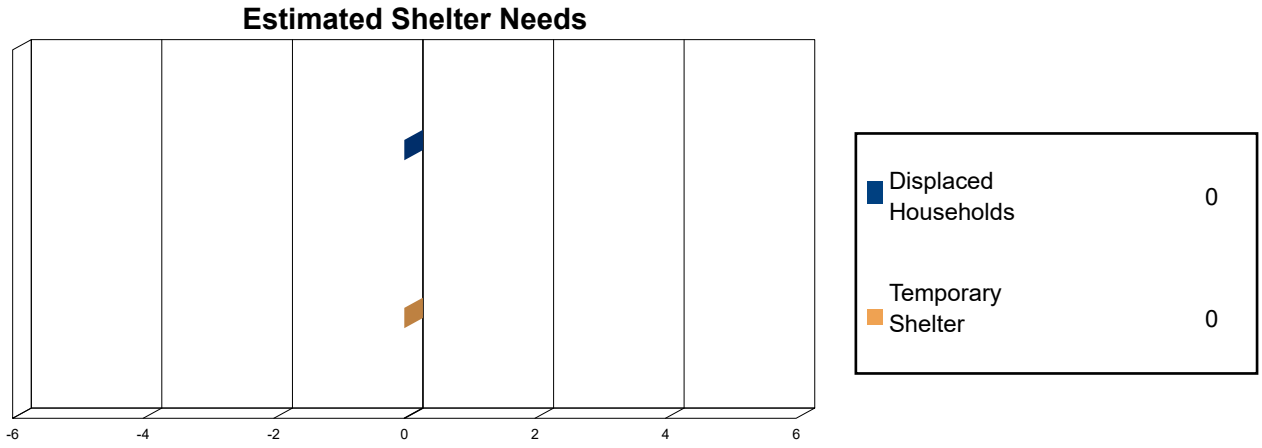


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 82 tons of debris will be generated. Of the total amount, 42 tons (51%) is Other Tree Debris. Of the remaining 40 tons, Brick/Wood comprises 87% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 12,613) will seek temporary shelter in public shelters.

Economic Loss

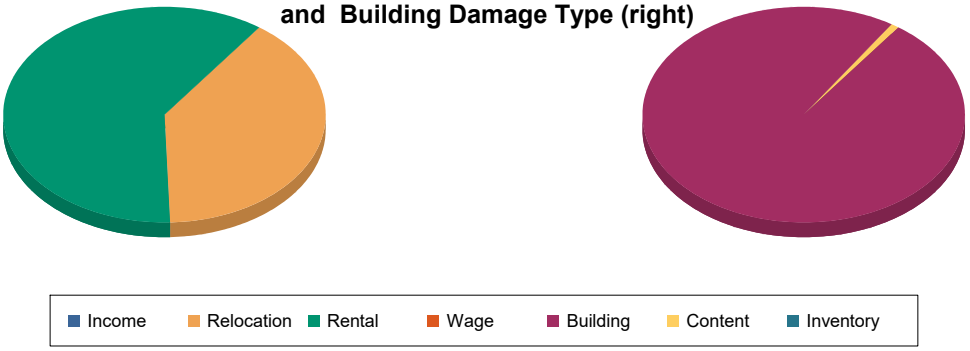
The total economic loss estimated for the hurricane is 0.5 million dollars, which represents 0.02 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 69% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

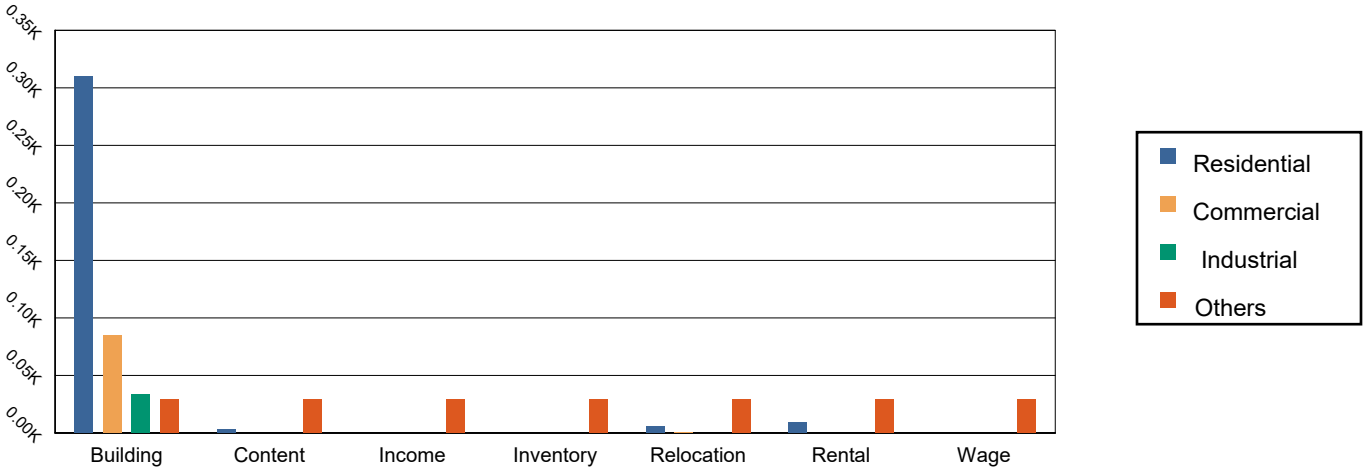


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	310.23	85.04	33.41	29.03	457.71
	Content	3.57	0.00	0.00	0.00	3.57
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**313.79**	**85.04**	**33.41**	**29.03**	**461.27**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	5.67	0.36	0.00	0.02	6.05
	Rental	9.24	0.00	0.00	0.00	9.24
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**14.91**	**0.36**	**0.00**	**0.02**	**15.29**

Total

Total	**328.71**	**85.40**	**33.41**	**29.05**	**476.56**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	12,613	1,494,860	1,478,560	2,973,420
Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**
Study Region Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_Locks_HU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.37 square miles and contains 4 census tracts. There are over 5 thousand households in the region and a total population of 12,613 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86% of the buildings (and 50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,784 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

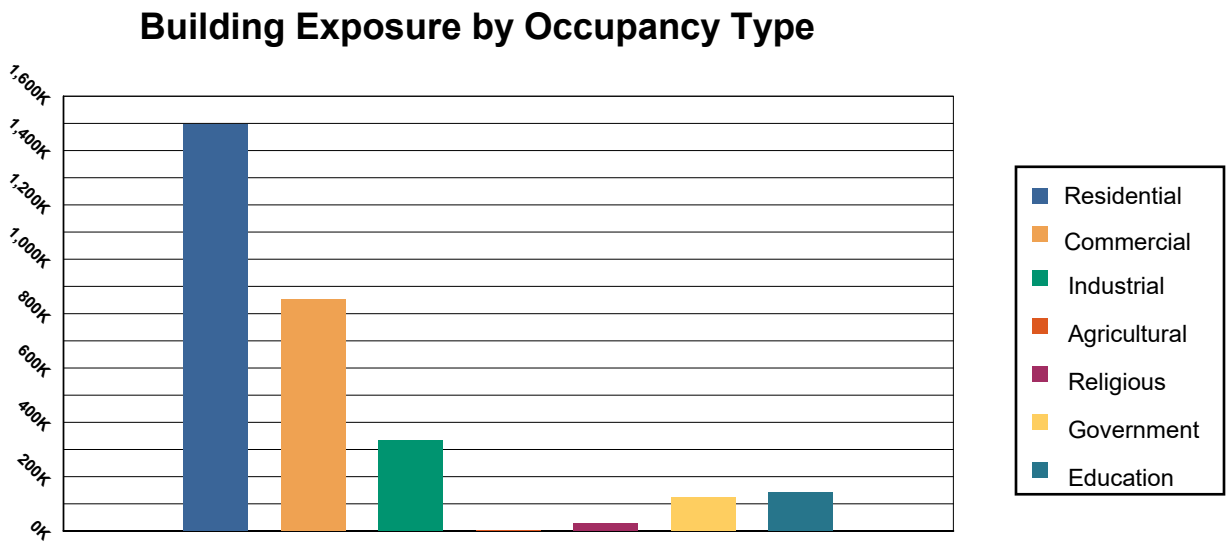


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,494,860	50.27%
Commercial	850,386	28.60%
Industrial	334,077	11.24%
Agricultural	3,770	0.13%
Religious	26,176	0.88%
Government	123,728	4.16%
Education	140,423	4.72%
Total	**2,973,420**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

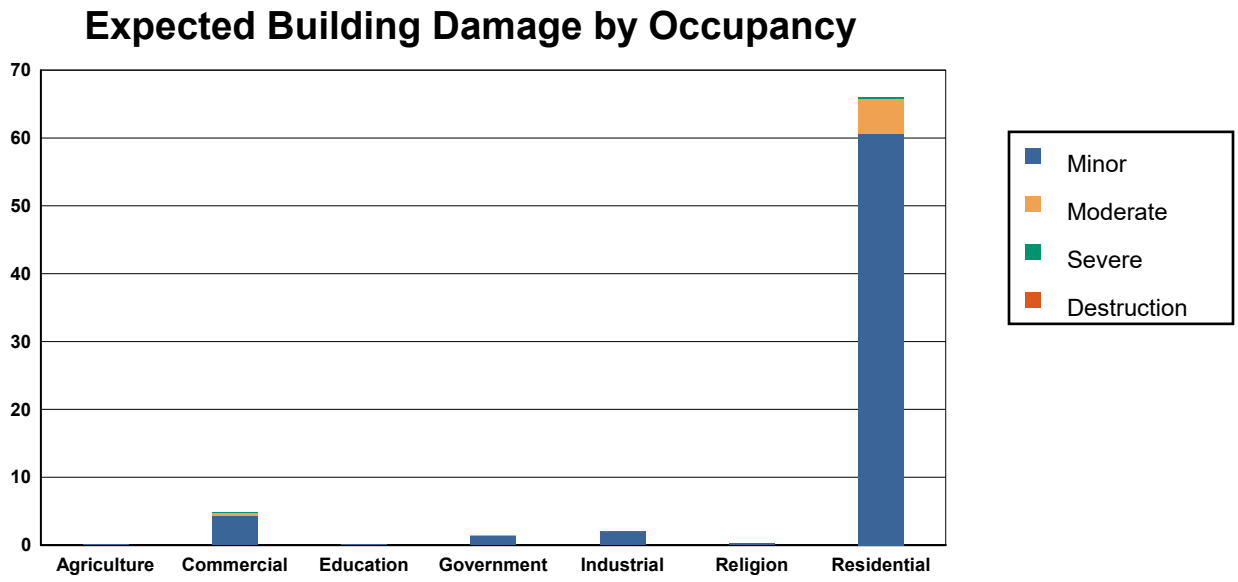


Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.88	98.52	0.11	1.34	0.01	0.12	0.00	0.03	0.00	0.00
Commercial	354.12	98.64	4.25	1.18	0.61	0.17	0.02	0.01	0.00	0.00
Education	5.92	98.73	0.08	1.25	0.00	0.02	0.00	0.00	0.00	0.00
Government	104.55	98.64	1.42	1.34	0.02	0.02	0.00	0.00	0.00	0.00
Industrial	142.92	98.57	1.98	1.36	0.09	0.06	0.02	0.01	0.00	0.00
Religion	22.73	98.82	0.26	1.14	0.01	0.03	0.00	0.00	0.00	0.00
Residential	4,071.07	98.41	60.71	1.47	5.05	0.12	0.17	0.00	0.00	0.00
Total	**4,709.20**		**68.81**		**5.78**		**0.21**		**0.00**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	83	98.38	1	1.61	0	0.02	0	0.00	0	0.00
Masonry	449	97.60	10	2.08	1	0.31	0	0.01	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	319	98.63	4	1.17	1	0.19	0	0.01	0	0.00
Wood	3,867	98.81	45	1.15	2	0.04	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

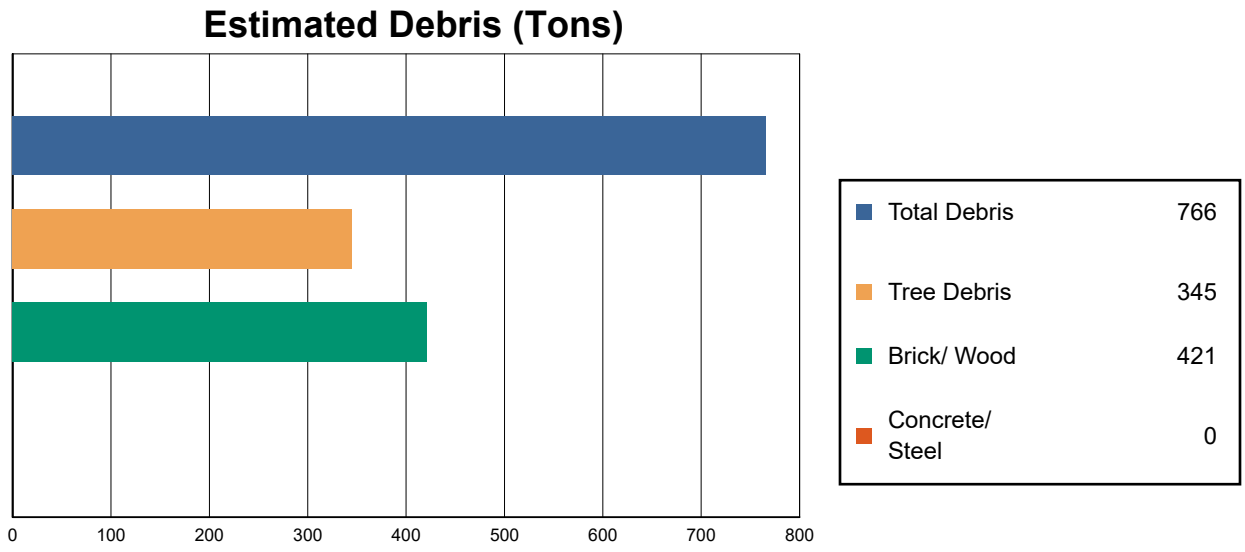
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	2	0	0	2
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

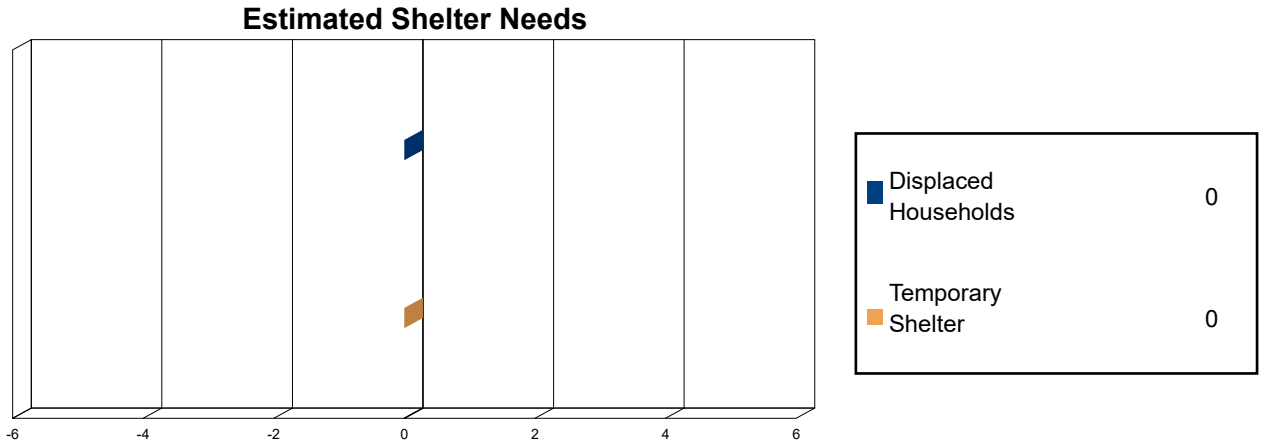


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 766 tons of debris will be generated. Of the total amount, 187 tons (24%) is Other Tree Debris. Of the remaining 579 tons, Brick/Wood comprises 73% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 17 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 158 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 12,613) will seek temporary shelter in public shelters.

Economic Loss

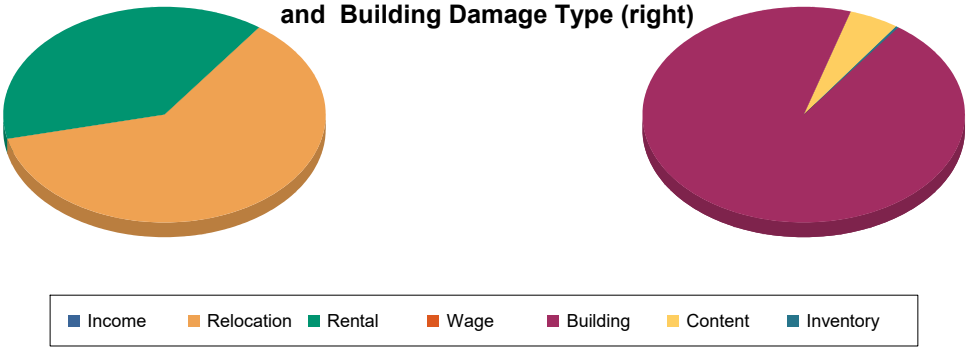
The total economic loss estimated for the hurricane is 4.3 million dollars, which represents 0.14 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 4 million dollars. 7% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 85% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

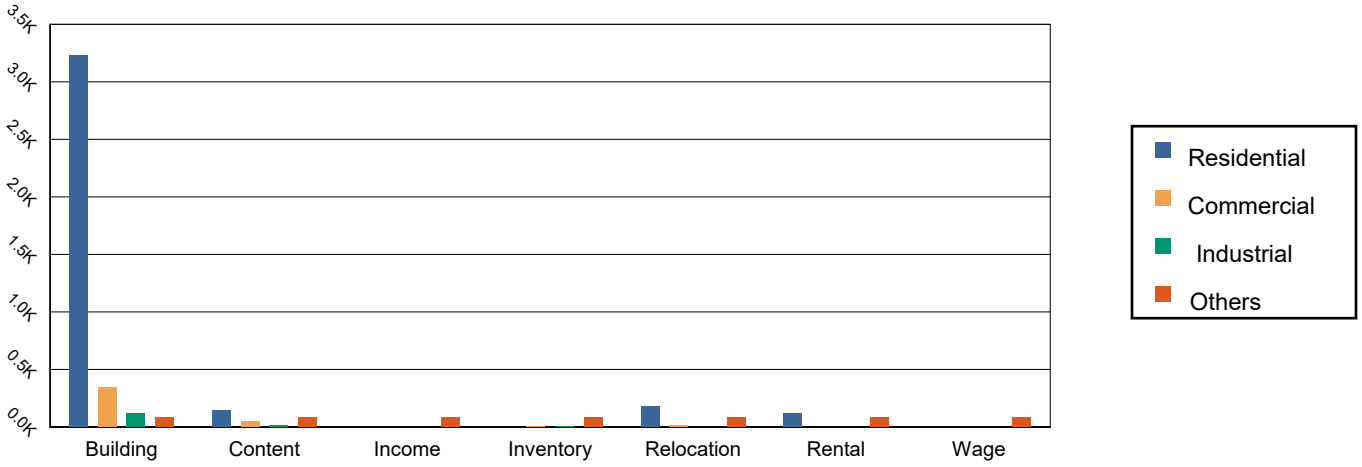


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,230.41	346.52	113.69	79.85	3,770.47
	Content	143.13	45.77	15.59	0.38	204.87
	Inventory	0.00	8.41	2.16	0.28	10.84
	Subtotal	**3,373.54**	**400.69**	**131.44**	**80.50**	**3,986.18**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	176.94	11.22	0.62	0.40	189.18
	Rental	119.05	0.00	0.00	0.00	119.05
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**295.99**	**11.22**	**0.62**	**0.40**	**308.22**

Total

Total	**3,669.53**	**411.91**	**132.06**	**80.90**	**4,294.40**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	12,613	1,494,860	1,478,560	2,973,420
Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**
Study Region Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_Locks_HU
Hurricane Scenario:	Probabilistic 100-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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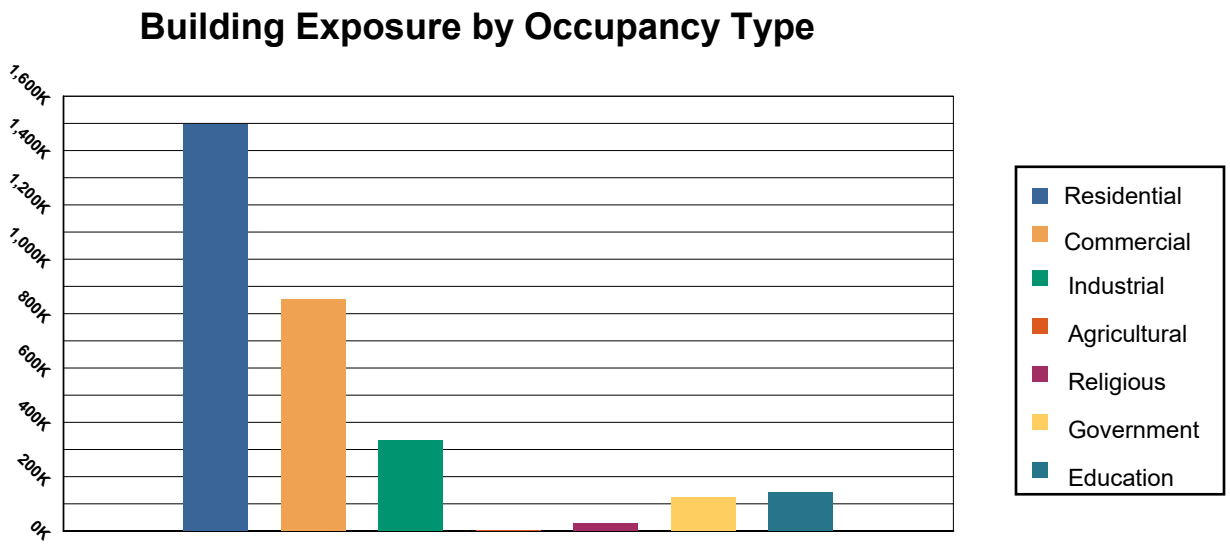

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Occupancy	Exposure ($1000)	Percent of Tot
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Government	123,728	4.16%
Education	140,423	4.72%
Total	**2,973,420**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 31 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

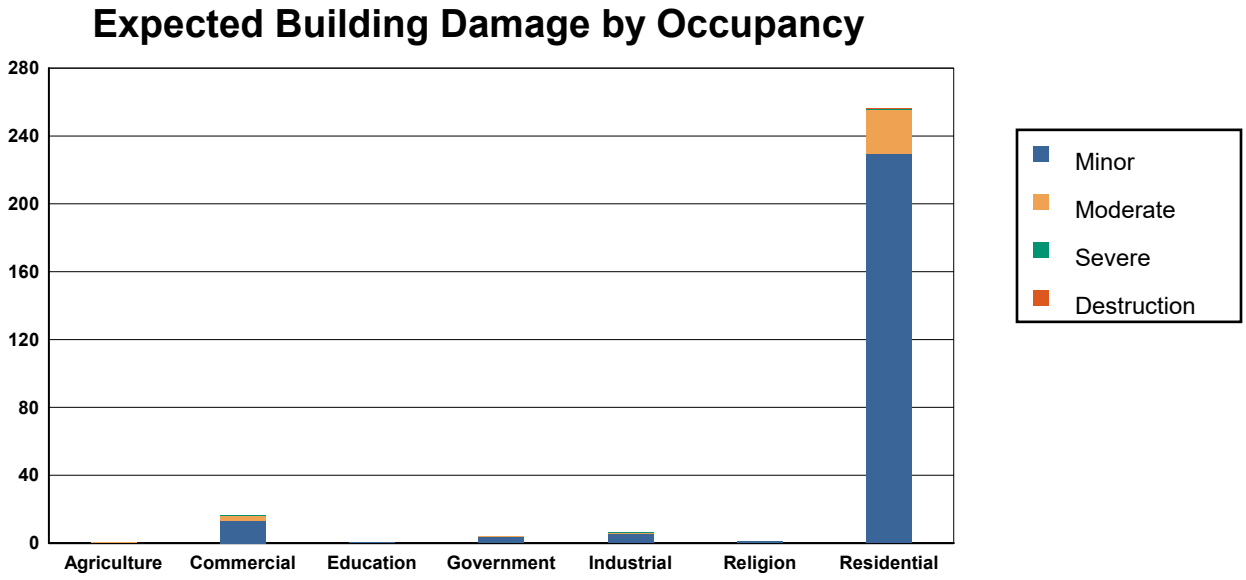


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	7.56	94.48	0.36	4.51	0.06	0.73	0.02	0.28	0.00	0.01
Commercial	342.67	95.45	13.03	3.63	2.87	0.80	0.42	0.12	0.00	0.00
Education	5.76	96.02	0.23	3.78	0.01	0.21	0.00	0.00	0.00	0.00
Government	101.82	96.05	3.97	3.74	0.21	0.20	0.00	0.00	0.00	0.00
Industrial	138.57	95.57	5.60	3.86	0.67	0.46	0.16	0.11	0.00	0.00
Religion	22.06	95.91	0.89	3.88	0.05	0.20	0.00	0.01	0.00	0.00
Residential	3,880.90	93.81	229.62	5.55	25.61	0.62	0.57	0.01	0.30	0.01
Total	**4,499.34**		**253.70**		**29.48**		**1.18**		**0.30**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	80	95.28	4	4.42	0	0.30	0	0.00	0	0.00
Masonry	429	93.27	24	5.24	6	1.40	0	0.08	0	0.00
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	309	95.68	11	3.29	3	0.89	0	0.14	0	0.00
Wood	3,704	94.62	200	5.11	10	0.26	0	0.01	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

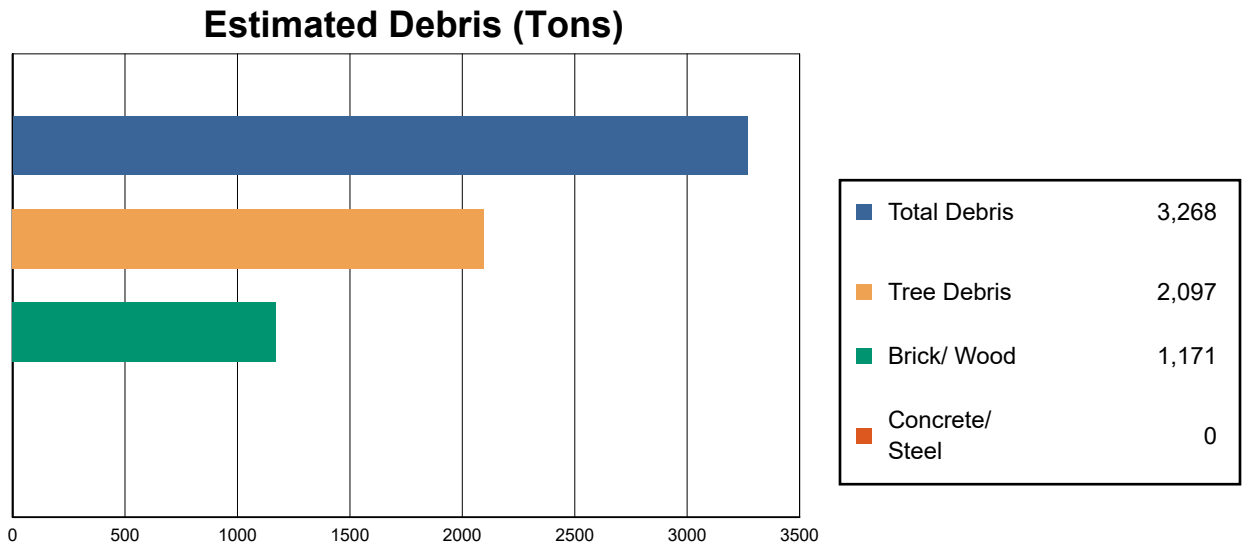
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	2	0	0	2
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

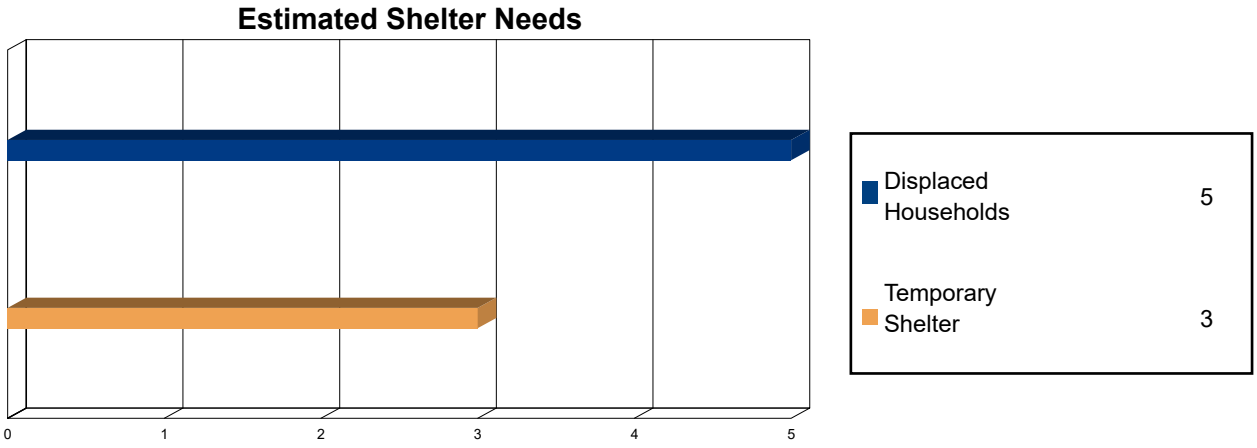


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,268 tons of debris will be generated. Of the total amount, 795 tons (24%) is Other Tree Debris. Of the remaining 2,473 tons, Brick/Wood comprises 47% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 47 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,302 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the hurricane. Of these, 3 people (out of a total population of 12,613) will seek temporary shelter in public shelters.

Economic Loss

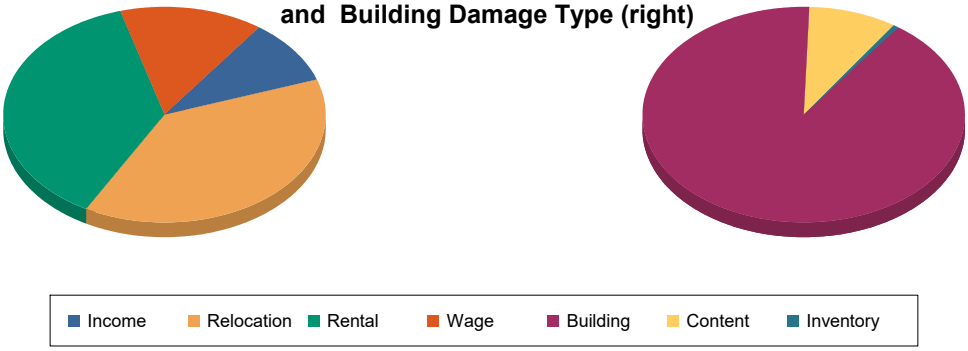
The total economic loss estimated for the hurricane is 12.4 million dollars, which represents 0.42 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 12 million dollars. 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 76% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

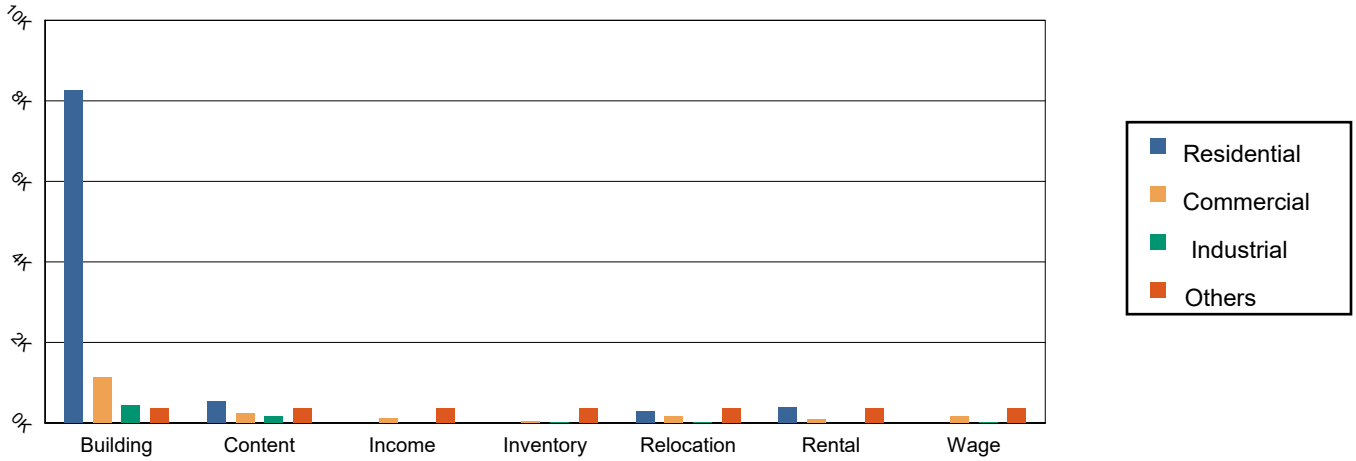


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	8,269.65	1,133.60	425.45	277.79	10,106.50
	Content	524.21	244.64	168.60	34.63	972.08
	Inventory	0.00	45.82	20.75	1.84	68.41
	Subtotal	**8,793.87**	**1,424.06**	**614.80**	**314.26**	**11,146.99**
Business Interruption Loss						
	Income	0.00	116.63	2.03	7.41	126.08
	Relocation	300.20	171.49	11.04	9.10	491.83
	Rental	393.14	88.21	1.37	0.55	483.28
	Wage	0.00	166.95	3.36	17.48	187.79
	Subtotal	**693.35**	**543.29**	**17.80**	**34.54**	**1,288.99**

Total

Total	**9,487.21**	**1,967.35**	**632.60**	**348.80**	**12,435.98**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	12,613	1,494,860	1,478,560	2,973,420
Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**
Study Region Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_Locks_HU
Hurricane Scenario:	Probabilistic 200-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.37 square miles and contains 4 census tracts. There are over 5 thousand households in the region and a total population of 12,613 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86% of the buildings (and 50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,784 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

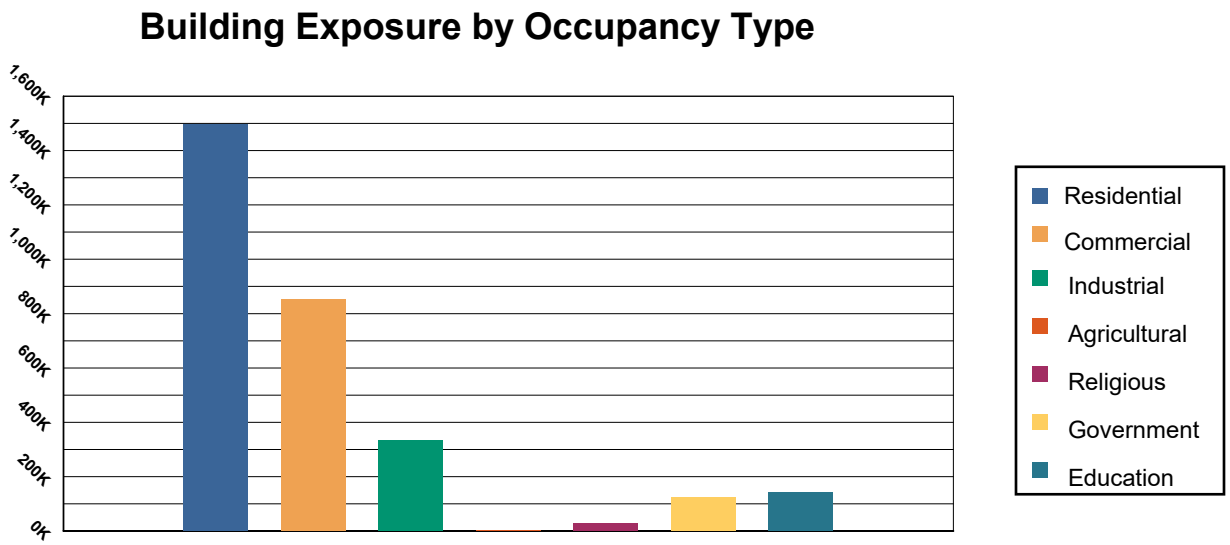


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,494,860	50.27%
Commercial	850,386	28.60%
Industrial	334,077	11.24%
Agricultural	3,770	0.13%
Religious	26,176	0.88%
Government	123,728	4.16%
Education	140,423	4.72%
Total	**2,973,420**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 97 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

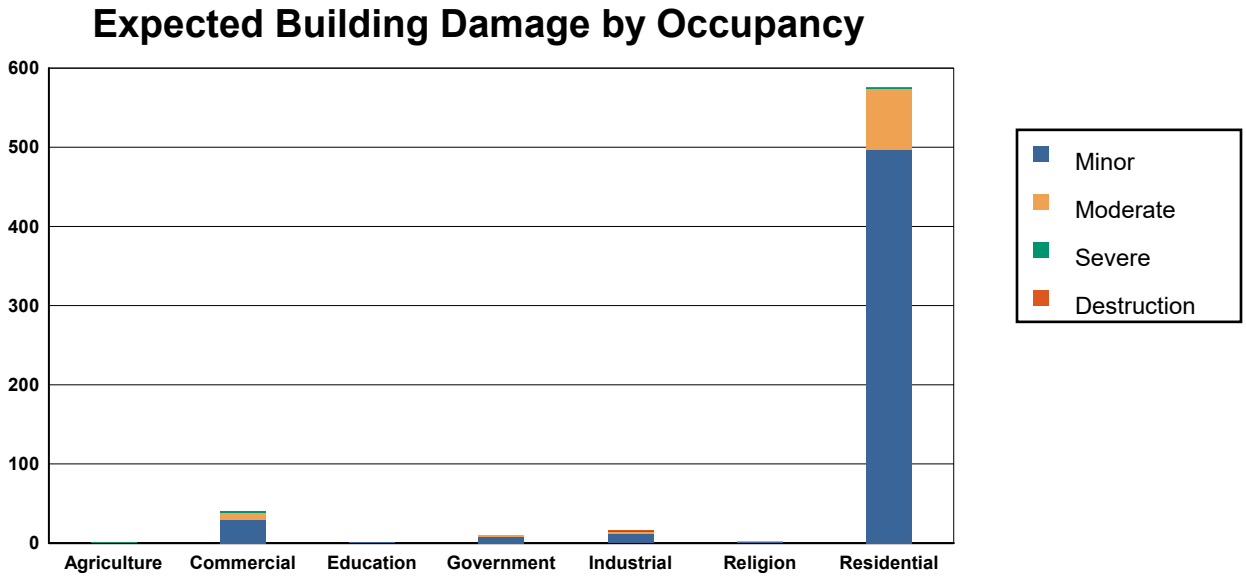


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	6.94	86.76	0.79	9.92	0.18	2.25	0.08	1.00	0.01	0.08
Commercial	319.11	88.89	29.21	8.14	8.78	2.45	1.90	0.53	0.00	0.00
Education	5.41	90.14	0.51	8.52	0.08	1.30	0.00	0.05	0.00	0.00
Government	95.82	90.40	8.75	8.26	1.38	1.30	0.04	0.04	0.00	0.00
Industrial	129.43	89.26	12.04	8.31	2.80	1.93	0.68	0.47	0.05	0.03
Religion	20.63	89.69	2.10	9.12	0.26	1.14	0.01	0.05	0.00	0.00
Residential	3,560.20	86.06	496.53	12.00	76.71	1.85	2.36	0.06	1.20	0.03
Total	**4,137.54**		**549.94**		**90.19**		**5.07**		**1.25**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	75	88.73	8	9.42	2	1.82	0	0.03	0	0.00
Masonry	395	85.88	46	9.98	18	3.81	1	0.31	0	0.02
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	289	89.48	23	7.16	9	2.69	2	0.67	0	0.00
Wood	3,413	87.20	458	11.70	40	1.02	2	0.05	1	0.03

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

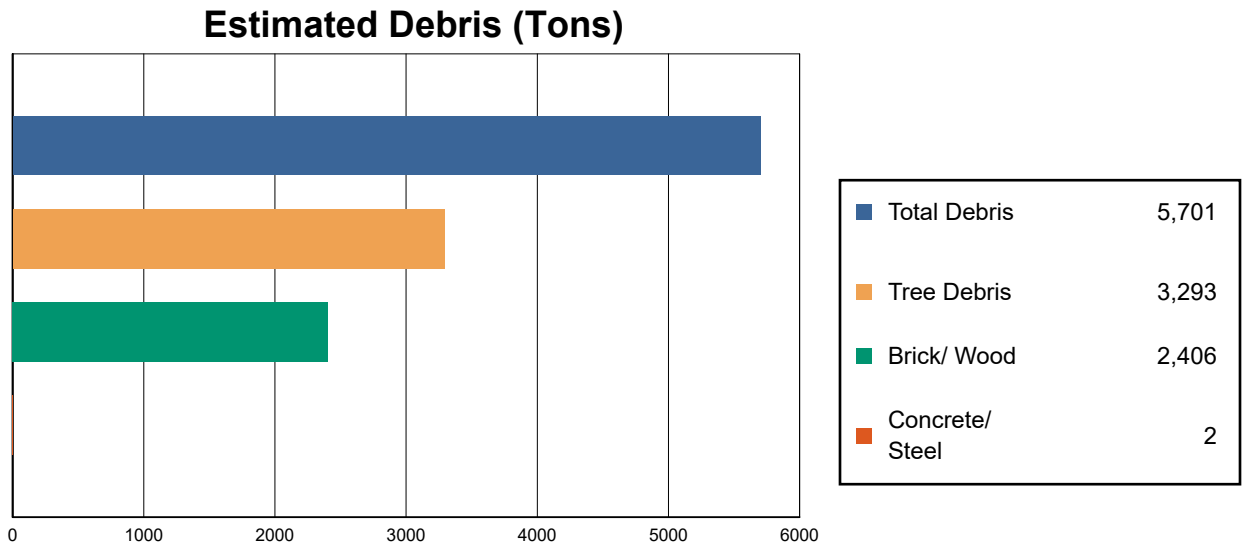
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	2	0	0	2
Schools	4	0	0	4

Induced Hurricane Damage

Debris Generation

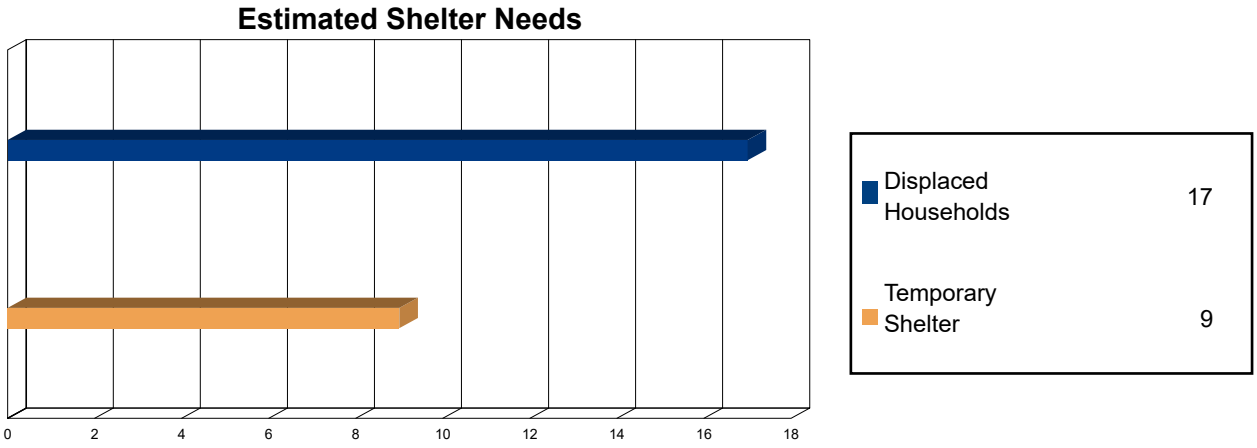


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,701 tons of debris will be generated. Of the total amount, 1,281 tons (22%) is Other Tree Debris. Of the remaining 4,420 tons, Brick/Wood comprises 54% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 96 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,012 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 17 households to be displaced due to the hurricane. Of these, 9 people (out of a total population of 12,613) will seek temporary shelter in public shelters.

Economic Loss

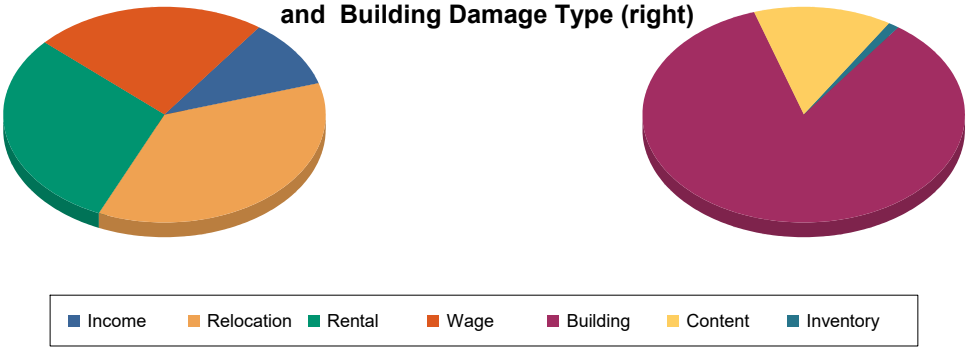
The total economic loss estimated for the hurricane is 27.9 million dollars, which represents 0.94 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 28 million dollars. 13% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 68% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

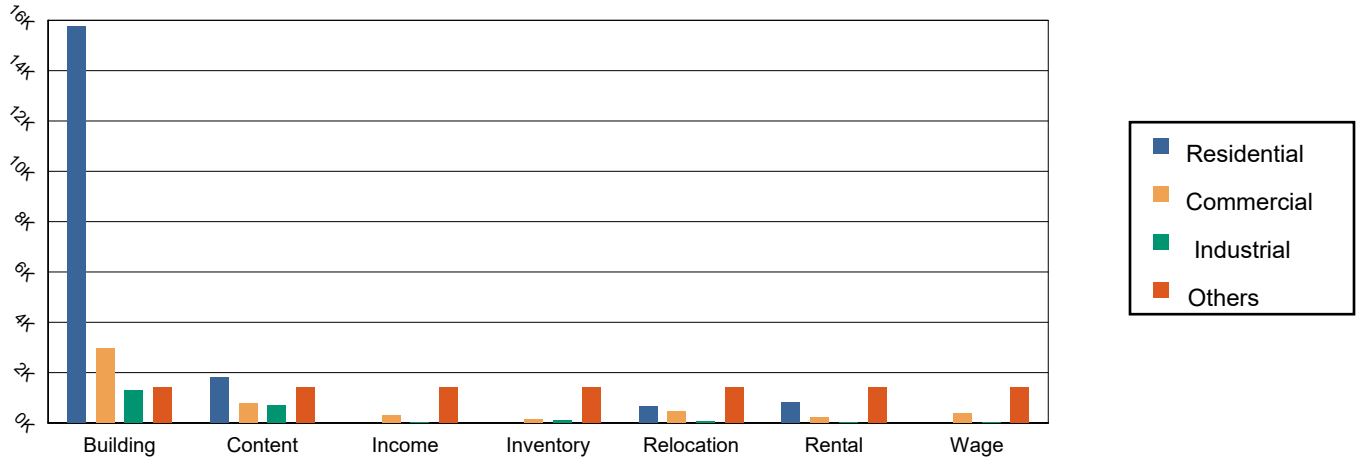


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	15,739.25	2,966.06	1,286.52	694.07	20,685.89
	Content	1,796.42	797.73	714.35	120.13	3,428.62
	Inventory	0.00	153.09	86.75	6.67	246.50
	Subtotal	**17,535.67**	**3,916.88**	**2,087.61**	**820.86**	**24,361.02**
Business Interruption Loss						
	Income	0.00	299.58	14.75	51.01	365.34
	Relocation	655.43	466.96	73.62	92.72	1,288.74
	Rental	828.41	217.87	12.09	14.45	1,072.82
	Wage	0.00	377.47	24.43	424.80	826.70
	Subtotal	**1,483.84**	**1,361.89**	**124.89**	**582.98**	**3,553.60**

Total

Total	19,019.51	5,278.77	2,212.50	1,403.84	27,914.62

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	12,613	1,494,860	1,478,560	2,973,420
Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**
Study Region Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_Locks_HU
Hurricane Scenario:	Probabilistic 500-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

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Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.37 square miles and contains 4 census tracts. There are over 5 thousand households in the region and a total population of 12,613 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86% of the buildings (and 50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

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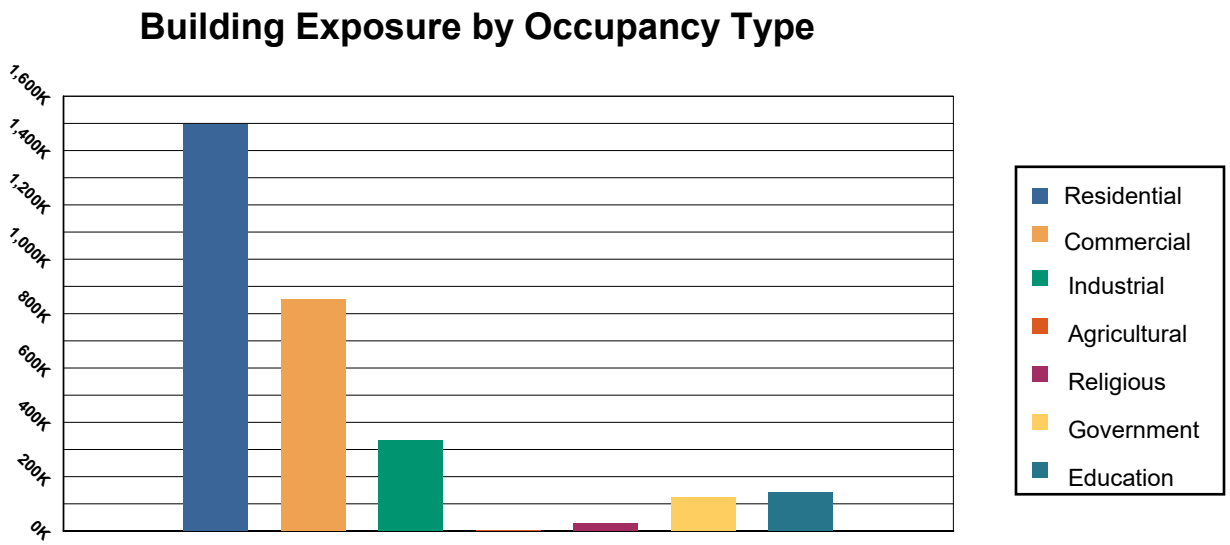

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,494,860	50.27%
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Agricultural	3,770	0.13%
Religious	26,176	0.88%
Government	123,728	4.16%
Education	140,423	4.72%
Total	**2,973,420**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 254 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the region. There are an estimated 7 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

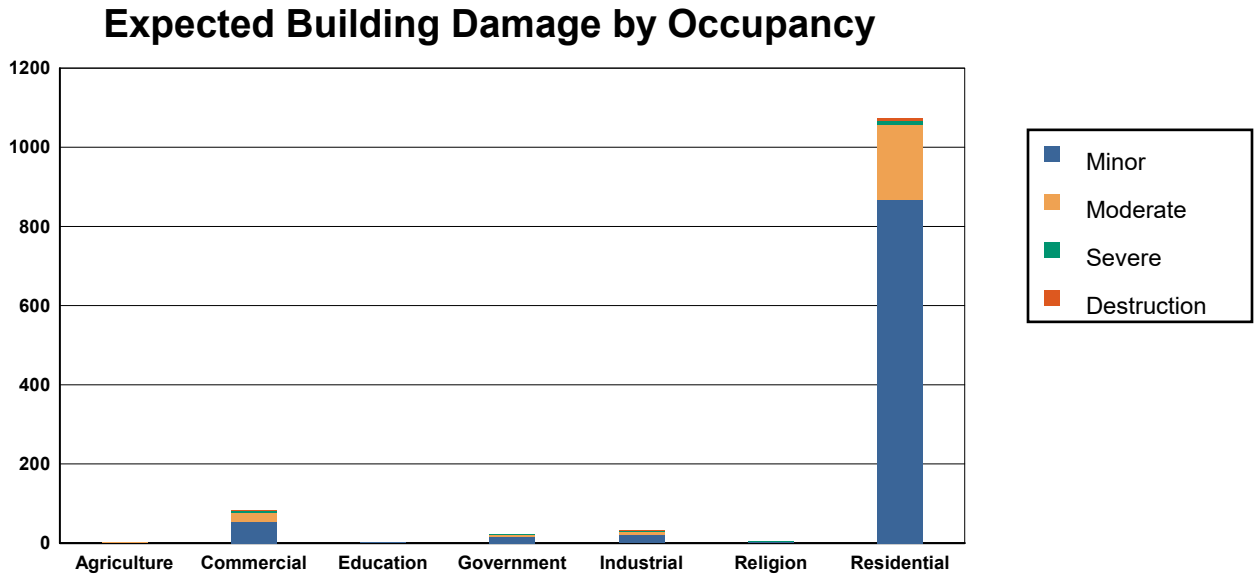


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	5.96	74.48	1.40	17.44	0.42	5.27	0.20	2.51	0.02	0.30
Commercial	277.39	77.27	53.11	14.79	22.62	6.30	5.84	1.63	0.04	0.01
Education	4.75	79.11	0.94	15.71	0.29	4.80	0.02	0.39	0.00	0.00
Government	85.10	80.28	15.68	14.79	4.85	4.58	0.37	0.35	0.00	0.00
Industrial	113.32	78.15	21.14	14.58	8.27	5.70	2.11	1.45	0.16	0.11
Religion	18.08	78.62	3.91	16.99	0.94	4.08	0.07	0.31	0.00	0.00
Residential	3,063.14	74.04	866.37	20.94	190.70	4.61	10.12	0.24	6.67	0.16
Total	**3,567.74**		**962.54**		**228.09**		**18.73**		**6.90**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	65	77.03	14	16.32	5	6.31	0	0.34	0	0.00
Masonry	340	73.99	75	16.26	40	8.71	4	0.94	0	0.09
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	253	78.40	41	12.79	22	6.73	7	2.07	0	0.02
Wood	2,952	75.43	828	21.15	119	3.04	9	0.22	6	0.16

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

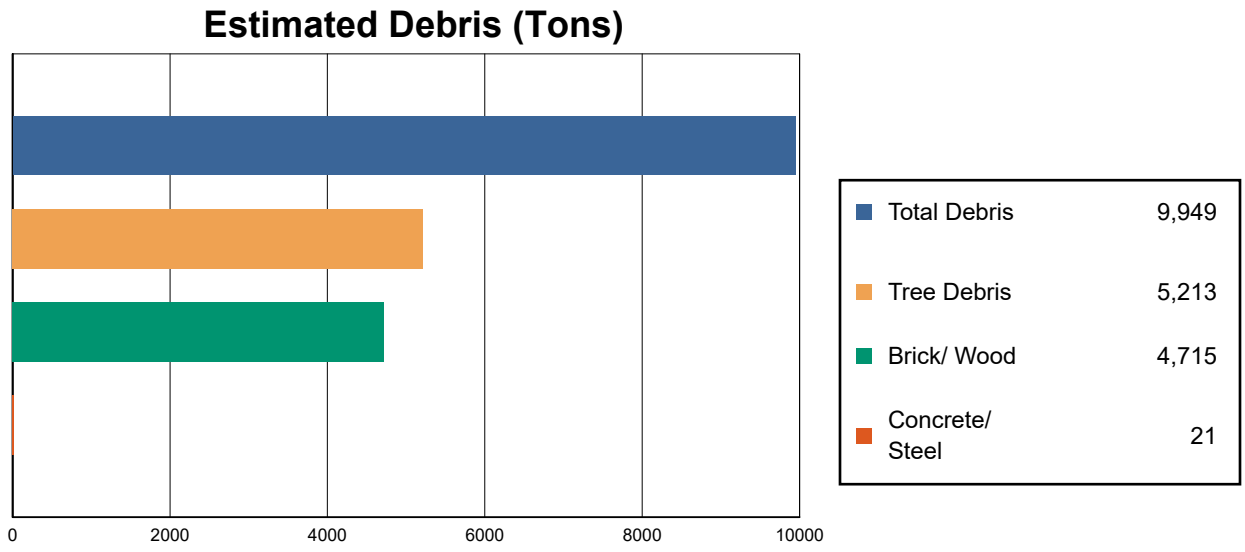
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	2	0	0	2
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

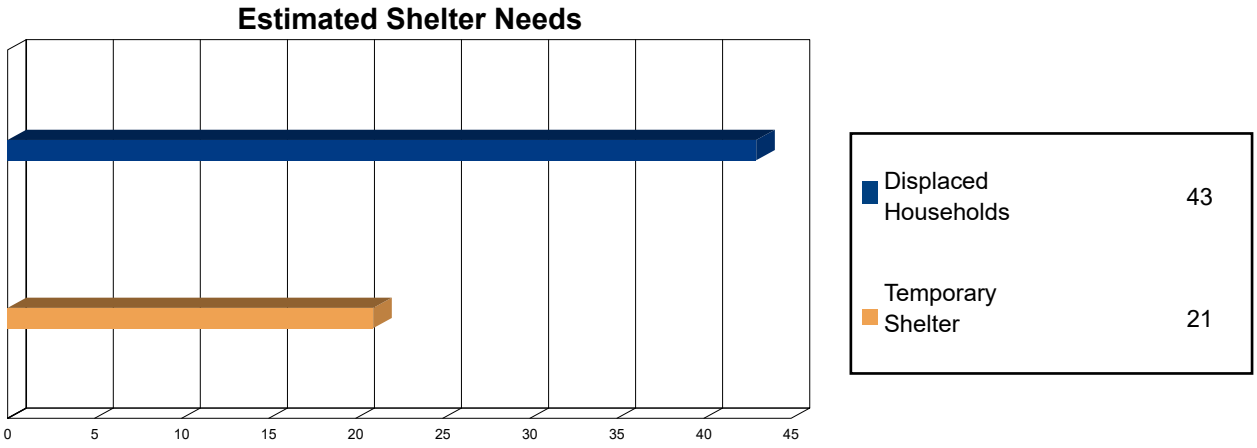


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 9,949 tons of debris will be generated. Of the total amount, 2,053 tons (21%) is Other Tree Debris. Of the remaining 7,896 tons, Brick/Wood comprises 60% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 189 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,160 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 43 households to be displaced due to the hurricane. Of these, 21 people (out of a total population of 12,613) will seek temporary shelter in public shelters.

Economic Loss

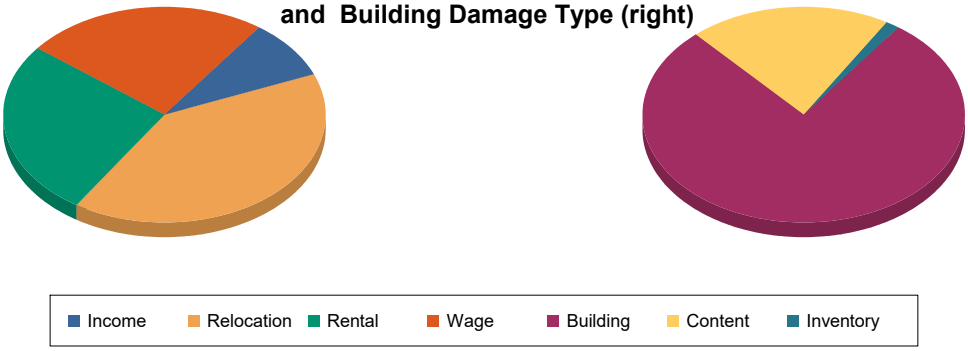
The total economic loss estimated for the hurricane is 64.2 million dollars, which represents 2.16 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 64 million dollars. 14% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 61% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

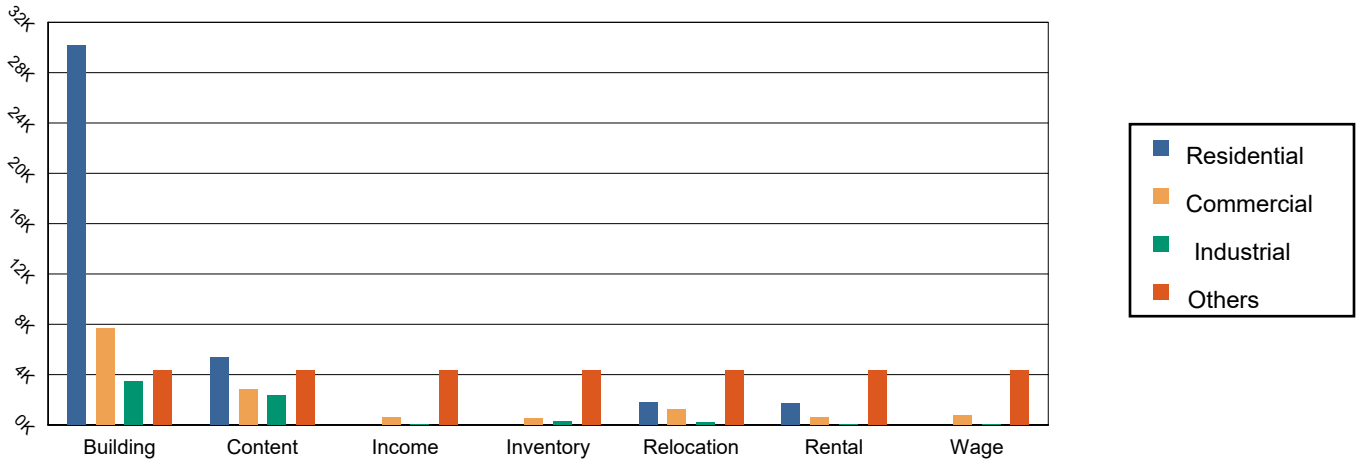


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	30,179.49	7,657.16	3,495.20	1,873.41	43,205.27
	Content	5,379.44	2,806.16	2,380.30	558.23	11,124.13
	Inventory	0.00	529.84	280.57	18.76	829.17
	Subtotal	**35,558.93**	**10,993.15**	**6,156.07**	**2,450.40**	**55,158.56**
Business Interruption Loss						
	Income	0.00	624.96	38.56	145.46	808.97
	Relocation	1,797.71	1,269.85	235.54	352.24	3,655.35
	Rental	1,712.57	598.02	35.78	55.37	2,401.74
	Wage	0.00	793.85	63.95	1,354.71	2,212.51
	Subtotal	**3,510.28**	**3,286.68**	**373.83**	**1,907.78**	**9,078.57**

Total

Total	**39,069.21**	**14,279.84**	**6,529.90**	**4,358.18**	**64,237.13**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	12,613	1,494,860	1,478,560	2,973,420
Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**
Study Region Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**

Hazus: Hurricane Global Risk Report

Region Name:	Windsor_Locks_HU
Hurricane Scenario:	Probabilistic 1000-year Return Period
Print Date:	Saturday, May 13, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

Section	Page #
General Description of the Region	3
Building Inventory	4
General Building Stock	
Essential Facility Inventory	
Hurricane Scenario Parameters	5
Building Damage	6
General Building Stock	
Essential Facilities Damage	
Induced Hurricane Damage	8
Debris Generation	
Social Impact	8
Shelter Requirements	
Economic Loss	9
Building Losses	
Appendix A: County Listing for the Region	10
Appendix B: Regional Population and Building Value Data	11

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.37 square miles and contains 4 census tracts. There are over 5 thousand households in the region and a total population of 12,613 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,973 million dollars. Approximately 86% of the buildings (and 50% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,784 buildings in the region which have an aggregate total replacement value of Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provi distribution of the building value by State and County.

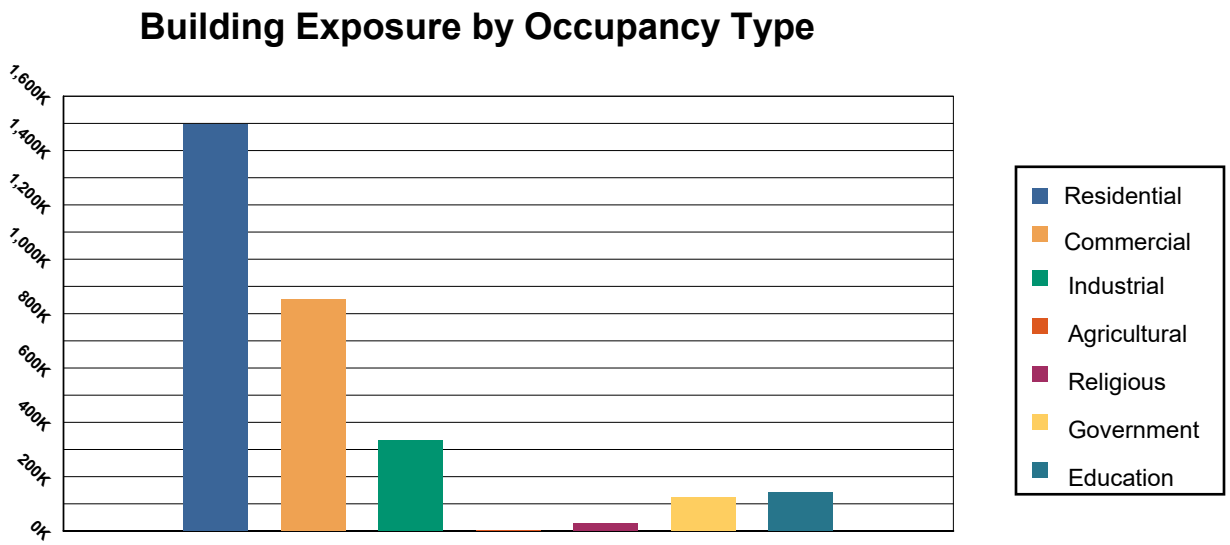


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	1,494,860	50.27%
Commercial	850,386	28.60%
Industrial	334,077	11.24%
Agricultural	3,770	0.13%
Religious	26,176	0.88%
Government	123,728	4.16%
Education	140,423	4.72%
Total	**2,973,420**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 424 buildings will be at least moderately damaged. This is over 9% of the total number of buildings in the region. There are an estimated 16 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

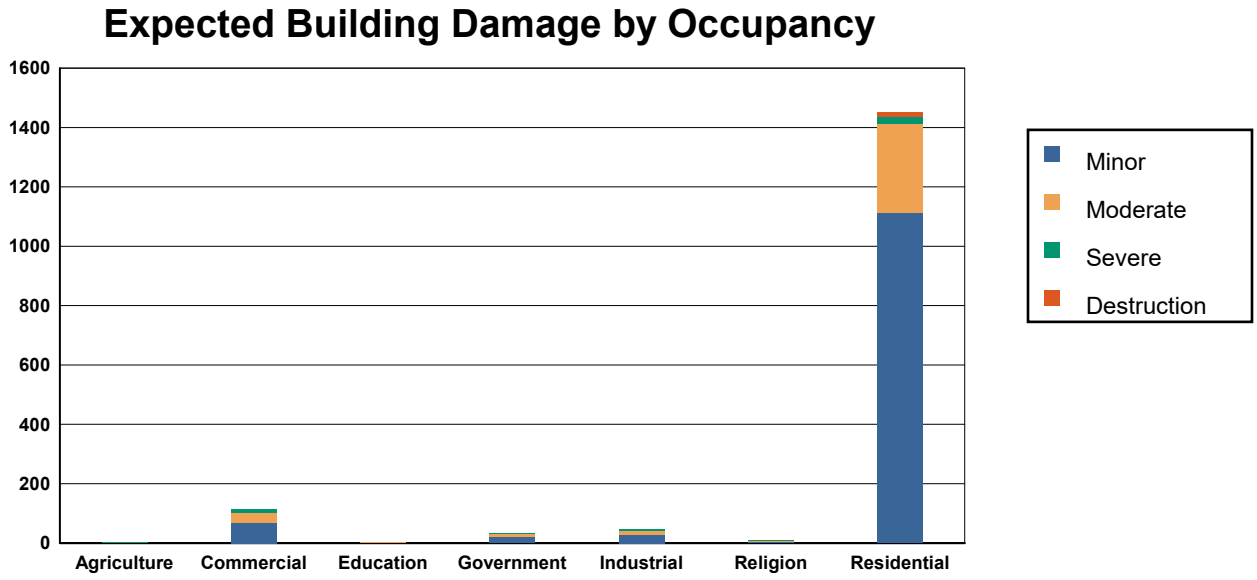


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	5.12	63.95	1.83	22.87	0.68	8.45	0.33	4.12	0.05	0.61
Commercial	243.77	67.90	67.64	18.84	36.40	10.14	11.07	3.08	0.12	0.03
Education	4.20	69.95	1.21	20.23	0.52	8.75	0.06	1.08	0.00	0.00
Government	73.63	69.46	21.21	20.01	9.90	9.34	1.26	1.19	0.00	0.00
Industrial	98.74	68.10	27.21	18.77	14.54	10.03	4.16	2.87	0.35	0.24
Religion	15.86	68.95	5.18	22.51	1.76	7.66	0.20	0.88	0.00	0.00
Residential	2,683.83	64.87	1,110.61	26.85	303.37	7.33	23.54	0.57	15.65	0.38
Total	**3,125.14**		**1,234.89**		**367.18**		**40.63**		**16.16**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	56	66.83	17	20.61	10	11.48	1	1.08	0	0.00
Masonry	295	64.22	93	20.14	62	13.55	9	1.90	1	0.20
MH	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	221	68.56	53	16.40	36	10.99	13	3.99	0	0.06
Wood	2,595	66.30	1,079	27.56	206	5.26	20	0.51	14	0.37

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

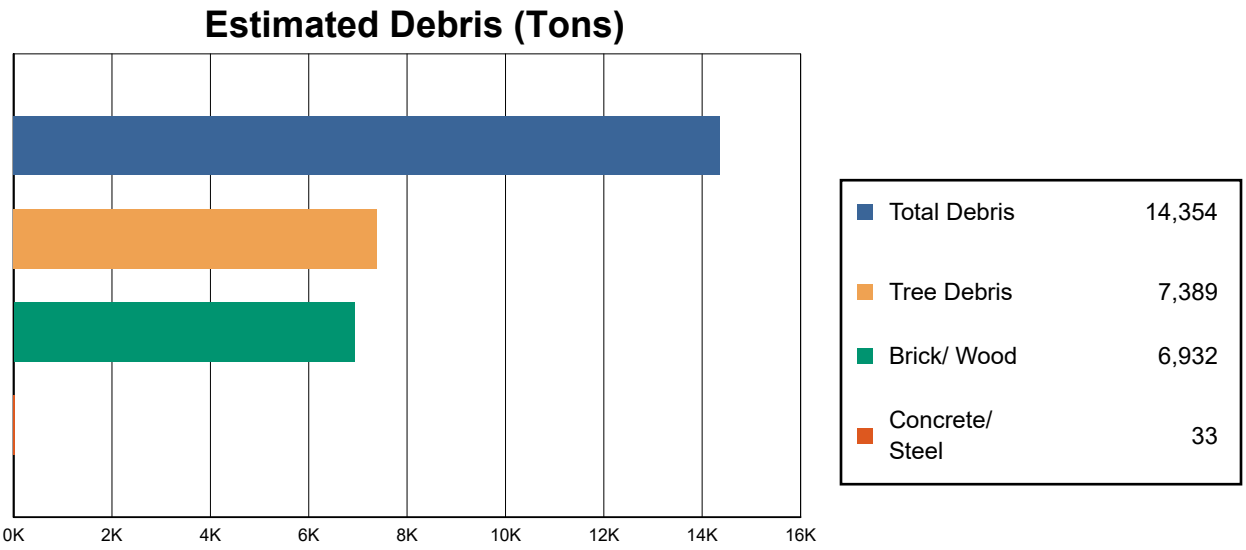
Thematic Map of Essential Facilities

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	Probability of at Least Moderate Damage > 50%	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	4	0	0	4
Police Stations	2	0	0	2
Schools	4	0	0	0

Induced Hurricane Damage

Debris Generation

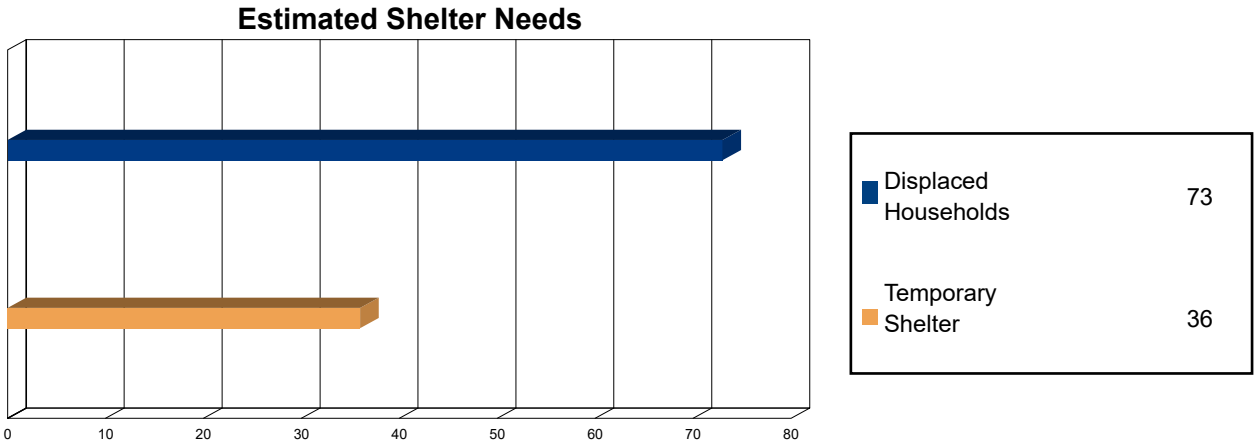


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 14,354 tons of debris will be generated. Of the total amount, 2,718 tons (19%) is Other Tree Debris. Of the remaining 11,636 tons, Brick/Wood comprises 60% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 279 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,671 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 73 households to be displaced due to the hurricane. Of these, 36 people (out of a total population of 12,613) will seek temporary shelter in public shelters.

Economic Loss

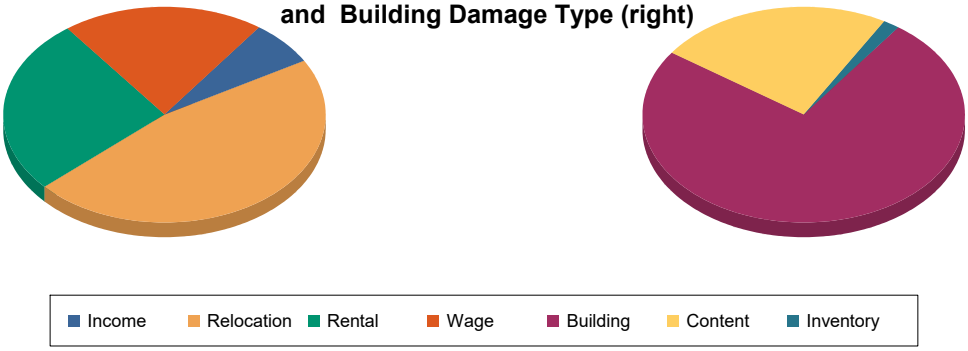
The total economic loss estimated for the hurricane is 104.7 million dollars, which represents 3.52 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 105 million dollars. 14% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 59% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

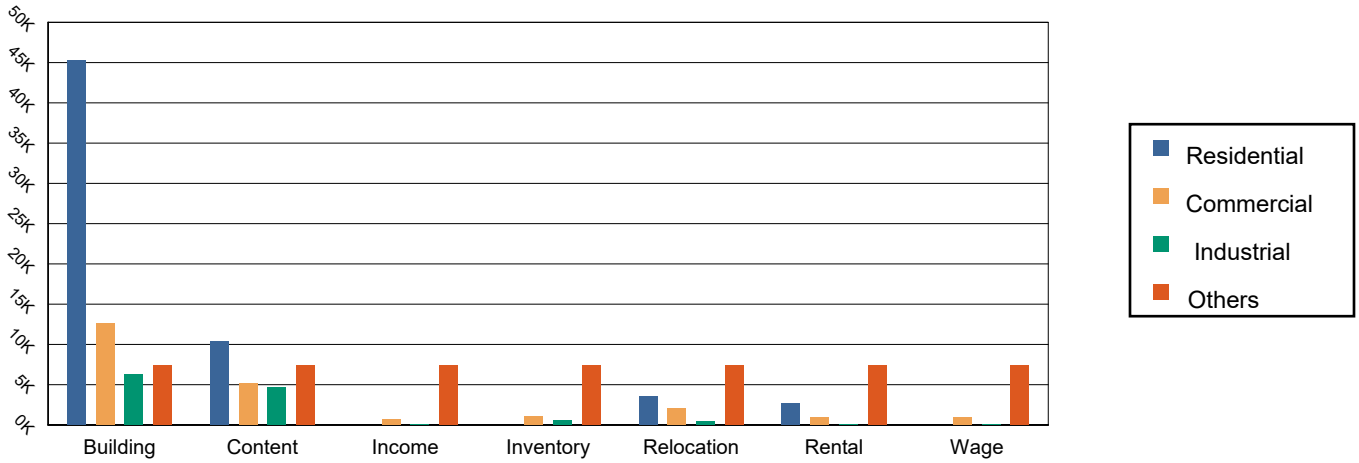


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	45,294.59	12,562.55	6,269.63	3,356.16	67,482.92
	Content	10,327.69	5,199.39	4,603.32	1,195.20	21,325.61
	Inventory	0.00	1,025.75	540.61	34.19	1,600.55
	Subtotal	**55,622.28**	**18,787.70**	**11,413.56**	**4,585.55**	**90,409.09**
Business Interruption Loss						
	Income	0.00	702.78	56.82	185.60	945.21
	Relocation	3,578.24	2,024.74	422.46	642.54	6,667.98
	Rental	2,667.33	942.20	61.61	103.03	3,774.18
	Wage	0.00	954.09	94.34	1,824.31	2,872.75
	Subtotal	**6,245.57**	**4,623.82**	**635.24**	**2,755.48**	**14,260.11**

Total

Total	**61,867.85**	**23,411.52**	**12,048.81**	**7,341.03**	**104,669.20**

Appendix A: County Listing for the Region

Connecticut
- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	12,613	1,494,860	1,478,560	2,973,420
Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**
Study Region Total	**12,613**	**1,494,860**	**1,478,560**	**2,973,420**

Hazus: Earthquake Global Risk Report

Region Name: Andover_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 15.70 square miles and contains 1 census tracts. There are over 1 thousand households in the region which has a total population of 3,151 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 564 (millions of dollars). Approximately 93.00 % of the buildings (and 82.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 225 and 209 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 1 thousand buildings in the region which have an aggregate total replacement value of 564 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 89% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 1 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 434.00 (millions of dollars). This inventory includes over 29.83 miles of highways, 6 bridges, 96.93 miles of pipes.

Table 1: Transportation System Lifeline Inventory

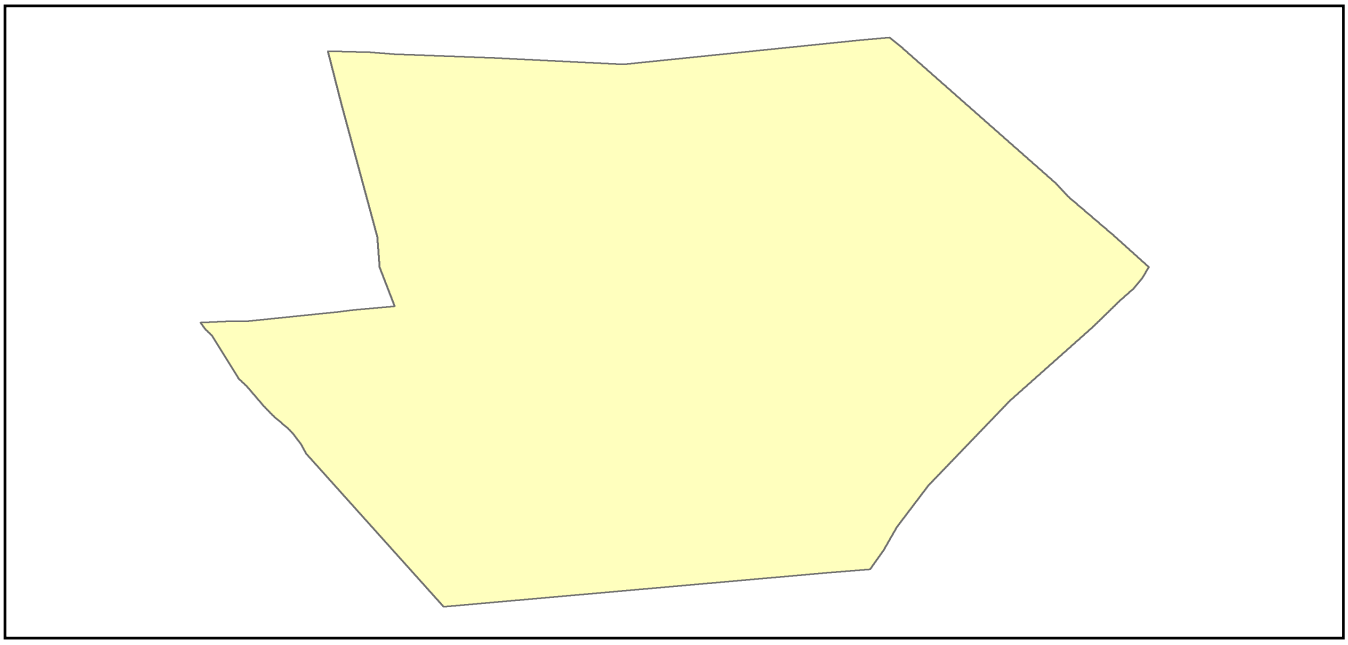
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	6	3.7411
	Segments	6	222.1777
	Tunnels	0	0.0000
		Subtotal	**225.9188**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**225.90**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	1.5435
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.5435**
Waste Water	Distribution Lines	NA	0.9261
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.9261**
Natural Gas	Distribution Lines	NA	0.6174
	Facilities	0	0.0000
	Pipelines	4	206.2465
		Subtotal	**206.8639**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**209.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 278 buildings will be at least moderately damaged. This is over 21.00 % of the buildings in the region. There are an estimated 29 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

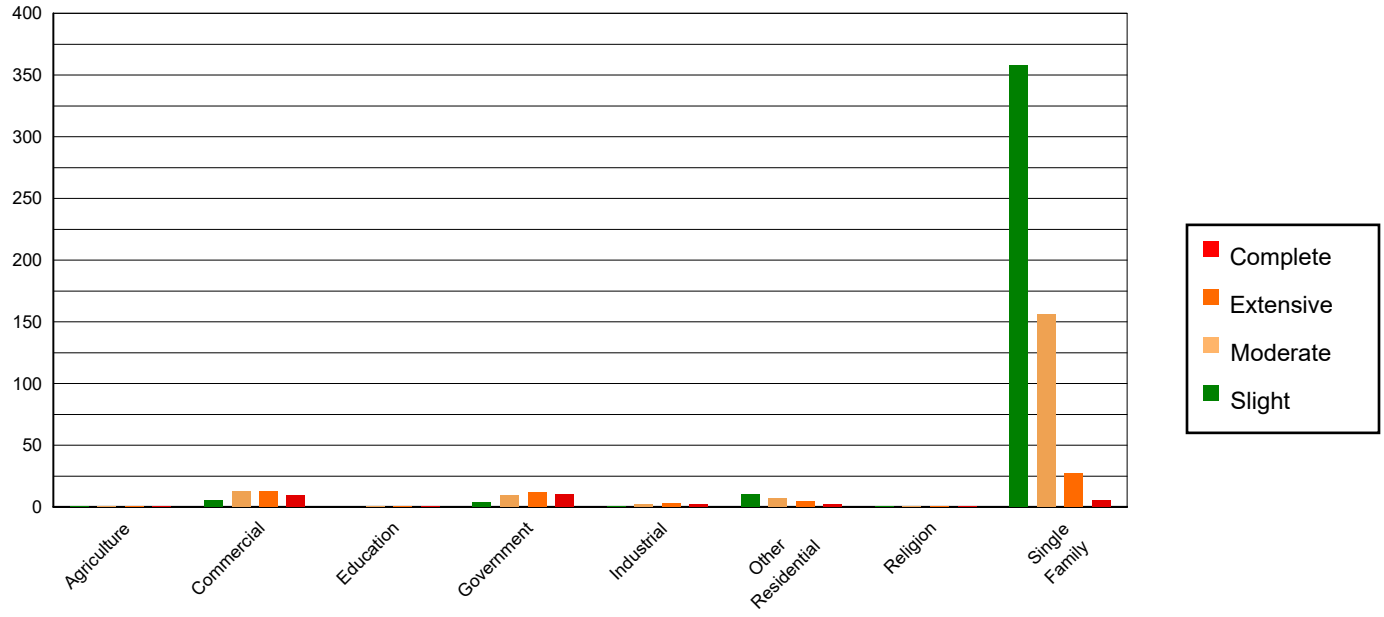


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0.16	0.02	0.28	0.08	0.66	0.35	0.52	0.86	0.38	1.27
Commercial	4.16	0.64	5.59	1.48	12.91	6.82	12.74	21.21	9.61	32.26
Education	0.10	0.01	0.12	0.03	0.28	0.15	0.29	0.49	0.21	0.71
Government	2.47	0.38	3.32	0.88	9.43	4.99	11.95	19.90	9.82	32.97
Industrial	0.51	0.08	0.69	0.18	2.02	1.07	2.60	4.33	2.18	7.32
Other Residential	15.72	2.40	9.79	2.59	7.10	3.76	4.10	6.84	2.28	7.66
Religion	0.88	0.14	0.62	0.16	0.65	0.34	0.51	0.86	0.33	1.11
Single Family	629.90	96.33	357.76	94.60	156.05	82.52	27.32	45.51	4.97	16.70
Total	**654**		**378**		**189**		**60**		**30**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	633.88	96.94	357.48	94.53	151.53	80.13	22.35	37.23	2.23	7.47
Steel	1.78	0.27	2.79	0.74	11.41	6.03	17.59	29.30	15.69	52.67
Concrete	0.27	0.04	0.43	0.11	1.91	1.01	2.97	4.95	2.49	8.35
Precast	0.11	0.02	0.14	0.04	0.64	0.34	1.15	1.92	1.22	4.09
RM	1.10	0.17	0.82	0.22	2.67	1.41	3.58	5.96	2.21	7.43
URM	16.76	2.56	16.52	4.37	20.95	11.08	12.39	20.64	5.96	20.00
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**654**		**378**		**189**		**60**		**30**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	1	1	0	0
EOCs	1	1	0	0
PoliceStations	1	1	0	0
FireStations	1	1	0	0

Transportation Lifeline Damage

Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	6	0	0	6	6
	Bridges	6	0	0	6	6
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	48	0	0
Waste Water	29	0	0
Natural Gas	20	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

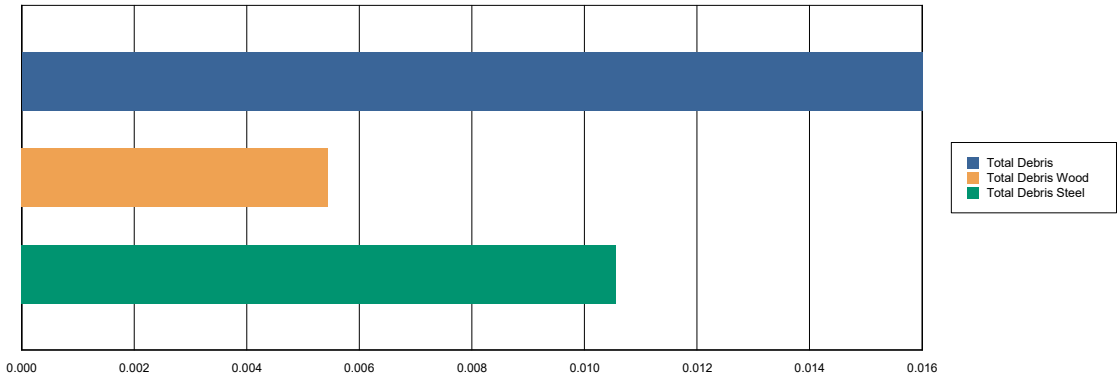
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 16,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 34.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 640 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



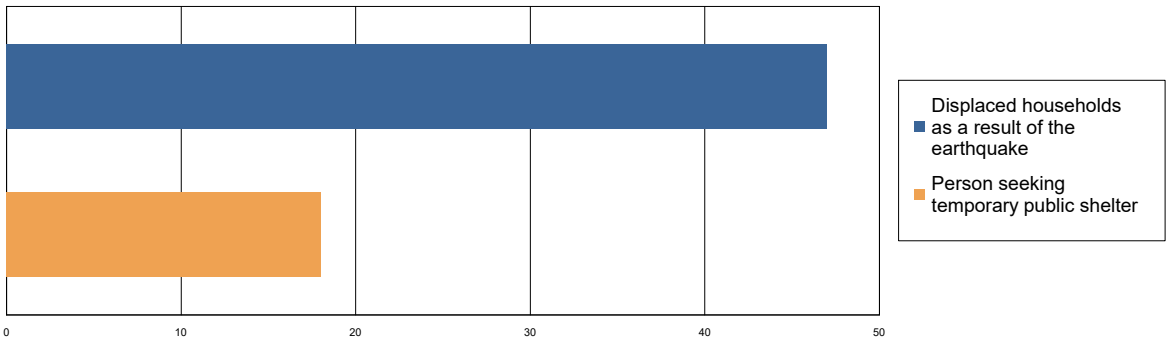
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.01	0.02	640 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 47 households to be displaced due to the earthquake. Of these, 18 people (out of a total population of 3,151) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
47	18

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.34	0.10	0.02	0.03
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.25	0.07	0.01	0.02
	Other-Residential	2.58	0.73	0.12	0.23
	Single Family	3.95	0.71	0.08	0.15
	Total	**7**	**2**	**0**	**0**
2 PM	Commercial	25.77	7.38	1.13	2.21
	Commuting	0.00	0.01	0.01	0.00
	Educational	5.76	1.69	0.27	0.53
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.87	0.55	0.09	0.17
	Other-Residential	0.74	0.21	0.03	0.07
	Single Family	1.13	0.21	0.03	0.05
	Total	**35**	**10**	**2**	**3**
5 PM	Commercial	20.63	5.90	0.92	1.74
	Commuting	0.07	0.24	0.23	0.05
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.17	0.35	0.05	0.11
	Other-Residential	1.02	0.29	0.05	0.09
	Single Family	1.55	0.29	0.03	0.06
	Total	**24**	**7**	**1**	**2**

Economic Loss

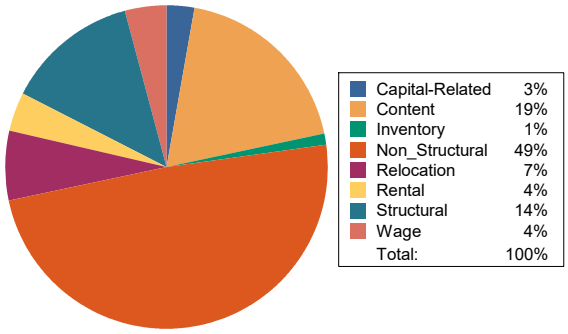
The total economic loss estimated for the earthquake is 89.00 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 88.83 (millions of dollars); 18 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 43 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

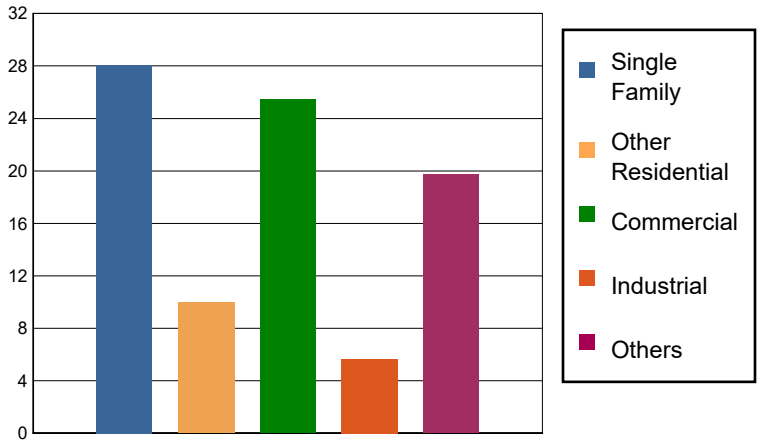


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.0677	1.5106	0.1122	0.9266	3.6171
	Capital-Related	0.0000	0.4531	1.9729	0.0663	0.0982	2.5905
	Rental	0.4521	1.1906	1.2539	0.0638	0.4845	3.4449
	Relocation	1.6531	0.2756	1.7859	0.1419	2.0926	5.9491
	Subtotal	**2.1052**	**2.9870**	**6.5233**	**0.3842**	**3.6019**	**15.6016**
Capital Stock Losses							
	Structural	3.5062	0.9660	3.7721	0.7869	3.0129	12.0441
	Non_Structural	16.5293	4.9222	10.3025	2.5901	9.2874	43.6315
	Content	5.9373	1.0659	4.2741	1.6102	3.7288	16.6163
	Inventory	0.0000	0.0000	0.5664	0.2863	0.0804	0.9331
	Subtotal	**25.9728**	**6.9541**	**18.9151**	**5.2735**	**16.1095**	**73.2250**
	Total	**28.08**	**9.94**	**25.44**	**5.66**	**19.71**	**88.83**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	222.1777	0.0000	0.00
	Bridges	3.7411	0.1741	4.65
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**225.9188**	**0.1741**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**225.92**	**0.17**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.5435	0.0000	0.00
	Subtotal	**1.5435**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	0.9261	0.0000	0.00
	Subtotal	**0.9261**	**0.0000**	
Natural Gas	Pipelines	206.2465	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	0.6174	0.0000	0.00
	Subtotal	**206.8639**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**209.33**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	3,151	465	99	564
Total Region		**3,151**	**465**	**99**	**564**

Hazus: Earthquake Global Risk Report

Region Name: Avon_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.58 square miles and contains 4 census tracts. There are over 7 thousand households in the region which has a total population of 18,932 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 5,274 (millions of dollars). Approximately 89.00 % of the buildings (and 76.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 618 and 10 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 7 thousand buildings in the region which have an aggregate total replacement value of 5,274 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 628.00 (millions of dollars). This inventory includes over 65.24 miles of highways, 8 bridges, 318.14 miles of pipes.

Table 1: Transportation System Lifeline Inventory

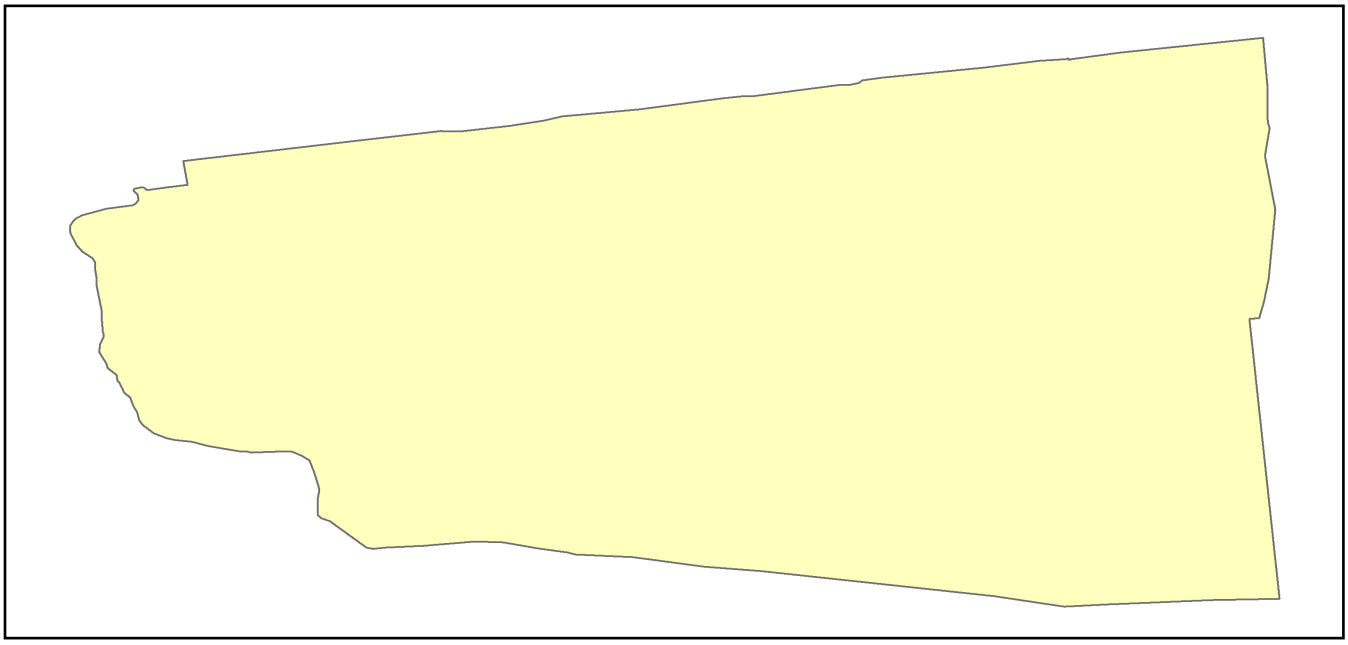
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	8	14.9250
	Segments	31	603.8944
	Tunnels	0	0.0000
		Subtotal	**618.8194**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**618.80**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	5.1210
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**5.1210**
Waste Water	Distribution Lines	NA	3.0726
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.0726**
Natural Gas	Distribution Lines	NA	2.0484
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.0484**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	6	0.6900
		Subtotal	**0.6900**
		Total	**10.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 562 buildings will be at least moderately damaged. This is over 7.00 % of the buildings in the region. There are an estimated 16 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

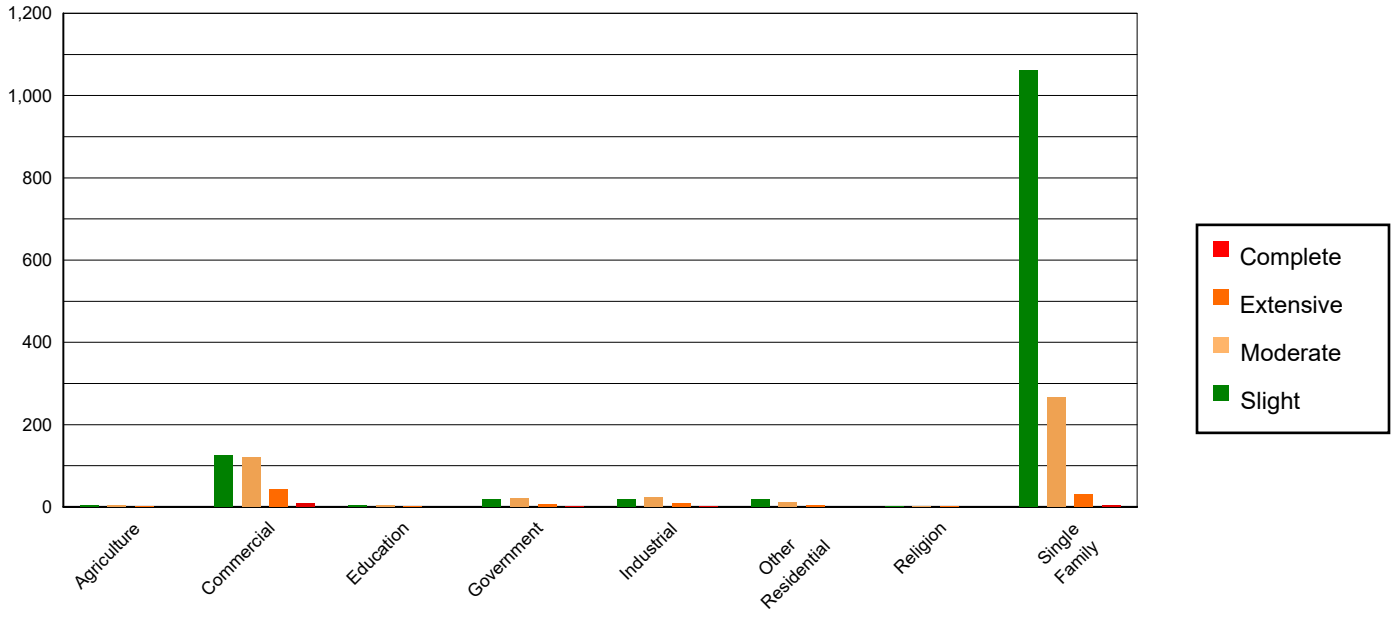


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	10.47	0.18	4.66	0.37	3.49	0.78	1.17	1.22	0.21	1.32
Commercial	298.28	5.02	125.52	10.03	121.13	26.91	43.22	45.18	8.85	54.47
Education	9.15	0.15	3.69	0.29	3.68	0.82	1.21	1.27	0.27	1.67
Government	43.40	0.73	18.24	1.46	20.47	4.55	7.28	7.61	1.61	9.93
Industrial	46.14	0.78	19.89	1.59	22.59	5.02	8.60	8.99	1.79	10.99
Other Residential	71.27	1.20	17.15	1.37	10.20	2.27	2.88	3.01	0.49	3.03
Religion	9.72	0.16	2.65	0.21	1.92	0.43	0.60	0.63	0.11	0.67
Single Family	5457.70	91.79	1060.03	84.68	266.65	59.24	30.71	32.10	2.91	17.92
Total	**5,946**		**1,252**		**450**		**96**		**16**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	5439.68	91.48	1055.46	84.31	243.20	54.03	18.56	19.40	0.21	1.30
Steel	150.62	2.53	75.33	6.02	103.84	23.07	42.52	44.45	9.89	60.85
Concrete	25.80	0.43	11.81	0.94	16.37	3.64	5.40	5.64	1.03	6.32
Precast	14.20	0.24	4.45	0.36	6.19	1.38	2.95	3.08	0.20	1.20
RM	47.35	0.80	9.80	0.78	11.02	2.45	3.96	4.14	0.09	0.55
URM	268.48	4.52	94.99	7.59	69.51	15.44	22.27	23.28	4.84	29.77
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**5,946**		**1,252**		**450**		**96**		**16**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	8	0	0	8
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	4	0	0	4

Transportation Lifeline Damage

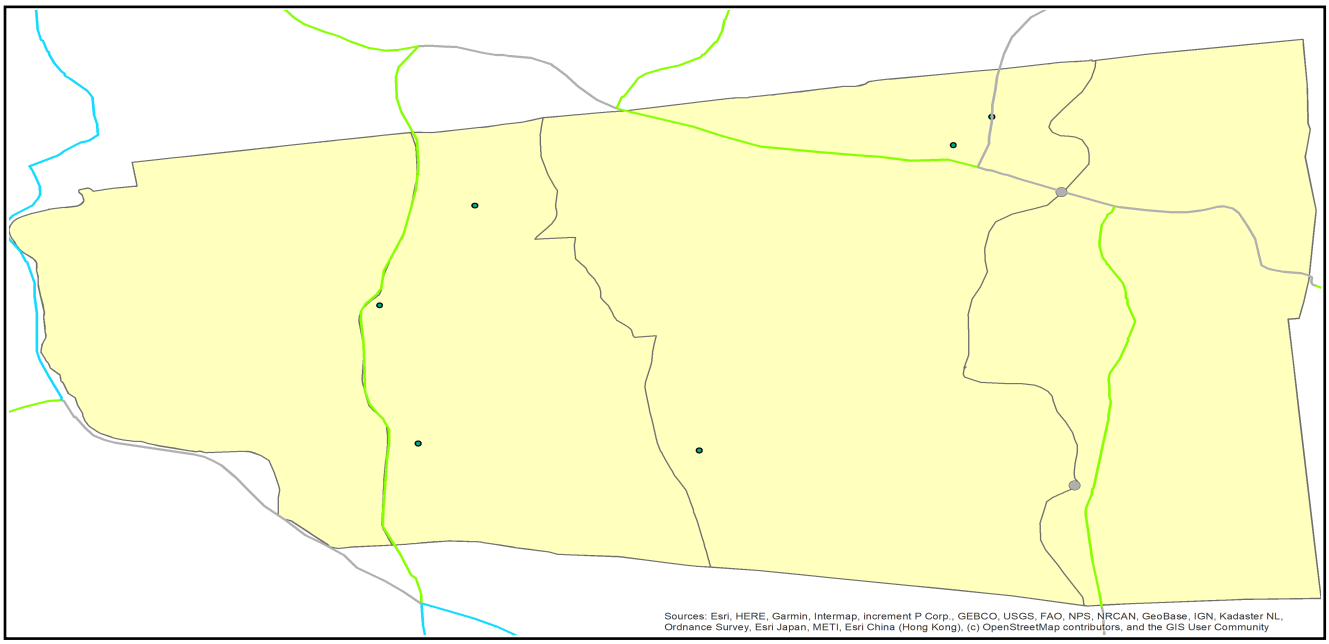


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	31	0	0	14	14
	Bridges	8	0	0	8	8
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	6	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	159	0	0
Waste Water	95	0	0
Natural Gas	64	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

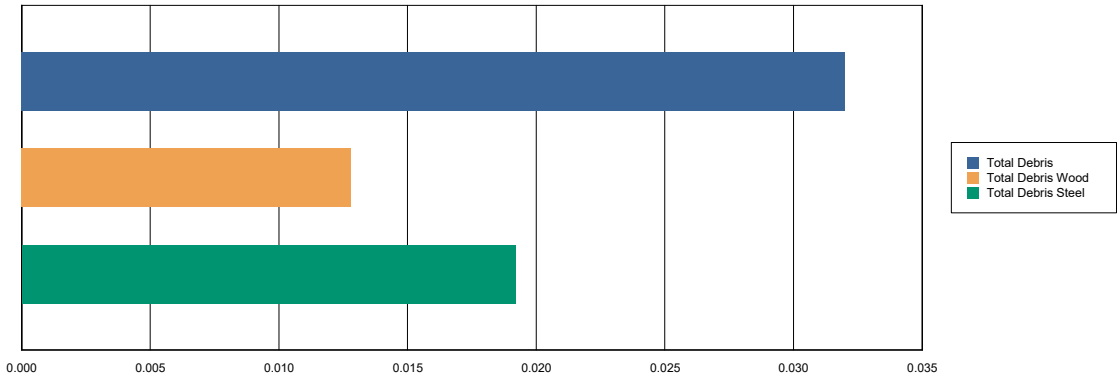
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 32,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 40.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 1,280 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



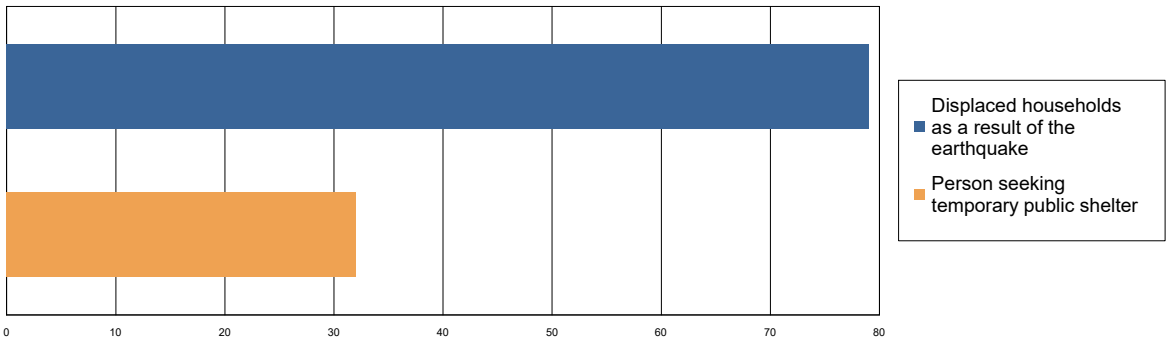
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.02	0.03	1,280 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 79 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 18,932) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
79	32

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.55	0.11	0.01	0.03
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.01	0.00	0.00	0.00
	Industrial	0.43	0.09	0.01	0.02
	Other-Residential	1.52	0.31	0.04	0.08
	Single Family	5.19	0.65	0.06	0.11
	Total	**8**	**1**	**0**	**0**
2 PM	Commercial	31.76	6.59	0.81	1.56
	Commuting	0.00	0.00	0.00	0.00
	Educational	8.67	1.85	0.24	0.46
	Hotels	0.00	0.00	0.00	0.00
	Industrial	3.18	0.67	0.08	0.16
	Other-Residential	0.49	0.10	0.01	0.02
	Single Family	1.57	0.21	0.02	0.04
	Total	**46**	**9**	**1**	**2**
5 PM	Commercial	19.83	4.11	0.51	0.97
	Commuting	0.02	0.03	0.04	0.01
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.99	0.42	0.05	0.10
	Other-Residential	0.60	0.12	0.02	0.03
	Single Family	2.01	0.26	0.02	0.05
	Total	**24**	**5**	**1**	**1**

Economic Loss

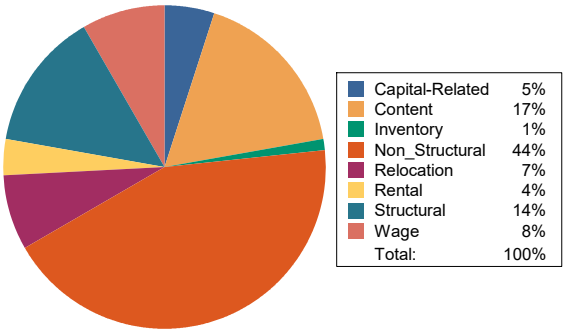
The total economic loss estimated for the earthquake is 205.52 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 205.39 (millions of dollars); 24 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 42 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

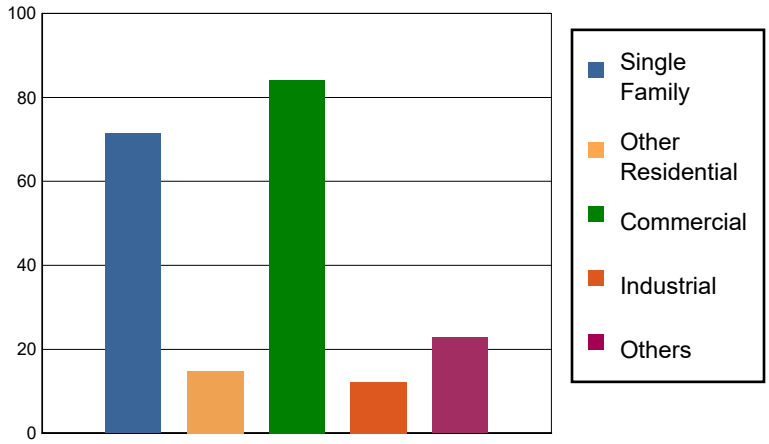


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	3.4118	11.9771	0.2738	1.1965	16.8592
	Capital-Related	0.0000	1.4520	8.7046	0.1581	0.1686	10.4833
	Rental	0.9498	1.3825	4.6239	0.1061	0.4863	7.5486
	Relocation	3.3794	0.3032	7.2947	0.7276	3.1776	14.8825
	Subtotal	**4.3292**	**6.5495**	**32.6003**	**1.2656**	**5.0290**	**49.7736**
Capital Stock Losses							
	Structural	8.7444	1.5778	12.3224	2.2838	3.9695	28.8979
	Non_Structural	43.0654	5.4570	25.7738	5.1641	9.8903	89.3506
	Content	15.3149	1.2213	11.6120	2.9806	3.8649	34.9937
	Inventory	0.0000	0.0000	1.8431	0.4875	0.0482	2.3788
	Subtotal	**67.1247**	**8.2561**	**51.5513**	**10.9160**	**17.7729**	**155.6210**
	Total	**71.45**	**14.81**	**84.15**	**12.18**	**22.80**	**205.39**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	603.8944	0.0000	0.00
	Bridges	14.9250	0.1209	0.81
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**618.8194**	**0.1209**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**618.82**	**0.12**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	5.1210	0.0000	0.00
	Subtotal	**5.1210**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.0726	0.0000	0.00
	Subtotal	**3.0726**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.0484	0.0000	0.00
	Subtotal	**2.0484**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.6900	0.0000	0.00
	Subtotal	**0.6900**	**0.0000**	
	Total	**10.93**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	18,932	4,026	1,248	5,274
Total Region		**18,932**	**4,026**	**1,248**	**5,274**

Hazus: Earthquake Global Risk Report

Region Name: Berlin_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.98 square miles and contains 4 census tracts. There are over 8 thousand households in the region which has a total population of 20,175 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,778 (millions of dollars). Approximately 85.00 % of the buildings (and 59.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,229 and 522 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 8 thousand buildings in the region which have an aggregate total replacement value of 4,778 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 81% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 8 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,751.00 (millions of dollars). This inventory includes over 52.82 miles of highways, 44 bridges, 333.68 miles of pipes.

Table 1: Transportation System Lifeline Inventory

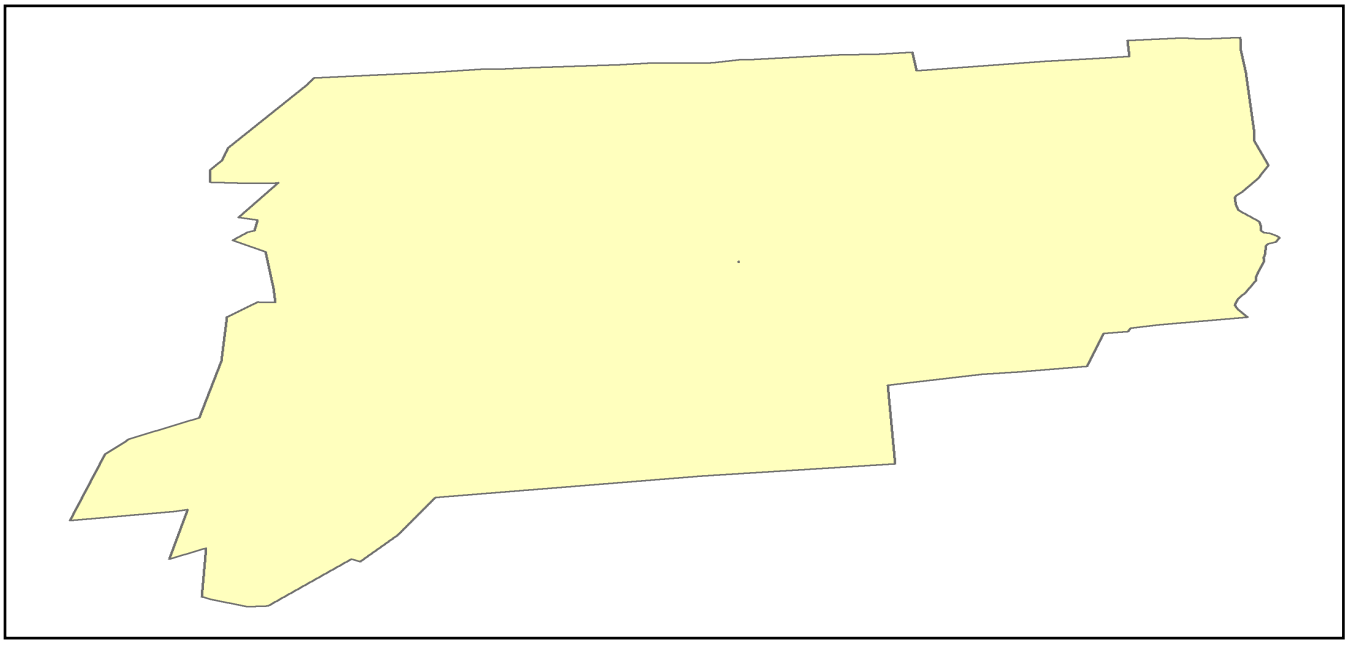
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	44	93.9951
	Segments	53	590.1349
	Tunnels	0	0.0000
		Subtotal	**684.1300**
Railways	Bridges	8	41.6800
	Facilities	1	2.6630
	Segments	31	1500.5470
	Tunnels	0	0.0000
		Subtotal	**1544.8900**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**2,229.00**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	5.7030
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**5.7030**
Waste Water	Distribution Lines	NA	3.4218
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.4218**
Natural Gas	Distribution Lines	NA	2.2812
	Facilities	0	0.0000
	Pipelines	8	511.1881
		Subtotal	**513.4693**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	1	0.1150
		Subtotal	**0.1150**
		Total	**522.70**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,568 buildings will be at least moderately damaged. This is over 19.00 % of the buildings in the region. There are an estimated 173 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

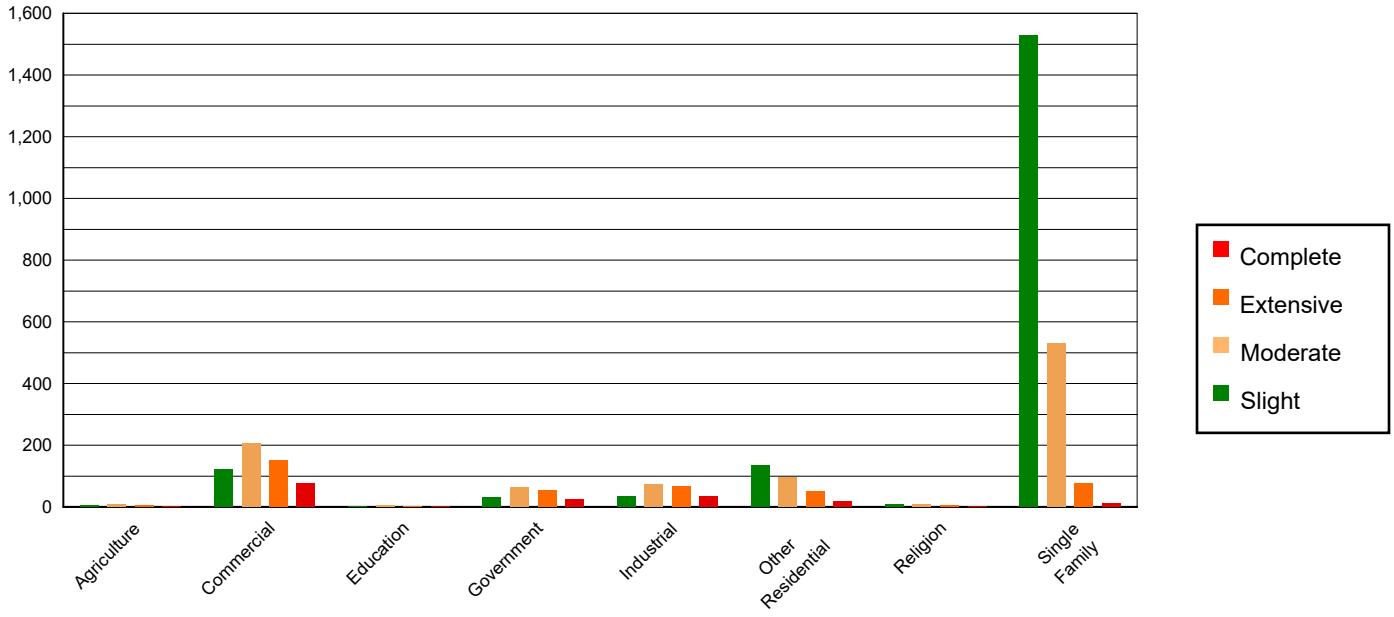


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	5.14	0.11	5.83	0.31	8.58	0.87	4.89	1.20	2.55	1.47
Commercial	132.71	2.88	121.73	6.52	205.57	20.83	149.74	36.71	75.25	43.37
Education	3.34	0.07	2.77	0.15	4.80	0.49	3.47	0.85	1.61	0.93
Government	34.29	0.74	30.63	1.64	62.93	6.38	52.65	12.91	26.50	15.27
Industrial	37.25	0.81	34.97	1.87	73.43	7.44	65.53	16.06	35.83	20.65
Other Residential	307.11	6.67	134.63	7.21	94.38	9.56	49.81	12.21	19.08	10.99
Religion	16.78	0.36	8.14	0.44	7.80	0.79	4.59	1.13	1.68	0.97
Single Family	4069.46	88.35	1529.74	81.87	529.54	53.65	77.26	18.94	11.01	6.35
Total	**4,606**		**1,868**		**987**		**408**		**174**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	4263.32	92.56	1621.74	86.80	567.77	57.52	68.41	16.77	6.22	3.59
Steel	52.84	1.15	62.04	3.32	183.18	18.56	189.63	46.48	112.73	64.97
Concrete	8.72	0.19	10.14	0.54	32.53	3.30	33.90	8.31	17.90	10.32
Precast	7.01	0.15	4.68	0.25	11.71	1.19	12.13	2.97	4.61	2.66
RM	46.70	1.01	20.76	1.11	40.95	4.15	30.86	7.57	5.26	3.03
URM	225.38	4.89	146.62	7.85	145.95	14.79	66.56	16.32	22.74	13.11
MH	2.10	0.05	2.46	0.13	4.94	0.50	6.44	1.58	4.05	2.34
Total	**4,606**		**1,868**		**987**		**408**		**174**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	8	0	0	0
EOCs	1	0	0	0
PoliceStations	1	0	0	0
FireStations	4	0	0	1

Transportation Lifeline Damage

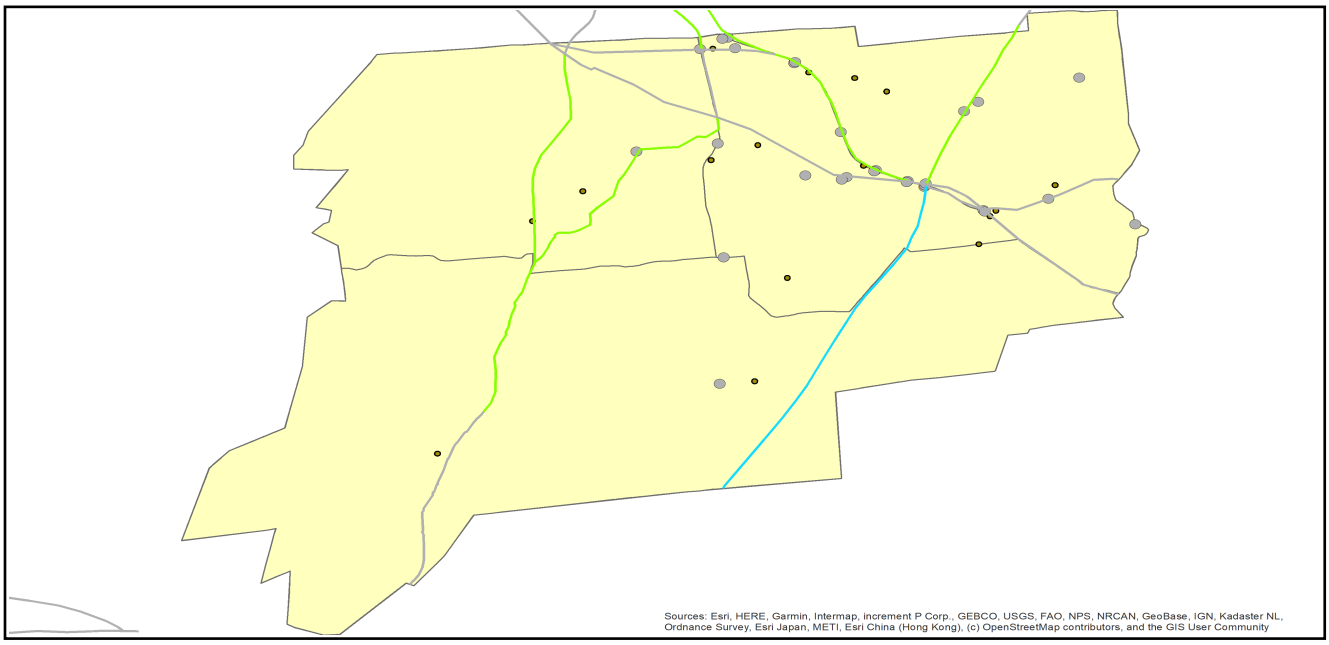


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	53	0	0	53	53
	Bridges	44	8	0	36	43
	Tunnels	0	0	0	0	0
Railways	Segments	31	0	0	31	31
	Bridges	8	0	0	8	8
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	1	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	177	0	0
Waste Water	106	0	0
Natural Gas	50	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

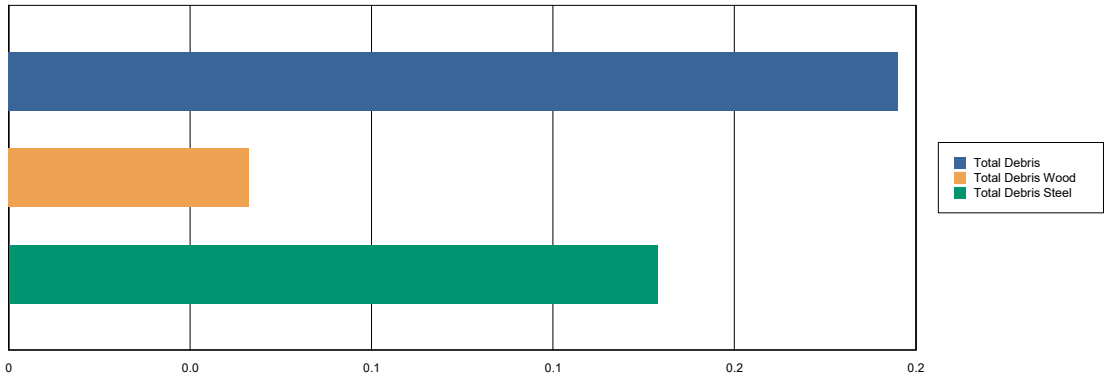
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 196,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 27.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 7,840 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



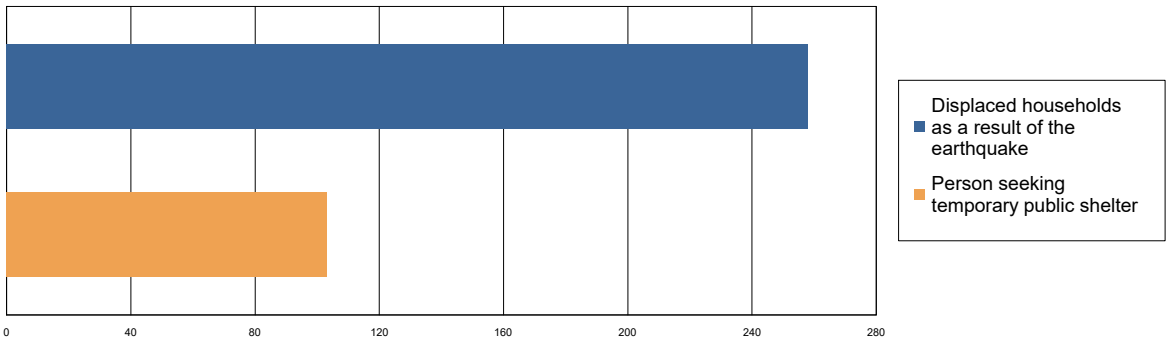
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.05	0.14	0.20	7,840 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 258 households to be displaced due to the earthquake. Of these, 103 people (out of a total population of 20,175) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
258	103

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	2.73	0.72	0.10	0.20
	Commuting	0.01	0.01	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.09	0.02	0.00	0.01
	Industrial	5.34	1.46	0.21	0.42
	Other-Residential	13.34	3.32	0.49	0.97
	Single Family	12.20	1.91	0.19	0.37
	Total	**34**	**7**	**1**	**2**
2 PM	Commercial	164.61	43.50	6.23	12.12
	Commuting	0.05	0.06	0.10	0.02
	Educational	30.80	8.37	1.29	2.52
	Hotels	0.02	0.00	0.00	0.00
	Industrial	39.46	10.80	1.59	3.09
	Other-Residential	3.81	0.95	0.14	0.27
	Single Family	3.52	0.57	0.06	0.11
	Total	**242**	**64**	**9**	**18**
5 PM	Commercial	109.13	28.82	4.17	7.99
	Commuting	0.99	1.25	2.20	0.42
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.03	0.01	0.00	0.00
	Industrial	24.66	6.75	0.99	1.93
	Other-Residential	5.24	1.31	0.20	0.37
	Single Family	4.77	0.78	0.08	0.15
	Total	**145**	**39**	**8**	**11**

Economic Loss

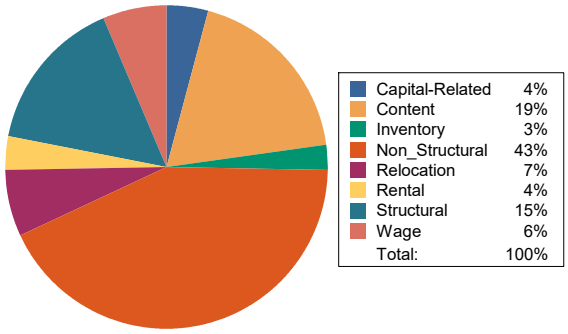
The total economic loss estimated for the earthquake is 832.02 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 820.88 (millions of dollars); 21 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 18 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

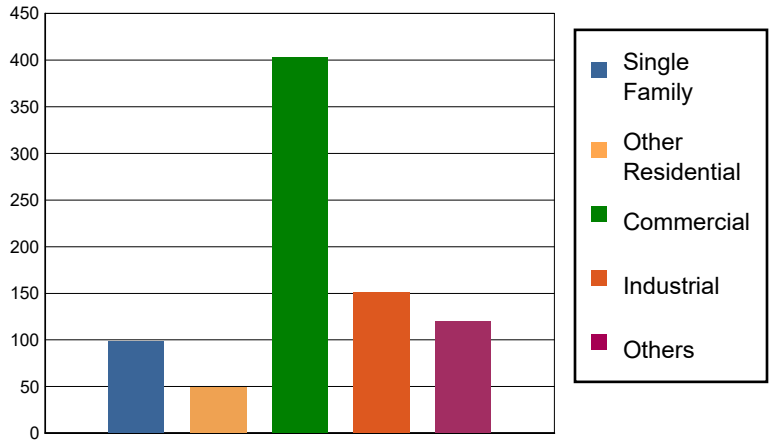


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	2.4586	39.4796	3.3494	6.6142	51.9018
	Capital-Related	0.0000	1.0444	31.1958	2.0180	0.5692	34.8274
	Rental	1.5499	4.4937	17.7216	1.0040	4.1292	28.8984
	Relocation	5.6315	2.2180	27.0343	4.4797	15.1664	54.5299
	Subtotal	**7.1814**	**10.2147**	**115.4313**	**10.8511**	**26.4790**	**170.1575**
Capital Stock Losses							
	Structural	11.9092	5.6974	66.8053	23.3917	19.3551	127.1587
	Non_Structural	57.8813	26.9949	144.5455	67.7018	52.9333	350.0568
	Content	21.1758	6.1924	62.6119	42.3284	20.5500	152.8585
	Inventory	0.0000	0.0000	13.3576	6.8463	0.4456	20.6495
	Subtotal	**90.9663**	**38.8847**	**287.3203**	**140.2682**	**93.2840**	**650.7235**
	Total	**98.15**	**49.10**	**402.75**	**151.12**	**119.76**	**820.88**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	590.1349	0.0000	0.00
	Bridges	93.9951	10.0618	10.70
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**684.1300**	**10.0618**	
Railways	Segments	1500.5470	0.0000	0.00
	Bridges	41.6800	0.6025	1.45
	Tunnels	0.0000	0.0000	0.00
	Facilities	2.6630	0.4754	17.85
	Subtotal	**1544.8900**	**1.0779**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**2,229.02**	**11.14**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	5.7030	0.0000	0.00
	Subtotal	**5.7030**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.4218	0.0000	0.00
	Subtotal	**3.4218**	**0.0000**	
Natural Gas	Pipelines	511.1881	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.2812	0.0000	0.00
	Subtotal	**513.4693**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.1150	0.0000	0.00
	Subtotal	**0.1150**	**0.0000**	
	Total	**522.71**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	20,175	2,814	1,964	4,778
Total Region		**20,175**	**2,814**	**1,964**	**4,778**

Hazus: Earthquake Global Risk Report

Region Name: Bloomfield_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.25 square miles and contains 5 census tracts. There are over 9 thousand households in the region which has a total population of 21,535 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,731 (millions of dollars). Approximately 86.00 % of the buildings (and 49.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,064 and 298 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 6 thousand buildings in the region which have an aggregate total replacement value of 4,731 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 83% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 11 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,362.00 (millions of dollars). This inventory includes over 67.11 miles of highways, 15 bridges, 324.98 miles of pipes.

Table 1: Transportation System Lifeline Inventory

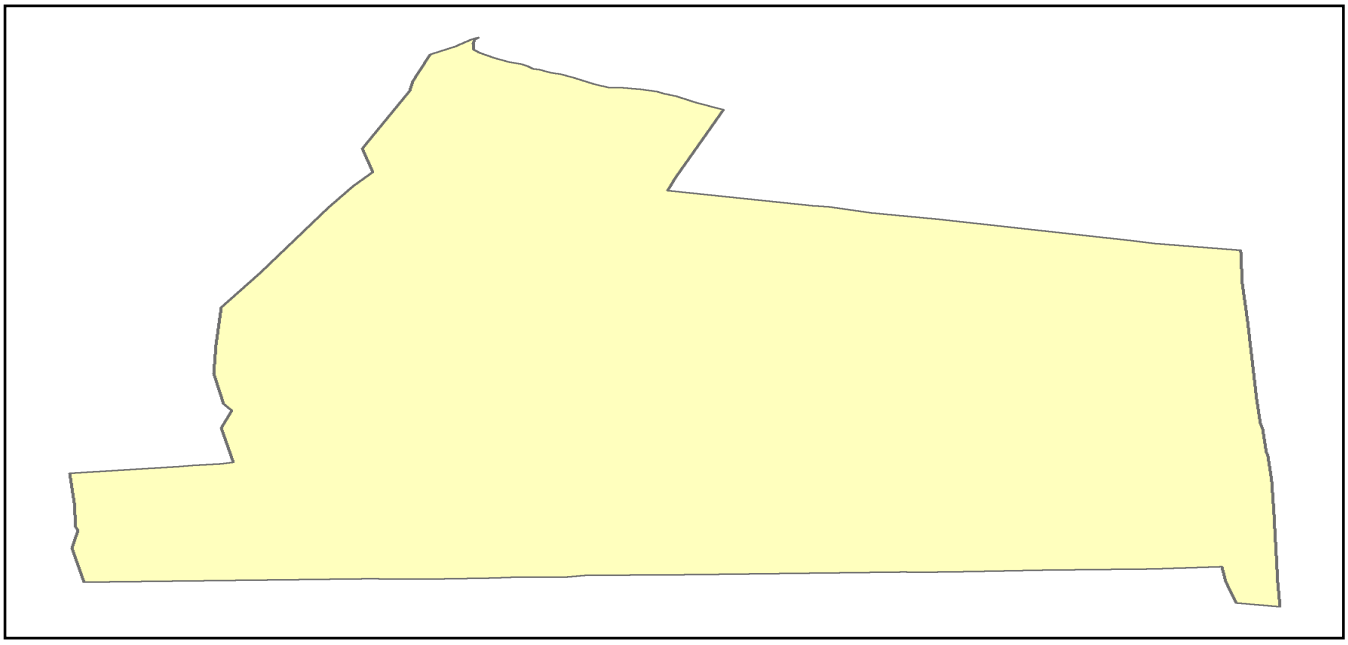
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	15	21.4240
	Segments	44	730.2850
	Tunnels	0	0.0000
		Subtotal	**751.7090**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	35	1312.8460
	Tunnels	0	0.0000
		Subtotal	**1312.8460**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**2,064.60**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	5.9801
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**5.9801**
Waste Water	Distribution Lines	NA	3.5881
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.5881**
Natural Gas	Distribution Lines	NA	2.3920
	Facilities	0	0.0000
	Pipelines	1	286.3532
		Subtotal	**288.7452**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	2	0.2300
		Subtotal	**0.2300**
		Total	**298.50**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 733 buildings will be at least moderately damaged. This is over 11.00 % of the buildings in the region. There are an estimated 33 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

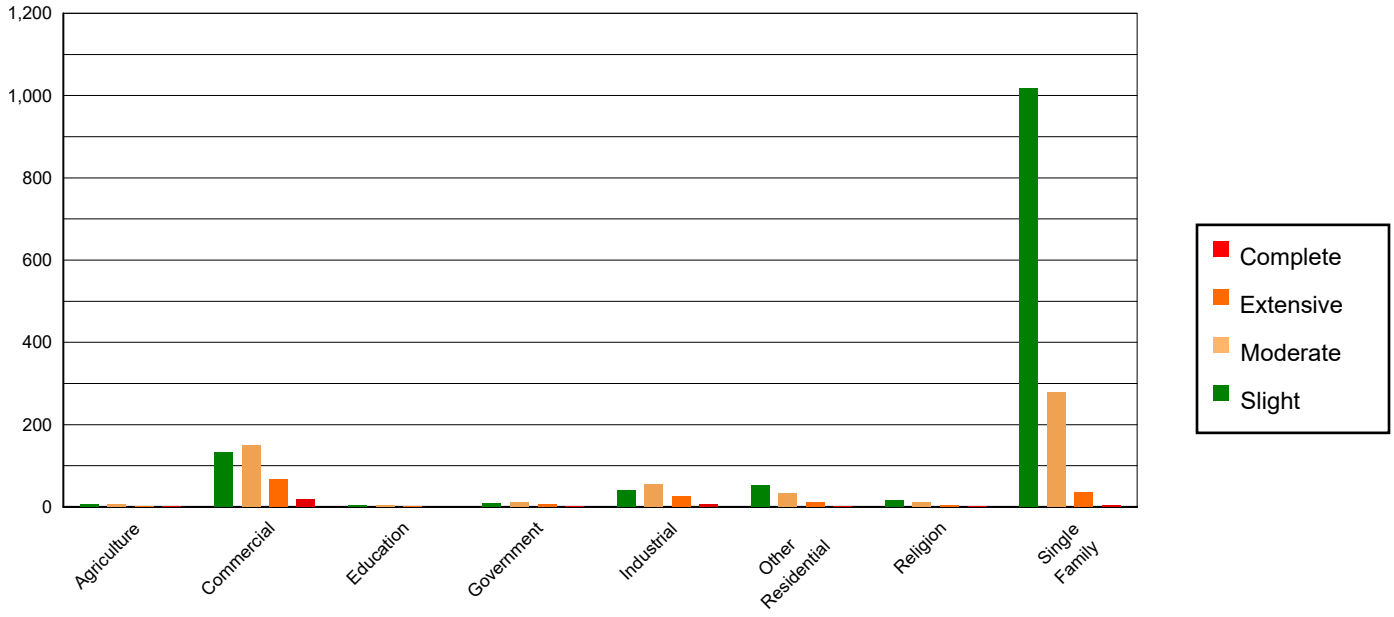


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	13.38	0.27	7.34	0.57	6.23	1.14	2.44	1.61	0.61	1.81
Commercial	261.10	5.28	133.91	10.48	149.58	27.30	66.67	44.10	17.73	52.29
Education	7.44	0.15	3.75	0.29	4.41	0.81	1.88	1.24	0.51	1.50
Government	14.03	0.28	7.70	0.60	10.59	1.93	5.18	3.43	1.49	4.40
Industrial	80.36	1.62	41.19	3.22	53.74	9.81	25.19	16.66	6.51	19.21
Other Residential	185.94	3.76	52.78	4.13	32.65	5.96	11.20	7.41	2.42	7.15
Religion	45.98	0.93	14.77	1.16	11.78	2.15	4.49	2.97	0.98	2.90
Single Family	4338.39	87.70	1016.92	79.55	278.90	50.90	34.15	22.58	3.64	10.74
Total	**4,947**		**1,278**		**548**		**151**		**34**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	4450.69	89.97	1052.02	82.29	271.95	49.64	22.85	15.11	0.64	1.88
Steel	134.48	2.72	83.85	6.56	139.35	25.43	74.06	48.98	21.96	64.76
Concrete	24.04	0.49	13.76	1.08	23.73	4.33	11.59	7.67	3.27	9.64
Precast	13.73	0.28	5.18	0.41	8.30	1.51	4.84	3.20	0.54	1.59
RM	61.45	1.24	15.33	1.20	19.37	3.54	8.10	5.36	0.29	0.85
URM	262.25	5.30	108.23	8.47	85.20	15.55	29.76	19.68	7.21	21.28
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**4,947**		**1,278**		**548**		**151**		**34**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	11	0	0	6
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	6	0	0	4

Transportation Lifeline Damage

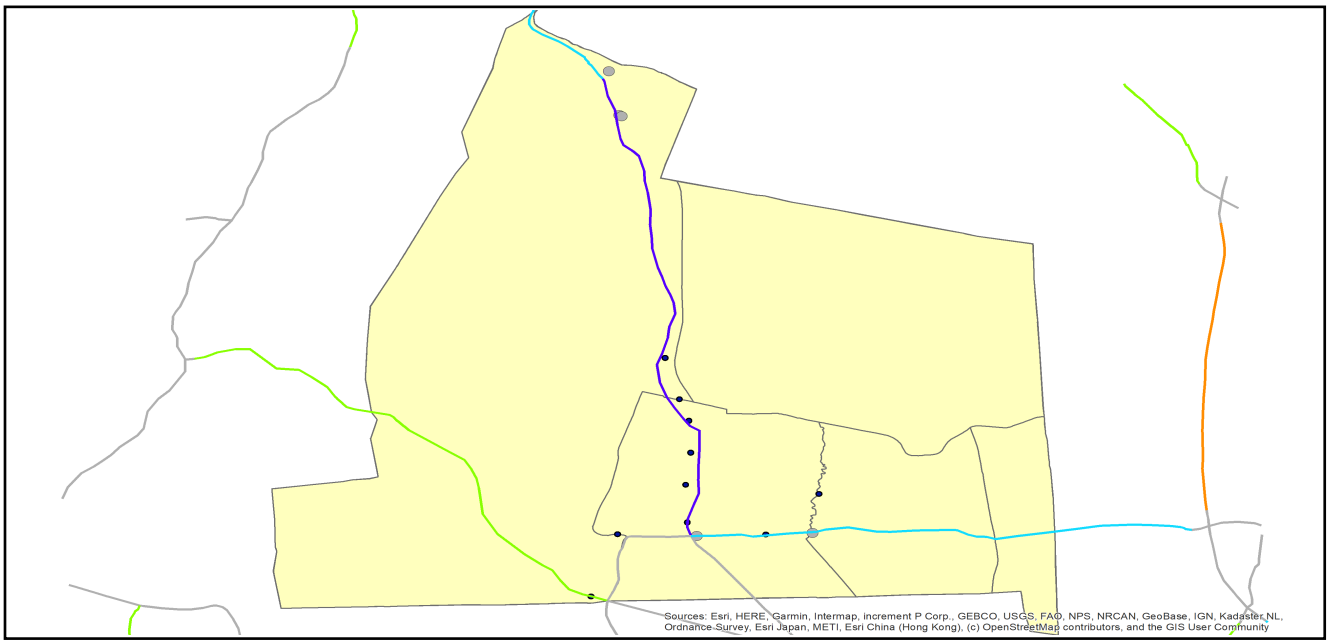


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	44	0	0	41	41
	Bridges	15	0	0	15	15
	Tunnels	0	0	0	0	0
Railways	Segments	35	0	0	19	19
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	2	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	186	0	0
Waste Water	111	0	0
Natural Gas	28	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

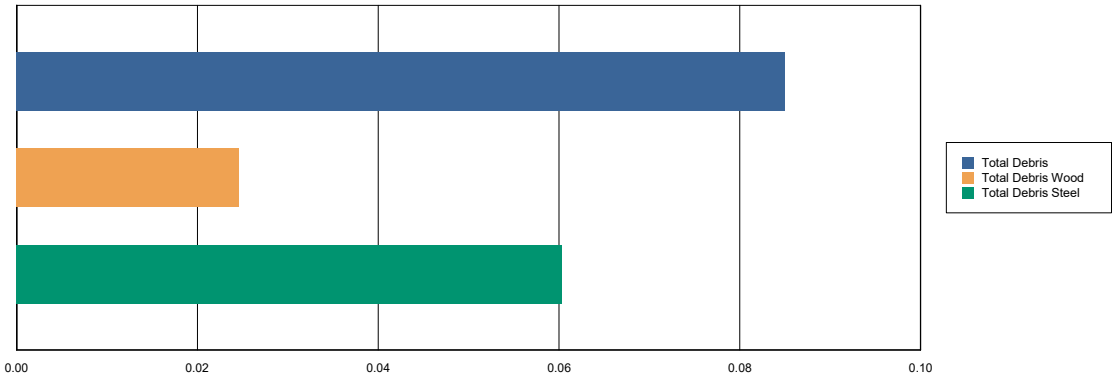
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 85,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 29.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 3,400 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



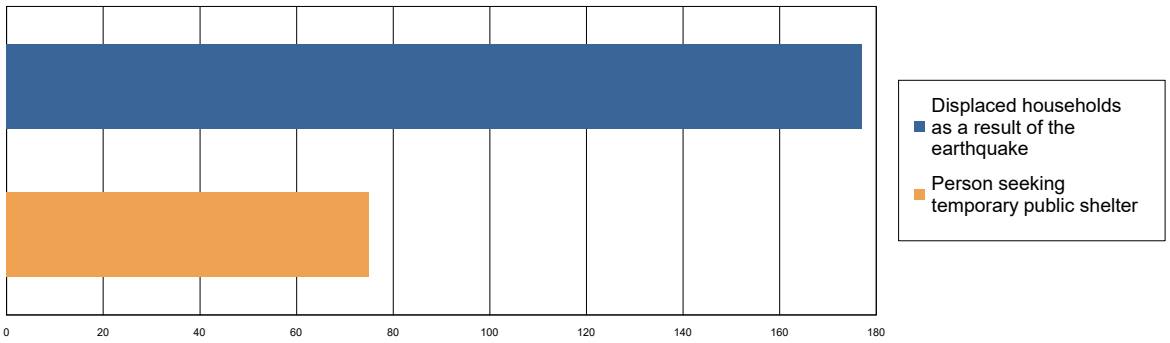
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.02	0.06	0.09	3,400 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 177 households to be displaced due to the earthquake. Of these, 75 people (out of a total population of 21,535) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
177	75

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.91	0.20	0.03	0.05
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.95	0.44	0.06	0.11
	Other-Residential	8.94	2.03	0.29	0.56
	Single Family	6.46	0.86	0.08	0.15
	Total	**18**	**4**	**0**	**1**
2 PM	Commercial	55.56	12.51	1.61	3.12
	Commuting	0.00	0.00	0.00	0.00
	Educational	9.63	2.24	0.31	0.60
	Hotels	0.00	0.00	0.00	0.00
	Industrial	14.36	3.21	0.41	0.79
	Other-Residential	2.94	0.67	0.10	0.18
	Single Family	2.02	0.28	0.03	0.05
	Total	**85**	**19**	**2**	**5**
5 PM	Commercial	36.69	8.30	1.08	2.07
	Commuting	0.02	0.05	0.06	0.01
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	8.98	2.01	0.26	0.49
	Other-Residential	3.50	0.80	0.11	0.22
	Single Family	2.50	0.35	0.03	0.06
	Total	**52**	**11**	**2**	**3**

Economic Loss

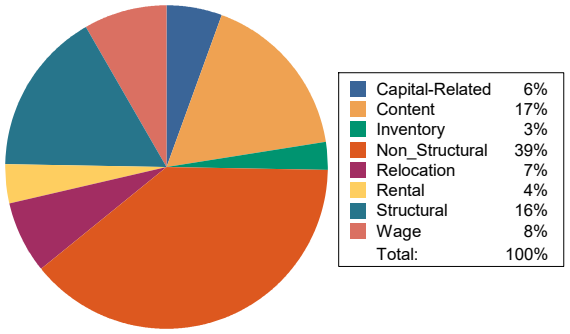
The total economic loss estimated for the earthquake is 384.80 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 384.63 (millions of dollars); 25 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 19 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

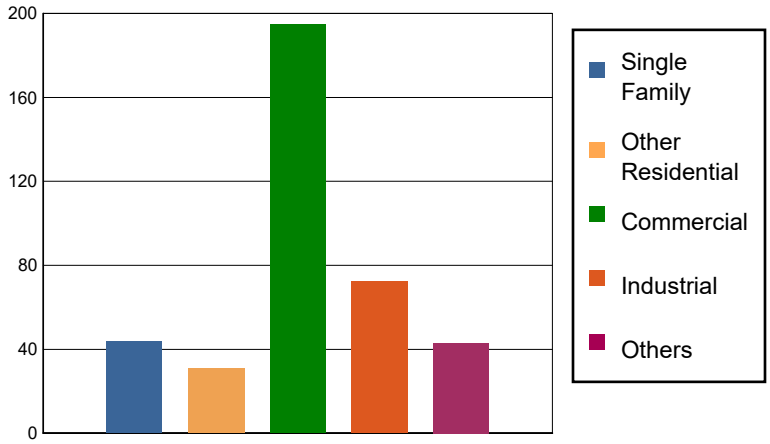


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	4.5842	24.0784	1.5889	1.9785	32.2300
	Capital-Related	0.0000	1.9518	18.5717	0.9467	0.3294	21.7996
	Rental	0.6526	2.2244	9.8979	0.6665	0.8016	14.2430
	Relocation	2.3368	0.8856	15.2533	3.7044	5.7947	27.9748
	Subtotal	**2.9894**	**9.6460**	**67.8013**	**6.9065**	**8.9042**	**96.2474**
Capital Stock Losses							
	Structural	5.1998	4.0726	33.1140	13.0882	7.6751	63.1497
	Non_Structural	25.9701	14.0317	61.1713	30.4340	18.5947	150.2018
	Content	9.5138	3.1583	26.2679	18.8165	7.4940	65.2505
	Inventory	0.0000	0.0000	6.4017	3.1103	0.2721	9.7841
	Subtotal	**40.6837**	**21.2626**	**126.9549**	**65.4490**	**34.0359**	**288.3861**
	Total	**43.67**	**30.91**	**194.76**	**72.36**	**42.94**	**384.63**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	730.2850	0.0000	0.00
	Bridges	21.4240	0.1603	0.75
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**751.7090**	**0.1603**	
Railways	Segments	1312.8460	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1312.8460**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**2,064.56**	**0.16**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	5.9801	0.0000	0.00
	Subtotal	**5.9801**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.5881	0.0000	0.00
	Subtotal	**3.5881**	**0.0000**	
Natural Gas	Pipelines	286.3532	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.3920	0.0000	0.00
	Subtotal	**288.7452**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.2300	0.0000	0.00
	Subtotal	**0.2300**	**0.0000**	
	Total	**298.54**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	21,535	2,295	2,435	4,731
Total Region		**21,535**	**2,295**	**2,435**	**4,731**

Hazus: Earthquake Global Risk Report

Region Name: Bolton_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 14.70 square miles and contains 1 census tracts. There are over 1 thousand households in the region which has a total population of 4,858 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 1 thousand buildings in the region with a total building replacement value (excluding contents) of 820 (millions of dollars). Approximately 85.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 242 and 110 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 1 thousand buildings in the region which have an aggregate total replacement value of 820 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 82% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 2 schools, 1 fire stations, 0 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 352.00 (millions of dollars). This inventory includes over 24.23 miles of highways, 7 bridges, 109.36 miles of pipes.

Table 1: Transportation System Lifeline Inventory

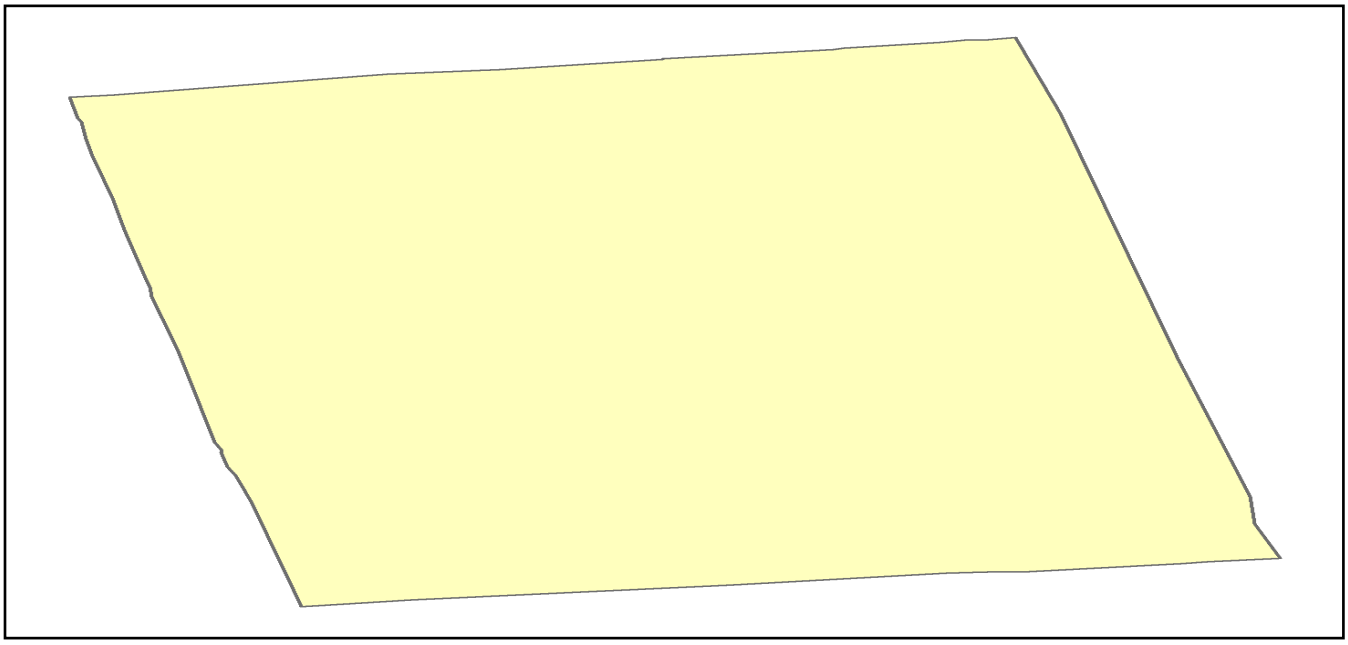
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	7	17.6475
	Segments	18	224.8353
	Tunnels	0	0.0000
		Subtotal	**242.4828**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**242.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	1.9981
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.9981**
Waste Water	Distribution Lines	NA	1.1989
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.1989**
Natural Gas	Distribution Lines	NA	0.7992
	Facilities	0	0.0000
	Pipelines	2	106.9232
		Subtotal	**107.7224**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**110.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 308 buildings will be at least moderately damaged. This is over 23.00 % of the buildings in the region. There are an estimated 39 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

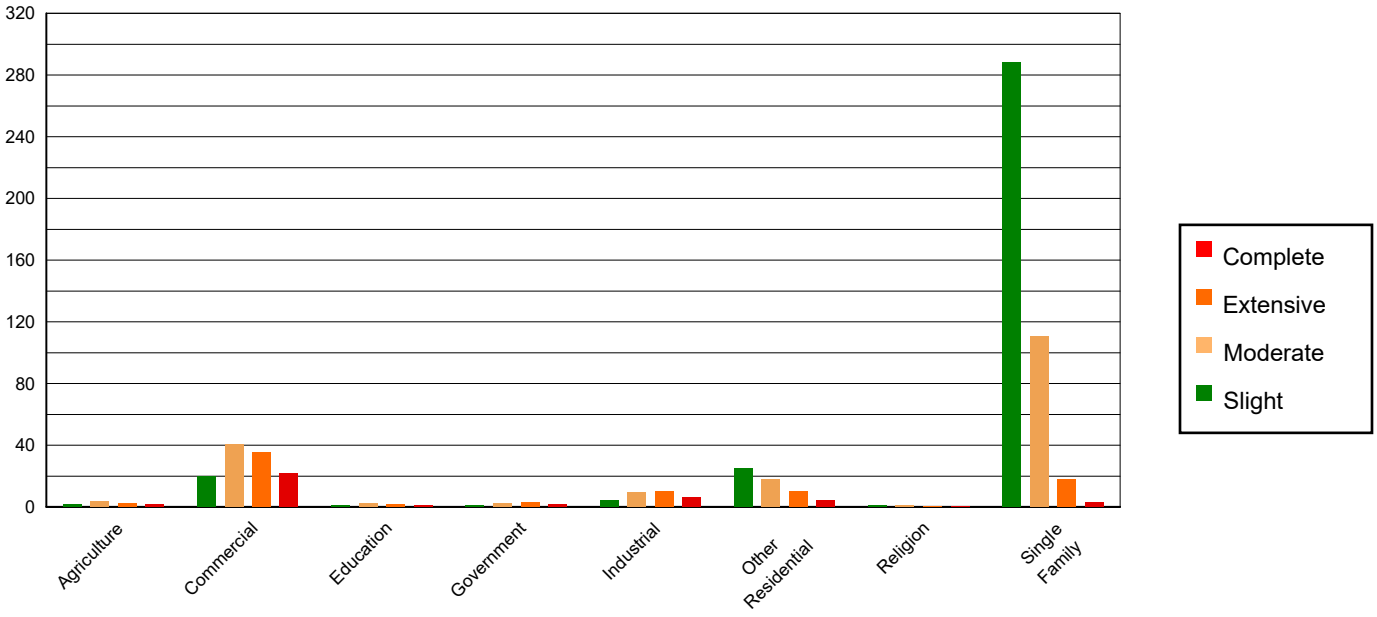


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1.39	0.20	1.95	0.57	3.71	1.97	2.48	3.07	1.47	3.72
Commercial	17.99	2.55	19.42	5.68	40.38	21.45	35.74	44.19	21.48	54.39
Education	1.03	0.15	1.03	0.30	2.10	1.12	1.82	2.25	1.02	2.59
Government	0.94	0.13	1.04	0.31	2.60	1.38	2.71	3.35	1.70	4.32
Industrial	3.53	0.50	3.96	1.16	9.57	5.09	9.74	12.05	6.20	15.69
Other Residential	48.56	6.87	24.85	7.27	18.05	9.59	10.09	12.48	4.46	11.28
Religion	1.82	0.26	1.05	0.31	1.06	0.56	0.73	0.90	0.34	0.86
Single Family	631.44	89.35	288.37	84.40	110.80	58.85	17.56	21.71	2.83	7.16
Total	**707**		**342**		**188**		**81**		**40**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	662.56	93.76	304.34	89.07	119.63	63.54	17.37	21.48	2.31	5.84
Steel	5.86	0.83	8.06	2.36	28.17	14.96	34.77	43.00	24.48	61.97
Concrete	0.89	0.13	1.23	0.36	4.70	2.50	5.99	7.41	3.90	9.87
Precast	0.74	0.10	0.60	0.18	1.74	0.93	2.07	2.56	0.98	2.48
RM	5.21	0.74	2.85	0.84	6.91	3.67	6.83	8.44	2.38	6.02
URM	31.43	4.45	24.58	7.20	27.12	14.40	13.83	17.10	5.45	13.81
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**707**		**342**		**188**		**81**		**40**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	2	1	0	0
EOCs	1	0	0	0
PoliceStations	0	0	0	0
FireStations	1	0	0	0

Transportation Lifeline Damage

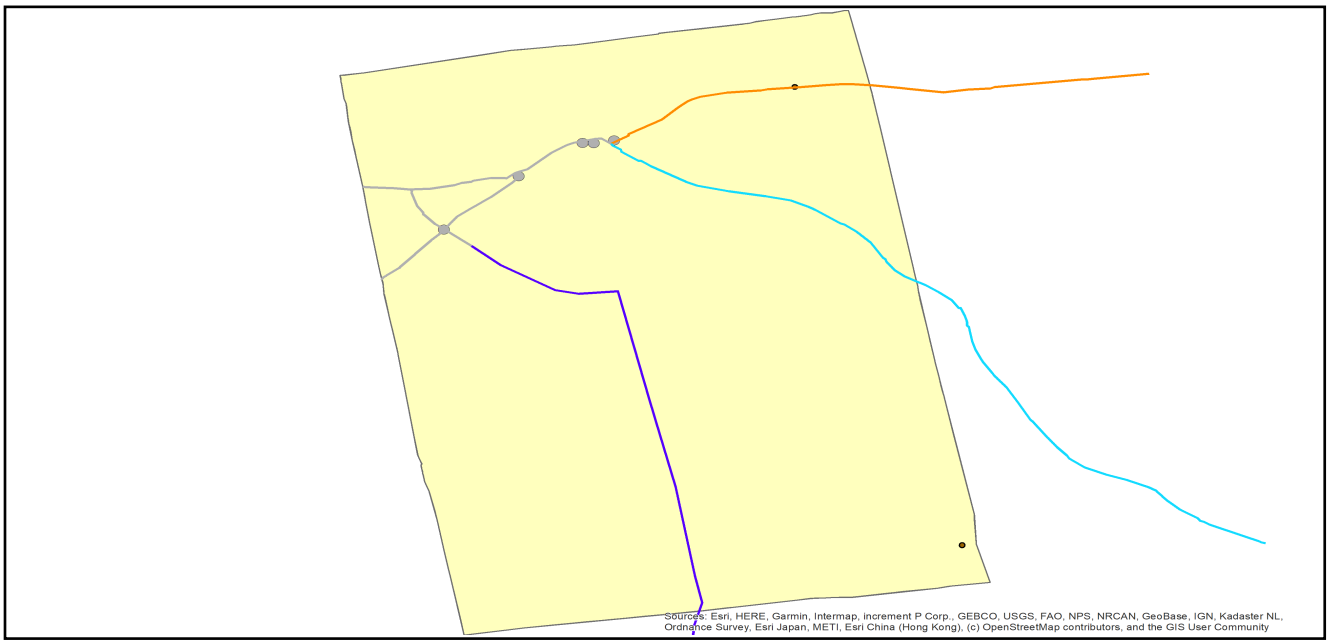


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	18	0	0	18	18
	Bridges	7	1	0	6	7
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	62	0	0
Waste Water	37	0	0
Natural Gas	11	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

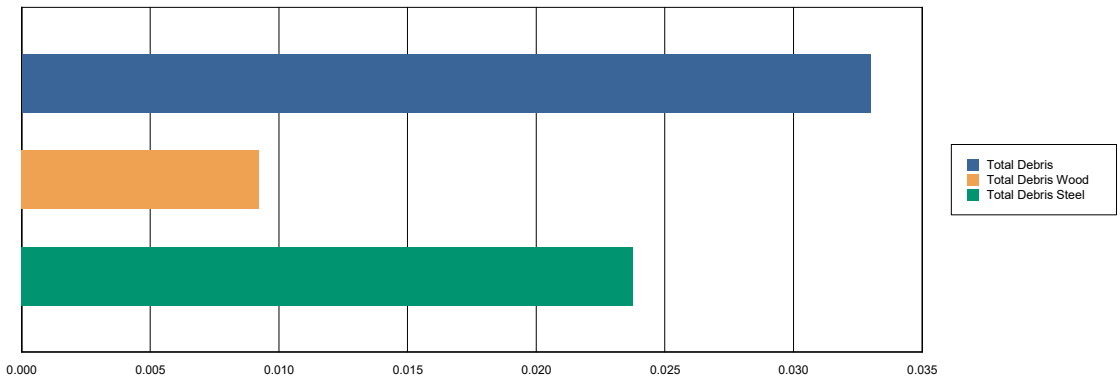
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 33,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 28.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 1,320 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



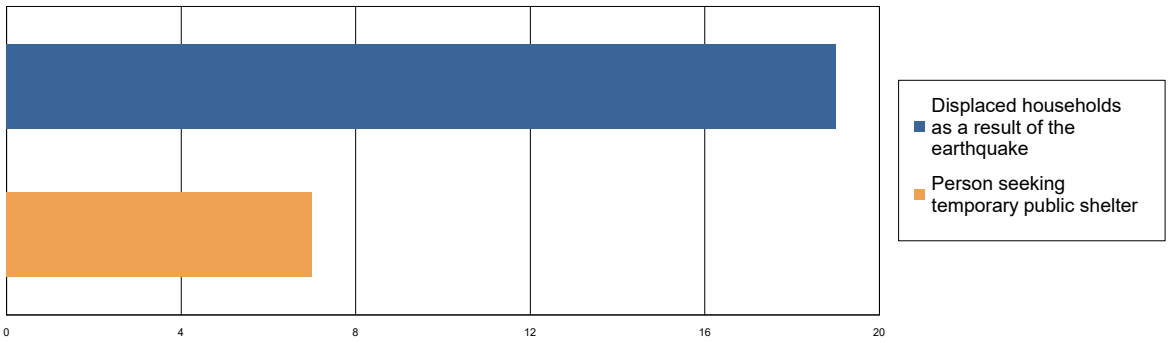
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.02	0.03	1,320 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 19 households to be displaced due to the earthquake. Of these, 7 people (out of a total population of 4,858) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
19	7

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.31	0.08	0.01	0.02
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.33	0.09	0.01	0.03
	Other-Residential	11.39	3.28	0.54	1.08
	Single Family	3.72	0.63	0.07	0.13
	Total	**16**	**4**	**1**	**1**
2 PM	Commercial	23.13	6.28	0.91	1.75
	Commuting	0.01	0.02	0.03	0.01
	Educational	11.96	3.36	0.53	1.03
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.44	0.68	0.10	0.20
	Other-Residential	3.47	1.00	0.17	0.32
	Single Family	1.14	0.20	0.02	0.04
	Total	**42**	**12**	**2**	**3**
5 PM	Commercial	17.82	4.84	0.71	1.34
	Commuting	0.30	0.45	0.69	0.14
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.53	0.43	0.06	0.13
	Other-Residential	4.46	1.28	0.21	0.41
	Single Family	1.46	0.26	0.03	0.05
	Total	**26**	**7**	**2**	**2**

Economic Loss

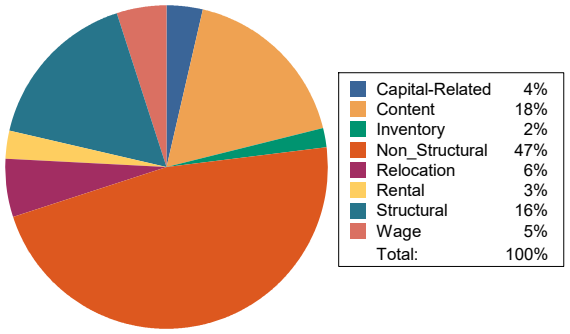
The total economic loss estimated for the earthquake is 149.78 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 148.27 (millions of dollars); 17 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 31 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

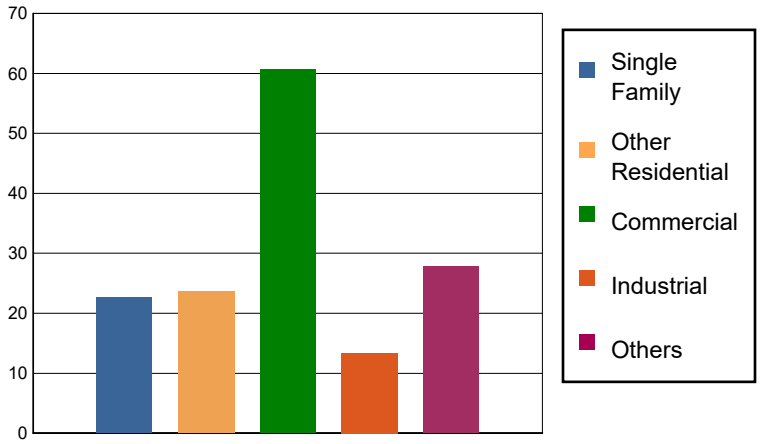


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.5028	5.9592	0.2607	0.6341	7.3568
	Capital-Related	0.0000	0.2140	4.6453	0.1472	0.2307	5.2372
	Rental	0.3324	1.4535	2.1486	0.0803	0.2348	4.2496
	Relocation	1.2119	0.6320	3.4865	0.4166	2.8238	8.5708
	Subtotal	**1.5443**	**2.8023**	**16.2396**	**0.9048**	**3.9234**	**25.4144**
Capital Stock Losses							
	Structural	2.8063	4.0053	10.1471	2.0908	5.1151	24.1646
	Non_Structural	13.4224	13.9610	22.5443	6.3233	13.3577	69.6087
	Content	4.8707	2.9170	9.7743	3.4282	5.0314	26.0216
	Inventory	0.0000	0.0000	1.9663	0.6680	0.4222	3.0565
	Subtotal	**21.0994**	**20.8833**	**44.4320**	**12.5103**	**23.9264**	**122.8514**
	Total	**22.64**	**23.69**	**60.67**	**13.42**	**27.85**	**148.27**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	224.8353	0.0000	0.00
	Bridges	17.6475	1.5093	8.55
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**242.4828**	**1.5093**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**242.48**	**1.51**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.9981	0.0000	0.00
	Subtotal	**1.9981**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.1989	0.0000	0.00
	Subtotal	**1.1989**	**0.0000**	
Natural Gas	Pipelines	106.9232	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	0.7992	0.0000	0.00
	Subtotal	**107.7224**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**110.92**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	4,858	570	249	820
Total Region		**4,858**	**570**	**249**	**820**

Hazus: Earthquake Global Risk Report

Region Name: Canton_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 25.02 square miles and contains 2 census tracts. There are over 4 thousand households in the region which has a total population of 10,124 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,156 (millions of dollars). Approximately 84.00 % of the buildings (and 69.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 334 and 164 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 3 thousand buildings in the region which have an aggregate total replacement value of 2,156 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 81% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 498.00 (millions of dollars). This inventory includes over 31.69 miles of highways, 18 bridges, 205.05 miles of pipes.

Table 1: Transportation System Lifeline Inventory

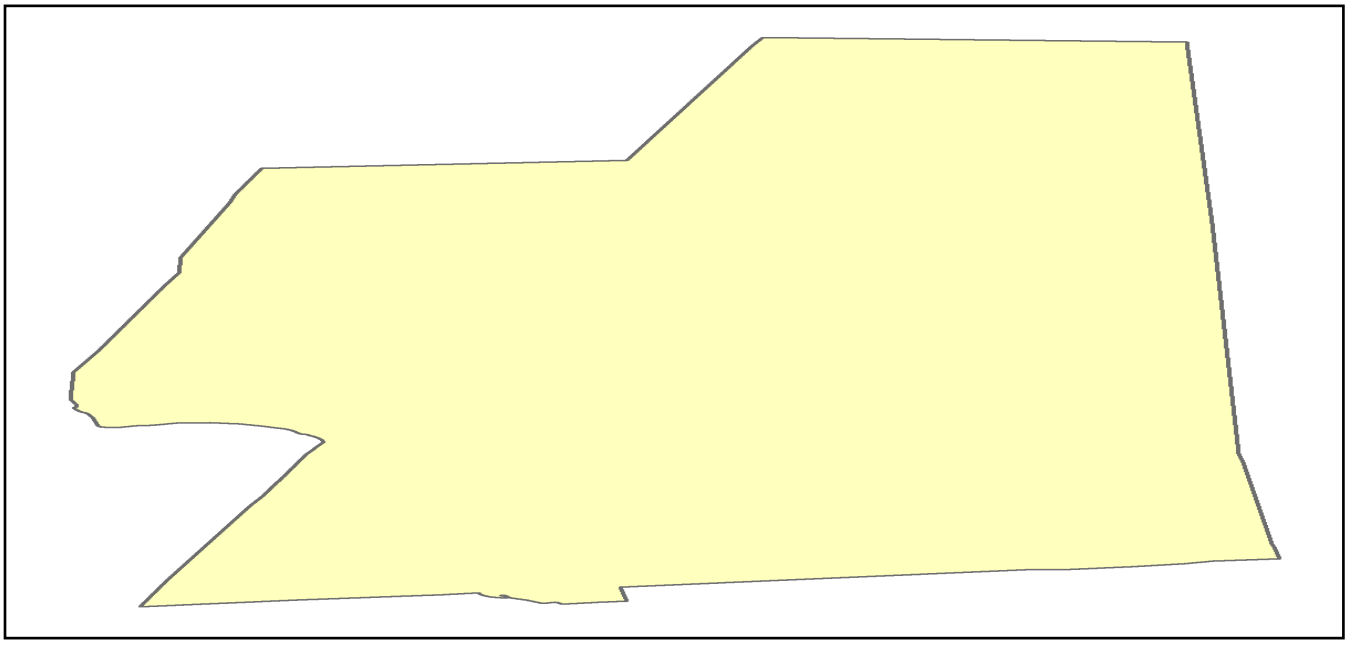
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	18	30.9659
	Segments	15	303.1112
	Tunnels	0	0.0000
		Subtotal	**334.0771**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**334.10**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	3.3035
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.3035**
Waste Water	Distribution Lines	NA	1.9821
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**159.4283**
Natural Gas	Distribution Lines	NA	1.3214
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.3214**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**164.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 250 buildings will be at least moderately damaged. This is over 6.00 % of the buildings in the region. There are an estimated 5 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

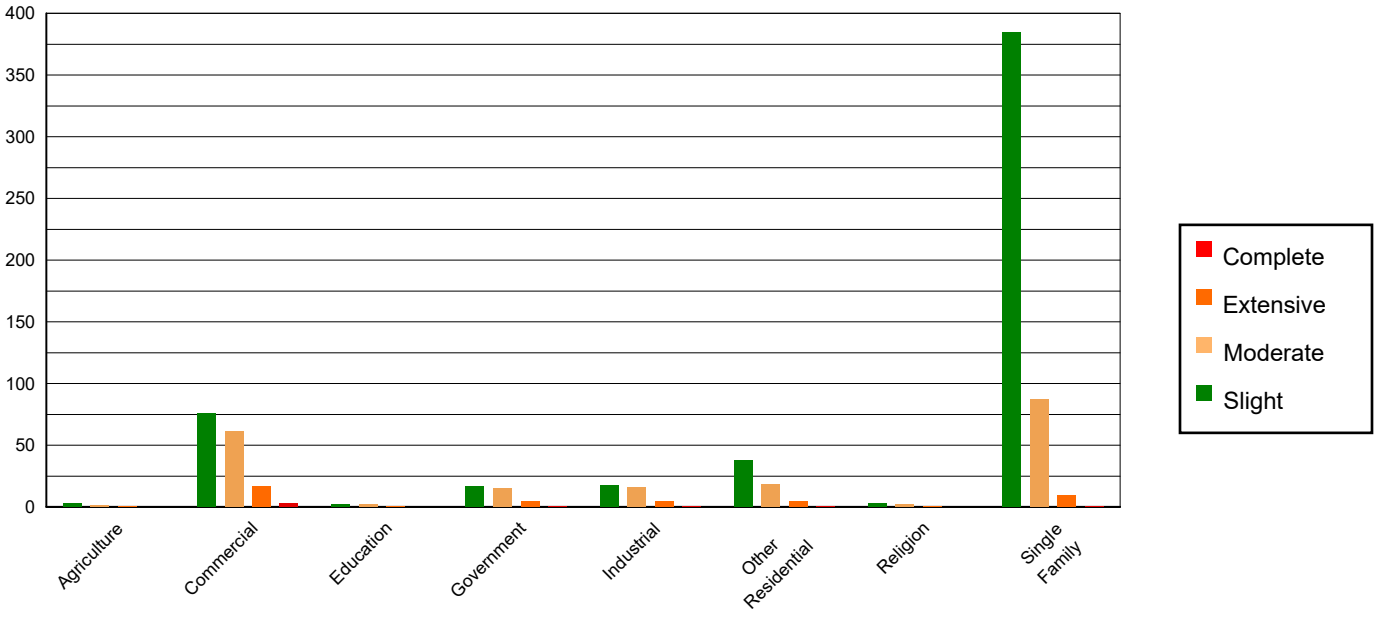


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	8.35	0.27	2.60	0.48	1.59	0.78	0.41	1.01	0.05	0.88
Commercial	241.04	7.75	76.27	14.11	61.22	29.96	16.79	41.44	2.68	46.12
Education	7.98	0.26	2.43	0.45	2.00	0.98	0.50	1.23	0.09	1.58
Government	48.33	1.55	16.26	3.01	15.39	7.53	4.25	10.48	0.78	13.41
Industrial	55.12	1.77	17.62	3.26	16.08	7.87	4.46	11.02	0.71	12.16
Other Residential	195.95	6.30	37.77	6.99	18.56	9.08	4.15	10.26	0.57	9.77
Religion	14.15	0.46	3.17	0.59	2.06	1.01	0.54	1.33	0.08	1.44
Single Family	2538.79	81.64	384.53	71.12	87.42	42.79	9.41	23.22	0.85	14.66
Total	**3,110**		**541**		**204**		**41**		**6**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2671.52	85.91	406.17	75.13	82.56	40.41	5.45	13.46	0.02	0.32
Steel	157.59	5.07	57.39	10.62	61.94	30.31	17.87	44.11	3.25	55.89
Concrete	27.42	0.88	9.29	1.72	9.88	4.83	2.17	5.36	0.27	4.70
Precast	11.36	0.37	2.80	0.52	3.36	1.65	1.31	3.25	0.06	0.95
RM	51.55	1.66	8.29	1.53	8.11	3.97	2.42	5.98	0.03	0.54
URM	190.28	6.12	56.68	10.48	38.47	18.83	11.28	27.84	2.19	37.59
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**3,110**		**541**		**204**		**41**		**6**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	5	0	0	5
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	3	0	0	3

Transportation Lifeline Damage

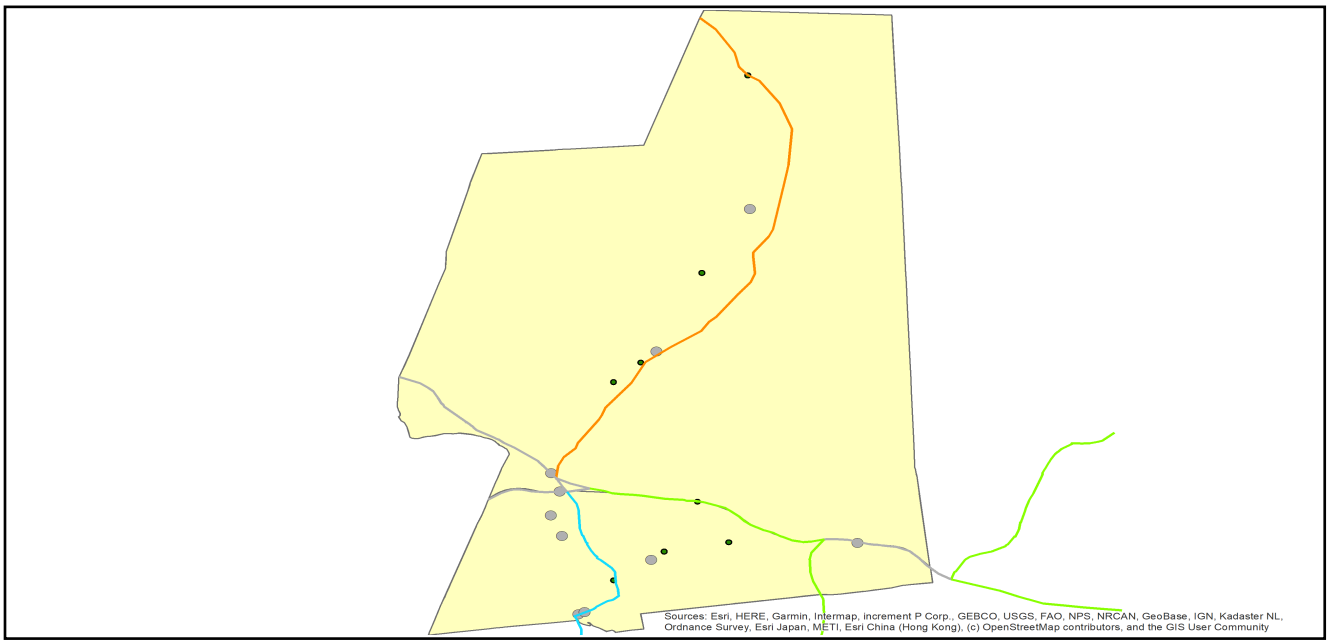


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	15	0	0	13	13
	Bridges	18	0	0	18	18
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	103	0	0
Waste Water	62	0	0
Natural Gas	41	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

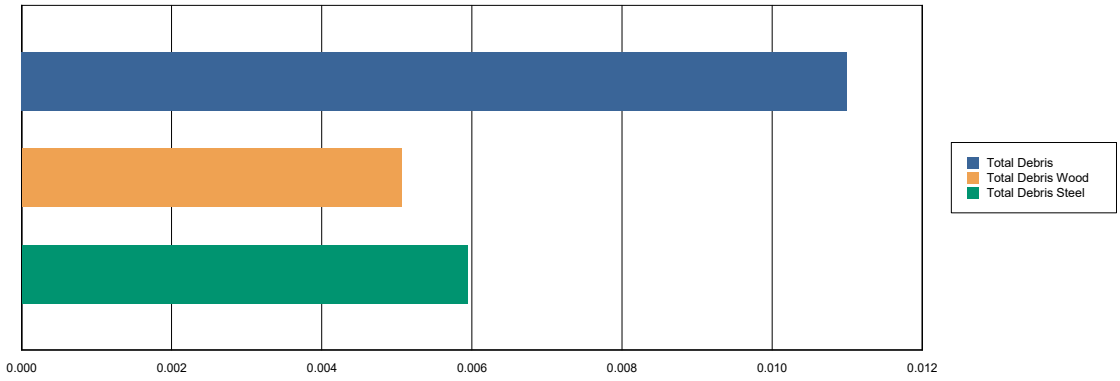
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 11,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 46.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 440 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



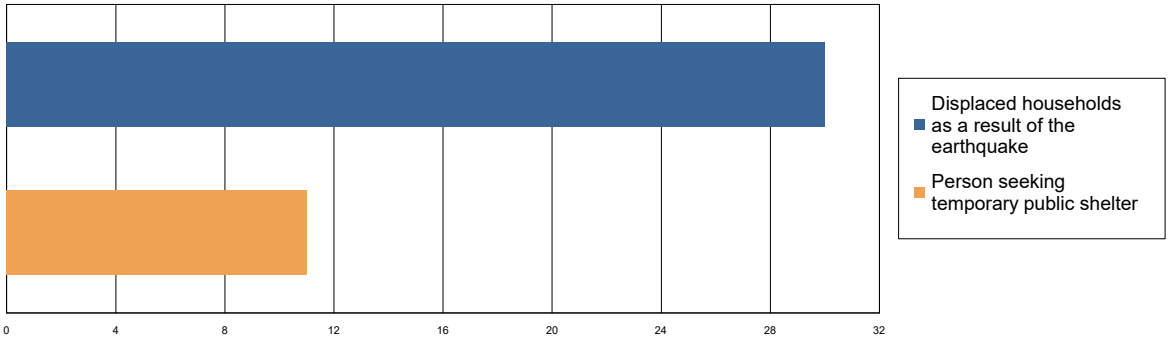
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.01	0.01	440 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 30 households to be displaced due to the earthquake. Of these, 11 people (out of a total population of 10,124) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
30	11

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.17	0.03	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.07	0.01	0.00	0.00
	Other-Residential	1.38	0.25	0.03	0.05
	Single Family	1.97	0.23	0.02	0.04
	Total	**4**	**1**	**0**	**0**
2 PM	Commercial	10.23	1.93	0.22	0.43
	Commuting	0.00	0.00	0.00	0.00
	Educational	2.17	0.42	0.05	0.10
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.54	0.10	0.01	0.02
	Other-Residential	0.44	0.08	0.01	0.02
	Single Family	0.59	0.07	0.01	0.01
	Total	**14**	**3**	**0**	**1**
5 PM	Commercial	6.43	1.22	0.14	0.27
	Commuting	0.00	0.01	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.34	0.06	0.01	0.01
	Other-Residential	0.54	0.10	0.01	0.02
	Single Family	0.76	0.09	0.01	0.02
	Total	**8**	**1**	**0**	**0**

Economic Loss

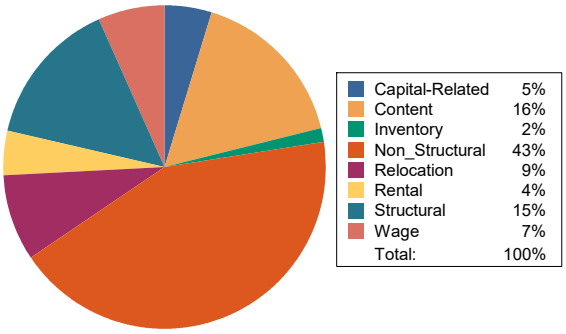
The total economic loss estimated for the earthquake is 62.83 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 62.77 (millions of dollars); 24 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 37 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

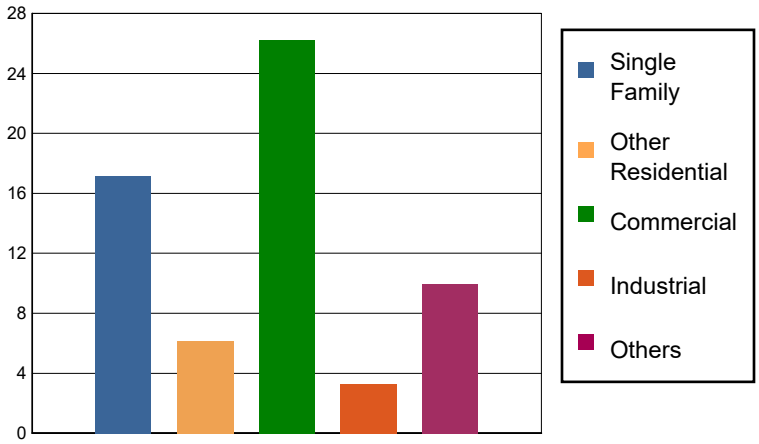


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.5558	2.8916	0.0765	0.6499	4.1738
	Capital-Related	0.0000	0.2366	2.6889	0.0451	0.0611	3.0317
	Rental	0.2771	0.4908	1.6479	0.0333	0.3079	2.7570
	Relocation	0.9758	0.2887	2.4625	0.2153	1.4496	5.3919
	Subtotal	**1.2529**	**1.5719**	**9.6909**	**0.3702**	**2.4685**	**15.3544**
Capital Stock Losses							
	Structural	2.1742	0.7210	4.0919	0.6165	1.6926	9.2962
	Non_Structural	10.2928	3.0991	8.1273	1.3727	4.1088	27.0007
	Content	3.4314	0.7564	3.5040	0.8018	1.6521	10.1457
	Inventory	0.0000	0.0000	0.8140	0.1215	0.0336	0.9691
	Subtotal	**15.8984**	**4.5765**	**16.5372**	**2.9125**	**7.4871**	**47.4117**
	Total	**17.15**	**6.15**	**26.23**	**3.28**	**9.96**	**62.77**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	303.1112	0.0000	0.00
	Bridges	30.9659	0.0578	0.19
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**334.0771**	**0.0578**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**334.08**	**0.06**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.3035	0.0000	0.00
	Subtotal	**3.3035**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	1.9821	0.0000	0.00
	Subtotal	**159.4283**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.3214	0.0000	0.00
	Subtotal	**1.3214**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**164.05**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	10,124	1,481	674	2,156
Total Region		**10,124**	**1,481**	**674**	**2,156**

Hazus: Earthquake Global Risk Report

Region Name: Columbia_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 21.99 square miles and contains 1 census tracts. There are over 2 thousand households in the region which has a total population of 5,272 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,081 (millions of dollars). Approximately 92.00 % of the buildings (and 76.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 342 and 150 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 2 thousand buildings in the region which have an aggregate total replacement value of 1,081 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 1 schools, 1 fire stations, 0 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 492.00 (millions of dollars). This inventory includes over 47.22 miles of highways, 2 bridges, 125.52 miles of pipes.

Table 1: Transportation System Lifeline Inventory

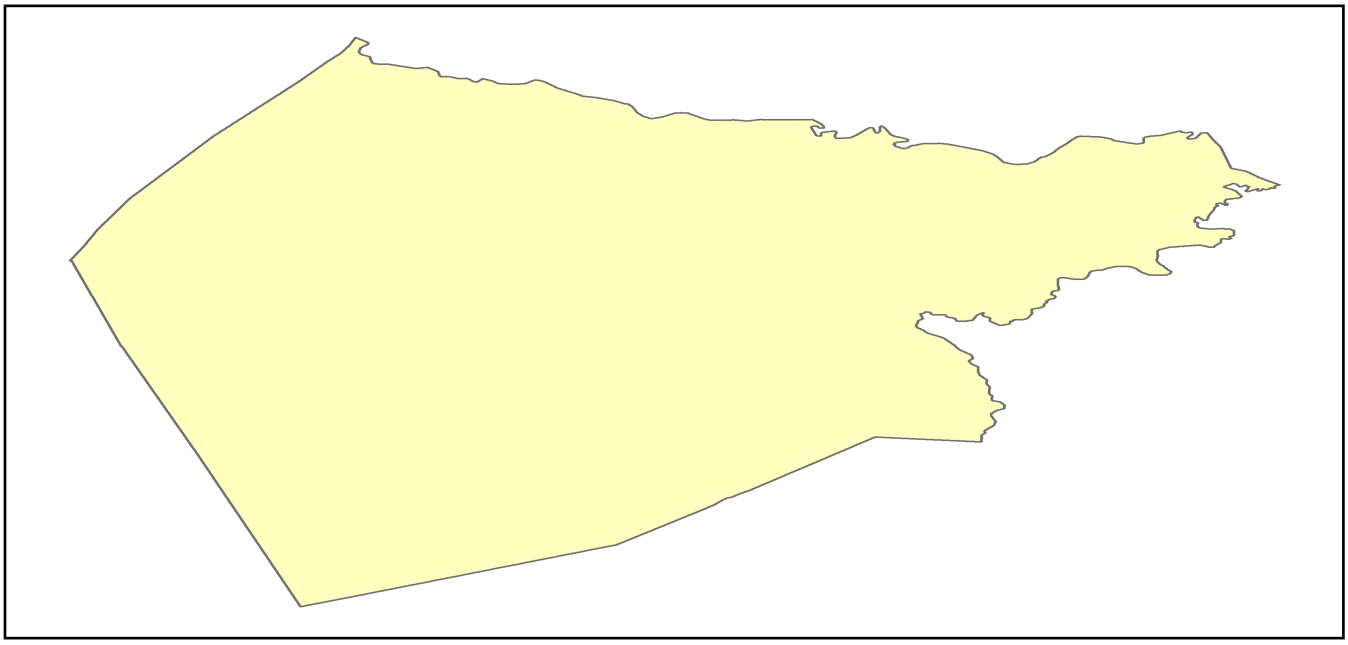
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	2	4.8619
	Segments	13	322.7950
	Tunnels	0	0.0000
		Subtotal	**327.6569**
Railways	Bridges	1	5.2100
	Facilities	0	0.0000
	Segments	2	9.1661
	Tunnels	0	0.0000
		Subtotal	**14.3761**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**342.00**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	2.2462
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.2462**
Waste Water	Distribution Lines	NA	1.3477
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.3477**
Natural Gas	Distribution Lines	NA	0.8985
	Facilities	0	0.0000
	Pipelines	4	146.5059
		Subtotal	**147.4044**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**151.00**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 632 buildings will be at least moderately damaged. This is over 26.00 % of the buildings in the region. There are an estimated 82 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

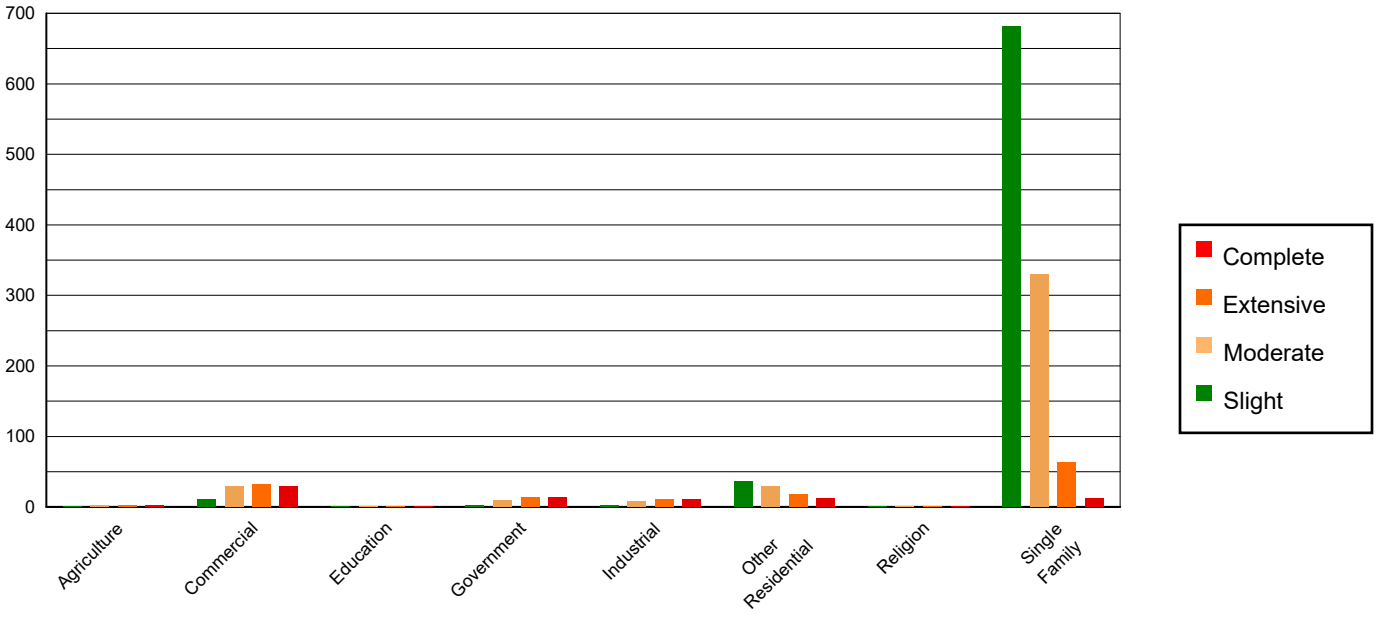


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0.36	0.03	0.77	0.10	2.20	0.54	1.98	1.40	1.69	2.05
Commercial	6.82	0.63	10.76	1.46	28.51	6.97	31.97	22.55	28.95	35.07
Education	0.26	0.02	0.38	0.05	1.03	0.25	1.24	0.88	1.08	1.31
Government	1.86	0.17	2.84	0.39	8.98	2.20	13.14	9.27	13.17	15.95
Industrial	1.67	0.16	2.59	0.35	8.01	1.96	11.31	7.98	11.41	13.82
Other Residential	50.37	4.68	36.99	5.02	28.73	7.03	18.28	12.90	12.62	15.29
Religion	1.49	0.14	1.22	0.17	1.31	0.32	1.11	0.79	0.87	1.05
Single Family	1013.69	94.16	681.93	92.47	329.92	80.72	62.70	44.24	12.76	15.46
Total	**1,077**		**737**		**409**		**142**		**83**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1045.05	97.08	698.80	94.76	332.19	81.28	55.79	39.36	6.92	8.39
Steel	2.34	0.22	4.02	0.54	18.99	4.65	35.44	25.01	39.28	47.58
Concrete	0.44	0.04	0.76	0.10	3.82	0.94	7.11	5.02	7.51	9.10
Precast	0.17	0.02	0.24	0.03	1.19	0.29	2.32	1.64	3.11	3.76
RM	1.78	0.17	1.69	0.23	6.58	1.61	10.12	7.14	7.88	9.55
URM	26.75	2.48	31.98	4.34	45.93	11.24	30.96	21.84	17.86	21.63
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1,077**		**737**		**409**		**142**		**83**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	1	1	0	0
EOCs	1	1	0	0
PoliceStations	0	0	0	0
FireStations	1	1	0	0

Transportation Lifeline Damage

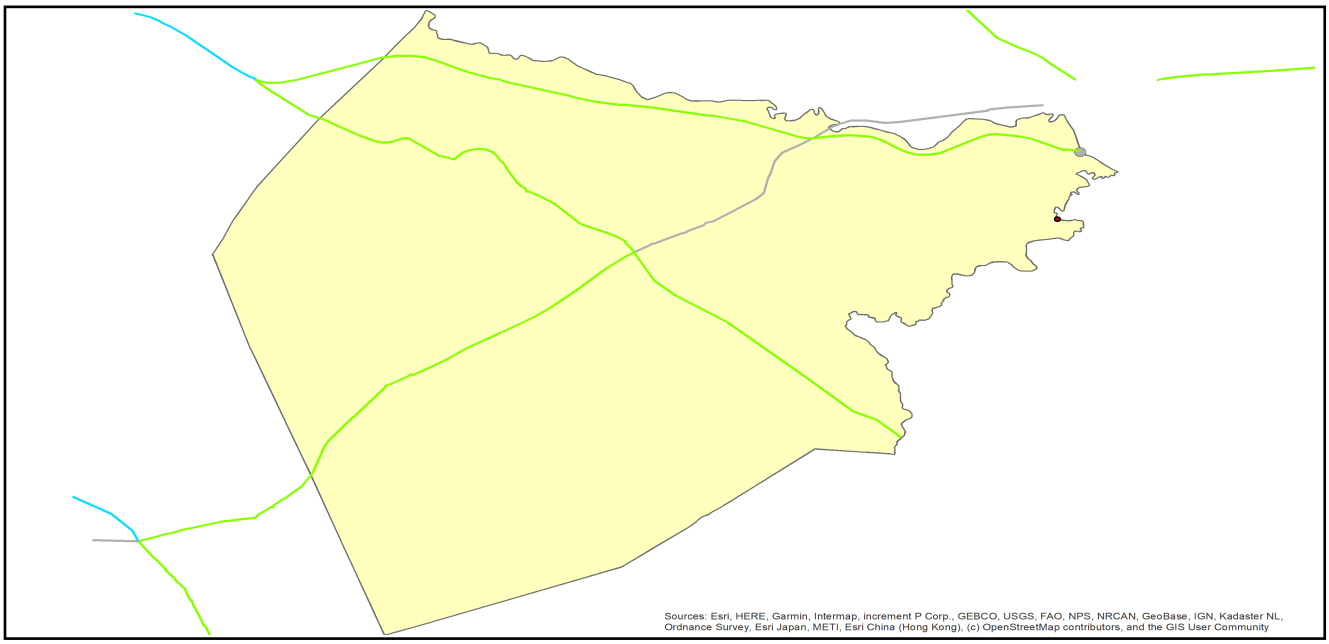


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	13	0	0	12	12
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
Railways	Segments	2	0	0	0	0
	Bridges	1	0	0	1	1
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	70	0	0
Waste Water	42	0	0
Natural Gas	14	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

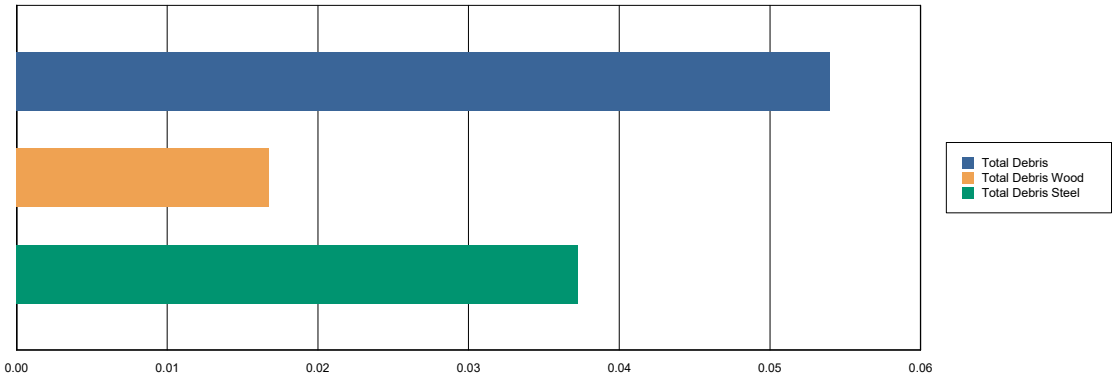
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 54,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 31.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 2,160 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



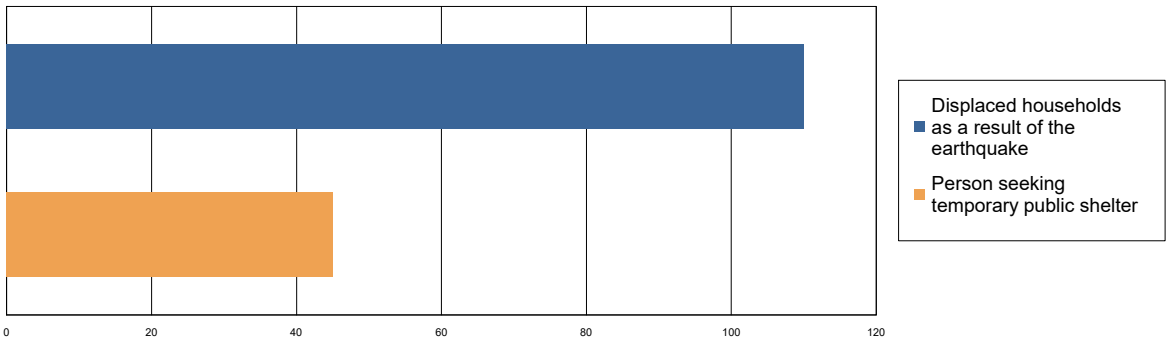
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.02	0.04	0.05	2,160 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 110 households to be displaced due to the earthquake. Of these, 45 people (out of a total population of 5,272) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
110	45

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.21	0.35	0.05	0.11
	Commuting	0.00	0.00	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.87	0.26	0.04	0.08
	Other-Residential	11.29	3.43	0.58	1.15
	Single Family	7.98	1.53	0.18	0.34
	Total	**21**	**6**	**1**	**2**
2 PM	Commercial	78.62	22.95	3.53	6.88
	Commuting	0.02	0.03	0.06	0.01
	Educational	12.25	3.67	0.60	1.17
	Hotels	0.00	0.00	0.00	0.00
	Industrial	6.41	1.92	0.30	0.59
	Other-Residential	3.39	1.02	0.18	0.33
	Single Family	2.41	0.48	0.06	0.11
	Total	**103**	**30**	**5**	**9**
5 PM	Commercial	54.74	15.96	2.48	4.76
	Commuting	0.48	0.64	1.09	0.21
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	4.01	1.20	0.19	0.37
	Other-Residential	4.44	1.34	0.23	0.44
	Single Family	3.15	0.63	0.08	0.14
	Total	**67**	**20**	**4**	**6**

Economic Loss

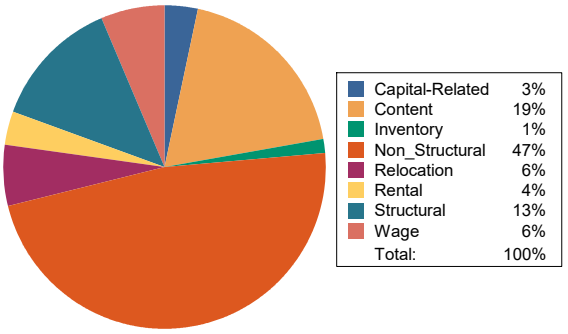
The total economic loss estimated for the earthquake is 264.40 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 263.69 (millions of dollars); 19 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 35 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

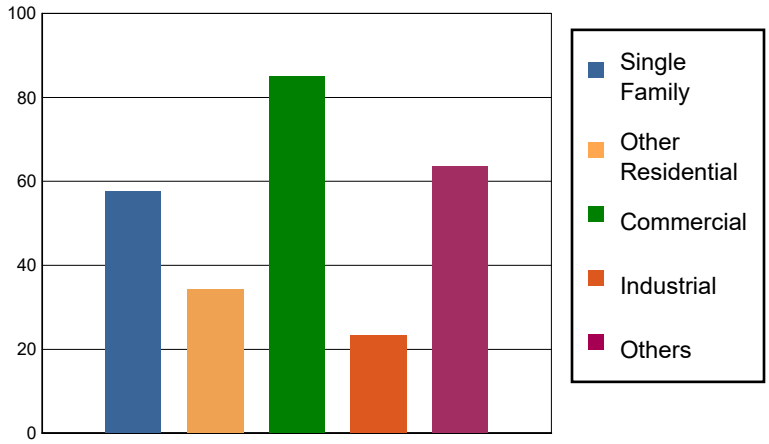


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	2.4764	8.9078	0.5063	4.9998	16.8903
	Capital-Related	0.0000	1.0513	7.1917	0.2977	0.2096	8.7503
	Rental	1.0225	3.3745	3.4385	0.1039	1.2946	9.2340
	Relocation	3.7408	0.9039	5.0171	0.4331	5.8375	15.9324
	Subtotal	**4.7633**	**7.8061**	**24.5551**	**1.3410**	**12.3415**	**50.8070**
Capital Stock Losses							
	Structural	7.2016	4.2180	10.9020	3.1406	8.6239	34.0861
	Non_Structural	33.6110	18.3269	32.9594	10.9517	29.2905	125.1395
	Content	11.9714	3.9120	14.1210	6.6523	13.1973	49.8540
	Inventory	0.0000	0.0000	2.4631	1.1923	0.1446	3.8000
	Subtotal	**52.7840**	**26.4569**	**60.4455**	**21.9369**	**51.2563**	**212.8796**
	Total	**57.55**	**34.26**	**85.00**	**23.28**	**63.60**	**263.69**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	322.7950	0.0000	0.00
	Bridges	4.8619	0.5659	11.64
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**327.6569**	**0.5659**	
Railways	Segments	9.1661	0.0000	0.00
	Bridges	5.2100	0.1490	2.86
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**14.3761**	**0.1490**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**342.03**	**0.71**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.2462	0.0000	0.00
	Subtotal	**2.2462**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.3477	0.0000	0.00
	Subtotal	**1.3477**	**0.0000**	
Natural Gas	Pipelines	146.5059	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	0.8985	0.0000	0.00
	Subtotal	**147.4044**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**151.00**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	5,272	817	264	1,081
Total Region		**5,272**	**817**	**264**	**1,081**

Hazus: Earthquake Global Risk Report

Region Name: Coventry_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 38.25 square miles and contains 2 census tracts. There are over 4 thousand households in the region which has a total population of 12,235 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 2,160 (millions of dollars). Approximately 91.00 % of the buildings (and 76.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 664 and 262 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 5 thousand buildings in the region which have an aggregate total replacement value of 2,160 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 926.00 (millions of dollars). This inventory includes over 63.38 miles of highways, 25 bridges, 262.22 miles of pipes.

Table 1: Transportation System Lifeline Inventory

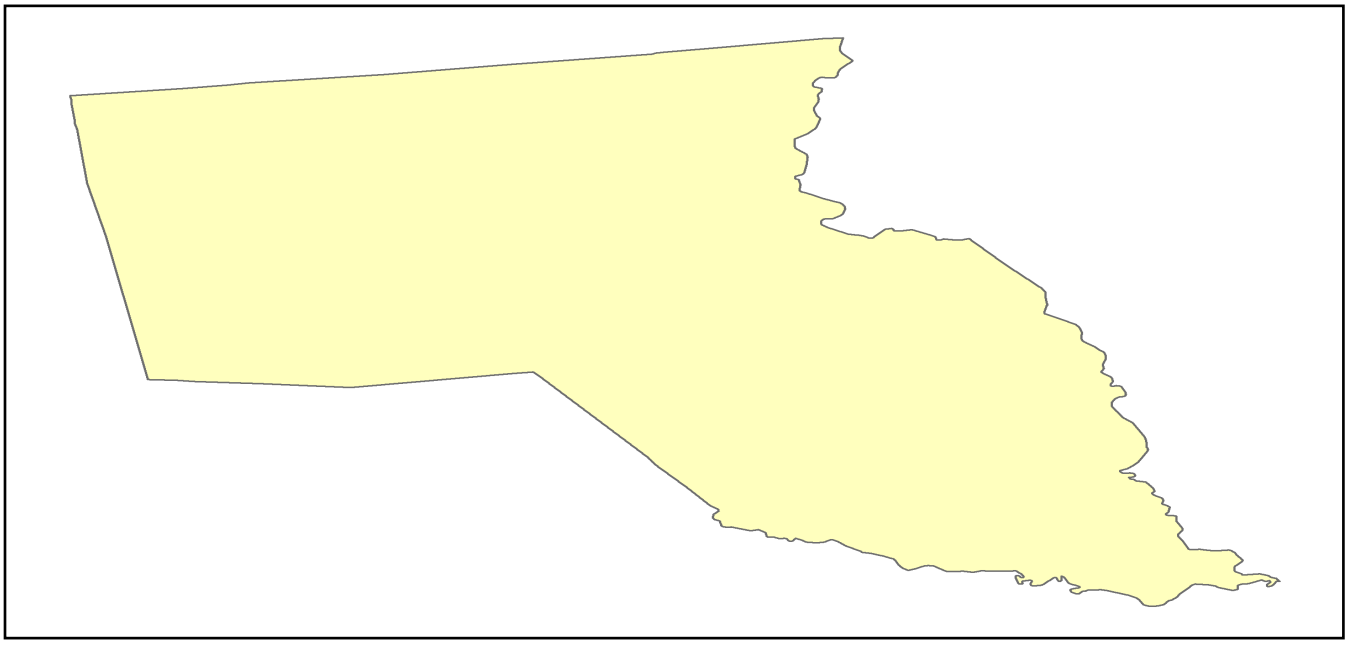
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	25	38.1236
	Segments	22	544.3843
	Tunnels	0	0.0000
		Subtotal	**582.5079**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	7	82.4883
	Tunnels	0	0.0000
		Subtotal	**82.4883**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**665.00**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	4.7839
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**4.7839**
Waste Water	Distribution Lines	NA	2.8703
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.8703**
Natural Gas	Distribution Lines	NA	1.9135
	Facilities	0	0.0000
	Pipelines	6	253.4291
		Subtotal	**255.3426**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**263.00**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 882 buildings will be at least moderately damaged. This is over 17.00 % of the buildings in the region. There are an estimated 80 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

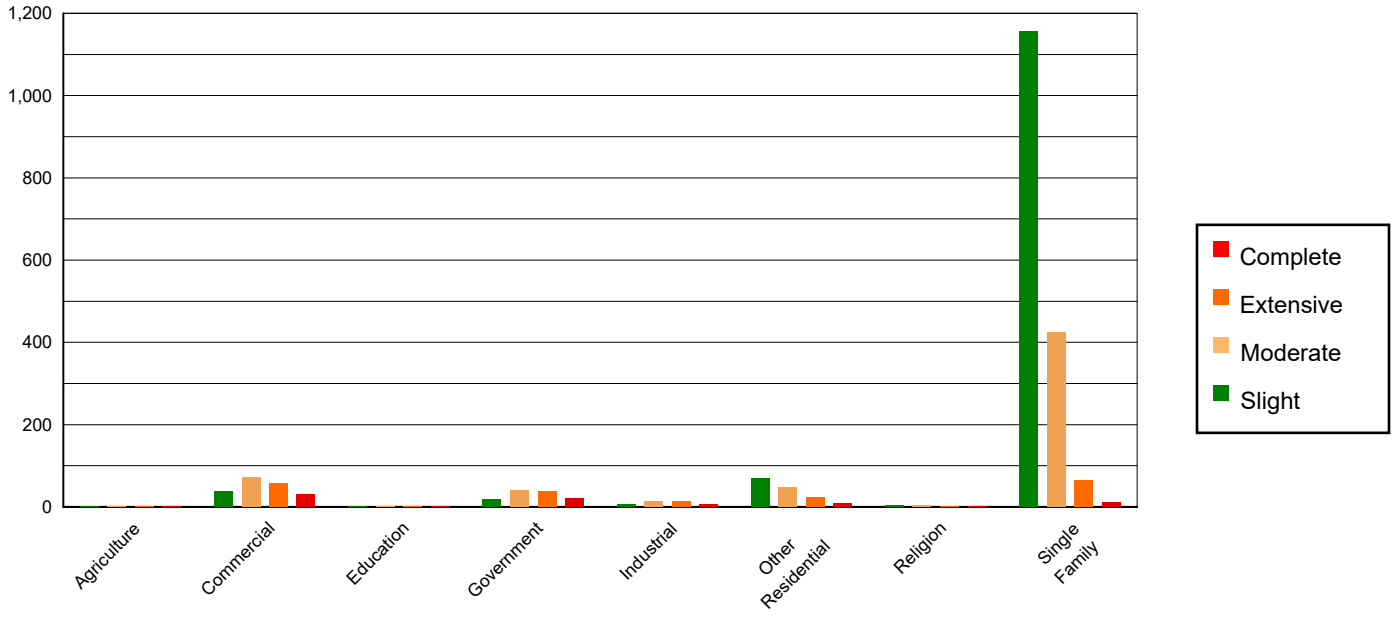


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1.38	0.05	1.51	0.12	2.19	0.36	1.26	0.63	0.66	0.82
Commercial	40.23	1.34	38.62	2.99	71.10	11.80	56.78	28.51	31.28	38.82
Education	0.81	0.03	0.77	0.06	1.50	0.25	1.25	0.63	0.67	0.84
Government	18.65	0.62	18.08	1.40	40.16	6.67	37.11	18.63	21.00	26.06
Industrial	5.72	0.19	5.78	0.45	12.97	2.15	12.27	6.16	7.26	9.01
Other Residential	151.88	5.05	70.27	5.43	47.49	7.88	23.45	11.78	8.91	11.06
Religion	6.37	0.21	3.36	0.26	3.30	0.55	2.10	1.05	0.88	1.09
Single Family	2780.22	92.51	1155.21	89.30	423.73	70.34	64.94	32.61	9.90	12.29
Total	**3,005**		**1,294**		**602**		**199**		**81**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2854.38	94.98	1180.38	91.25	419.01	69.55	51.76	25.99	4.15	5.15
Steel	18.30	0.61	22.35	1.73	69.27	11.50	76.13	38.23	48.55	60.25
Concrete	3.30	0.11	3.86	0.30	12.38	2.05	13.46	6.76	7.62	9.45
Precast	2.13	0.07	1.51	0.12	4.03	0.67	4.48	2.25	1.96	2.43
RM	16.74	0.56	7.89	0.61	16.76	2.78	14.31	7.19	3.90	4.84
URM	110.42	3.67	77.60	6.00	80.98	13.44	39.01	19.59	14.40	17.87
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**3,005**		**1,294**		**602**		**199**		**81**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	4	0	0	1
EOCs	1	0	0	0
PoliceStations	1	0	0	0
FireStations	4	0	0	2

Transportation Lifeline Damage

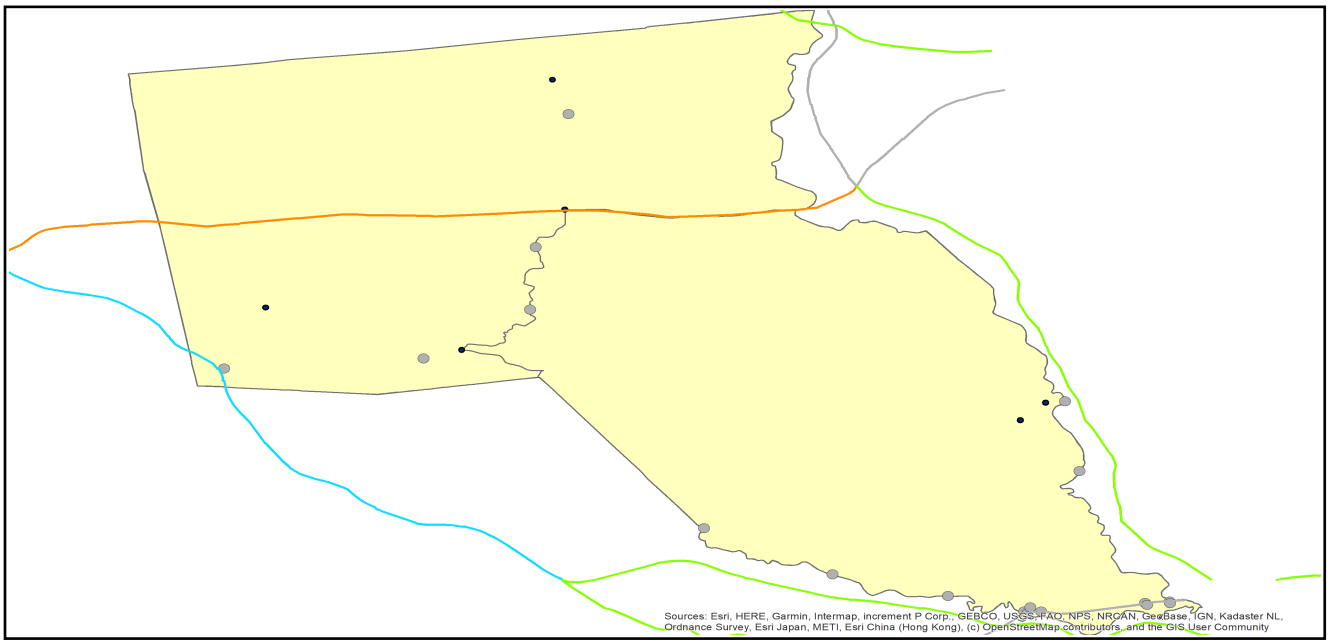


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	22	0	0	15	15
	Bridges	25	4	0	21	23
	Tunnels	0	0	0	0	0
Railways	Segments	7	0	0	6	6
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	149	0	0
Waste Water	89	0	0
Natural Gas	25	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

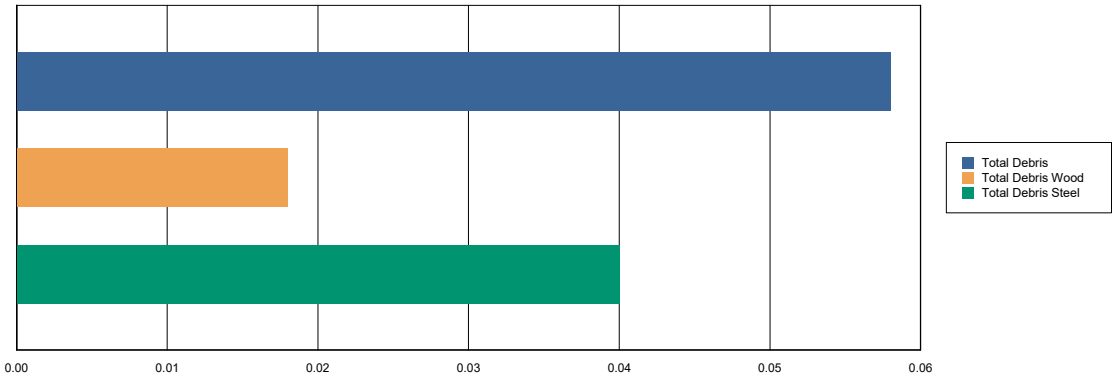
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 58,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 31.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 2,320 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



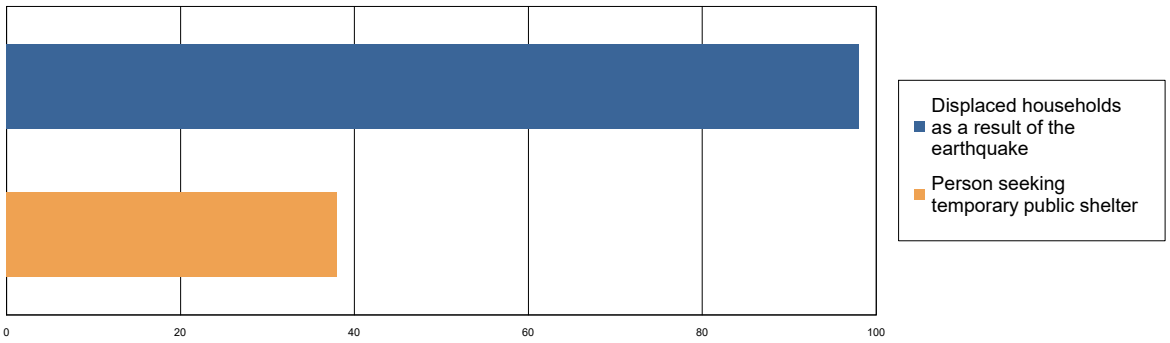
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.02	0.04	0.06	2,320 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 98 households to be displaced due to the earthquake. Of these, 38 people (out of a total population of 12,235) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
98	38

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.03	0.28	0.04	0.08
	Commuting	0.00	0.01	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.48	0.13	0.02	0.04
	Other-Residential	7.55	1.96	0.30	0.60
	Single Family	9.23	1.50	0.16	0.30
	Total	**18**	**4**	**1**	**1**
2 PM	Commercial	70.53	19.07	2.78	5.39
	Commuting	0.03	0.05	0.08	0.02
	Educational	21.23	5.94	0.93	1.82
	Hotels	0.00	0.00	0.00	0.00
	Industrial	3.54	0.98	0.15	0.29
	Other-Residential	2.02	0.53	0.08	0.16
	Single Family	2.43	0.41	0.05	0.08
	Total	**100**	**27**	**4**	**8**
5 PM	Commercial	54.56	14.74	2.18	4.14
	Commuting	0.79	1.14	1.82	0.36
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.21	0.61	0.09	0.18
	Other-Residential	2.97	0.77	0.12	0.23
	Single Family	3.61	0.61	0.07	0.12
	Total	**64**	**18**	**4**	**5**

Economic Loss

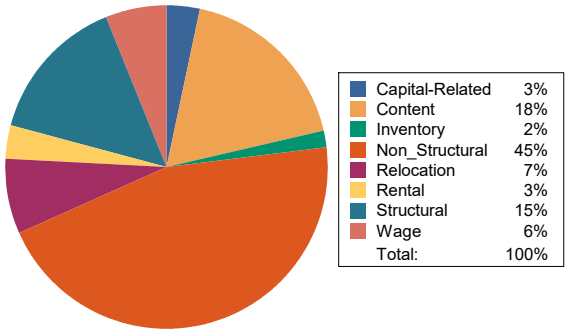
The total economic loss estimated for the earthquake is 299.06 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 293.71 (millions of dollars); 20 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 30 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

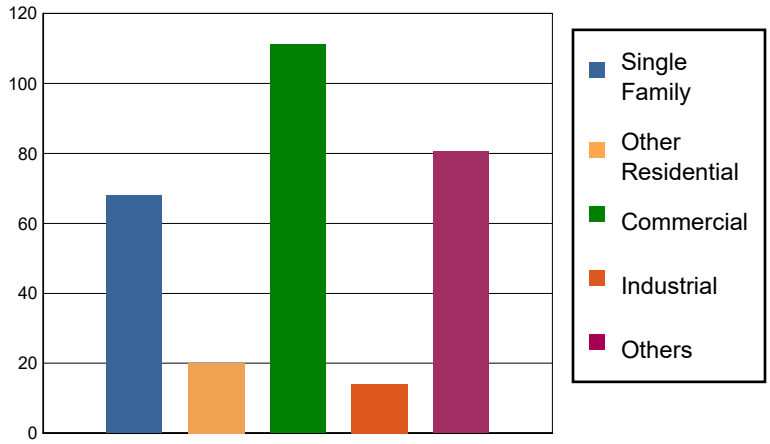


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.2671	12.8931	0.2796	3.8342	18.2740
	Capital-Related	0.0000	0.5392	8.9590	0.1807	0.4372	10.1161
	Rental	1.0544	1.8261	4.4029	0.0956	2.2251	9.6041
	Relocation	3.8376	1.0691	7.1101	0.4431	9.4221	21.8820
	Subtotal	**4.8920**	**4.7015**	**33.3651**	**0.9990**	**15.9186**	**59.8762**
Capital Stock Losses							
	Structural	8.3275	2.2565	17.1509	2.2547	12.8968	42.8864
	Non_Structural	40.1088	10.6158	38.8089	6.6395	37.2799	133.4529
	Content	14.6111	2.4391	17.6418	3.6037	14.2357	52.5314
	Inventory	0.0000	0.0000	4.1403	0.5830	0.2433	4.9666
	Subtotal	**63.0474**	**15.3114**	**77.7419**	**13.0809**	**64.6557**	**233.8373**
	Total	**67.94**	**20.01**	**111.11**	**14.08**	**80.57**	**293.71**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	544.3843	0.0000	0.00
	Bridges	38.1236	5.3440	14.02
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**582.5079**	**5.3440**	
Railways	Segments	82.4883	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**82.4883**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**665.00**	**5.34**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	4.7839	0.0000	0.00
	Subtotal	**4.7839**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.8703	0.0000	0.00
	Subtotal	**2.8703**	**0.0000**	
Natural Gas	Pipelines	253.4291	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.9135	0.0000	0.00
	Subtotal	**255.3426**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**263.00**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	12,235	1,633	526	2,160
Total Region		**12,235**	**1,633**	**526**	**2,160**

Hazus: Earthquake Global Risk Report

Region Name: East_Granby_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 17.66 square miles and contains 2 census tracts. There are over 2 thousand households in the region which has a total population of 5,214 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,622 (millions of dollars). Approximately 85.00 % of the buildings (and 49.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,446 and 5 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 2 thousand buildings in the region which have an aggregate total replacement value of 1,622 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 83% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,451.00 (millions of dollars). This inventory includes over 55.92 miles of highways, 7 bridges, 155.34 miles of pipes.

Table 1: Transportation System Lifeline Inventory

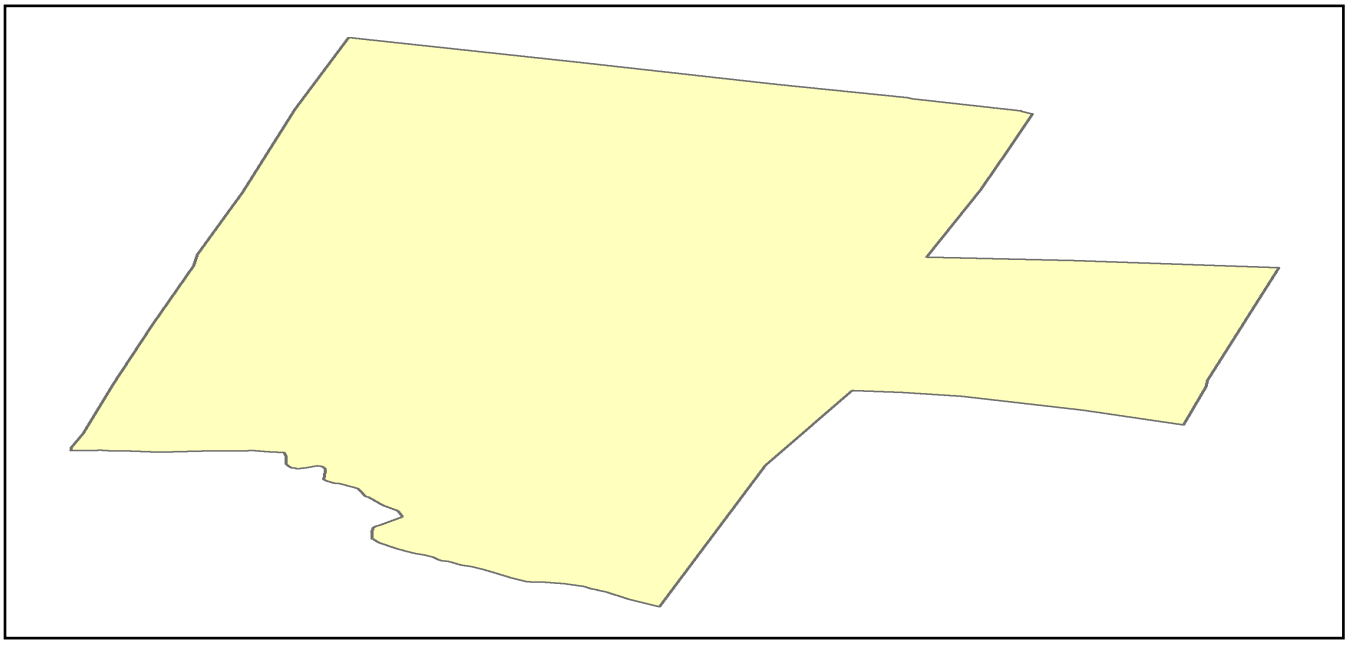
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	7	28.9596
	Segments	24	525.1198
	Tunnels	0	0.0000
		Subtotal	**554.0794**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	8	892.5414
	Tunnels	0	0.0000
		Subtotal	**892.5414**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**1,446.60**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	2.5013
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.5013**
Waste Water	Distribution Lines	NA	1.5008
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.5008**
Natural Gas	Distribution Lines	NA	1.0005
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.0005**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**5.00**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 146 buildings will be at least moderately damaged. This is over 6.00 % of the buildings in the region. There are an estimated 3 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

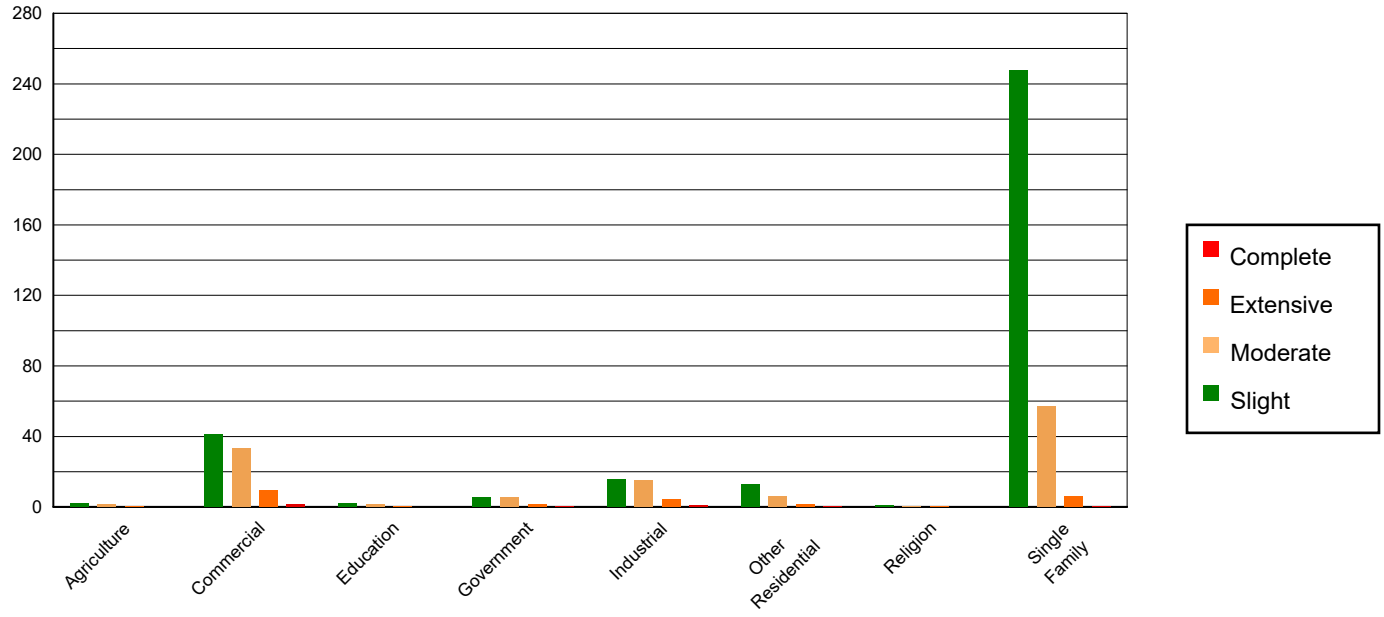


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	6.22	0.33	2.07	0.63	1.31	1.09	0.36	1.52	0.05	1.41
Commercial	127.73	6.86	41.13	12.55	33.42	27.85	9.21	39.36	1.51	45.24
Education	6.11	0.33	1.88	0.57	1.55	1.29	0.39	1.66	0.07	2.15
Government	16.54	0.89	5.54	1.69	5.22	4.35	1.44	6.14	0.26	7.86
Industrial	48.14	2.59	15.86	4.84	14.94	12.45	4.37	18.70	0.69	20.75
Other Residential	66.97	3.60	12.57	3.84	5.99	4.99	1.31	5.60	0.17	5.22
Religion	4.22	0.23	0.96	0.29	0.63	0.52	0.17	0.71	0.03	0.77
Single Family	1584.77	85.17	247.59	75.58	56.94	47.45	6.15	26.30	0.56	16.60
Total	**1,861**		**328**		**120**		**23**		**3**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1624.10	87.29	253.46	77.37	52.12	43.43	3.49	14.91	0.01	0.37
Steel	88.07	4.73	32.72	9.99	35.79	29.82	10.63	45.45	1.94	58.06
Concrete	14.17	0.76	4.79	1.46	5.08	4.23	1.09	4.67	0.14	4.10
Precast	6.36	0.34	1.59	0.49	1.92	1.60	0.76	3.24	0.03	0.95
RM	25.19	1.35	4.09	1.25	4.02	3.35	1.21	5.18	0.02	0.49
URM	102.80	5.52	30.93	9.44	21.08	17.56	6.21	26.56	1.21	36.03
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1,861**		**328**		**120**		**23**		**3**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	4	0	0	4
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	3	0	0	3

Transportation Lifeline Damage

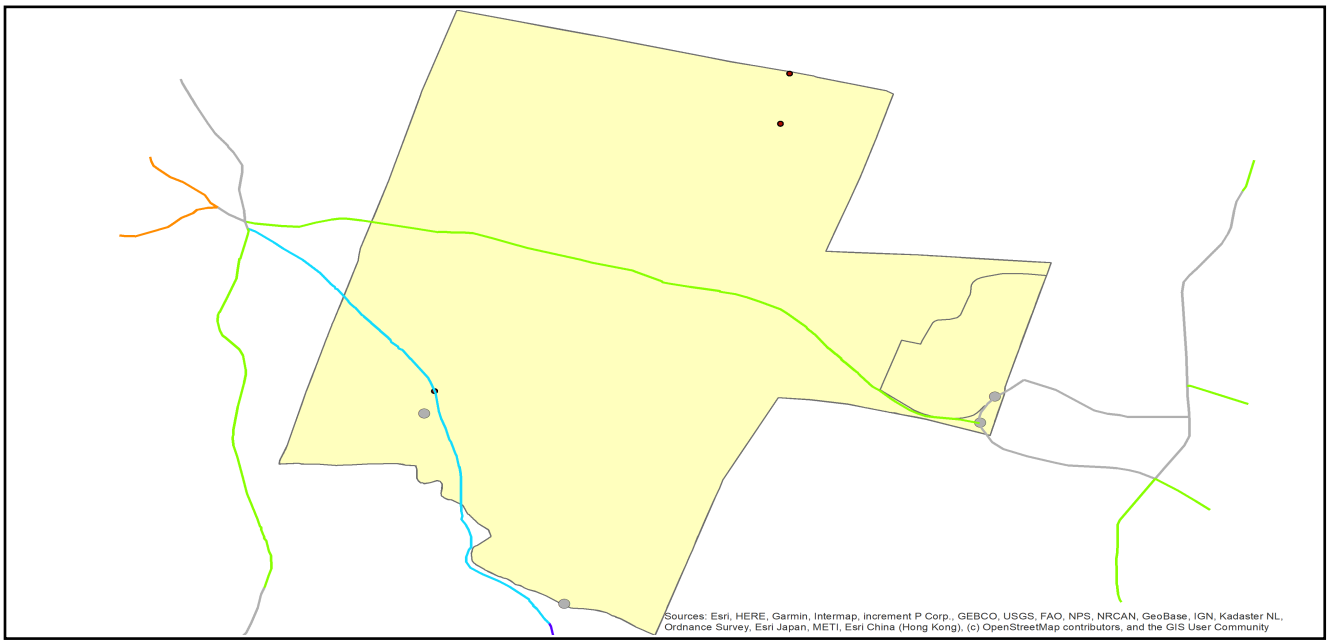


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	24	0	0	15	15
	Bridges	7	0	0	7	7
	Tunnels	0	0	0	0	0
Railways	Segments	8	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	78	0	0
Waste Water	47	0	0
Natural Gas	31	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

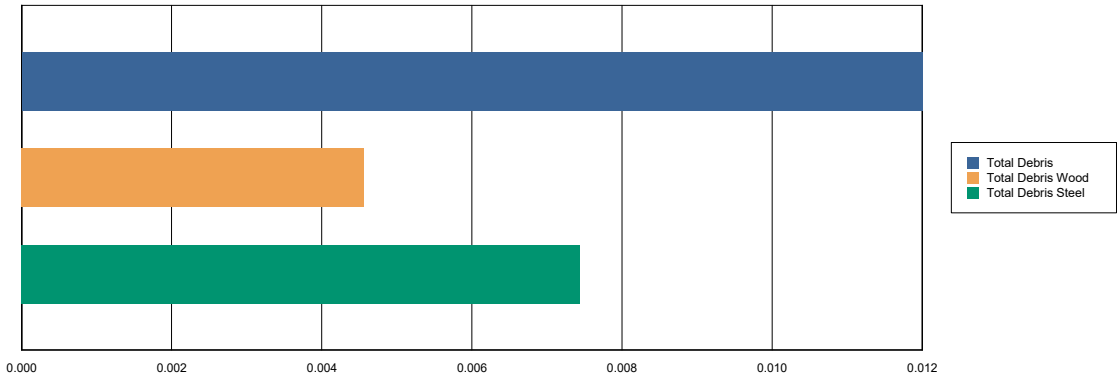
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 12,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 38.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 480 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



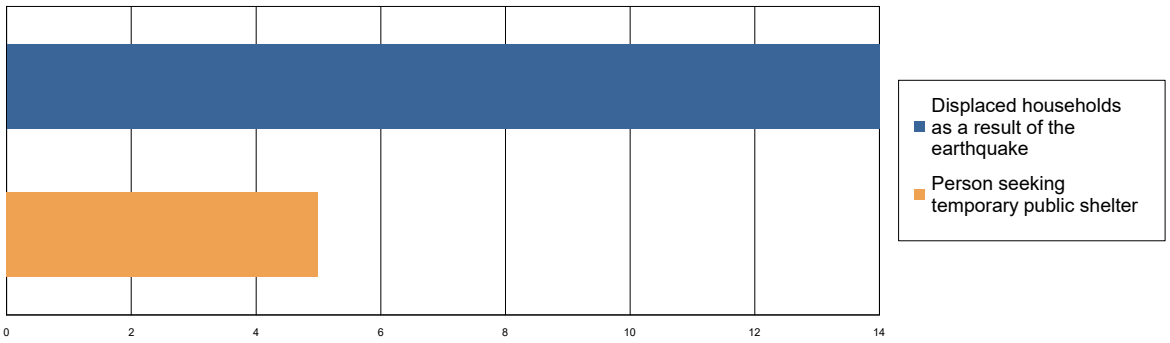
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.00	0.01	0.01	480 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 14 households to be displaced due to the earthquake. Of these, 5 people (out of a total population of 5,214) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
14	5

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.11	0.02	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.43	0.08	0.01	0.02
	Other-Residential	0.29	0.05	0.01	0.01
	Single Family	1.11	0.13	0.01	0.02
	Total	**2**	**0**	**0**	**0**
2 PM	Commercial	6.34	1.20	0.14	0.27
	Commuting	0.00	0.00	0.00	0.00
	Educational	1.09	0.21	0.03	0.05
	Hotels	0.00	0.00	0.00	0.00
	Industrial	3.16	0.62	0.07	0.14
	Other-Residential	0.08	0.01	0.00	0.00
	Single Family	0.29	0.04	0.00	0.01
	Total	**11**	**2**	**0**	**0**
5 PM	Commercial	3.94	0.75	0.09	0.16
	Commuting	0.00	0.01	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.98	0.38	0.04	0.09
	Other-Residential	0.12	0.02	0.00	0.00
	Single Family	0.43	0.05	0.00	0.01
	Total	**6**	**1**	**0**	**0**

Economic Loss

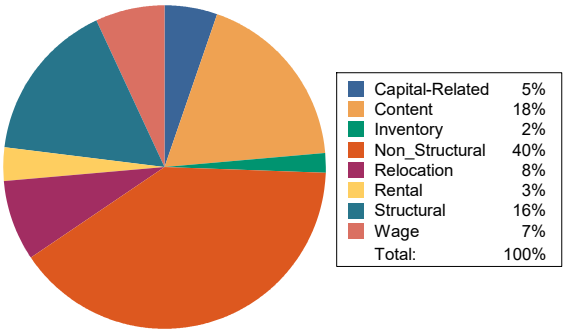
The total economic loss estimated for the earthquake is 61.47 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 61.04 (millions of dollars); 24 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 19 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

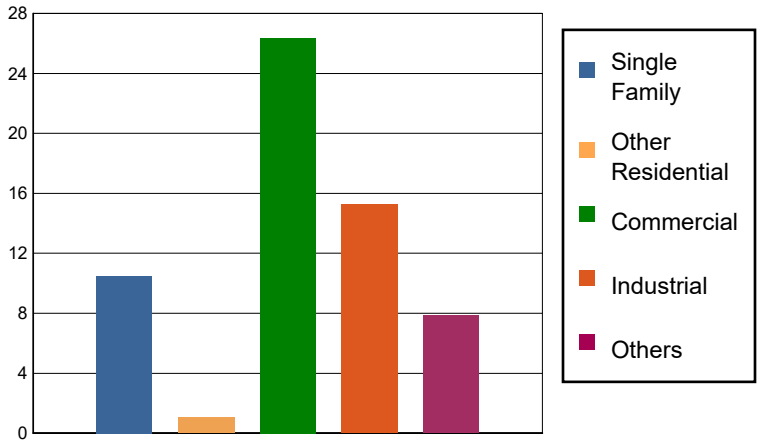


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0000	3.5270	0.3000	0.4917	4.3187
	Capital-Related	0.0000	0.0000	2.9295	0.2257	0.0462	3.2014
	Rental	0.1473	0.0934	1.4257	0.1807	0.2820	2.1291
	Relocation	0.5196	0.0731	2.2240	0.8339	1.1787	4.8293
	Subtotal	**0.6669**	**0.1665**	**10.1062**	**1.5403**	**1.9986**	**14.4785**
Capital Stock Losses							
	Structural	1.3329	0.1262	4.1306	2.8106	1.3346	9.7349
	Non_Structural	6.3518	0.6156	7.9228	6.3409	3.1647	24.3958
	Content	2.1420	0.1545	3.5503	4.0204	1.2953	11.1625
	Inventory	0.0000	0.0000	0.6591	0.5674	0.0381	1.2646
	Subtotal	**9.8267**	**0.8963**	**16.2628**	**13.7393**	**5.8327**	**46.5578**
	Total	**10.49**	**1.06**	**26.37**	**15.28**	**7.83**	**61.04**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	525.1198	0.0000	0.00
	Bridges	28.9596	0.4318	1.49
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**554.0794**	**0.4318**	
Railways	Segments	892.5414	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**892.5414**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**1,446.62**	**0.43**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.5013	0.0000	0.00
	Subtotal	**2.5013**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.5008	0.0000	0.00
	Subtotal	**1.5008**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.0005	0.0000	0.00
	Subtotal	**1.0005**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**5.00**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	5,214	790	832	1,622
Total Region		**5,214**	**790**	**832**	**1,622**

Hazus: Earthquake Global Risk Report

Region Name: East_Hartford_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.74 square miles and contains 14 census tracts. There are over 20 thousand households in the region which has a total population of 51,045 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 13 thousand buildings in the region with a total building replacement value (excluding contents) of 8,591 (millions of dollars). Approximately 89.00 % of the buildings (and 54.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 6,053 and 213 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 13 thousand buildings in the region which have an aggregate total replacement value of 8,591 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 80% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 20 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 6,266.00 (millions of dollars). This inventory includes over 116.20 miles of highways, 63 bridges, 444.28 miles of pipes.

Table 1: Transportation System Lifeline Inventory

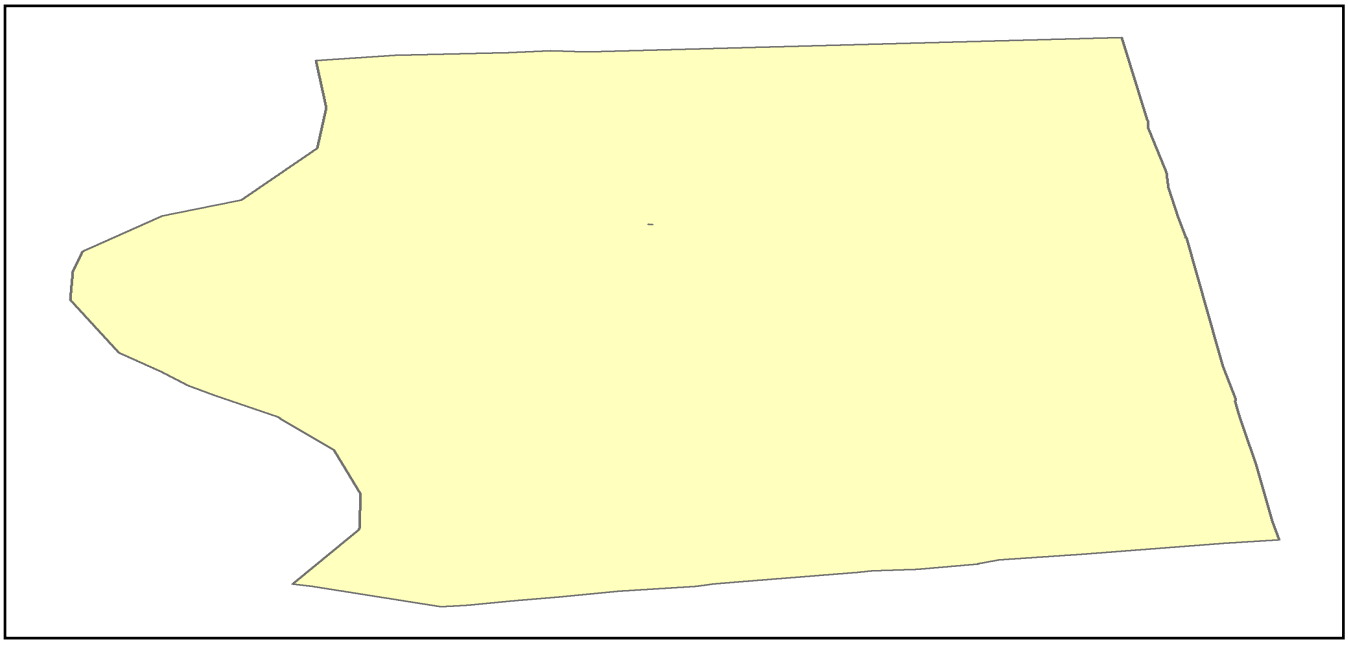
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	63	485.0006
	Segments	150	1467.0571
	Tunnels	0	0.0000
		Subtotal	**1952.0577**
Railways	Bridges	2	10.4200
	Facilities	1	2.6630
	Segments	61	4084.5282
	Tunnels	0	0.0000
		Subtotal	**4097.6112**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	1	3.4902
		Subtotal	**3.4902**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**6,053.20**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	7.1524
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**7.1524**
Waste Water	Distribution Lines	NA	4.2915
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**161.7377**
Natural Gas	Distribution Lines	NA	2.8610
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.8610**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	2	42.1355
		Subtotal	**42.1355**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**213.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 2,430 buildings will be at least moderately damaged. This is over 18.00 % of the buildings in the region. There are an estimated 227 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

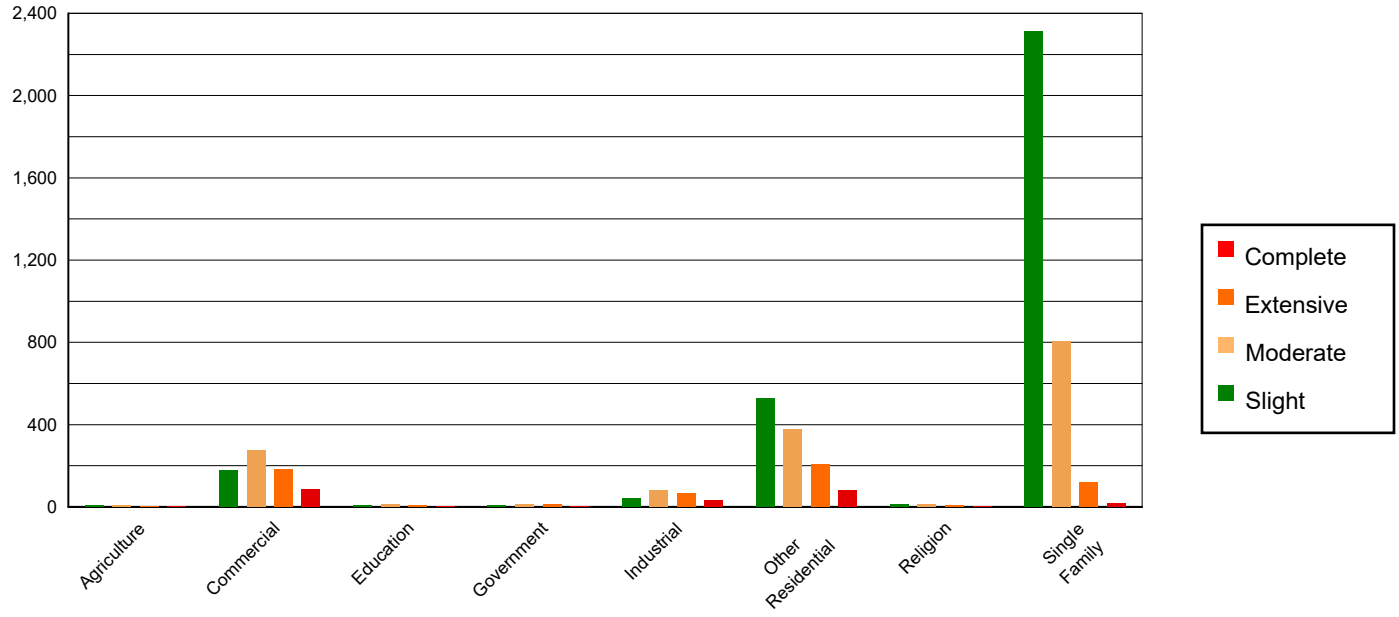


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	7.70	0.10	7.60	0.25	9.84	0.62	5.30	0.87	2.56	1.13
Commercial	219.81	2.86	178.35	5.76	274.62	17.23	184.32	30.23	83.90	36.95
Education	11.24	0.15	8.74	0.28	14.51	0.91	10.04	1.65	4.47	1.97
Government	9.02	0.12	7.53	0.24	14.64	0.92	11.44	1.88	5.37	2.36
Industrial	50.12	0.65	42.37	1.37	82.29	5.16	66.08	10.84	32.14	14.16
Other Residential	1272.92	16.55	526.67	17.00	377.05	23.66	206.18	33.81	79.18	34.87
Religion	30.80	0.40	14.34	0.46	13.54	0.85	7.66	1.26	2.66	1.17
Single Family	6090.84	79.18	2312.68	74.64	807.01	50.64	118.70	19.47	16.77	7.38
Total	**7,692**		**3,098**		**1,593**		**610**		**227**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	6982.75	90.77	2638.05	85.15	894.59	56.14	101.29	16.61	6.37	2.81
Steel	78.41	1.02	82.50	2.66	226.93	14.24	211.53	34.69	113.01	49.78
Concrete	22.71	0.30	22.23	0.72	58.62	3.68	52.40	8.59	24.00	10.57
Precast	9.97	0.13	5.84	0.19	13.05	0.82	12.00	1.97	3.72	1.64
RM	125.25	1.63	48.41	1.56	84.21	5.28	54.02	8.86	6.53	2.87
URM	450.11	5.85	276.62	8.93	267.21	16.77	117.95	19.34	38.74	17.06
MH	23.25	0.30	24.64	0.80	48.88	3.07	60.55	9.93	34.68	15.27
Total	**7,692**		**3,098**		**1,593**		**610**		**227**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	20	0	0	0
EOCs	1	0	0	0
PoliceStations	1	0	0	0
FireStations	5	0	0	0

Transportation Lifeline Damage

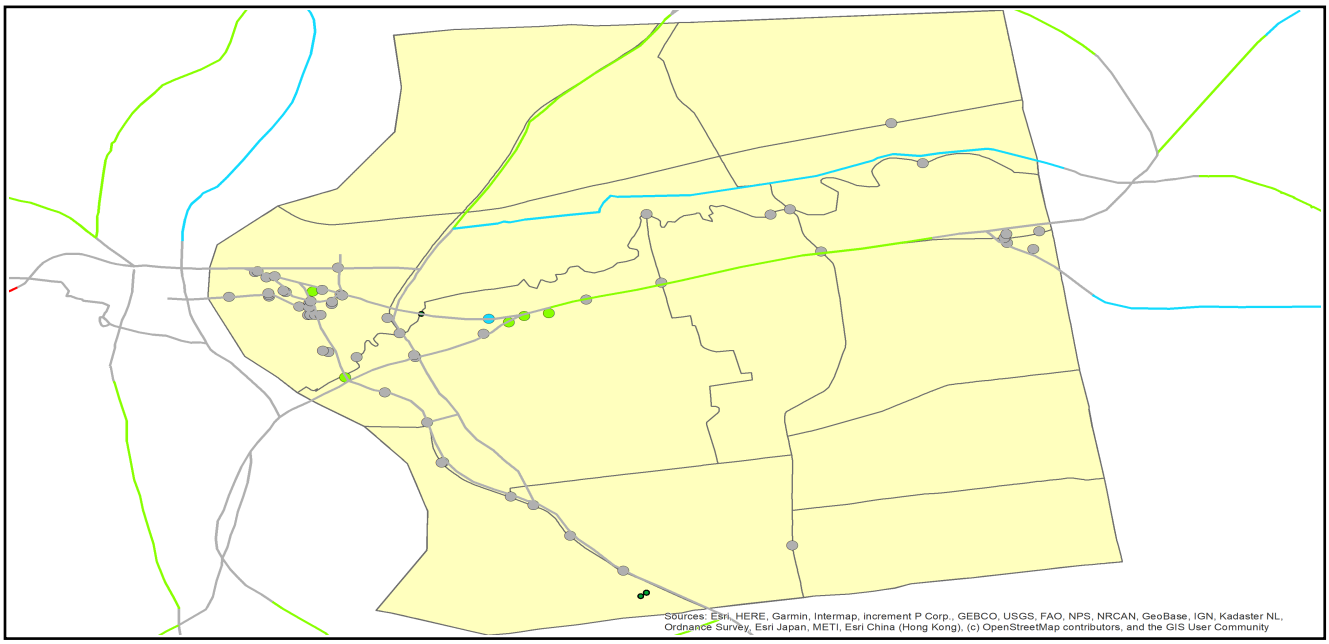


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	150	0	0	133	133
	Bridges	63	3	1	60	62
	Tunnels	0	0	0	0	0
Railways	Segments	61	0	0	61	61
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	1	0	0	1	1
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	2	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	222	0	0
Waste Water	133	0	0
Natural Gas	89	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

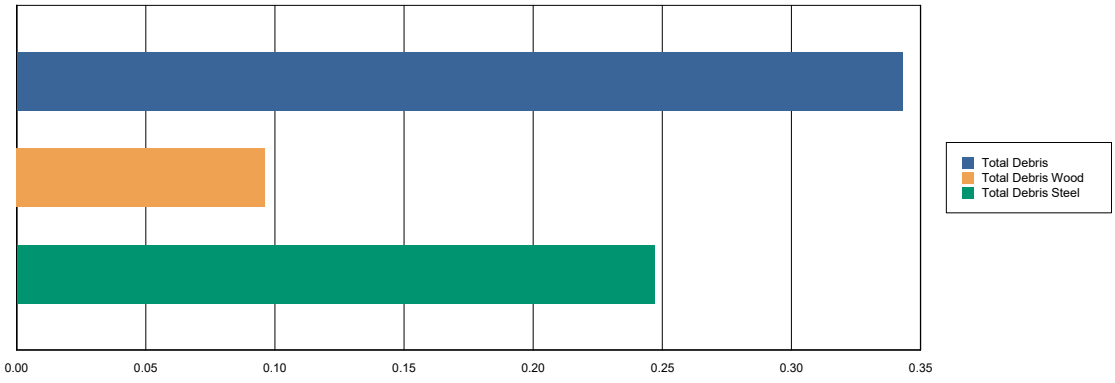
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 343,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 28.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 13,720 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



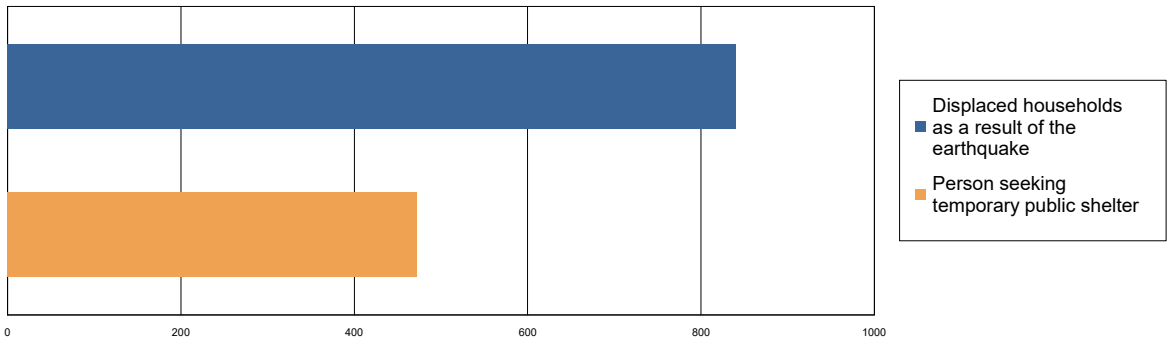
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.10	0.25	0.34	13,720 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 840 households to be displaced due to the earthquake. Of these, 472 people (out of a total population of 51,045) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
840	472

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.97	0.51	0.07	0.14
	Commuting	0.00	0.01	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.27	0.07	0.01	0.02
	Industrial	4.75	1.26	0.18	0.36
	Other-Residential	95.35	23.94	3.51	6.90
	Single Family	21.39	3.35	0.34	0.65
	Total	**124**	**29**	**4**	**8**
2 PM	Commercial	148.03	38.25	5.40	10.44
	Commuting	0.03	0.05	0.08	0.02
	Educational	121.82	33.33	5.21	10.13
	Hotels	0.05	0.01	0.00	0.00
	Industrial	35.05	9.32	1.36	2.63
	Other-Residential	25.26	6.36	0.95	1.80
	Single Family	5.67	0.92	0.10	0.18
	Total	**336**	**88**	**13**	**25**
5 PM	Commercial	122.99	31.82	4.56	8.62
	Commuting	0.65	1.11	1.58	0.32
	Educational	22.97	6.43	1.03	1.99
	Hotels	0.08	0.02	0.00	0.01
	Industrial	21.90	5.82	0.85	1.65
	Other-Residential	37.20	9.37	1.40	2.66
	Single Family	8.36	1.36	0.15	0.27
	Total	**214**	**56**	**10**	**16**

Economic Loss

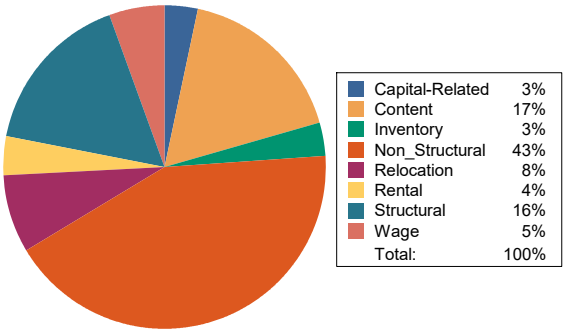
The total economic loss estimated for the earthquake is 1,426.69 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 1,404.84 (millions of dollars); 20 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 22 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

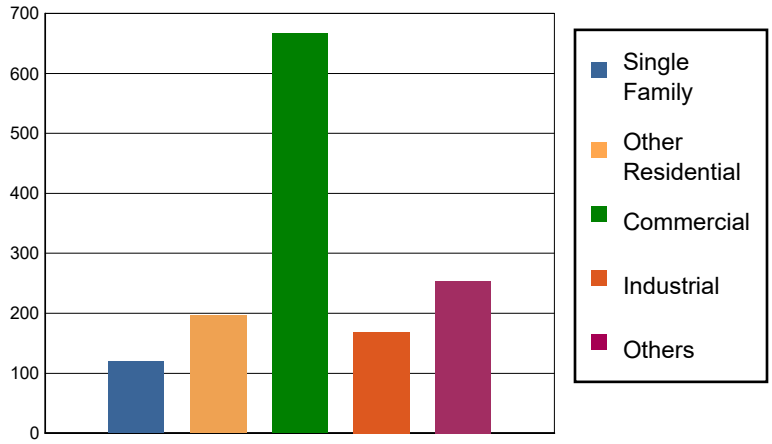


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	7.9144	55.5054	4.5377	9.1625	77.1200
	Capital-Related	0.0000	3.3645	37.6849	2.6955	2.4083	46.1532
	Rental	2.0587	15.1409	32.1710	0.9912	5.0684	55.4302
	Relocation	7.4811	7.3242	51.8946	4.6521	35.5789	106.9309
	Subtotal	**9.5398**	**33.7440**	**177.2559**	**12.8765**	**52.2181**	**285.6343**
Capital Stock Losses							
	Structural	14.4229	28.4706	122.3304	27.4929	38.5639	231.2807
	Non_Structural	70.1138	109.3745	228.7805	75.3085	116.1306	599.7079
	Content	25.6438	24.0900	100.9452	44.8537	46.1895	241.7222
	Inventory	0.0000	0.0000	37.7777	7.9145	0.8045	46.4967
	Subtotal	**110.1805**	**161.9351**	**489.8338**	**155.5696**	**201.6885**	**1119.2075**
	Total	**119.72**	**195.68**	**667.09**	**168.45**	**253.91**	**1404.84**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1467.0571	0.0000	0.00
	Bridges	485.0006	20.6816	4.26
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1952.0577**	**20.6816**	
Railways	Segments	4084.5282	0.0000	0.00
	Bridges	10.4200	0.1079	1.04
	Tunnels	0.0000	0.0000	0.00
	Facilities	2.6630	0.4260	16.00
	Subtotal	**4097.6112**	**0.5339**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	3.4902	0.6279	17.99
	Subtotal	**3.4902**	**0.6279**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**6,053.16**	**21.84**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	7.1524	0.0000	0.00
	Subtotal	**7.1524**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	4.2915	0.0000	0.00
	Subtotal	**161.7377**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.8610	0.0000	0.00
	Subtotal	**2.8610**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	42.1355	0.0000	0.00
	Subtotal	**42.1355**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**213.89**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	51,045	4,680	3,910	8,591
Total Region		**51,045**	**4,680**	**3,910**	**8,591**

Hazus: Earthquake Global Risk Report

Region Name: East_Windsor_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.82 square miles and contains 2 census tracts. There are over 4 thousand households in the region which has a total population of 11,190 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,843 (millions of dollars). Approximately 82.00 % of the buildings (and 48.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,365 and 451 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 2,843 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 73% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,816.00 (millions of dollars). This inventory includes over 50.33 miles of highways, 11 bridges, 213.75 miles of pipes.

Table 1: Transportation System Lifeline Inventory

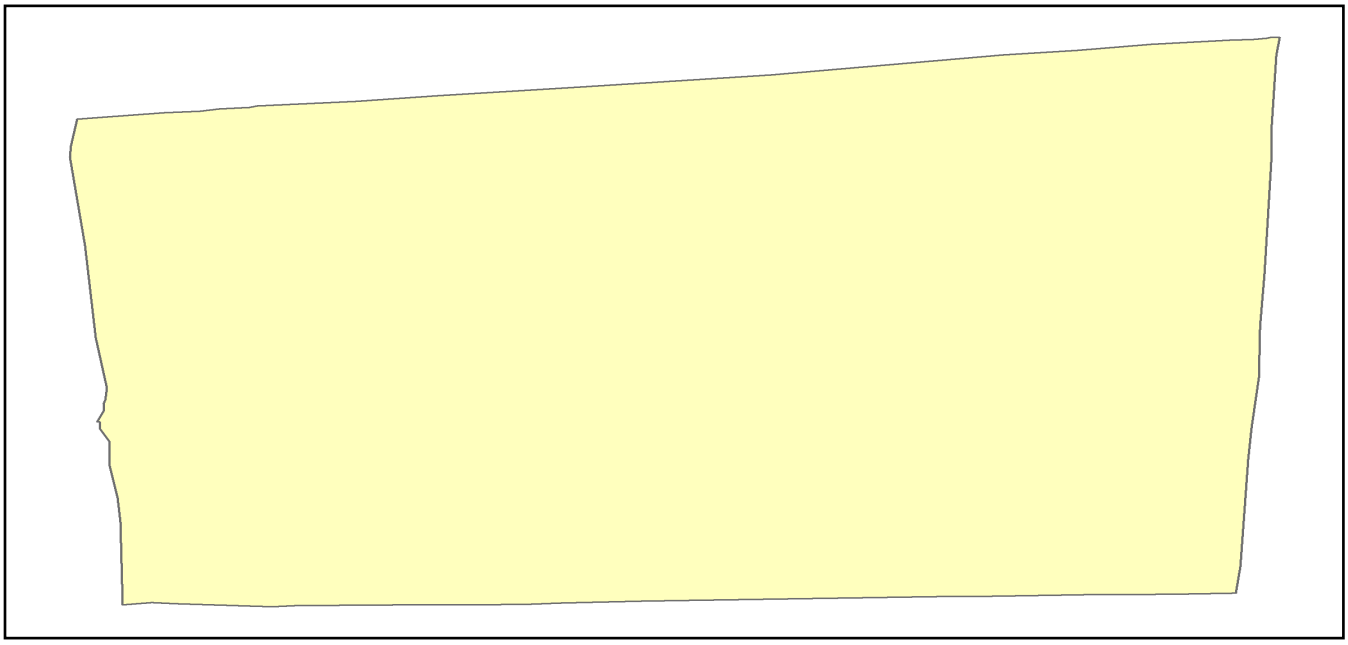
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	11	32.4893
	Segments	38	579.4049
	Tunnels	0	0.0000
		Subtotal	**611.8942**
Railways	Bridges	3	15.6300
	Facilities	0	0.0000
	Segments	13	1735.3406
	Tunnels	0	0.0000
		Subtotal	**1750.9706**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	1	2.8289
		Subtotal	**2.8289**
		Total	**2,365.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	3.7438
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.7438**
Waste Water	Distribution Lines	NA	2.2463
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**159.6925**
Natural Gas	Distribution Lines	NA	1.4975
	Facilities	0	0.0000
	Pipelines	1	286.3532
		Subtotal	**287.8507**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**451.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 591 buildings will be at least moderately damaged. This is over 14.00 % of the buildings in the region. There are an estimated 33 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

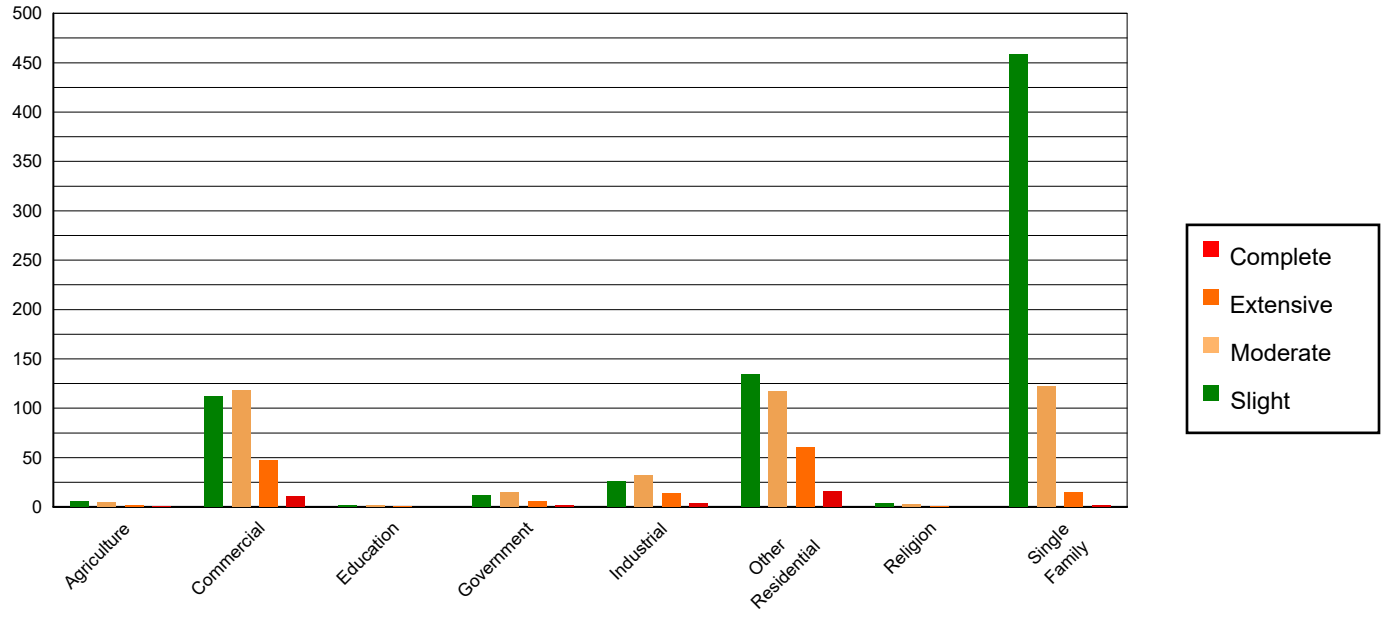


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	10.82	0.38	5.57	0.74	4.54	1.10	1.69	1.16	0.37	1.11
Commercial	240.32	8.37	112.16	14.89	118.39	28.70	47.19	32.40	10.93	32.72
Education	4.14	0.14	1.86	0.25	2.04	0.49	0.77	0.53	0.19	0.57
Government	23.10	0.80	11.29	1.50	14.18	3.44	5.95	4.08	1.48	4.44
Industrial	53.11	1.85	25.48	3.38	31.60	7.66	13.62	9.35	3.18	9.53
Other Residential	453.15	15.78	134.78	17.89	116.81	28.32	60.75	41.71	15.51	46.43
Religion	12.87	0.45	3.87	0.51	2.99	0.72	1.06	0.73	0.22	0.65
Single Family	2073.65	72.22	458.31	60.84	121.91	29.56	14.61	10.03	1.52	4.55
Total	**2,871**		**753**		**412**		**146**		**33**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2379.62	82.88	535.86	71.13	134.93	32.71	10.75	7.38	0.29	0.87
Steel	124.09	4.32	70.27	9.33	108.28	26.25	50.16	34.44	13.14	39.34
Concrete	28.55	0.99	15.00	1.99	23.83	5.78	10.31	7.08	2.57	7.70
Precast	13.11	0.46	4.54	0.60	6.77	1.64	3.52	2.41	0.29	0.85
RM	69.54	2.42	15.61	2.07	18.43	4.47	7.03	4.83	0.20	0.58
URM	211.15	7.35	81.87	10.87	62.43	15.14	21.01	14.43	4.84	14.49
MH	45.11	1.57	30.17	4.01	57.78	14.01	42.85	29.43	12.08	36.16
Total	**2,871**		**753**		**412**		**146**		**33**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	4	0	0	4
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	3	0	0	3

Transportation Lifeline Damage

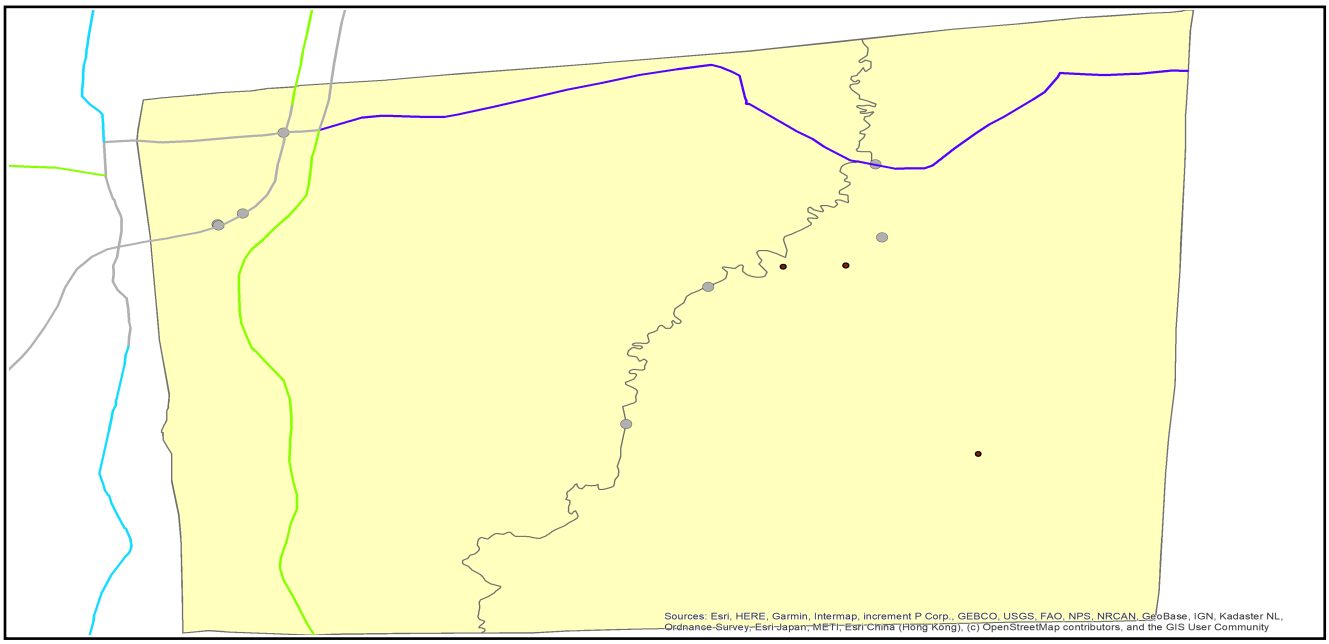


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	38	0	0	38	38
	Bridges	11	0	0	11	11
	Tunnels	0	0	0	0	0
Railways	Segments	13	0	0	6	6
	Bridges	3	0	0	3	3
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	1	0	0	1	1

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	116	0	0
Waste Water	70	0	0
Natural Gas	28	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

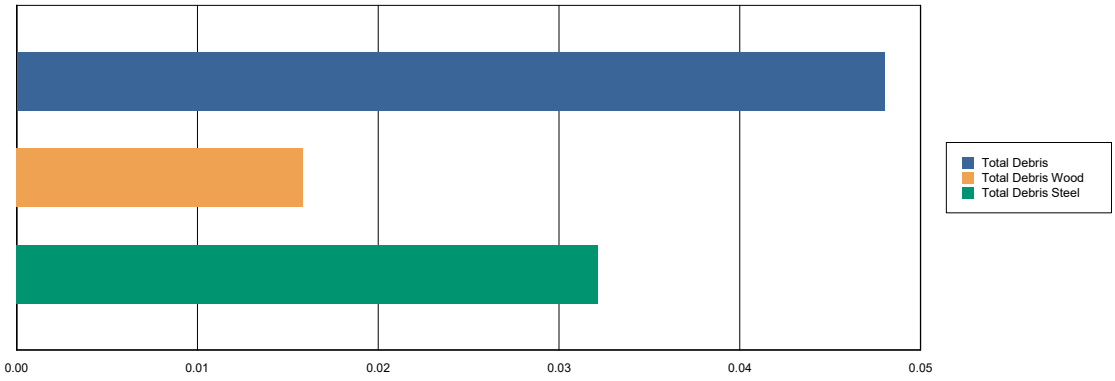
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 48,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 33.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 1,920 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



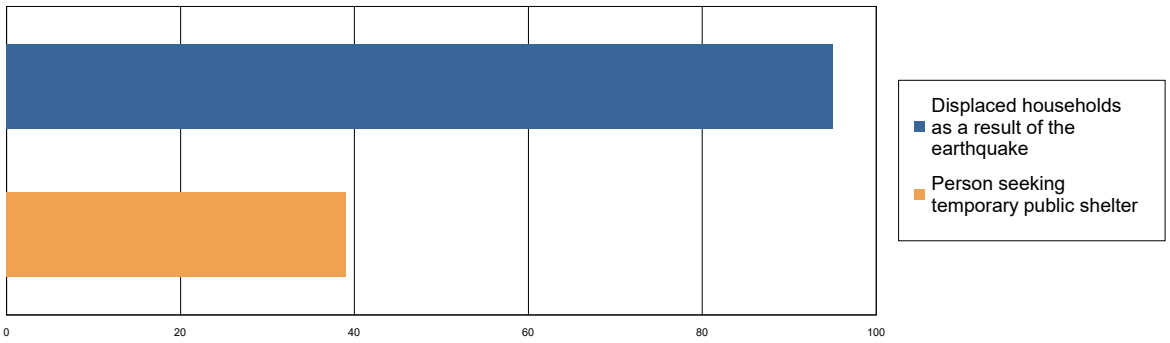
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.02	0.03	0.05	1,920 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 95 households to be displaced due to the earthquake. Of these, 39 people (out of a total population of 11,190) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
95	39

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.43	0.10	0.01	0.02
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.61	0.13	0.02	0.03
	Other-Residential	7.50	1.49	0.16	0.30
	Single Family	2.62	0.34	0.03	0.06
	Total	**11**	**2**	**0**	**0**
2 PM	Commercial	25.42	5.58	0.72	1.40
	Commuting	0.01	0.01	0.02	0.00
	Educational	6.79	1.54	0.21	0.41
	Hotels	0.00	0.00	0.00	0.00
	Industrial	4.48	0.99	0.13	0.25
	Other-Residential	2.45	0.49	0.05	0.10
	Single Family	0.77	0.10	0.01	0.02
	Total	**40**	**9**	**1**	**2**
5 PM	Commercial	16.12	3.55	0.46	0.89
	Commuting	0.20	0.24	0.43	0.08
	Educational	1.40	0.31	0.04	0.08
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.80	0.62	0.08	0.16
	Other-Residential	2.86	0.57	0.06	0.12
	Single Family	1.02	0.14	0.01	0.02
	Total	**24**	**5**	**1**	**1**

Economic Loss

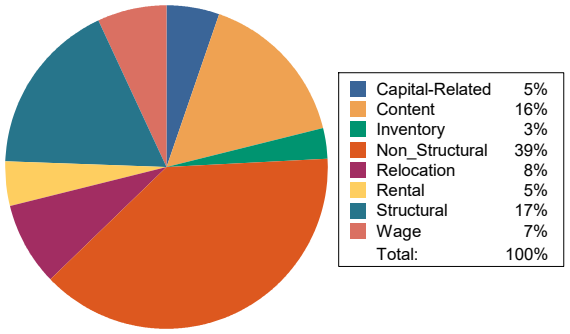
The total economic loss estimated for the earthquake is 211.91 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 210.82 (millions of dollars); 25 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 21 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

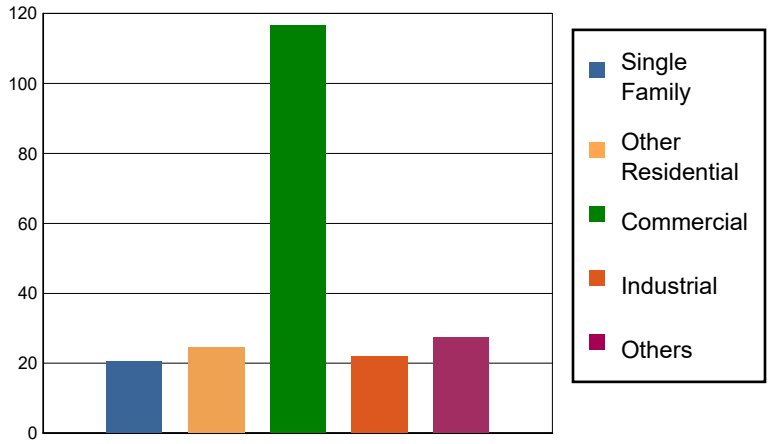


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.9462	10.5169	0.5645	1.4995	14.5271
	Capital-Related	0.0000	0.8281	9.9594	0.3673	0.2173	11.3721
	Rental	0.3175	2.0235	6.4413	0.1731	0.8588	9.8142
	Relocation	1.1352	1.3529	9.9408	0.9272	4.1849	17.5410
	Subtotal	**1.4527**	**6.1507**	**36.8584**	**2.0321**	**6.7605**	**53.2544**
Capital Stock Losses							
	Structural	2.4473	3.1326	22.5552	4.0194	4.5956	36.7501
	Non_Structural	12.2141	12.2911	36.5497	9.2349	11.2463	81.5361
	Content	4.4625	2.8032	15.5852	5.6963	4.5634	33.1106
	Inventory	0.0000	0.0000	4.9929	0.9381	0.2414	6.1724
	Subtotal	**19.1239**	**18.2269**	**79.6830**	**19.8887**	**20.6467**	**157.5692**
	Total	**20.58**	**24.38**	**116.54**	**21.92**	**27.41**	**210.82**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	579.4049	0.0000	0.00
	Bridges	32.4893	1.0170	3.13
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**611.8942**	**1.0170**	
Railways	Segments	1735.3406	0.0000	0.00
	Bridges	15.6300	0.0660	0.42
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1750.9706**	**0.0660**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	2.8289	0.0000	0.00
	Subtotal	**2.8289**	**0.0000**	
	Total	**2,365.69**	**1.08**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.7438	0.0000	0.00
	Subtotal	**3.7438**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	2.2463	0.0000	0.00
	Subtotal	**159.6925**	**0.0000**	
Natural Gas	Pipelines	286.3532	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.4975	0.0000	0.00
	Subtotal	**287.8507**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**451.29**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	11,190	1,367	1,475	2,843
Total Region		**11,190**	**1,367**	**1,475**	**2,843**

Hazus: Earthquake Global Risk Report

Region Name: Ellington_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.59 square miles and contains 3 census tracts. There are over 6 thousand households in the region which has a total population of 16,426 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,421 (millions of dollars). Approximately 90.00 % of the buildings (and 73.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 803 and 9 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 5 thousand buildings in the region which have an aggregate total replacement value of 3,421 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 85% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 5 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 812.00 (millions of dollars). This inventory includes over 73.94 miles of highways, 11 bridges, 292.04 miles of pipes.

Table 1: Transportation System Lifeline Inventory

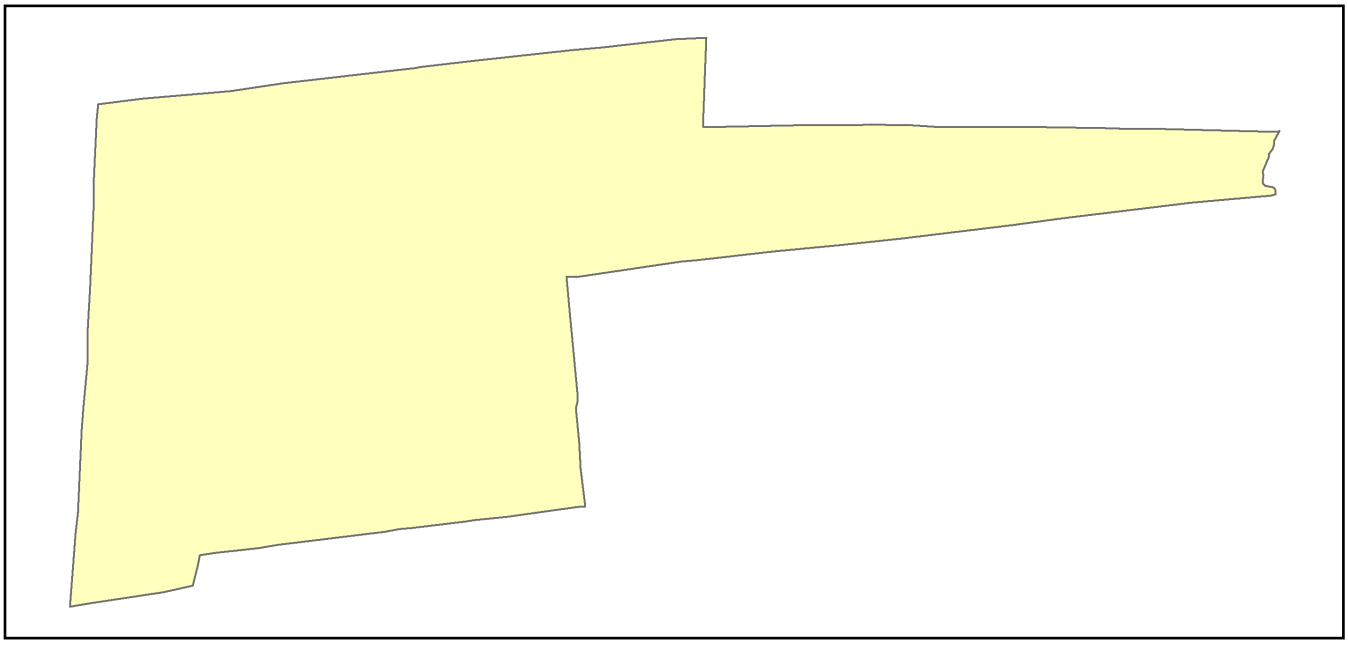
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	11	5.1586
	Segments	31	756.0842
	Tunnels	0	0.0000
		Subtotal	**761.2428**
Railways	Bridges	1	5.2100
	Facilities	0	0.0000
	Segments	5	36.0140
	Tunnels	0	0.0000
		Subtotal	**41.2240**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	1	1.3051
		Subtotal	**1.3051**
		Total	**803.80**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	4.7083
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**4.7083**
Waste Water	Distribution Lines	NA	2.8250
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.8250**
Natural Gas	Distribution Lines	NA	1.8833
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.8833**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	1	0.1150
		Subtotal	**0.1150**
		Total	**9.50**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 551 buildings will be at least moderately damaged. This is over 10.00 % of the buildings in the region. There are an estimated 25 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

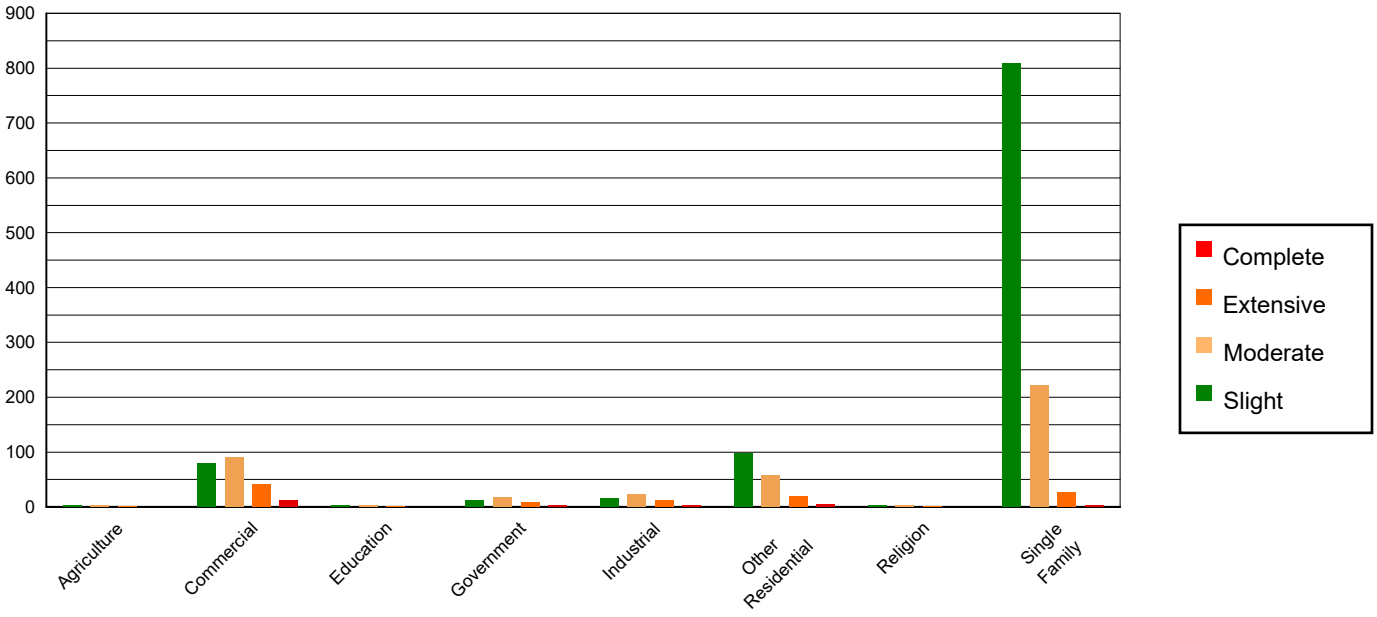


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	5.91	0.15	3.17	0.31	2.65	0.64	1.02	0.92	0.24	0.95
Commercial	148.44	3.71	78.96	7.72	89.63	21.55	41.36	37.44	11.60	45.96
Education	4.51	0.11	2.29	0.22	2.70	0.65	1.17	1.06	0.32	1.29
Government	22.07	0.55	12.39	1.21	17.33	4.17	8.65	7.83	2.55	10.10
Industrial	29.79	0.74	16.32	1.59	22.29	5.36	11.32	10.25	3.28	13.00
Other Residential	344.67	8.61	97.49	9.53	56.74	13.65	18.98	17.18	4.11	16.30
Religion	9.35	0.23	3.04	0.30	2.45	0.59	0.95	0.86	0.21	0.84
Single Family	3438.70	85.89	809.33	79.11	222.02	53.39	27.03	24.46	2.92	11.57
Total	**4,003**		**1,023**		**416**		**110**		**25**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3641.28	90.95	859.39	84.01	220.56	53.04	18.54	16.78	0.51	2.01
Steel	74.75	1.87	49.20	4.81	86.31	20.76	48.08	43.52	15.27	60.50
Concrete	16.05	0.40	9.64	0.94	17.20	4.14	9.12	8.26	2.73	10.84
Precast	6.62	0.17	2.60	0.25	4.32	1.04	2.72	2.46	0.40	1.57
RM	52.55	1.31	13.32	1.30	17.07	4.11	7.27	6.58	0.28	1.12
URM	212.20	5.30	88.83	8.68	70.37	16.92	24.75	22.40	6.05	23.97
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**4,003**		**1,023**		**416**		**110**		**25**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	5	0	0	4
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	2	0	0	2

Transportation Lifeline Damage

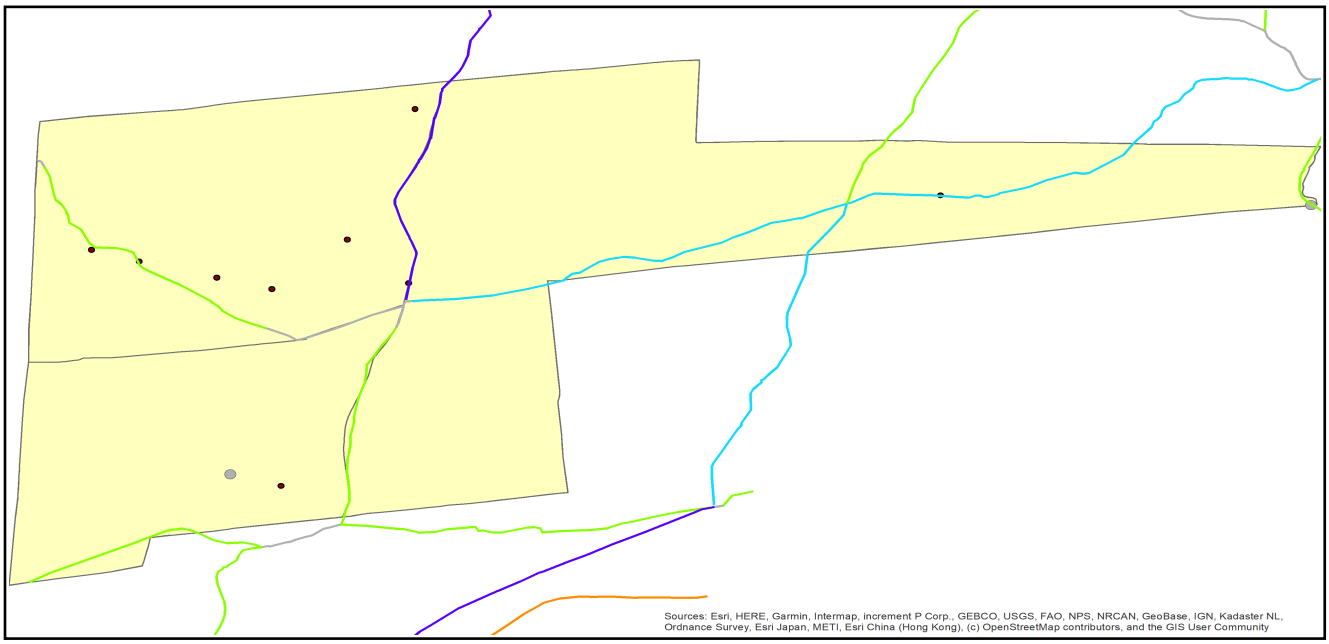


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	31	0	0	31	31
	Bridges	11	0	0	11	11
	Tunnels	0	0	0	0	0
Railways	Segments	5	0	0	5	5
	Bridges	1	0	0	1	1
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	1	0	0	1	1

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	1	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	146	0	0
Waste Water	88	0	0
Natural Gas	59	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

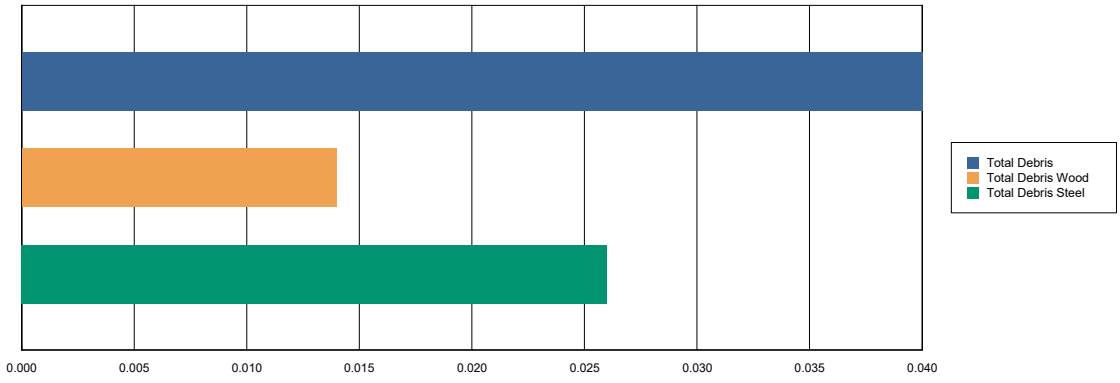
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 40,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 35.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 1,600 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



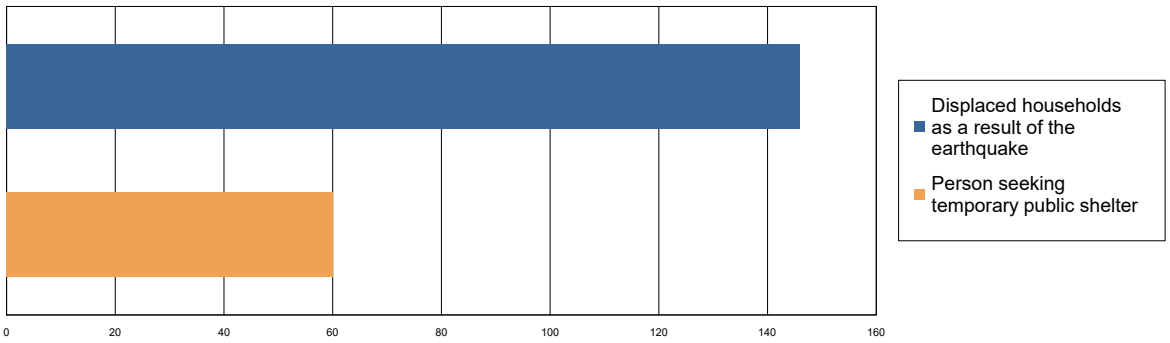
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.03	0.04	1,600 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 146 households to be displaced due to the earthquake. Of these, 60 people (out of a total population of 16,426) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
146	60

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.28	0.06	0.01	0.02
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.43	0.10	0.01	0.03
	Other-Residential	5.92	1.26	0.17	0.33
	Single Family	4.72	0.63	0.06	0.11
	Total	**11**	**2**	**0**	**0**
2 PM	Commercial	19.57	4.45	0.58	1.11
	Commuting	0.00	0.00	0.00	0.00
	Educational	10.99	2.66	0.38	0.75
	Hotels	0.00	0.00	0.00	0.00
	Industrial	3.20	0.76	0.10	0.20
	Other-Residential	1.66	0.36	0.05	0.09
	Single Family	1.21	0.17	0.02	0.03
	Total	**37**	**8**	**1**	**2**
5 PM	Commercial	15.52	3.52	0.46	0.87
	Commuting	0.05	0.07	0.11	0.02
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.00	0.47	0.06	0.12
	Other-Residential	2.33	0.50	0.07	0.13
	Single Family	1.83	0.26	0.02	0.05
	Total	**22**	**5**	**1**	**1**

Economic Loss

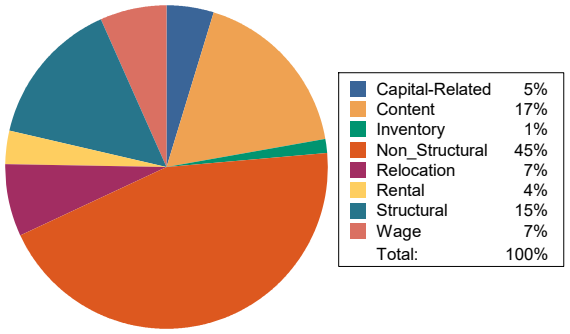
The total economic loss estimated for the earthquake is 206.64 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 206.59 (millions of dollars); 22 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 36 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

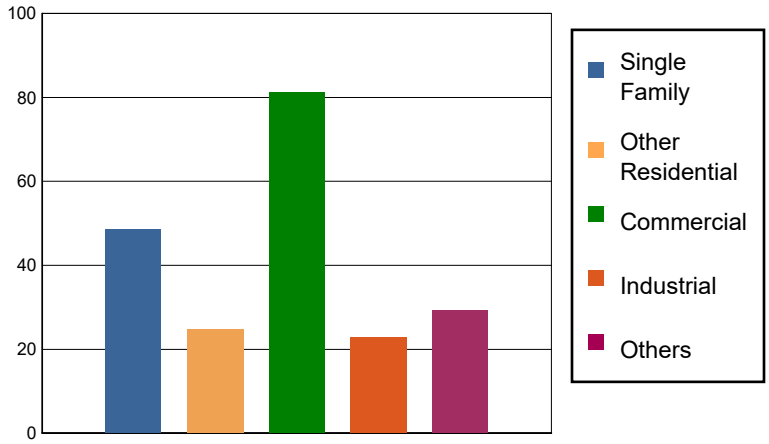


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.4184	10.9751	0.5370	1.8235	13.7540
	Capital-Related	0.0000	0.1781	9.2057	0.3095	0.2041	9.8974
	Rental	0.6449	1.9798	3.9336	0.1742	0.5390	7.2715
	Relocation	2.3118	1.4285	6.0905	1.0690	3.7881	14.6879
	Subtotal	**2.9567**	**4.0048**	**30.2049**	**2.0897**	**6.3547**	**45.6108**
Capital Stock Losses							
	Structural	5.8128	2.9694	12.2235	4.1422	5.0129	30.1608
	Non_Structural	29.1341	14.2263	25.9152	9.8974	12.8344	92.0074
	Content	10.7288	3.5175	11.2664	5.6022	5.0015	36.1164
	Inventory	0.0000	0.0000	1.5997	1.0219	0.0753	2.6969
	Subtotal	**45.6757**	**20.7132**	**51.0048**	**20.6637**	**22.9241**	**160.9815**
	Total	**48.63**	**24.72**	**81.21**	**22.75**	**29.28**	**206.59**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	756.0842	0.0000	0.00
	Bridges	5.1586	0.0262	0.51
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**761.2428**	**0.0262**	
Railways	Segments	36.0140	0.0000	0.00
	Bridges	5.2100	0.0182	0.35
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**41.2240**	**0.0182**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	1.3051	0.0000	0.00
	Subtotal	**1.3051**	**0.0000**	
	Total	**803.77**	**0.04**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	4.7083	0.0000	0.00
	Subtotal	**4.7083**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.8250	0.0000	0.00
	Subtotal	**2.8250**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.8833	0.0000	0.00
	Subtotal	**1.8833**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.1150	0.0000	0.00
	Subtotal	**0.1150**	**0.0000**	
	Total	**9.53**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	16,426	2,487	934	3,421
Total Region		**16,426**	**2,487**	**934**	**3,421**

Hazus: Earthquake Global Risk Report

Region Name: Enfield_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.26 square miles and contains 12 census tracts. There are over 16 thousand households in the region which has a total population of 42,141 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 14 thousand buildings in the region with a total building replacement value (excluding contents) of 7,873 (millions of dollars). Approximately 90.00 % of the buildings (and 56.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,041 and 460 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 14 thousand buildings in the region which have an aggregate total replacement value of 7,873 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 85% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 14 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,501.00 (millions of dollars). This inventory includes over 46.60 miles of highways, 25 bridges, 441.79 miles of pipes.

Table 1: Transportation System Lifeline Inventory

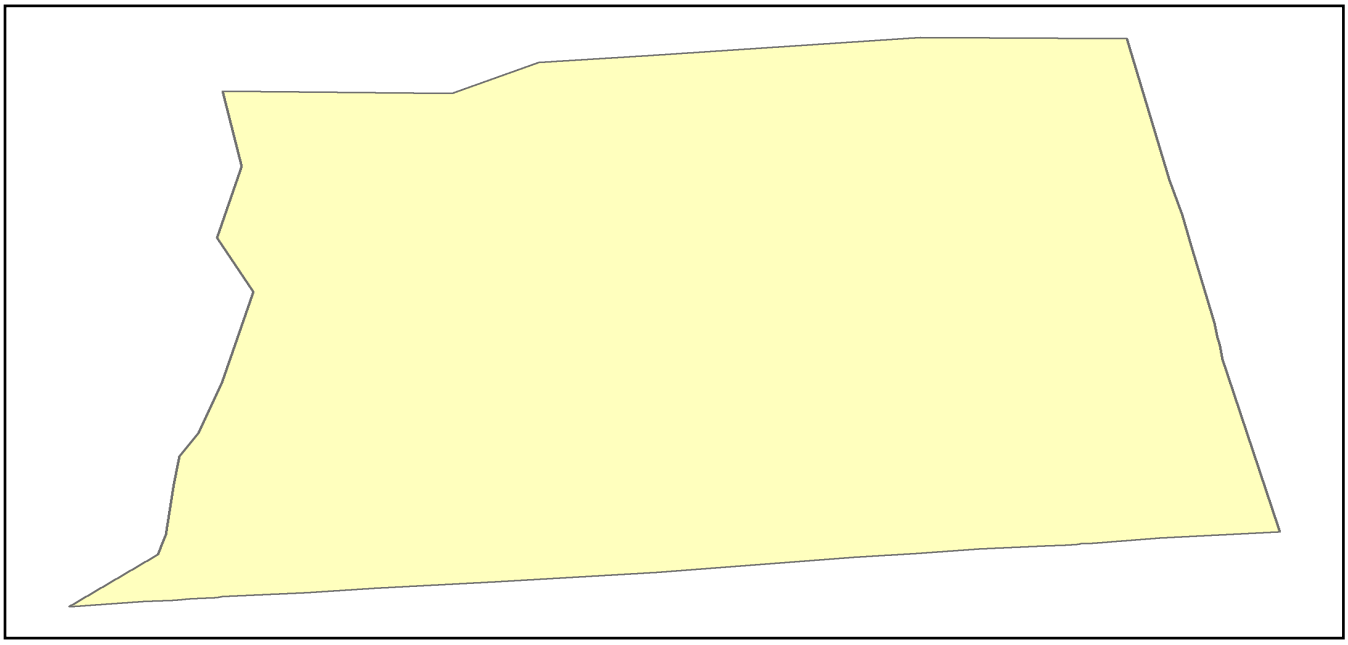
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	25	164.9656
	Segments	43	528.4120
	Tunnels	0	0.0000
		Subtotal	**693.3776**
Railways	Bridges	11	57.3100
	Facilities	0	0.0000
	Segments	15	1291.2606
	Tunnels	0	0.0000
		Subtotal	**1348.5706**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**2,041.90**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	8.3294
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**8.3294**
Waste Water	Distribution Lines	NA	4.9976
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**162.4438**
Natural Gas	Distribution Lines	NA	3.3318
	Facilities	0	0.0000
	Pipelines	1	286.3532
		Subtotal	**289.6850**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**460.50**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 818 buildings will be at least moderately damaged. This is over 6.00 % of the buildings in the region. There are an estimated 16 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

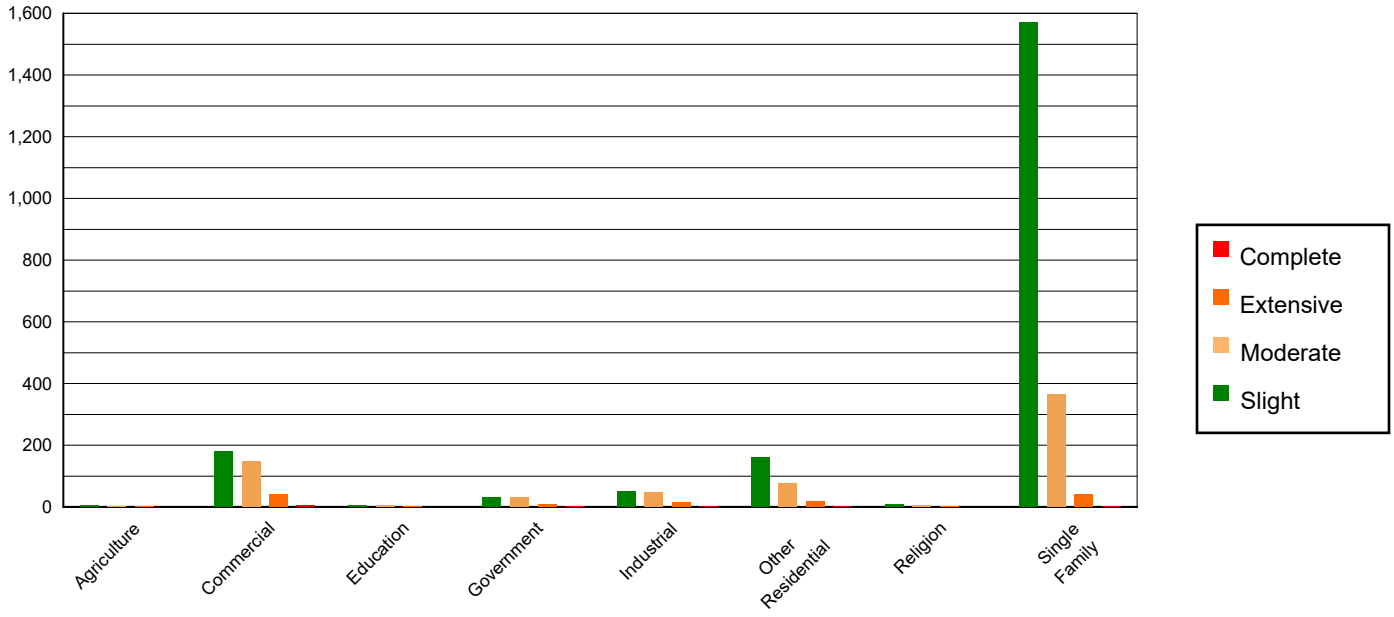


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	15.38	0.13	5.21	0.26	3.36	0.49	0.93	0.76	0.13	0.78
Commercial	565.58	4.86	179.56	8.93	146.63	21.60	40.63	33.03	6.60	39.28
Education	21.44	0.18	6.54	0.33	5.40	0.80	1.36	1.10	0.25	1.50
Government	96.66	0.83	32.23	1.60	30.29	4.46	8.30	6.74	1.52	9.06
Industrial	150.51	1.29	49.56	2.46	46.83	6.90	13.82	11.24	2.28	13.56
Other Residential	874.12	7.52	159.74	7.94	76.35	11.25	16.59	13.48	2.21	13.15
Religion	33.27	0.29	7.43	0.37	4.83	0.71	1.27	1.04	0.20	1.18
Single Family	9871.67	84.89	1570.36	78.10	365.24	53.80	40.11	32.61	3.61	21.50
Total	**11,629**		**2,011**		**679**		**123**		**17**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	10335.33	88.88	1619.86	80.56	334.91	49.33	23.39	19.01	0.05	0.30
Steel	389.84	3.35	141.77	7.05	154.22	22.72	45.00	36.58	8.31	49.43
Concrete	79.20	0.68	26.41	1.31	27.64	4.07	6.03	4.91	0.75	4.48
Precast	28.18	0.24	6.95	0.35	8.36	1.23	3.28	2.67	0.14	0.83
RM	159.11	1.37	24.77	1.23	23.91	3.52	7.05	5.73	0.09	0.53
URM	636.98	5.48	190.86	9.49	129.89	19.13	38.26	31.10	7.47	44.43
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**11,629**		**2,011**		**679**		**123**		**17**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	14	0	0	14
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	6	0	0	6

Transportation Lifeline Damage

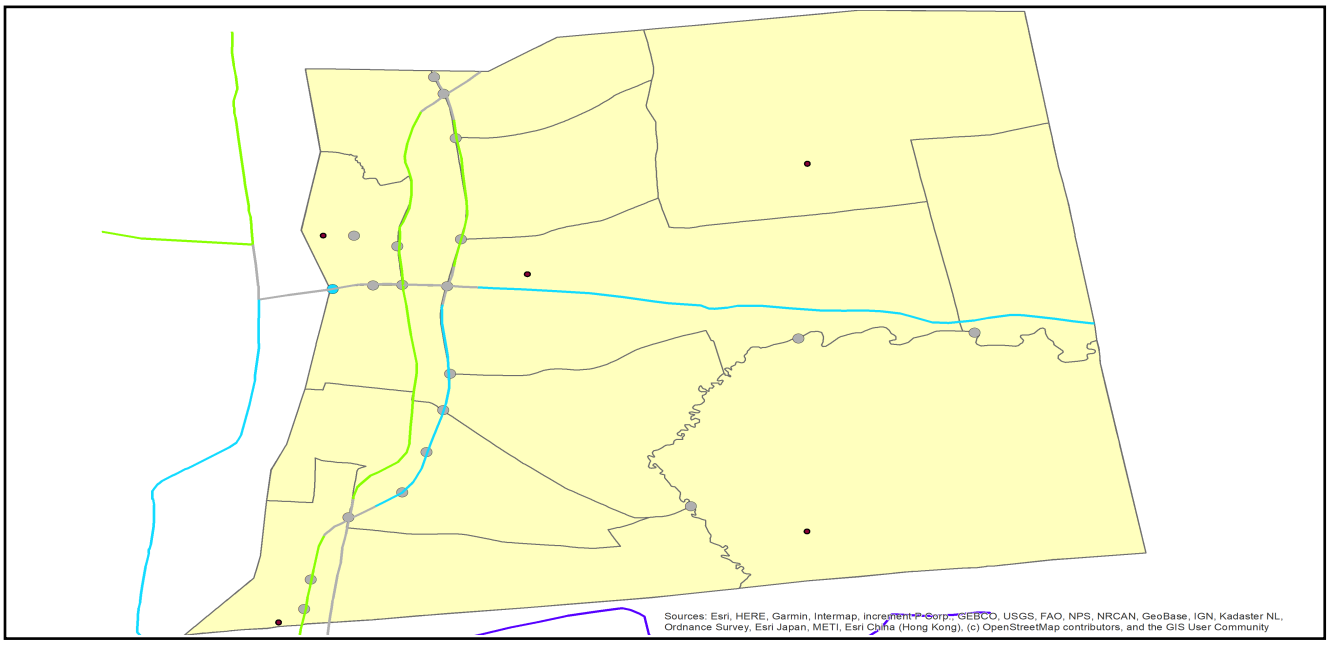


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	43	0	0	34	34
	Bridges	25	0	0	25	25
	Tunnels	0	0	0	0	0
Railways	Segments	15	0	0	9	9
	Bridges	11	0	0	11	11
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	259	0	0
Waste Water	155	0	0
Natural Gas	28	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

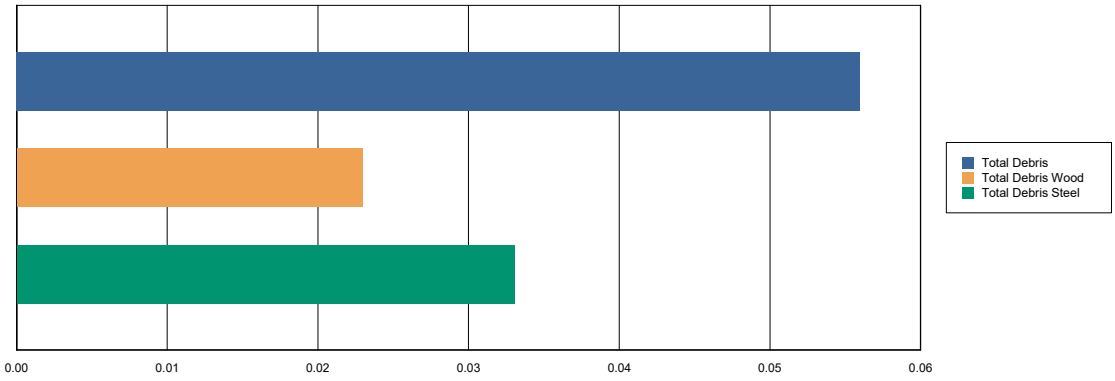
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 56,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 41.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 2,240 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



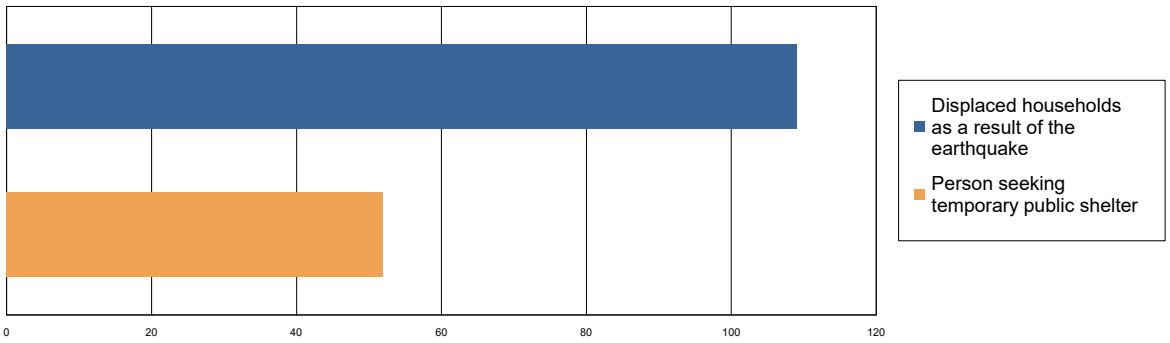
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.02	0.03	0.06	2,240 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 109 households to be displaced due to the earthquake. Of these, 52 people (out of a total population of 42,141) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
109	52

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.83	0.16	0.02	0.04
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.01	0.00	0.00	0.00
	Industrial	0.55	0.10	0.01	0.02
	Other-Residential	7.62	1.34	0.15	0.29
	Single Family	7.59	0.92	0.08	0.15
	Total	**17**	**3**	**0**	**1**
2 PM	Commercial	50.08	9.60	1.11	2.15
	Commuting	0.01	0.01	0.02	0.00
	Educational	10.90	2.14	0.26	0.50
	Hotels	0.00	0.00	0.00	0.00
	Industrial	4.06	0.76	0.08	0.16
	Other-Residential	2.25	0.40	0.05	0.09
	Single Family	2.01	0.25	0.02	0.04
	Total	**69**	**13**	**2**	**3**
5 PM	Commercial	33.03	6.36	0.75	1.42
	Commuting	0.18	0.22	0.40	0.08
	Educational	1.18	0.23	0.03	0.05
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.54	0.48	0.05	0.10
	Other-Residential	3.01	0.54	0.06	0.12
	Single Family	2.93	0.37	0.03	0.06
	Total	**43**	**8**	**1**	**2**

Economic Loss

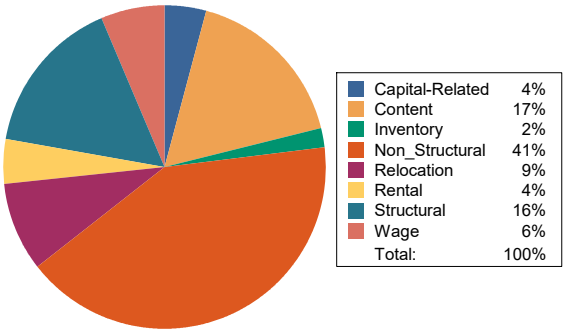
The total economic loss estimated for the earthquake is 276.53 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 275.21 (millions of dollars); 24 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 27 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

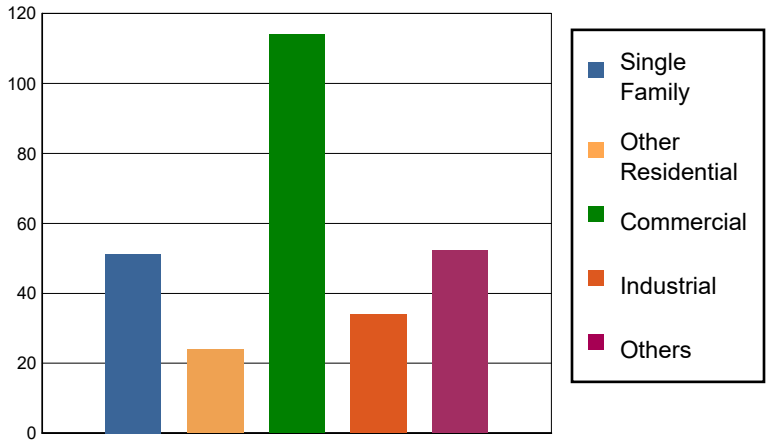


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.0735	12.1752	0.6697	3.5865	17.5049
	Capital-Related	0.0000	0.4565	9.9471	0.4050	0.3474	11.1560
	Rental	0.7441	2.1303	6.7189	0.4533	1.7591	11.8057
	Relocation	2.6274	1.1909	10.4818	2.3741	8.0025	24.6767
	Subtotal	**3.3715**	**4.8512**	**39.3230**	**3.9021**	**13.6955**	**65.1433**
Capital Stock Losses							
	Structural	6.4425	3.1096	19.7918	6.2544	8.3379	43.9362
	Non_Structural	30.8788	12.8468	35.3071	13.7362	21.3438	114.1127
	Content	10.5120	3.0971	15.7501	8.7460	8.7130	46.8182
	Inventory	0.0000	0.0000	3.8604	1.2537	0.0891	5.2032
	Subtotal	**47.8333**	**19.0535**	**74.7094**	**29.9903**	**38.4838**	**210.0703**
	Total	**51.20**	**23.90**	**114.03**	**33.89**	**52.18**	**275.21**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	528.4120	0.0000	0.00
	Bridges	164.9656	1.2209	0.74
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**693.3776**	**1.2209**	
Railways	Segments	1291.2606	0.0000	0.00
	Bridges	57.3100	0.0972	0.17
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1348.5706**	**0.0972**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**2,041.95**	**1.32**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	8.3294	0.0000	0.00
	Subtotal	**8.3294**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	4.9976	0.0000	0.00
	Subtotal	**162.4438**	**0.0000**	
Natural Gas	Pipelines	286.3532	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.3318	0.0000	0.00
	Subtotal	**289.6850**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**460.46**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	42,141	4,401	3,471	7,873
Total Region		**42,141**	**4,401**	**3,471**	**7,873**

Hazus: Earthquake Global Risk Report

Region Name: Farmington_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.77 square miles and contains 6 census tracts. There are over 11 thousand households in the region which has a total population of 26,712 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 7,066 (millions of dollars). Approximately 87.00 % of the buildings (and 60.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 3,176 and 615 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 7 thousand buildings in the region which have an aggregate total replacement value of 7,066 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 81% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 137 beds. There are 10 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 3,791.00 (millions of dollars). This inventory includes over 95.69 miles of highways, 32 bridges, 364.12 miles of pipes.

Table 1: Transportation System Lifeline Inventory

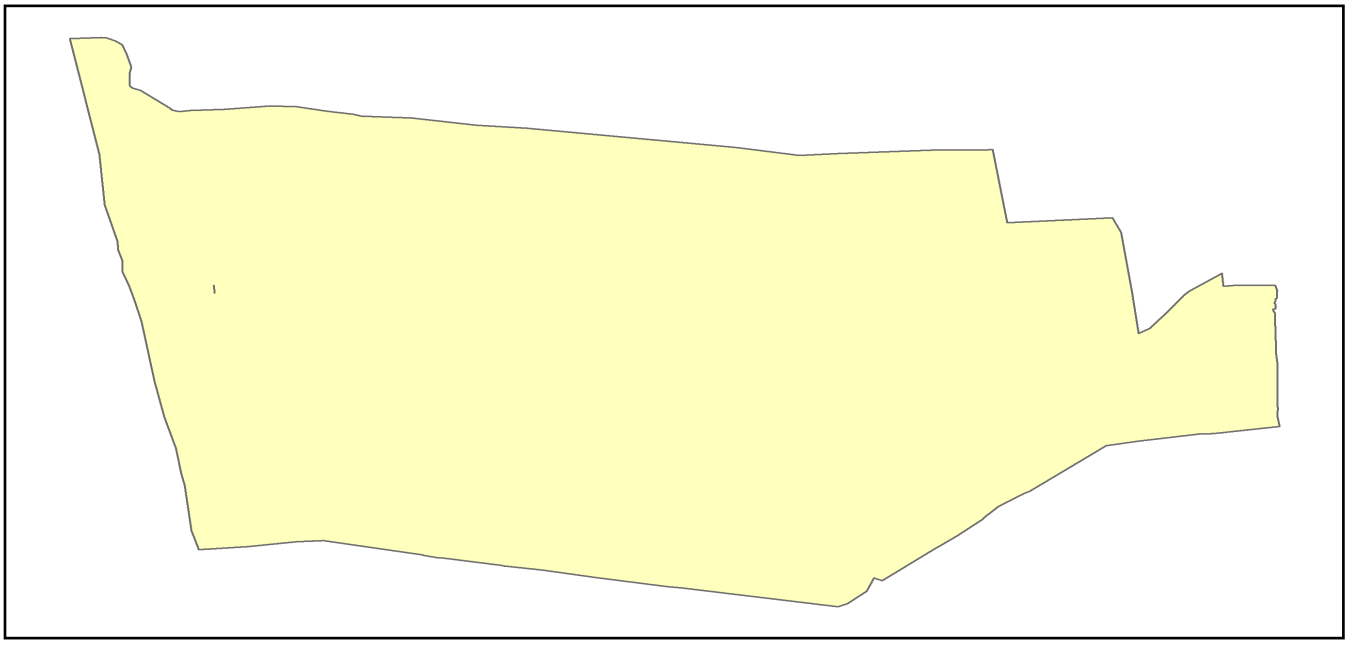
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	32	198.6230
	Segments	87	1025.7508
	Tunnels	0	0.0000
		Subtotal	**1224.3738**
Railways	Bridges	1	5.2100
	Facilities	0	0.0000
	Segments	16	1947.0636
	Tunnels	0	0.0000
		Subtotal	**1952.2736**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**3,176.60**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.4490
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**6.4490**
Waste Water	Distribution Lines	NA	3.8694
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**161.3156**
Natural Gas	Distribution Lines	NA	2.5796
	Facilities	0	0.0000
	Pipelines	5	444.7156
		Subtotal	**447.2952**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	4	0.4600
		Subtotal	**0.4600**
		Total	**615.50**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 855 buildings will be at least moderately damaged. This is over 12.00 % of the buildings in the region. There are an estimated 45 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

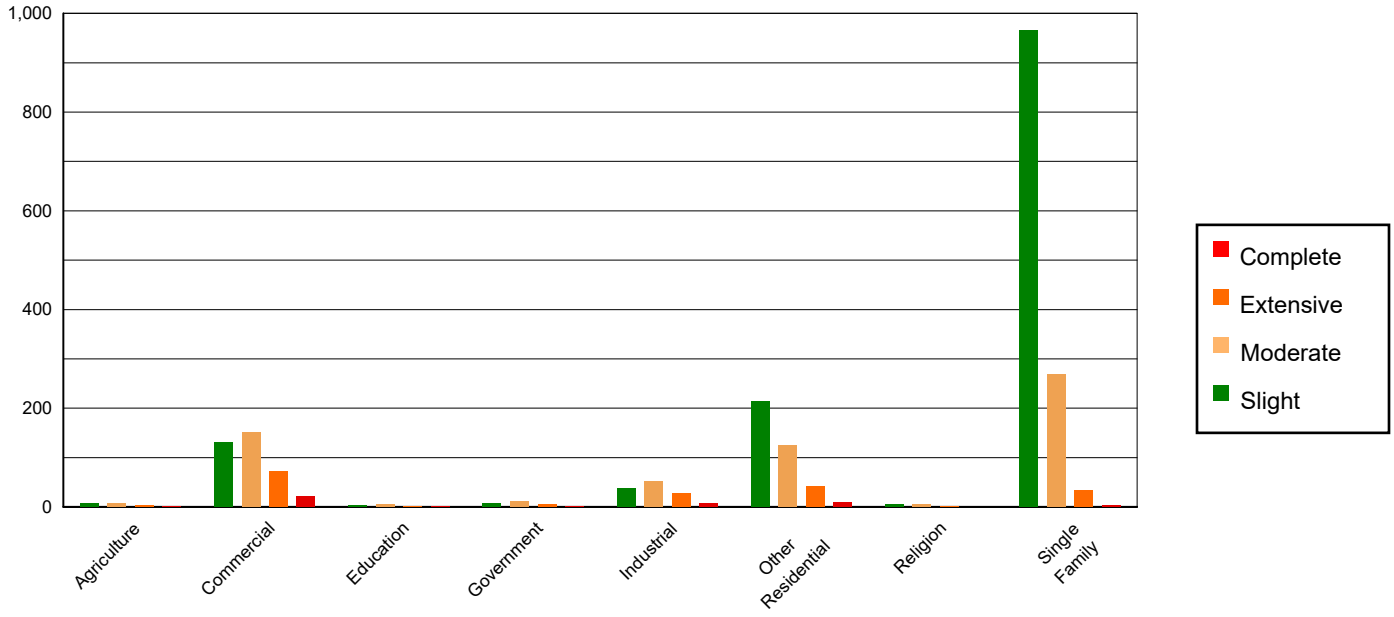


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	13.14	0.26	7.61	0.55	6.73	1.08	2.76	1.48	0.78	1.71
Commercial	239.98	4.66	130.52	9.52	150.75	24.16	71.71	38.43	21.04	46.36
Education	8.43	0.16	4.30	0.31	5.23	0.84	2.36	1.26	0.68	1.49
Government	12.38	0.24	7.52	0.55	11.16	1.79	6.03	3.23	1.91	4.21
Industrial	70.02	1.36	37.92	2.76	52.01	8.34	26.42	14.16	7.64	16.83
Other Residential	758.77	14.74	213.19	15.54	125.40	20.10	42.35	22.70	9.28	20.46
Religion	15.20	0.30	5.24	0.38	4.34	0.70	1.79	0.96	0.43	0.94
Single Family	4028.57	78.28	965.37	70.38	268.26	43.00	33.18	17.78	3.62	7.99
Total	**5,146**		**1,372**		**624**		**187**		**45**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	4543.79	88.29	1099.74	80.18	290.57	46.58	25.00	13.40	0.82	1.81
Steel	124.12	2.41	81.79	5.96	146.74	23.52	84.51	45.29	27.81	61.30
Concrete	30.43	0.59	18.33	1.34	32.79	5.26	17.66	9.46	5.37	11.84
Precast	11.57	0.22	4.61	0.34	7.80	1.25	5.02	2.69	0.79	1.73
RM	101.46	1.97	25.69	1.87	33.11	5.31	14.31	7.67	0.60	1.31
URM	335.12	6.51	141.51	10.32	112.87	18.09	40.11	21.49	9.98	22.01
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**5,146**		**1,372**		**624**		**187**		**45**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 137 hospital beds available for use. On the day of the earthquake, the model estimates that only 60 hospital beds (44.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 67.00% of the beds will be back in service. By 30 days, 89.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	0
Schools	10	0	0	6
EOCs	1	0	0	1
PoliceStations	2	0	0	1
FireStations	6	0	0	3

Transportation Lifeline Damage

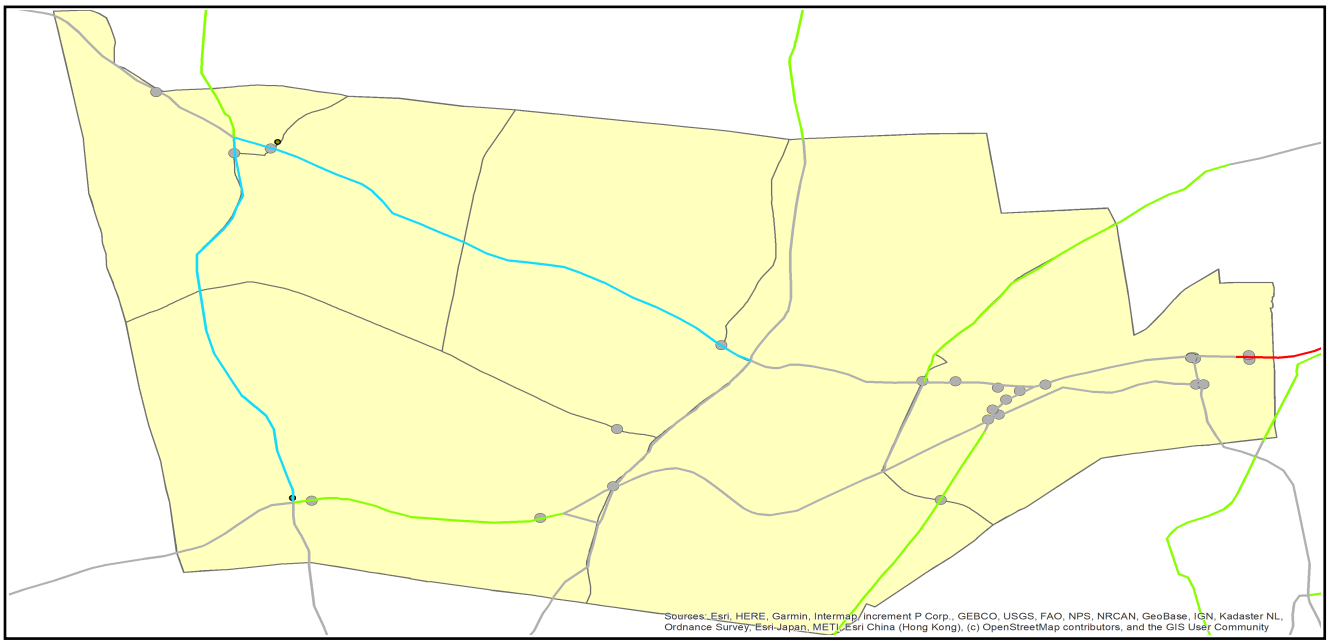


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	87	0	0	85	85
	Bridges	32	5	0	29	31
	Tunnels	0	0	0	0	0
Railways	Segments	16	0	0	0	0
	Bridges	1	0	0	1	1
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	4	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	200	0	0
Waste Water	120	0	0
Natural Gas	44	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

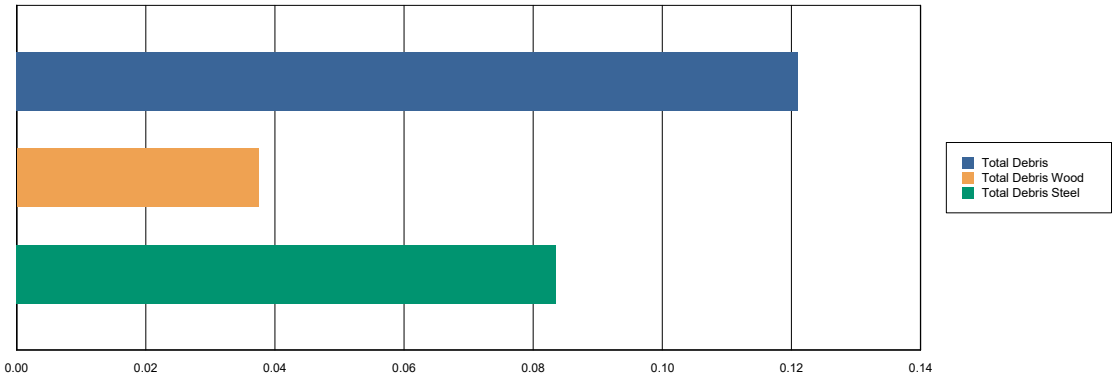
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 121,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 31.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 4,840 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



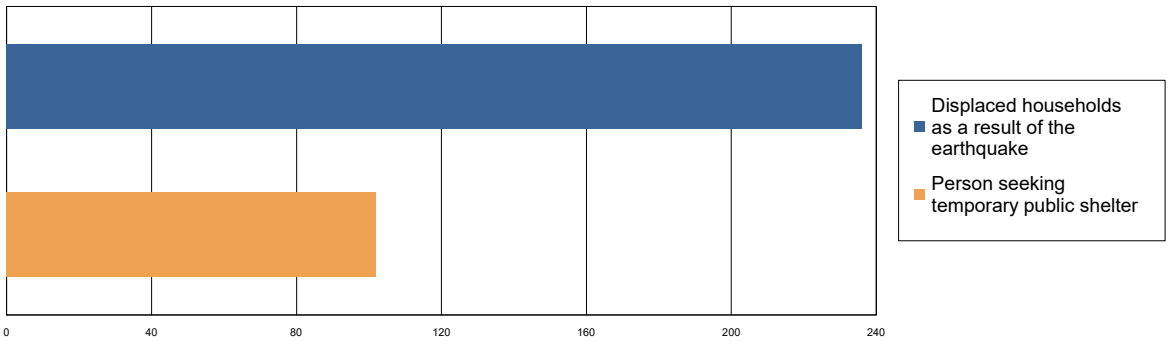
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.04	0.08	0.12	4,840 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 236 households to be displaced due to the earthquake. Of these, 102 people (out of a total population of 26,712) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
236	102

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.14	0.27	0.04	0.07
	Commuting	0.00	0.00	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.08	0.02	0.00	0.01
	Industrial	10.39	2.59	0.36	0.71
	Other-Residential	13.24	2.95	0.41	0.81
	Single Family	7.53	1.01	0.09	0.18
	Total	**32**	**7**	**1**	**2**
2 PM	Commercial	68.63	16.20	2.12	4.11
	Commuting	0.03	0.04	0.07	0.01
	Educational	31.68	7.55	1.08	2.09
	Hotels	0.02	0.00	0.00	0.00
	Industrial	76.66	19.08	2.67	5.17
	Other-Residential	4.64	1.06	0.15	0.29
	Single Family	2.51	0.36	0.03	0.06
	Total	**184**	**44**	**6**	**12**
5 PM	Commercial	42.75	10.01	1.32	2.52
	Commuting	0.60	0.76	1.33	0.25
	Educational	7.63	1.80	0.26	0.50
	Hotels	0.02	0.01	0.00	0.00
	Industrial	47.91	11.93	1.67	3.23
	Other-Residential	5.20	1.17	0.17	0.31
	Single Family	2.92	0.41	0.04	0.07
	Total	**107**	**26**	**5**	**7**

Economic Loss

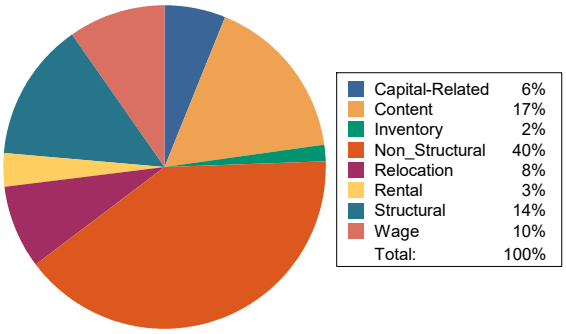
The total economic loss estimated for the earthquake is 650.43 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 633.46 (millions of dollars); 27 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 24 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

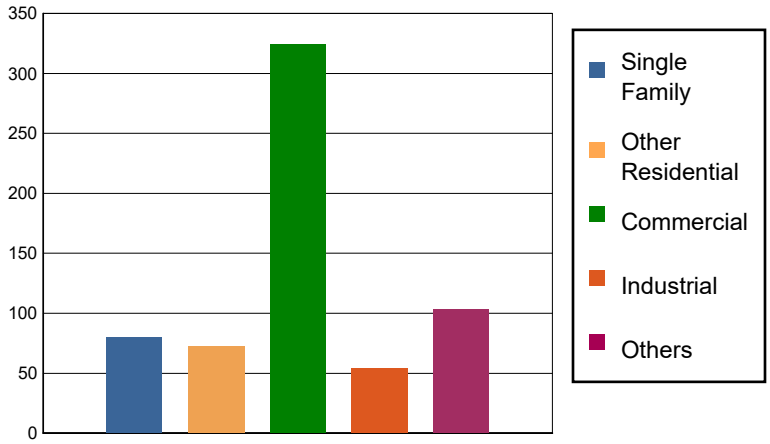


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	6.3675	49.3585	1.6056	3.8710	61.2026
	Capital-Related	0.0000	2.7109	33.5240	0.9611	1.3429	38.5389
	Rental	1.2439	5.4211	12.9130	0.3729	2.0461	21.9970
	Relocation	4.4634	2.7750	24.9435	1.9945	17.6206	51.7970
	Subtotal	**5.7073**	**17.2745**	**120.7390**	**4.9341**	**24.8806**	**173.5355**
Capital Stock Losses							
	Structural	9.4389	9.7590	44.9228	9.7523	14.2207	88.0937
	Non_Structural	47.2319	36.5651	103.5961	23.2675	44.7160	255.3766
	Content	17.4185	8.4292	47.4647	13.6881	19.0248	106.0253
	Inventory	0.0000	0.0000	7.5083	2.4058	0.5134	10.4275
	Subtotal	**74.0893**	**54.7533**	**203.4919**	**49.1137**	**78.4749**	**459.9231**
	Total	**79.80**	**72.03**	**324.23**	**54.05**	**103.36**	**633.46**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1025.7508	0.0000	0.00
	Bridges	198.6230	16.9482	8.53
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1224.3738**	**16.9482**	
Railways	Segments	1947.0636	0.0000	0.00
	Bridges	5.2100	0.0213	0.41
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1952.2736**	**0.0213**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**3,176.65**	**16.97**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	6.4490	0.0000	0.00
	Subtotal	**6.4490**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	3.8694	0.0000	0.00
	Subtotal	**161.3156**	**0.0000**	
Natural Gas	Pipelines	444.7156	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.5796	0.0000	0.00
	Subtotal	**447.2952**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.4600	0.0000	0.00
	Subtotal	**0.4600**	**0.0000**	
	Total	**615.52**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	26,712	4,256	2,809	7,066
Total Region		**26,712**	**4,256**	**2,809**	**7,066**

Hazus: Earthquake Global Risk Report

Region Name: Glastonbury_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 52.17 square miles and contains 7 census tracts. There are over 13 thousand households in the region which has a total population of 35,159 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 12 thousand buildings in the region with a total building replacement value (excluding contents) of 7,592 (millions of dollars). Approximately 86.00 % of the buildings (and 72.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,758 and 218 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 12 thousand buildings in the region which have an aggregate total replacement value of 7,592 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 83% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 9 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,976.00 (millions of dollars). This inventory includes over 75.81 miles of highways, 51 bridges, 442.42 miles of pipes.

Table 1: Transportation System Lifeline Inventory

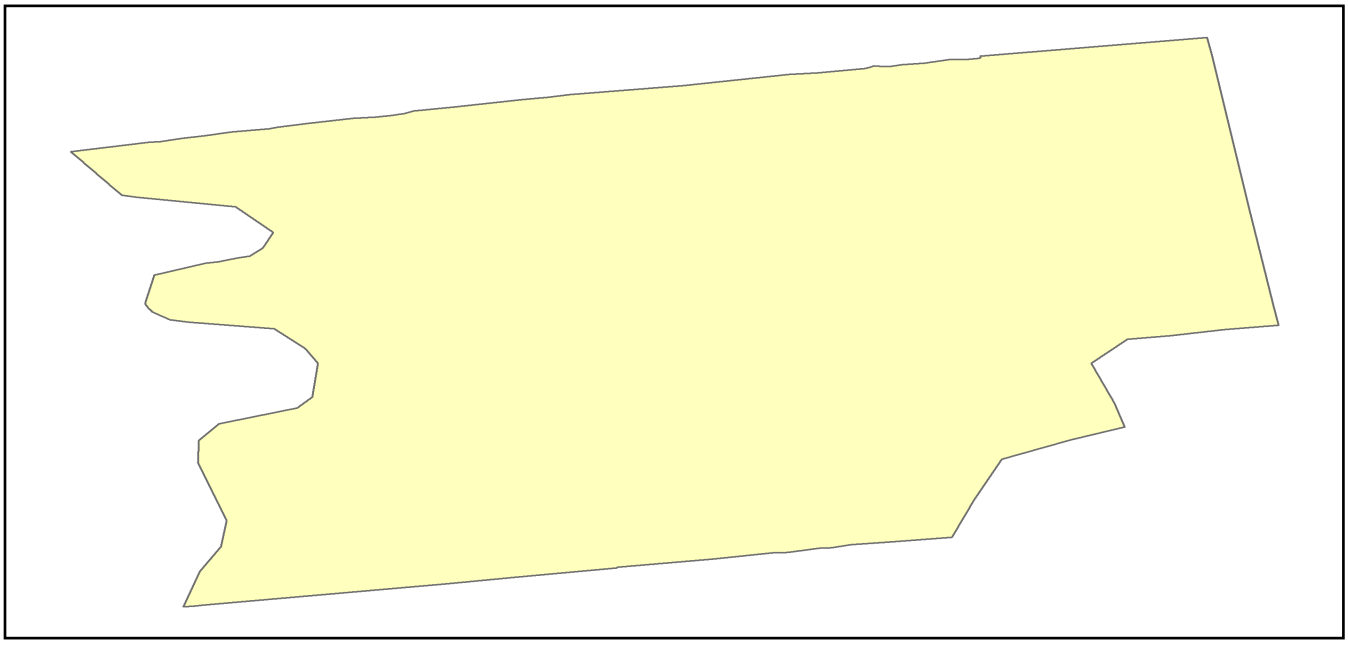
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	51	98.2007
	Segments	65	921.6185
	Tunnels	0	0.0000
		Subtotal	**1019.8192**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	10	737.8126
	Tunnels	0	0.0000
		Subtotal	**737.8126**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	1	1.3310
		Subtotal	**1.3310**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**1,759.00**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	8.8312
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**8.8312**
Waste Water	Distribution Lines	NA	5.2987
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**162.7449**
Natural Gas	Distribution Lines	NA	3.5325
	Facilities	0	0.0000
	Pipelines	1	37.9128
		Subtotal	**41.4453**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	4.9743
		Subtotal	**4.9743**
Communication	Facilities	1	0.1150
		Subtotal	**0.1150**
		Total	**218.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 3,179 buildings will be at least moderately damaged. This is over 26.00 % of the buildings in the region. There are an estimated 431 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

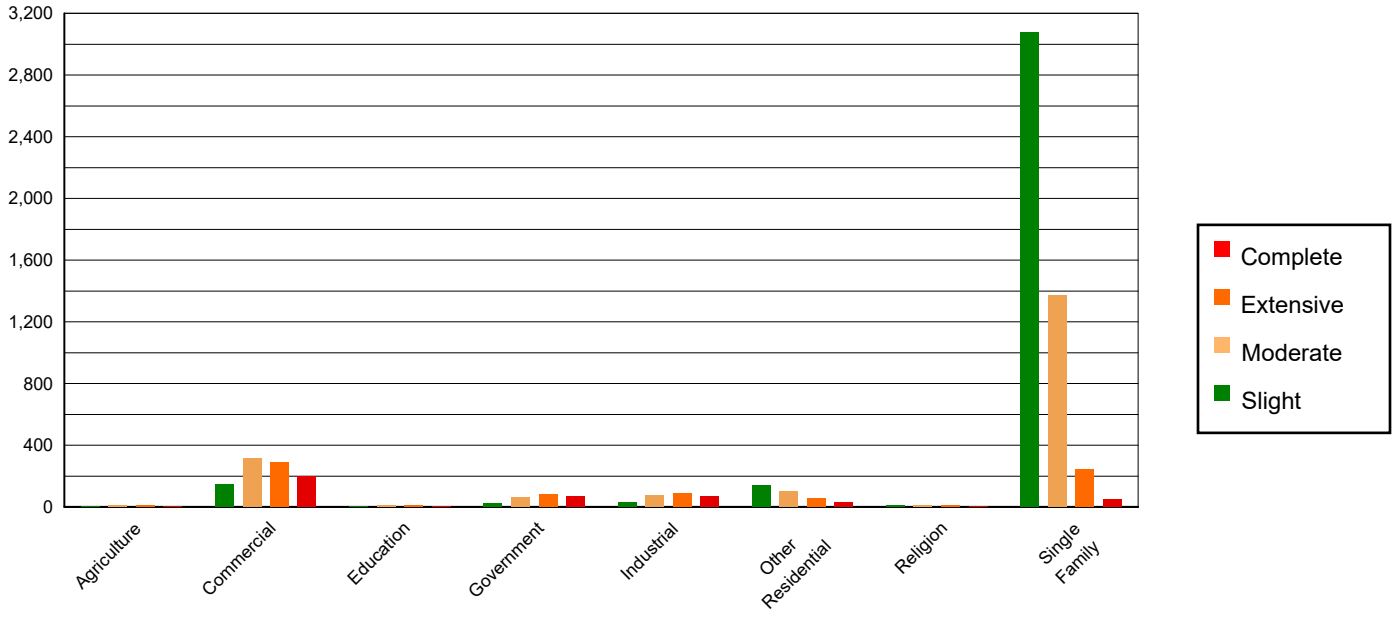


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	3.15	0.05	5.37	0.16	12.48	0.64	9.78	1.24	7.23	1.67
Commercial	122.75	2.14	146.44	4.26	316.25	16.14	291.35	36.94	200.22	46.37
Education	3.60	0.06	4.01	0.12	8.90	0.45	8.68	1.10	5.82	1.35
Government	16.75	0.29	21.93	0.64	62.10	3.17	78.79	9.99	66.43	15.39
Industrial	24.65	0.43	29.92	0.87	77.39	3.95	89.14	11.30	69.90	16.19
Other Residential	237.95	4.14	138.79	4.04	100.71	5.14	57.76	7.32	30.79	7.13
Religion	15.05	0.26	10.15	0.30	10.58	0.54	8.14	1.03	5.08	1.18
Single Family	5317.82	92.62	3076.92	89.61	1370.85	69.97	245.10	31.08	46.31	10.73
Total	**5,742**		**3,434**		**1,959**		**789**		**432**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	5462.20	95.13	3157.28	91.95	1420.07	72.48	231.79	29.39	31.56	7.31
Steel	35.00	0.61	51.79	1.51	199.55	10.18	287.38	36.44	245.83	56.94
Concrete	5.32	0.09	7.87	0.23	33.07	1.69	48.16	6.11	38.05	8.81
Precast	3.96	0.07	3.76	0.11	12.99	0.66	18.85	2.39	15.00	3.47
RM	27.26	0.47	17.27	0.50	48.90	2.50	58.10	7.37	30.66	7.10
URM	207.84	3.62	195.35	5.69	244.22	12.46	143.79	18.23	70.14	16.24
MH	0.14	0.00	0.21	0.01	0.45	0.02	0.66	0.08	0.53	0.12
Total	**5,742**		**3,434**		**1,959**		**789**		**432**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	9	6	0	0
EOCs	1	1	0	0
PoliceStations	1	1	0	0
FireStations	4	3	0	0

Transportation Lifeline Damage

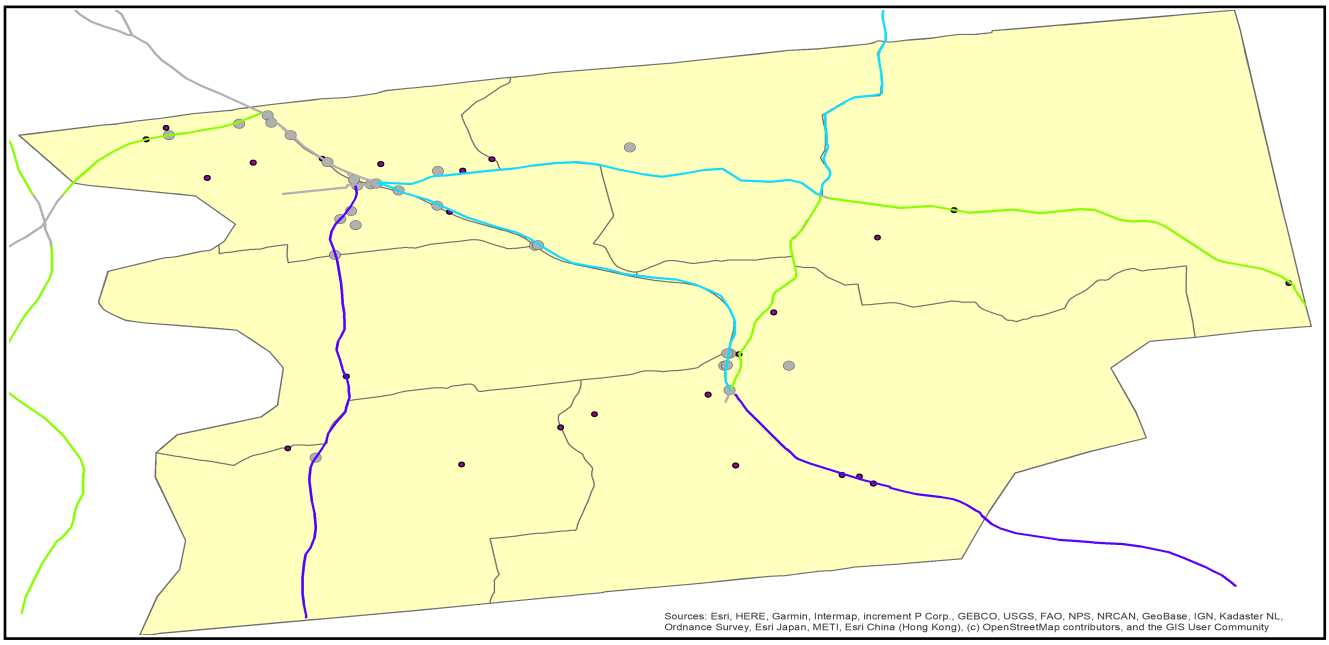


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	65	0	0	54	54
	Bridges	51	7	0	44	46
	Tunnels	0	0	0	0	0
Railways	Segments	10	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	1	0	0	1	1
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	0	0
Communication	1	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	274	0	0
Waste Water	165	0	0
Natural Gas	4	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

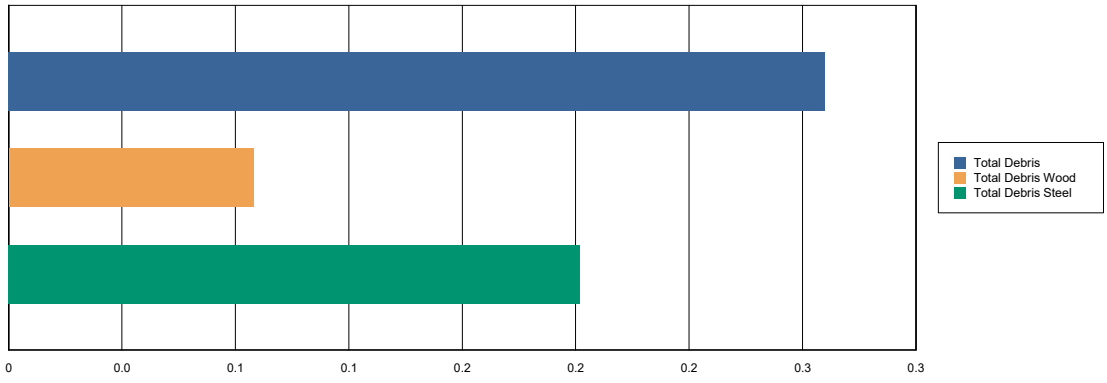
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 288,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 30.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 11,520 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



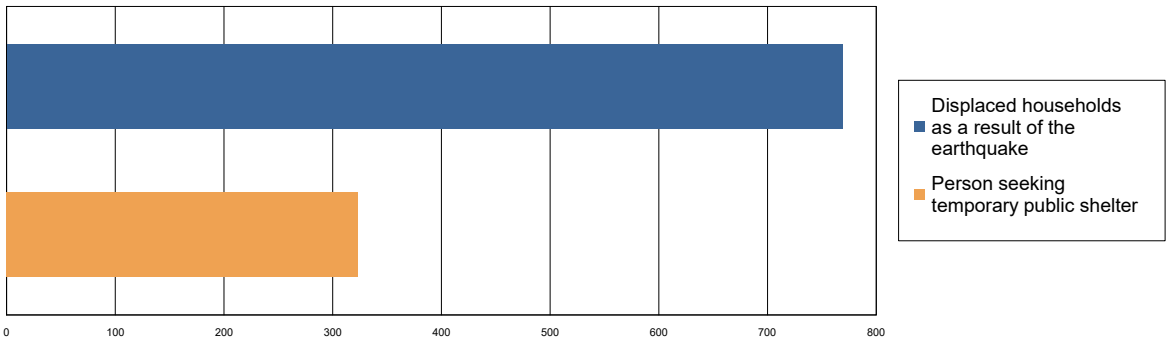
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.09	0.20	0.29	11,520 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 769 households to be displaced due to the earthquake. Of these, 323 people (out of a total population of 35,159) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
769	323

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	7.32	2.06	0.31	0.60
	Commuting	0.01	0.01	0.02	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.03	0.01	0.00	0.00
	Industrial	5.21	1.49	0.22	0.43
	Other-Residential	30.44	8.51	1.37	2.71
	Single Family	41.52	7.64	0.86	1.67
	Total	**85**	**20**	**3**	**5**
2 PM	Commercial	449.74	127.05	19.17	37.37
	Commuting	0.08	0.13	0.19	0.04
	Educational	111.67	32.48	5.22	10.20
	Hotels	0.01	0.00	0.00	0.00
	Industrial	38.50	10.98	1.65	3.19
	Other-Residential	9.31	2.59	0.42	0.80
	Single Family	11.41	2.18	0.26	0.48
	Total	**621**	**175**	**27**	**52**
5 PM	Commercial	309.46	87.86	13.45	25.82
	Commuting	1.73	2.80	4.12	0.83
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.01	0.00	0.00	0.00
	Industrial	24.06	6.86	1.03	1.99
	Other-Residential	11.97	3.34	0.55	1.04
	Single Family	16.37	3.13	0.37	0.69
	Total	**364**	**104**	**20**	**30**

Economic Loss

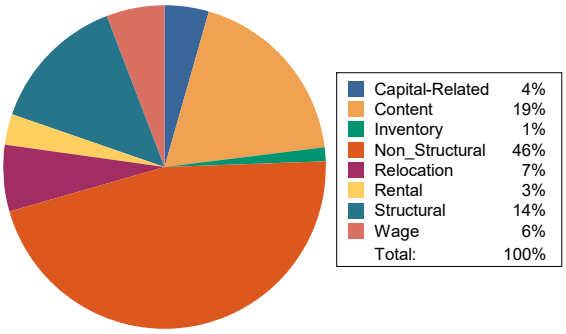
The total economic loss estimated for the earthquake is 1,485.88 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 1,472.94 (millions of dollars); 20 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 29 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

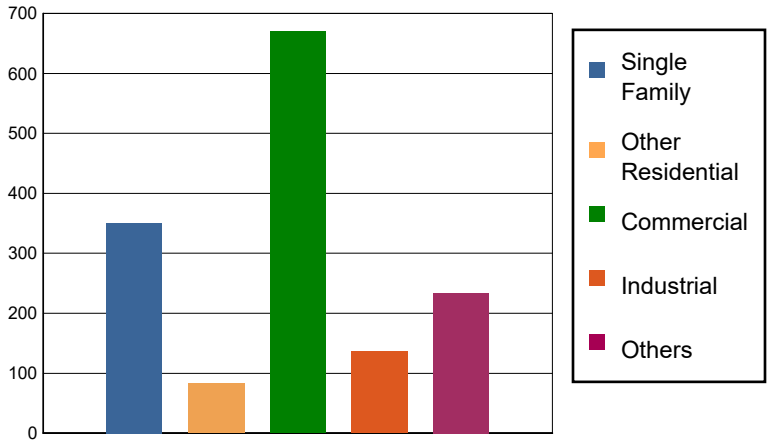


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	4.6884	70.3669	2.2032	9.9059	87.1644
	Capital-Related	0.0000	1.9955	59.3982	1.2842	1.1749	63.8528
	Rental	5.3731	6.0747	28.3235	0.9661	6.1493	46.8867
	Relocation	19.6440	3.2869	43.7642	4.5080	25.0769	96.2800
	Subtotal	**25.0171**	**16.0455**	**201.8528**	**8.9615**	**42.3070**	**294.1839**
Capital Stock Losses							
	Structural	44.1233	9.9924	91.9682	19.6990	36.3599	202.1428
	Non_Structural	207.2540	46.1393	251.8756	63.6742	110.1103	679.0534
	Content	74.2071	10.3376	109.5459	38.5708	43.6008	276.2622
	Inventory	0.0000	0.0000	14.3847	5.7092	1.2012	21.2951
	Subtotal	**325.5844**	**66.4693**	**467.7744**	**127.6532**	**191.2722**	**1178.7535**
	Total	**350.60**	**82.51**	**669.63**	**136.61**	**233.58**	**1472.94**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	921.6185	0.0000	0.00
	Bridges	98.2007	12.6093	12.84
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1019.8192**	**12.6093**	
Railways	Segments	737.8126	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**737.8126**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	1.3310	0.3329	25.01
	Subtotal	**1.3310**	**0.3329**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**1,758.96**	**12.94**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	8.8312	0.0000	0.00
	Subtotal	**8.8312**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	5.2987	0.0000	0.00
	Subtotal	**162.7449**	**0.0000**	
Natural Gas	Pipelines	37.9128	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.5325	0.0000	0.00
	Subtotal	**41.4453**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	4.9743	0.0000	0.00
	Subtotal	**4.9743**	**0.0000**	
Communication	Facilities	0.1150	0.0000	0.00
	Subtotal	**0.1150**	**0.0000**	
	Total	**218.11**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	35,159	5,462	2,129	7,592
Total Region		**35,159**	**5,462**	**2,129**	**7,592**

Hazus: Earthquake Global Risk Report

Region Name: Granby_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.84 square miles and contains 2 census tracts. There are over 4 thousand households in the region which has a total population of 10,903 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,350 (millions of dollars). Approximately 90.00 % of the buildings (and 78.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 529 and 8 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 2,350 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 4 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 537.00 (millions of dollars). This inventory includes over 54.68 miles of highways, 31 bridges, 275.27 miles of pipes.

Table 1: Transportation System Lifeline Inventory

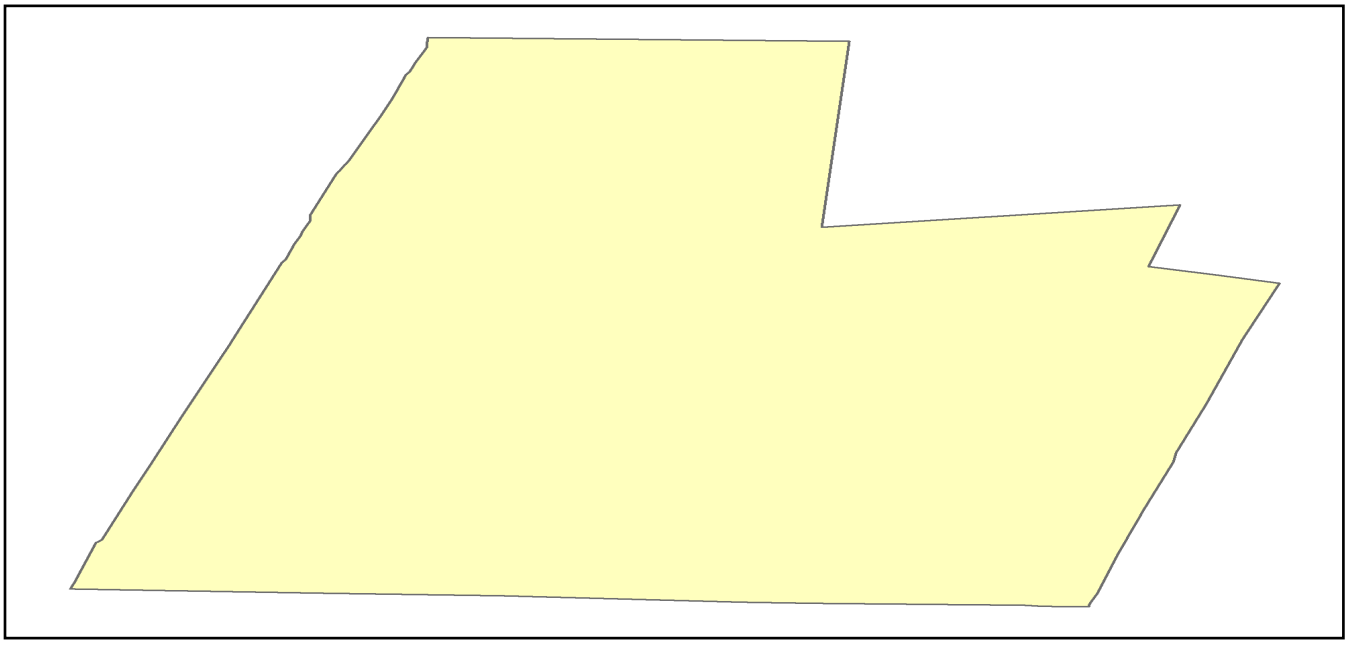
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	31	19.8639
	Segments	12	510.0810
	Tunnels	0	0.0000
		Subtotal	**529.9449**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**529.90**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	4.4308
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**4.4308**
Waste Water	Distribution Lines	NA	2.6585
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.6585**
Natural Gas	Distribution Lines	NA	1.7723
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.7723**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**8.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 173 buildings will be at least moderately damaged. This is over 4.00 % of the buildings in the region. There are an estimated 2 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

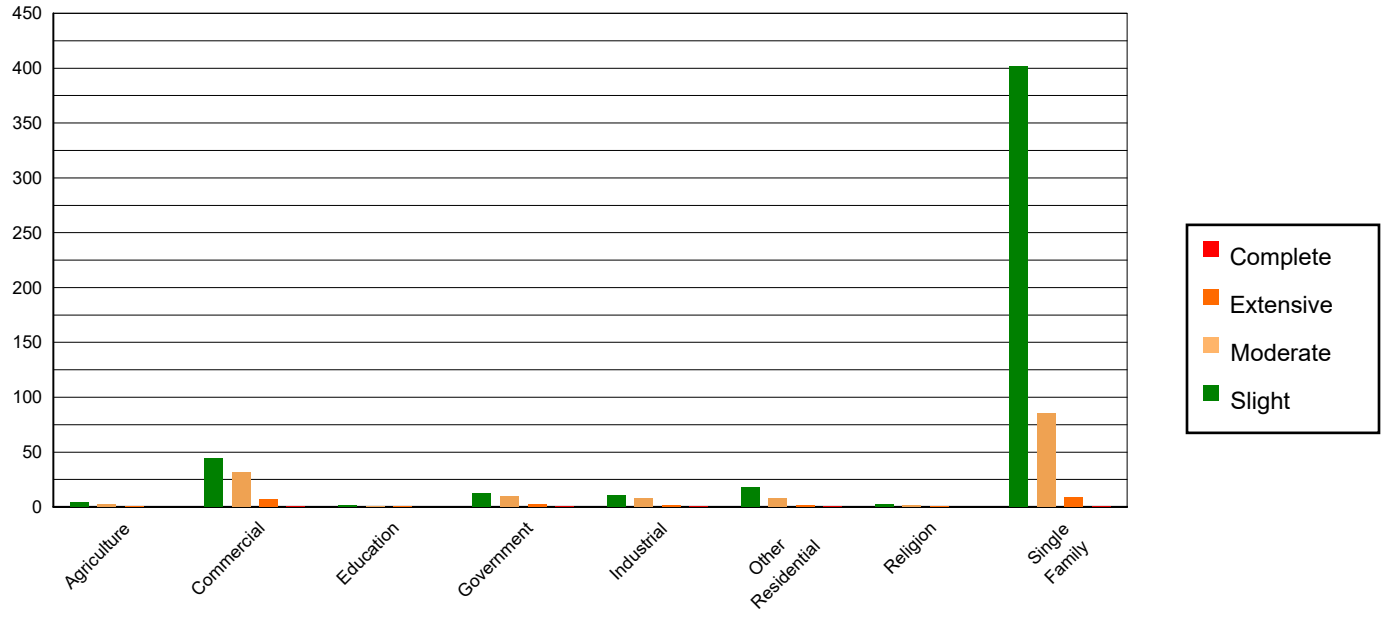


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	15.59	0.43	3.83	0.77	2.07	1.40	0.46	2.02	0.05	1.75
Commercial	169.81	4.64	44.14	8.93	31.63	21.47	7.40	32.24	1.01	37.12
Education	5.48	0.15	1.34	0.27	0.95	0.65	0.20	0.86	0.03	1.16
Government	48.96	1.34	12.65	2.56	9.94	6.74	2.13	9.26	0.32	11.91
Industrial	42.82	1.17	10.76	2.18	8.33	5.65	1.84	8.02	0.25	9.14
Other Residential	113.21	3.09	17.80	3.60	8.13	5.52	1.65	7.17	0.21	7.62
Religion	12.91	0.35	2.36	0.48	1.38	0.93	0.32	1.38	0.04	1.60
Single Family	3252.82	88.84	401.46	81.21	84.94	57.64	8.97	39.06	0.81	29.70
Total	**3,662**		**494**		**147**		**23**		**3**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3284.78	89.71	398.43	80.60	72.95	49.50	4.60	20.04	0.01	0.28
Steel	133.97	3.66	37.70	7.63	33.69	22.86	7.59	33.06	1.14	41.92
Concrete	21.40	0.58	5.63	1.14	5.00	3.39	0.85	3.70	0.09	3.17
Precast	8.91	0.24	1.82	0.37	1.98	1.34	0.68	2.95	0.02	0.79
RM	35.02	0.96	4.68	0.95	4.17	2.83	1.11	4.84	0.01	0.32
URM	177.52	4.85	46.08	9.32	29.60	20.08	8.13	35.41	1.45	53.52
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**3,662**		**494**		**147**		**23**		**3**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	4	0	0	4
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	3	0	0	3

Transportation Lifeline Damage

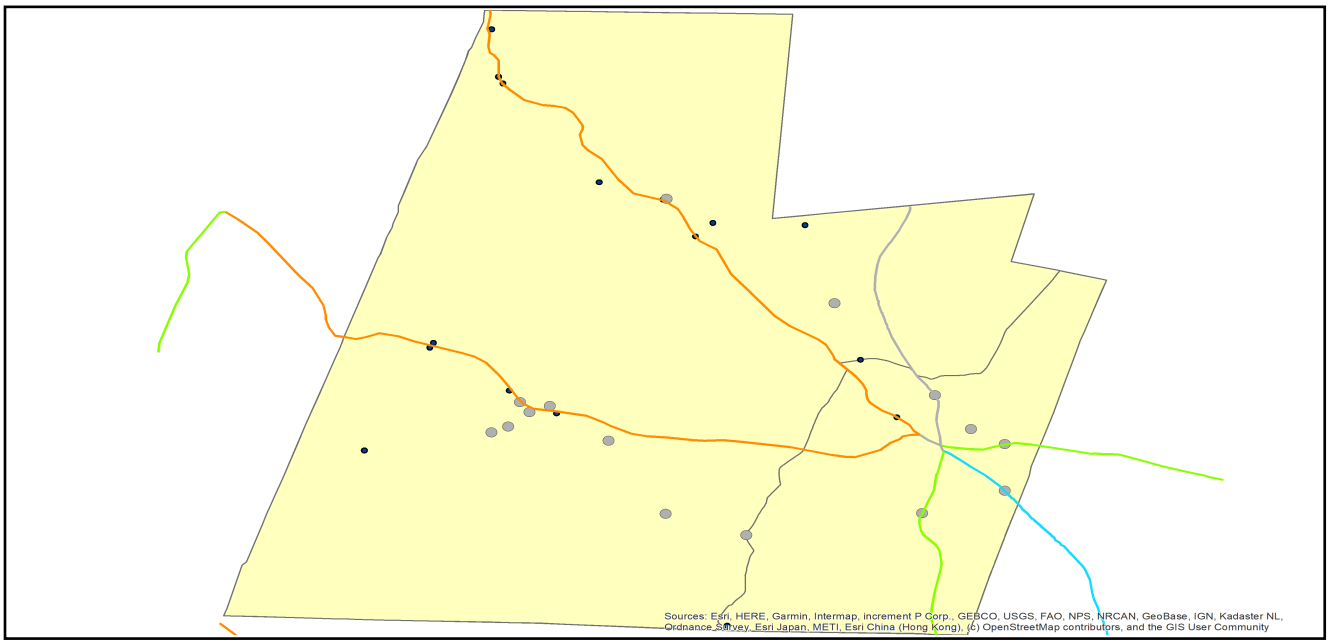


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	12	0	0	10	10
	Bridges	31	0	0	31	31
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	138	0	0
Waste Water	83	0	0
Natural Gas	55	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

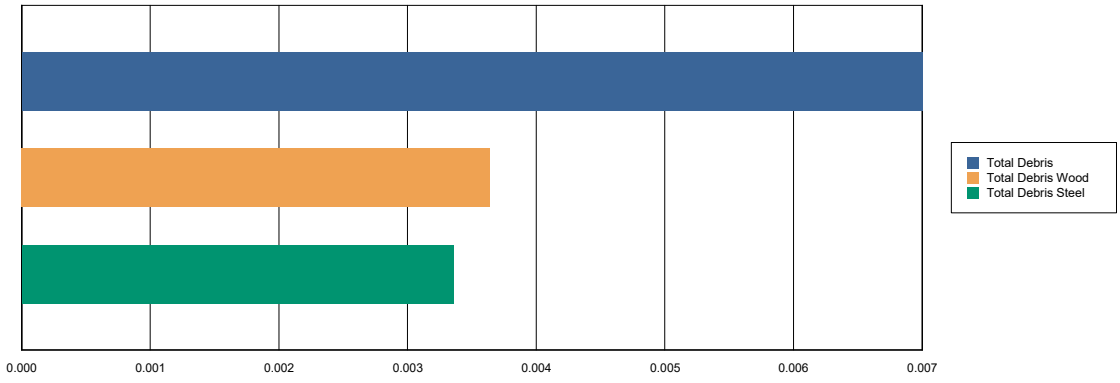
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 52.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 280 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



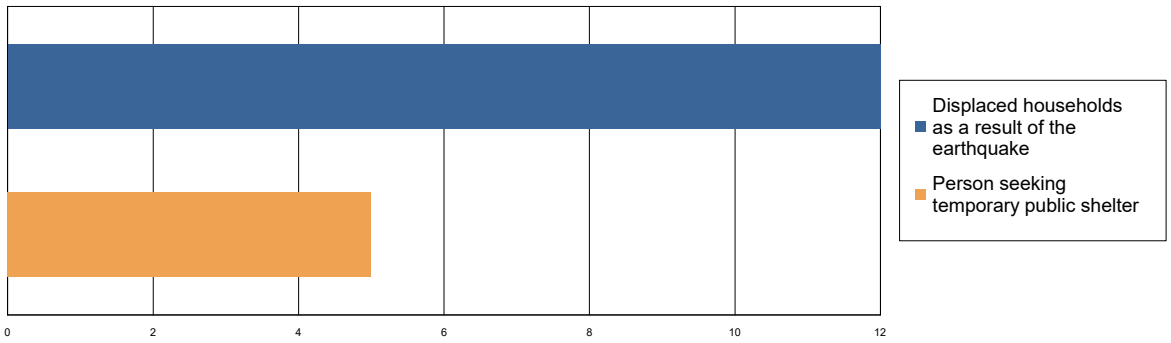
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.00	0.00	0.01	280 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 12 households to be displaced due to the earthquake. Of these, 5 people (out of a total population of 10,903) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
12	5

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.07	0.01	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.03	0.01	0.00	0.00
	Other-Residential	0.76	0.13	0.01	0.03
	Single Family	1.86	0.21	0.02	0.03
	Total	**3**	**0**	**0**	**0**
2 PM	Commercial	5.01	0.88	0.09	0.18
	Commuting	0.00	0.00	0.00	0.00
	Educational	1.93	0.35	0.04	0.08
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.24	0.04	0.00	0.01
	Other-Residential	0.23	0.04	0.00	0.01
	Single Family	0.52	0.06	0.01	0.01
	Total	**8**	**1**	**0**	**0**
5 PM	Commercial	3.67	0.65	0.07	0.13
	Commuting	0.02	0.03	0.05	0.01
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.15	0.03	0.00	0.01
	Other-Residential	0.30	0.05	0.01	0.01
	Single Family	0.72	0.09	0.01	0.01
	Total	**5**	**1**	**0**	**0**

Economic Loss

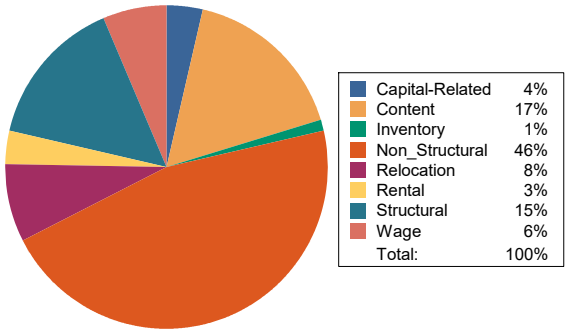
The total economic loss estimated for the earthquake is 43.25 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 43.14 (millions of dollars); 21 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 49 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

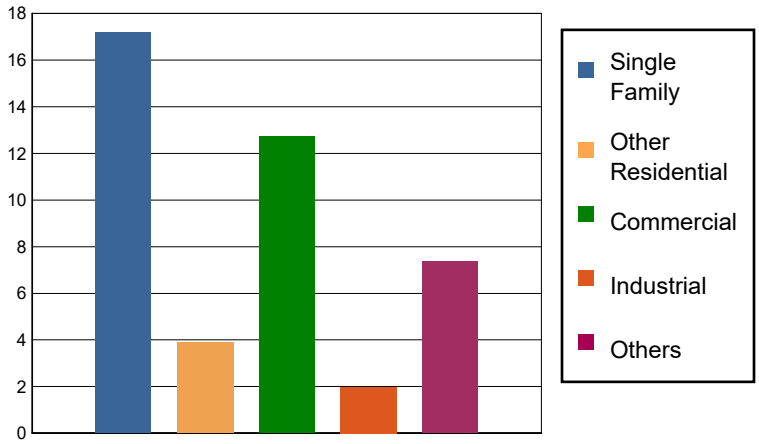


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.4807	1.8375	0.0571	0.3838	2.7591
	Capital-Related	0.0000	0.2046	1.2960	0.0333	0.0505	1.5844
	Rental	0.2510	0.3535	0.6653	0.0191	0.2159	1.5048
	Relocation	0.8762	0.1399	1.1138	0.1056	1.0795	3.3150
	Subtotal	**1.1272**	**1.1787**	**4.9126**	**0.2151**	**1.7297**	**9.1633**
Capital Stock Losses							
	Structural	2.2961	0.5038	1.9926	0.3620	1.2811	6.4356
	Non_Structural	10.4481	1.8043	3.7264	0.8329	3.0903	19.9020
	Content	3.3089	0.4134	1.7224	0.4795	1.2346	7.1588
	Inventory	0.0000	0.0000	0.3604	0.0860	0.0332	0.4796
	Subtotal	**16.0531**	**2.7215**	**7.8018**	**1.7604**	**5.6392**	**33.9760**
	Total	**17.18**	**3.90**	**12.71**	**1.98**	**7.37**	**43.14**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	510.0810	0.0000	0.00
	Bridges	19.8639	0.1104	0.56
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**529.9449**	**0.1104**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**529.94**	**0.11**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	4.4308	0.0000	0.00
	Subtotal	**4.4308**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.6585	0.0000	0.00
	Subtotal	**2.6585**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.7723	0.0000	0.00
	Subtotal	**1.7723**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**8.86**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	10,903	1,823	527	2,350
Total Region		**10,903**	**1,823**	**527**	**2,350**

Hazus: Earthquake Global Risk Report

Region Name: Hartford_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
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General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.05 square miles and contains 41 census tracts. There are over 47 thousand households in the region which has a total population of 121,054 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 20 thousand buildings in the region with a total building replacement value (excluding contents) of 18,506 (millions of dollars). Approximately 77.00 % of the buildings (and 47.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 8,143 and 1,202 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 20 thousand buildings in the region which have an aggregate total replacement value of 18,506 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 64% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 1,731 beds. There are 62 schools, 12 fire stations, 7 police stations and 2 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 9,345.00 (millions of dollars). This inventory includes over 116.82 miles of highways, 109 bridges, 457.95 miles of pipes.

Table 1: Transportation System Lifeline Inventory

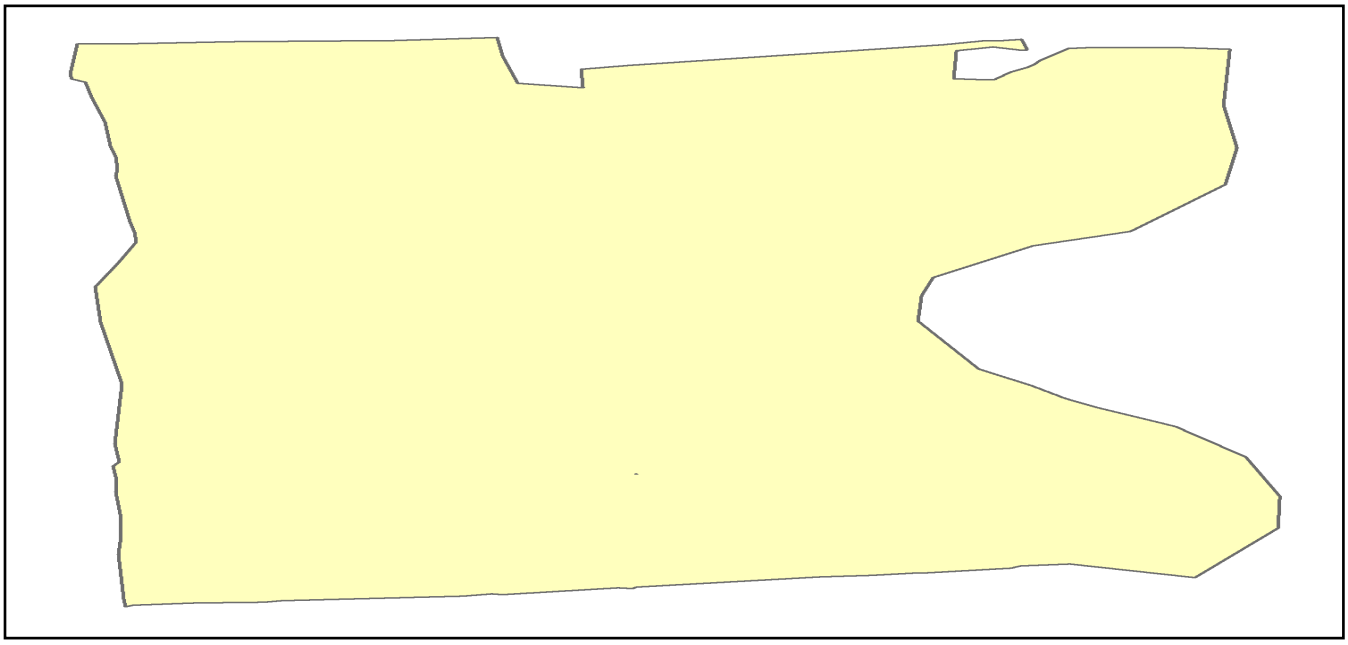
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	109	1890.6467
	Segments	145	1445.0863
	Tunnels	5	34.3248
		Subtotal	**3370.0578**
Railways	Bridges	5	26.0500
	Facilities	1	2.6630
	Segments	65	4705.5818
	Tunnels	0	0.0000
		Subtotal	**4734.2948**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	4	13.9611
		Subtotal	**13.9611**
Airport	Facilities	1	13.3560
	Runways	2	12.0248
		Subtotal	**25.3808**
		Total	**8,143.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	8.6485
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**8.6485**
Waste Water	Distribution Lines	NA	5.1891
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**162.6353**
Natural Gas	Distribution Lines	NA	3.4594
	Facilities	0	0.0000
	Pipelines	1	286.3532
		Subtotal	**289.8126**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	5	741.5174
		Subtotal	**741.5174**
Communication	Facilities	3	0.3450
		Subtotal	**0.3450**
		Total	**1,203.00**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 4,942 buildings will be at least moderately damaged. This is over 24.00 % of the buildings in the region. There are an estimated 489 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

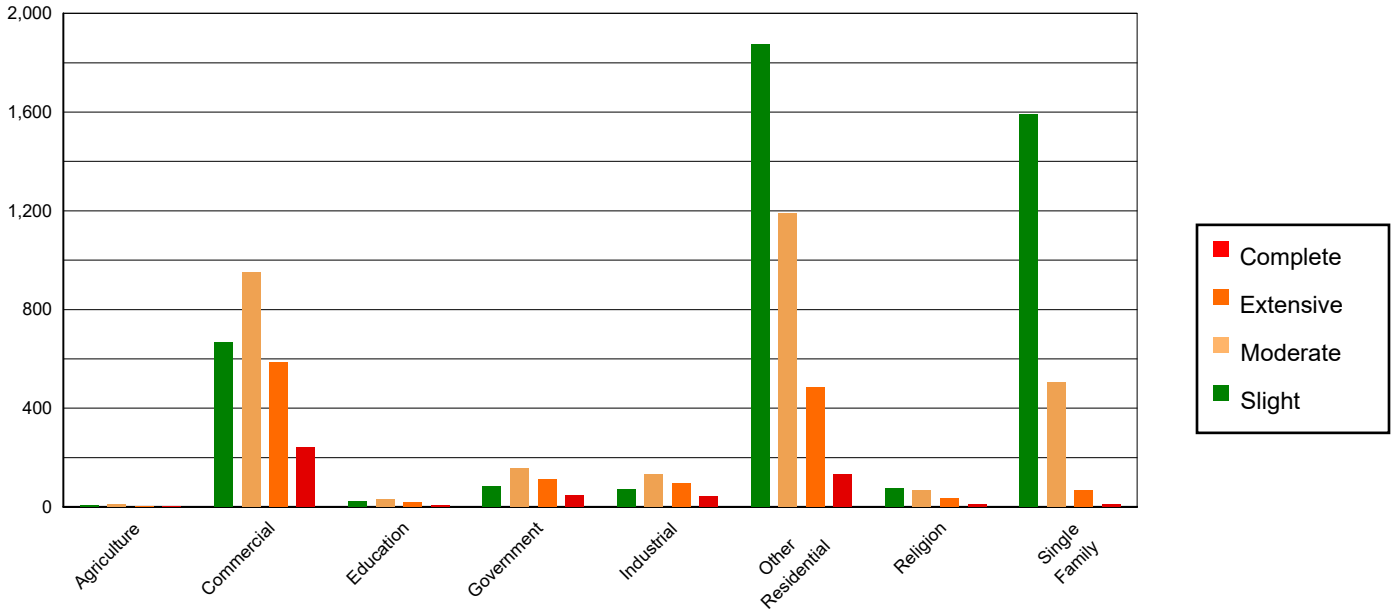


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	8.74	0.08	7.75	0.18	9.01	0.30	4.54	0.32	1.96	0.40
Commercial	884.80	7.78	667.24	15.19	952.62	31.30	587.31	41.67	240.03	49.00
Education	30.09	0.26	21.02	0.48	31.92	1.05	19.49	1.38	7.49	1.53
Government	106.95	0.94	84.04	1.91	154.66	5.08	111.05	7.88	47.30	9.66
Industrial	92.70	0.81	73.05	1.66	132.14	4.34	97.90	6.95	43.21	8.82
Other Residential	5101.05	44.83	1875.42	42.68	1188.35	39.05	484.65	34.39	130.53	26.65
Religion	178.18	1.57	75.80	1.73	69.10	2.27	35.28	2.50	10.64	2.17
Single Family	4976.37	43.73	1589.55	36.18	505.28	16.60	69.07	4.90	8.73	1.78
Total	**11,379**		**4,394**		**3,043**		**1,409**		**490**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	9007.97	79.16	3028.13	68.92	1020.32	33.53	107.86	7.65	8.40	1.71
Steel	311.80	2.74	303.67	6.91	772.21	25.38	645.86	45.83	308.53	62.98
Concrete	109.66	0.96	95.23	2.17	219.89	7.23	167.58	11.89	65.14	13.30
Precast	39.63	0.35	21.27	0.48	44.07	1.45	36.87	2.62	9.41	1.92
RM	534.64	4.70	186.07	4.23	295.94	9.72	166.83	11.84	13.40	2.74
URM	1375.18	12.09	759.50	17.29	690.64	22.70	284.29	20.17	85.01	17.35
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**11,379**		**4,394**		**3,043**		**1,409**		**490**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 1,731 hospital beds available for use. On the day of the earthquake, the model estimates that only 701 hospital beds (41.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 64.00% of the beds will be back in service. By 30 days, 87.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	5	0	0	0
Schools	62	0	0	0
EOCs	2	0	0	0
PoliceStations	7	0	0	0
FireStations	12	0	0	0

Transportation Lifeline Damage

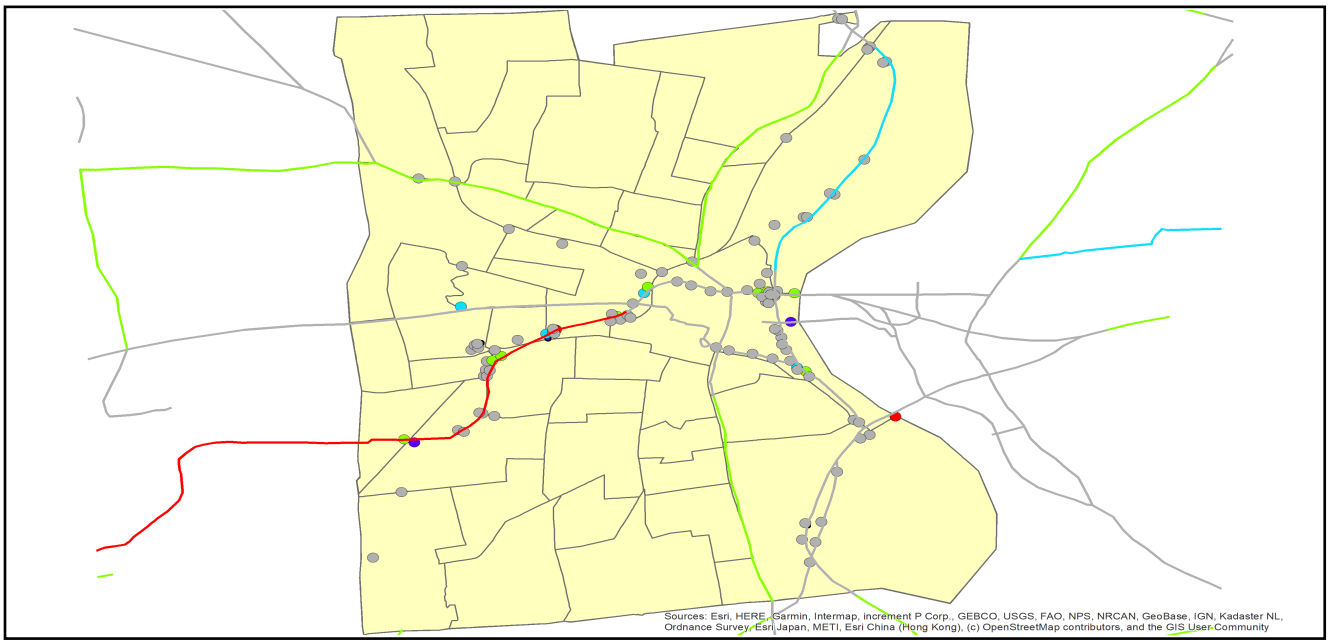


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	145	0	0	144	144
	Bridges	109	8	0	104	107
	Tunnels	5	0	0	5	5
Railways	Segments	65	0	0	65	65
	Bridges	5	0	0	5	5
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	4	0	0	4	4
Airport	Facilities	1	0	0	1	1
	Runways	2	0	0	2	2

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	5	0	0	0	0
Communication	3	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	269	0	0
Waste Water	161	0	0
Natural Gas	28	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

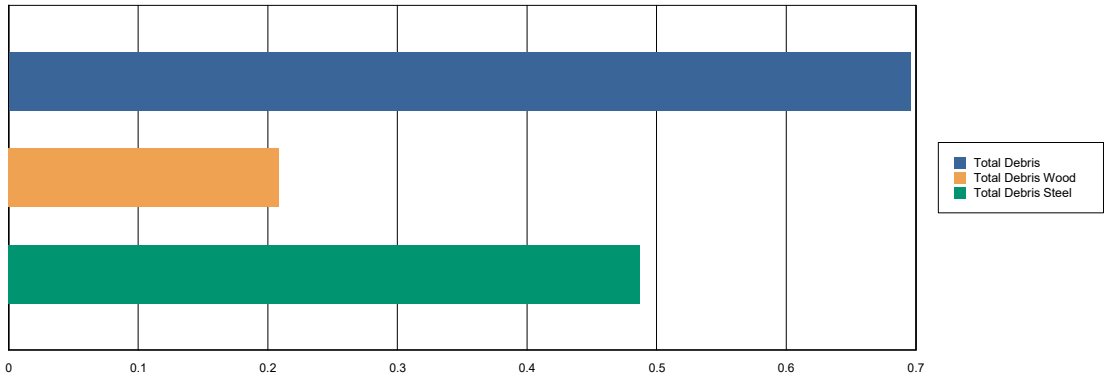
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 1 ignitions that will burn about 0.01 sq. mi 0.05 % of the region's total area.) The model also estimates that the fires will displace about 63 people and burn about 5 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 696,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 30.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 27,840 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



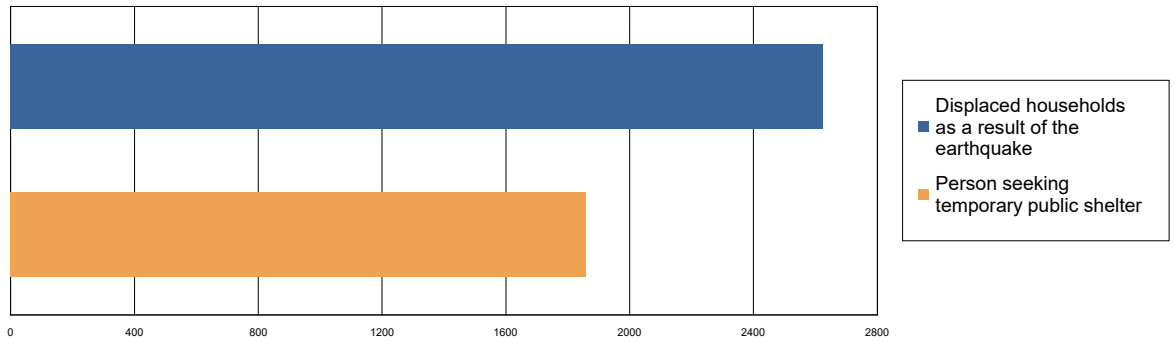
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.21	0.49	0.70	27,840 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2,623 households to be displaced due to the earthquake. Of these, 1,859 people (out of a total population of 121,054) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
2,623	1,859

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	18.45	4.68	0.65	1.28
	Commuting	0.02	0.02	0.03	0.01
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.23	0.06	0.01	0.02
	Industrial	6.64	1.73	0.24	0.48
	Other-Residential	274.54	64.46	9.25	18.21
	Single Family	14.88	2.19	0.21	0.41
	Total	**315**	**73**	**10**	**20**
2 PM	Commercial	1017.17	257.87	35.99	70.14
	Commuting	0.14	0.17	0.30	0.06
	Educational	263.15	68.56	10.40	20.18
	Hotels	0.04	0.01	0.00	0.00
	Industrial	49.01	12.77	1.81	3.49
	Other-Residential	86.72	20.64	3.04	5.76
	Single Family	4.38	0.67	0.07	0.13
	Total	**1,421**	**361**	**52**	**100**
5 PM	Commercial	603.39	152.86	21.42	41.41
	Commuting	2.67	3.20	5.83	1.11
	Educational	50.33	13.09	2.00	3.85
	Hotels	0.07	0.02	0.00	0.01
	Industrial	30.63	7.98	1.13	2.18
	Other-Residential	108.14	25.57	3.75	7.09
	Single Family	5.80	0.89	0.09	0.17
	Total	**801**	**204**	**34**	**56**

Economic Loss

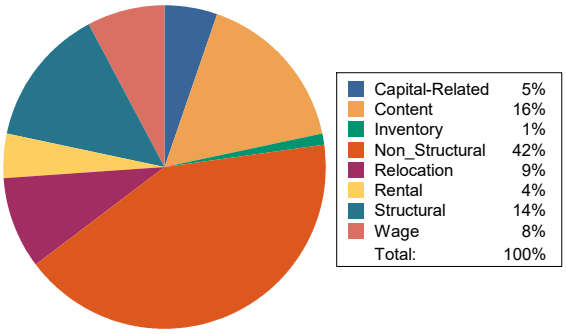
The total economic loss estimated for the earthquake is 3,151.55 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 3,083.98 (millions of dollars); 27 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 19 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

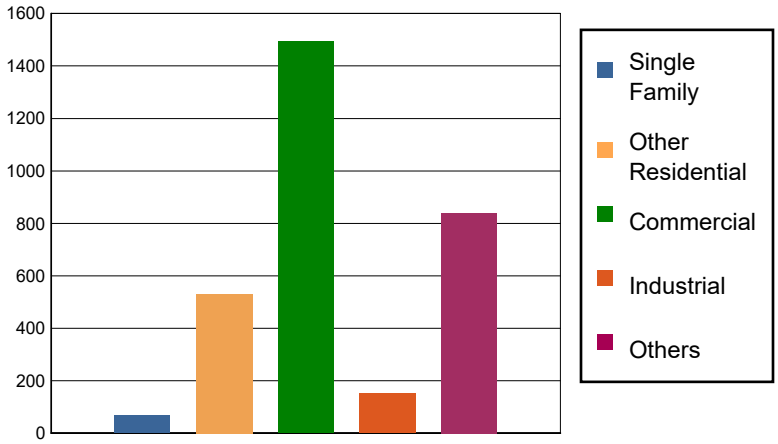


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	18.3984	173.9477	3.0217	42.3244	237.6922
	Capital-Related	0.0000	7.8272	146.9880	1.7996	8.4268	165.0416
	Rental	1.1985	43.6839	68.4267	1.2577	23.8615	138.4283
	Relocation	4.3363	26.2816	111.8602	6.2256	134.2214	282.9251
	Subtotal	**5.5348**	**96.1911**	**501.2226**	**12.3046**	**208.8341**	**824.0872**
Capital Stock Losses							
	Structural	7.8693	67.8336	219.5580	25.3568	111.1485	431.7662
	Non_Structural	38.9572	296.2445	519.8537	68.3397	367.0331	1,290.4282
	Content	14.4233	69.8858	222.6752	40.5193	152.0898	499.5934
	Inventory	0.0000	0.0000	31.2513	6.4079	0.4409	38.1001
	Subtotal	**61.2498**	**433.9639**	**993.3382**	**140.6237**	**630.7123**	**2259.8879**
	Total	**66.78**	**530.16**	**1494.56**	**152.93**	**839.55**	**3083.98**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1445.0863	0.0000	0.00
	Bridges	1890.6467	61.7473	3.27
	Tunnels	34.3248	0.3279	0.96
	Subtotal	**3370.0578**	**62.0752**	
Railways	Segments	4705.5818	0.0000	0.00
	Bridges	26.0500	0.2648	1.02
	Tunnels	0.0000	0.0000	0.00
	Facilities	2.6630	0.4636	17.41
	Subtotal	**4734.2948**	**0.7284**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	13.9611	2.3453	16.80
	Subtotal	**13.9611**	**2.3453**	
Airport	Facilities	13.3560	2.4218	18.13
	Runways	12.0248	0.0000	0.00
	Subtotal	**25.3808**	**2.4218**	
	Total	**8,143.69**	**67.57**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	8.6485	0.0000	0.00
	Subtotal	**8.6485**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	5.1891	0.0000	0.00
	Subtotal	**162.6353**	**0.0000**	
Natural Gas	Pipelines	286.3532	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.4594	0.0000	0.00
	Subtotal	**289.8126**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	741.5174	0.0000	0.00
	Subtotal	**741.5174**	**0.0000**	
Communication	Facilities	0.3450	0.0000	0.00
	Subtotal	**0.3450**	**0.0000**	
	Total	**1,202.96**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	121,054	8,688	9,817	18,506
Total Region		**121,054**	**8,688**	**9,817**	**18,506**

Hazus: Earthquake Global Risk Report

Region Name: Hebron_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

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The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 37.25 square miles and contains 2 census tracts. There are over 3 thousand households in the region which has a total population of 9,098 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 1,896 (millions of dollars). Approximately 91.00 % of the buildings (and 77.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 270 and 168 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 3 thousand buildings in the region which have an aggregate total replacement value of 1,896 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 4 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 438.00 (millions of dollars). This inventory includes over 38.53 miles of highways, 8 bridges, 196.35 miles of pipes.

Table 1: Transportation System Lifeline Inventory

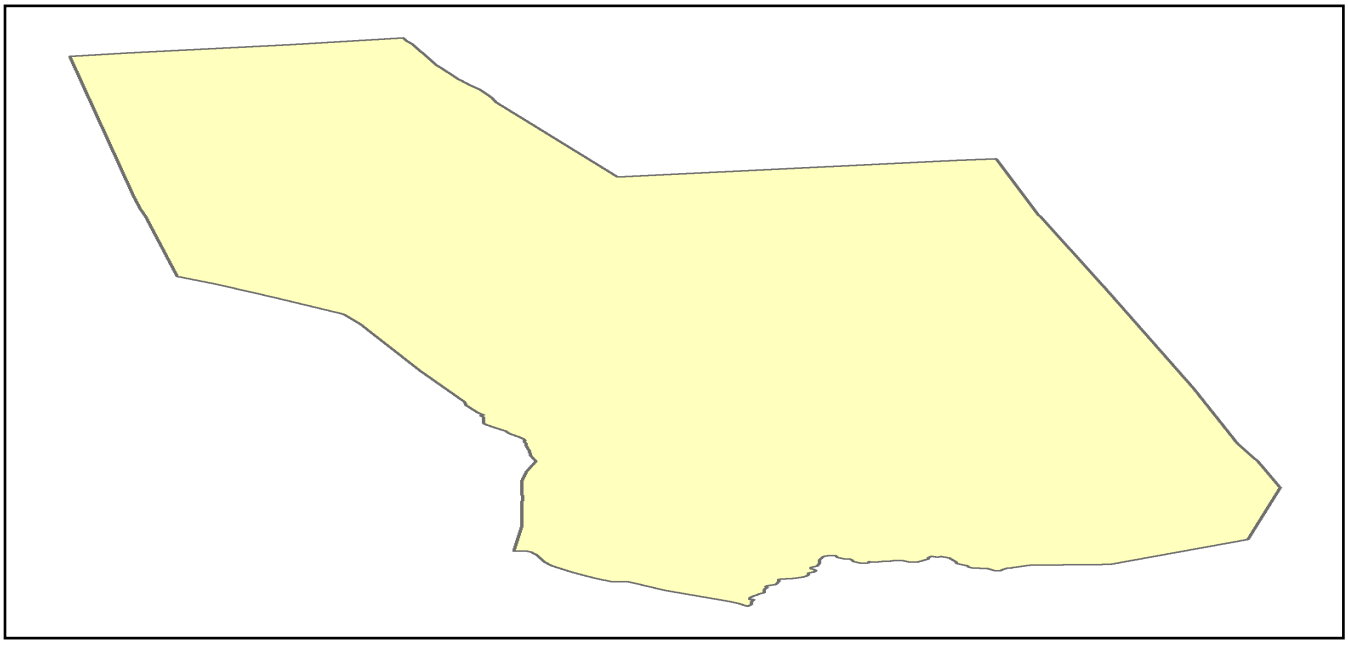
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	8	2.7800
	Segments	9	267.4761
	Tunnels	0	0.0000
		Subtotal	**270.2561**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**270.30**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	3.6348
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.6348**
Waste Water	Distribution Lines	NA	2.1809
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.1809**
Natural Gas	Distribution Lines	NA	1.4539
	Facilities	0	0.0000
	Pipelines	3	160.8337
		Subtotal	**162.2876**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**168.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,340 buildings will be at least moderately damaged. This is over 37.00 % of the buildings in the region. There are an estimated 241 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

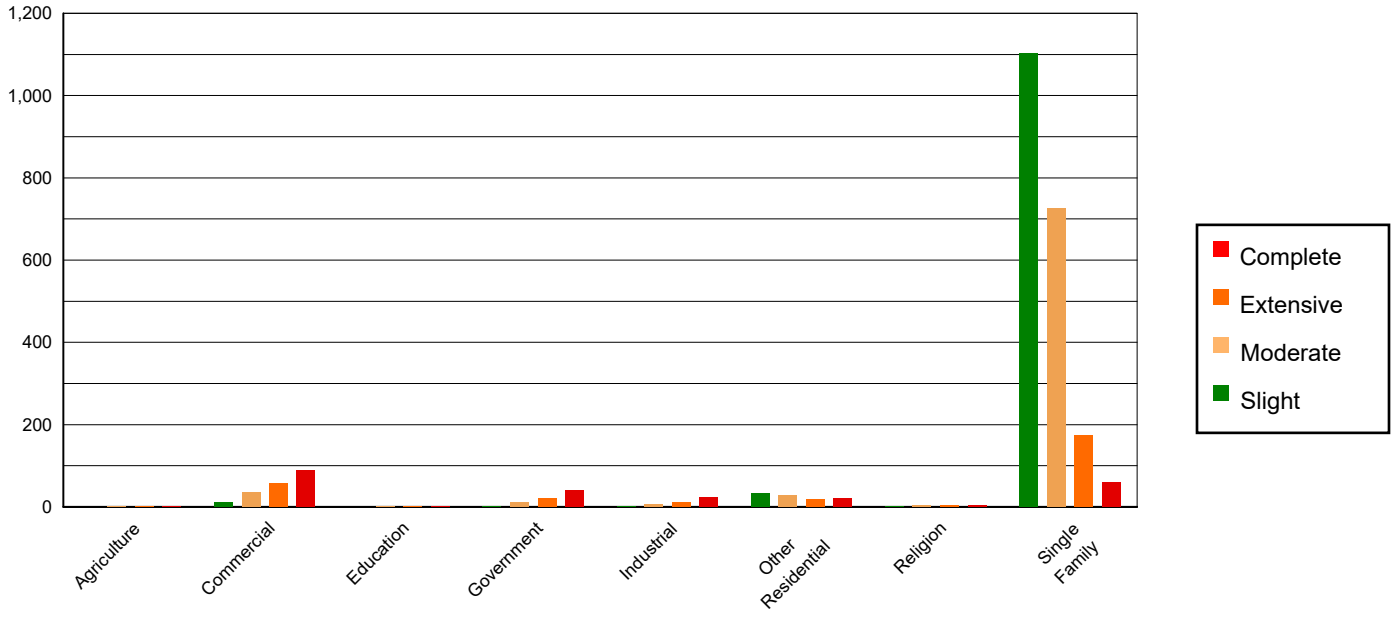


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0.17	0.02	0.46	0.04	1.72	0.21	2.06	0.72	2.59	1.07
Commercial	4.85	0.43	10.30	0.89	36.21	4.46	55.80	19.42	88.84	36.78
Education	0.17	0.02	0.33	0.03	1.11	0.14	1.79	0.62	2.60	1.08
Government	1.19	0.11	2.41	0.21	9.86	1.21	20.75	7.22	39.80	16.48
Industrial	0.65	0.06	1.38	0.12	5.71	0.70	11.61	4.04	22.66	9.38
Other Residential	31.58	2.81	32.82	2.85	28.02	3.45	17.41	6.06	21.17	8.77
Religion	2.34	0.21	2.73	0.24	3.12	0.38	2.97	1.03	4.85	2.01
Single Family	1083.60	96.36	1102.46	95.63	725.98	89.44	174.92	60.89	59.03	24.44
Total	**1,125**		**1,153**		**812**		**287**		**242**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1107.54	98.49	1123.17	97.42	734.36	90.47	166.33	57.90	28.69	11.88
Steel	1.35	0.12	2.69	0.23	16.49	2.03	46.88	16.32	96.35	39.89
Concrete	0.22	0.02	0.45	0.04	2.87	0.35	7.71	2.68	15.40	6.37
Precast	0.10	0.01	0.17	0.01	1.07	0.13	2.53	0.88	6.81	2.82
RM	0.90	0.08	1.09	0.09	5.75	0.71	11.39	3.96	18.31	7.58
URM	14.44	1.28	25.32	2.20	51.19	6.31	52.46	18.26	76.00	31.46
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1,125**		**1,153**		**812**		**287**		**242**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	4	4	0	0
EOCs	1	1	0	0
PoliceStations	1	1	0	0
FireStations	2	2	0	0

Transportation Lifeline Damage

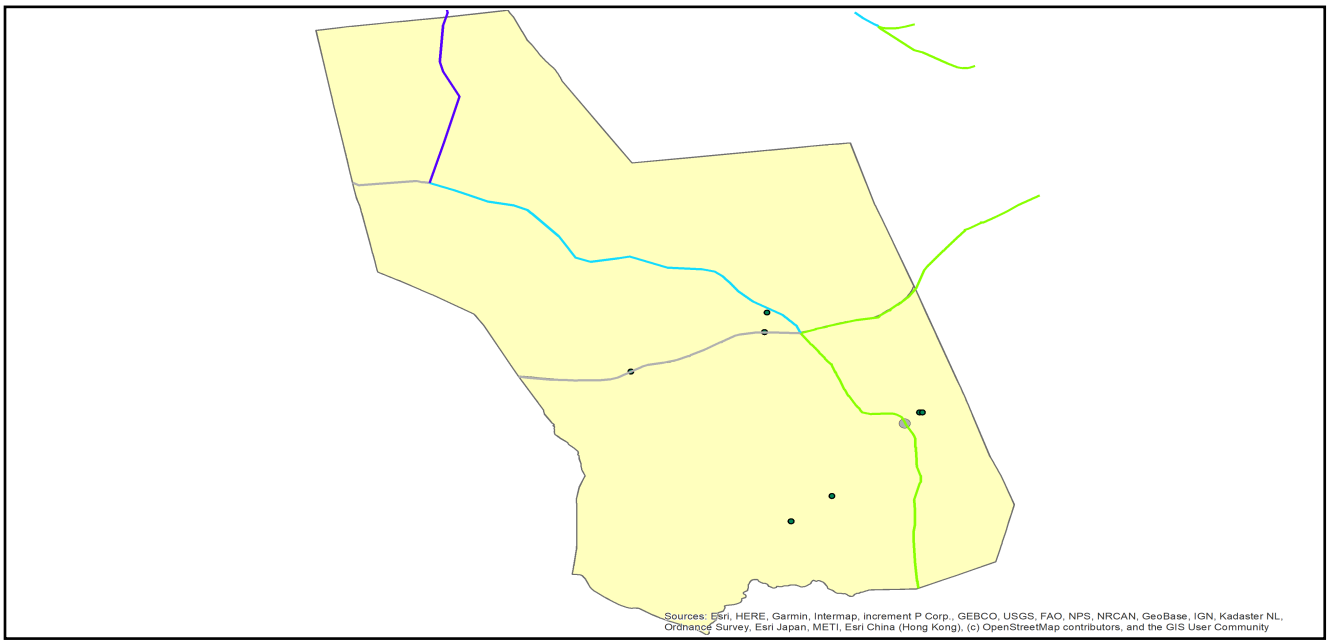


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	9	0	0	9	9
	Bridges	8	0	0	8	8
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	113	0	0
Waste Water	68	0	0
Natural Gas	16	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

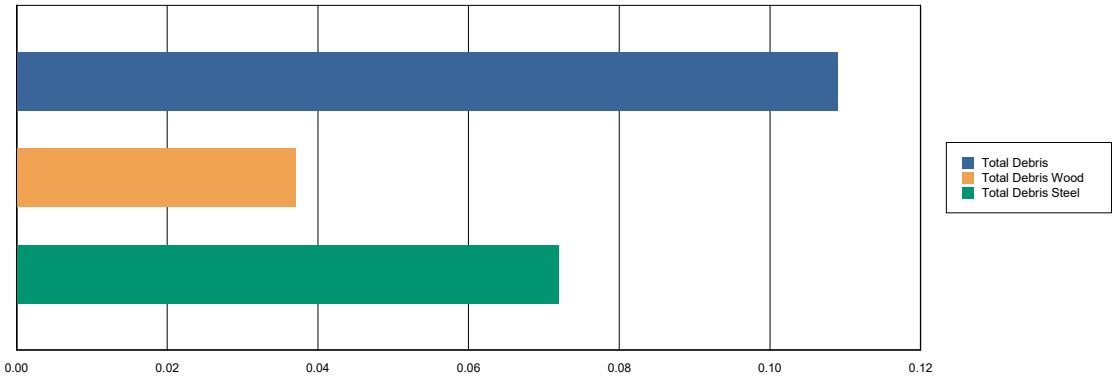
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 109,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 34.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 4,360 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



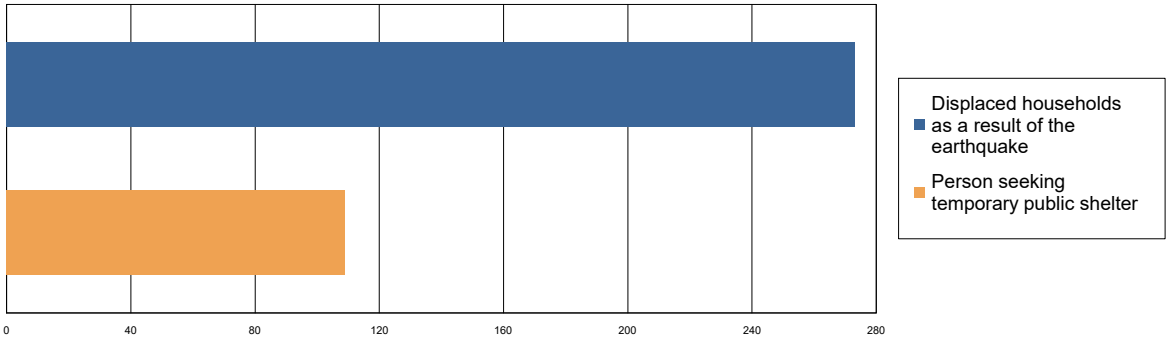
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.04	0.07	0.11	4,360 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 273 households to be displaced due to the earthquake. Of these, 109 people (out of a total population of 9,098) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
273	109

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	2.72	0.84	0.13	0.26
	Commuting	0.01	0.01	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.57	0.18	0.03	0.06
	Other-Residential	15.37	4.77	0.80	1.57
	Single Family	33.46	7.80	1.01	1.98
	Total	**52**	**14**	**2**	**4**
2 PM	Commercial	199.29	61.51	9.80	19.09
	Commuting	0.05	0.07	0.11	0.02
	Educational	90.04	27.91	4.61	9.02
	Hotels	0.00	0.00	0.00	0.00
	Industrial	4.21	1.31	0.21	0.41
	Other-Residential	4.36	1.36	0.23	0.44
	Single Family	9.56	2.31	0.32	0.59
	Total	**308**	**94**	**15**	**30**
5 PM	Commercial	157.62	48.64	7.84	14.96
	Commuting	1.00	1.47	2.31	0.46
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.63	0.82	0.13	0.25
	Other-Residential	6.10	1.90	0.32	0.61
	Single Family	13.35	3.22	0.44	0.82
	Total	**181**	**56**	**11**	**17**

Economic Loss

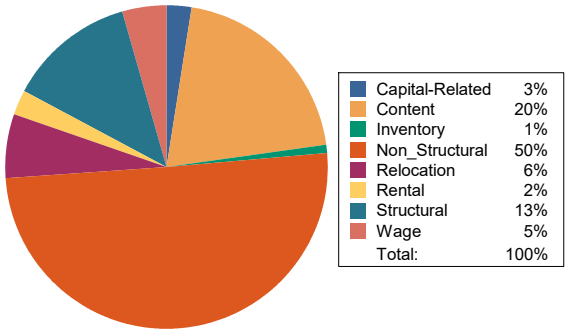
The total economic loss estimated for the earthquake is 609.29 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 608.92 (millions of dollars); 16 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 35 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

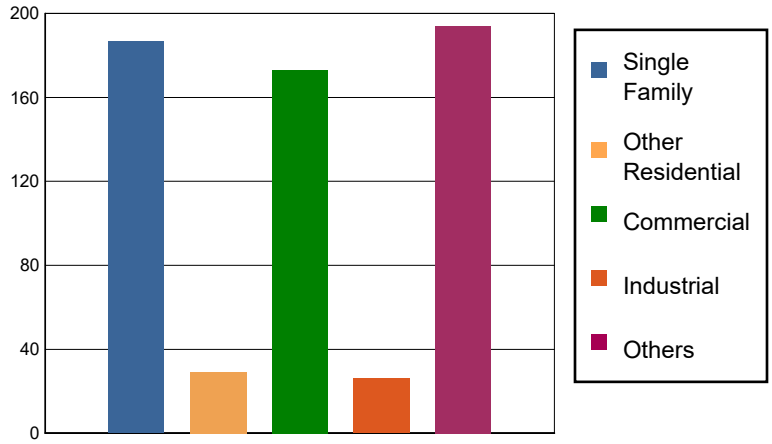


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.2565	20.0621	0.4011	6.1183	27.8380
	Capital-Related	0.0000	0.5349	14.2322	0.2301	1.0010	15.9982
	Rental	2.8519	2.2088	5.8076	0.1789	3.3548	14.4020
	Relocation	10.3451	1.2874	8.9446	0.5690	17.0909	38.2370
	Subtotal	**13.1970**	**5.2876**	**49.0465**	**1.3791**	**27.5650**	**96.4752**
Capital Stock Losses							
	Structural	24.7247	3.1052	19.1776	3.1548	27.5335	77.6958
	Non_Structural	111.1731	16.8885	68.6546	12.6463	97.8794	307.2419
	Content	37.6659	3.8399	32.5552	7.4983	40.6764	122.2357
	Inventory	0.0000	0.0000	3.5820	1.2063	0.4808	5.2691
	Subtotal	**173.5637**	**23.8336**	**123.9694**	**24.5057**	**166.5701**	**512.4425**
	Total	**186.76**	**29.12**	**173.02**	**25.88**	**194.14**	**608.92**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	267.4761	0.0000	0.00
	Bridges	2.7800	0.3721	13.38
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**270.2561**	**0.3721**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**270.26**	**0.37**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.6348	0.0000	0.00
	Subtotal	**3.6348**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.1809	0.0000	0.00
	Subtotal	**2.1809**	**0.0000**	
Natural Gas	Pipelines	160.8337	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.4539	0.0000	0.00
	Subtotal	**162.2876**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**168.10**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	9,098	1,453	442	1,896
Total Region		**9,098**	**1,453**	**442**	**1,896**

Hazus: Earthquake Global Risk Report

Region Name: Manchester_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 27.68 square miles and contains 15 census tracts. There are over 25 thousand households in the region which has a total population of 59,713 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 17 thousand buildings in the region with a total building replacement value (excluding contents) of 11,095 (millions of dollars). Approximately 87.00 % of the buildings (and 54.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,718 and 175 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 17 thousand buildings in the region which have an aggregate total replacement value of 11,095 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 80% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 249 beds. There are 21 schools, 7 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,893.00 (millions of dollars). This inventory includes over 62.76 miles of highways, 72 bridges, 569.18 miles of pipes.

Table 1: Transportation System Lifeline Inventory

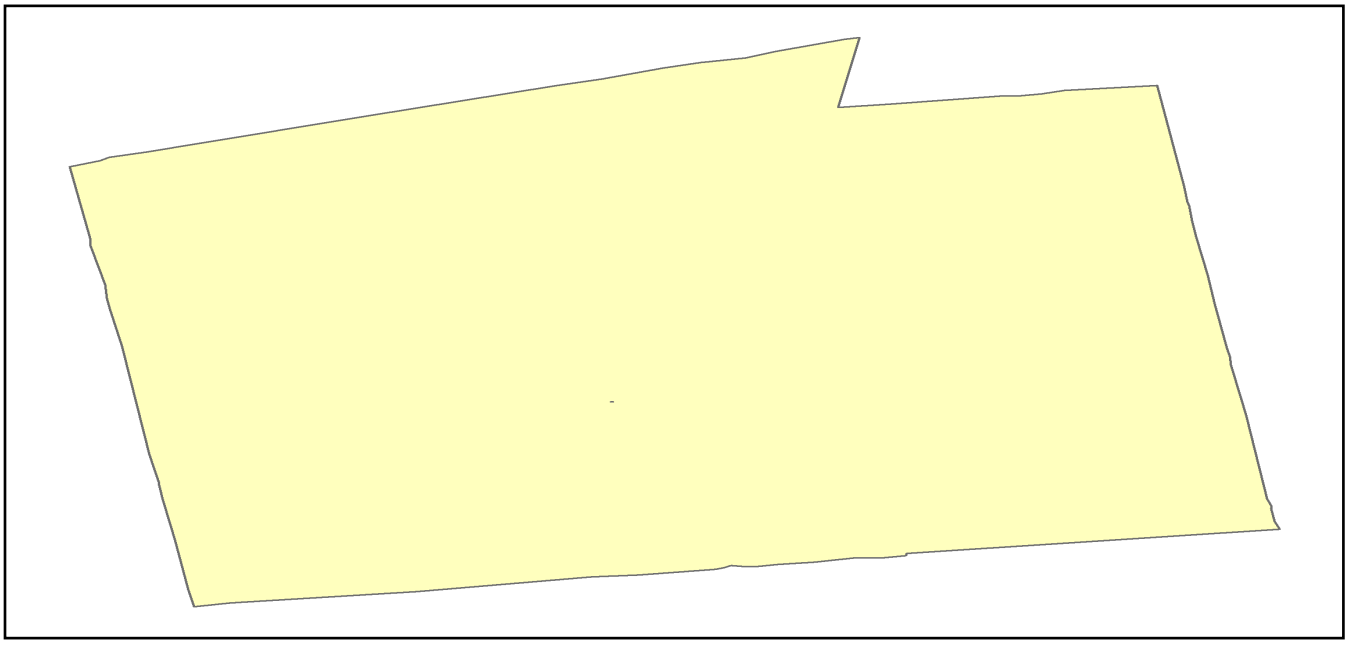
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	72	390.9109
	Segments	44	770.1807
	Tunnels	0	0.0000
		Subtotal	**1161.0916**
Railways	Bridges	3	15.6300
	Facilities	0	0.0000
	Segments	3	541.5602
	Tunnels	0	0.0000
		Subtotal	**557.1902**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**1,718.30**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	9.1665
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**9.1665**
Waste Water	Distribution Lines	NA	5.4999
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**162.9461**
Natural Gas	Distribution Lines	NA	3.6666
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.6666**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	1	0.1150
		Subtotal	**0.1150**
		Total	**175.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 3,406 buildings will be at least moderately damaged. This is over 20.00 % of the buildings in the region. There are an estimated 343 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

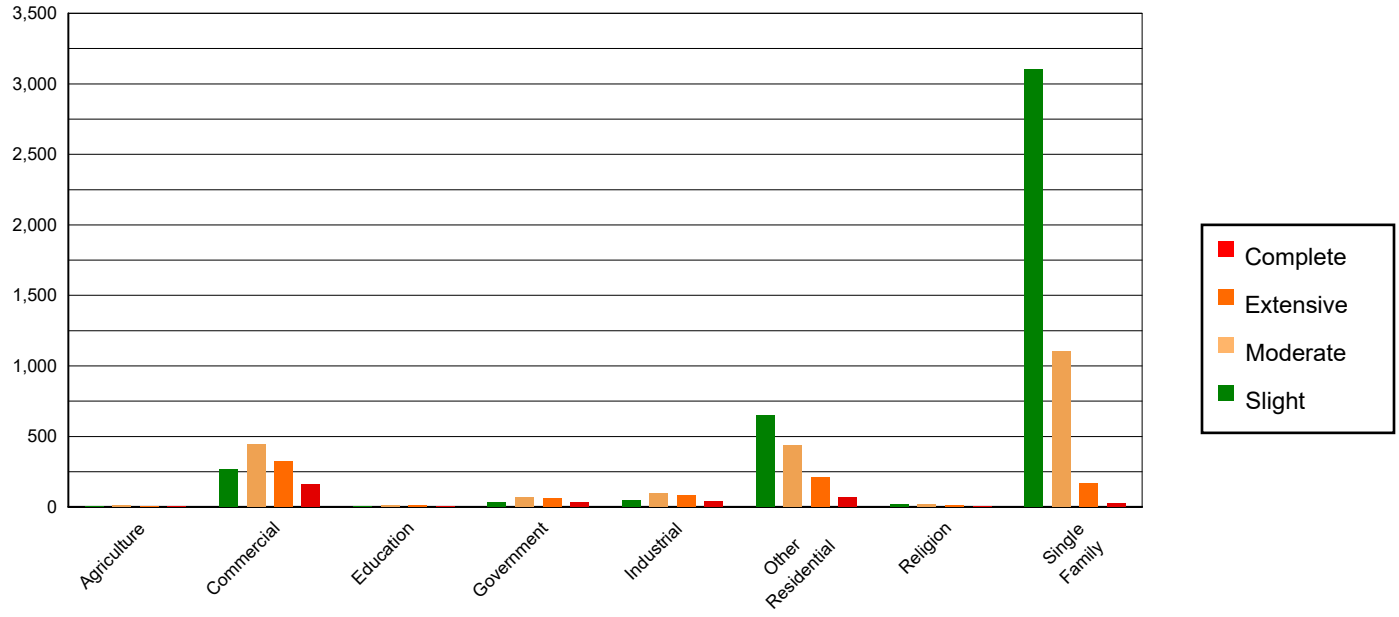


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	6.35	0.06	6.86	0.17	9.63	0.44	5.40	0.62	2.76	0.81
Commercial	303.39	3.10	267.46	6.47	447.00	20.37	324.69	37.39	160.47	46.77
Education	8.77	0.09	7.46	0.18	13.21	0.60	9.84	1.13	4.72	1.38
Government	35.59	0.36	33.28	0.80	71.41	3.25	63.02	7.26	33.69	9.82
Industrial	55.84	0.57	48.92	1.18	97.00	4.42	81.39	9.37	41.85	12.20
Other Residential	1477.81	15.10	650.26	15.73	434.85	19.81	207.67	23.92	71.41	20.81
Religion	39.04	0.40	19.70	0.48	19.12	0.87	11.67	1.34	4.48	1.30
Single Family	7858.01	80.31	3100.87	74.99	1102.71	50.24	164.66	18.96	23.76	6.92
Total	**9,785**		**4,135**		**2,195**		**868**		**343**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	8934.43	91.31	3545.02	85.74	1249.37	56.92	149.33	17.20	11.43	3.33
Steel	105.17	1.07	119.45	2.89	349.89	15.94	354.95	40.88	206.50	60.18
Concrete	22.68	0.23	25.94	0.63	79.92	3.64	82.82	9.54	43.15	12.58
Precast	13.21	0.14	8.47	0.20	20.28	0.92	20.09	2.31	7.09	2.07
RM	145.23	1.48	62.86	1.52	120.75	5.50	88.55	10.20	15.17	4.42
URM	564.08	5.76	373.07	9.02	374.71	17.07	172.60	19.88	59.79	17.42
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**9,785**		**4,135**		**2,195**		**868**		**343**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 249 hospital beds available for use. On the day of the earthquake, the model estimates that only 83 hospital beds (33.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 57.00% of the beds will be back in service. By 30 days, 83.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	0
Schools	21	0	0	1
EOCs	1	0	0	1
PoliceStations	2	0	0	0
FireStations	7	0	0	2

Transportation Lifeline Damage

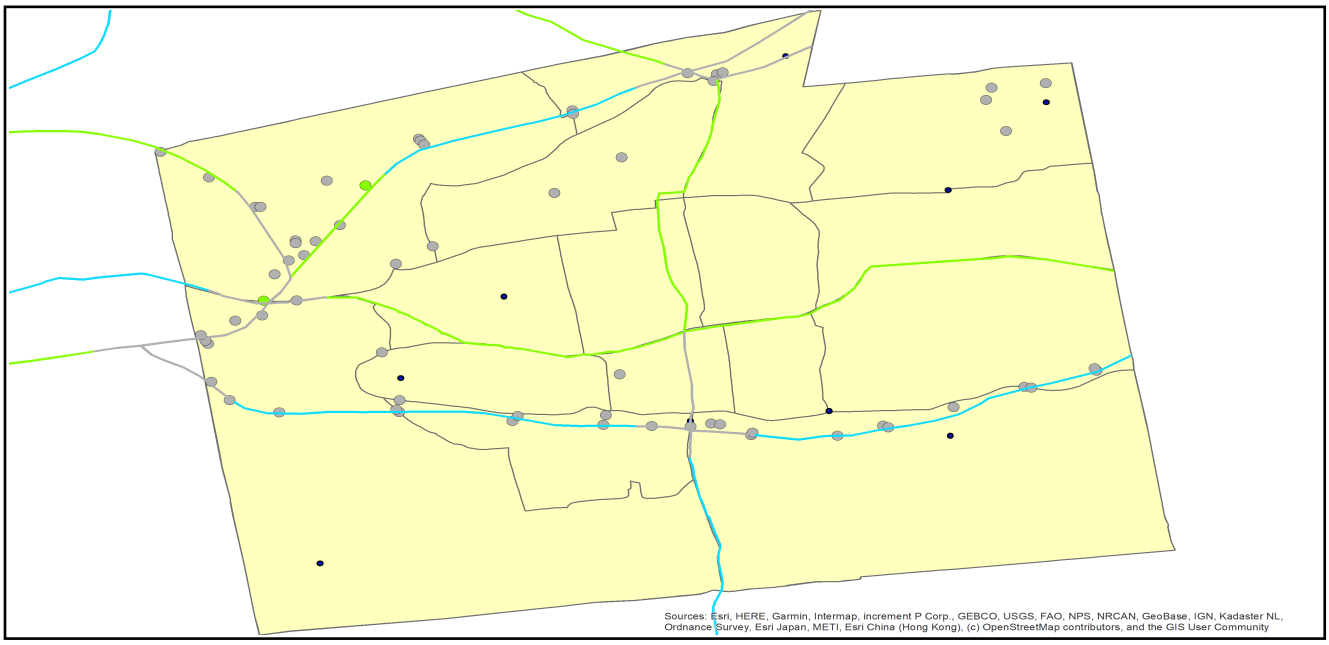


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	44	0	0	44	44
	Bridges	72	2	0	70	72
	Tunnels	0	0	0	0	0
Railways	Segments	3	0	0	1	1
	Bridges	3	0	0	3	3
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	1	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	285	0	0
Waste Water	171	0	0
Natural Gas	114	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

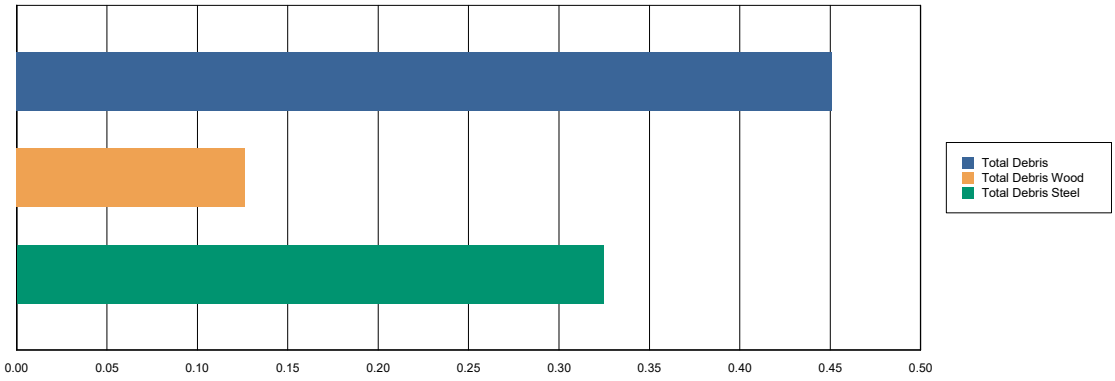
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 451,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 28.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 18,040 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



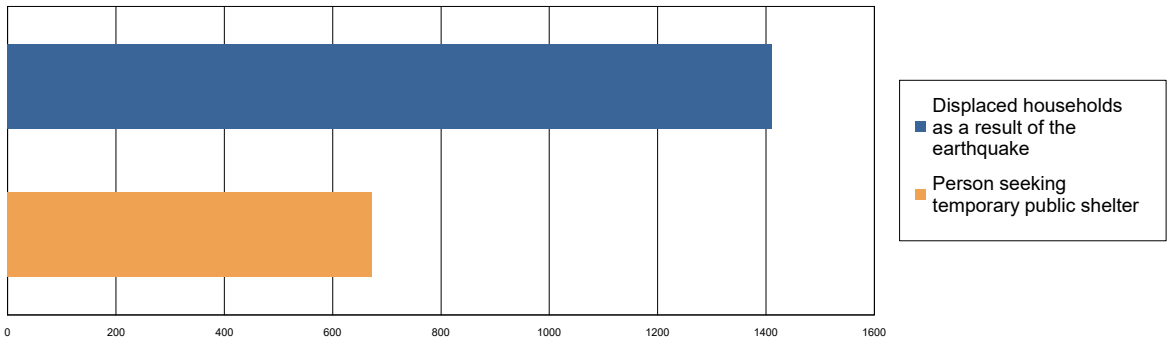
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.13	0.32	0.45	18,040 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1,412 households to be displaced due to the earthquake. Of these, 672 people (out of a total population of 59,713) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
1,412	672

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	6.45	1.70	0.24	0.47
	Commuting	0.00	0.01	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.14	0.04	0.01	0.01
	Industrial	5.67	1.51	0.22	0.42
	Other-Residential	102.65	26.02	3.95	7.79
	Single Family	26.56	4.24	0.43	0.84
	Total	**141**	**34**	**5**	**10**
2 PM	Commercial	396.86	104.66	14.99	29.14
	Commuting	0.04	0.06	0.10	0.02
	Educational	168.09	46.72	7.38	14.32
	Hotels	0.03	0.01	0.00	0.00
	Industrial	41.84	11.13	1.60	3.10
	Other-Residential	30.42	7.72	1.19	2.26
	Single Family	7.65	1.27	0.14	0.26
	Total	**645**	**172**	**25**	**49**
5 PM	Commercial	267.14	70.65	10.24	19.61
	Commuting	0.87	1.23	1.99	0.39
	Educational	38.95	11.07	1.79	3.44
	Hotels	0.04	0.01	0.00	0.00
	Industrial	26.15	6.96	1.00	1.94
	Other-Residential	40.40	10.27	1.59	3.01
	Single Family	10.39	1.73	0.19	0.35
	Total	**384**	**102**	**17**	**29**

Economic Loss

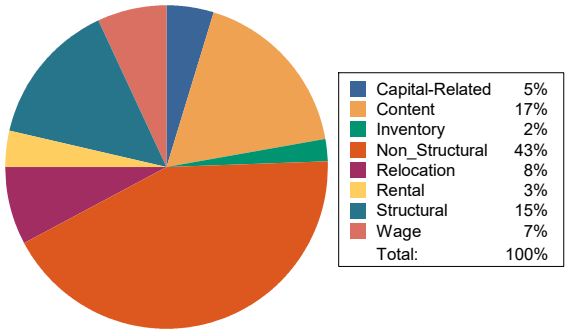
The total economic loss estimated for the earthquake is 2,038.10 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 2,021.17 (millions of dollars); 23 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 20 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

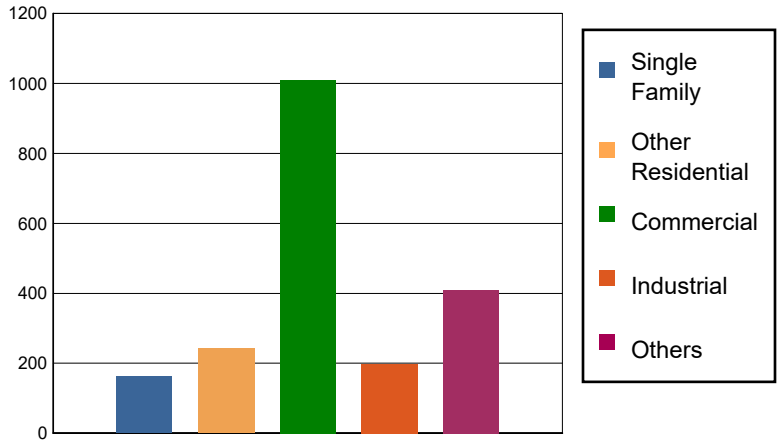


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	9.0113	111.8904	3.9950	16.2238	141.1205
	Capital-Related	0.0000	3.8338	85.6224	2.4020	3.7327	95.5909
	Rental	2.7260	19.5877	38.3772	1.5778	8.4180	70.6867
	Relocation	9.9170	11.5106	71.4992	7.0619	56.6261	156.6148
	Subtotal	**12.6430**	**43.9434**	**307.3892**	**15.0367**	**85.0006**	**464.0129**
Capital Stock Losses							
	Structural	19.7373	30.2866	153.1951	31.5427	59.0489	293.8106
	Non_Structural	95.5297	135.8879	359.0308	87.7368	188.7574	866.9426
	Content	34.8665	31.1898	156.1817	54.3518	76.2810	352.8708
	Inventory	0.0000	0.0000	34.5227	8.6492	0.3592	43.5311
	Subtotal	**150.1335**	**197.3643**	**702.9303**	**182.2805**	**324.4465**	**1557.1551**
	Total	**162.78**	**241.31**	**1010.32**	**197.32**	**409.45**	**2021.17**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	770.1807	0.0000	0.00
	Bridges	390.9109	16.7148	4.28
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1161.0916**	**16.7148**	
Railways	Segments	541.5602	0.0000	0.00
	Bridges	15.6300	0.2125	1.36
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**557.1902**	**0.2125**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**1,718.28**	**16.93**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	9.1665	0.0000	0.00
	Subtotal	**9.1665**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	5.4999	0.0000	0.00
	Subtotal	**162.9461**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.6666	0.0000	0.00
	Subtotal	**3.6666**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.1150	0.0000	0.00
	Subtotal	**0.1150**	**0.0000**	
	Total	**175.89**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	59,713	5,947	5,148	11,095
Total Region		**59,713**	**5,947**	**5,148**	**11,095**

Hazus: Earthquake Global Risk Report

Region Name: Mansfield_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 45.67 square miles and contains 4 census tracts. There are over 6 thousand households in the region which has a total population of 25,892 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 5,757 (millions of dollars). Approximately 86.00 % of the buildings (and 41.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 589 and 423 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 5,757 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 76% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 57 beds. There are 8 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,012.00 (millions of dollars). This inventory includes over 50.33 miles of highways, 33 bridges, 326.84 miles of pipes.

Table 1: Transportation System Lifeline Inventory

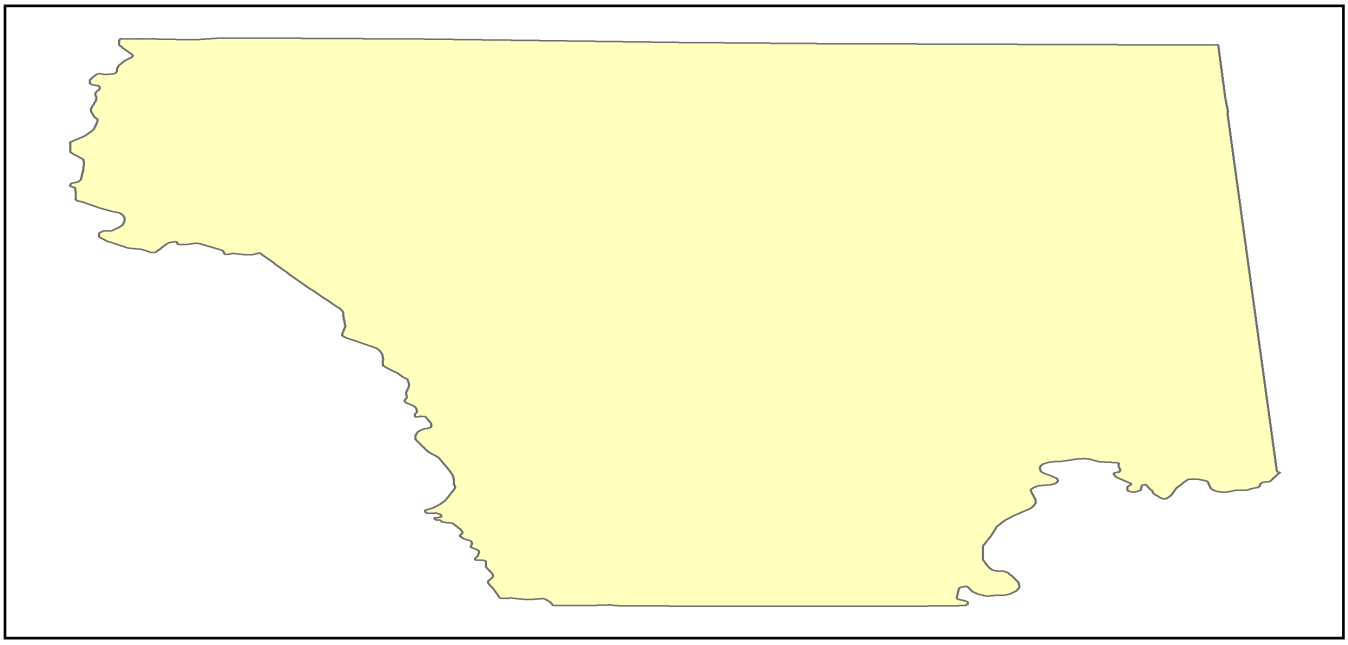
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	33	57.9453
	Segments	22	408.0234
	Tunnels	0	0.0000
		Subtotal	**465.9687**
Railways	Bridges	7	36.4700
	Facilities	0	0.0000
	Segments	7	82.4883
	Tunnels	0	0.0000
		Subtotal	**118.9583**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	2	4.1401
		Subtotal	**4.1401**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**589.10**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.2259
	Facilities	1	38.2950
	Pipelines	0	0.0000
		Subtotal	**44.5209**
Waste Water	Distribution Lines	NA	3.7355
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**161.1817**
Natural Gas	Distribution Lines	NA	2.4904
	Facilities	0	0.0000
	Pipelines	5	177.3271
		Subtotal	**179.8175**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	37.6001
		Subtotal	**37.6001**
Communication	Facilities	1	0.1150
		Subtotal	**0.1150**
		Total	**423.20**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,016 buildings will be at least moderately damaged. This is over 21.00 % of the buildings in the region. There are an estimated 110 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

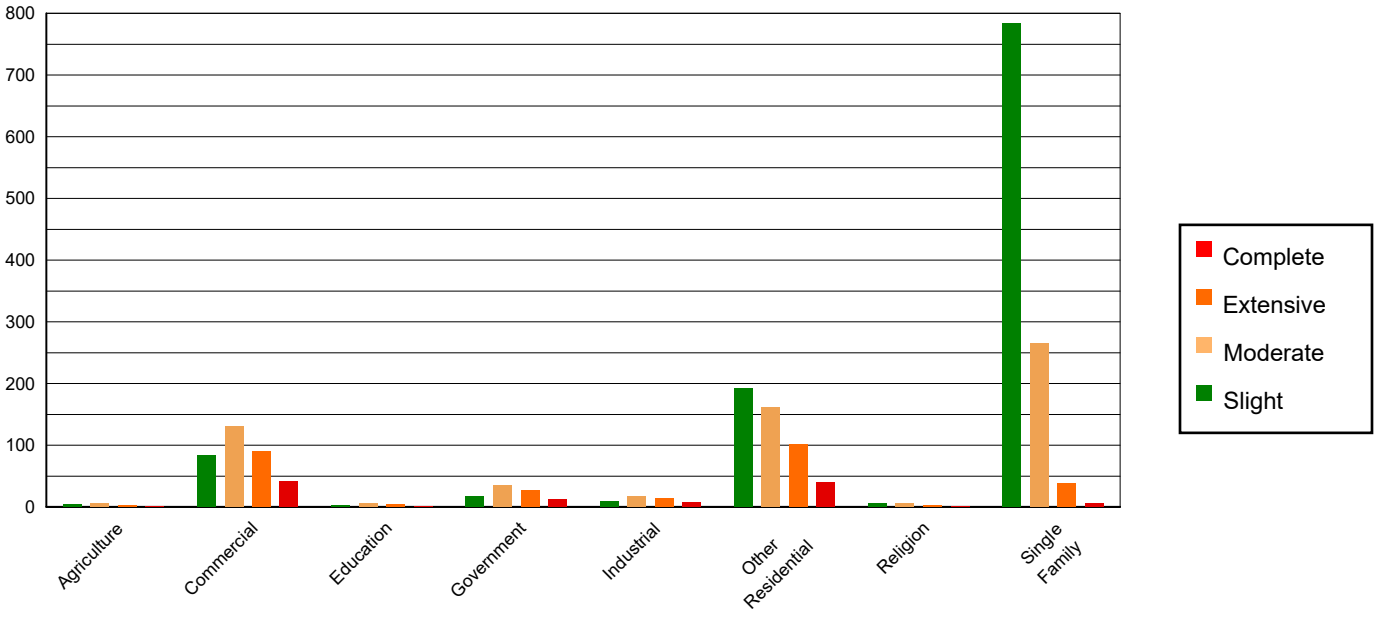


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	3.89	0.14	3.87	0.35	5.10	0.82	2.78	0.99	1.36	1.23
Commercial	102.80	3.68	83.20	7.57	131.24	20.98	90.10	32.08	41.66	37.69
Education	4.34	0.16	3.26	0.30	5.29	0.85	3.57	1.27	1.54	1.40
Government	20.86	0.75	17.38	1.58	34.03	5.44	26.88	9.57	12.85	11.63
Industrial	10.06	0.36	8.69	0.79	17.15	2.74	14.05	5.00	7.05	6.38
Other Residential	439.99	15.76	191.57	17.43	161.49	25.82	102.08	36.35	39.86	36.07
Religion	13.92	0.50	6.19	0.56	5.74	0.92	3.12	1.11	1.03	0.93
Single Family	2196.40	78.66	784.74	71.41	265.41	42.43	38.28	13.63	5.16	4.67
Total	**2,792**		**1,099**		**625**		**281**		**111**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2488.60	89.12	898.54	81.77	302.32	48.33	34.38	12.24	2.41	2.18
Steel	40.34	1.44	42.25	3.84	113.88	18.21	105.11	37.43	56.30	50.94
Concrete	12.26	0.44	11.41	1.04	29.43	4.71	25.60	9.11	11.77	10.65
Precast	7.33	0.26	4.12	0.37	9.04	1.45	8.11	2.89	2.53	2.29
RM	48.72	1.74	18.78	1.71	32.91	5.26	21.56	7.68	2.88	2.60
URM	174.15	6.24	104.56	9.52	99.94	15.98	43.63	15.53	14.16	12.81
MH	20.88	0.75	19.24	1.75	37.94	6.07	42.46	15.12	20.47	18.52
Total	**2,792**		**1,099**		**625**		**281**		**111**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 57 hospital beds available for use. On the day of the earthquake, the model estimates that only 17 hospital beds (31.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 54.00% of the beds will be back in service. By 30 days, 81.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	0
Schools	8	1	0	0
EOCs	1	0	0	0
PoliceStations	2	0	0	0
FireStations	4	0	0	0

Transportation Lifeline Damage

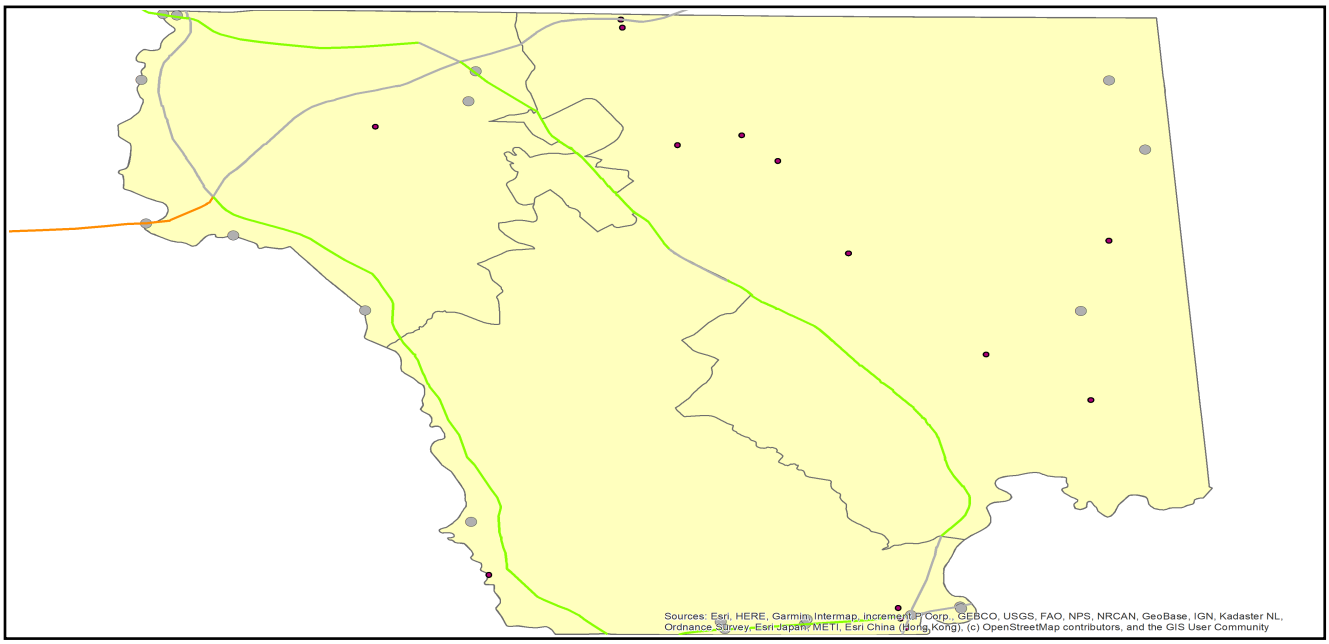


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	22	0	0	21	21
	Bridges	33	0	0	33	33
	Tunnels	0	0	0	0	0
Railways	Segments	7	0	0	6	6
	Bridges	7	0	0	7	7
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	2	0	0	2	2
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	0	0	1	1
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	0	0
Communication	1	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	193	0	0
Waste Water	116	0	0
Natural Gas	18	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

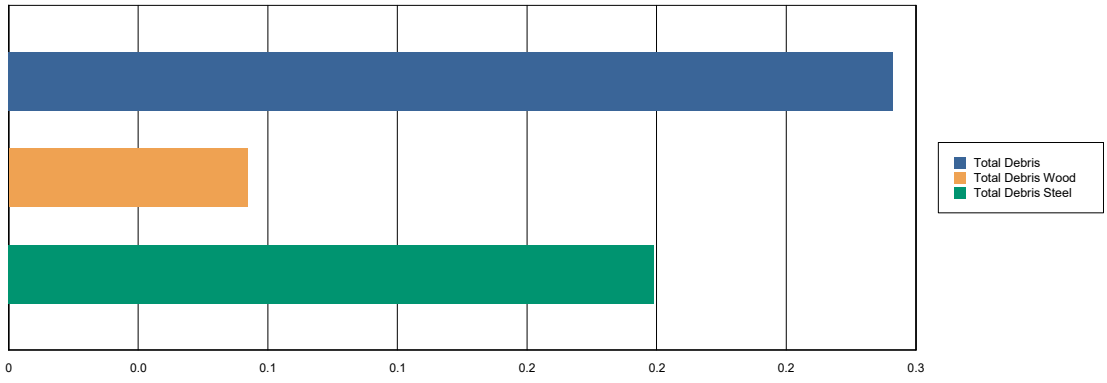
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 44 people and burn about 3 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 273,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 27.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 10,920 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



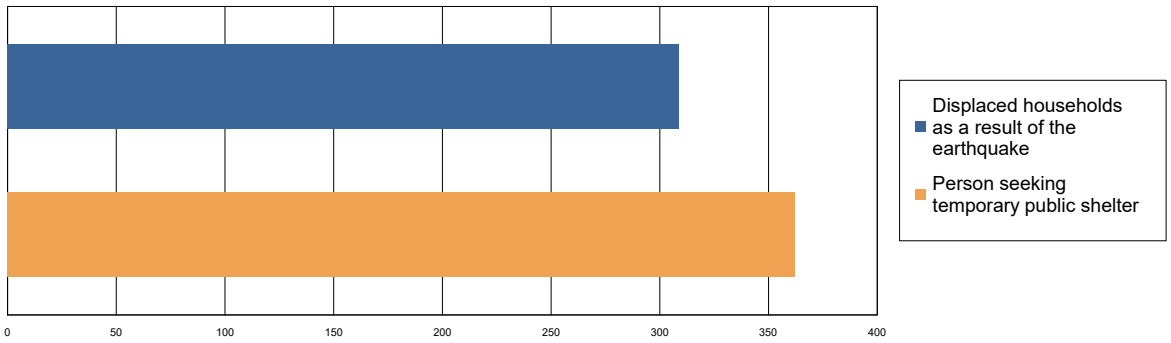
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.07	0.20	0.27	10,920 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 309 households to be displaced due to the earthquake. Of these, 362 people (out of a total population of 25,892) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
309	362

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.49	0.39	0.06	0.11
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.55	0.15	0.02	0.04
	Other-Residential	66.38	17.50	2.69	5.29
	Single Family	6.44	1.00	0.10	0.19
	Total	**75**	**19**	**3**	**6**
2 PM	Commercial	114.04	29.84	4.27	8.28
	Commuting	0.01	0.02	0.03	0.01
	Educational	259.91	69.29	10.73	20.69
	Hotels	0.00	0.00	0.00	0.00
	Industrial	4.09	1.09	0.16	0.30
	Other-Residential	53.50	14.36	2.30	4.38
	Single Family	2.46	0.40	0.04	0.08
	Total	**434**	**115**	**18**	**34**
5 PM	Commercial	65.24	17.11	2.47	4.73
	Commuting	0.25	0.38	0.59	0.12
	Educational	118.31	31.52	4.88	9.41
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.56	0.68	0.10	0.19
	Other-Residential	25.81	6.80	1.06	2.02
	Single Family	2.51	0.41	0.04	0.08
	Total	**215**	**57**	**9**	**17**

Economic Loss

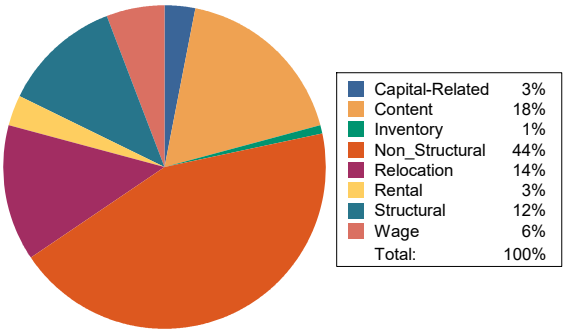
The total economic loss estimated for the earthquake is 1,244.61 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 1,236.60 (millions of dollars); 25 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 18 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

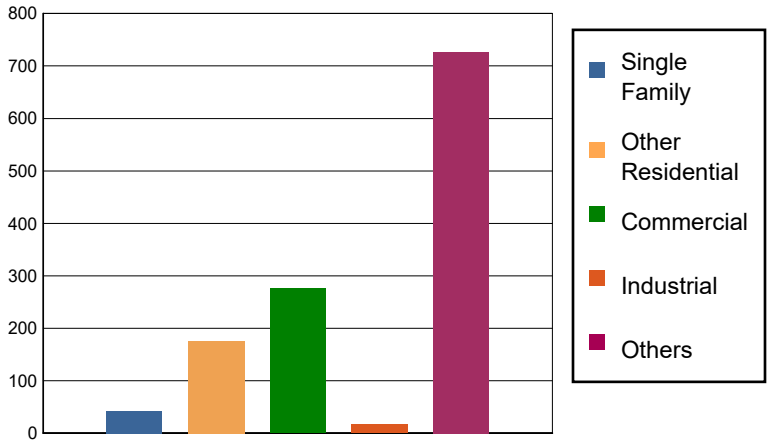


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	6.6127	33.4118	0.3388	30.2832	70.6465
	Capital-Related	0.0000	2.8133	22.4161	0.1979	12.0123	37.4396
	Rental	0.7253	12.1891	9.7835	0.1557	15.5081	38.3617
	Relocation	2.6325	4.6973	19.8407	0.6813	140.2135	168.0653
	Subtotal	**3.3578**	**26.3124**	**85.4521**	**1.3737**	**198.0171**	**314.5131**
Capital Stock Losses							
	Structural	5.0929	32.0004	42.1426	2.8008	66.1159	148.1526
	Non_Structural	24.8125	97.3446	95.4077	7.8143	318.4712	543.8503
	Content	9.0676	19.7096	43.7350	4.3741	143.0987	219.9850
	Inventory	0.0000	0.0000	8.8397	0.7111	0.5514	10.1022
	Subtotal	**38.9730**	**149.0546**	**190.1250**	**15.7003**	**528.2372**	**922.0901**
	Total	**42.33**	**175.37**	**275.58**	**17.07**	**726.25**	**1236.60**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	408.0234	0.0000	0.00
	Bridges	57.9453	2.4771	4.27
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**465.9687**	**2.4771**	
Railways	Segments	82.4883	0.0000	0.00
	Bridges	36.4700	0.5844	1.60
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**118.9583**	**0.5844**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	4.1401	0.6693	16.17
	Subtotal	**4.1401**	**0.6693**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**589.07**	**3.73**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	38.2950	4.2756	11.16
	Distribution Lines	6.2259	0.0000	0.00
	Subtotal	**44.5209**	**4.2756**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	3.7355	0.0000	0.00
	Subtotal	**161.1817**	**0.0000**	
Natural Gas	Pipelines	177.3271	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.4904	0.0000	0.00
	Subtotal	**179.8175**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	37.6001	0.0000	0.00
	Subtotal	**37.6001**	**0.0000**	
Communication	Facilities	0.1150	0.0000	0.00
	Subtotal	**0.1150**	**0.0000**	
	Total	**423.24**	**4.28**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	25,892	2,371	3,386	5,757
Total Region		**25,892**	**2,371**	**3,386**	**5,757**

Hazus: Earthquake Global Risk Report

Region Name: Marlborough_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23.52 square miles and contains 1 census tracts. There are over 2 thousand households in the region which has a total population of 6,133 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 1,234 (millions of dollars). Approximately 90.00 % of the buildings (and 80.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 185 and 43 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 2 thousand buildings in the region which have an aggregate total replacement value of 1,234 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 1 schools, 2 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 228.00 (millions of dollars). This inventory includes over 17.40 miles of highways, 17 bridges, 148.51 miles of pipes.

Table 1: Transportation System Lifeline Inventory

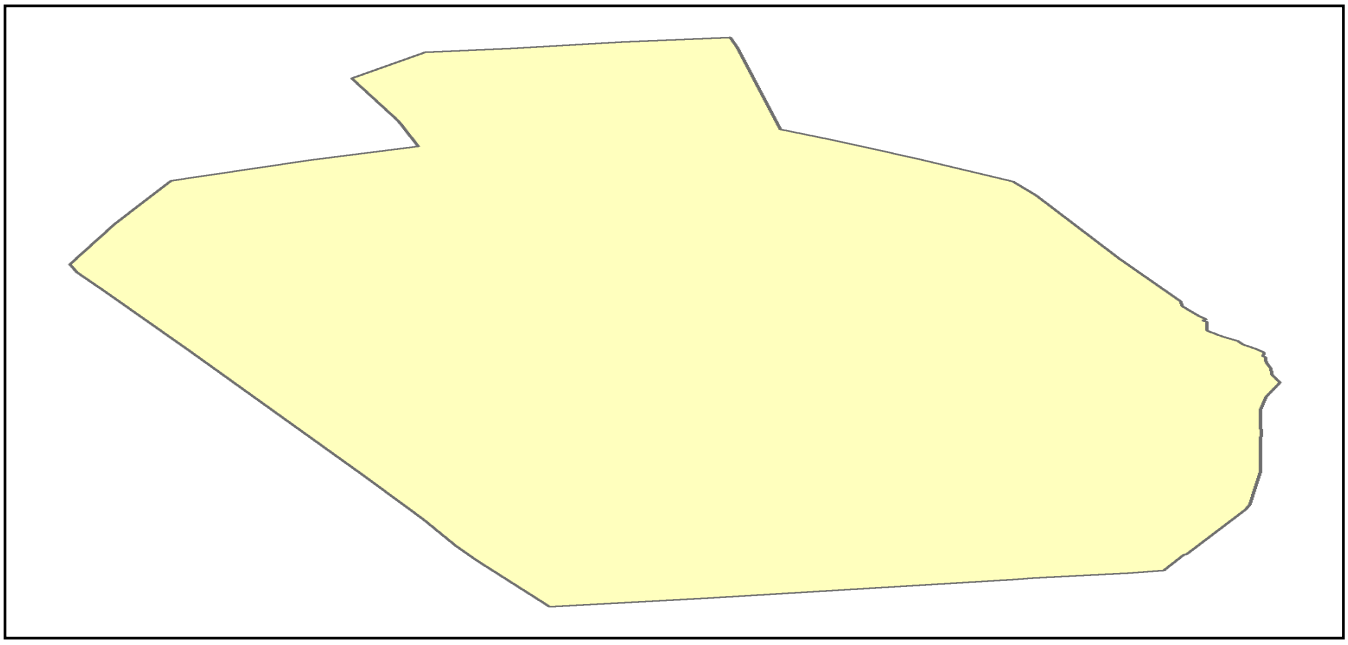
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	17	39.7092
	Segments	6	145.5583
	Tunnels	0	0.0000
		Subtotal	**185.2675**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**185.30**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	2.9144
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.9144**
Waste Water	Distribution Lines	NA	1.7486
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.7486**
Natural Gas	Distribution Lines	NA	1.1658
	Facilities	0	0.0000
	Pipelines	1	37.9128
		Subtotal	**39.0786**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**43.70**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,030 buildings will be at least moderately damaged. This is over 40.00 % of the buildings in the region. There are an estimated 208 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

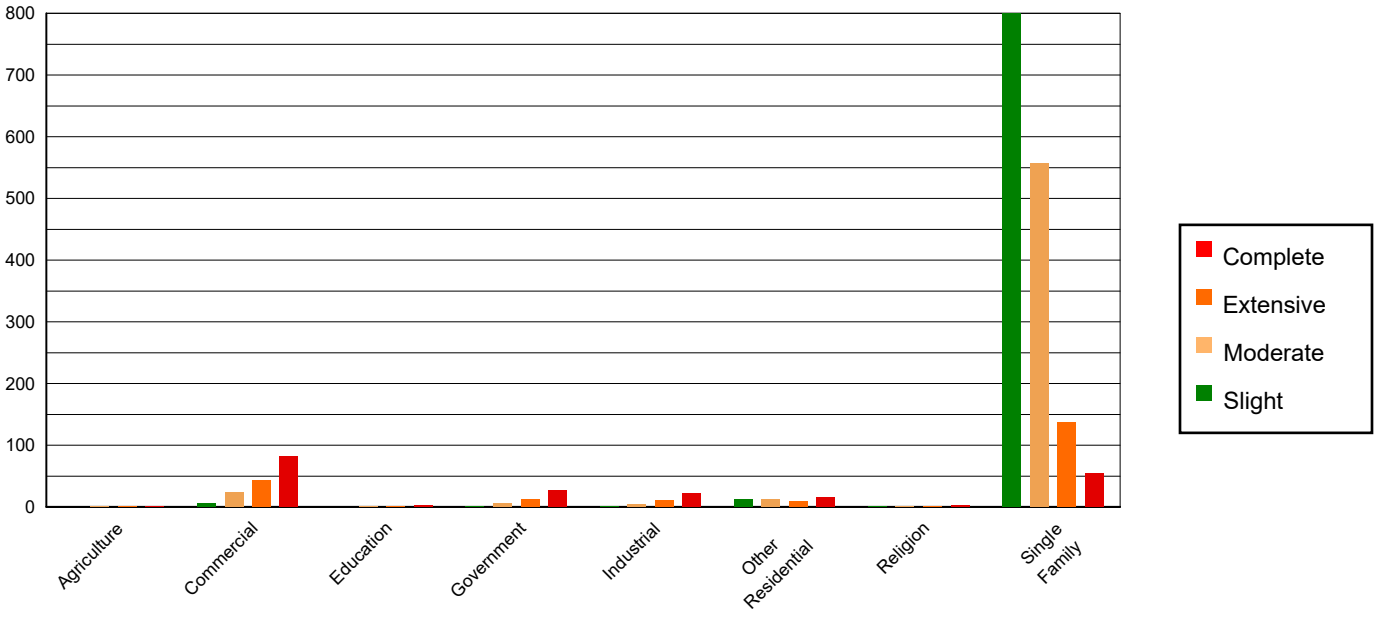


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0.04	0.01	0.16	0.02	0.78	0.13	1.17	0.54	1.84	0.88
Commercial	1.75	0.25	5.12	0.62	23.35	3.86	42.61	19.66	81.18	38.88
Education	0.07	0.01	0.19	0.02	0.84	0.14	1.70	0.78	3.20	1.53
Government	0.41	0.06	1.04	0.13	5.16	0.85	12.52	5.77	26.87	12.87
Industrial	0.34	0.05	0.90	0.11	4.46	0.74	10.28	4.74	22.01	10.54
Other Residential	10.43	1.50	12.76	1.55	11.93	1.97	9.64	4.45	16.24	7.78
Religion	1.00	0.14	1.28	0.16	1.46	0.24	1.48	0.68	2.78	1.33
Single Family	683.34	97.99	799.73	97.39	556.88	92.07	137.38	63.38	54.67	26.18
Total	**697**		**821**		**605**		**217**		**209**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	692.36	99.28	808.58	98.47	561.63	92.85	132.24	61.00	24.32	11.65
Steel	0.59	0.08	1.29	0.16	9.32	1.54	32.23	14.87	77.14	36.94
Concrete	0.09	0.01	0.20	0.02	1.50	0.25	4.83	2.23	11.33	5.42
Precast	0.05	0.01	0.09	0.01	0.66	0.11	1.68	0.78	5.42	2.60
RM	0.38	0.05	0.51	0.06	3.13	0.52	6.80	3.14	13.24	6.34
URM	3.91	0.56	10.38	1.26	27.79	4.59	36.43	16.81	71.90	34.43
MH	0.02	0.00	0.14	0.02	0.84	0.14	2.55	1.17	5.46	2.61
Total	**697**		**821**		**605**		**217**		**209**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	1	1	0	0
EOCs	1	1	0	0
PoliceStations	1	1	0	0
FireStations	2	2	0	0

Transportation Lifeline Damage

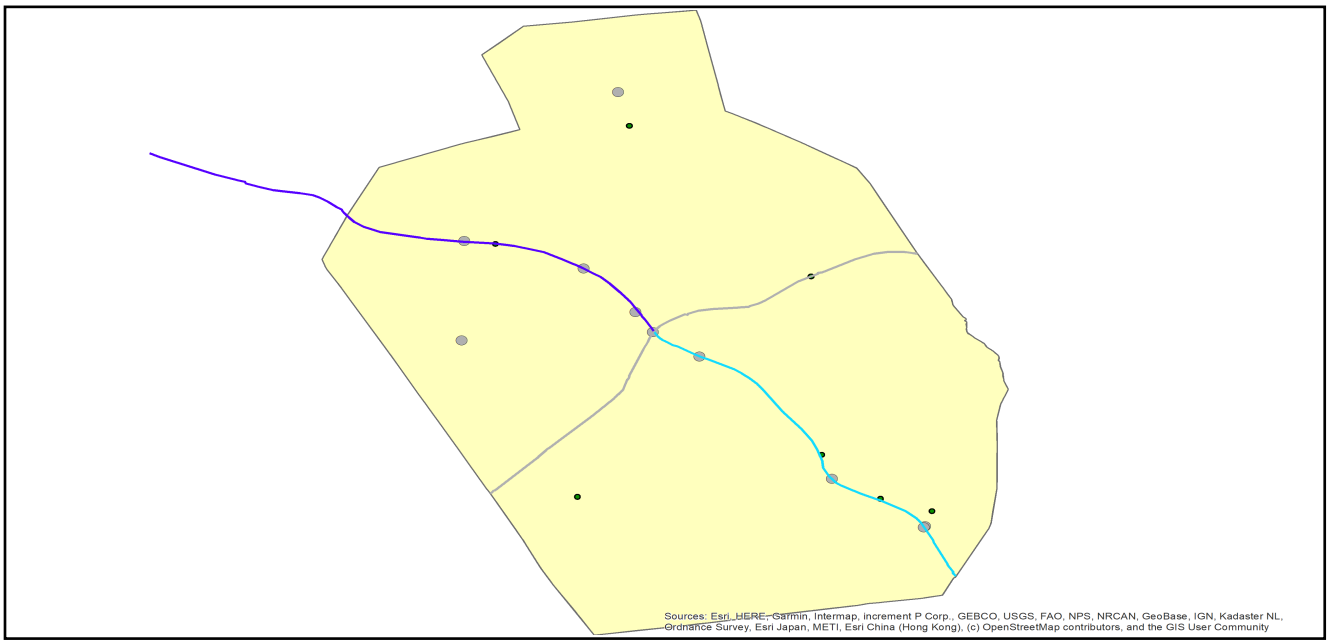


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	6	0	0	6	6
	Bridges	17	8	2	10	12
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	91	0	0
Waste Water	54	0	0
Natural Gas	4	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

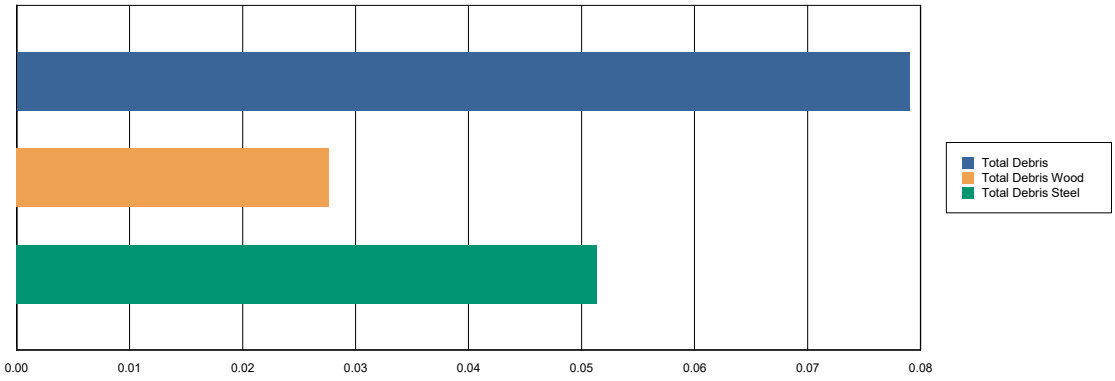
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 79,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 35.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 3,160 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



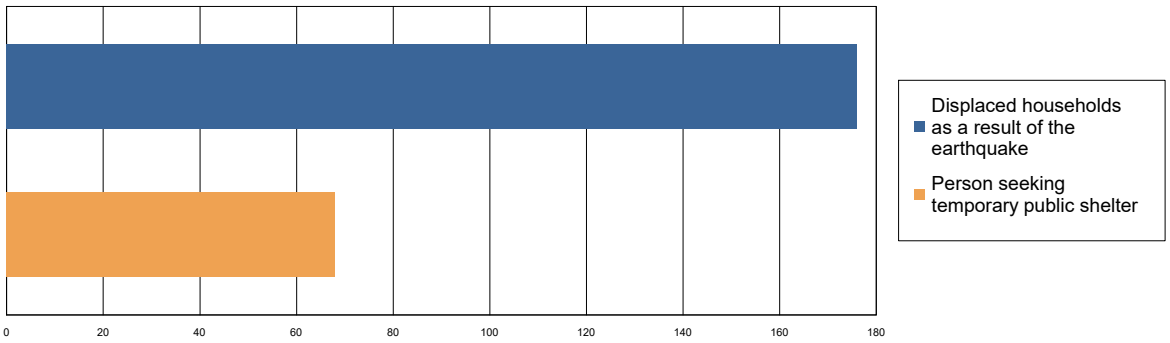
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.03	0.05	0.08	3,160 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 176 households to be displaced due to the earthquake. Of these, 68 people (out of a total population of 6,133) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
176	68

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.65	0.51	0.08	0.16
	Commuting	0.01	0.02	0.02	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.11	0.35	0.05	0.11
	Other-Residential	9.91	3.10	0.51	1.00
	Single Family	27.93	6.84	0.93	1.81
	Total	**41**	**11**	**2**	**3**
2 PM	Commercial	119.61	36.90	5.84	11.38
	Commuting	0.10	0.14	0.22	0.04
	Educational	27.45	8.67	1.44	2.82
	Hotels	0.00	0.00	0.00	0.00
	Industrial	8.22	2.56	0.41	0.79
	Other-Residential	3.02	0.95	0.16	0.30
	Single Family	8.61	2.18	0.31	0.58
	Total	**167**	**51**	**8**	**16**
5 PM	Commercial	90.31	27.89	4.47	8.53
	Commuting	2.11	3.12	4.90	0.97
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	5.14	1.60	0.26	0.50
	Other-Residential	3.92	1.23	0.21	0.39
	Single Family	11.18	2.83	0.40	0.75
	Total	**113**	**37**	**10**	**11**

Economic Loss

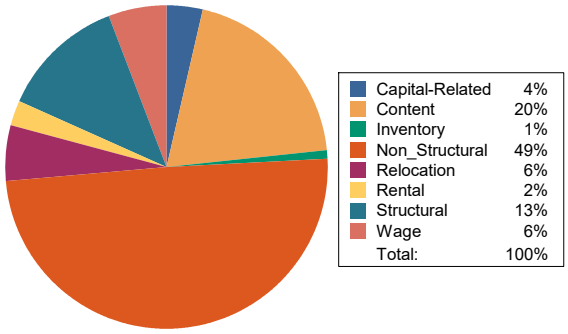
The total economic loss estimated for the earthquake is 444.00 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 429.49 (millions of dollars); 18 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 40 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

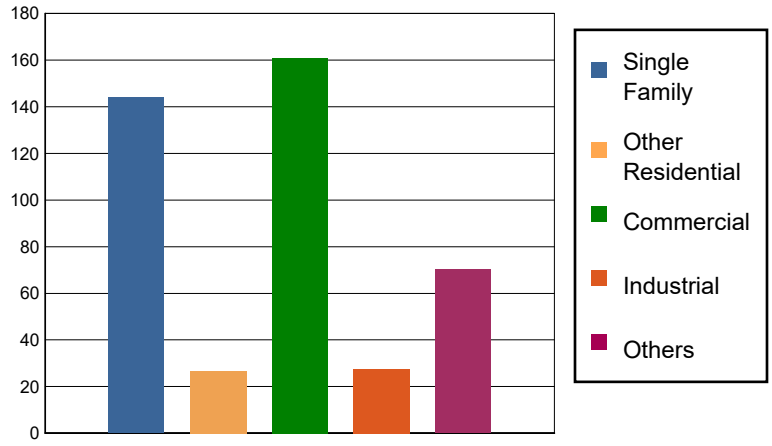


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	4.8501	17.3017	0.4722	2.7292	25.3532
	Capital-Related	0.0000	2.0653	12.9360	0.2659	0.2942	15.5614
	Rental	2.4200	1.7394	5.0264	0.0940	1.4265	10.7063
	Relocation	8.7434	0.6869	7.5476	0.5857	6.1969	23.7605
	Subtotal	**11.1634**	**9.3417**	**42.8117**	**1.4178**	**10.6468**	**75.3814**
Capital Stock Losses							
	Structural	19.2910	2.5514	18.9484	3.4607	9.5417	53.7932
	Non_Structural	85.3064	12.0237	65.3758	14.0326	34.8031	211.5416
	Content	28.3204	2.6779	30.9286	7.4659	15.1310	84.5238
	Inventory	0.0000	0.0000	2.8890	1.1880	0.1720	4.2490
	Subtotal	**132.9178**	**17.2530**	**118.1418**	**26.1472**	**59.6478**	**354.1076**
	Total	**144.08**	**26.59**	**160.95**	**27.57**	**70.29**	**429.49**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	145.5583	0.0000	0.00
	Bridges	39.7092	14.5083	36.54
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**185.2675**	**14.5083**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**185.27**	**14.51**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.9144	0.0000	0.00
	Subtotal	**2.9144**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.7486	0.0000	0.00
	Subtotal	**1.7486**	**0.0000**	
Natural Gas	Pipelines	37.9128	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.1658	0.0000	0.00
	Subtotal	**39.0786**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**43.74**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	6,133	984	250	1,234
Total Region		**6,133**	**984**	**250**	**1,234**

Hazus: Earthquake Global Risk Report

Region Name: New_Britain_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.46 square miles and contains 21 census tracts. There are over 29 thousand households in the region which has a total population of 74,135 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 10,340 (millions of dollars). Approximately 89.00 % of the buildings (and 55.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 3,171 and 470 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 16 thousand buildings in the region which have an aggregate total replacement value of 10,340 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 75% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 457 beds. There are 21 schools, 6 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 3,641.00 (millions of dollars). This inventory includes over 73.32 miles of highways, 62 bridges, 380.90 miles of pipes.

Table 1: Transportation System Lifeline Inventory

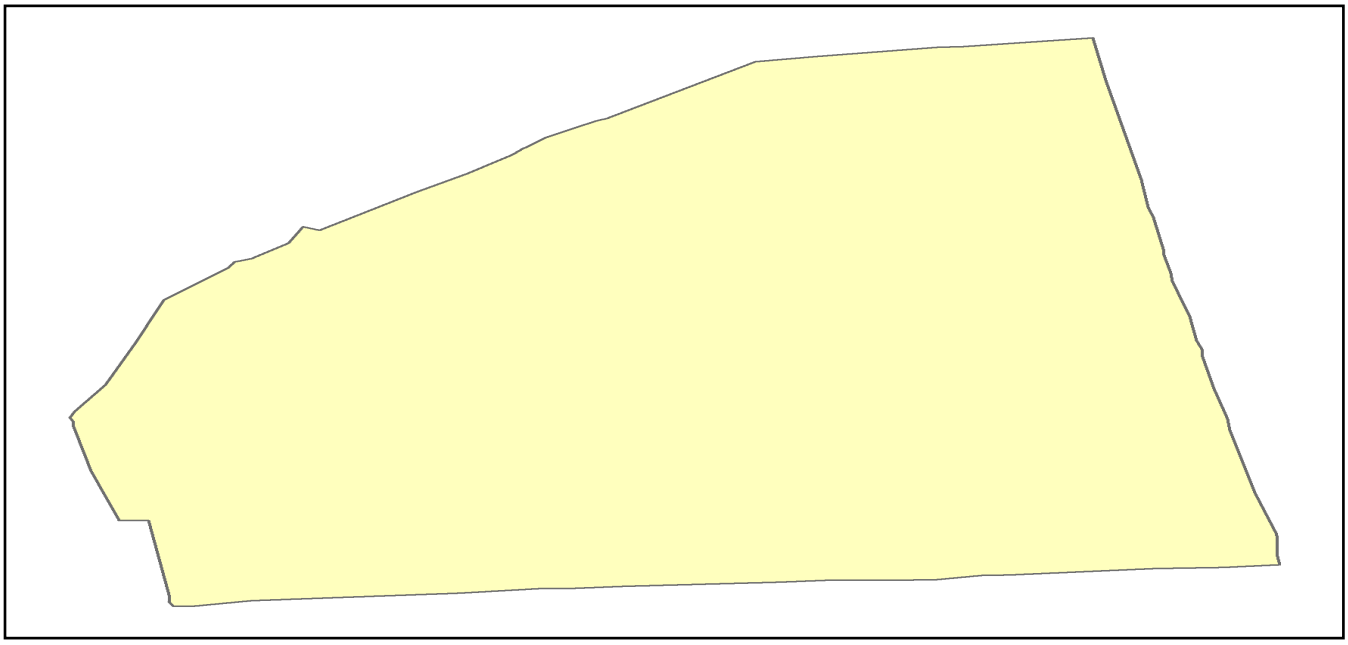
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	62	385.0635
	Segments	79	861.5824
	Tunnels	0	0.0000
		Subtotal	**1246.6459**
Railways	Bridges	7	36.4700
	Facilities	0	0.0000
	Segments	33	1874.6142
	Tunnels	0	0.0000
		Subtotal	**1911.0842**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	1	13.3560
	Runways	0	0.0000
		Subtotal	**13.3560**
		Total	**3,171.10**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.7680
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**6.7680**
Waste Water	Distribution Lines	NA	4.0608
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**4.0608**
Natural Gas	Distribution Lines	NA	2.7072
	Facilities	0	0.0000
	Pipelines	5	451.9376
		Subtotal	**454.6448**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	5.2669
		Subtotal	**5.2669**
Communication	Facilities	1	0.1150
		Subtotal	**0.1150**
		Total	**470.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
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Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 3,045 buildings will be at least moderately damaged. This is over 18.00 % of the buildings in the region. There are an estimated 250 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

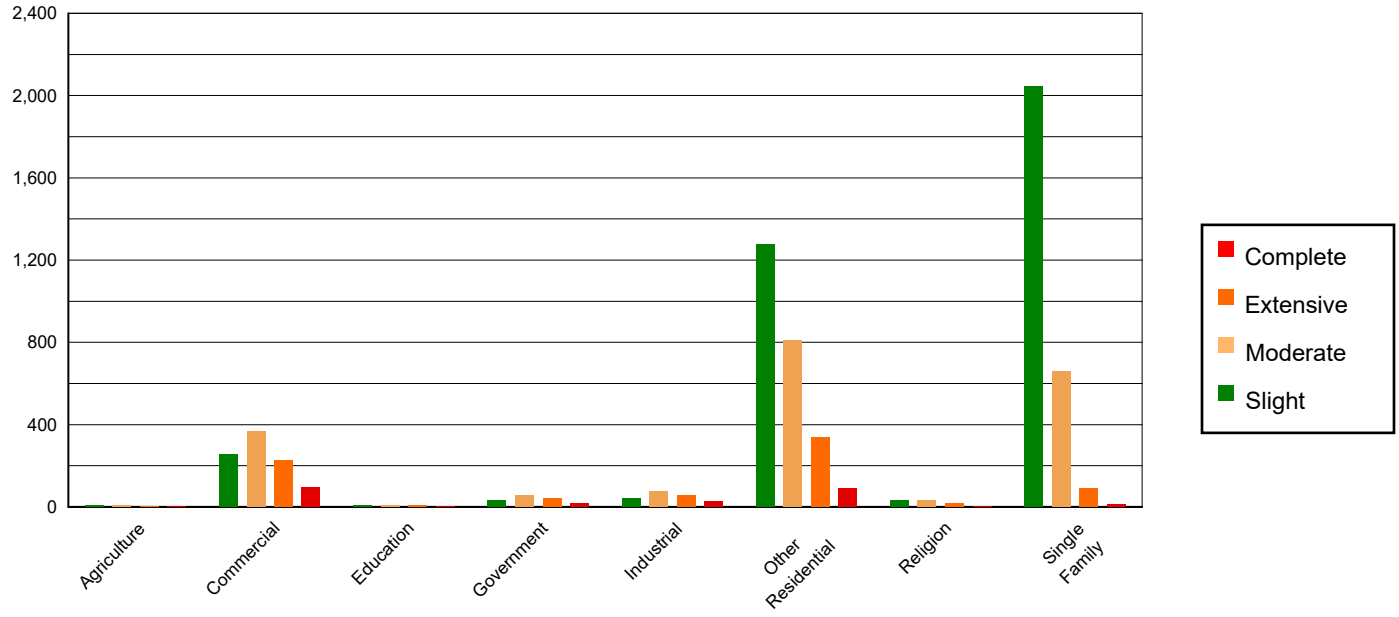


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	7.17	0.07	6.51	0.18	7.67	0.38	3.91	0.50	1.73	0.69
Commercial	334.52	3.30	254.55	6.89	365.95	18.15	227.89	29.26	94.10	37.60
Education	9.29	0.09	6.62	0.18	10.21	0.51	6.38	0.82	2.51	1.00
Government	38.34	0.38	30.64	0.83	57.29	2.84	42.21	5.42	18.52	7.40
Industrial	52.20	0.52	41.52	1.12	75.91	3.77	56.93	7.31	25.44	10.17
Other Residential	3391.56	33.49	1277.85	34.61	812.32	40.29	335.62	43.09	91.65	36.63
Religion	72.40	0.72	31.56	0.85	29.06	1.44	15.23	1.96	4.75	1.90
Single Family	6220.48	61.43	2042.69	55.33	657.62	32.62	90.68	11.64	11.53	4.61
Total	**10,126**		**3,692**		**2,016**		**779**		**250**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	8748.23	86.39	2906.46	78.72	916.05	45.44	94.90	12.18	4.98	1.99
Steel	128.71	1.27	127.20	3.45	336.24	16.68	286.67	36.81	139.14	55.61
Concrete	57.99	0.57	51.95	1.41	121.48	6.03	94.99	12.20	37.36	14.93
Precast	16.09	0.16	8.80	0.24	18.58	0.92	15.87	2.04	4.25	1.70
RM	307.81	3.04	109.41	2.96	176.09	8.73	100.56	12.91	8.34	3.33
URM	867.12	8.56	488.11	13.22	447.59	22.20	185.88	23.87	56.15	22.44
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**10,126**		**3,692**		**2,016**		**779**		**250**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 457 hospital beds available for use. On the day of the earthquake, the model estimates that only 184 hospital beds (40.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 64.00% of the beds will be back in service. By 30 days, 87.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	2	0	0	0
Schools	21	0	0	0
EOCs	1	0	0	0
PoliceStations	2	0	0	0
FireStations	6	0	0	0

Transportation Lifeline Damage

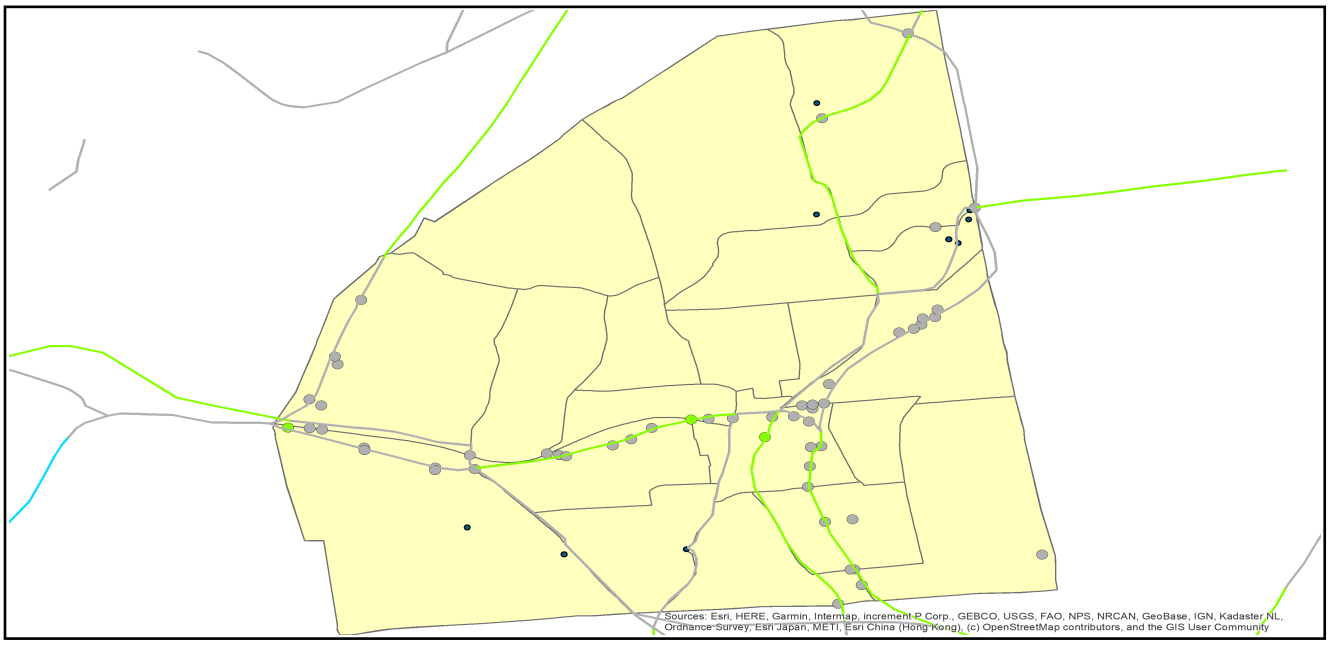


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	79	0	0	78	78
	Bridges	62	2	0	60	62
	Tunnels	0	0	0	0	0
Railways	Segments	33	0	0	21	21
	Bridges	7	0	0	7	7
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	0	0
Communication	1	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	210	0	0
Waste Water	126	0	0
Natural Gas	45	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

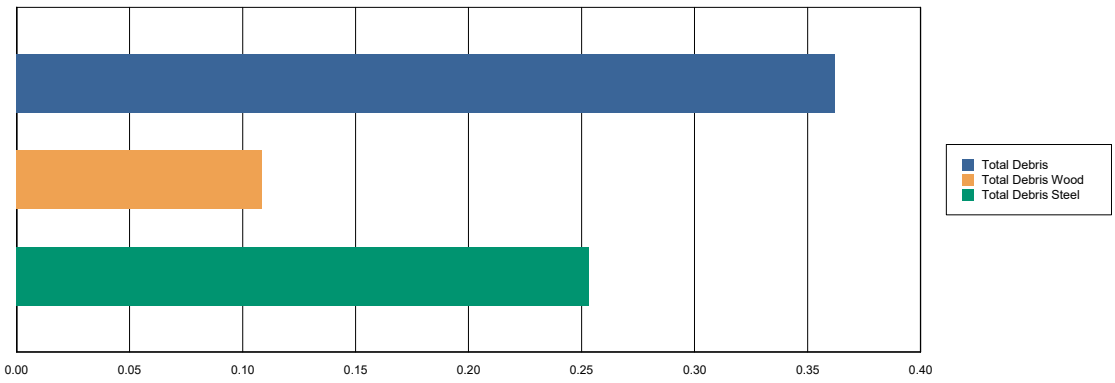
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 362,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 30.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 14,480 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



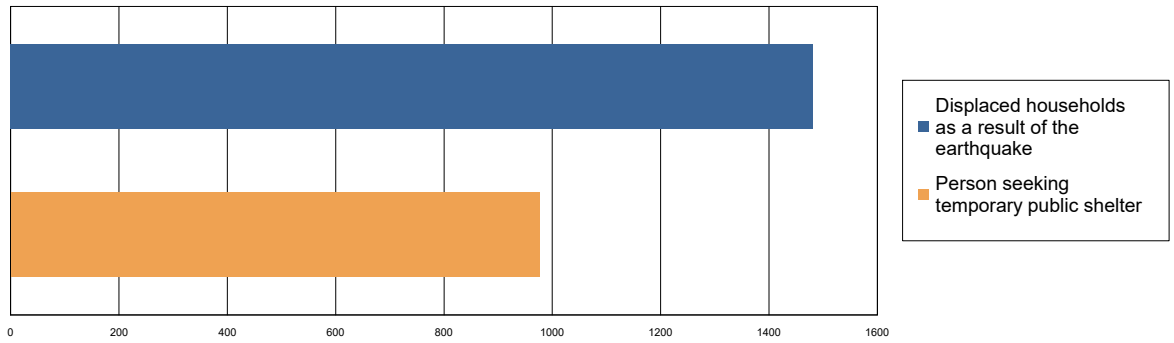
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.11	0.25	0.36	14,480 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1,481 households to be displaced due to the earthquake. Of these, 976 people (out of a total population of 74,135) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
1,481	976

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	4.25	1.09	0.15	0.30
	Commuting	0.01	0.01	0.02	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	3.62	0.94	0.13	0.26
	Other-Residential	128.85	30.16	4.31	8.49
	Single Family	16.05	2.38	0.23	0.45
	Total	**153**	**35**	**5**	**10**
2 PM	Commercial	288.50	73.69	10.40	20.18
	Commuting	0.08	0.11	0.19	0.04
	Educational	192.41	50.86	7.80	15.10
	Hotels	0.00	0.00	0.00	0.00
	Industrial	26.67	6.96	0.99	1.91
	Other-Residential	42.50	10.03	1.47	2.77
	Single Family	5.14	0.80	0.08	0.15
	Total	**555**	**142**	**21**	**40**
5 PM	Commercial	199.45	50.95	7.26	13.88
	Commuting	1.56	2.13	3.54	0.69
	Educational	57.22	15.22	2.36	4.54
	Hotels	0.00	0.00	0.00	0.00
	Industrial	16.67	4.35	0.62	1.19
	Other-Residential	50.78	11.98	1.75	3.31
	Single Family	6.26	0.97	0.10	0.19
	Total	**332**	**86**	**16**	**24**

Economic Loss

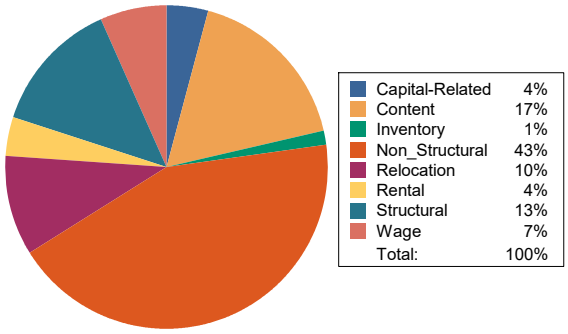
The total economic loss estimated for the earthquake is 1,631.51 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 1,608.49 (millions of dollars); 25 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 22 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

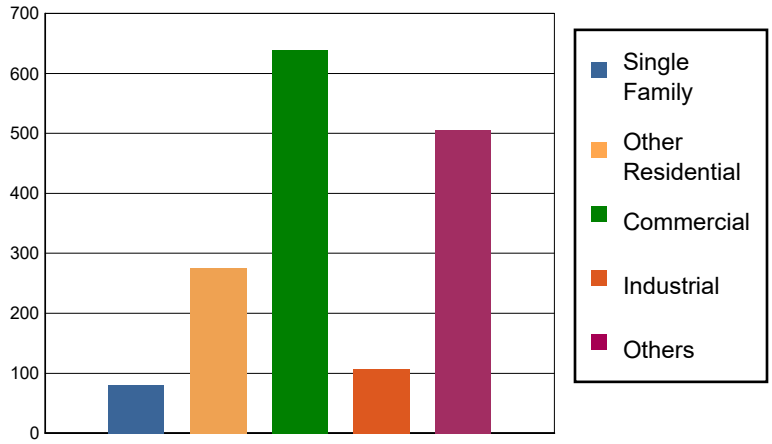


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	7.2673	74.6873	2.4185	23.0892	107.4623
	Capital-Related	0.0000	3.0942	54.6592	1.4805	6.5928	65.8267
	Rental	1.4398	22.8758	25.7814	0.7611	12.1552	63.0133
	Relocation	5.2142	15.0729	51.2096	3.6159	87.6395	162.7521
	Subtotal	**6.6540**	**48.3102**	**206.3375**	**8.2760**	**129.4767**	**399.0544**
Capital Stock Losses							
	Structural	9.4672	35.6020	93.0912	17.4768	58.4472	214.0844
	Non_Structural	46.9887	155.0460	224.2828	47.1888	221.0240	694.5303
	Content	17.5002	36.5698	99.2516	29.3460	95.8237	278.4913
	Inventory	0.0000	0.0000	16.5904	4.7451	0.9990	22.3345
	Subtotal	**73.9561**	**227.2178**	**433.2160**	**98.7567**	**376.2939**	**1209.4405**
	Total	**80.61**	**275.53**	**639.55**	**107.03**	**505.77**	**1608.49**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	861.5824	0.0000	0.00
	Bridges	385.0635	20.5026	5.32
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1246.6459**	**20.5026**	
Railways	Segments	1874.6142	0.0000	0.00
	Bridges	36.4700	0.3983	1.09
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1911.0842**	**0.3983**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	13.3560	2.1104	15.80
	Runways	0.0000	0.0000	0.00
	Subtotal	**13.3560**	**2.1104**	
	Total	**3,171.09**	**23.01**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	6.7680	0.0000	0.00
	Subtotal	**6.7680**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	4.0608	0.0000	0.00
	Subtotal	**4.0608**	**0.0000**	
Natural Gas	Pipelines	451.9376	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.7072	0.0000	0.00
	Subtotal	**454.6448**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	5.2669	0.0000	0.00
	Subtotal	**5.2669**	**0.0000**	
Communication	Facilities	0.1150	0.0000	0.00
	Subtotal	**0.1150**	**0.0000**	
	Total	**470.86**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	74,135	5,651	4,689	10,340
Total Region		**74,135**	**5,651**	**4,689**	**10,340**

Hazus: Earthquake Global Risk Report

Region Name: Newington_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.14 square miles and contains 7 census tracts. There are over 12 thousand households in the region which has a total population of 30,536 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,260 (millions of dollars). Approximately 88.00 % of the buildings (and 53.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,595 and 374 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 9 thousand buildings in the region which have an aggregate total replacement value of 5,260 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 85% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 2 hospitals in the region with a total bed capacity of beds. There are 8 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,969.00 (millions of dollars). This inventory includes over 77.05 miles of highways, 25 bridges, 273.40 miles of pipes.

Table 1: Transportation System Lifeline Inventory

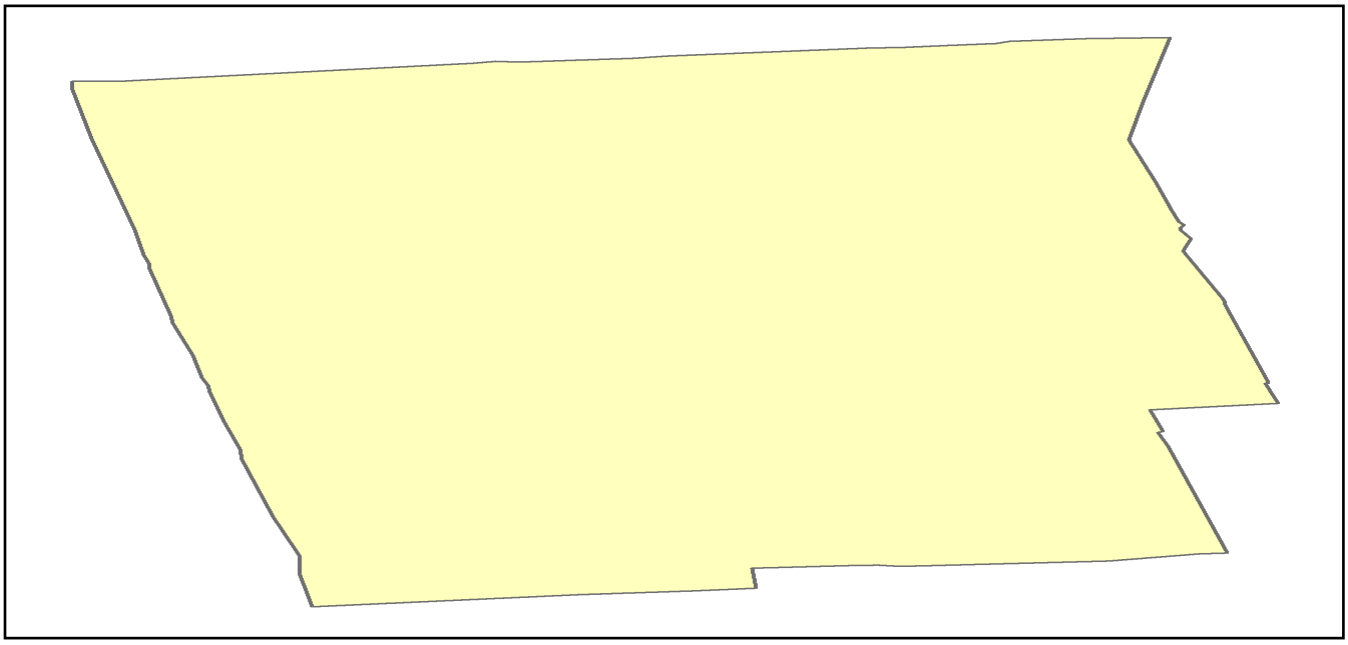
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	25	53.4977
	Segments	57	953.5034
	Tunnels	0	0.0000
		Subtotal	**1007.0011**
Railways	Bridges	2	10.4200
	Facilities	0	0.0000
	Segments	29	1578.3276
	Tunnels	0	0.0000
		Subtotal	**1588.7476**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**2,595.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	4.7822
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**4.7822**
Waste Water	Distribution Lines	NA	2.8693
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.8693**
Natural Gas	Distribution Lines	NA	1.9129
	Facilities	0	0.0000
	Pipelines	3	364.5134
		Subtotal	**366.4263**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	2	0.2300
		Subtotal	**0.2300**
		Total	**374.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,568 buildings will be at least moderately damaged. This is over 16.00 % of the buildings in the region. There are an estimated 136 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

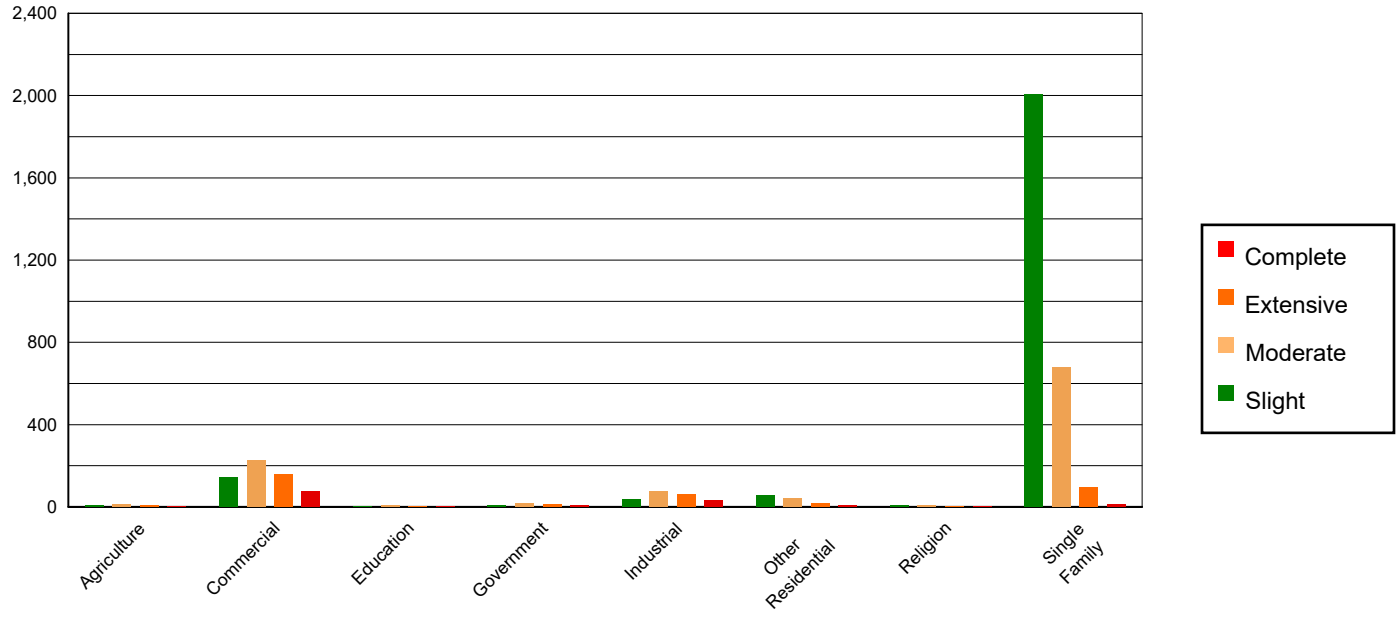


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	9.13	0.15	8.87	0.39	11.21	1.05	5.96	1.63	2.84	2.08
Commercial	172.15	2.88	144.18	6.33	227.98	21.37	157.30	43.06	73.40	53.73
Education	6.55	0.11	5.07	0.22	8.29	0.78	5.64	1.54	2.45	1.79
Government	10.19	0.17	8.67	0.38	17.07	1.60	13.59	3.72	6.49	4.75
Industrial	46.39	0.78	39.38	1.73	76.17	7.14	61.72	16.90	30.33	22.20
Other Residential	143.74	2.40	58.07	2.55	40.09	3.76	18.97	5.19	6.13	4.49
Religion	19.59	0.33	9.16	0.40	8.66	0.81	4.90	1.34	1.69	1.24
Single Family	5573.22	93.18	2003.80	87.99	677.51	63.50	97.18	26.61	13.29	9.73
Total	**5,981**		**2,277**		**1,067**		**365**		**137**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	5615.55	93.89	2030.24	89.16	674.90	63.25	75.00	20.53	4.89	3.58
Steel	59.85	1.00	64.89	2.85	177.63	16.65	170.15	46.58	93.26	68.27
Concrete	9.88	0.17	10.03	0.44	28.13	2.64	25.63	7.02	12.03	8.80
Precast	7.99	0.13	4.79	0.21	10.93	1.02	10.24	2.80	3.27	2.39
RM	41.77	0.70	17.03	0.75	30.95	2.90	20.86	5.71	2.57	1.88
URM	245.92	4.11	150.19	6.60	144.44	13.54	63.37	17.35	20.60	15.08
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**5,981**		**2,277**		**1,067**		**365**		**137**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (39.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 62.00% of the beds will be back in service. By 30 days, 86.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	2	0	0	0
Schools	8	0	0	0
EOCs	1	0	0	0
PoliceStations	1	0	0	0
FireStations	5	0	0	0

Transportation Lifeline Damage

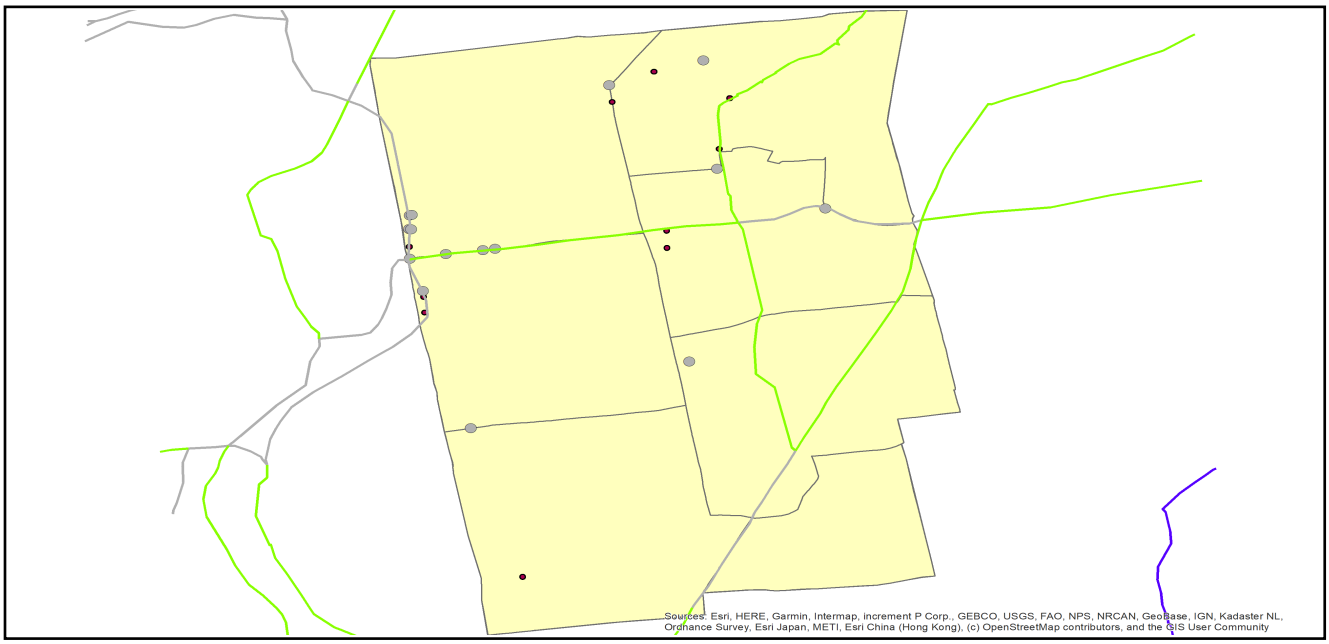


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	57	0	0	53	53
	Bridges	25	1	0	24	25
	Tunnels	0	0	0	0	0
Railways	Segments	29	0	0	4	4
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	2	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	149	0	0
Waste Water	89	0	0
Natural Gas	36	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

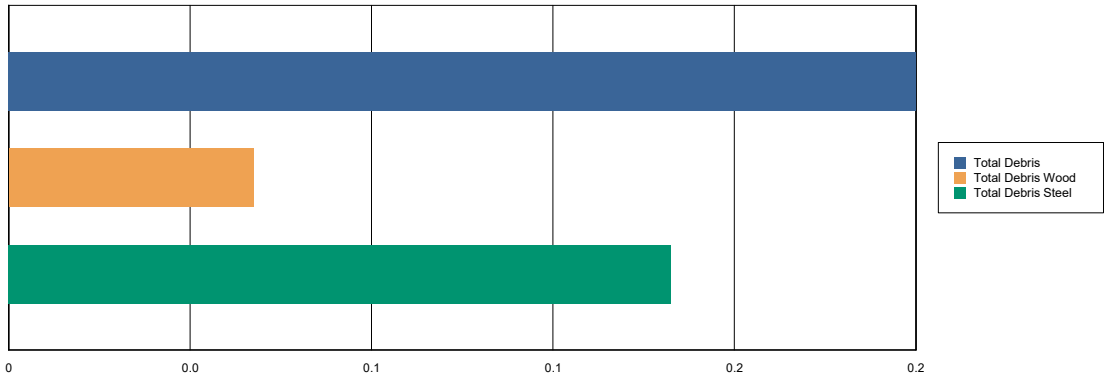
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 200,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 27.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 8,000 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



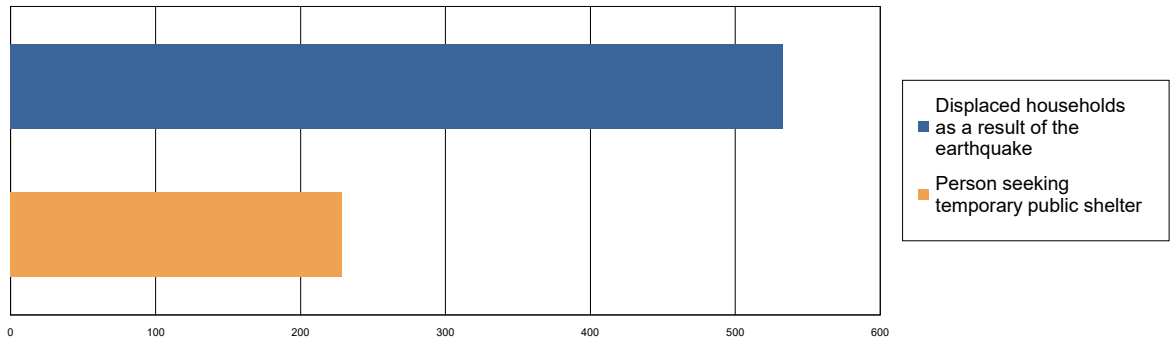
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.05	0.15	0.20	8,000 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 533 households to be displaced due to the earthquake. Of these, 229 people (out of a total population of 30,536) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
533	229

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	4.90	1.28	0.18	0.36
	Commuting	0.00	0.00	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	5.03	1.34	0.19	0.38
	Other-Residential	17.87	4.54	0.69	1.36
	Single Family	18.42	2.85	0.28	0.55
	Total	**46**	**10**	**1**	**3**
2 PM	Commercial	279.53	73.16	10.39	20.24
	Commuting	0.03	0.04	0.06	0.01
	Educational	38.46	10.31	1.58	3.09
	Hotels	0.00	0.00	0.00	0.00
	Industrial	37.11	9.87	1.43	2.77
	Other-Residential	6.26	1.61	0.25	0.47
	Single Family	5.95	0.96	0.10	0.19
	Total	**367**	**96**	**14**	**27**
5 PM	Commercial	168.84	44.16	6.32	12.16
	Commuting	0.55	0.74	1.24	0.24
	Educational	0.74	0.21	0.03	0.06
	Hotels	0.00	0.00	0.00	0.00
	Industrial	23.19	6.17	0.89	1.73
	Other-Residential	7.02	1.79	0.28	0.52
	Single Family	7.19	1.16	0.12	0.23
	Total	**208**	**54**	**9**	**15**

Economic Loss

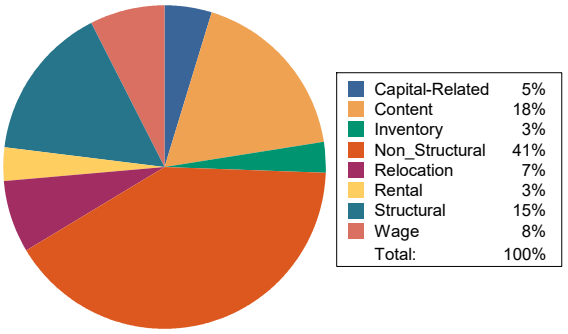
The total economic loss estimated for the earthquake is 871.75 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 870.65 (millions of dollars); 23 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 17 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

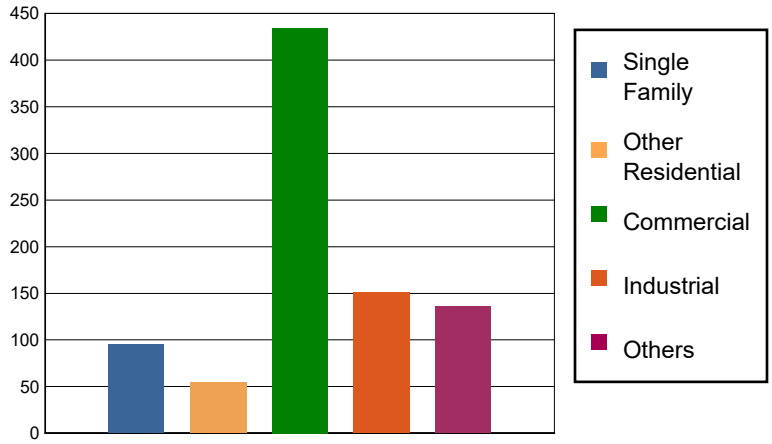


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	7.8737	47.9652	3.3125	6.6633	65.8147
	Capital-Related	0.0000	3.3517	34.7640	1.9814	0.7653	40.8624
	Rental	1.5498	3.9287	19.2263	1.1072	4.2612	30.0732
	Relocation	5.6258	1.4701	31.6394	5.3211	17.5118	61.5682
	Subtotal	**7.1756**	**16.6242**	**133.5949**	**11.7222**	**29.2016**	**198.3185**
Capital Stock Losses							
	Structural	11.5133	6.6105	69.2429	24.5083	22.5690	134.4440
	Non_Structural	56.0815	25.4092	147.0373	67.6276	60.3001	356.4557
	Content	20.5258	5.5986	65.1409	40.3969	23.2927	154.9549
	Inventory	0.0000	0.0000	19.3488	6.4668	0.6619	26.4775
	Subtotal	**88.1206**	**37.6183**	**300.7699**	**138.9996**	**106.8237**	**672.3321**
	Total	**95.30**	**54.24**	**434.36**	**150.72**	**136.03**	**870.65**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	953.5034	0.0000	0.00
	Bridges	53.4977	0.9824	1.84
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1007.0011**	**0.9824**	
Railways	Segments	1578.3276	0.0000	0.00
	Bridges	10.4200	0.1165	1.12
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1588.7476**	**0.1165**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**2,595.75**	**1.10**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	4.7822	0.0000	0.00
	Subtotal	**4.7822**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.8693	0.0000	0.00
	Subtotal	**2.8693**	**0.0000**	
Natural Gas	Pipelines	364.5134	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.9129	0.0000	0.00
	Subtotal	**366.4263**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.2300	0.0000	0.00
	Subtotal	**0.2300**	**0.0000**	
	Total	**374.31**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	30,536	2,810	2,450	5,260
Total Region		**30,536**	**2,810**	**2,450**	**5,260**

Hazus: Earthquake Global Risk Report

Region Name: Plainville_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.78 square miles and contains 5 census tracts. There are over 7 thousand households in the region which has a total population of 17,525 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 3,709 (millions of dollars). Approximately 87.00 % of the buildings (and 54.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,014 and 321 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 7 thousand buildings in the region which have an aggregate total replacement value of 3,709 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 81% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 7 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,335.00 (millions of dollars). This inventory includes over 56.54 miles of highways, 30 bridges, 163.42 miles of pipes.

Table 1: Transportation System Lifeline Inventory

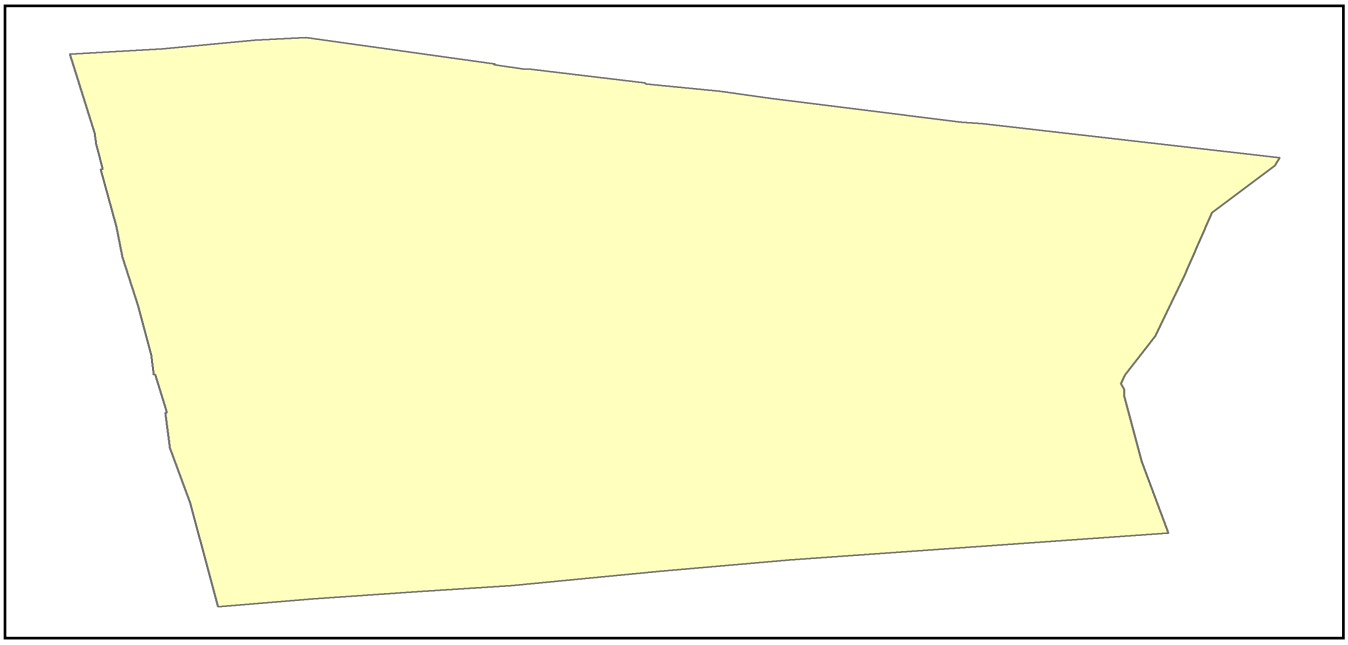
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	30	193.5135
	Segments	58	578.8862
	Tunnels	0	0.0000
		Subtotal	**772.3997**
Railways	Bridges	3	15.6300
	Facilities	0	0.0000
	Segments	12	1208.9924
	Tunnels	0	0.0000
		Subtotal	**1224.6224**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	1	13.3560
	Runways	1	3.9975
		Subtotal	**17.3535**
		Total	**2,014.40**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	2.9761
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.9761**
Waste Water	Distribution Lines	NA	1.7857
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**159.2319**
Natural Gas	Distribution Lines	NA	1.1904
	Facilities	0	0.0000
	Pipelines	4	158.3624
		Subtotal	**159.5528**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**321.80**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,025 buildings will be at least moderately damaged. This is over 14.00 % of the buildings in the region. There are an estimated 68 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

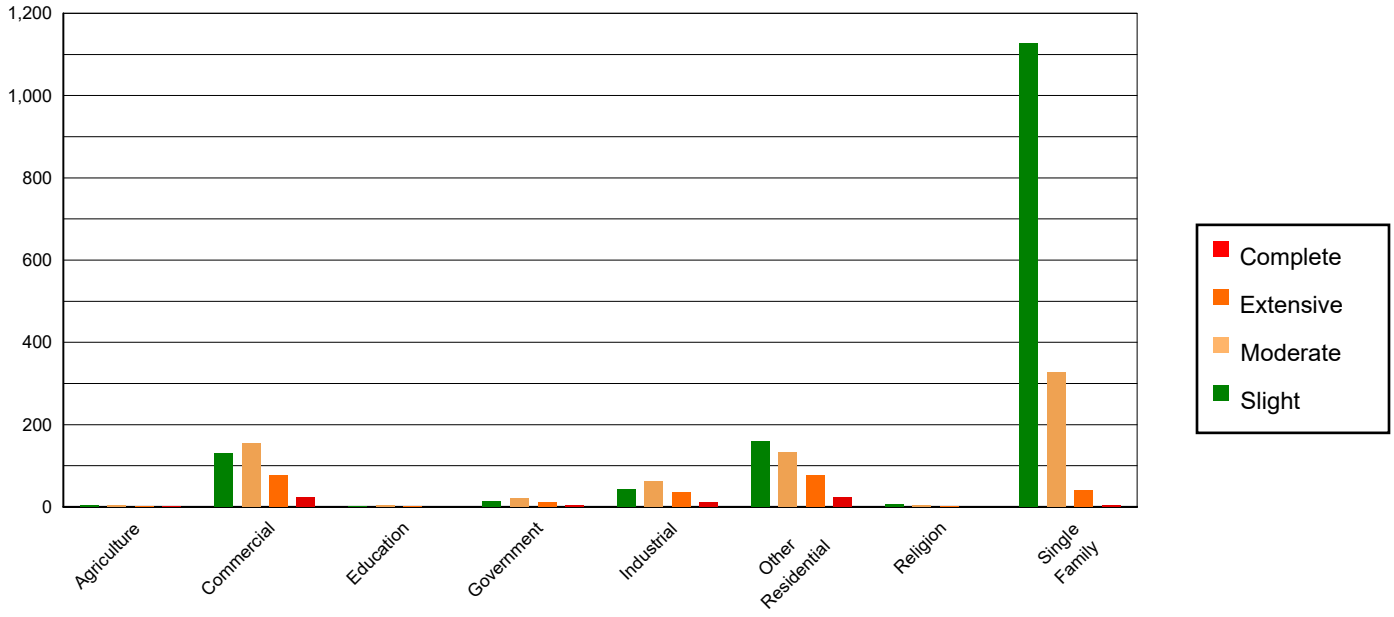


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	7.13	0.14	4.74	0.32	4.48	0.63	1.98	0.80	0.66	0.96
Commercial	218.42	4.33	128.85	8.67	155.56	21.92	78.00	31.60	24.17	35.18
Education	4.43	0.09	2.48	0.17	3.15	0.44	1.50	0.61	0.44	0.64
Government	23.27	0.46	14.14	0.95	20.88	2.94	11.21	4.54	3.50	5.09
Industrial	70.76	1.40	42.80	2.88	62.77	8.84	35.37	14.33	11.29	16.44
Other Residential	469.73	9.31	160.20	10.79	131.34	18.50	75.22	30.48	23.51	34.21
Religion	16.23	0.32	5.67	0.38	4.71	0.66	1.95	0.79	0.46	0.66
Single Family	4234.34	83.94	1126.50	75.84	326.89	46.06	41.59	16.85	4.68	6.81
Total	**5,044**		**1,485**		**710**		**247**		**69**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	4515.40	89.51	1210.46	81.49	334.76	47.16	30.01	12.16	1.01	1.47
Steel	107.29	2.13	78.79	5.30	149.64	21.08	93.39	37.84	32.89	47.86
Concrete	24.01	0.48	16.02	1.08	30.91	4.36	18.18	7.36	5.93	8.63
Precast	11.55	0.23	5.06	0.34	9.30	1.31	6.70	2.71	1.28	1.87
RM	72.58	1.44	20.53	1.38	28.08	3.96	12.96	5.25	0.60	0.87
URM	280.22	5.56	128.61	8.66	106.36	14.98	39.29	15.92	10.21	14.86
MH	33.28	0.66	25.92	1.74	50.73	7.15	46.29	18.75	16.78	24.43
Total	**5,044**		**1,485**		**710**		**247**		**69**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	7	0	0	0
EOCs	1	0	0	0
PoliceStations	1	0	0	0
FireStations	1	0	0	0

Transportation Lifeline Damage

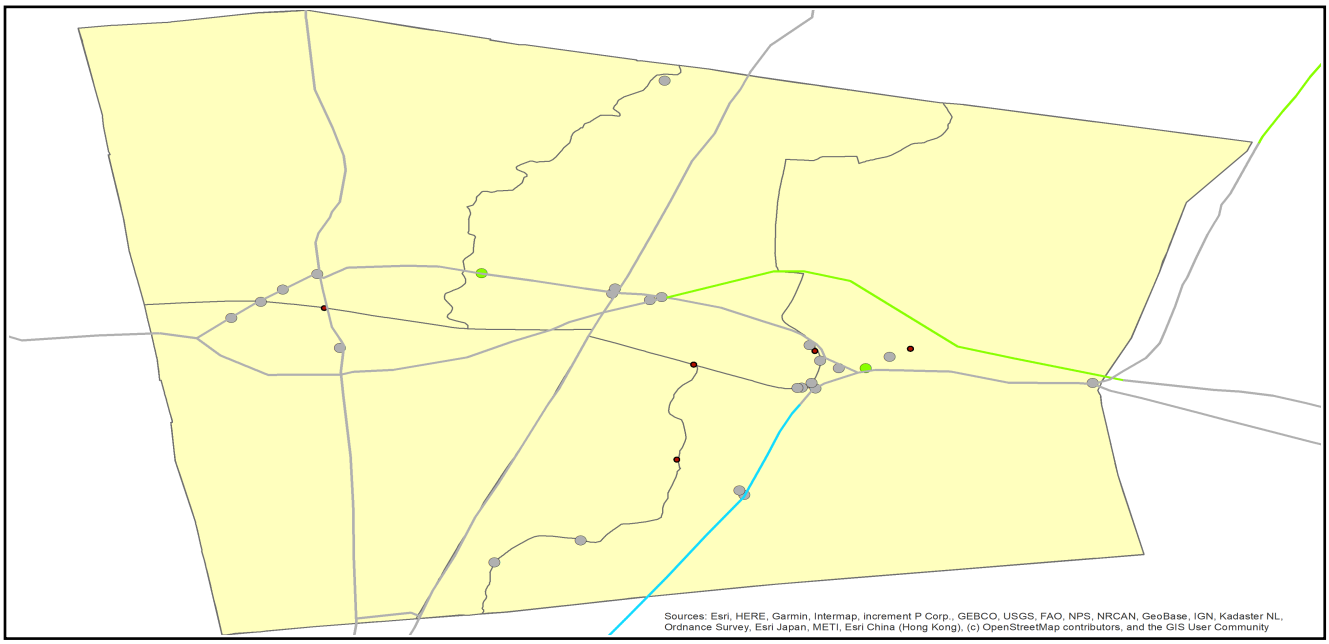


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	58	0	0	49	49
	Bridges	30	2	0	28	30
	Tunnels	0	0	0	0	0
Railways	Segments	12	0	0	7	7
	Bridges	3	0	0	3	3
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	1	0	0	1	1

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	92	0	0
Waste Water	55	0	0
Natural Gas	16	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

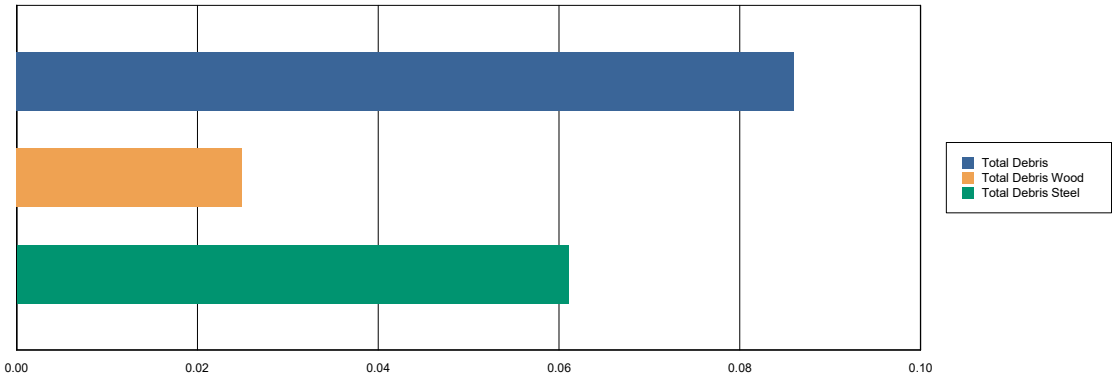
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 86,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 29.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 3,440 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



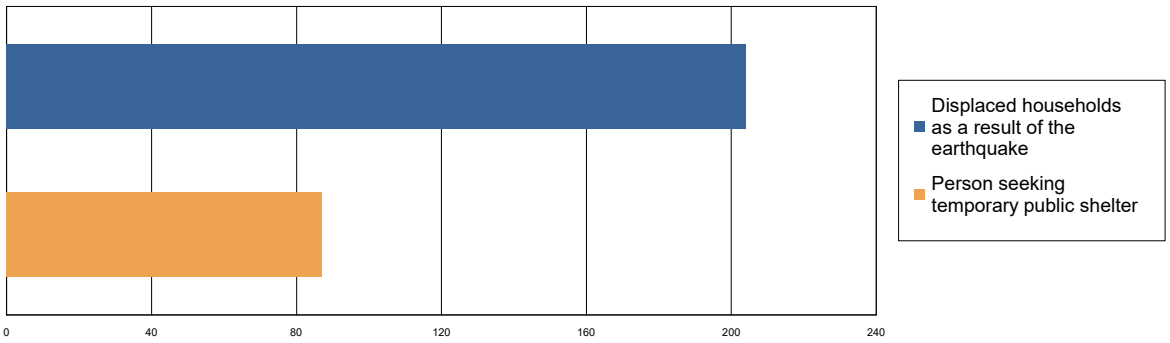
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.02	0.06	0.09	3,440 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 204 households to be displaced due to the earthquake. Of these, 87 people (out of a total population of 17,525) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
204	87

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.96	0.23	0.03	0.06
	Commuting	0.00	0.00	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.15	0.51	0.07	0.13
	Other-Residential	11.77	2.56	0.30	0.58
	Single Family	6.05	0.84	0.08	0.15
	Total	**21**	**4**	**0**	**1**
2 PM	Commercial	56.34	13.25	1.74	3.37
	Commuting	0.02	0.03	0.05	0.01
	Educational	9.75	2.35	0.34	0.66
	Hotels	0.00	0.00	0.00	0.00
	Industrial	15.81	3.78	0.50	0.97
	Other-Residential	3.33	0.73	0.09	0.17
	Single Family	1.68	0.24	0.02	0.04
	Total	**87**	**20**	**3**	**5**
5 PM	Commercial	36.48	8.58	1.14	2.18
	Commuting	0.49	0.62	1.09	0.21
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	9.88	2.36	0.31	0.61
	Other-Residential	4.51	0.99	0.12	0.23
	Single Family	2.35	0.34	0.03	0.06
	Total	**54**	**13**	**3**	**3**

Economic Loss

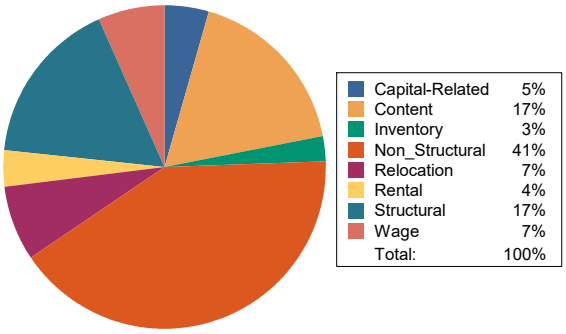
The total economic loss estimated for the earthquake is 364.41 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 354.92 (millions of dollars); 22 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 21 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

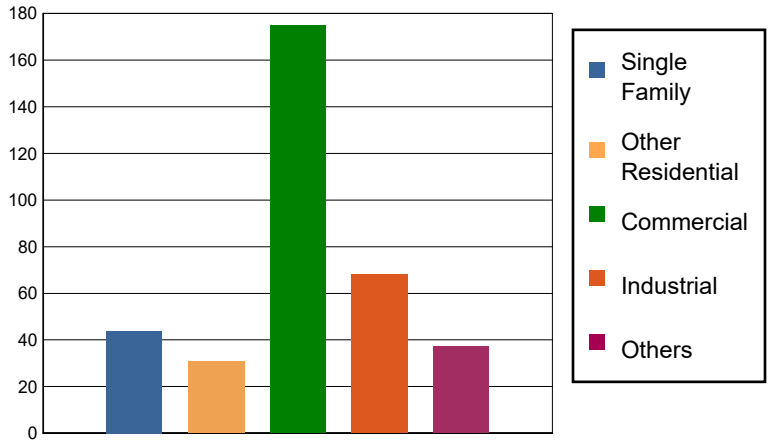


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.5519	18.1848	1.6976	1.8237	23.2580
	Capital-Related	0.0000	0.6605	14.3398	0.9969	0.2555	16.2527
	Rental	0.6799	2.3568	8.7917	0.5890	1.0503	13.4677
	Relocation	2.4467	1.7167	13.7995	3.0410	5.1827	26.1866
	Subtotal	**3.1266**	**6.2859**	**55.1158**	**6.3245**	**8.3122**	**79.1650**
Capital Stock Losses							
	Structural	5.1751	4.1855	31.2533	12.0843	6.4833	59.1815
	Non_Structural	25.9891	16.4943	57.5837	29.4263	16.1348	145.6282
	Content	9.6690	3.7677	24.7499	17.3401	6.1841	61.7108
	Inventory	0.0000	0.0000	6.2695	2.7901	0.1766	9.2362
	Subtotal	**40.8332**	**24.4475**	**119.8564**	**61.6408**	**28.9788**	**275.7567**
	Total	**43.96**	**30.73**	**174.97**	**67.97**	**37.29**	**354.92**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	578.8862	0.0000	0.00
	Bridges	193.5135	7.5373	3.89
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**772.3997**	**7.5373**	
Railways	Segments	1208.9924	0.0000	0.00
	Bridges	15.6300	0.1018	0.65
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1224.6224**	**0.1018**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	13.3560	1.8493	13.85
	Runways	3.9975	0.0000	0.00
	Subtotal	**17.3535**	**1.8493**	
	Total	**2,014.38**	**9.49**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.9761	0.0000	0.00
	Subtotal	**2.9761**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	1.7857	0.0000	0.00
	Subtotal	**159.2319**	**0.0000**	
Natural Gas	Pipelines	158.3624	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.1904	0.0000	0.00
	Subtotal	**159.5528**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**321.76**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	17,525	2,011	1,697	3,709
Total Region		**17,525**	**2,011**	**1,697**	**3,709**

Hazus: Earthquake Global Risk Report

Region Name: Rocky_Hill_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.85 square miles and contains 4 census tracts. There are over 8 thousand households in the region which has a total population of 20,845 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,942 (millions of dollars). Approximately 83.00 % of the buildings (and 61.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,455 and 172 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 5 thousand buildings in the region which have an aggregate total replacement value of 3,942 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 79% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 125 beds. There are 6 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,627.00 (millions of dollars). This inventory includes over 60.27 miles of highways, 11 bridges, 233.64 miles of pipes.

Table 1: Transportation System Lifeline Inventory

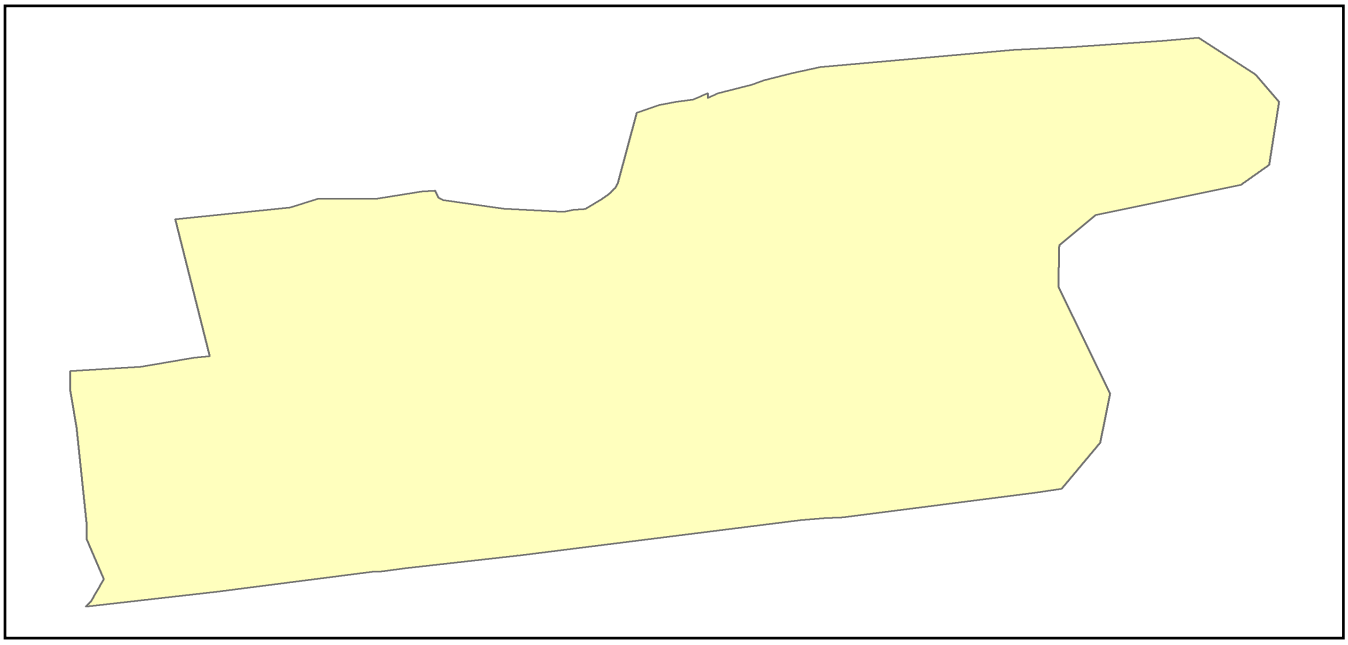
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	11	90.2621
	Segments	40	763.0989
	Tunnels	0	0.0000
		Subtotal	**853.3610**
Railways	Bridges	2	10.4200
	Facilities	0	0.0000
	Segments	1	579.7635
	Tunnels	0	0.0000
		Subtotal	**590.1835**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	1	1.3310
		Subtotal	**1.3310**
Port	Facilities	3	10.4708
		Subtotal	**10.4708**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**1,455.30**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	3.7645
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.7645**
Waste Water	Distribution Lines	NA	2.2587
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**159.7049**
Natural Gas	Distribution Lines	NA	1.5058
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.5058**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	7.3075
		Subtotal	**7.3075**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**172.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,485 buildings will be at least moderately damaged. This is over 26.00 % of the buildings in the region. There are an estimated 227 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

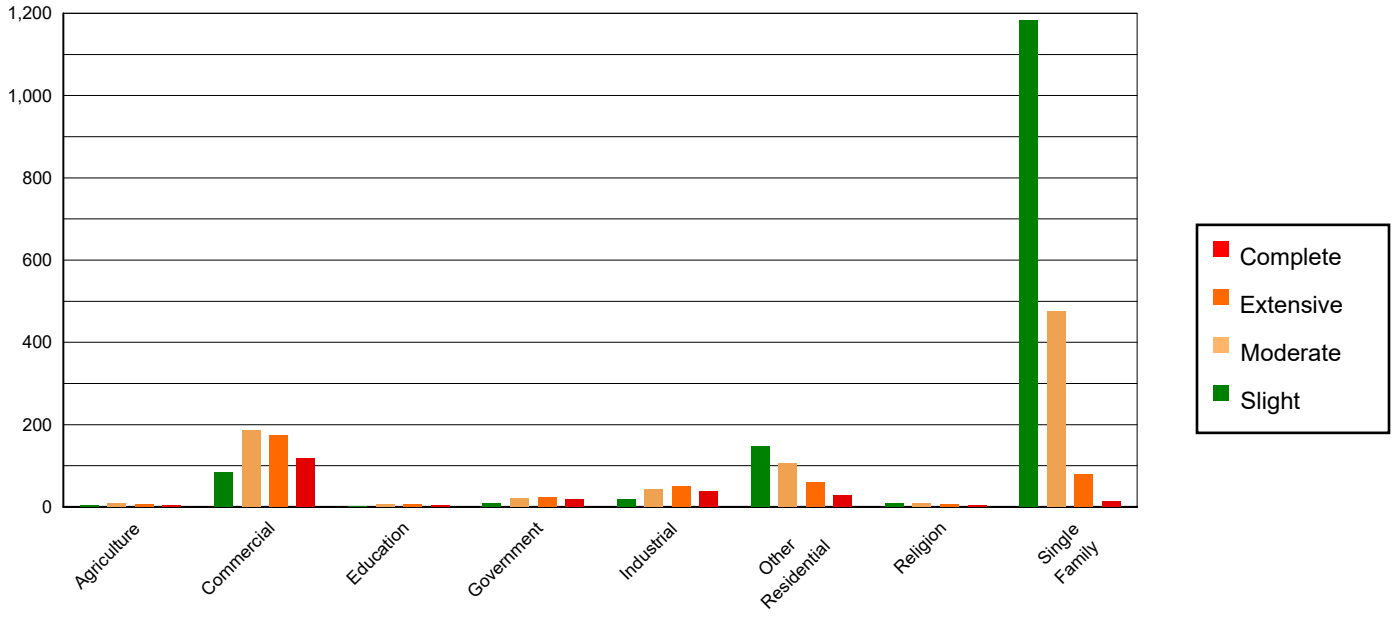


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	2.65	0.10	4.26	0.29	9.07	1.06	6.60	1.64	4.42	1.94
Commercial	69.68	2.52	84.47	5.81	184.76	21.61	173.19	42.98	118.90	52.28
Education	2.29	0.08	2.53	0.17	5.54	0.65	5.27	1.31	3.37	1.48
Government	6.27	0.23	7.75	0.53	20.80	2.43	24.27	6.02	17.92	7.88
Industrial	14.44	0.52	17.34	1.19	43.64	5.10	48.94	12.14	36.64	16.11
Other Residential	261.98	9.47	147.13	10.11	105.45	12.33	59.26	14.71	29.18	12.83
Religion	13.80	0.50	8.96	0.62	9.25	1.08	6.98	1.73	4.00	1.76
Single Family	2395.61	86.59	1182.50	81.27	476.43	55.73	78.47	19.47	12.99	5.71
Total	**2,767**		**1,455**		**855**		**403**		**227**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2588.21	93.55	1290.59	88.70	541.92	63.39	86.66	21.50	13.36	5.88
Steel	20.30	0.73	29.83	2.05	114.51	13.39	160.67	39.87	131.11	57.65
Concrete	3.50	0.13	5.20	0.36	21.45	2.51	30.61	7.60	22.91	10.07
Precast	1.93	0.07	1.93	0.13	6.95	0.81	10.39	2.58	8.13	3.58
RM	20.40	0.74	12.86	0.88	35.52	4.15	41.09	10.20	20.00	8.80
URM	132.38	4.78	114.53	7.87	134.59	15.74	73.55	18.25	31.90	14.03
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**2,767**		**1,455**		**855**		**403**		**227**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 125 hospital beds available for use. On the day of the earthquake, the model estimates that only 43 hospital beds (35.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 51.00% of the beds will be back in service. By 30 days, 81.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	0
Schools	6	2	0	0
EOCs	1	1	0	0
PoliceStations	1	1	0	0
FireStations	3	2	0	0

Transportation Lifeline Damage

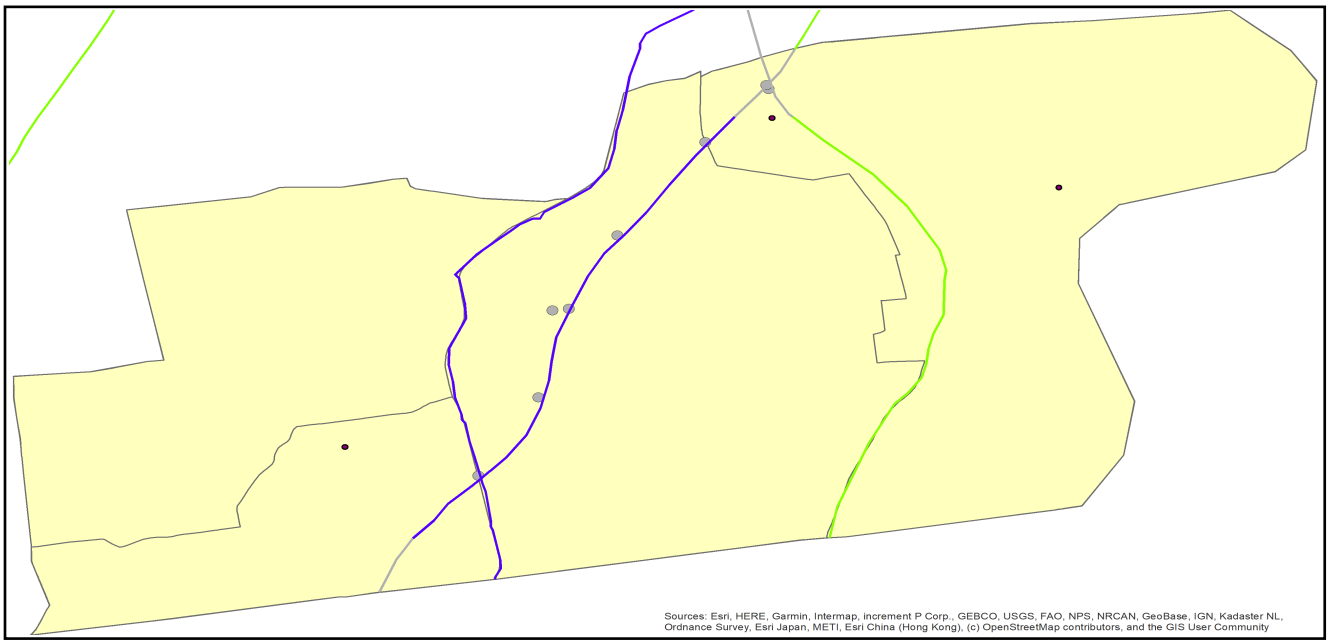


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	40	0	0	38	38
	Bridges	11	0	0	11	11
	Tunnels	0	0	0	0	0
Railways	Segments	1	0	0	1	1
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	1	0	0	1	1
Port	Facilities	3	0	0	3	3
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	117	0	0
Waste Water	70	0	0
Natural Gas	47	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

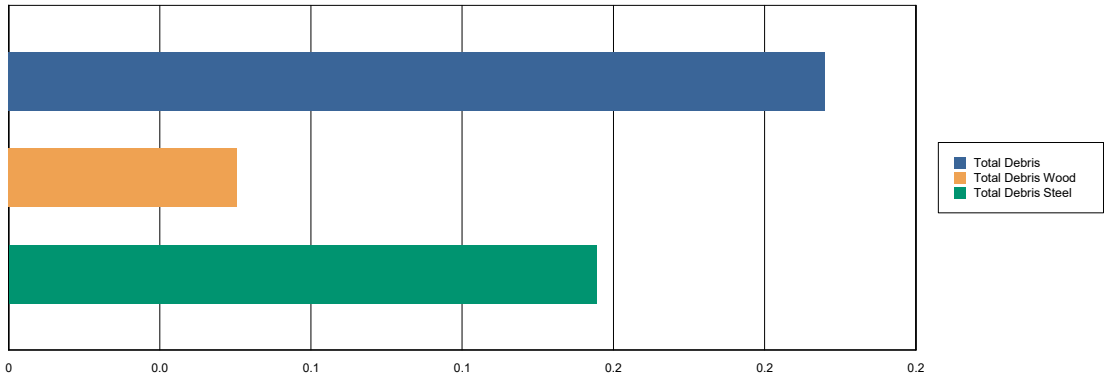
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 216,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 28.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 8,640 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



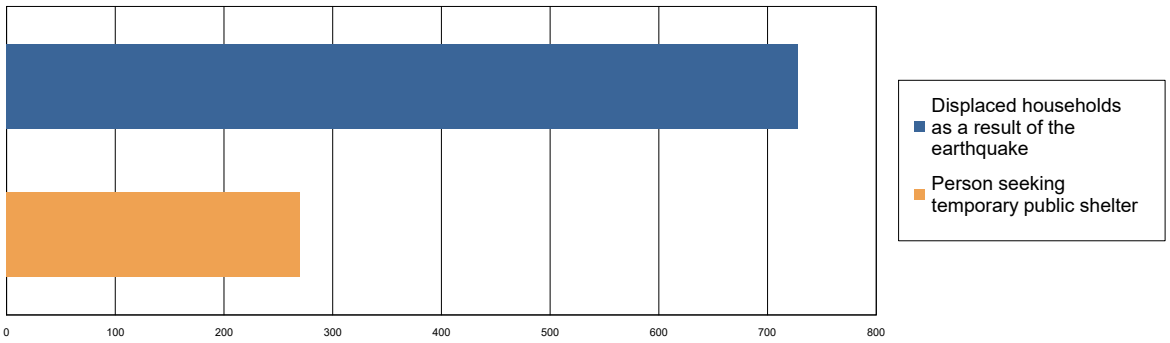
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.06	0.16	0.22	8,640 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 728 households to be displaced due to the earthquake. Of these, 270 people (out of a total population of 20,845) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
728	270

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	4.17	1.17	0.17	0.34
	Commuting	0.00	0.00	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.02	0.01	0.00	0.00
	Industrial	3.29	0.93	0.14	0.27
	Other-Residential	45.98	12.72	2.04	4.03
	Single Family	13.72	2.37	0.25	0.50
	Total	**67**	**17**	**3**	**5**
2 PM	Commercial	238.88	66.74	9.92	19.35
	Commuting	0.02	0.03	0.05	0.01
	Educational	36.28	10.39	1.66	3.23
	Hotels	0.00	0.00	0.00	0.00
	Industrial	24.29	6.90	1.03	2.00
	Other-Residential	14.07	3.89	0.63	1.20
	Single Family	4.21	0.76	0.09	0.16
	Total	**318**	**89**	**13**	**26**
5 PM	Commercial	147.58	41.17	6.16	11.86
	Commuting	0.49	0.62	1.08	0.21
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.01	0.00	0.00	0.00
	Industrial	15.18	4.31	0.64	1.25
	Other-Residential	18.09	5.00	0.81	1.54
	Single Family	5.39	0.97	0.11	0.21
	Total	**187**	**52**	**9**	**15**

Economic Loss

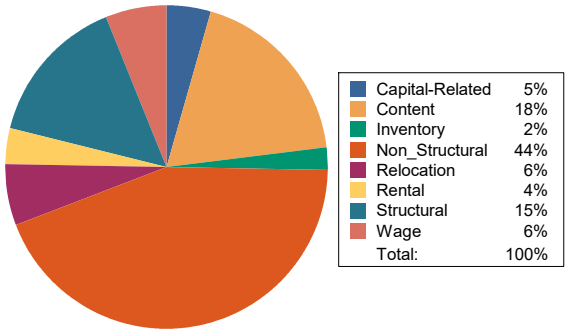
The total economic loss estimated for the earthquake is 953.31 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 946.37 (millions of dollars); 20 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 23 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

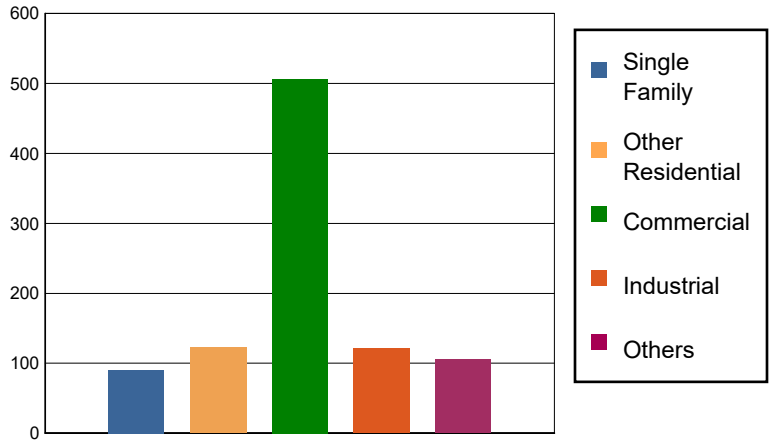


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	6.8333	46.8863	1.7577	3.6327	59.1100
	Capital-Related	0.0000	2.9071	38.0528	1.0698	0.6581	42.6878
	Rental	1.5285	9.2490	19.7635	0.8112	2.1707	33.5229
	Relocation	5.5799	4.9014	30.8510	3.9500	11.5298	56.8121
	Subtotal	**7.1084**	**23.8908**	**135.5536**	**7.5887**	**17.9913**	**192.1328**
Capital Stock Losses							
	Structural	11.1584	14.2573	80.6326	17.4034	17.8129	141.2646
	Non_Structural	53.1826	68.8276	190.1452	55.6157	48.9970	416.7681
	Content	19.2263	15.5207	84.8138	35.3485	19.4428	174.3521
	Inventory	0.0000	0.0000	15.3563	5.3188	1.1779	21.8530
	Subtotal	**83.5673**	**98.6056**	**370.9479**	**113.6864**	**87.4306**	**754.2378**
	Total	**90.68**	**122.50**	**506.50**	**121.28**	**105.42**	**946.37**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	763.0989	0.0000	0.00
	Bridges	90.2621	3.6328	4.02
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**853.3610**	**3.6328**	
Railways	Segments	579.7635	0.0000	0.00
	Bridges	10.4200	0.3178	3.05
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**590.1835**	**0.3178**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	1.3310	0.3312	24.88
	Subtotal	**1.3310**	**0.3312**	
Port	Facilities	10.4708	2.6572	25.38
	Subtotal	**10.4708**	**2.6572**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**1,455.35**	**6.94**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.7645	0.0000	0.00
	Subtotal	**3.7645**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	2.2587	0.0000	0.00
	Subtotal	**159.7049**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.5058	0.0000	0.00
	Subtotal	**1.5058**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	7.3075	0.0000	0.00
	Subtotal	**7.3075**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**172.28**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	20,845	2,406	1,536	3,942
Total Region		**20,845**	**2,406**	**1,536**	**3,942**

Hazus: Earthquake Global Risk Report

Region Name: Simsbury_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 34.29 square miles and contains 6 census tracts. There are over 9 thousand households in the region which has a total population of 24,517 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 4,616 (millions of dollars). Approximately 86.00 % of the buildings (and 71.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,100 and 260 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 6 thousand buildings in the region which have an aggregate total replacement value of 4,616 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 81% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 10 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,360.00 (millions of dollars). This inventory includes over 53.44 miles of highways, 11 bridges, 420.67 miles of pipes.

Table 1: Transportation System Lifeline Inventory

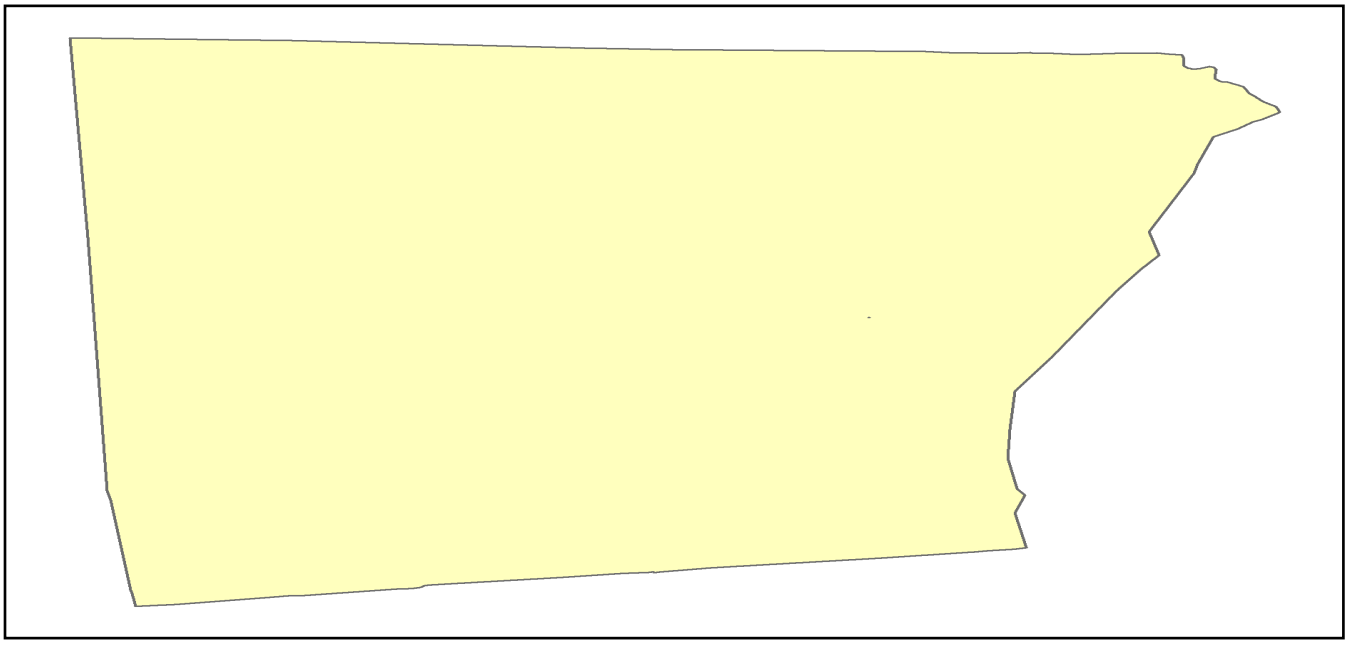
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	11	32.3186
	Segments	21	476.9067
	Tunnels	0	0.0000
		Subtotal	**509.2253**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	1	590.0816
	Tunnels	0	0.0000
		Subtotal	**590.0816**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	1	1.6033
		Subtotal	**1.6033**
		Total	**1,100.90**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.7764
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**6.7764**
Waste Water	Distribution Lines	NA	4.0658
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**161.5120**
Natural Gas	Distribution Lines	NA	2.7106
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.7106**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	89.8825
		Subtotal	**89.8825**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**260.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 489 buildings will be at least moderately damaged. This is over 7.00 % of the buildings in the region. There are an estimated 12 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

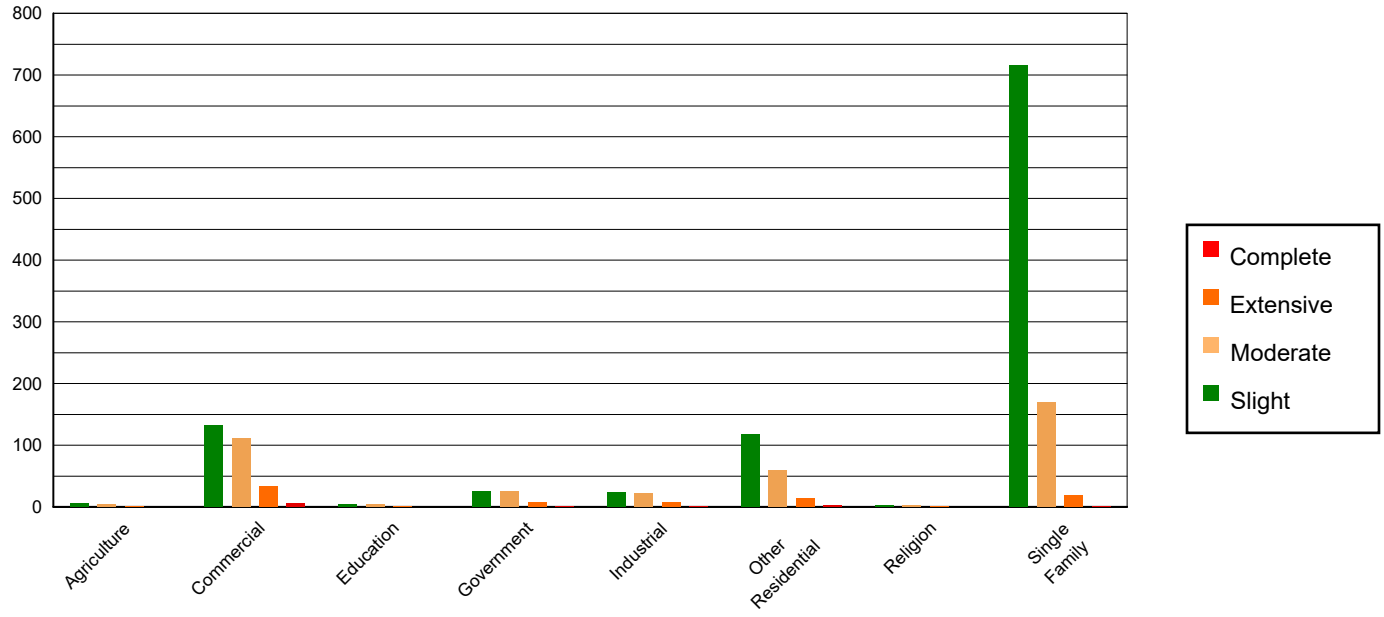


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	16.40	0.30	6.09	0.59	4.12	1.04	1.21	1.48	0.19	1.48
Commercial	382.06	7.09	131.75	12.85	110.46	27.96	32.96	40.11	5.77	46.03
Education	13.30	0.25	4.46	0.44	3.93	1.00	1.09	1.33	0.22	1.76
Government	67.71	1.26	24.31	2.37	24.25	6.14	7.28	8.86	1.45	11.57
Industrial	64.22	1.19	22.63	2.21	22.19	5.62	6.74	8.20	1.22	9.76
Other Residential	583.73	10.83	117.34	11.45	58.50	14.81	13.52	16.46	1.90	15.13
Religion	12.41	0.23	2.96	0.29	1.99	0.50	0.55	0.67	0.09	0.72
Single Family	4252.33	78.86	715.48	69.80	169.68	42.94	18.82	22.90	1.70	13.55
Total	**5,392**		**1,025**		**395**		**82**		**13**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	4645.22	86.15	783.65	76.45	168.07	42.54	11.83	14.39	0.06	0.48
Steel	226.19	4.19	90.50	8.83	106.14	26.86	34.23	41.66	6.91	55.13
Concrete	48.51	0.90	17.95	1.75	20.40	5.16	4.99	6.08	0.69	5.52
Precast	17.55	0.33	4.62	0.45	5.76	1.46	2.37	2.89	0.11	0.91
RM	103.86	1.93	17.67	1.72	17.84	4.51	5.56	6.77	0.08	0.67
URM	350.81	6.51	110.61	10.79	76.91	19.47	23.19	28.22	4.68	37.28
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**5,392**		**1,025**		**395**		**82**		**13**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	10	0	0	10
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	6	0	0	6

Transportation Lifeline Damage

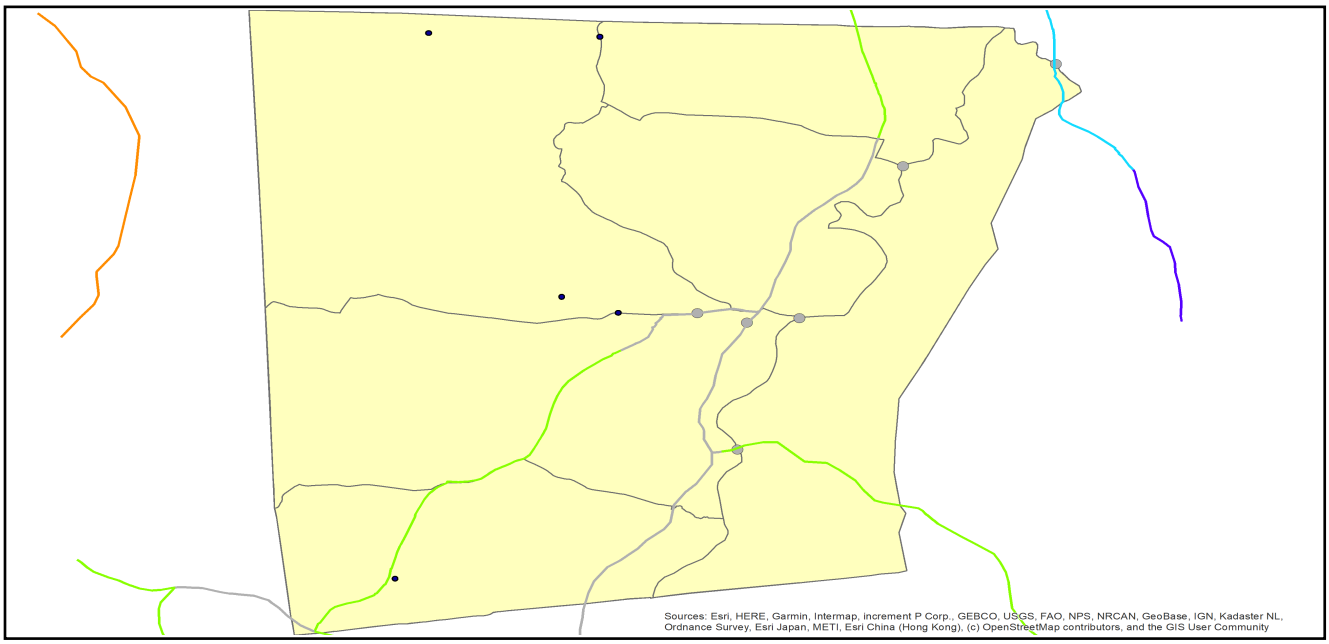


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	21	0	0	21	21
	Bridges	11	0	0	11	11
	Tunnels	0	0	0	0	0
Railways	Segments	1	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	1	0	0	1	1

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	211	0	0
Waste Water	126	0	0
Natural Gas	84	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

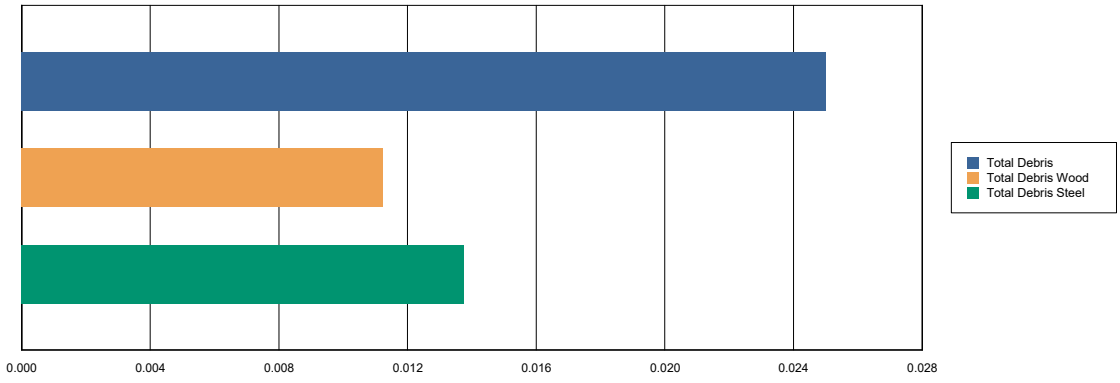
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 25,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 45.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 1,000 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



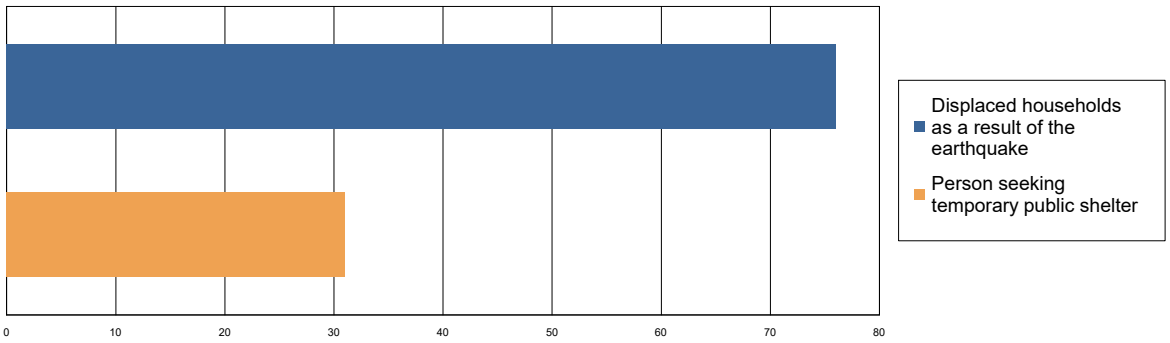
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.01	0.03	1,000 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 76 households to be displaced due to the earthquake. Of these, 31 people (out of a total population of 24,517) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
76	31

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.31	0.06	0.01	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.12	0.02	0.00	0.01
	Other-Residential	4.34	0.78	0.09	0.18
	Single Family	4.74	0.58	0.05	0.10
	Total	**10**	**1**	**0**	**0**
2 PM	Commercial	19.38	3.79	0.44	0.86
	Commuting	0.00	0.00	0.01	0.00
	Educational	7.85	1.57	0.19	0.37
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.85	0.17	0.02	0.04
	Other-Residential	1.17	0.22	0.03	0.05
	Single Family	1.25	0.16	0.01	0.03
	Total	**31**	**6**	**1**	**1**
5 PM	Commercial	13.61	2.67	0.32	0.60
	Commuting	0.07	0.11	0.17	0.03
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.53	0.10	0.01	0.02
	Other-Residential	1.72	0.32	0.04	0.07
	Single Family	1.83	0.23	0.02	0.04
	Total	**18**	**3**	**1**	**1**

Economic Loss

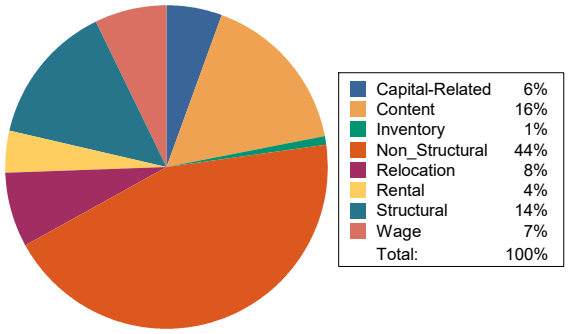
The total economic loss estimated for the earthquake is 151.15 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 150.76 (millions of dollars); 25 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 39 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

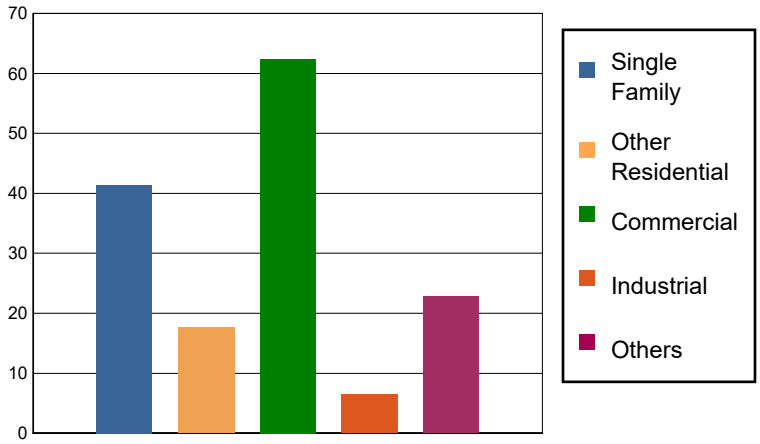


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.0473	8.8655	0.1674	0.9722	11.0524
	Capital-Related	0.0000	0.4459	7.8295	0.0976	0.1783	8.5513
	Rental	0.5548	1.3680	3.6526	0.0711	0.4386	6.0851
	Relocation	1.9628	0.8909	5.2332	0.3552	3.1428	11.5849
	Subtotal	**2.5176**	**3.7521**	**25.5808**	**0.6913**	**4.7319**	**37.2737**
Capital Stock Losses							
	Structural	5.1988	2.1415	8.5167	1.2015	4.1903	21.2488
	Non_Structural	25.0730	9.4435	19.1702	2.7185	9.8410	66.2462
	Content	8.6187	2.3345	8.2060	1.5859	3.8771	24.6222
	Inventory	0.0000	0.0000	0.9249	0.2819	0.1638	1.3706
	Subtotal	**38.8905**	**13.9195**	**36.8178**	**5.7878**	**18.0722**	**113.4878**
	Total	**41.41**	**17.67**	**62.40**	**6.48**	**22.80**	**150.76**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	476.9067	0.0000	0.00
	Bridges	32.3186	0.3874	1.20
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**509.2253**	**0.3874**	
Railways	Segments	590.0816	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**590.0816**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	1.6033	0.0000	0.00
	Subtotal	**1.6033**	**0.0000**	
	Total	**1,100.91**	**0.39**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	6.7764	0.0000	0.00
	Subtotal	**6.7764**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	4.0658	0.0000	0.00
	Subtotal	**161.5120**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.7106	0.0000	0.00
	Subtotal	**2.7106**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	89.8825	0.0000	0.00
	Subtotal	**89.8825**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**260.88**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	24,517	3,283	1,333	4,616
Total Region		**24,517**	**3,283**	**1,333**	**4,616**

Hazus: Earthquake Global Risk Report

Region Name: Somers_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.57 square miles and contains 3 census tracts. There are over 3 thousand households in the region which has a total population of 10,255 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 2,303 (millions of dollars). Approximately 88.00 % of the buildings (and 69.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 221 and 177 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 3 thousand buildings in the region which have an aggregate total replacement value of 2,303 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 84% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 4 schools, 1 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 398.00 (millions of dollars). This inventory includes over 19.88 miles of highways, 13 bridges, 241.09 miles of pipes.

Table 1: Transportation System Lifeline Inventory

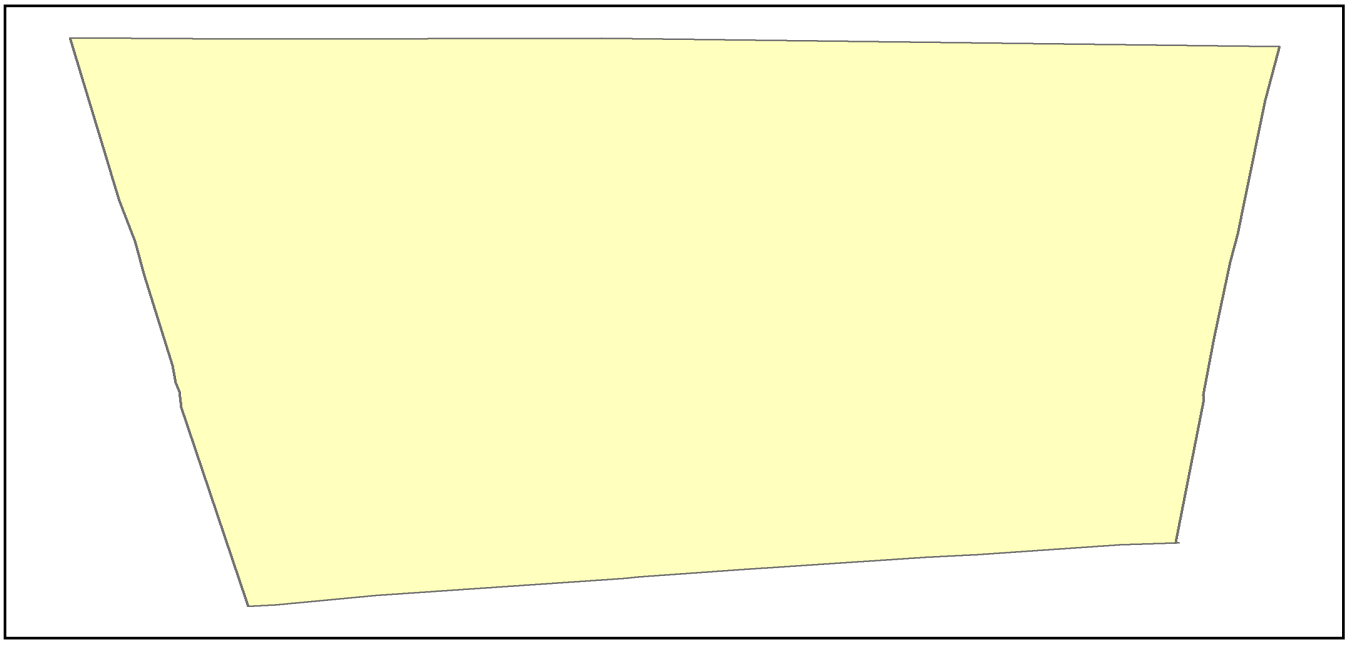
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	13	6.6906
	Segments	14	214.7426
	Tunnels	0	0.0000
		Subtotal	**221.4332**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**221.40**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	3.8819
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.8819**
Waste Water	Distribution Lines	NA	2.3292
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**159.7754**
Natural Gas	Distribution Lines	NA	1.5528
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.5528**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	12.1792
		Subtotal	**12.1792**
Communication	Facilities	1	0.1150
		Subtotal	**0.1150**
		Total	**177.50**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 227 buildings will be at least moderately damaged. This is over 6.00 % of the buildings in the region. There are an estimated 5 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

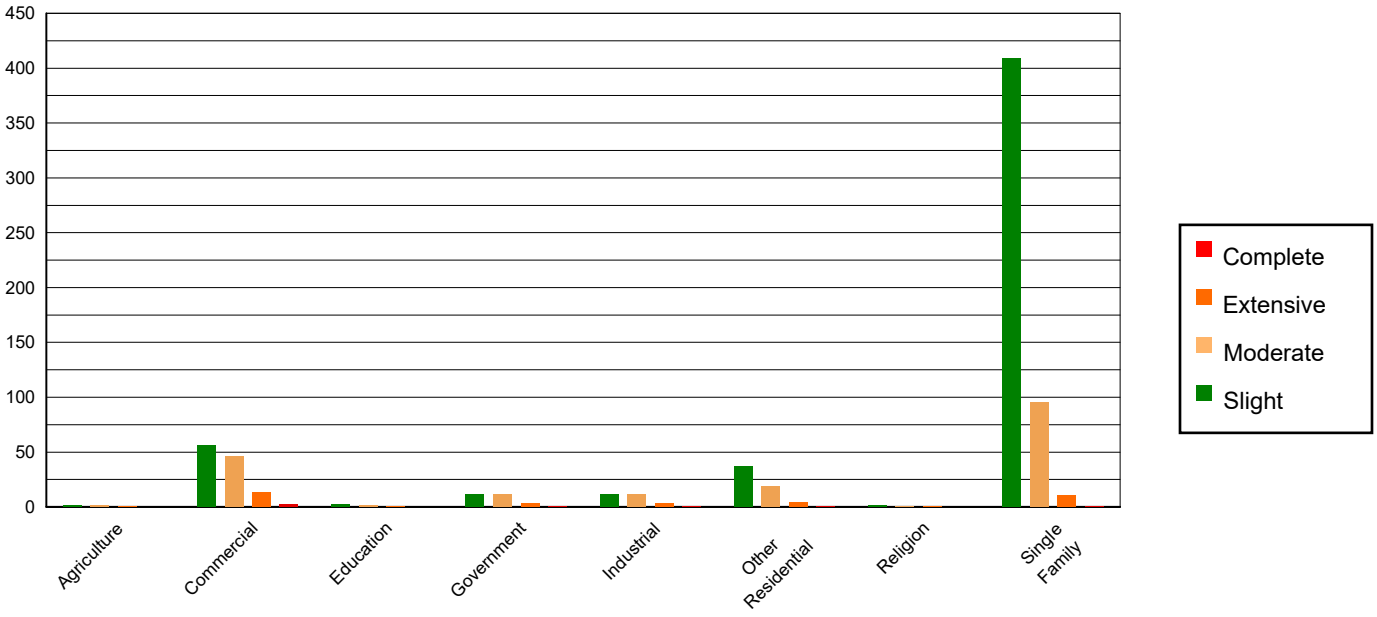


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	5.47	0.18	1.90	0.36	1.24	0.66	0.35	0.97	0.05	0.95
Commercial	168.05	5.65	55.95	10.54	46.46	24.85	13.31	37.19	2.24	43.84
Education	6.58	0.22	2.09	0.39	1.78	0.95	0.47	1.30	0.09	1.74
Government	33.96	1.14	11.77	2.22	11.40	6.10	3.26	9.10	0.61	12.04
Industrial	33.56	1.13	11.50	2.17	11.04	5.90	3.36	9.38	0.56	10.89
Other Residential	189.62	6.38	37.44	7.05	19.05	10.19	4.31	12.04	0.58	11.33
Religion	6.28	0.21	1.45	0.27	0.96	0.51	0.26	0.73	0.04	0.81
Single Family	2529.81	85.08	408.74	77.00	95.03	50.83	10.48	29.30	0.94	18.39
Total	**2,973**		**531**		**187**		**36**		**5**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2632.30	88.53	422.69	79.63	87.90	47.01	6.18	17.27	0.02	0.31
Steel	106.35	3.58	41.06	7.74	46.44	24.84	14.25	39.83	2.73	53.46
Concrete	21.07	0.71	7.43	1.40	8.11	4.34	1.86	5.20	0.24	4.77
Precast	8.36	0.28	2.12	0.40	2.58	1.38	1.03	2.87	0.05	0.89
RM	40.40	1.36	6.67	1.26	6.61	3.53	2.01	5.62	0.03	0.54
URM	163.60	5.50	50.18	9.45	34.47	18.43	10.24	28.62	2.02	39.64
MH	1.24	0.04	0.68	0.13	0.85	0.46	0.21	0.59	0.02	0.40
Total	**2,973**		**531**		**187**		**36**		**5**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	4	0	0	4
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	1	0	0	1

Transportation Lifeline Damage

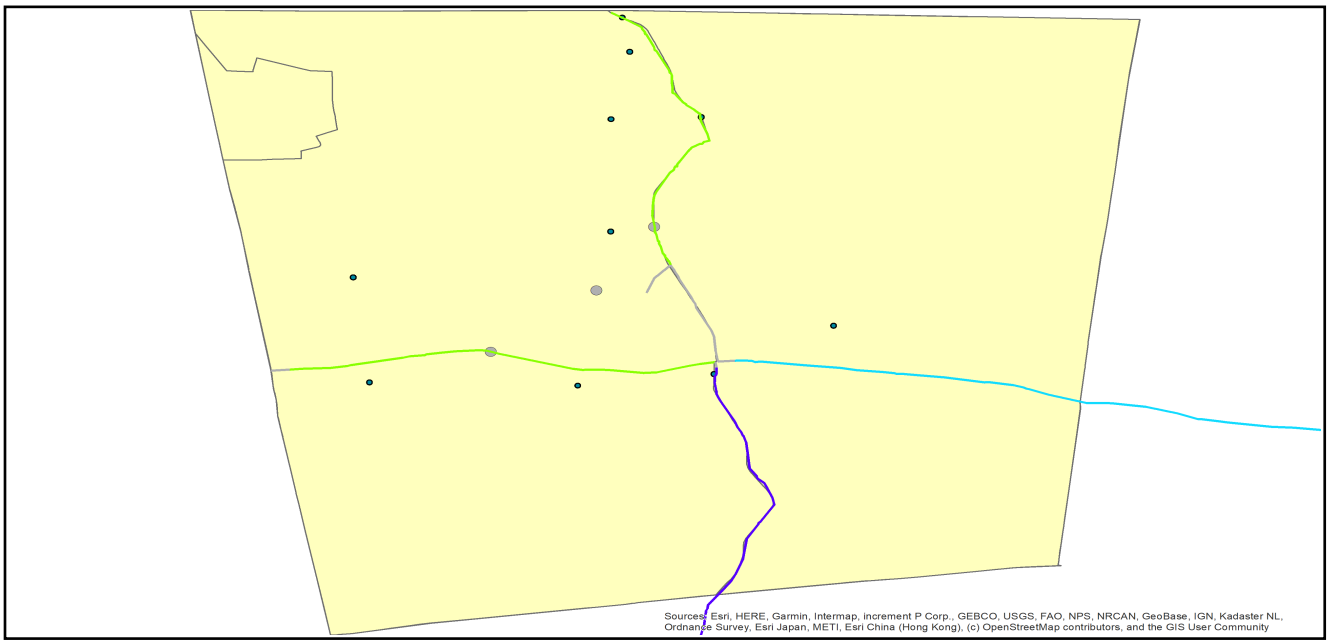


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	14	0	0	14	14
	Bridges	13	0	0	13	13
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	0	0
Communication	1	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	121	0	0
Waste Water	72	0	0
Natural Gas	48	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

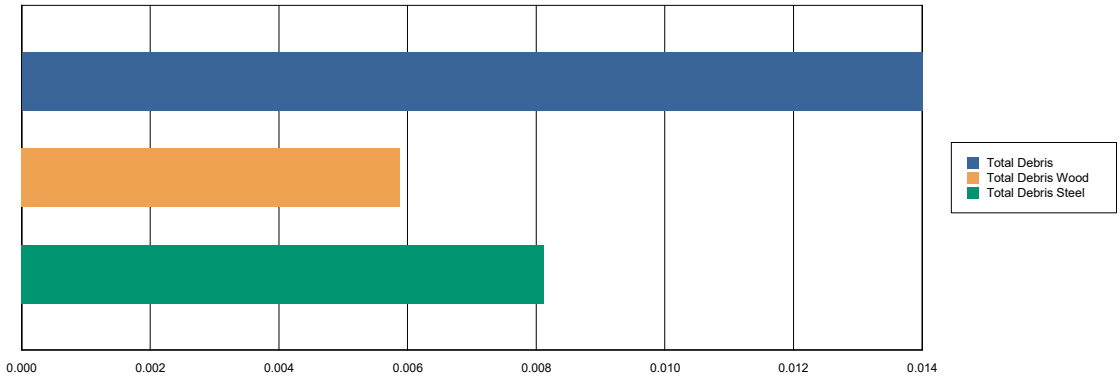
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 14,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 42.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 560 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



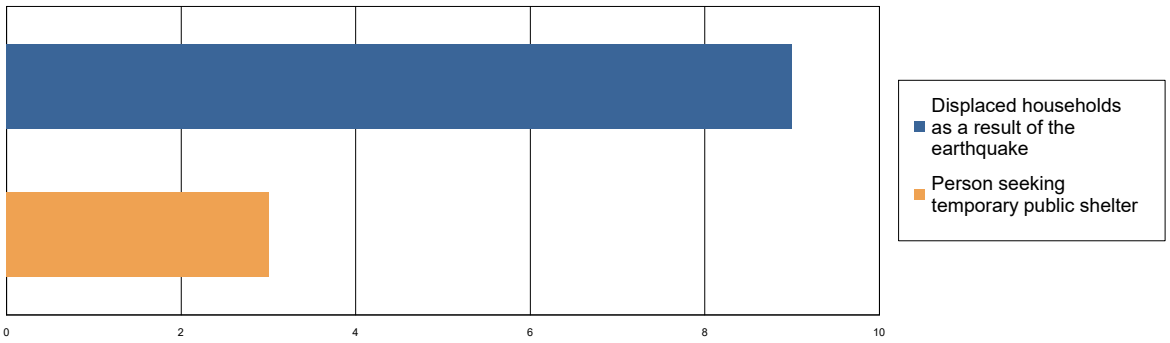
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.01	0.01	560 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 9 households to be displaced due to the earthquake. Of these, 3 people (out of a total population of 10,255) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
9	3

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.08	0.02	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.04	0.01	0.00	0.00
	Other-Residential	0.91	0.16	0.02	0.03
	Single Family	2.20	0.26	0.02	0.04
	Total	**3**	**0**	**0**	**0**
2 PM	Commercial	6.08	1.17	0.14	0.26
	Commuting	0.00	0.00	0.00	0.00
	Educational	2.78	0.55	0.07	0.13
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.29	0.05	0.01	0.01
	Other-Residential	0.28	0.05	0.01	0.01
	Single Family	0.63	0.08	0.01	0.01
	Total	**10**	**2**	**0**	**0**
5 PM	Commercial	4.56	0.88	0.10	0.20
	Commuting	0.00	0.01	0.01	0.00
	Educational	0.23	0.05	0.01	0.01
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.18	0.03	0.00	0.01
	Other-Residential	0.36	0.06	0.01	0.01
	Single Family	0.85	0.11	0.01	0.02
	Total	**6**	**1**	**0**	**0**

Economic Loss

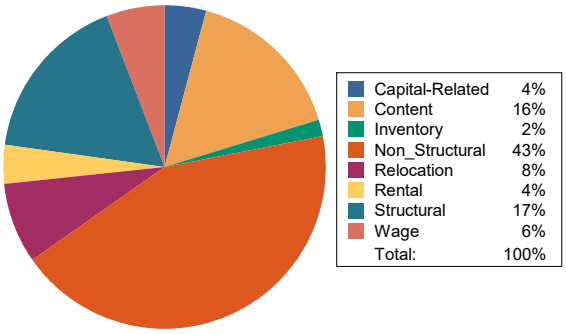
The total economic loss estimated for the earthquake is 73.43 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 73.42 (millions of dollars); 22 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 38 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

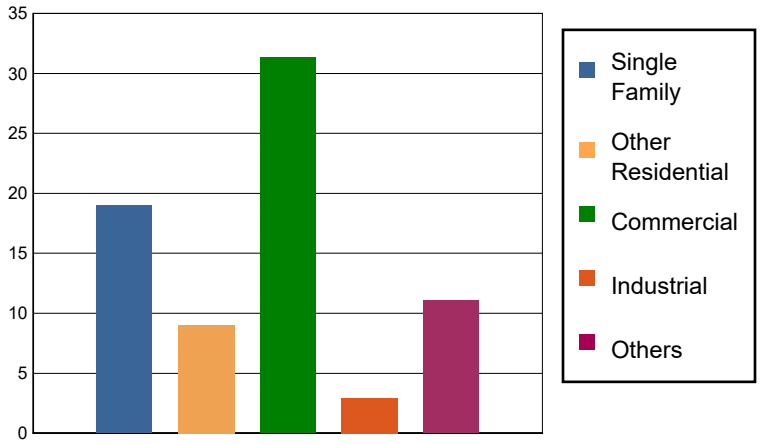


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0168	3.5681	0.0596	0.7064	4.3509
	Capital-Related	0.0000	0.0071	2.9249	0.0337	0.0758	3.0415
	Rental	0.2904	0.6963	1.4570	0.0266	0.3393	2.8096
	Relocation	1.0252	0.3791	2.6274	0.2175	1.6436	5.8928
	Subtotal	**1.3156**	**1.0993**	**10.5774**	**0.3374**	**2.7651**	**16.0948**
Capital Stock Losses							
	Structural	2.3886	1.7948	5.8233	0.5613	1.8796	12.4476
	Non_Structural	11.4323	5.0121	9.6549	1.2433	4.5237	31.8663
	Content	3.8843	1.1138	4.3434	0.6865	1.8381	11.8661
	Inventory	0.0000	0.0000	0.9668	0.1000	0.0737	1.1405
	Subtotal	**17.7052**	**7.9207**	**20.7884**	**2.5911**	**8.3151**	**57.3205**
	Total	**19.02**	**9.02**	**31.37**	**2.93**	**11.08**	**73.42**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	214.7426	0.0000	0.00
	Bridges	6.6906	0.0121	0.18
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**221.4332**	**0.0121**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**221.43**	**0.01**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.8819	0.0000	0.00
	Subtotal	**3.8819**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	2.3292	0.0000	0.00
	Subtotal	**159.7754**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.5528	0.0000	0.00
	Subtotal	**1.5528**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	12.1792	0.0000	0.00
	Subtotal	**12.1792**	**0.0000**	
Communication	Facilities	0.1150	0.0000	0.00
	Subtotal	**0.1150**	**0.0000**	
	Total	**177.50**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	10,255	1,597	705	2,303
Total Region		**10,255**	**1,597**	**705**	**2,303**

Hazus: Earthquake Global Risk Report

Region Name: South_Windsor_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 28.66 square miles and contains 6 census tracts. There are over 10 thousand households in the region which has a total population of 26,918 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 6,385 (millions of dollars). Approximately 85.00 % of the buildings (and 59.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 3,575 and 456 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 8 thousand buildings in the region which have an aggregate total replacement value of 6,385 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 82% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 8 schools, 2 fire stations, 1 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 4,031.00 (millions of dollars). This inventory includes over 75.81 miles of highways, 17 bridges, 341.75 miles of pipes.

Table 1: Transportation System Lifeline Inventory

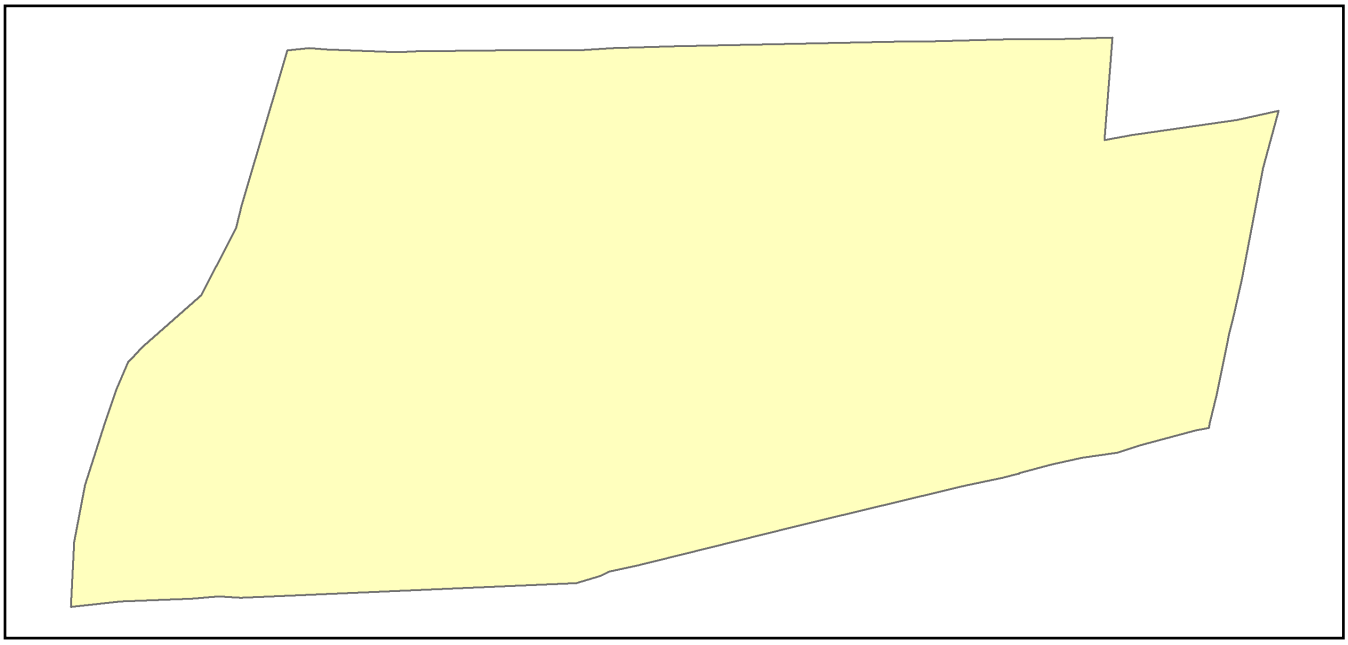
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	17	157.8475
	Segments	63	937.8379
	Tunnels	0	0.0000
		Subtotal	**1095.6854**
Railways	Bridges	6	31.2600
	Facilities	0	0.0000
	Segments	28	2448.8490
	Tunnels	0	0.0000
		Subtotal	**2480.1090**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**3,575.80**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.3151
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**6.3151**
Waste Water	Distribution Lines	NA	3.7891
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**161.2353**
Natural Gas	Distribution Lines	NA	2.5261
	Facilities	0	0.0000
	Pipelines	1	286.3532
		Subtotal	**288.8793**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**456.40**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,347 buildings will be at least moderately damaged. This is over 16.00 % of the buildings in the region. There are an estimated 104 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

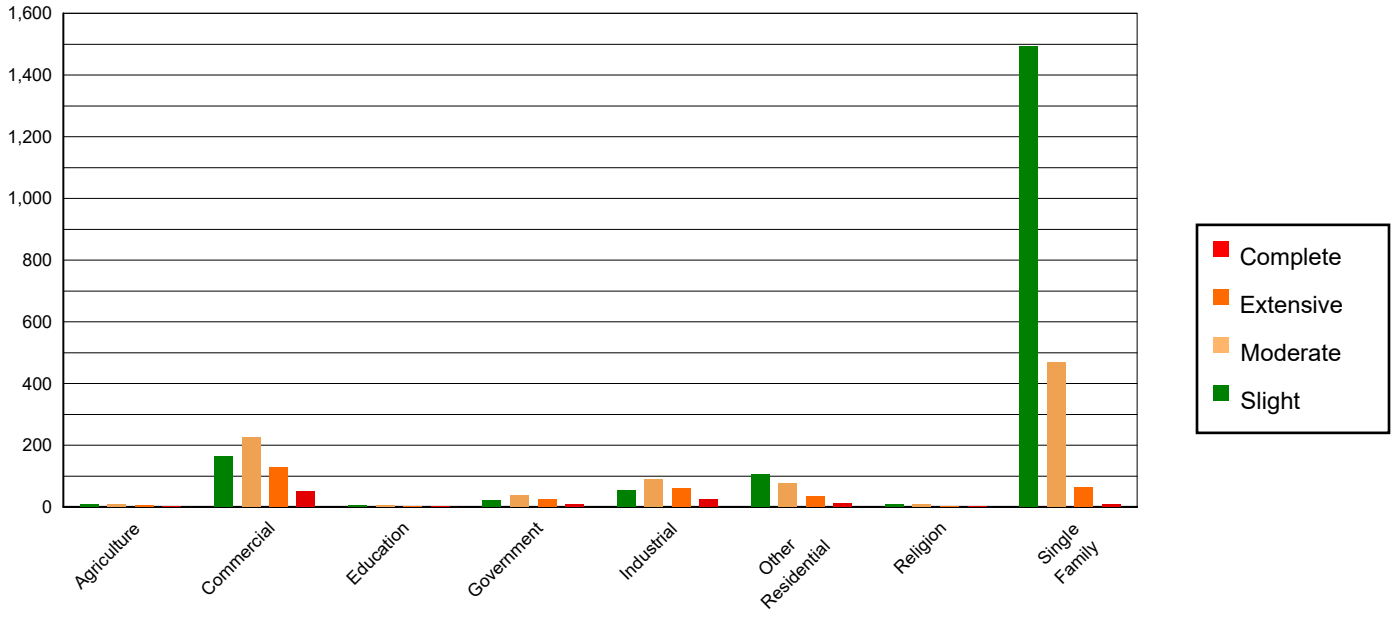


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	10.58	0.19	8.44	0.45	9.04	0.98	4.30	1.32	1.65	1.59
Commercial	230.68	4.23	162.76	8.76	223.47	24.35	129.73	39.81	48.36	46.50
Education	6.77	0.12	4.54	0.24	6.58	0.72	3.76	1.15	1.35	1.30
Government	30.09	0.55	22.04	1.19	37.99	4.14	25.11	7.71	9.77	9.39
Industrial	75.59	1.39	54.00	2.90	90.45	9.86	60.56	18.59	23.41	22.51
Other Residential	291.80	5.35	106.91	5.75	74.38	8.10	35.32	10.84	10.59	10.18
Religion	20.84	0.38	8.59	0.46	7.71	0.84	3.78	1.16	1.08	1.04
Single Family	4789.34	87.79	1491.50	80.24	468.10	51.01	63.28	19.42	7.79	7.49
Total	**5,456**		**1,859**		**918**		**326**		**104**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	4968.29	91.07	1567.61	84.34	482.44	52.57	48.13	14.77	2.39	2.30
Steel	104.12	1.91	93.09	5.01	210.27	22.91	160.76	49.34	69.21	66.55
Concrete	19.18	0.35	15.62	0.84	35.38	3.86	24.85	7.63	9.25	8.90
Precast	11.44	0.21	5.91	0.32	12.19	1.33	10.17	3.12	2.58	2.48
RM	65.84	1.21	22.51	1.21	35.30	3.85	19.54	6.00	1.44	1.38
URM	281.64	5.16	149.67	8.05	133.59	14.56	53.89	16.54	15.70	15.10
MH	5.18	0.10	4.35	0.23	8.55	0.93	8.48	2.60	3.43	3.30
Total	**5,456**		**1,859**		**918**		**326**		**104**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	8	0	0	5
EOCs	0	0	0	0
PoliceStations	1	0	0	1
FireStations	2	0	0	2

Transportation Lifeline Damage

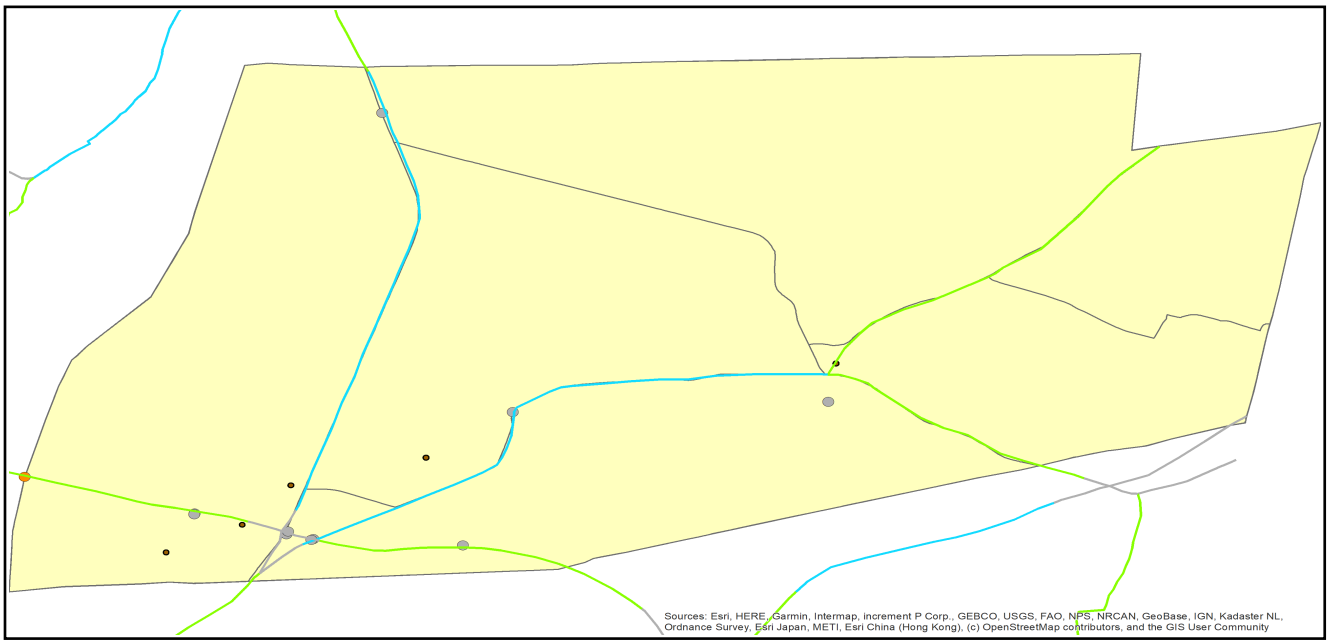


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	63	0	0	63	63
	Bridges	17	0	0	17	17
	Tunnels	0	0	0	0	0
Railways	Segments	28	0	0	21	21
	Bridges	6	0	0	6	6
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	196	0	0
Waste Water	118	0	0
Natural Gas	28	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

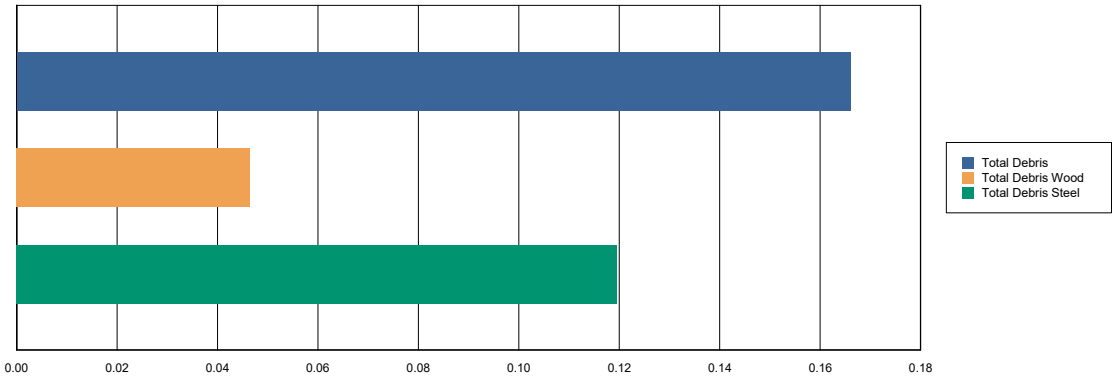
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 166,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 28.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 6,640 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



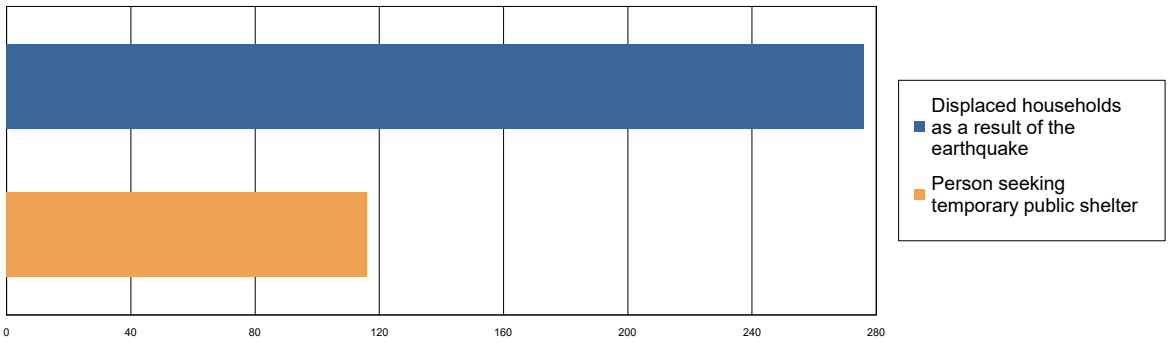
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.05	0.12	0.17	6,640 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 276 households to be displaced due to the earthquake. Of these, 116 people (out of a total population of 26,918) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
276	116

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.98	0.49	0.07	0.13
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	3.51	0.88	0.12	0.23
	Other-Residential	14.81	3.50	0.50	0.98
	Single Family	11.89	1.74	0.17	0.33
	Total	**32**	**7**	**1**	**2**
2 PM	Commercial	121.27	30.07	4.11	7.96
	Commuting	0.01	0.02	0.03	0.01
	Educational	26.14	6.67	0.99	1.93
	Hotels	0.00	0.00	0.00	0.00
	Industrial	25.87	6.47	0.89	1.71
	Other-Residential	4.20	1.00	0.14	0.27
	Single Family	3.15	0.48	0.05	0.09
	Total	**181**	**45**	**6**	**12**
5 PM	Commercial	85.52	21.27	2.95	5.63
	Commuting	0.23	0.35	0.54	0.11
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	16.17	4.05	0.55	1.07
	Other-Residential	5.82	1.38	0.20	0.38
	Single Family	4.63	0.71	0.07	0.13
	Total	**112**	**28**	**4**	**7**

Economic Loss

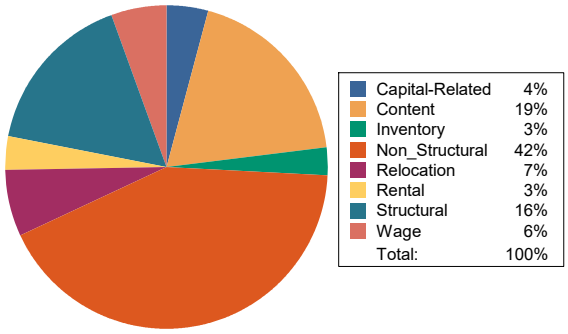
The total economic loss estimated for the earthquake is 715.25 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 713.60 (millions of dollars); 20 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 21 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

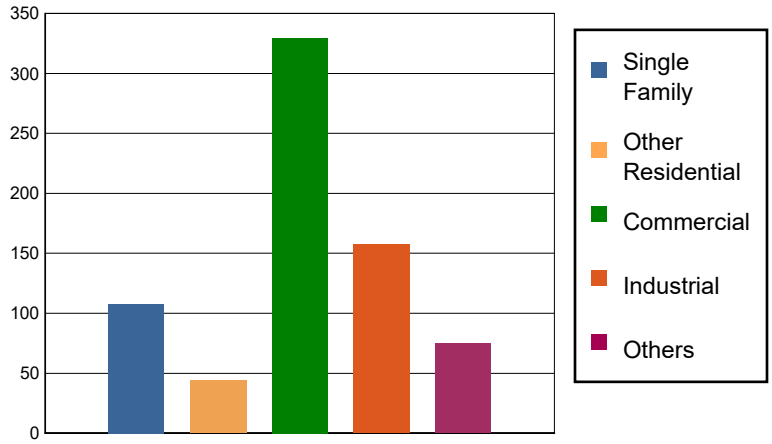


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	2.2572	30.8458	2.9188	3.8524	39.8742
	Capital-Related	0.0000	0.9610	26.9958	1.8356	0.4888	30.2812
	Rental	1.3500	3.1600	15.7879	1.5078	1.6989	23.5046
	Relocation	4.8822	1.9203	24.5852	6.9223	9.4734	47.7834
	Subtotal	**6.2322**	**8.2985**	**98.2147**	**13.1845**	**15.5135**	**141.4434**
Capital Stock Losses							
	Structural	12.8948	5.8280	58.7094	26.5454	13.0239	117.0015
	Non_Structural	64.4840	24.2747	111.8739	68.2202	32.8035	301.6563
	Content	24.1286	5.6920	48.0422	42.9756	12.9720	133.8104
	Inventory	0.0000	0.0000	12.6373	6.5103	0.5360	19.6836
	Subtotal	**101.5074**	**35.7947**	**231.2628**	**144.2515**	**59.3354**	**572.1518**
	Total	**107.74**	**44.09**	**329.48**	**157.44**	**74.85**	**713.60**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	937.8379	0.0000	0.00
	Bridges	157.8475	1.4348	0.91
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1095.6854**	**1.4348**	
Railways	Segments	2448.8490	0.0000	0.00
	Bridges	31.2600	0.2134	0.68
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**2480.1090**	**0.2134**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**3,575.79**	**1.65**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	6.3151	0.0000	0.00
	Subtotal	**6.3151**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	3.7891	0.0000	0.00
	Subtotal	**161.2353**	**0.0000**	
Natural Gas	Pipelines	286.3532	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.5261	0.0000	0.00
	Subtotal	**288.8793**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**456.43**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	26,918	3,758	2,626	6,385
Total Region		**26,918**	**3,758**	**2,626**	**6,385**

Hazus: Earthquake Global Risk Report

Region Name: Southington_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 36.61 square miles and contains 12 census tracts. There are over 17 thousand households in the region which has a total population of 43,501 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 15 thousand buildings in the region with a total building replacement value (excluding contents) of 8,844 (millions of dollars). Approximately 88.00 % of the buildings (and 69.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,143 and 473 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 15 thousand buildings in the region which have an aggregate total replacement value of 8,844 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 81% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 15 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,616.00 (millions of dollars). This inventory includes over 72.08 miles of highways, 62 bridges, 470.38 miles of pipes.

Table 1: Transportation System Lifeline Inventory

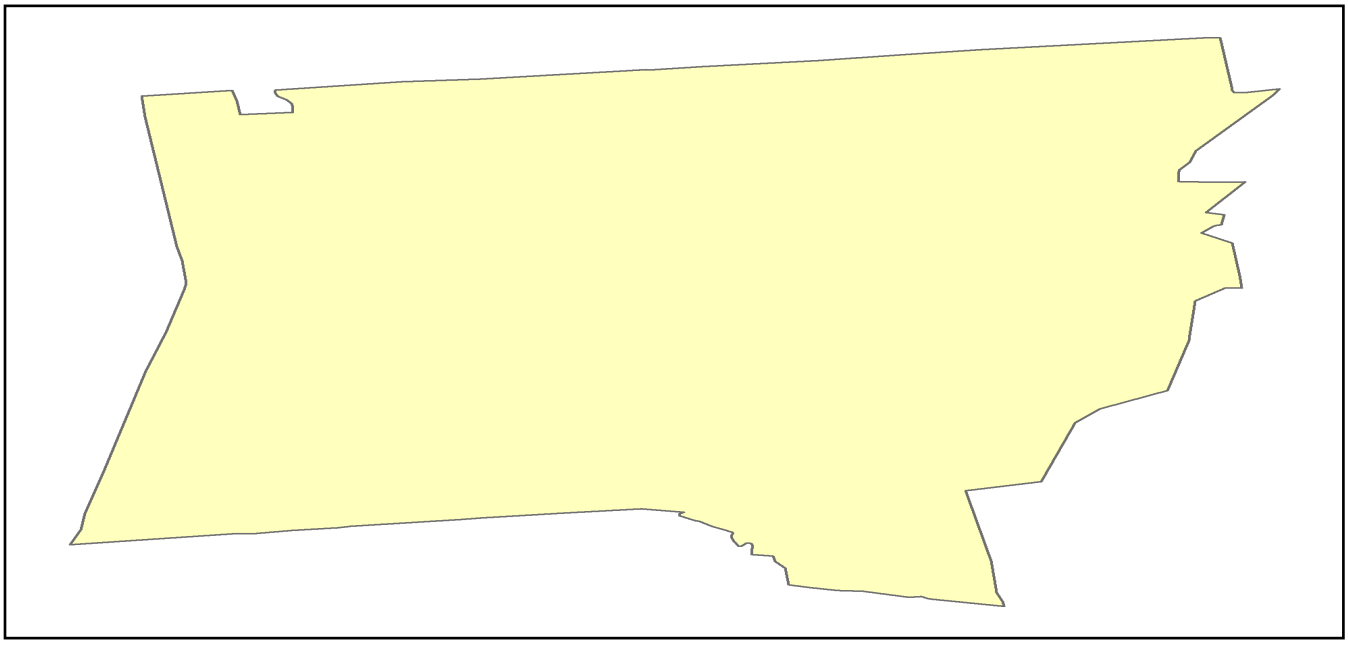
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	62	212.4744
	Segments	88	763.4623
	Tunnels	0	0.0000
		Subtotal	**975.9367**
Railways	Bridges	2	10.4200
	Facilities	0	0.0000
	Segments	11	1157.3110
	Tunnels	0	0.0000
		Subtotal	**1167.7310**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**2,143.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	8.8777
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**8.8777**
Waste Water	Distribution Lines	NA	5.3266
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**162.7728**
Natural Gas	Distribution Lines	NA	3.5511
	Facilities	0	0.0000
	Pipelines	12	298.2189
		Subtotal	**301.7700**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	1	0.1150
		Subtotal	**0.1150**
		Total	**473.50**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 2,256 buildings will be at least moderately damaged. This is over 14.00 % of the buildings in the region. There are an estimated 157 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

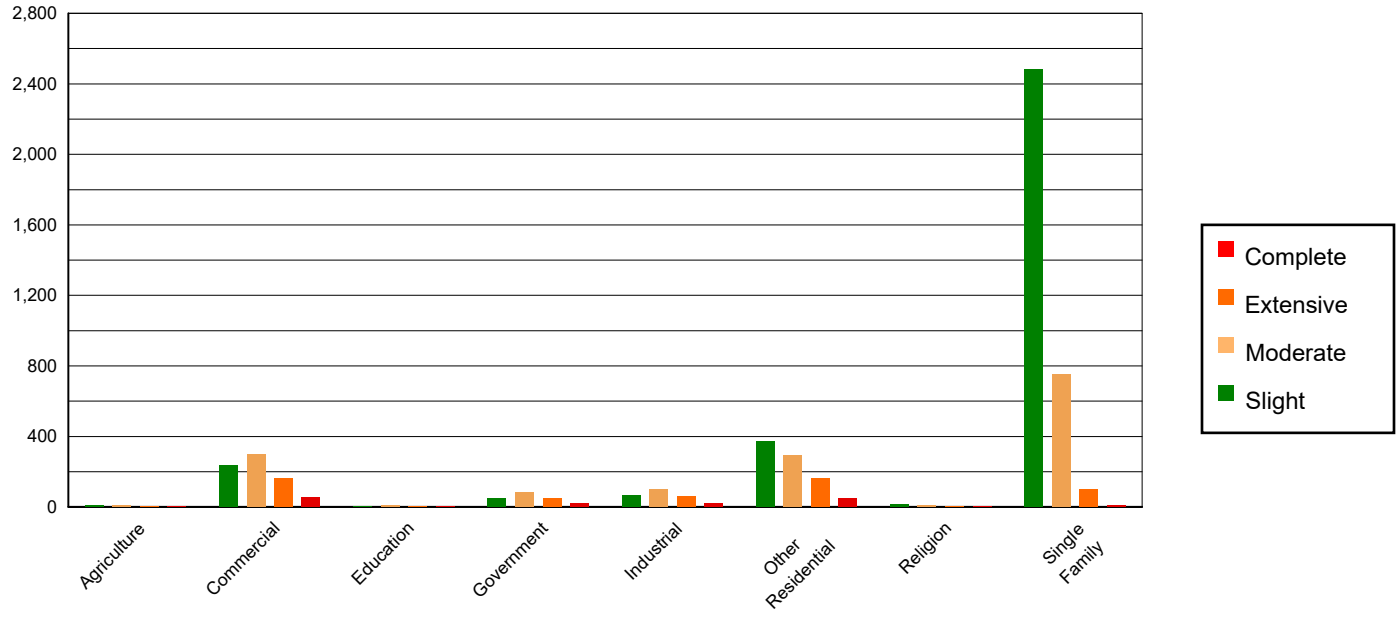


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	16.12	0.16	11.68	0.36	11.79	0.76	5.44	1.00	1.97	1.25
Commercial	373.48	3.62	235.09	7.25	299.73	19.25	159.00	29.30	52.71	33.55
Education	9.07	0.09	5.49	0.17	7.40	0.47	3.82	0.70	1.22	0.78
Government	74.98	0.73	51.02	1.57	82.96	5.33	50.75	9.35	18.29	11.64
Industrial	102.83	1.00	65.80	2.03	100.89	6.48	59.94	11.04	20.54	13.08
Other Residential	1064.50	10.31	374.45	11.55	293.13	18.83	160.49	29.57	49.43	31.47
Religion	33.46	0.32	12.61	0.39	10.85	0.70	4.85	0.89	1.23	0.79
Single Family	8647.54	83.78	2485.18	76.67	750.18	48.18	98.41	18.13	11.69	7.44
Total	**10,322**		**3,241**		**1,557**		**543**		**157**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	9294.56	90.05	2681.44	82.73	772.82	49.64	72.83	13.42	2.83	1.80
Steel	194.14	1.88	153.20	4.73	310.94	19.97	208.56	38.43	79.76	50.78
Concrete	43.92	0.43	31.48	0.97	63.85	4.10	40.15	7.40	13.71	8.73
Precast	20.02	0.19	9.33	0.29	18.00	1.16	13.83	2.55	3.04	1.94
RM	145.63	1.41	44.01	1.36	63.20	4.06	31.22	5.75	1.75	1.12
URM	561.29	5.44	273.40	8.43	233.28	14.98	89.39	16.47	24.40	15.53
MH	62.41	0.60	48.48	1.50	94.82	6.09	86.70	15.97	31.59	20.11
Total	**10,322**		**3,241**		**1,557**		**543**		**157**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	15	0	0	6
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	3	0	0	1

Transportation Lifeline Damage

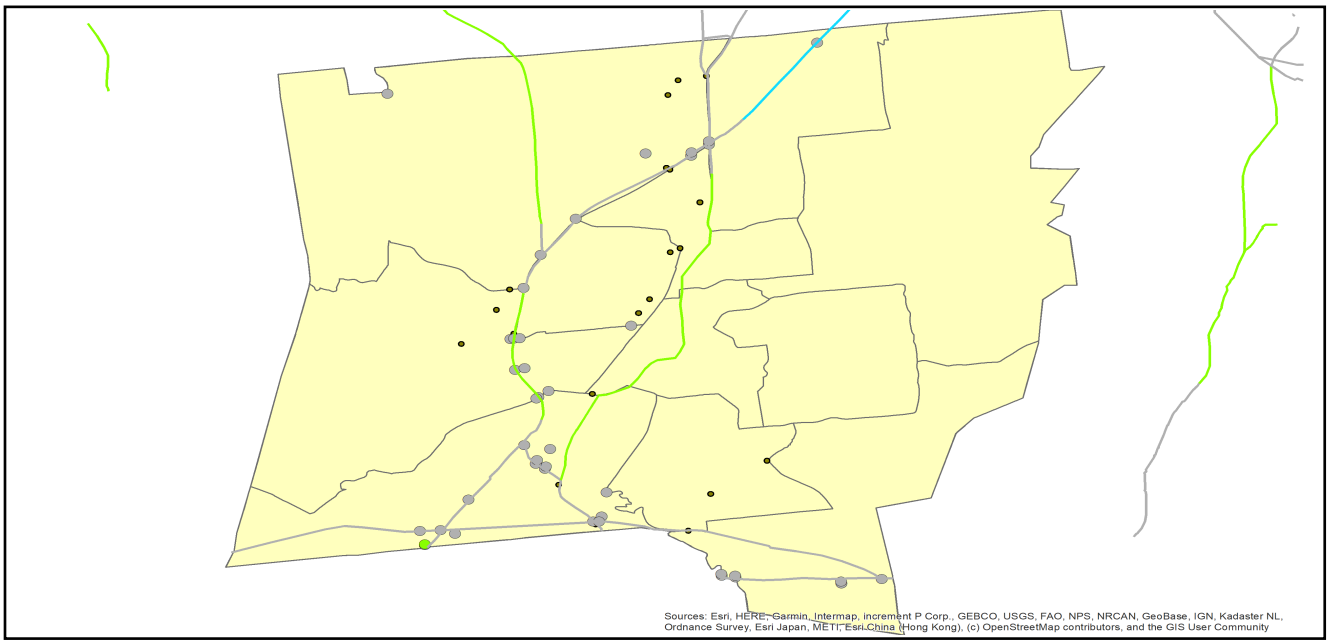


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	88	0	0	88	88
	Bridges	62	1	0	61	62
	Tunnels	0	0	0	0	0
Railways	Segments	11	0	0	2	2
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	1	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	276	0	0
Waste Water	165	0	0
Natural Gas	29	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

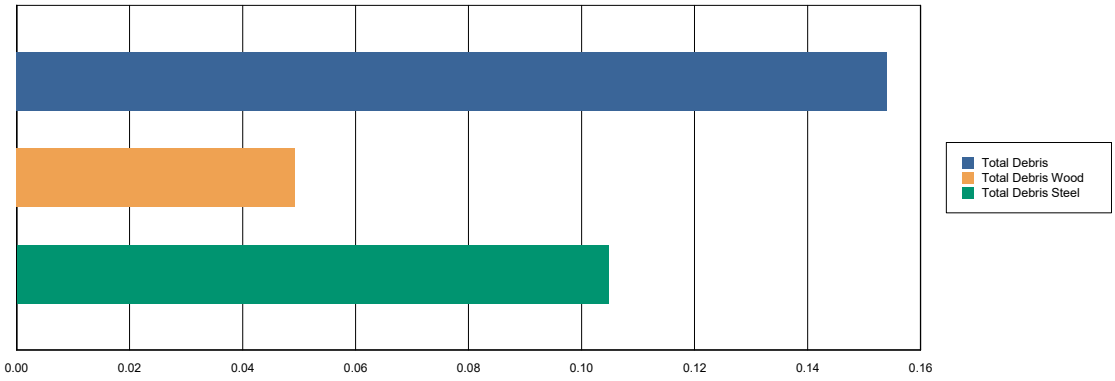
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 154,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 32.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 6,160 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



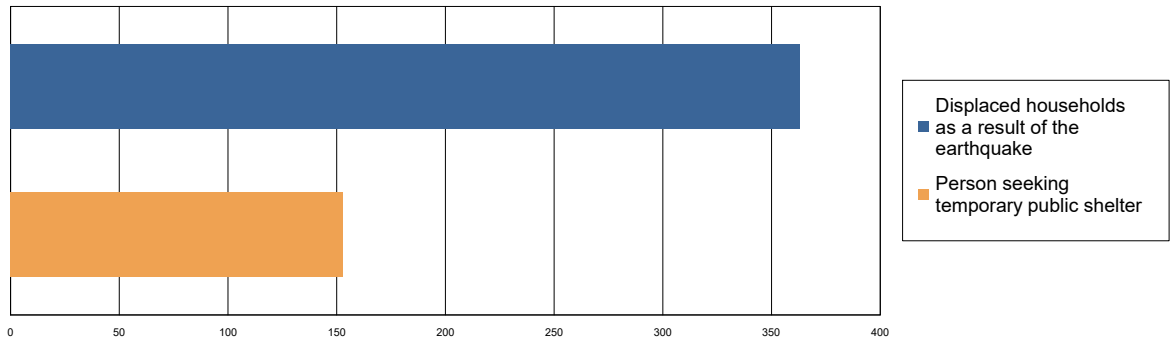
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.05	0.10	0.15	6,160 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 363 households to be displaced due to the earthquake. Of these, 153 people (out of a total population of 43,501) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
363	153

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	2.37	0.57	0.08	0.15
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.02	0.01	0.00	0.00
	Industrial	2.03	0.50	0.07	0.13
	Other-Residential	28.22	6.19	0.77	1.49
	Single Family	16.26	2.31	0.22	0.42
	Total	**49**	**10**	**1**	**2**
2 PM	Commercial	158.66	38.41	5.18	10.02
	Commuting	0.02	0.03	0.04	0.01
	Educational	36.64	9.17	1.35	2.63
	Hotels	0.00	0.00	0.00	0.00
	Industrial	14.98	3.65	0.50	0.97
	Other-Residential	8.56	1.90	0.24	0.46
	Single Family	4.56	0.68	0.07	0.13
	Total	**223**	**54**	**7**	**14**
5 PM	Commercial	114.95	27.98	3.83	7.29
	Commuting	0.40	0.54	0.91	0.18
	Educational	0.21	0.05	0.01	0.01
	Hotels	0.01	0.00	0.00	0.00
	Industrial	9.36	2.28	0.31	0.60
	Other-Residential	10.91	2.42	0.31	0.58
	Single Family	6.32	0.94	0.09	0.17
	Total	**142**	**34**	**5**	**9**

Economic Loss

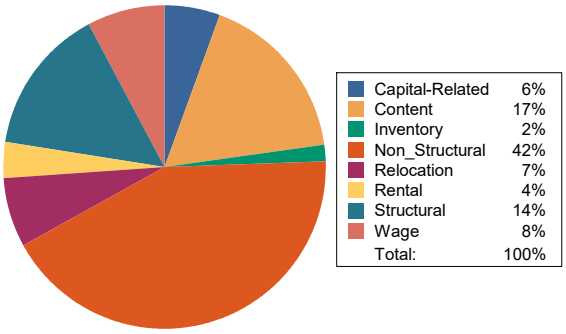
The total economic loss estimated for the earthquake is 771.97 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 765.23 (millions of dollars); 24 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 31 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

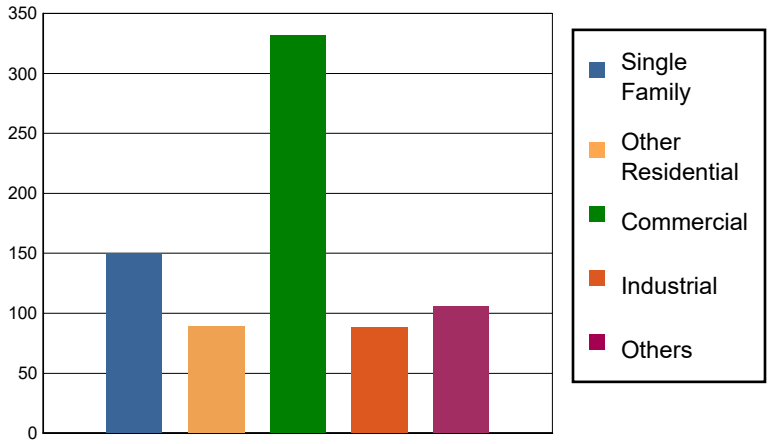


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	6.4518	45.9456	2.4498	5.6581	60.5053
	Capital-Related	0.0000	2.7449	38.0928	1.4819	0.6165	42.9361
	Rental	1.9737	7.5172	14.7233	0.7371	3.5354	28.4867
	Relocation	7.1210	4.6268	24.1207	3.1950	14.5984	53.6619
	Subtotal	**9.0947**	**21.3407**	**122.8824**	**7.8638**	**24.4084**	**185.5900**
Capital Stock Losses							
	Structural	17.8595	10.7777	48.6924	15.4807	18.0496	110.8599
	Non_Structural	89.4522	46.2398	105.1322	37.9210	45.6650	324.4102
	Content	33.3797	10.8014	45.5271	23.2032	17.4640	130.3754
	Inventory	0.0000	0.0000	9.6436	3.9322	0.4164	13.9922
	Subtotal	**140.6914**	**67.8189**	**208.9953**	**80.5371**	**81.5950**	**579.6377**
	Total	**149.79**	**89.16**	**331.88**	**88.40**	**106.00**	**765.23**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	763.4623	0.0000	0.00
	Bridges	212.4744	6.6711	3.14
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**975.9367**	**6.6711**	
Railways	Segments	1157.3110	0.0000	0.00
	Bridges	10.4200	0.0662	0.64
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1167.7310**	**0.0662**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**2,143.67**	**6.74**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	8.8777	0.0000	0.00
	Subtotal	**8.8777**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	5.3266	0.0000	0.00
	Subtotal	**162.7728**	**0.0000**	
Natural Gas	Pipelines	298.2189	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.5511	0.0000	0.00
	Subtotal	**301.7700**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.1150	0.0000	0.00
	Subtotal	**0.1150**	**0.0000**	
	Total	**473.54**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	43,501	6,079	2,764	8,844
Total Region		**43,501**	**6,079**	**2,764**	**8,844**

Hazus: Earthquake Global Risk Report

Region Name: Stafford_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 58.77 square miles and contains 3 census tracts. There are over 4 thousand households in the region which has a total population of 11,472 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,217 (millions of dollars). Approximately 89.00 % of the buildings (and 65.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 551 and 169 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 2,217 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 83% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 72 beds. There are 5 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 720.00 (millions of dollars). This inventory includes over 44.12 miles of highways, 24 bridges, 367.23 miles of pipes.

Table 1: Transportation System Lifeline Inventory

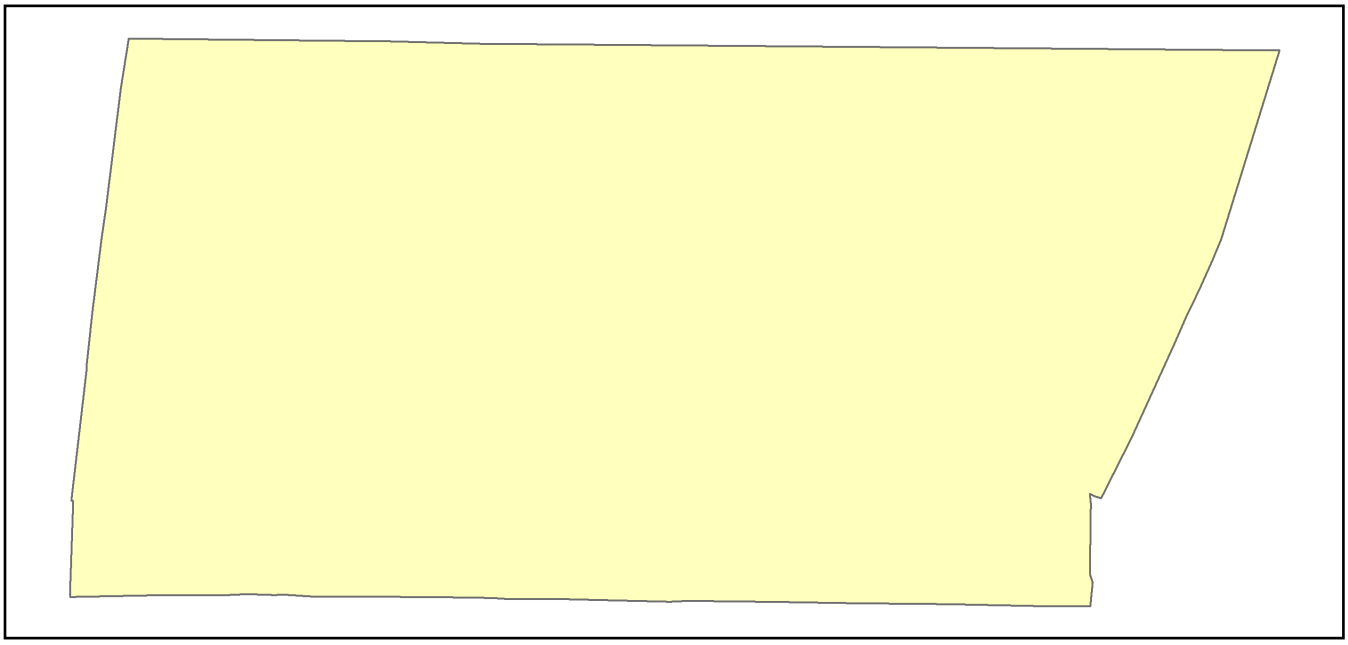
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	24	13.2688
	Segments	12	437.5692
	Tunnels	0	0.0000
	Subtotal		**450.8380**
Railways	Bridges	9	46.8900
	Facilities	0	0.0000
	Segments	7	54.0929
	Tunnels	0	0.0000
	Subtotal		**100.9829**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
	Subtotal		**0.0000**
Bus	Facilities	0	0.0000
	Subtotal		**0.0000**
Ferry	Facilities	0	0.0000
	Subtotal		**0.0000**
Port	Facilities	0	0.0000
	Subtotal		**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
	Subtotal		**0.0000**
	Total		**551.80**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	5.9156
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**5.9156**
Waste Water	Distribution Lines	NA	3.5494
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**160.9956**
Natural Gas	Distribution Lines	NA	2.3662
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.3662**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**169.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 333 buildings will be at least moderately damaged. This is over 7.00 % of the buildings in the region. There are an estimated 8 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

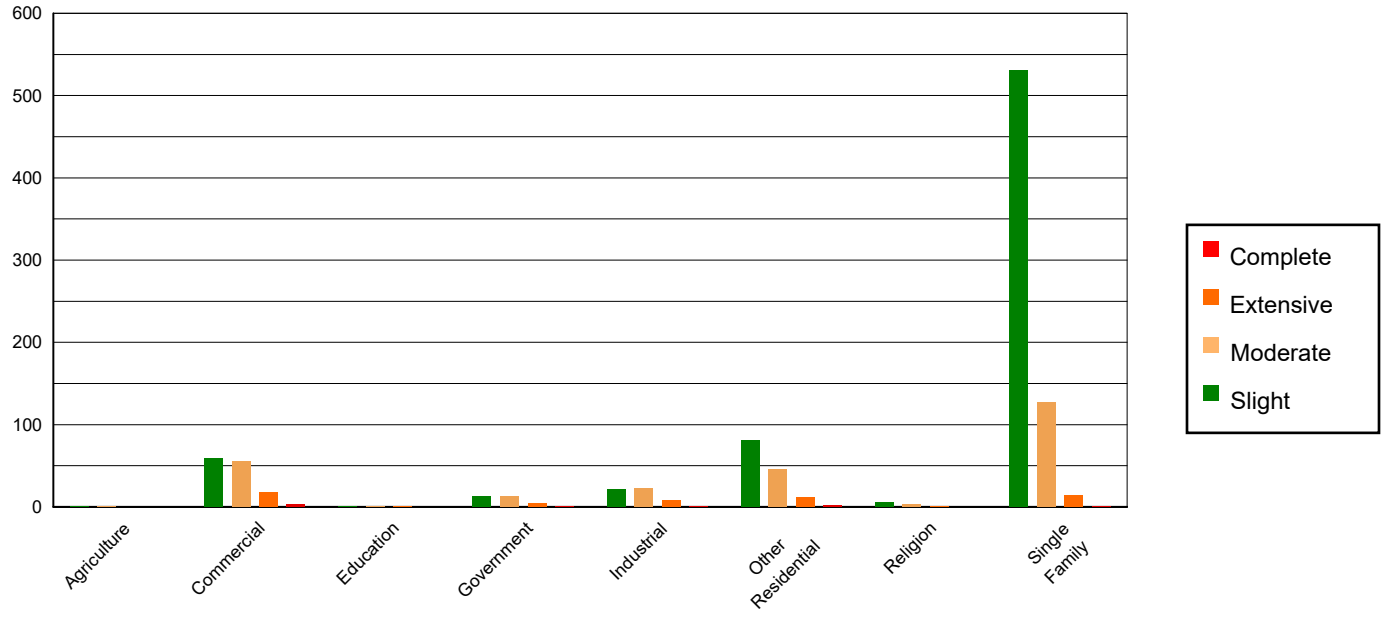


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	3.50	0.09	1.31	0.18	0.89	0.33	0.26	0.46	0.04	0.46
Commercial	160.04	4.34	59.44	8.34	54.71	20.38	17.52	30.86	3.29	37.89
Education	3.86	0.10	1.39	0.20	1.29	0.48	0.38	0.67	0.08	0.92
Government	32.89	0.89	12.65	1.78	13.28	4.95	4.28	7.54	0.89	10.22
Industrial	58.33	1.58	21.59	3.03	22.16	8.25	7.60	13.39	1.31	15.14
Other Residential	364.88	9.88	80.75	11.33	45.32	16.88	11.43	20.13	1.61	18.61
Religion	20.79	0.56	5.27	0.74	3.68	1.37	1.08	1.90	0.18	2.12
Single Family	3047.18	82.55	530.16	74.40	127.16	47.36	14.23	25.05	1.27	14.65
Total	**3,691**		**713**		**268**		**57**		**9**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3256.36	88.21	563.03	79.02	121.75	45.35	8.90	15.66	0.03	0.35
Steel	117.80	3.19	51.14	7.18	64.00	23.84	22.35	39.35	4.67	53.77
Concrete	25.57	0.69	10.23	1.44	12.28	4.57	3.29	5.79	0.49	5.59
Precast	8.79	0.24	2.47	0.35	3.21	1.20	1.38	2.43	0.07	0.83
RM	59.06	1.60	10.69	1.50	11.16	4.16	3.62	6.37	0.06	0.70
URM	215.76	5.84	70.20	9.85	49.43	18.41	15.13	26.65	3.09	35.65
MH	8.15	0.22	4.79	0.67	6.67	2.48	2.12	3.74	0.27	3.11
Total	**3,691**		**713**		**268**		**57**		**9**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 72 hospital beds available for use. On the day of the earthquake, the model estimates that only 41 hospital beds (58.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 78.00% of the beds will be back in service. By 30 days, 94.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	1
Schools	5	0	0	5
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	3	0	0	3

Transportation Lifeline Damage

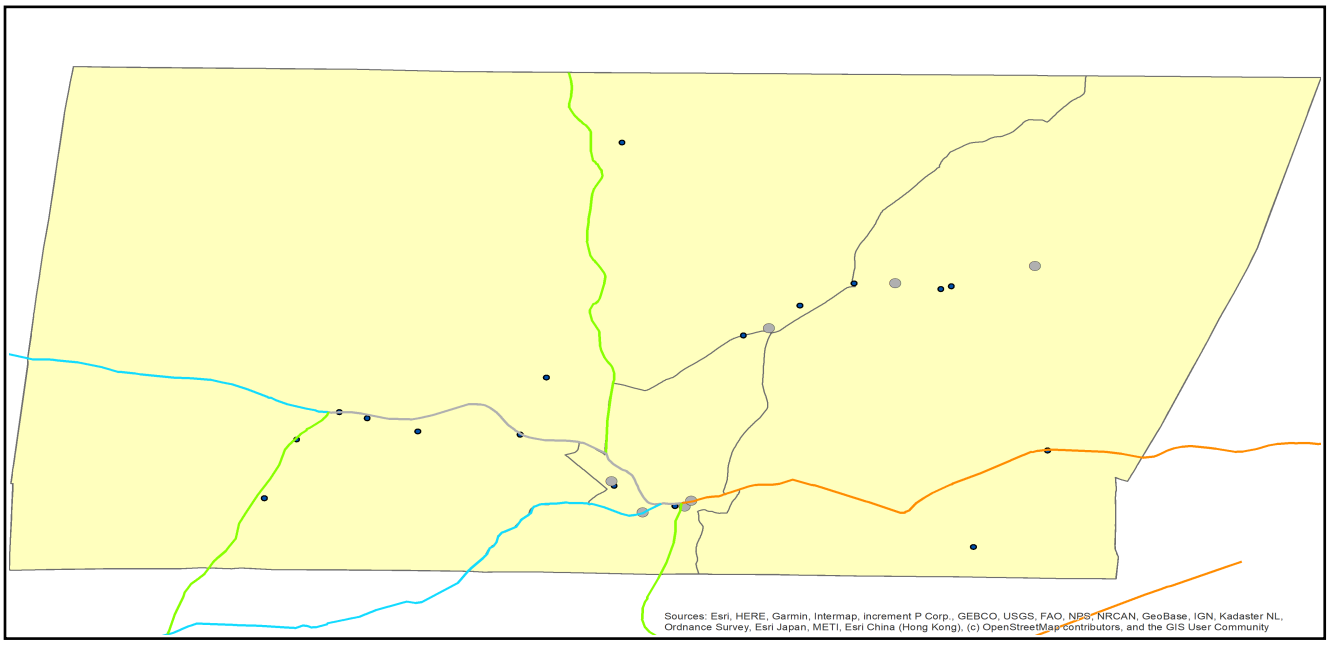


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	12	0	0	12	12
	Bridges	24	0	0	24	24
	Tunnels	0	0	0	0	0
Railways	Segments	7	0	0	6	6
	Bridges	9	0	0	9	9
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	184	0	0
Waste Water	110	0	0
Natural Gas	74	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

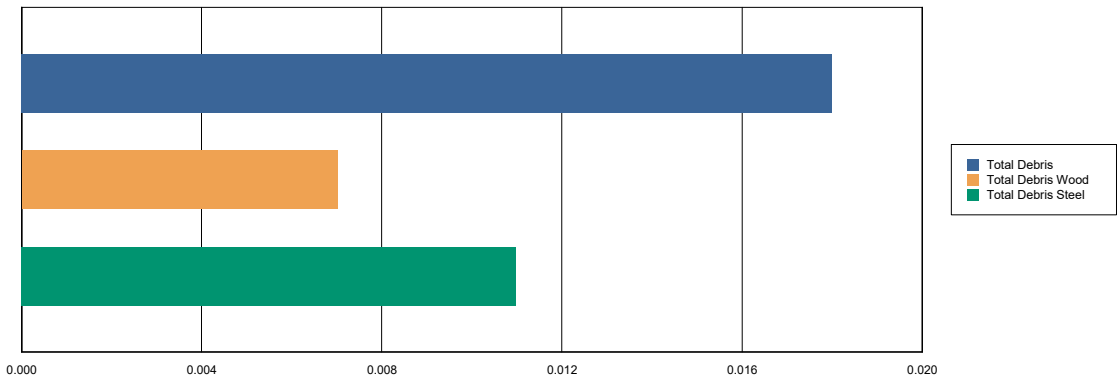
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 18,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 39.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 720 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



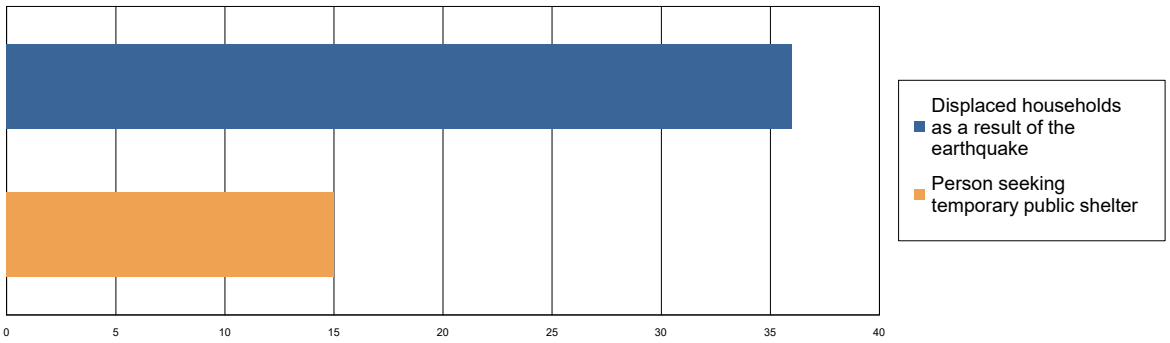
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.01	0.02	720 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 36 households to be displaced due to the earthquake. Of these, 15 people (out of a total population of 11,472) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
36	15

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.12	0.02	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.13	0.02	0.00	0.01
	Other-Residential	2.79	0.51	0.06	0.11
	Single Family	2.48	0.30	0.03	0.05
	Total	**6**	**1**	**0**	**0**
2 PM	Commercial	8.71	1.76	0.21	0.41
	Commuting	0.00	0.00	0.01	0.00
	Educational	3.29	0.68	0.09	0.17
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.92	0.18	0.02	0.04
	Other-Residential	0.88	0.16	0.02	0.04
	Single Family	0.77	0.10	0.01	0.02
	Total	**15**	**3**	**0**	**1**
5 PM	Commercial	6.55	1.32	0.16	0.31
	Commuting	0.08	0.10	0.17	0.03
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.58	0.11	0.01	0.03
	Other-Residential	1.10	0.20	0.02	0.05
	Single Family	0.96	0.12	0.01	0.02
	Total	**9**	**2**	**0**	**0**

Economic Loss

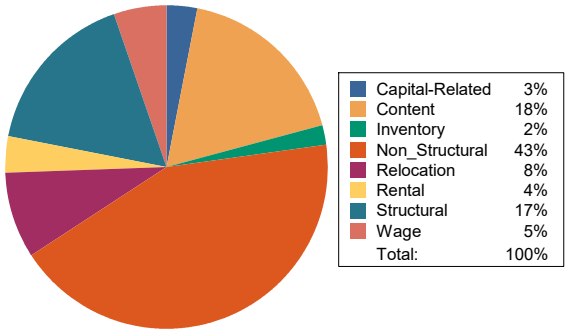
The total economic loss estimated for the earthquake is 84.95 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 84.74 (millions of dollars); 21 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 32 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

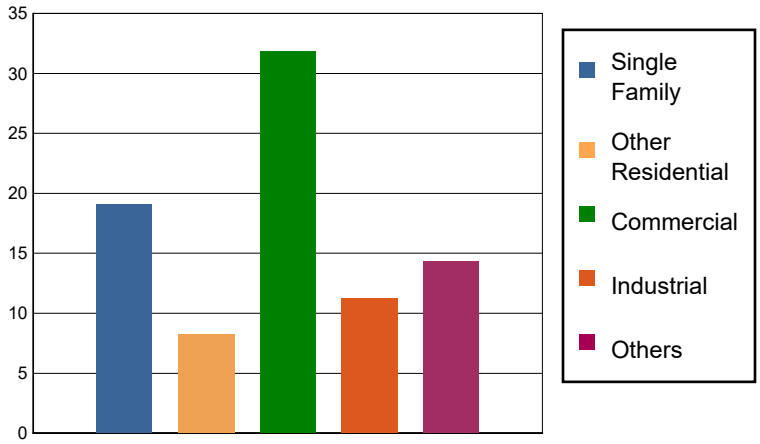


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0472	3.1427	0.2358	1.0779	4.5036
	Capital-Related	0.0000	0.0200	2.4107	0.1408	0.0884	2.6599
	Rental	0.2842	0.6946	1.6992	0.1460	0.3720	3.1960
	Relocation	1.0066	0.5184	2.8530	0.7478	2.0197	7.1455
	Subtotal	**1.2908**	**1.2802**	**10.1056**	**1.2704**	**3.5580**	**17.5050**
Capital Stock Losses							
	Structural	2.3592	1.0701	6.1343	2.0718	2.3604	13.9958
	Non_Structural	11.4558	4.7078	9.8662	4.5734	5.9871	36.5903
	Content	3.9683	1.1627	4.3967	2.9321	2.4342	14.8940
	Inventory	0.0000	0.0000	1.3244	0.4196	0.0077	1.7517
	Subtotal	**17.7833**	**6.9406**	**21.7216**	**9.9969**	**10.7894**	**67.2318**
	Total	**19.07**	**8.22**	**31.83**	**11.27**	**14.35**	**84.74**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	437.5692	0.0000	0.00
	Bridges	13.2688	0.1083	0.82
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**450.8380**	**0.1083**	
Railways	Segments	54.0929	0.0000	0.00
	Bridges	46.8900	0.1051	0.22
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**100.9829**	**0.1051**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**551.82**	**0.21**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	5.9156	0.0000	0.00
	Subtotal	**5.9156**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	3.5494	0.0000	0.00
	Subtotal	**160.9956**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.3662	0.0000	0.00
	Subtotal	**2.3662**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**169.28**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	11,472	1,444	773	2,217
Total Region		**11,472**	**1,444**	**773**	**2,217**

Hazus: Earthquake Global Risk Report

Region Name: Suffield_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 42.72 square miles and contains 4 census tracts. There are over 5 thousand households in the region which has a total population of 15,752 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 3,183 (millions of dollars). Approximately 90.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,233 and 453 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 3,183 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 86% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,686.00 (millions of dollars). This inventory includes over 65.87 miles of highways, 12 bridges, 274.02 miles of pipes.

Table 1: Transportation System Lifeline Inventory

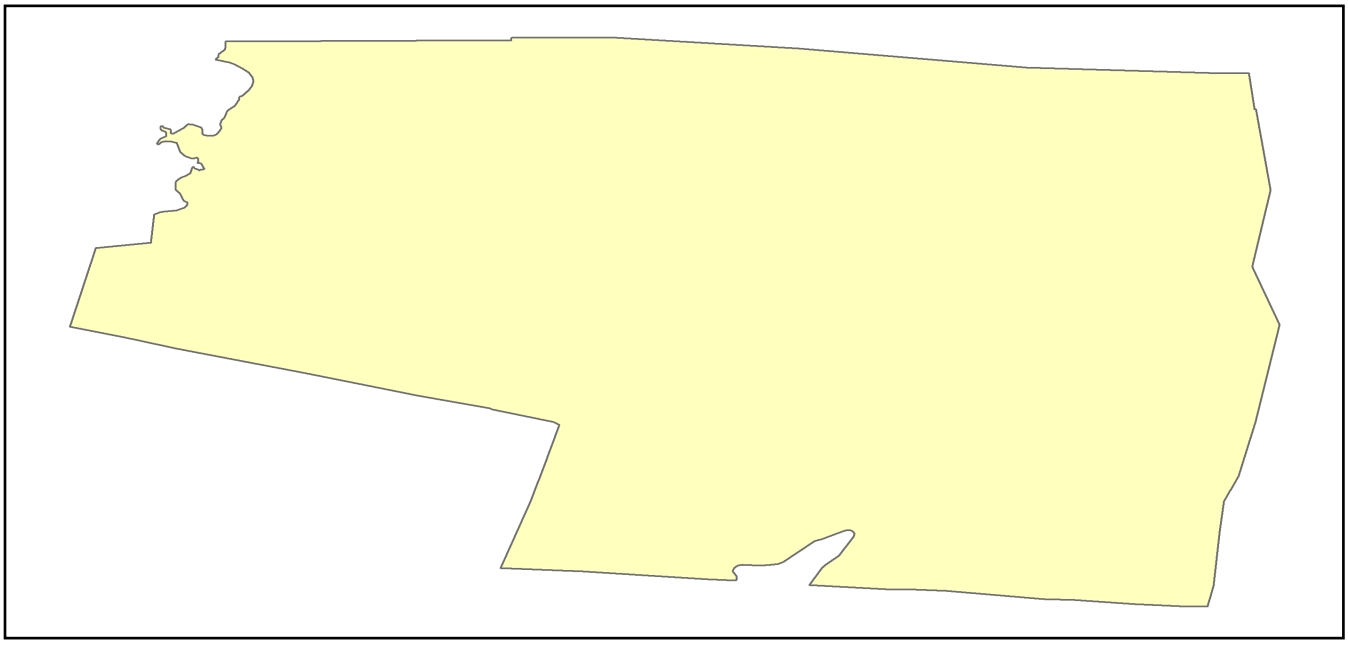
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	12	15.5039
	Segments	55	681.3497
	Tunnels	0	0.0000
		Subtotal	**696.8536**
Railways	Bridges	2	10.4200
	Facilities	0	0.0000
	Segments	20	1526.0205
	Tunnels	0	0.0000
		Subtotal	**1536.4405**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**2,233.30**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	4.9477
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**4.9477**
Waste Water	Distribution Lines	NA	2.9686
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**160.4148**
Natural Gas	Distribution Lines	NA	1.9791
	Facilities	0	0.0000
	Pipelines	1	286.3532
		Subtotal	**288.3323**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**453.70**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 238 buildings will be at least moderately damaged. This is over 5.00 % of the buildings in the region. There are an estimated 4 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

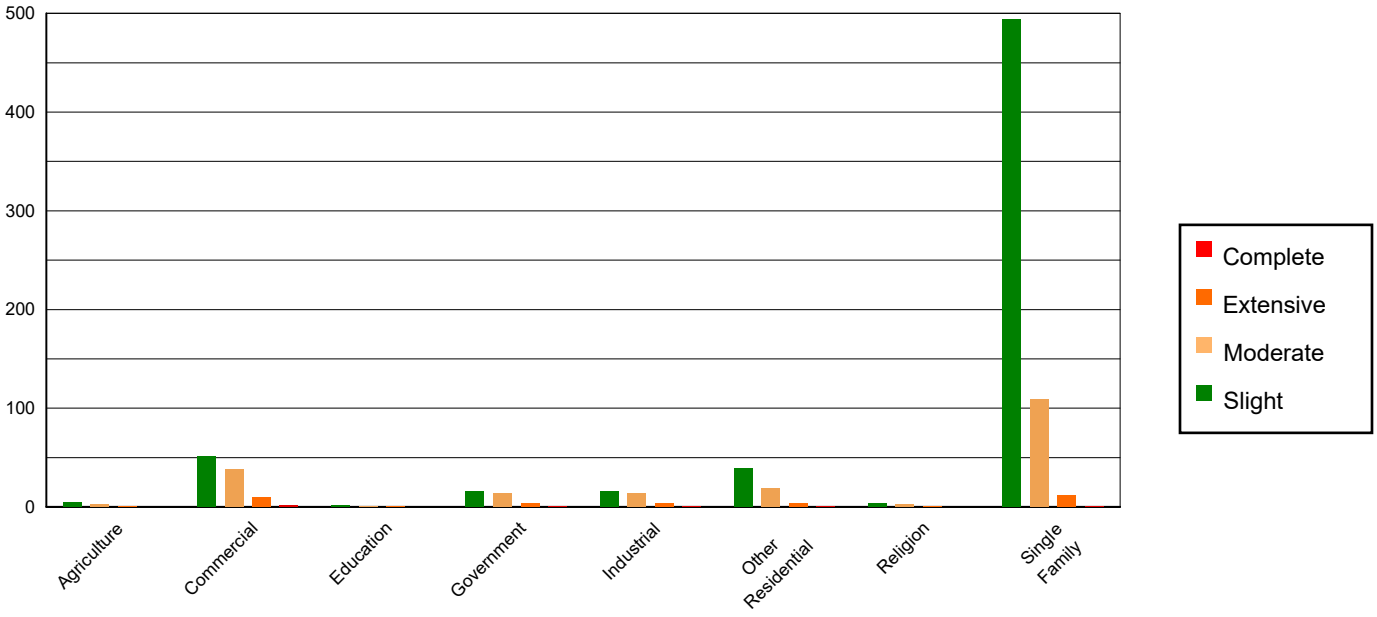


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	16.81	0.41	4.72	0.75	2.73	1.37	0.66	1.95	0.08	1.72
Commercial	177.36	4.32	51.12	8.17	38.33	19.18	9.74	28.57	1.46	33.06
Education	5.06	0.12	1.46	0.23	1.16	0.58	0.28	0.81	0.05	1.12
Government	52.11	1.27	15.83	2.53	13.95	6.98	3.51	10.29	0.60	13.72
Industrial	54.69	1.33	16.12	2.58	13.99	7.00	3.64	10.69	0.56	12.67
Other Residential	224.62	5.47	39.18	6.26	18.67	9.34	4.00	11.74	0.53	11.97
Religion	16.73	0.41	3.47	0.56	2.17	1.09	0.54	1.60	0.08	1.84
Single Family	3559.48	86.67	493.87	78.92	108.88	54.47	11.72	34.36	1.05	23.90
Total	**4,107**		**626**		**200**		**34**		**4**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3667.88	89.31	502.72	80.34	97.35	48.70	6.46	18.94	0.01	0.32
Steel	139.43	3.39	45.57	7.28	45.52	22.77	11.87	34.82	2.04	46.24
Concrete	26.74	0.65	8.11	1.30	7.96	3.98	1.57	4.61	0.18	4.13
Precast	10.40	0.25	2.39	0.38	2.75	1.38	1.02	2.99	0.04	0.88
RM	48.62	1.18	7.14	1.14	6.68	3.34	1.90	5.56	0.02	0.46
URM	213.78	5.21	59.85	9.56	39.62	19.82	11.28	33.08	2.11	47.97
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**4,107**		**626**		**200**		**34**		**4**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	4	0	0	4
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	4	0	0	4

Transportation Lifeline Damage

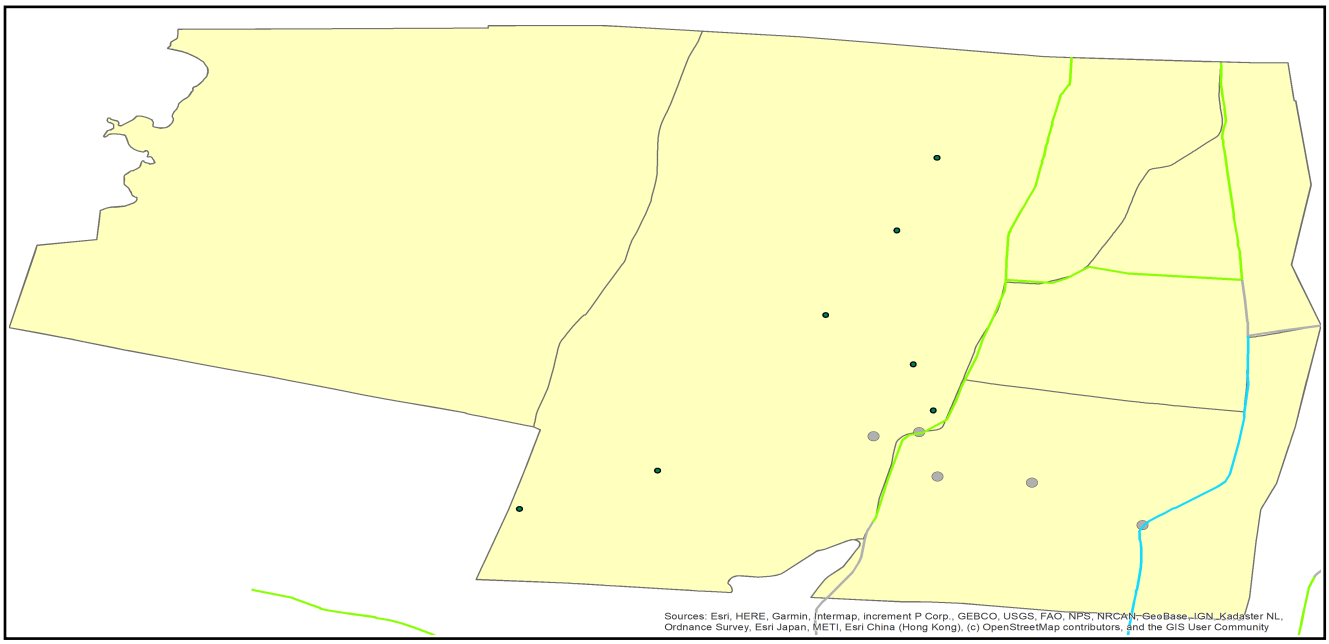


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	55	0	0	48	48
	Bridges	12	0	0	12	12
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	17	17
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	154	0	0
Waste Water	92	0	0
Natural Gas	28	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

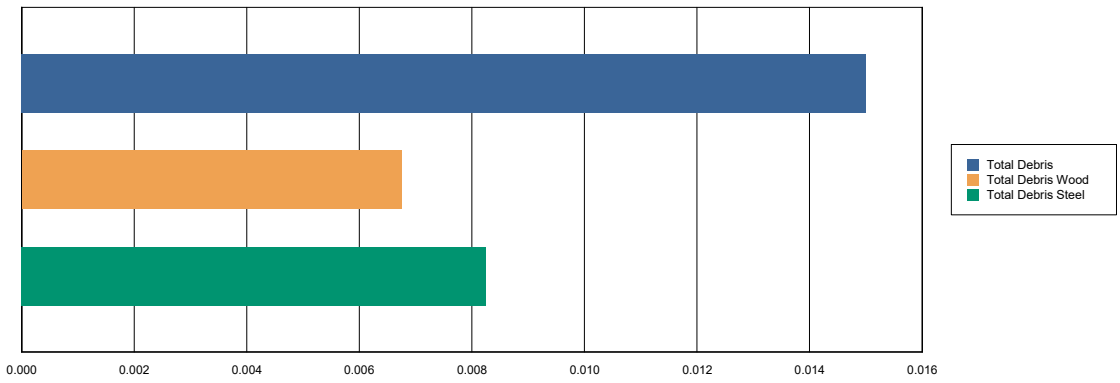
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 45.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 600 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



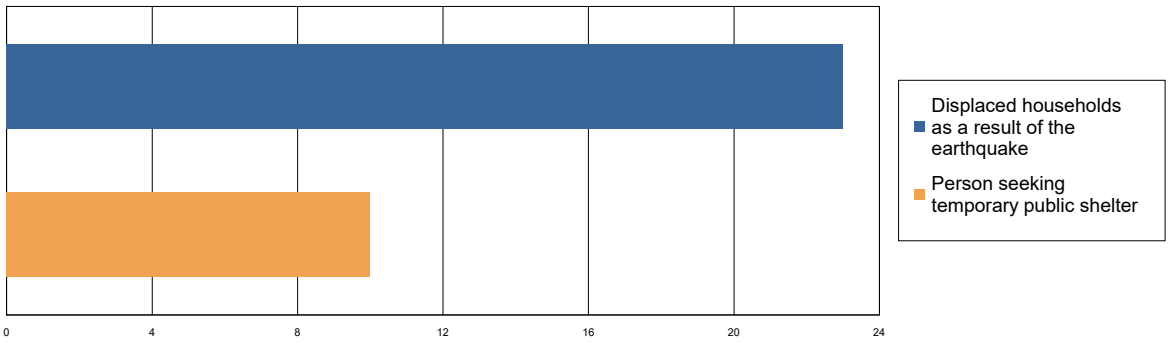
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.01	0.02	600 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 23 households to be displaced due to the earthquake. Of these, 10 people (out of a total population of 15,752) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
23	10

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.12	0.02	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.11	0.02	0.00	0.00
	Other-Residential	2.98	0.54	0.06	0.12
	Single Family	2.66	0.31	0.03	0.05
	Total	**6**	**1**	**0**	**0**
2 PM	Commercial	8.55	1.58	0.18	0.34
	Commuting	0.00	0.00	0.01	0.00
	Educational	2.83	0.53	0.06	0.12
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.78	0.15	0.02	0.03
	Other-Residential	1.05	0.20	0.02	0.04
	Single Family	0.84	0.11	0.01	0.02
	Total	**14**	**3**	**0**	**1**
5 PM	Commercial	6.18	1.14	0.13	0.24
	Commuting	0.03	0.04	0.08	0.01
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.49	0.09	0.01	0.02
	Other-Residential	1.17	0.22	0.03	0.05
	Single Family	1.02	0.13	0.01	0.02
	Total	**9**	**2**	**0**	**0**

Economic Loss

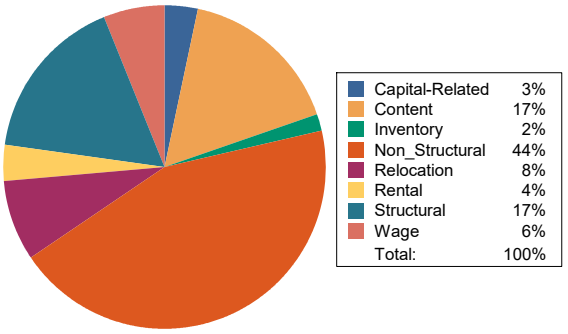
The total economic loss estimated for the earthquake is 83.52 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 83.19 (millions of dollars); 21 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 41 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

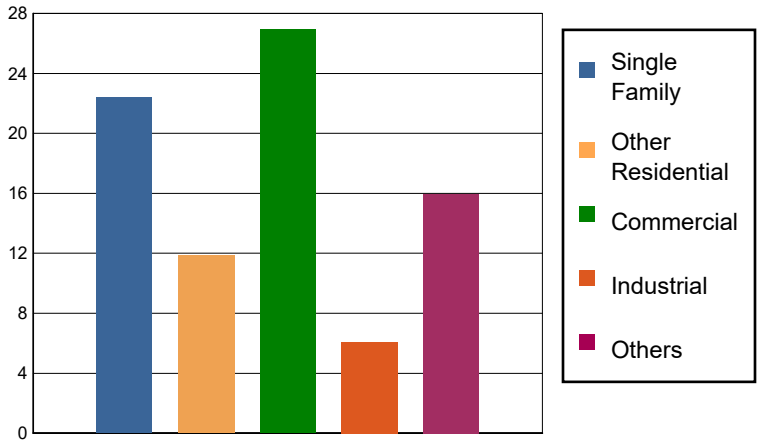


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.3606	2.5918	0.1830	0.9928	5.1282
	Capital-Related	0.0000	0.5793	1.8818	0.1087	0.1100	2.6798
	Rental	0.3269	0.9016	1.5011	0.0642	0.3450	3.1388
	Relocation	1.1471	0.3927	2.5028	0.2997	2.1941	6.5364
	Subtotal	**1.4740**	**3.2342**	**8.4775**	**0.6556**	**3.6419**	**17.4832**
Capital Stock Losses							
	Structural	2.9149	1.8182	5.1367	1.1161	2.8000	13.7859
	Non_Structural	13.5593	5.5433	8.5191	2.5169	6.6920	36.8306
	Content	4.4308	1.2463	3.8694	1.5343	2.7348	13.8156
	Inventory	0.0000	0.0000	0.9168	0.2641	0.0957	1.2766
	Subtotal	**20.9050**	**8.6078**	**18.4420**	**5.4314**	**12.3225**	**65.7087**
	Total	**22.38**	**11.84**	**26.92**	**6.09**	**15.96**	**83.19**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	681.3497	0.0000	0.00
	Bridges	15.5039	0.3078	1.99
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**696.8536**	**0.3078**	
Railways	Segments	1526.0205	0.0000	0.00
	Bridges	10.4200	0.0203	0.19
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1536.4405**	**0.0203**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**2,233.29**	**0.33**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	4.9477	0.0000	0.00
	Subtotal	**4.9477**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	2.9686	0.0000	0.00
	Subtotal	**160.4148**	**0.0000**	
Natural Gas	Pipelines	286.3532	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.9791	0.0000	0.00
	Subtotal	**288.3323**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**453.69**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	15,752	2,232	950	3,183
Total Region		**15,752**	**2,232**	**950**	**3,183**

Hazus: Earthquake Global Risk Report

Region Name: Tolland_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 40.26 square miles and contains 3 census tracts. There are over 5 thousand households in the region which has a total population of 14,563 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 5 thousand buildings in the region with a total building replacement value (excluding contents) of 3,056 (millions of dollars). Approximately 89.00 % of the buildings (and 77.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,215 and 11 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 5 thousand buildings in the region which have an aggregate total replacement value of 3,056 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 4 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,226.00 (millions of dollars). This inventory includes over 95.69 miles of highways, 19 bridges, 357.91 miles of pipes.

Table 1: Transportation System Lifeline Inventory

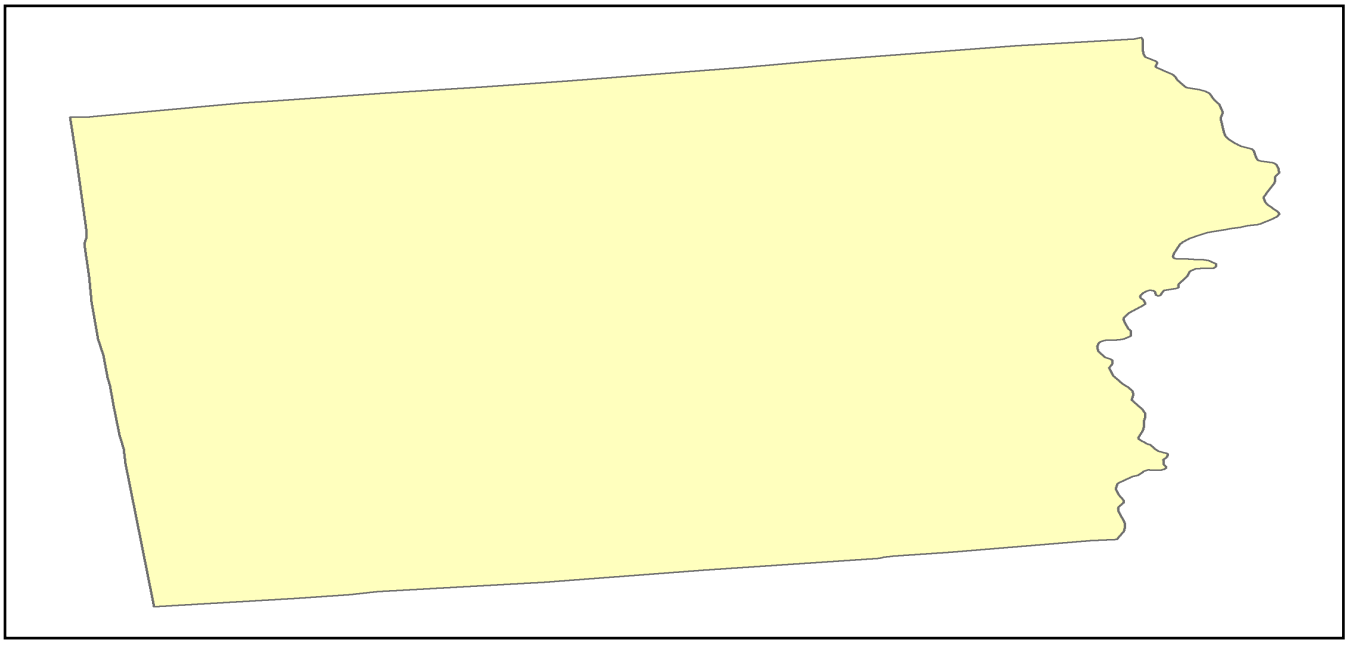
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	19	59.3483
	Segments	51	1029.9637
	Tunnels	0	0.0000
		Subtotal	**1089.3120**
Railways	Bridges	3	15.6300
	Facilities	0	0.0000
	Segments	9	110.9115
	Tunnels	0	0.0000
		Subtotal	**126.5415**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**1,215.90**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	5.7617
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**5.7617**
Waste Water	Distribution Lines	NA	3.4570
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.4570**
Natural Gas	Distribution Lines	NA	2.3047
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.3047**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**11.50**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 677 buildings will be at least moderately damaged. This is over 12.00 % of the buildings in the region. There are an estimated 40 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

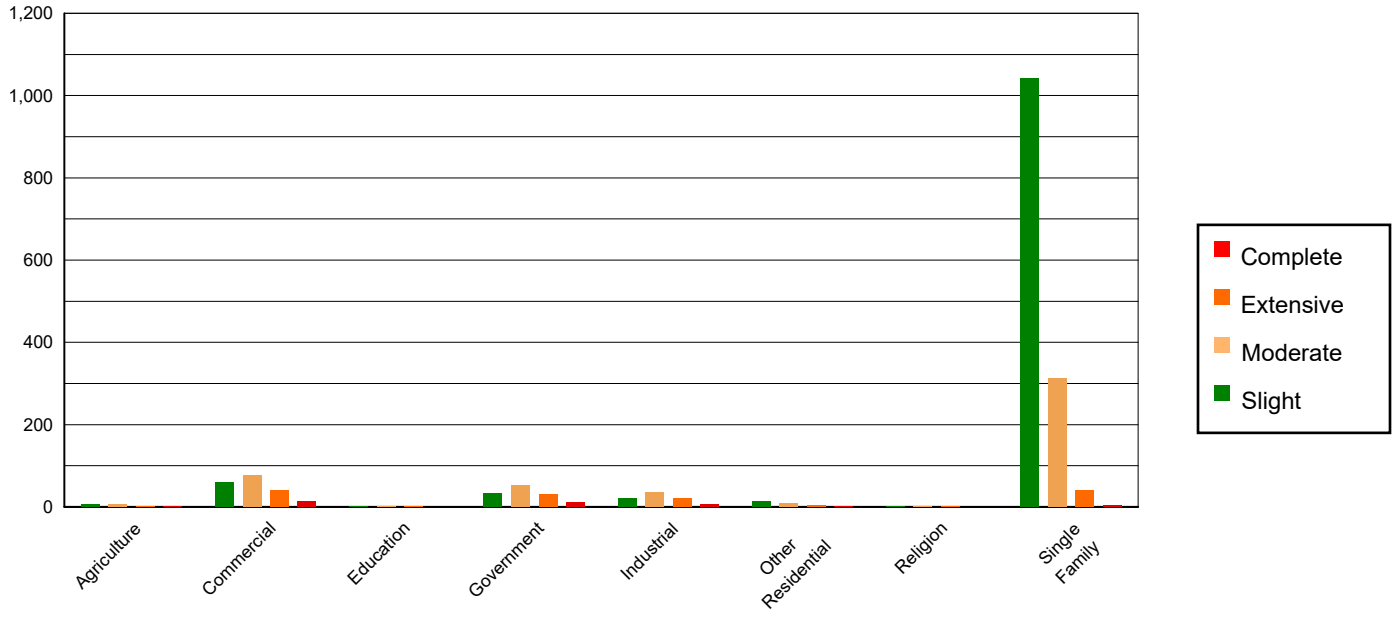


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	8.11	0.21	5.71	0.48	5.69	1.15	2.59	1.82	0.91	2.26
Commercial	92.76	2.37	59.62	5.06	76.65	15.50	41.57	29.15	14.41	35.93
Education	2.99	0.08	1.82	0.15	2.47	0.50	1.29	0.90	0.43	1.06
Government	49.79	1.27	32.41	2.75	51.34	10.38	30.58	21.44	10.87	27.11
Industrial	33.16	0.85	21.74	1.84	33.93	6.86	20.77	14.56	7.40	18.45
Other Residential	43.43	1.11	14.16	1.20	9.55	1.93	3.88	2.72	0.99	2.46
Religion	7.52	0.19	2.78	0.24	2.38	0.48	1.05	0.74	0.27	0.67
Single Family	3672.96	93.92	1040.80	88.28	312.51	63.20	40.89	28.67	4.84	12.06
Total	**3,911**		**1,179**		**495**		**143**		**40**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3648.80	93.30	1034.31	87.72	294.89	59.63	27.83	19.52	1.07	2.66
Steel	63.30	1.62	50.21	4.26	101.59	20.54	69.51	48.74	27.46	68.47
Concrete	10.29	0.26	7.29	0.62	15.03	3.04	9.30	6.52	3.21	8.01
Precast	6.42	0.16	3.04	0.26	6.02	1.22	4.74	3.32	1.09	2.71
RM	24.85	0.64	7.85	0.67	11.65	2.36	6.03	4.23	0.37	0.91
URM	156.86	4.01	76.18	6.46	65.04	13.15	24.95	17.50	6.83	17.02
MH	0.21	0.01	0.15	0.01	0.30	0.06	0.26	0.18	0.09	0.21
Total	**3,911**		**1,179**		**495**		**143**		**40**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	4	0	0	4
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	4	0	0	4

Transportation Lifeline Damage

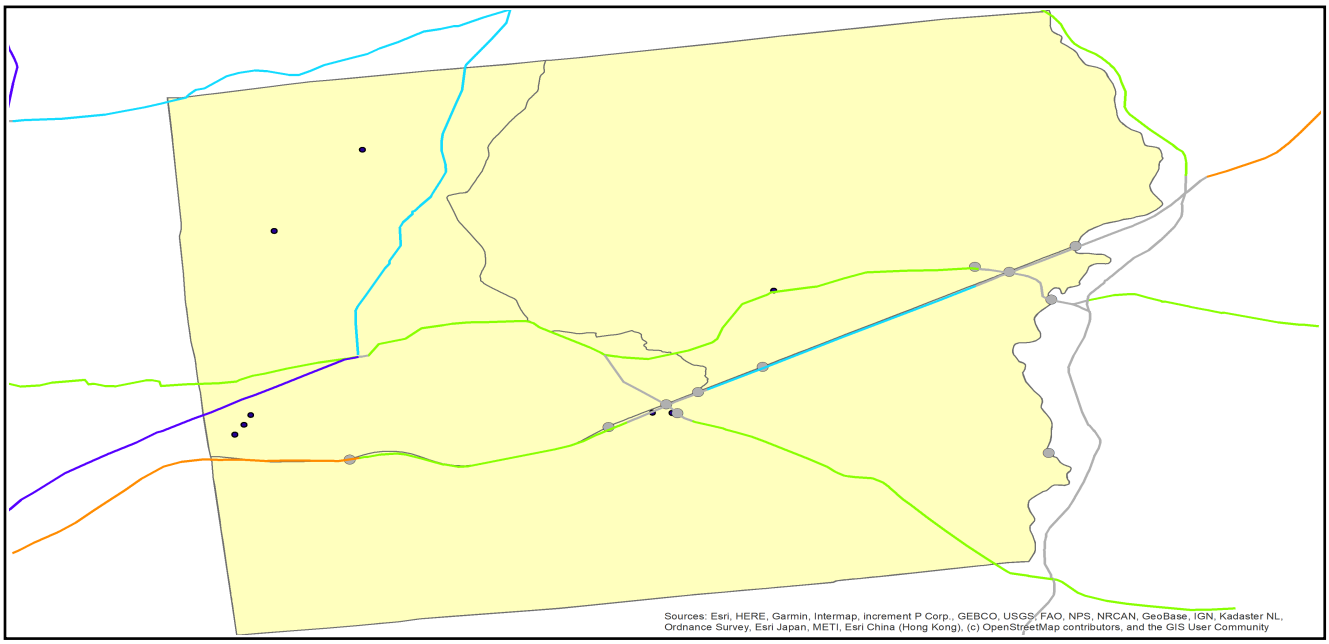


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	51	0	0	38	38
	Bridges	19	0	0	19	19
	Tunnels	0	0	0	0	0
Railways	Segments	9	0	0	9	9
	Bridges	3	0	0	3	3
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	179	0	0
Waste Water	107	0	0
Natural Gas	72	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

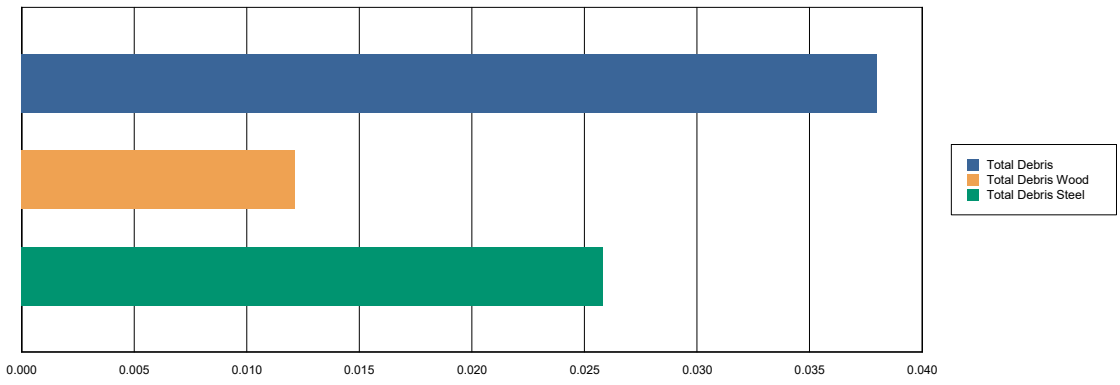
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 38,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 32.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 1,520 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



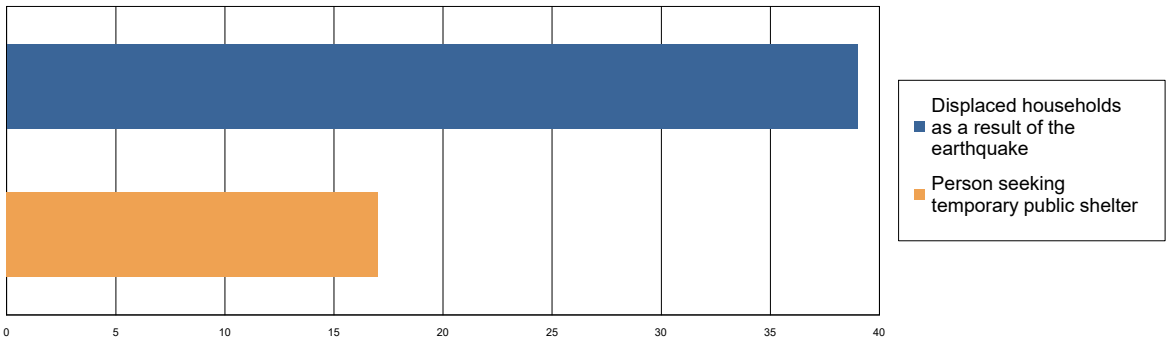
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.03	0.04	1,520 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 17 people (out of a total population of 14,563) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
39	17

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.65	0.16	0.02	0.04
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.60	0.15	0.02	0.04
	Other-Residential	1.97	0.46	0.07	0.13
	Single Family	7.13	1.01	0.09	0.18
	Total	**10**	**2**	**0**	**0**
2 PM	Commercial	44.08	10.76	1.47	2.85
	Commuting	0.01	0.01	0.01	0.00
	Educational	16.37	4.14	0.61	1.19
	Hotels	0.00	0.00	0.00	0.00
	Industrial	4.44	1.08	0.14	0.28
	Other-Residential	0.57	0.14	0.02	0.04
	Single Family	1.90	0.28	0.03	0.05
	Total	**67**	**16**	**2**	**4**
5 PM	Commercial	33.79	8.26	1.15	2.18
	Commuting	0.13	0.21	0.31	0.06
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.77	0.67	0.09	0.17
	Other-Residential	0.77	0.18	0.03	0.05
	Single Family	2.77	0.41	0.04	0.08
	Total	**40**	**10**	**2**	**3**

Economic Loss

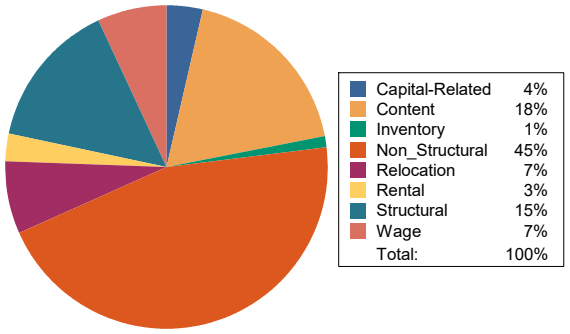
The total economic loss estimated for the earthquake is 214.99 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 213.21 (millions of dollars); 20 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 37 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

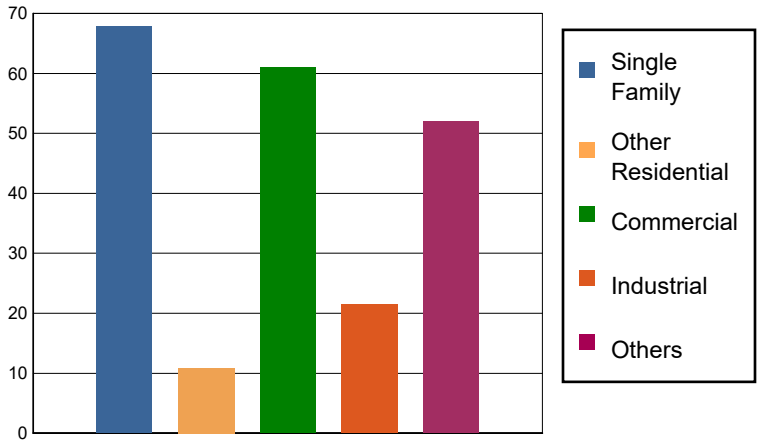


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	2.4804	8.6530	0.4249	3.0134	14.5717
	Capital-Related	0.0000	1.0561	6.0411	0.2631	0.3178	7.6781
	Rental	0.8665	0.7973	2.6300	0.2014	1.3658	5.8610
	Relocation	3.1245	0.2448	4.2789	1.0302	6.7236	15.4020
	Subtotal	**3.9910**	**4.5786**	**21.6030**	**1.9196**	**11.4206**	**43.5128**
Capital Stock Losses							
	Structural	8.1127	1.2166	9.5722	3.7475	8.8545	31.5035
	Non_Structural	40.6403	4.1892	19.6770	9.3823	22.7363	96.6251
	Content	15.1424	0.9242	8.8265	5.5924	8.7341	39.2196
	Inventory	0.0000	0.0000	1.2989	0.8306	0.2194	2.3489
	Subtotal	**63.8954**	**6.3300**	**39.3746**	**19.5528**	**40.5443**	**169.6971**
	Total	**67.89**	**10.91**	**60.98**	**21.47**	**51.96**	**213.21**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1029.9637	0.0000	0.00
	Bridges	59.3483	1.6934	2.85
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1089.3120**	**1.6934**	
Railways	Segments	110.9115	0.0000	0.00
	Bridges	15.6300	0.0808	0.52
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**126.5415**	**0.0808**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**1,215.85**	**1.77**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	5.7617	0.0000	0.00
	Subtotal	**5.7617**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.4570	0.0000	0.00
	Subtotal	**3.4570**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.3047	0.0000	0.00
	Subtotal	**2.3047**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**11.52**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	14,563	2,366	689	3,056
Total Region		**14,563**	**2,366**	**689**	**3,056**

Hazus: Earthquake Global Risk Report

Region Name: Vernon_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 18.08 square miles and contains 7 census tracts. There are over 13 thousand households in the region which has a total population of 30,215 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 8 thousand buildings in the region with a total building replacement value (excluding contents) of 4,838 (millions of dollars). Approximately 88.00 % of the buildings (and 71.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 734 and 213 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 8 thousand buildings in the region which have an aggregate total replacement value of 4,838 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 80% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 102 beds. There are 7 schools, 6 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 947.00 (millions of dollars). This inventory includes over 57.17 miles of highways, 37 bridges, 259.11 miles of pipes.

Table 1: Transportation System Lifeline Inventory

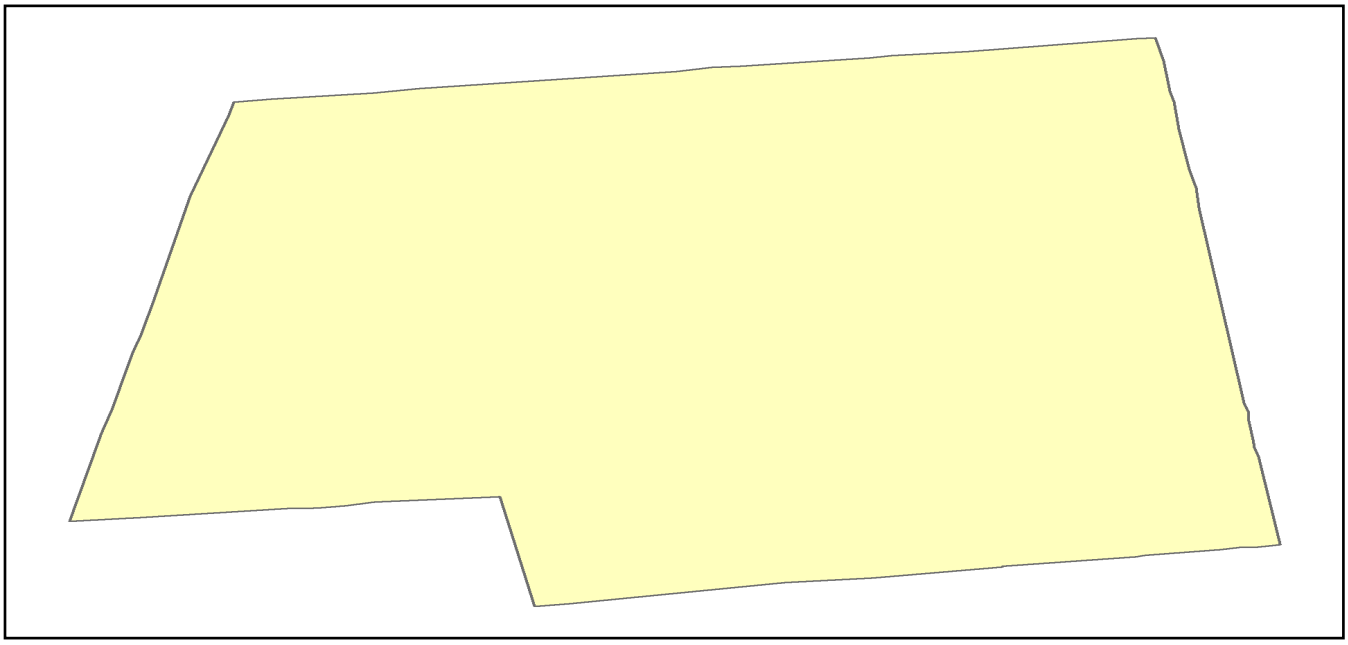
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	37	106.5990
	Segments	37	627.9138
	Tunnels	0	0.0000
		Subtotal	**734.5128**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**734.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	5.1264
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**5.1264**
Waste Water	Distribution Lines	NA	3.0758
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**160.5220**
Natural Gas	Distribution Lines	NA	2.0506
	Facilities	0	0.0000
	Pipelines	1	45.4127
		Subtotal	**47.4633**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**213.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,342 buildings will be at least moderately damaged. This is over 16.00 % of the buildings in the region. There are an estimated 100 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

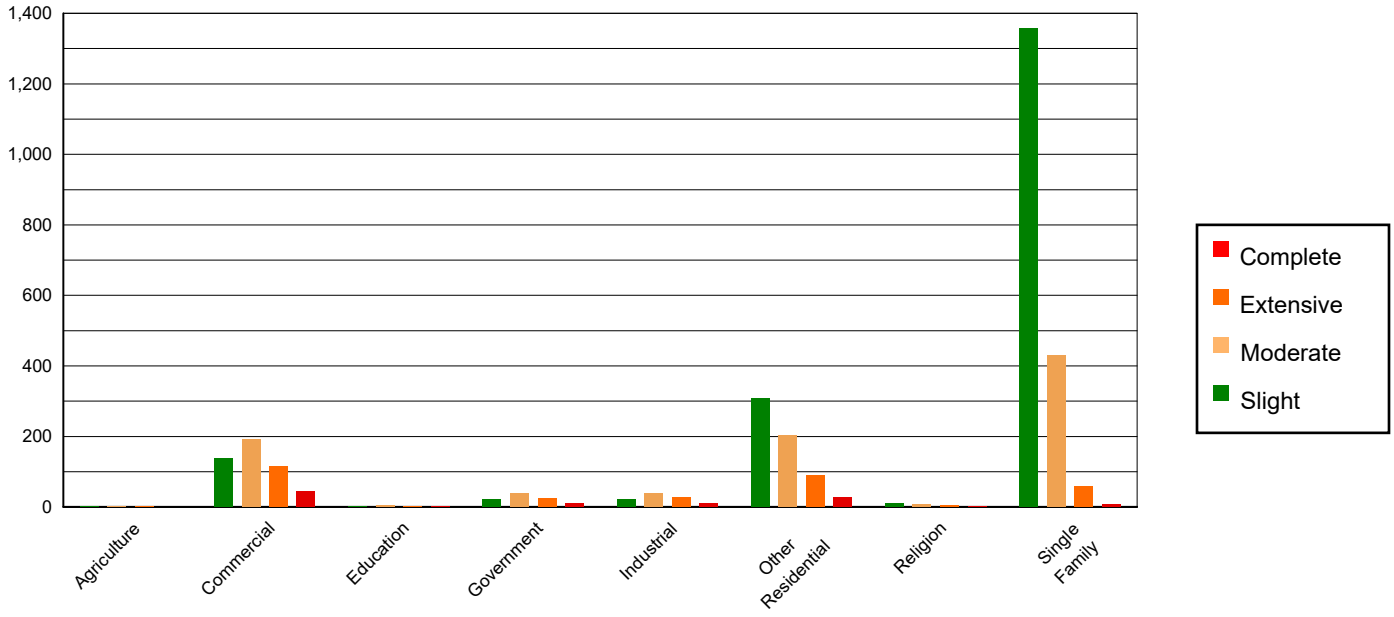


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	3.29	0.06	2.71	0.15	2.98	0.32	1.44	0.45	0.58	0.57
Commercial	191.42	3.54	137.25	7.38	192.58	20.97	114.26	35.32	43.48	43.32
Education	4.46	0.08	2.97	0.16	4.28	0.47	2.43	0.75	0.86	0.86
Government	30.46	0.56	22.34	1.20	38.60	4.20	25.63	7.92	9.97	9.93
Industrial	29.61	0.55	22.12	1.19	38.36	4.18	26.31	8.13	10.59	10.55
Other Residential	858.98	15.90	306.74	16.48	203.33	22.14	90.59	28.00	26.35	26.26
Religion	22.47	0.42	9.18	0.49	8.22	0.89	4.00	1.24	1.13	1.13
Single Family	4261.04	78.88	1357.57	72.95	430.16	46.83	58.82	18.18	7.41	7.38
Total	**5,402**		**1,861**		**919**		**323**		**100**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	4850.64	89.80	1547.07	83.14	472.90	51.48	47.64	14.73	2.31	2.31
Steel	79.12	1.46	72.22	3.88	169.36	18.44	130.50	40.34	57.25	57.04
Concrete	24.55	0.45	19.85	1.07	43.59	4.75	30.79	9.52	11.32	11.28
Precast	10.24	0.19	5.22	0.28	10.62	1.16	8.74	2.70	2.20	2.19
RM	96.67	1.79	32.06	1.72	49.21	5.36	26.46	8.18	1.86	1.86
URM	331.98	6.15	176.84	9.50	157.79	17.18	63.53	19.64	18.46	18.39
MH	8.52	0.16	7.63	0.41	15.06	1.64	15.83	4.89	6.96	6.93
Total	**5,402**		**1,861**		**919**		**323**		**100**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 102 hospital beds available for use. On the day of the earthquake, the model estimates that only 43 hospital beds (43.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 66.00% of the beds will be back in service. By 30 days, 88.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	0
Schools	7	0	0	2
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	6	0	0	2

Transportation Lifeline Damage

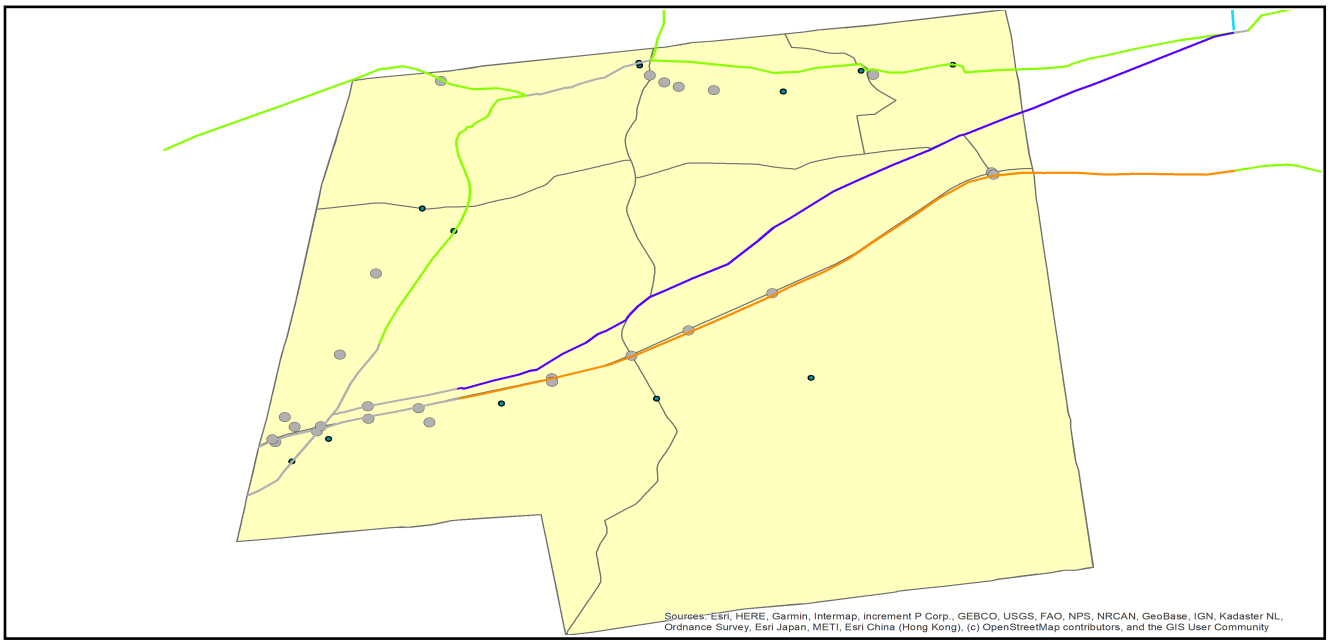


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	37	0	0	37	37
	Bridges	37	0	0	37	37
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	159	0	0
Waste Water	96	0	0
Natural Gas	4	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

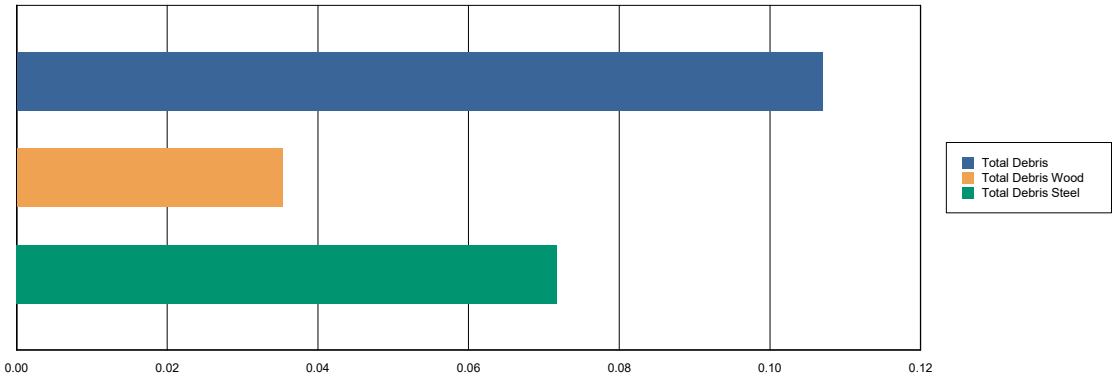
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 107,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 33.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 4,280 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



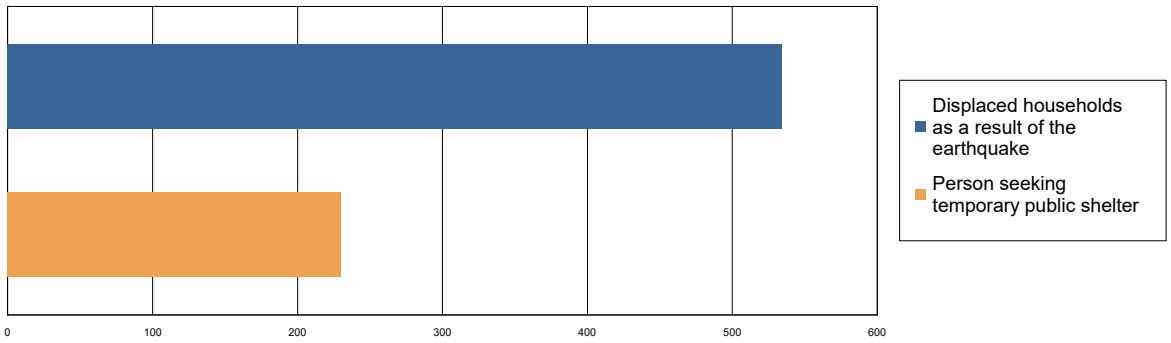
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.04	0.07	0.11	4,280 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 534 households to be displaced due to the earthquake. Of these, 230 people (out of a total population of 30,215) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
534	230

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.28	0.32	0.04	0.08
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.02	0.00	0.00	0.00
	Industrial	0.88	0.23	0.03	0.06
	Other-Residential	37.58	8.70	1.22	2.39
	Single Family	9.02	1.33	0.13	0.25
	Total	**49**	**11**	**1**	**3**
2 PM	Commercial	86.34	21.47	2.93	5.68
	Commuting	0.01	0.02	0.03	0.01
	Educational	21.49	5.48	0.82	1.59
	Hotels	0.00	0.00	0.00	0.00
	Industrial	6.51	1.68	0.24	0.46
	Other-Residential	11.14	2.60	0.37	0.70
	Single Family	2.66	0.41	0.04	0.08
	Total	**128**	**32**	**4**	**9**
5 PM	Commercial	62.59	15.56	2.15	4.09
	Commuting	0.24	0.40	0.58	0.12
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.01	0.00	0.00	0.00
	Industrial	4.07	1.05	0.15	0.29
	Other-Residential	14.74	3.44	0.49	0.93
	Single Family	3.51	0.54	0.06	0.10
	Total	**85**	**21**	**3**	**6**

Economic Loss

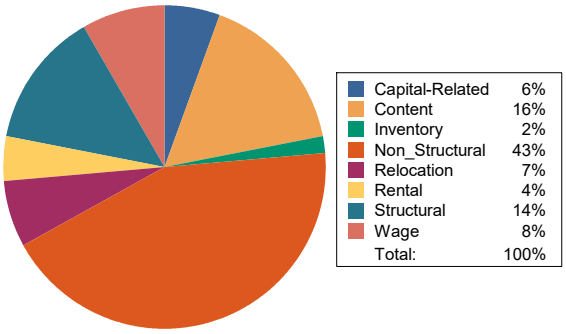
The total economic loss estimated for the earthquake is 526.27 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 522.78 (millions of dollars); 25 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 35 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

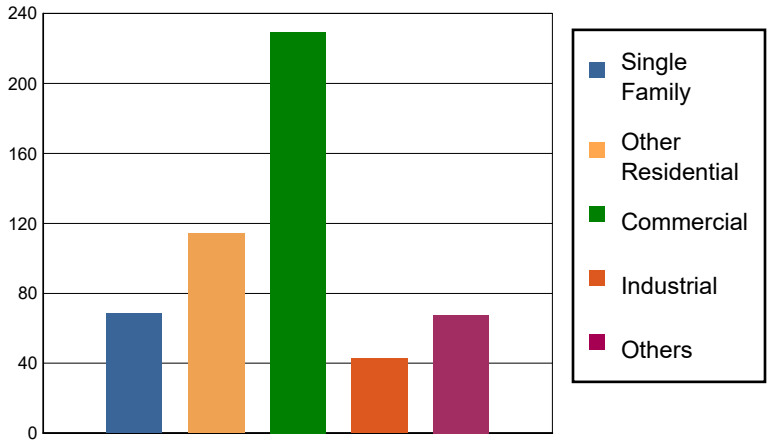


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	6.3467	32.2396	0.9968	3.9871	43.5702
	Capital-Related	0.0000	2.7011	25.5687	0.6007	0.4227	29.2932
	Rental	1.0142	8.8243	10.2192	0.3966	1.6476	22.1019
	Relocation	3.6695	5.2046	16.6428	1.5665	8.7313	35.8147
	Subtotal	**4.6837**	**23.0767**	**84.6703**	**3.5606**	**14.7887**	**130.7800**
Capital Stock Losses							
	Structural	8.1912	14.3900	30.6933	7.2194	11.2126	71.7065
	Non_Structural	40.5538	62.1354	75.1988	18.8589	30.0114	226.7583
	Content	15.0471	14.6669	32.8353	11.2551	11.5815	85.3859
	Inventory	0.0000	0.0000	6.1298	1.9296	0.0907	8.1501
	Subtotal	**63.7921**	**91.1923**	**144.8572**	**39.2630**	**52.8962**	**392.0008**
	Total	**68.48**	**114.27**	**229.53**	**42.82**	**67.68**	**522.78**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	627.9138	0.0000	0.00
	Bridges	106.5990	3.4852	3.27
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**734.5128**	**3.4852**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**734.51**	**3.49**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	5.1264	0.0000	0.00
	Subtotal	**5.1264**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	3.0758	0.0000	0.00
	Subtotal	**160.5220**	**0.0000**	
Natural Gas	Pipelines	45.4127	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.0506	0.0000	0.00
	Subtotal	**47.4633**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**213.11**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	30,215	3,427	1,410	4,838
Total Region		**30,215**	**3,427**	**1,410**	**4,838**

Hazus: Earthquake Global Risk Report

Region Name: West_Hartford_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 22.26 square miles and contains 17 census tracts. There are over 25 thousand households in the region which has a total population of 64,083 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 21 thousand buildings in the region with a total building replacement value (excluding contents) of 13,219 (millions of dollars). Approximately 89.00 % of the buildings (and 72.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,521 and 333 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 21 thousand buildings in the region which have an aggregate total replacement value of 13,219 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 85% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 332 beds. There are 34 schools, 5 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,854.00 (millions of dollars). This inventory includes over 82.02 miles of highways, 41 bridges, 485.29 miles of pipes.

Table 1: Transportation System Lifeline Inventory

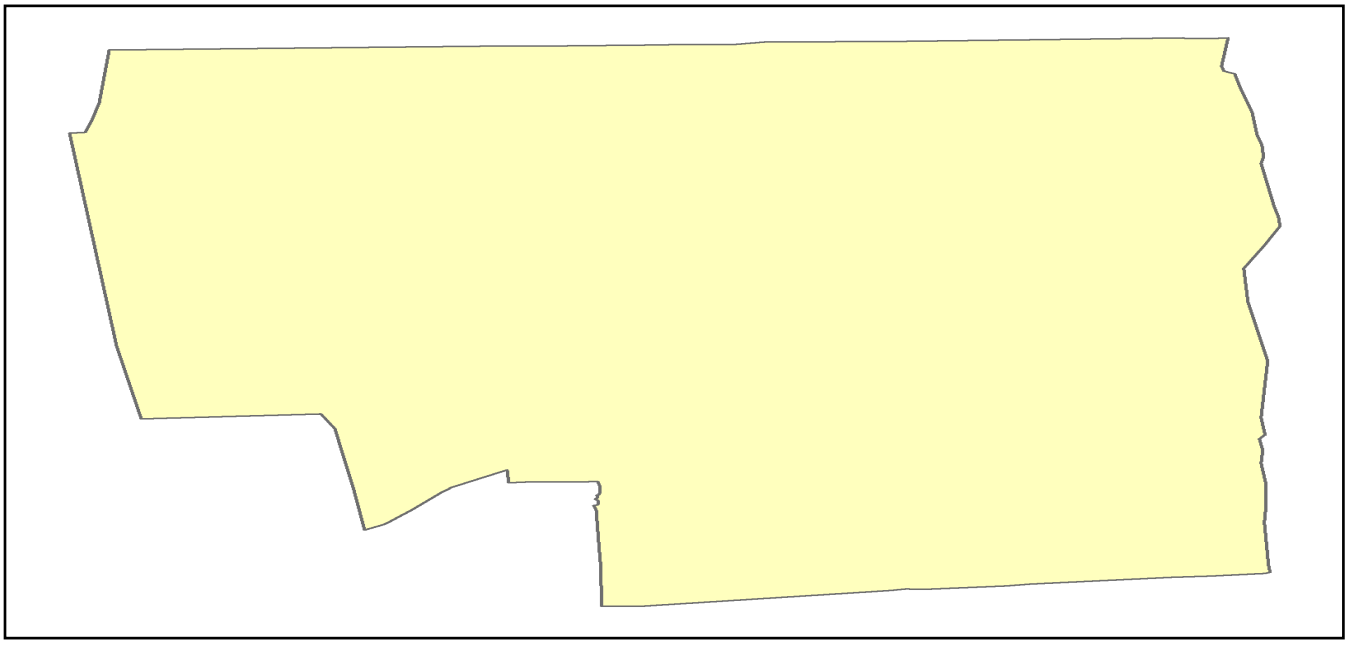
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	41	150.2007
	Segments	58	899.1665
	Tunnels	0	0.0000
		Subtotal	**1049.3672**
Railways	Bridges	2	10.4200
	Facilities	0	0.0000
	Segments	9	1461.9522
	Tunnels	0	0.0000
		Subtotal	**1472.3722**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**2,521.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	9.1479
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**9.1479**
Waste Water	Distribution Lines	NA	5.4888
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**5.4888**
Natural Gas	Distribution Lines	NA	3.6592
	Facilities	0	0.0000
	Pipelines	2	315.1058
		Subtotal	**318.7650**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	2	0.2300
		Subtotal	**0.2300**
		Total	**333.60**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 2,775 buildings will be at least moderately damaged. This is over 13.00 % of the buildings in the region. There are an estimated 181 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

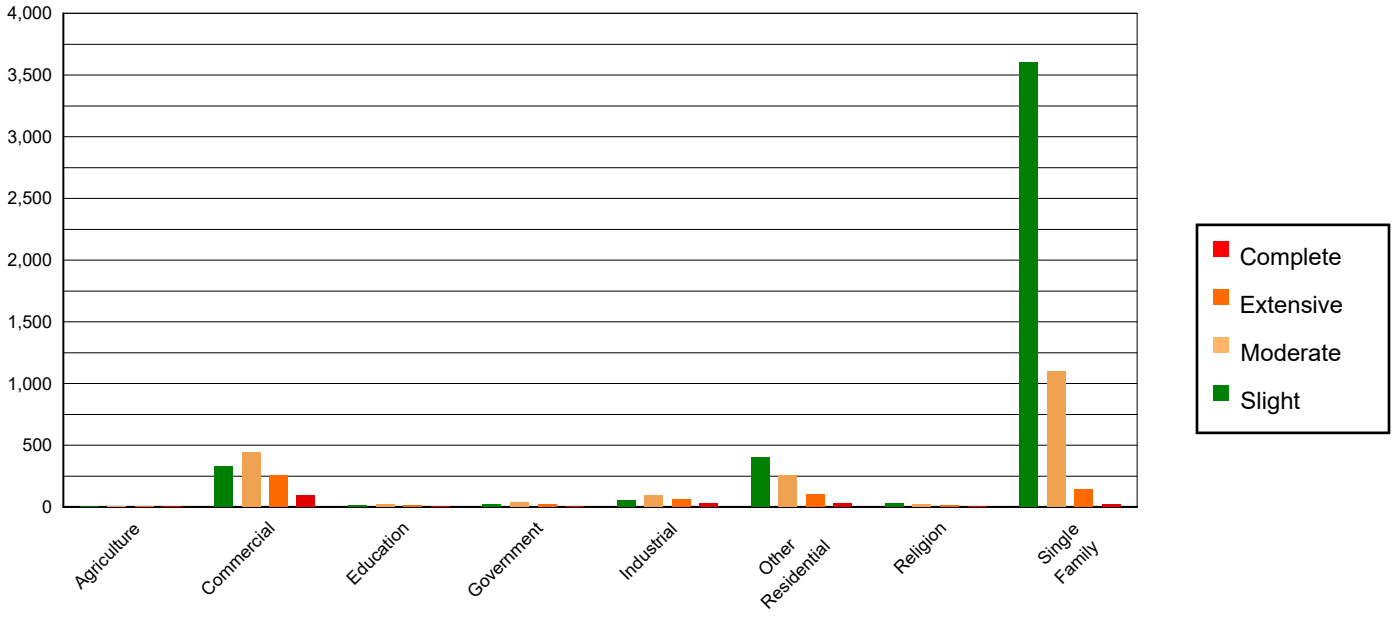


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	10.45	0.07	8.36	0.19	9.06	0.46	4.38	0.71	1.75	0.97
Commercial	486.29	3.45	332.89	7.45	446.75	22.56	256.22	41.73	94.85	52.40
Education	21.41	0.15	13.23	0.30	18.25	0.92	9.80	1.60	3.30	1.82
Government	30.14	0.21	20.93	0.47	34.76	1.76	21.95	3.57	8.23	4.54
Industrial	74.27	0.53	54.66	1.22	93.45	4.72	64.93	10.57	26.69	14.75
Other Residential	1146.12	8.13	403.57	9.03	253.63	12.81	100.00	16.28	25.68	14.19
Religion	65.57	0.47	25.89	0.58	22.82	1.15	10.77	1.75	2.95	1.63
Single Family	12264.32	86.99	3607.76	80.76	1101.35	55.62	146.01	23.78	17.56	9.70
Total	**14,099**		**4,467**		**1,980**		**614**		**181**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	12971.85	92.01	3845.47	86.08	1130.77	57.11	109.63	17.85	4.79	2.65
Steel	176.92	1.25	154.37	3.46	349.15	17.63	265.36	43.21	114.73	63.38
Concrete	41.56	0.29	33.04	0.74	72.47	3.66	50.65	8.25	18.58	10.26
Precast	20.16	0.14	9.94	0.22	19.43	0.98	15.21	2.48	3.42	1.89
RM	169.11	1.20	55.57	1.24	84.82	4.28	45.34	7.38	3.15	1.74
URM	718.95	5.10	368.89	8.26	323.44	16.33	127.87	20.82	36.34	20.07
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**14,099**		**4,467**		**1,980**		**614**		**181**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 332 hospital beds available for use. On the day of the earthquake, the model estimates that only 155 hospital beds (47.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 69.00% of the beds will be back in service. By 30 days, 90.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	0
Schools	34	0	0	2
EOCs	1	0	0	0
PoliceStations	1	0	0	0
FireStations	5	0	0	0

Transportation Lifeline Damage

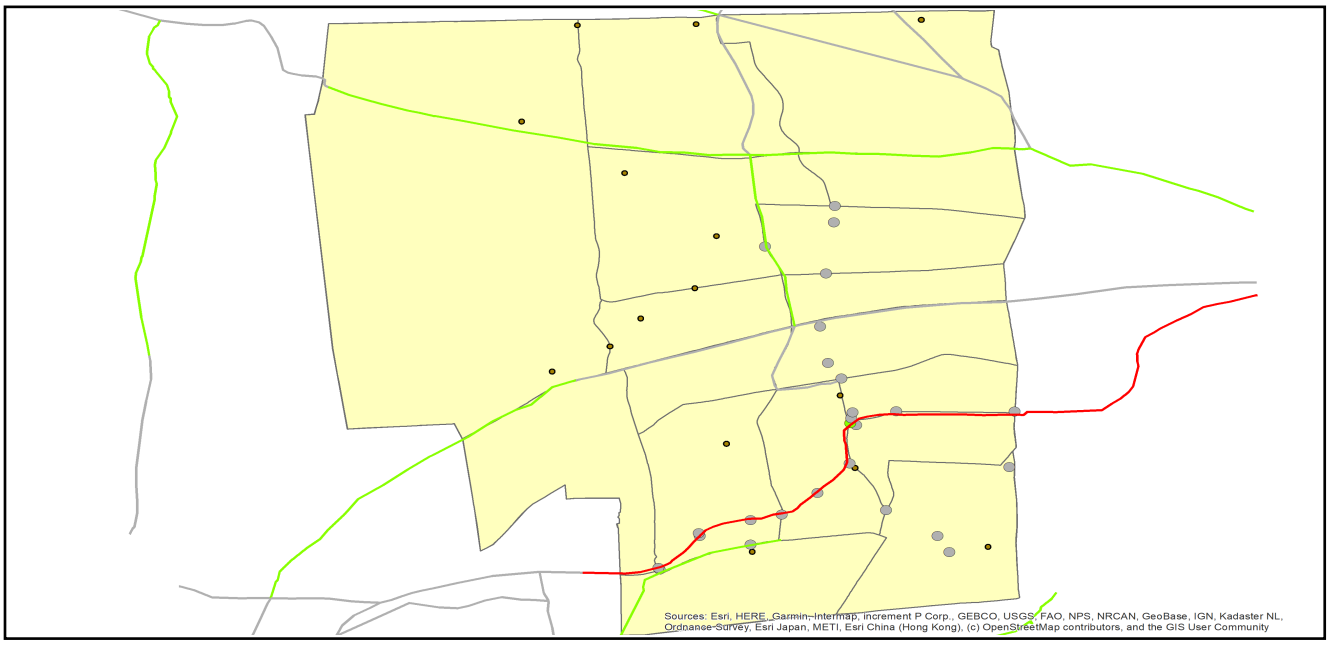


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	58	0	0	58	58
	Bridges	41	2	0	39	41
	Tunnels	0	0	0	0	0
Railways	Segments	9	0	0	2	2
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	2	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	284	0	0
Waste Water	171	0	0
Natural Gas	31	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

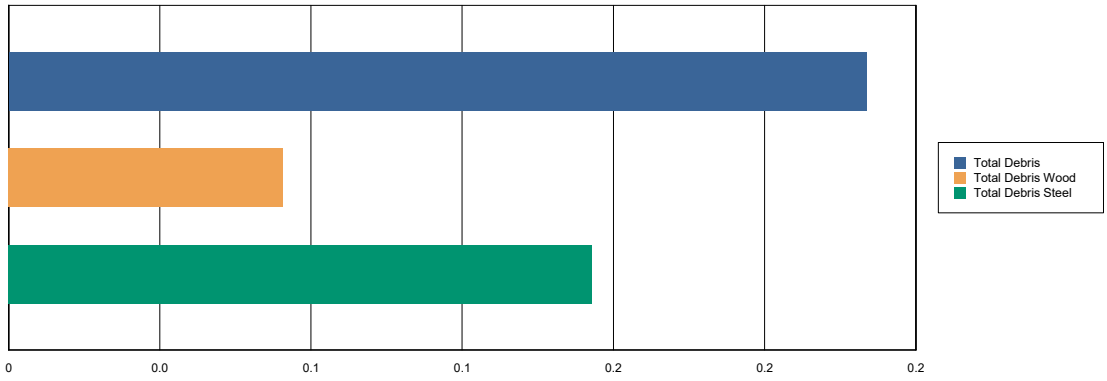
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 227,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 32.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 9,080 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



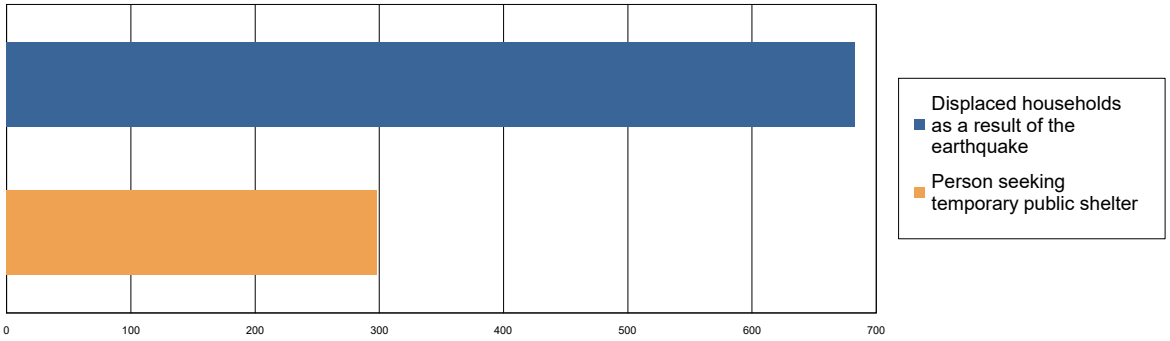
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.07	0.15	0.23	9,080 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 683 households to be displaced due to the earthquake. Of these, 298 people (out of a total population of 64,083) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
683	298

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	4.46	1.09	0.15	0.29
	Commuting	0.01	0.01	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.04	0.01	0.00	0.00
	Industrial	3.26	0.84	0.12	0.23
	Other-Residential	35.57	8.18	1.15	2.27
	Single Family	25.74	3.69	0.35	0.68
	Total	**69**	**14**	**2**	**3**
2 PM	Commercial	264.68	64.84	8.78	17.05
	Commuting	0.06	0.08	0.13	0.03
	Educational	92.45	23.18	3.43	6.66
	Hotels	0.01	0.00	0.00	0.00
	Industrial	24.07	6.21	0.88	1.70
	Other-Residential	11.29	2.62	0.38	0.72
	Single Family	7.59	1.13	0.11	0.21
	Total	**400**	**98**	**14**	**26**
5 PM	Commercial	170.11	41.65	5.69	10.90
	Commuting	1.34	1.68	2.97	0.57
	Educational	12.62	3.19	0.48	0.93
	Hotels	0.01	0.00	0.00	0.00
	Industrial	15.04	3.88	0.55	1.06
	Other-Residential	14.01	3.25	0.47	0.89
	Single Family	10.01	1.50	0.15	0.28
	Total	**223**	**55**	**10**	**15**

Economic Loss

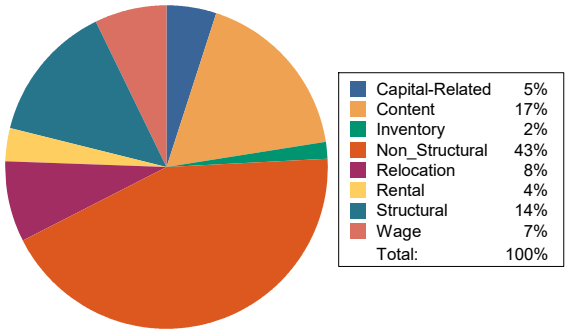
The total economic loss estimated for the earthquake is 1,189.86 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 1,180.43 (millions of dollars); 24 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 31 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

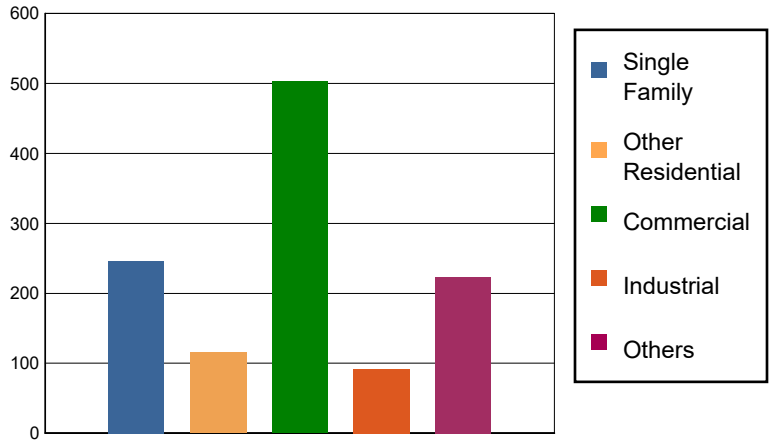


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	11.5662	61.0488	1.9573	9.1577	83.7300
	Capital-Related	0.0000	4.9247	49.8519	1.1903	2.3509	58.3178
	Rental	3.1868	8.8958	23.5250	0.8002	5.4628	41.8706
	Relocation	11.4990	5.0873	38.5516	3.5831	35.4069	94.1279
	Subtotal	**14.6858**	**30.4740**	**172.9773**	**7.5309**	**52.3783**	**278.0463**
Capital Stock Losses							
	Structural	29.4413	13.3242	74.0358	15.2614	32.2762	164.3389
	Non_Structural	147.4328	57.9296	167.6999	40.6548	98.2332	511.9503
	Content	55.0271	13.8169	72.6664	24.8342	39.6540	205.9986
	Inventory	0.0000	0.0000	15.8433	3.8494	0.4038	20.0965
	Subtotal	**231.9012**	**85.0707**	**330.2454**	**84.5998**	**170.5672**	**902.3843**
	Total	**246.59**	**115.54**	**503.22**	**92.13**	**222.95**	**1180.43**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	899.1665	0.0000	0.00
	Bridges	150.2007	9.3192	6.20
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1049.3672**	**9.3192**	
Railways	Segments	1461.9522	0.0000	0.00
	Bridges	10.4200	0.1064	1.02
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1472.3722**	**0.1064**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**2,521.74**	**9.43**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	9.1479	0.0000	0.00
	Subtotal	**9.1479**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	5.4888	0.0000	0.00
	Subtotal	**5.4888**	**0.0000**	
Natural Gas	Pipelines	315.1058	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.6592	0.0000	0.00
	Subtotal	**318.7650**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.2300	0.0000	0.00
	Subtotal	**0.2300**	**0.0000**	
	Total	**333.63**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	64,083	9,508	3,710	13,219
Total Region		**64,083**	**9,508**	**3,710**	**13,219**

Hazus: Earthquake Global Risk Report

Region Name: Wethersfield_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 13.10 square miles and contains 6 census tracts. There are over 11 thousand households in the region which has a total population of 27,298 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,449 (millions of dollars). Approximately 92.00 % of the buildings (and 78.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,379 and 296 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 9 thousand buildings in the region which have an aggregate total replacement value of 5,449 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 86% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of beds. There are 11 schools, 3 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,675.00 (millions of dollars). This inventory includes over 81.40 miles of highways, 29 bridges, 275.89 miles of pipes.

Table 1: Transportation System Lifeline Inventory

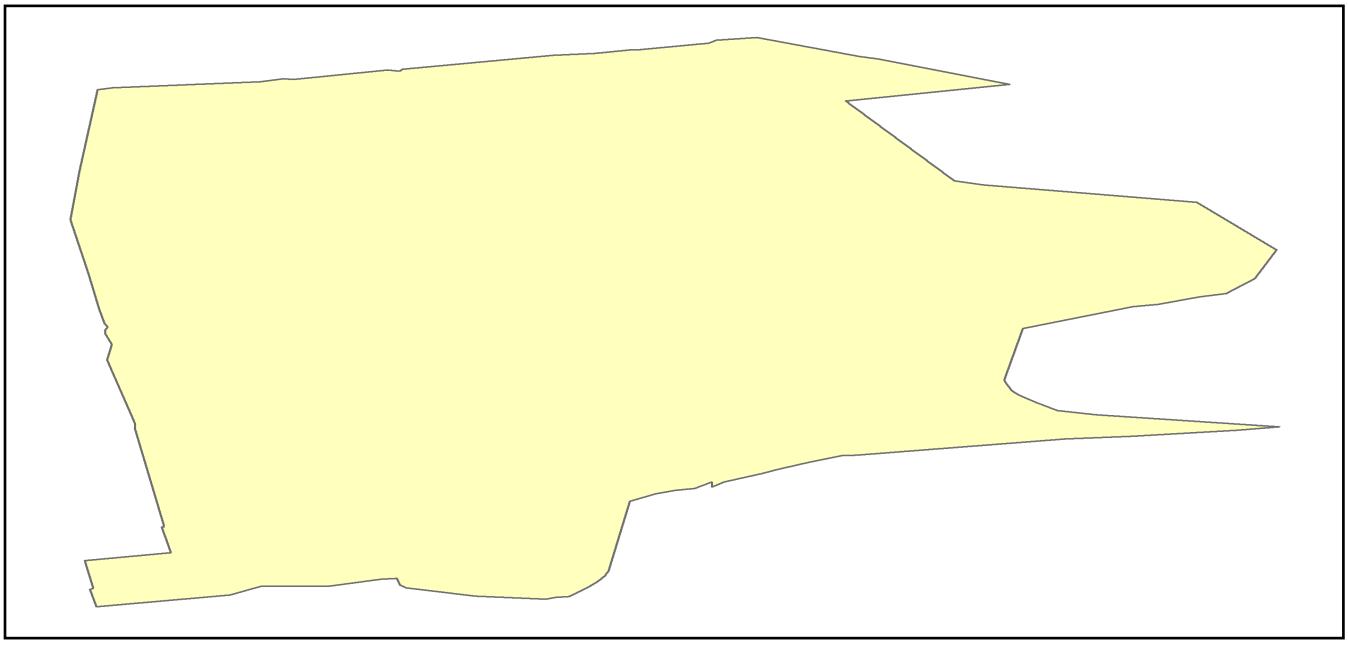
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	29	301.4110
	Segments	64	1035.5444
	Tunnels	0	0.0000
		Subtotal	**1336.9554**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	13	1039.2768
	Tunnels	0	0.0000
		Subtotal	**1039.2768**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	1	3.4902
		Subtotal	**3.4902**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**2,379.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	4.9896
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**4.9896**
Waste Water	Distribution Lines	NA	2.9938
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.9938**
Natural Gas	Distribution Lines	NA	1.9958
	Facilities	0	0.0000
	Pipelines	1	286.3532
		Subtotal	**288.3490**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**296.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,542 buildings will be at least moderately damaged. This is over 17.00 % of the buildings in the region. There are an estimated 131 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

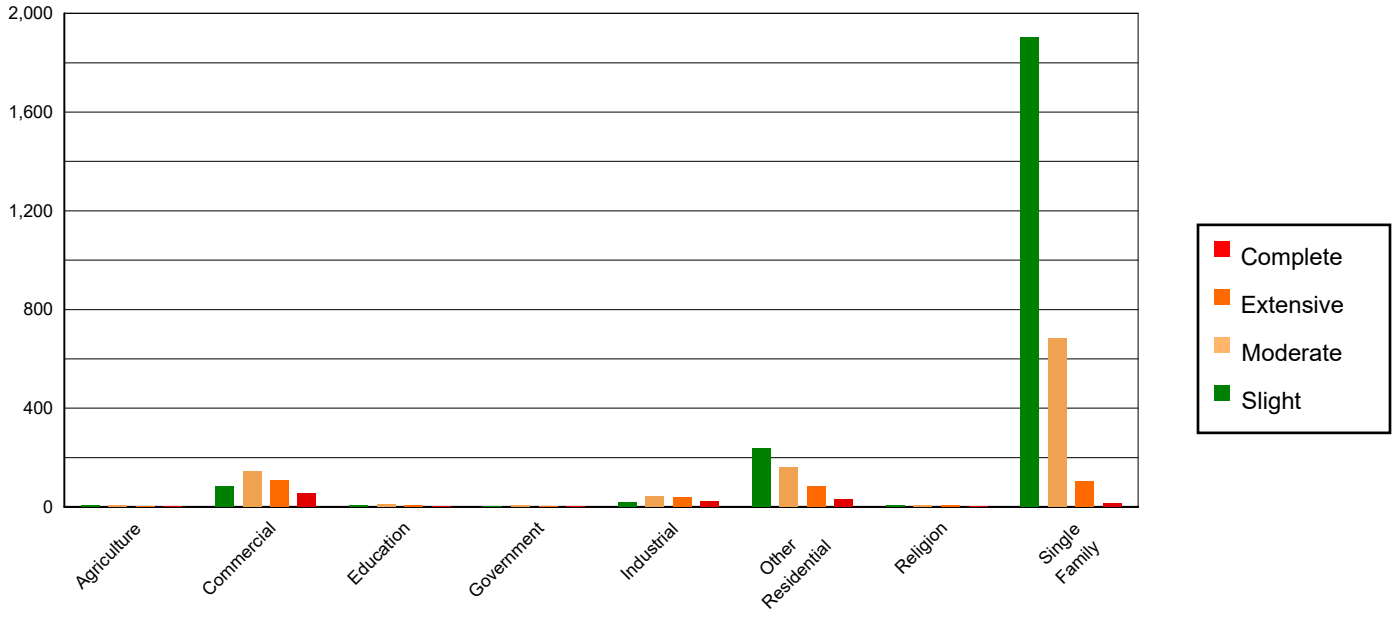


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4.00	0.07	4.82	0.21	7.47	0.70	4.36	1.25	2.34	1.79
Commercial	86.44	1.61	82.14	3.63	142.42	13.42	106.02	30.30	54.97	41.90
Education	5.88	0.11	5.16	0.23	9.36	0.88	7.13	2.04	3.48	2.65
Government	2.76	0.05	2.58	0.11	5.46	0.51	4.73	1.35	2.47	1.88
Industrial	20.18	0.38	19.70	0.87	41.99	3.96	37.91	10.83	21.22	16.17
Other Residential	524.92	9.78	235.40	10.41	161.85	15.25	81.31	23.23	29.53	22.51
Religion	16.49	0.31	8.61	0.38	8.45	0.80	5.32	1.52	2.13	1.62
Single Family	4707.24	87.69	1903.12	84.15	684.43	64.48	103.16	29.48	15.05	11.47
Total	**5,368**		**2,262**		**1,061**		**350**		**131**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	5043.93	93.96	2032.59	89.88	711.59	67.04	85.56	24.45	6.16	4.69
Steel	27.81	0.52	33.73	1.49	105.81	9.97	114.41	32.69	70.59	53.81
Concrete	6.71	0.12	8.23	0.36	27.00	2.54	29.50	8.43	16.05	12.23
Precast	4.03	0.08	2.77	0.12	6.93	0.65	7.15	2.04	2.68	2.04
RM	48.11	0.90	21.53	0.95	42.65	4.02	32.59	9.31	6.25	4.76
URM	236.12	4.40	161.30	7.13	164.72	15.52	77.20	22.06	27.31	20.82
MH	1.19	0.02	1.37	0.06	2.75	0.26	3.53	1.01	2.16	1.65
Total	**5,368**		**2,262**		**1,061**		**350**		**131**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (34.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 57.00% of the beds will be back in service. By 30 days, 83.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	0
Schools	11	0	0	0
EOCs	1	0	0	0
PoliceStations	1	0	0	0
FireStations	3	0	0	0

Transportation Lifeline Damage

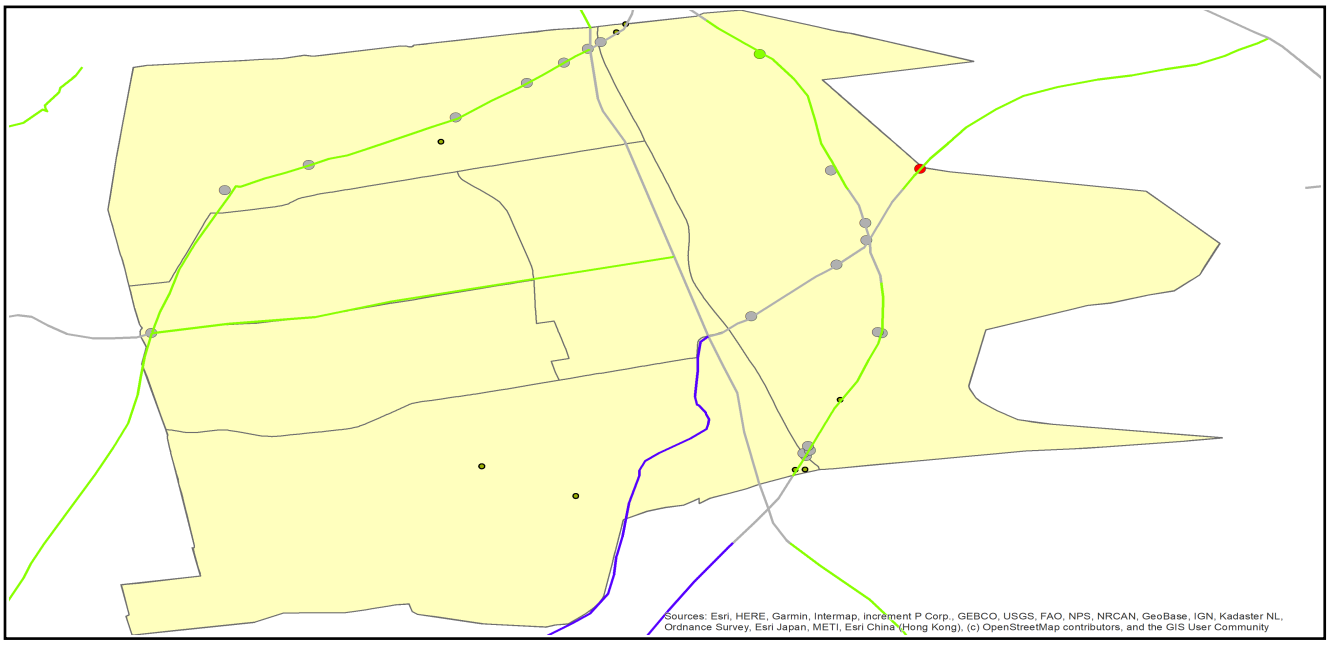


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	64	0	0	64	64
	Bridges	29	7	0	22	25
	Tunnels	0	0	0	0	0
Railways	Segments	13	0	0	8	8
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	1	0	0	1	1
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	155	0	0
Waste Water	93	0	0
Natural Gas	28	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

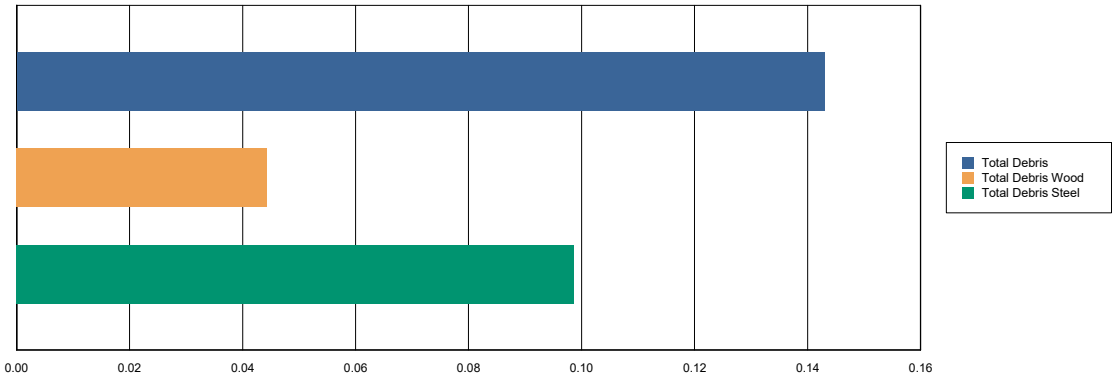
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 143,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 31.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 5,720 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



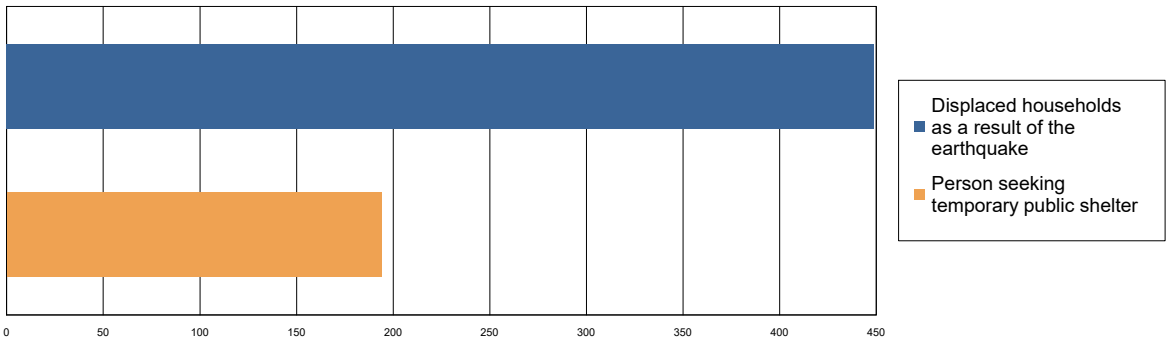
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.04	0.10	0.14	5,720 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 449 households to be displaced due to the earthquake. Of these, 194 people (out of a total population of 27,298) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
449	194

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.02	0.27	0.04	0.07
	Commuting	0.01	0.01	0.02	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.06	0.02	0.00	0.01
	Industrial	2.57	0.70	0.10	0.20
	Other-Residential	37.14	10.01	1.59	3.13
	Single Family	16.83	2.71	0.28	0.54
	Total	**58**	**14**	**2**	**4**
2 PM	Commercial	82.38	21.75	3.09	5.97
	Commuting	0.08	0.10	0.17	0.03
	Educational	47.16	12.99	2.03	3.96
	Hotels	0.01	0.00	0.00	0.00
	Industrial	19.01	5.19	0.76	1.48
	Other-Residential	10.40	2.81	0.45	0.86
	Single Family	4.80	0.80	0.09	0.16
	Total	**164**	**44**	**7**	**12**
5 PM	Commercial	69.03	18.21	2.63	4.96
	Commuting	1.73	2.12	3.80	0.72
	Educational	0.96	0.27	0.04	0.08
	Hotels	0.02	0.00	0.00	0.00
	Industrial	11.88	3.25	0.48	0.93
	Other-Residential	14.55	3.92	0.63	1.20
	Single Family	6.59	1.10	0.12	0.22
	Total	**105**	**29**	**8**	**8**

Economic Loss

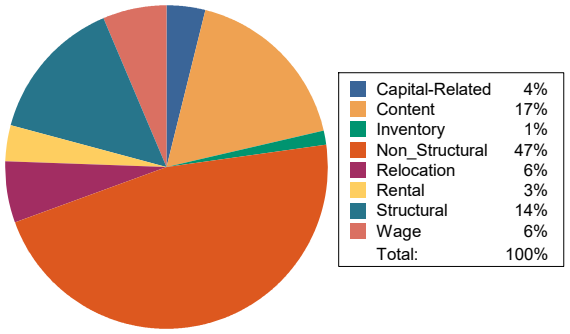
The total economic loss estimated for the earthquake is 701.02 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 683.11 (millions of dollars); 20 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 42 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

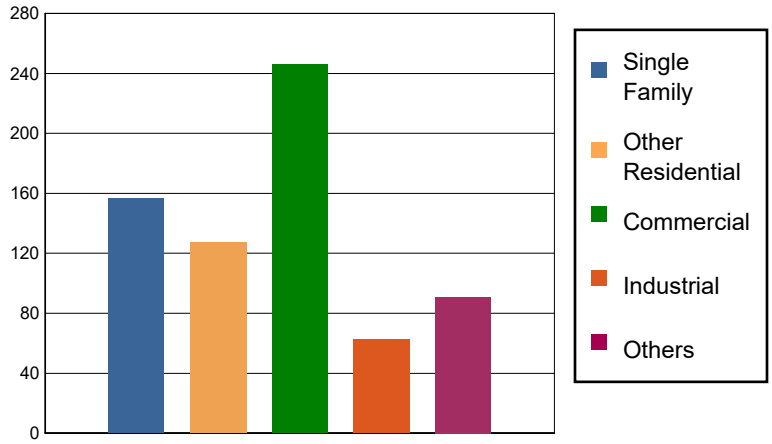


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	9.0494	31.0363	1.3680	2.6884	44.1421
	Capital-Related	0.0000	3.8523	21.3963	0.8071	0.7213	26.7770
	Rental	2.4508	9.1081	10.3012	0.3063	1.4588	23.6252
	Relocation	8.9191	3.9843	16.5283	1.9861	11.0217	42.4395
	Subtotal	**11.3699**	**25.9941**	**79.2621**	**4.4675**	**15.8902**	**136.9838**
Capital Stock Losses							
	Structural	19.0765	19.1842	34.7136	10.0770	15.3846	98.4359
	Non_Structural	92.2194	67.7232	86.8668	29.1666	42.6449	318.6209
	Content	33.6418	14.3962	38.7418	16.2103	16.3747	119.3648
	Inventory	0.0000	0.0000	6.4130	2.8087	0.4866	9.7083
	Subtotal	**144.9377**	**101.3036**	**166.7352**	**58.2626**	**74.8908**	**546.1299**
	Total	**156.31**	**127.30**	**246.00**	**62.73**	**90.78**	**683.11**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1035.5444	0.0000	0.00
	Bridges	301.4110	17.2169	5.71
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1336.9554**	**17.2169**	
Railways	Segments	1039.2768	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**1039.2768**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	3.4902	0.6840	19.60
	Subtotal	**3.4902**	**0.6840**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**2,379.72**	**17.90**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	4.9896	0.0000	0.00
	Subtotal	**4.9896**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.9938	0.0000	0.00
	Subtotal	**2.9938**	**0.0000**	
Natural Gas	Pipelines	286.3532	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.9958	0.0000	0.00
	Subtotal	**288.3490**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**296.33**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	27,298	4,277	1,171	5,449
Total Region		**27,298**	**4,277**	**1,171**	**5,449**

Hazus: Earthquake Global Risk Report

Region Name: Willington_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 33.53 square miles and contains 1 census tracts. There are over 2 thousand households in the region which has a total population of 5,566 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 968 (millions of dollars). Approximately 92.00 % of the buildings (and 75.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 766 and 7 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 2 thousand buildings in the region which have an aggregate total replacement value of 968 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 85% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 2 schools, 3 fire stations, 0 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 773.00 (millions of dollars). This inventory includes over 64.00 miles of highways, 15 bridges, 237.99 miles of pipes.

Table 1: Transportation System Lifeline Inventory

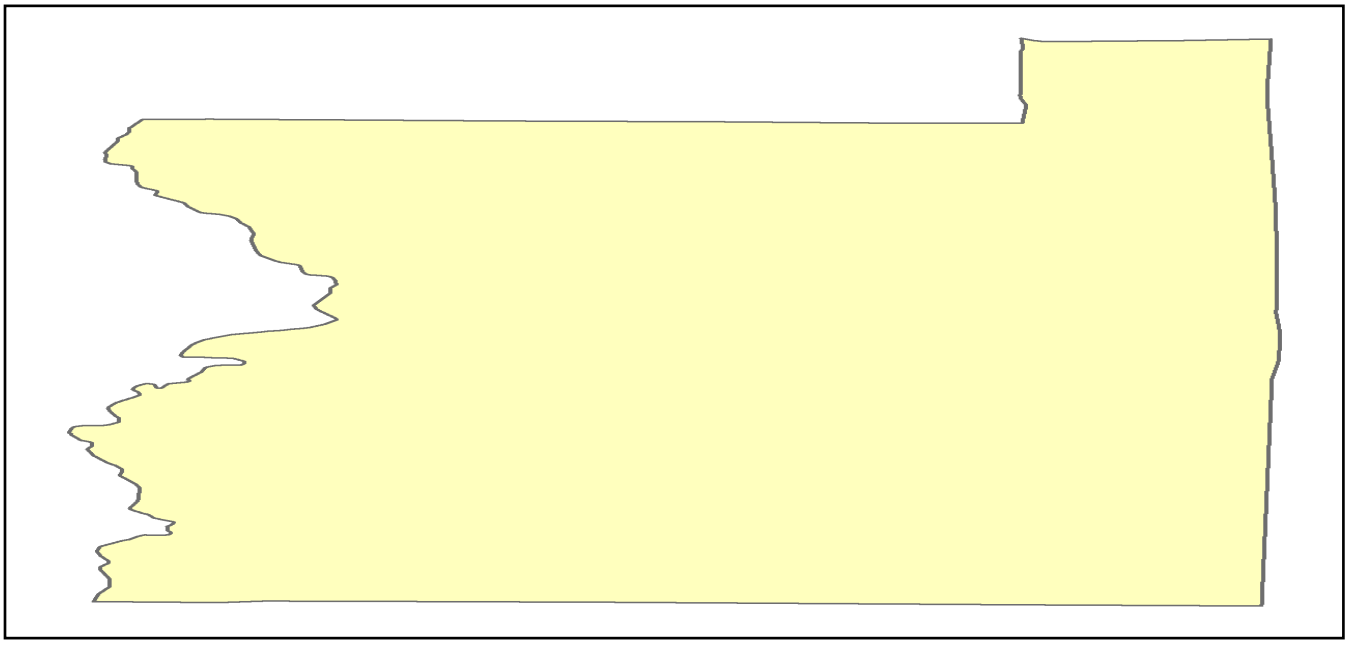
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	15	40.8744
	Segments	36	599.0823
	Tunnels	0	0.0000
		Subtotal	**639.9567**
Railways	Bridges	3	15.6300
	Facilities	0	0.0000
	Segments	9	110.9115
	Tunnels	0	0.0000
		Subtotal	**126.5415**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**766.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	3.8355
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**3.8355**
Waste Water	Distribution Lines	NA	2.3013
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.3013**
Natural Gas	Distribution Lines	NA	1.5342
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**1.5342**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**7.70**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 228 buildings will be at least moderately damaged. This is over 11.00 % of the buildings in the region. There are an estimated 12 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

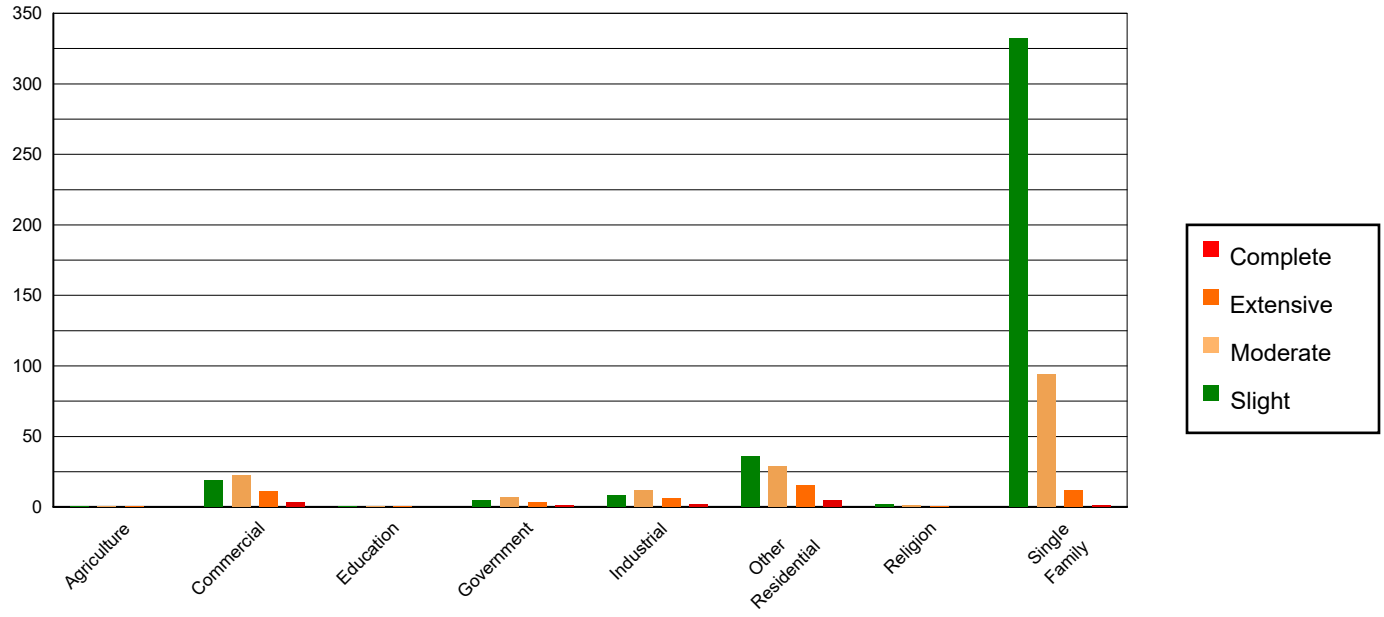


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1.18	0.08	0.75	0.19	0.68	0.41	0.30	0.61	0.09	0.76
Commercial	33.73	2.29	19.14	4.75	22.78	13.65	11.06	22.58	3.30	26.65
Education	1.16	0.08	0.63	0.16	0.77	0.46	0.35	0.71	0.10	0.79
Government	7.99	0.54	4.69	1.16	6.75	4.04	3.51	7.18	1.06	8.55
Industrial	13.37	0.91	8.03	1.99	11.53	6.91	6.17	12.59	1.90	15.34
Other Residential	111.36	7.57	36.19	8.98	28.65	17.17	15.30	31.25	4.50	36.30
Religion	4.50	0.31	1.56	0.39	1.29	0.77	0.53	1.08	0.12	0.99
Single Family	1297.40	88.22	332.15	82.39	94.39	56.58	11.75	24.00	1.32	10.61
Total	**1,471**		**403**		**167**		**49**		**12**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1350.47	91.83	343.72	85.26	90.85	54.46	7.92	16.17	0.23	1.87
Steel	22.23	1.51	15.67	3.89	28.63	17.16	16.77	34.26	5.66	45.71
Concrete	4.72	0.32	3.04	0.75	5.70	3.41	3.23	6.59	1.02	8.20
Precast	2.05	0.14	0.87	0.22	1.56	0.93	1.04	2.13	0.15	1.22
RM	15.13	1.03	4.09	1.01	5.42	3.25	2.40	4.91	0.10	0.81
URM	69.43	4.72	30.71	7.62	24.91	14.93	9.00	18.38	2.26	18.24
MH	6.64	0.45	5.01	1.24	9.78	5.86	8.60	17.56	2.97	23.95
Total	**1,471**		**403**		**167**		**49**		**12**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	2	0	0	0
EOCs	1	0	0	0
PoliceStations	0	0	0	0
FireStations	3	0	0	0

Transportation Lifeline Damage

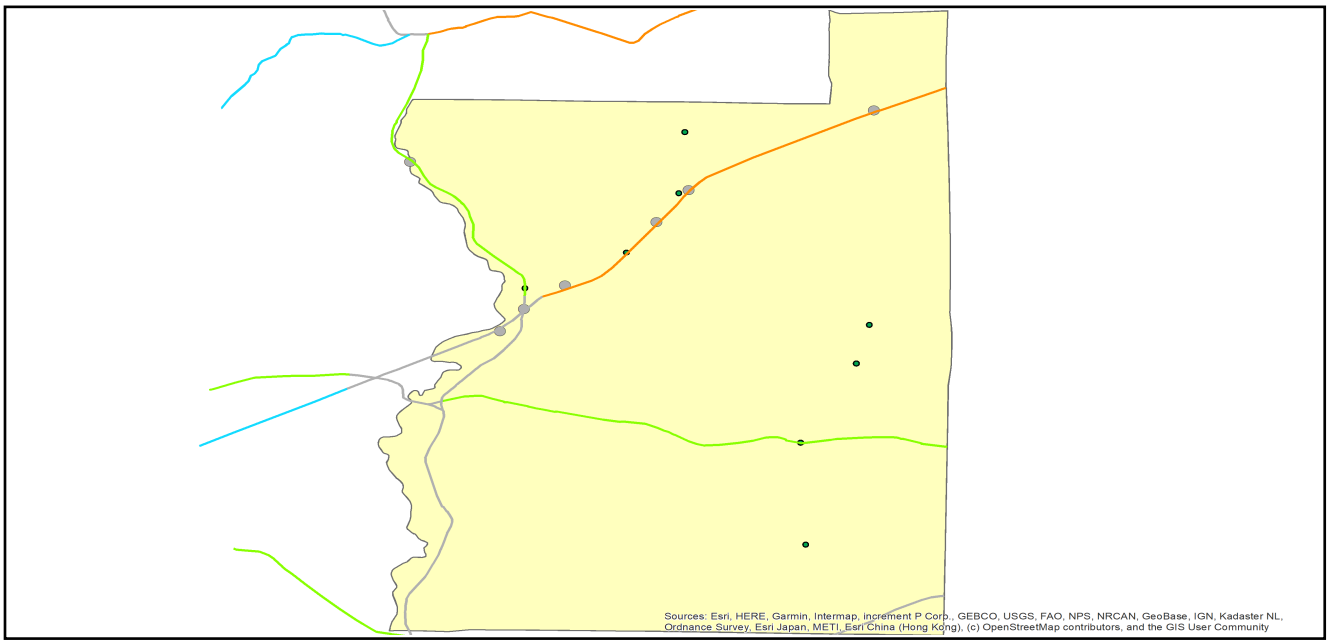


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	36	0	0	31	31
	Bridges	15	0	0	15	15
	Tunnels	0	0	0	0	0
Railways	Segments	9	0	0	9	9
	Bridges	3	0	0	3	3
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	119	0	0
Waste Water	71	0	0
Natural Gas	48	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

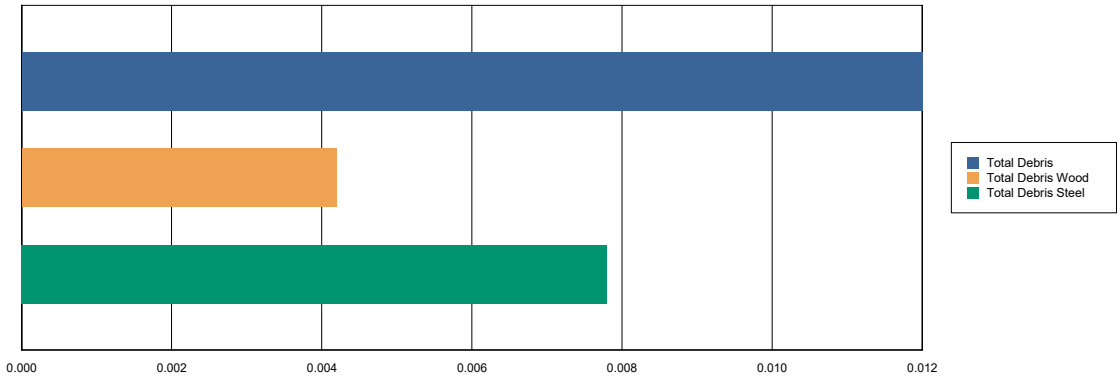
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 12,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 35.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 480 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



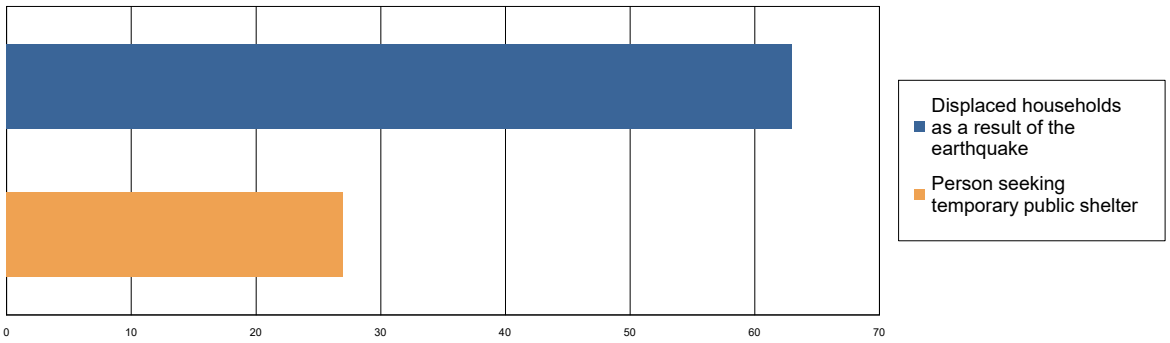
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.00	0.01	0.01	480 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 63 households to be displaced due to the earthquake. Of these, 27 people (out of a total population of 5,566) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
63	27

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.13	0.03	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.15	0.04	0.00	0.01
	Other-Residential	2.98	0.64	0.08	0.15
	Single Family	2.06	0.28	0.03	0.05
	Total	**5**	**1**	**0**	**0**
2 PM	Commercial	9.89	2.29	0.30	0.57
	Commuting	0.00	0.01	0.01	0.00
	Educational	1.93	0.46	0.07	0.13
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.09	0.26	0.03	0.07
	Other-Residential	1.02	0.22	0.03	0.05
	Single Family	0.71	0.10	0.01	0.02
	Total	**15**	**3**	**0**	**1**
5 PM	Commercial	7.23	1.68	0.22	0.42
	Commuting	0.09	0.13	0.20	0.04
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.68	0.16	0.02	0.04
	Other-Residential	1.15	0.25	0.03	0.06
	Single Family	0.80	0.11	0.01	0.02
	Total	**10**	**2**	**0**	**1**

Economic Loss

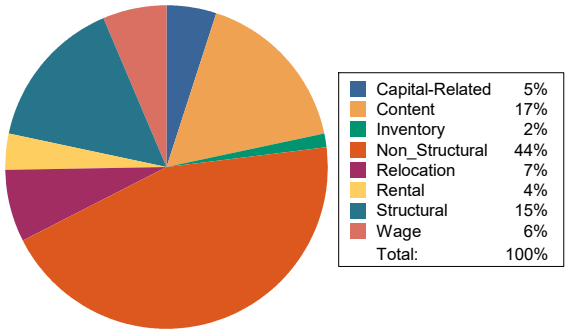
The total economic loss estimated for the earthquake is 64.79 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 63.32 (millions of dollars); 22 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 40 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

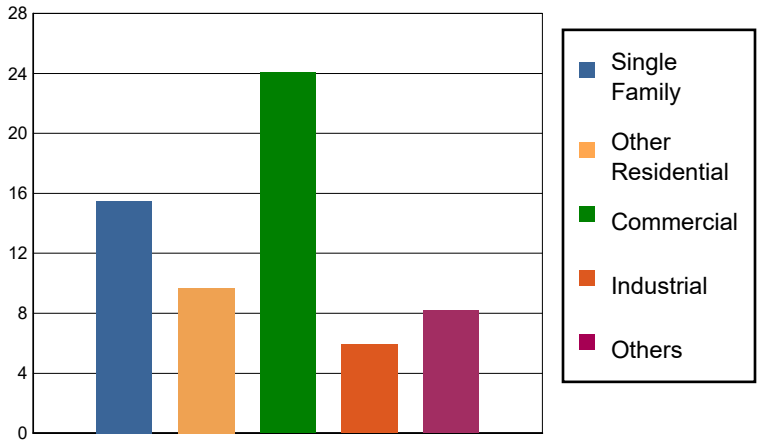


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.7230	2.6791	0.1229	0.5284	4.0534
	Capital-Related	0.0000	0.3077	2.6575	0.0832	0.0505	3.0989
	Rental	0.2382	0.7420	1.1083	0.0500	0.2152	2.3537
	Relocation	0.8560	0.4909	1.7007	0.2758	1.1062	4.4296
	Subtotal	**1.0942**	**2.2636**	**8.1456**	**0.5319**	**1.9003**	**13.9356**
Capital Stock Losses							
	Structural	1.8245	1.2173	4.1693	1.0881	1.3724	9.6716
	Non_Structural	9.1702	5.0292	7.7774	2.6373	3.5141	28.1282
	Content	3.4053	1.1734	3.2248	1.4344	1.3676	10.6055
	Inventory	0.0000	0.0000	0.7429	0.2191	0.0137	0.9757
	Subtotal	**14.4000**	**7.4199**	**15.9144**	**5.3789**	**6.2678**	**49.3810**
	Total	**15.49**	**9.68**	**24.06**	**5.91**	**8.17**	**63.32**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	599.0823	0.0000	0.00
	Bridges	40.8744	1.3751	3.36
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**639.9567**	**1.3751**	
Railways	Segments	110.9115	0.0000	0.00
	Bridges	15.6300	0.0918	0.59
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**126.5415**	**0.0918**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**766.50**	**1.47**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	3.8355	0.0000	0.00
	Subtotal	**3.8355**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.3013	0.0000	0.00
	Subtotal	**2.3013**	**0.0000**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.5342	0.0000	0.00
	Subtotal	**1.5342**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**7.67**	**0.00**	

Appendix A: County Listing for the Region

Tolland,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Tolland	5,566	727	241	968
Total Region		**5,566**	**727**	**241**	**968**

Hazus: Earthquake Global Risk Report

Region Name: Windsor_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 30.96 square miles and contains 8 census tracts. There are over 11 thousand households in the region which has a total population of 29,492 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 5,529 (millions of dollars). Approximately 90.00 % of the buildings (and 55.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 4,186 and 520 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 9 thousand buildings in the region which have an aggregate total replacement value of 5,529 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 86% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 11 schools, 4 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 4,706.00 (millions of dollars). This inventory includes over 84.51 miles of highways, 54 bridges, 395.81 miles of pipes.

Table 1: Transportation System Lifeline Inventory

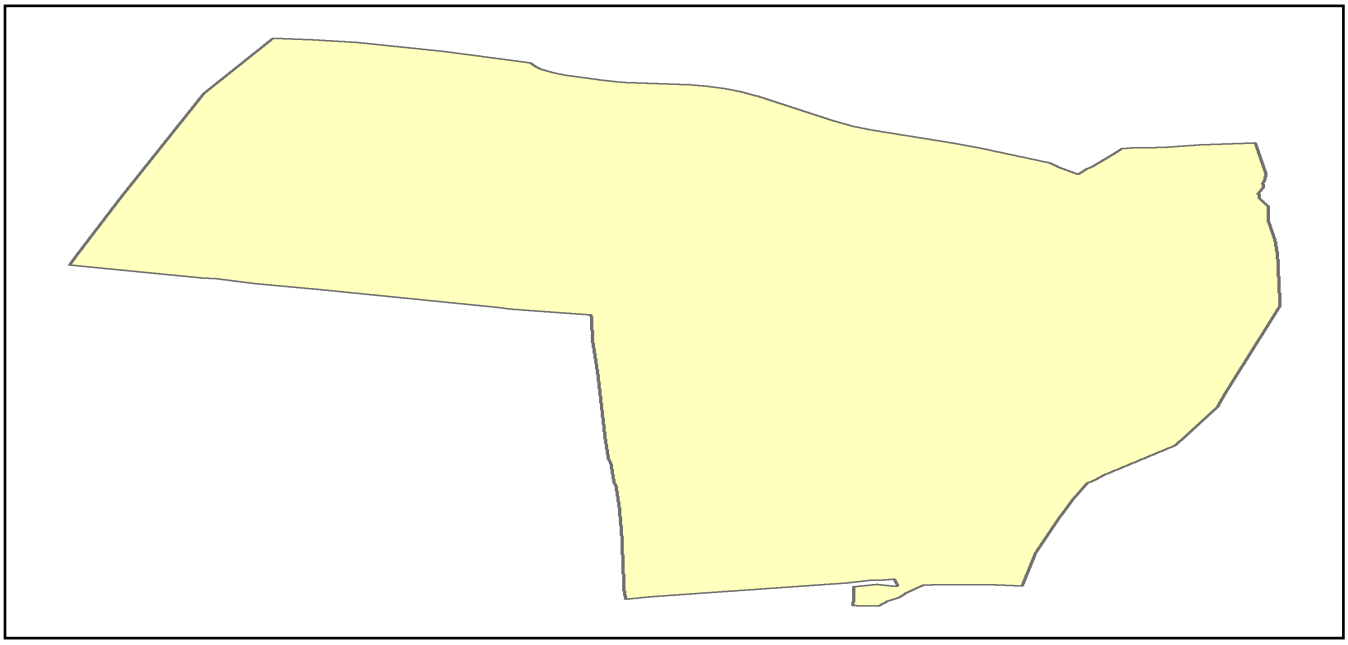
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	54	337.8651
	Segments	70	983.2277
	Tunnels	0	0.0000
		Subtotal	**1321.0928**
Railways	Bridges	6	31.2600
	Facilities	1	2.6630
	Segments	44	2831.1957
	Tunnels	0	0.0000
		Subtotal	**2865.1187**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
		Subtotal	**0.0000**
		Total	**4,186.20**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	7.4041
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**7.4041**
Waste Water	Distribution Lines	NA	4.4424
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**161.8886**
Natural Gas	Distribution Lines	NA	2.9616
	Facilities	0	0.0000
	Pipelines	1	286.3532
		Subtotal	**289.3148**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	61.4195
		Subtotal	**61.4195**
Communication	Facilities	1	0.1150
		Subtotal	**0.1150**
		Total	**520.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 912 buildings will be at least moderately damaged. This is over 9.00 % of the buildings in the region. There are an estimated 36 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

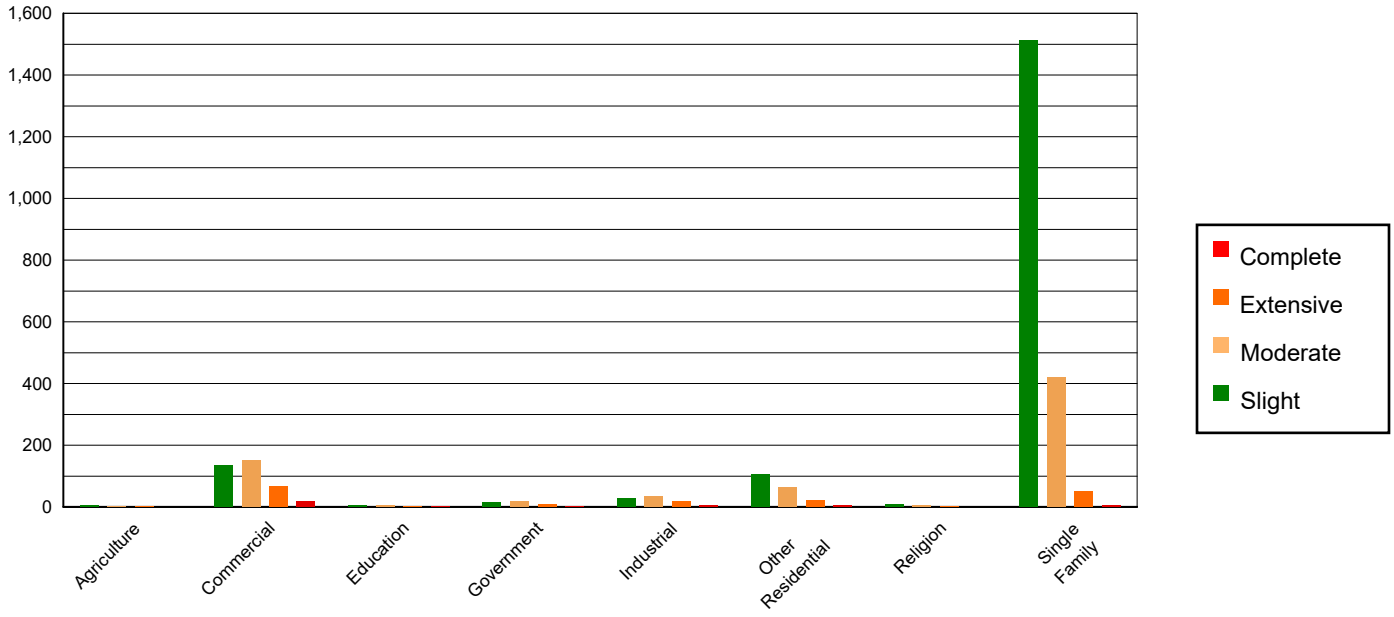


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	8.87	0.13	4.58	0.25	3.77	0.54	1.43	0.83	0.34	0.93
Commercial	273.40	3.90	136.01	7.50	149.85	21.27	65.95	38.40	17.79	48.39
Education	10.61	0.15	5.38	0.30	6.40	0.91	2.82	1.64	0.80	2.16
Government	25.65	0.37	13.81	0.76	18.83	2.67	9.08	5.29	2.63	7.15
Industrial	58.21	0.83	28.24	1.56	35.76	5.08	16.51	9.61	4.27	11.61
Other Residential	371.28	5.29	106.44	5.87	62.43	8.86	21.18	12.33	4.68	12.72
Religion	24.19	0.34	8.06	0.44	6.55	0.93	2.61	1.52	0.59	1.62
Single Family	6245.41	89.00	1510.93	83.32	420.83	59.74	52.16	30.37	5.67	15.42
Total	**7,018**		**1,813**		**704**		**172**		**37**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	6431.77	91.65	1552.68	85.62	401.93	57.06	34.65	20.17	0.89	2.42
Steel	136.22	1.94	81.98	4.52	134.90	19.15	71.04	41.37	21.64	58.86
Concrete	26.33	0.38	14.77	0.81	24.95	3.54	12.29	7.16	3.53	9.60
Precast	12.52	0.18	4.57	0.25	7.21	1.02	4.21	2.45	0.52	1.42
RM	73.46	1.05	18.25	1.01	23.25	3.30	9.90	5.77	0.40	1.08
URM	337.31	4.81	141.20	7.79	112.18	15.93	39.66	23.09	9.79	26.63
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**7,018**		**1,813**		**704**		**172**		**37**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	11	0	0	5
EOCs	1	0	0	0
PoliceStations	1	0	0	0
FireStations	4	0	0	2

Transportation Lifeline Damage

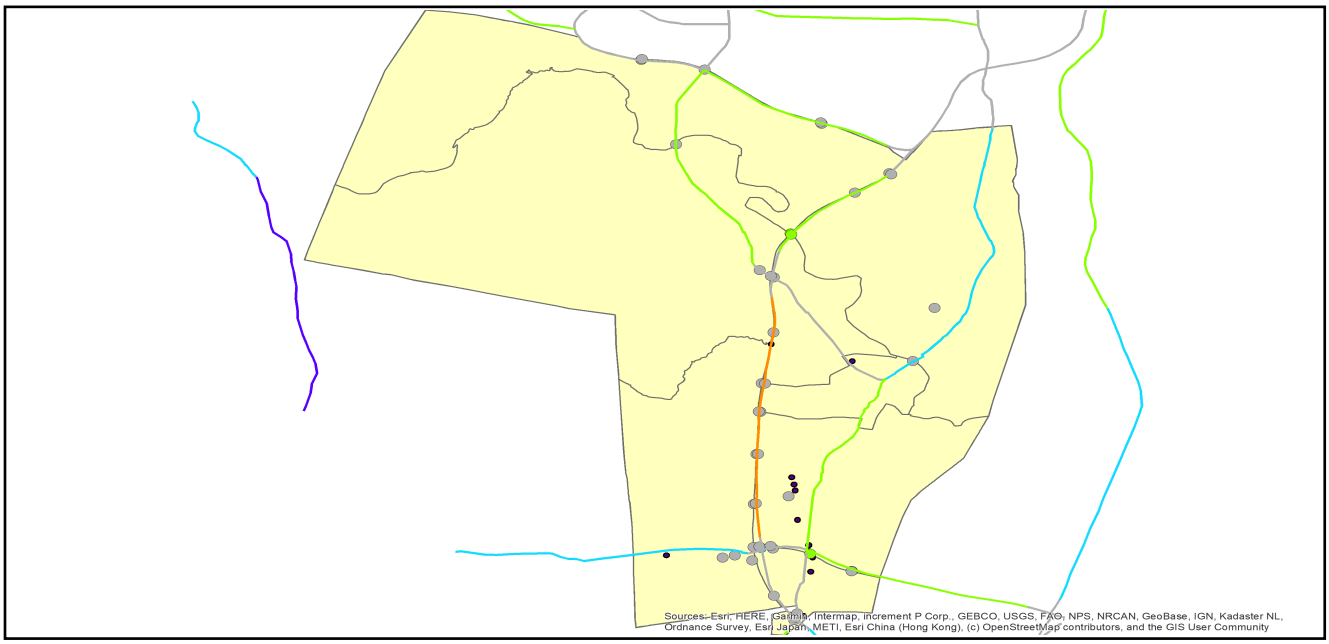


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	70	0	0	51	51
	Bridges	54	0	0	54	54
	Tunnels	0	0	0	0	0
Railways	Segments	44	0	0	25	25
	Bridges	6	0	0	6	6
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	0	0
Communication	1	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	230	0	0
Waste Water	138	0	0
Natural Gas	28	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

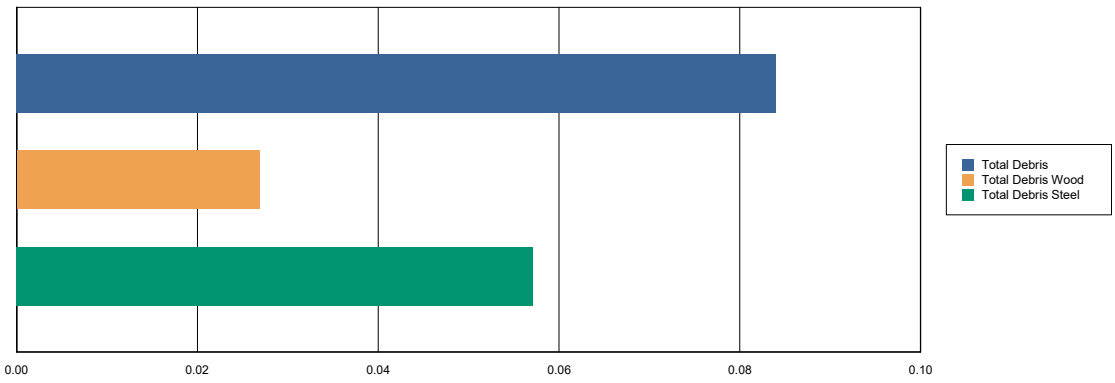
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 84,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 32.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 3,360 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



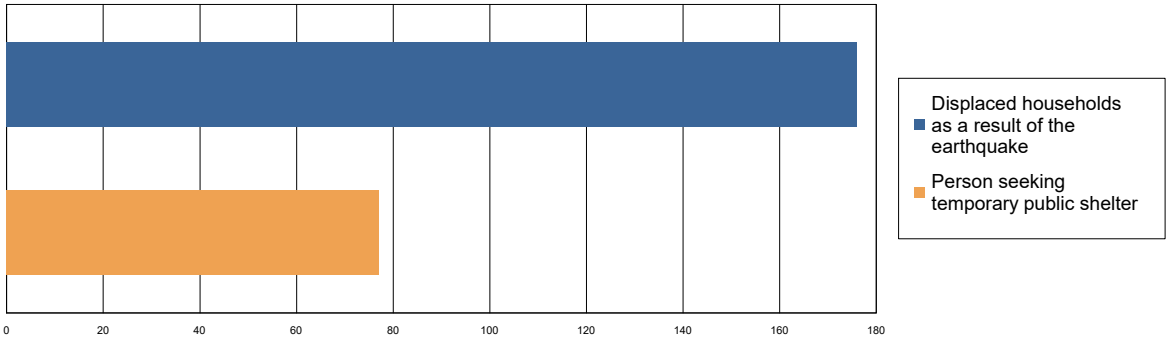
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.03	0.06	0.08	3,360 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 176 households to be displaced due to the earthquake. Of these, 77 people (out of a total population of 29,492) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
176	77

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.83	0.18	0.02	0.05
	Commuting	0.00	0.00	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.02	0.01	0.00	0.00
	Industrial	0.73	0.16	0.02	0.04
	Other-Residential	7.72	1.66	0.22	0.44
	Single Family	9.91	1.34	0.12	0.24
	Total	**19**	**3**	**0**	**1**
2 PM	Commercial	53.25	11.95	1.54	2.97
	Commuting	0.02	0.03	0.05	0.01
	Educational	22.38	5.41	0.78	1.52
	Hotels	0.00	0.00	0.00	0.00
	Industrial	5.41	1.17	0.15	0.28
	Other-Residential	2.05	0.44	0.06	0.12
	Single Family	2.68	0.38	0.04	0.07
	Total	**86**	**19**	**3**	**5**
5 PM	Commercial	38.96	8.81	1.15	2.19
	Commuting	0.50	0.66	1.13	0.22
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.01	0.00	0.00	0.00
	Industrial	3.38	0.73	0.09	0.18
	Other-Residential	3.04	0.66	0.09	0.17
	Single Family	3.84	0.54	0.05	0.10
	Total	**50**	**11**	**3**	**3**

Economic Loss

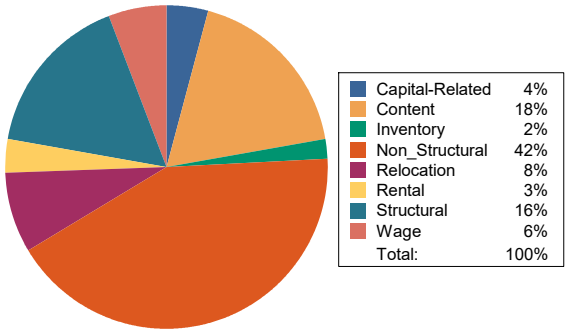
The total economic loss estimated for the earthquake is 382.68 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 377.25 (millions of dollars); 21 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 24 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

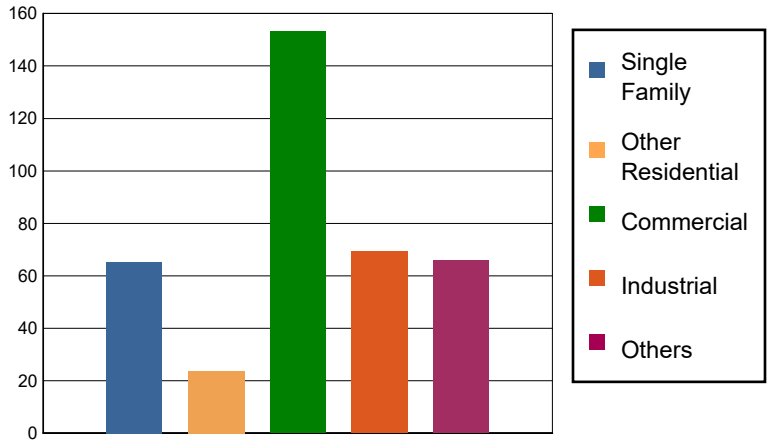


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.3516	16.4298	1.2863	2.5068	21.5745
	Capital-Related	0.0000	0.5750	13.4577	0.7749	0.5098	15.3174
	Rental	1.0044	2.0412	7.7249	0.8086	1.5190	13.0981
	Relocation	3.6012	1.1387	12.3964	4.2094	9.1657	30.5114
	Subtotal	**4.6056**	**5.1065**	**50.0088**	**7.0792**	**13.7013**	**80.5014**
Capital Stock Losses							
	Structural	7.7333	2.8696	27.2198	12.3618	11.6858	61.8703
	Non_Structural	38.7013	12.6298	49.8325	28.7459	29.1613	159.0708
	Content	14.2375	3.0431	21.6488	18.4914	11.2175	68.6383
	Inventory	0.0000	0.0000	4.4017	2.5277	0.2433	7.1727
	Subtotal	**60.6721**	**18.5425**	**103.1028**	**62.1268**	**52.3079**	**296.7521**
	Total	**65.28**	**23.65**	**153.11**	**69.21**	**66.01**	**377.25**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	983.2277	0.0000	0.00
	Bridges	337.8651	4.8847	1.45
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1321.0928**	**4.8847**	
Railways	Segments	2831.1957	0.0000	0.00
	Bridges	31.2600	0.1677	0.54
	Tunnels	0.0000	0.0000	0.00
	Facilities	2.6630	0.3687	13.85
	Subtotal	**2865.1187**	**0.5364**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**4,186.21**	**5.42**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	7.4041	0.0000	0.00
	Subtotal	**7.4041**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	4.4424	0.0000	0.00
	Subtotal	**161.8886**	**0.0000**	
Natural Gas	Pipelines	286.3532	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.9616	0.0000	0.00
	Subtotal	**289.3148**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	61.4195	0.0000	0.00
	Subtotal	**61.4195**	**0.0000**	
Communication	Facilities	0.1150	0.0000	0.00
	Subtotal	**0.1150**	**0.0000**	
	Total	**520.14**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	29,492	3,063	2,465	5,529
Total Region		**29,492**	**3,063**	**2,465**	**5,529**

Hazus: Earthquake Global Risk Report

Region Name: Windsor_Locks_EQ

Earthquake Scenario: East Haddam 1791

Print Date: July 11, 2023

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	
Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 9.36 square miles and contains 4 census tracts. There are over 5 thousand households in the region which has a total population of 12,613 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 2,973 (millions of dollars). Approximately 86.00 % of the buildings (and 50.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,616 and 561 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 2,973 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 82% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 4 schools, 4 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 3,177.00 (millions of dollars). This inventory includes over 57.17 miles of highways, 11 bridges, 170.88 miles of pipes.

Table 1: Transportation System Lifeline Inventory

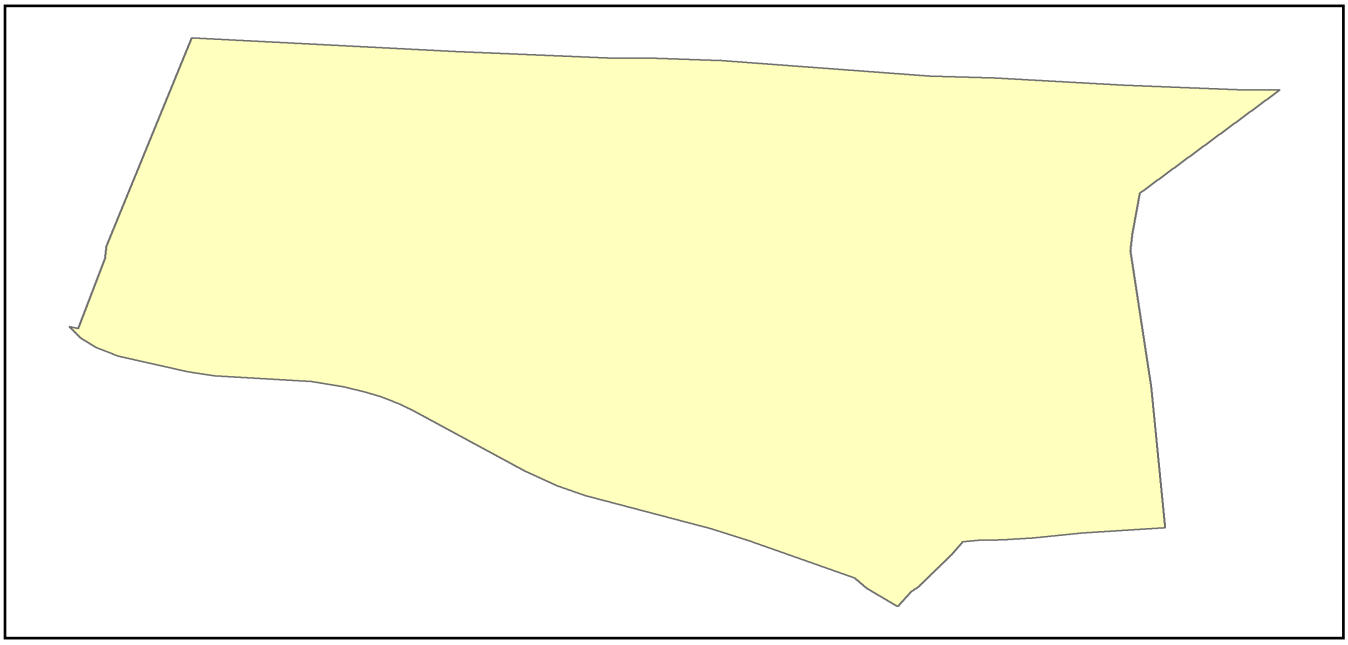
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	11	315.5634
	Segments	48	626.2299
	Tunnels	0	0.0000
		Subtotal	**941.7933**
Railways	Bridges	0	0.0000
	Facilities	1	2.6630
	Segments	18	1425.0364
	Tunnels	0	0.0000
		Subtotal	**1427.6994**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	1	198.5330
	Runways	3	48.8044
		Subtotal	**247.3374**
		Total	**2,616.80**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	2.8709
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**2.8709**
Waste Water	Distribution Lines	NA	1.7225
	Facilities	1	157.4462
	Pipelines	0	0.0000
		Subtotal	**159.1687**
Natural Gas	Distribution Lines	NA	1.1484
	Facilities	0	0.0000
	Pipelines	1	286.3532
		Subtotal	**287.5016**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	2	112.3614
		Subtotal	**112.3614**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**561.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	East Haddam 1791
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-72.40
Latitude of Epicenter	41.50
Earthquake Magnitude	6.40
Depth (km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 387 buildings will be at least moderately damaged. This is over 8.00 % of the buildings in the region. There are an estimated 11 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

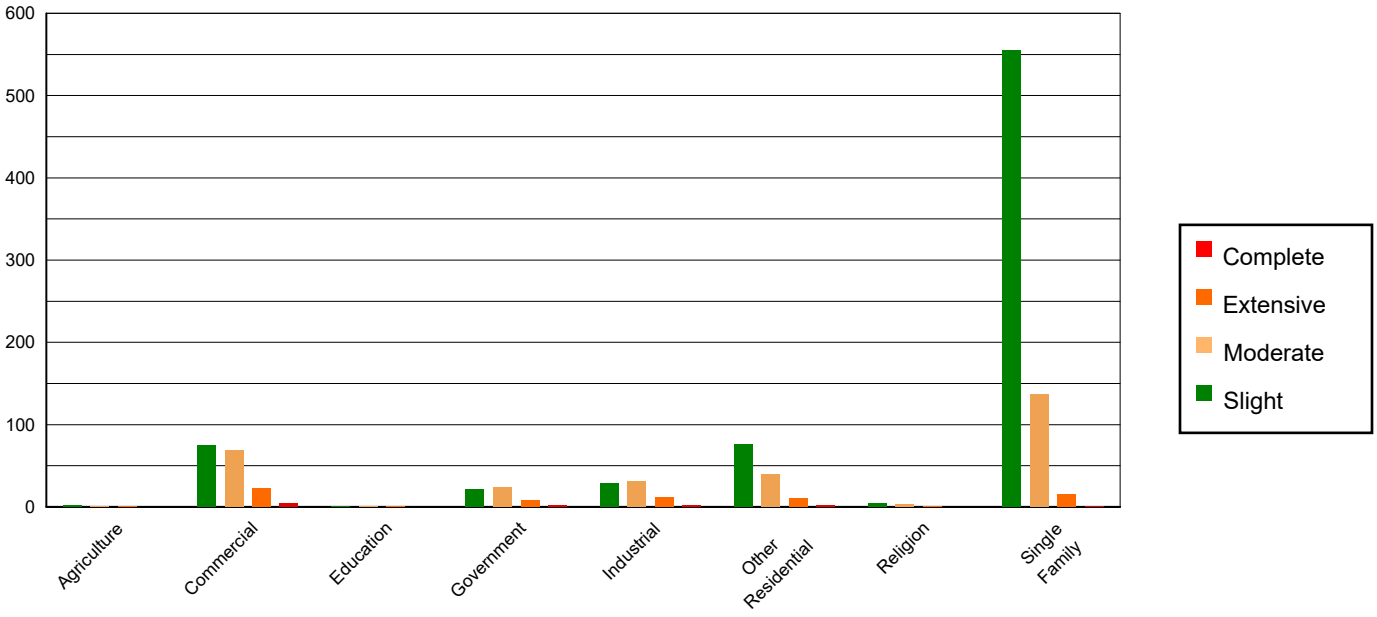


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4.37	0.12	1.83	0.24	1.32	0.43	0.42	0.59	0.07	0.60
Commercial	188.21	5.18	74.14	9.74	69.06	22.57	23.12	32.98	4.47	38.31
Education	3.19	0.09	1.21	0.16	1.16	0.38	0.36	0.51	0.08	0.67
Government	51.07	1.41	21.29	2.80	23.63	7.72	8.21	11.72	1.79	15.34
Industrial	71.21	1.96	28.80	3.78	31.38	10.26	11.42	16.29	2.18	18.70
Other Residential	337.19	9.28	75.57	9.93	39.71	12.98	10.02	14.29	1.52	12.97
Religion	15.17	0.42	3.99	0.52	2.83	0.93	0.86	1.22	0.15	1.29
Single Family	2964.46	81.56	554.56	72.84	136.88	44.74	15.69	22.38	1.42	12.13
Total	**3,635**		**761**		**306**		**70**		**12**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3175.83	87.37	594.19	78.04	133.83	43.74	10.09	14.39	0.05	0.44
Steel	136.23	3.75	63.96	8.40	84.32	27.56	31.77	45.33	7.06	60.40
Concrete	29.09	0.80	12.43	1.63	15.90	5.20	4.64	6.62	0.76	6.47
Precast	11.67	0.32	3.51	0.46	4.76	1.56	2.15	3.07	0.13	1.08
RM	61.96	1.70	11.96	1.57	12.92	4.22	4.39	6.26	0.09	0.73
URM	220.08	6.05	75.34	9.89	54.24	17.73	17.05	24.32	3.61	30.88
MH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**3,635**		**761**		**306**		**70**		**12**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	4	0	0	4
EOCs	1	0	0	1
PoliceStations	2	0	0	2
FireStations	4	0	0	4

Transportation Lifeline Damage

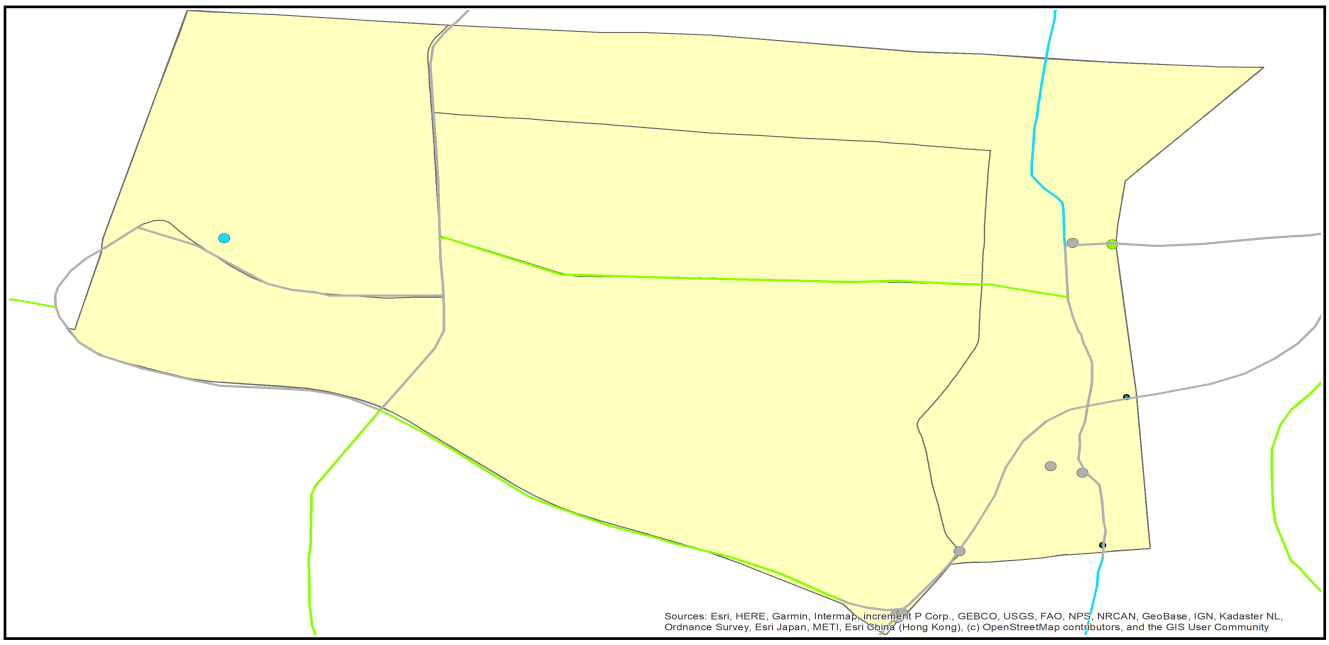


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	48	0	0	48	48
	Bridges	11	0	0	11	11
	Tunnels	0	0	0	0	0
Railways	Segments	18	0	0	18	18
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	3	0	0	3	3

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	2	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	89	0	0
Waste Water	54	0	0
Natural Gas	28	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

Induced Earthquake Damage

Fire Following Earthquake

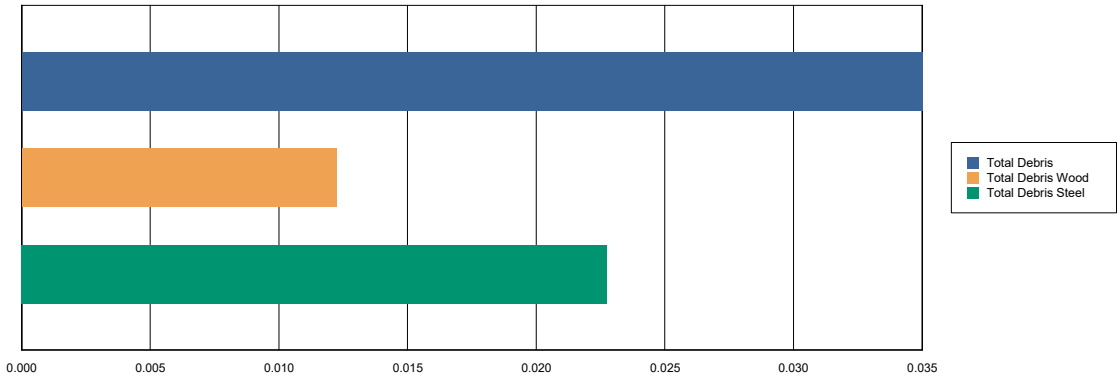
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 35,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 35.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 1,400 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



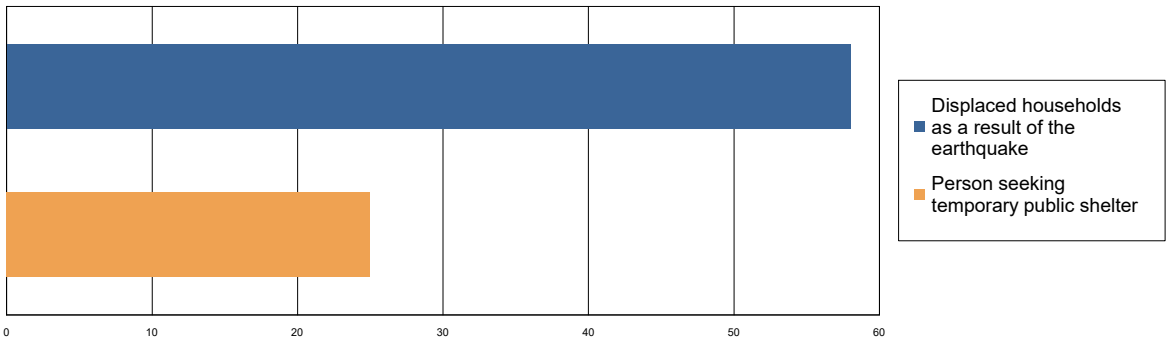
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.01	0.02	0.04	1,400 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 58 households to be displaced due to the earthquake. Of these, 25 people (out of a total population of 12,613) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
58	25

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.32	0.06	0.01	0.02
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.07	0.01	0.00	0.00
	Industrial	0.39	0.08	0.01	0.02
	Other-Residential	3.57	0.66	0.08	0.15
	Single Family	2.58	0.32	0.03	0.05
	Total	**7**	**1**	**0**	**0**
2 PM	Commercial	18.41	3.78	0.46	0.89
	Commuting	0.01	0.01	0.01	0.00
	Educational	3.41	0.72	0.09	0.18
	Hotels	0.01	0.00	0.00	0.00
	Industrial	2.88	0.59	0.07	0.14
	Other-Residential	0.96	0.18	0.02	0.04
	Single Family	0.68	0.09	0.01	0.02
	Total	**26**	**5**	**1**	**1**
5 PM	Commercial	12.04	2.48	0.30	0.58
	Commuting	0.14	0.18	0.31	0.06
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.02	0.00	0.00	0.00
	Industrial	1.80	0.37	0.04	0.09
	Other-Residential	1.41	0.27	0.03	0.06
	Single Family	1.00	0.13	0.01	0.02
	Total	**16**	**3**	**1**	**1**

Economic Loss

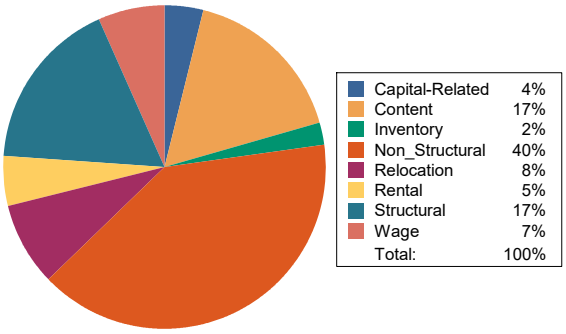
The total economic loss estimated for the earthquake is 176.11 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 154.99 (millions of dollars); 24 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 25 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

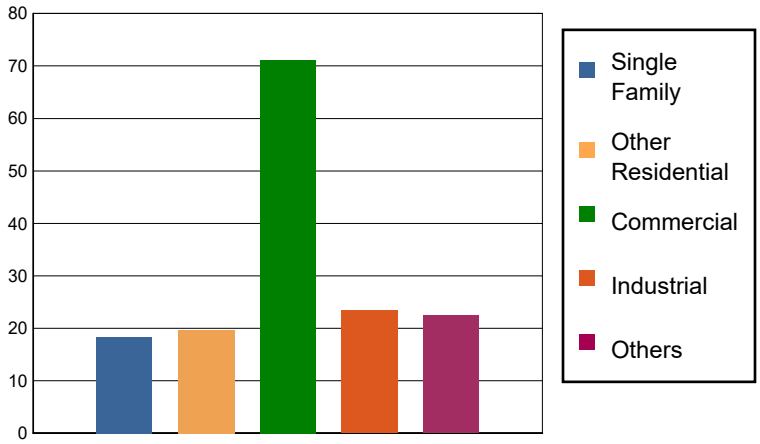


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	2.1009	6.4957	0.5681	1.3038	10.4685
	Capital-Related	0.0000	0.8920	4.7708	0.3396	0.1383	6.1407
	Rental	0.2895	2.6181	3.9649	0.2579	0.7507	7.8811
	Relocation	1.0283	0.7090	6.3839	1.3669	3.3109	12.7990
	Subtotal	**1.3178**	**6.3200**	**21.6153**	**2.5325**	**5.5037**	**37.2893**
Capital Stock Losses							
	Structural	2.2314	2.0082	14.0950	4.3045	3.8118	26.4509
	Non_Structural	10.9554	9.1857	22.9833	9.6116	9.3827	62.1187
	Content	3.8609	2.1867	10.0344	6.0743	3.6388	25.7951
	Inventory	0.0000	0.0000	2.3918	0.9055	0.0379	3.3352
	Subtotal	**17.0477**	**13.3806**	**49.5045**	**20.8959**	**16.8712**	**117.6999**
	Total	**18.37**	**19.70**	**71.12**	**23.43**	**22.37**	**154.99**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	626.2299	0.0000	0.00
	Bridges	315.5634	1.6486	0.52
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**941.7933**	**1.6486**	
Railways	Segments	1425.0364	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	2.6630	0.2870	10.78
	Subtotal	**1427.6994**	**0.2870**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	198.5330	19.1803	9.66
	Runways	48.8044	0.0000	0.00
	Subtotal	**247.3374**	**19.1803**	
	Total	**2,616.83**	**21.12**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.8709	0.0000	0.00
	Subtotal	**2.8709**	**0.0000**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	157.4462	0.0000	0.00
	Distribution Lines	1.7225	0.0000	0.00
	Subtotal	**159.1687**	**0.0000**	
Natural Gas	Pipelines	286.3532	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.1484	0.0000	0.00
	Subtotal	**287.5016**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	112.3614	0.0000	0.00
	Subtotal	**112.3614**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**561.90**	**0.00**	

Appendix A: County Listing for the Region

Hartford,CT

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Connecticut					
	Hartford	12,613	1,494	1,478	2,973
Total Region		**12,613**	**1,494**	**1,478**	**2,973**